



public works

Department:
Public Works
REPUBLIC OF SOUTH AFRICA

COEGA DEVELOPMENT CORPORATION (PTY) LTD

CONTRACT No. CDC/163/25

(WCS NO: 04521 & WCS: 056691)

FOR

ELLIOT MAGISTRATE COURT:

**PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE
ENTIRE FACILITY AND CAPITAL WORKS TO INCLUDE
CONSTRUCTION OF ADDITIONAL ACCOMMODATION**

CIDB GRADE: 7GB OR HIGHER

BOOK 2 (THE RETURNABLE)

CLOSING DATE: 24 JUNE 2025

TIME: 12:00

Classification: PUBLIC

PREPARED FOR:

Coega Development Corporation (Pty) Ltd
Harraway House, No. 12
Pearce Street, Berea
East London
5241

PREPARED BY:

Clarence Bobie Incorporated
90 Ebdon Street
Queenstown
5319

NAME OF TENDERER: _____

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**SBD1
PART A
INVITATION TO BID**

YOU ARE HEREBY INVITED TO BID FOR REQUIREMENTS OF THE (NAME OF DEPARTMENT/ PUBLIC ENTITY)									
BID NUMBER:	CDC/163/25	CLOSING DATE: 24 JUNE 2025				CLOSING TIME:		12H00	
DESCRIPTION	ELLIOT MAGISTRATE COURT								
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT (STREET ADDRESS)									
Mthatha Office; Ground Floor									
76 Blakeway									
Mthatha									
5001									
BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO					TECHNICAL ENQUIRIES MAY BE DIRECTED TO:				
CONTACT PERSON	ZINE MTANDA				CONTACT PERSON				
TELEPHONE NUMBER					TELEPHONE NUMBER				
FACSIMILE NUMBER					FACSIMILE NUMBER				
E-MAIL ADDRESS	mthathatenders@coega.co.za				E-MAIL ADDRESS				
SUPPLIER INFORMATION									
NAME OF BIDDER									
POSTAL ADDRESS									
STREET ADDRESS									
TELEPHONE NUMBER	CODE				NUMBER				
CELLPHONE NUMBER									
FACSIMILE NUMBER	CODE				NUMBER				
E-MAIL ADDRESS									
VAT REGISTRATION NUMBER									
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:				OR	CENTRAL SUPPLIER DATABASE No:	MAAA		
ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES OFFERED?	<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES ENCLOSE PROOF]				ARE YOU A FOREIGN BASED SUPPLIER FOR THE GOODS /SERVICES OFFERED?			<input type="checkbox"/> Yes <input type="checkbox"/> No [IF YES, ANSWER THE QUESTIONNAIRE BELOW]	
QUESTIONNAIRE TO BIDDING FOREIGN SUPPLIERS									
IS THE ENTITY A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?								<input type="checkbox"/> YES <input type="checkbox"/> NO	
DOES THE ENTITY HAVE A BRANCH IN THE RSA?								<input type="checkbox"/> YES <input type="checkbox"/> NO	
DOES THE ENTITY HAVE A PERMANENT ESTABLISHMENT IN THE RSA?								<input type="checkbox"/> YES <input type="checkbox"/> NO	
DOES THE ENTITY HAVE ANY SOURCE OF INCOME IN THE RSA?								<input type="checkbox"/> YES <input type="checkbox"/> NO	
IS THE ENTITY LIABLE IN THE RSA FOR ANY FORM OF TAXATION?								<input type="checkbox"/> YES <input type="checkbox"/> NO	
IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN IT IS NOT A REQUIREMENT TO REGISTER FOR A TAX COMPLIANCE STATUS SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 BELOW.									

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PART B
TERMS AND CONDITIONS FOR BIDDING

1. BID SUBMISSION:
1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.
1.2. ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED (NOT TO BE RE-TYPED) OR IN THE MANNER PRESCRIBED IN THE BID DOCUMENT.
1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.
1.4. THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM (SBD7).
2. TAX COMPLIANCE REQUIREMENTS
2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.
2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.
2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.
2.4 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.
2.5 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED; EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.
2.6 WHERE NO TCS PIN IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.
2.7 NO BIDS WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE, COMPANIES WITH DIRECTORS WHO ARE PERSONS IN THE SERVICE OF THE STATE, OR CLOSE CORPORATIONS WITH MEMBERS PERSONS IN THE SERVICE OF THE STATE."

NB: FAILURE TO PROVIDE / OR COMPLY WITH ANY OF THE ABOVE PARTICULARS MAY RENDER THE BID INVALID.

SIGNATURE OF BIDDER:

CAPACITY UNDER WHICH THIS BID IS SIGNED:
(Proof of authority must be submitted e.g. company resolution)

DATE:

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RESPONSIVENESS CHECKLIST

ITEM NO.	DESCRIPTION
1	Completed and signed Invitation to Bid (SBD 1) . In case of a Joint Venture/Consortium the information of all entities (Members of the JV/Consortiums) should be reflected on the SBD 1 Form.
2	Completed and signed Bidder's Disclosure (SBD 4) . (in case of a Joint Venture/Consortium, a separate SBD 4 form in respect of <u>each party to</u> the JV must be completed and submitted.
3	Completed and Signed Attendance Register at the mandatory briefing meeting. The attendance register must be completed in the name of the entity that will tender. One person cannot represent more than one company.
4	Bidders must be registered with the Construction Industry Development Board (CIDB) and must submit proof of an active CIDB grading of 7GB or higher. Emerging contractors with CIDB grading designation of 6GB PE are not eligible to make submission and will not be considered.
5	A Signed letter of intent to enter into a Joint Venture/Consortium. To be signed by all parties to the Joint Venture/ Consortium (Where applicable)
6	Completed and Signed Certificate of Authority of Signatory to be signed by all bidders. In case of a Joint Venture/ Consortium, the Authority of Lead Partner to sign JV/Consortium documents must ALSO be provided and signed by all parties in the JV. Proof of authority to sign may be submitted in the form of company resolution.
7	Signed Attendance Register at the mandatory briefing meeting. It must be completed in the name of the entity that will tender. One person cannot represent more than one company
8	<p>Demonstrated experience (past performance) in comparable projects (e.g., Construction of building facility). This criterion covers the experience and knowledge that the bidder has with working on other construction projects that are comparable in terms of complexity, size, value and construction durations.</p> <p>Bidders are to provide details on one construction projects with the minimum value of R9 million that have been completed in the past 5 years.</p> <p>Bidders MUST provide appointments letters, completion certificates <u>and</u> performance reports (all three documents must be submitted) from the previous employer or consultants that they have worked with. Details of contactable reference for a minimum of 1 (one) project listed are to be included.</p>

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ITEM NO.	DESCRIPTION
9	<p>An original fully completed, priced and handwritten Bill of Quantities (including Mechanical, Electrical BoQ & SHE BoQ (where applicable), must be filled in clearly legible with permanent black ink.</p> <p>In cases where the P&G's is not priced the bidder must explicitly indicate as such. Failure to provide the total amount for P&G's or to state if the amount is covered elsewhere will result in immediate disqualification. The bidder must expressly state "included or elsewhere covered" for the line items that are considered to be covered elsewhere in measured works items. Non- compliance will lead to immediate disqualification.</p> <p>Copies of the priced BoQ, alternatively scanned copies of priced Bills of Quantities are not acceptable and may result in disqualification</p>
10	Fully completed and Signed Form of Offer.

TENDER DOCUMENT CHECKLIST

Tenderers must complete this document checklist to ensure that all information is completed in the Tender Document.

ITEMS		CHECKED (by the Contractor)
1)	Correct Tender Offer of Amount carried forward to Cover Page and Form of Offer and Acceptance in Section C1	
2)	All pages requiring signatures signed by Tenderer	
3)	Bills of Quantities	
i)	Section Summaries and Final Summary Completed in BLACK INK	
ii)	Corrections crossed out and initialled	
4)	All returnable Documents and Schedules submitted	
A	Authority for Signatory	
B	Schedule of Work carried out by Tenderer	
C	Proposed Key Personnel	
D	Schedule of Proposed-Subcontractors	
F	Financial References	
G	Estimated Monthly Expenditure	
H	POPIA: Consent Form	
I	Details of Amendments and Qualifications	
K	EME / QSE Target Form	
L	Record of Addenda to Tender Document	
N	Joint Venture Disclosure Form	
O	BBBEE Validation & CIDB Certificate	
P	Quality Control System and Procedures	
SBD 1	Invitation to Bid	
SBD 4	Bidders Disclosure form	
SBD 6.1	Preference Points claim form	
C2.1	Pricing Instructions	
C3	Specifications & Pricing Schedules	

PART C1: AGREEMENT AND CONTRACT DATA

C1.1 Form of Offer and Acceptance Offer

The **Employer**, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of a contractor for Elliot Magistrate Court: Planned Maintenance, Repair and Refurbishment of The Entire Facility and Capital Works to Include Construction of Additional Accommodation (Bid No.: CDC/163/25)

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

The tenderer, identified in the Offer signature block, has examined the draft contract as listed in the Acceptance section and agreed to provide this Offer.

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VAT IS:

R (in words)

.....
.....

R (in figures)

THE OFFERED COST PARAMETERS TO PROVIDE THE WORKS, EXCLUSIVE OF VALUE ADDED TAX, ARE AS SET IN THE CONTRACT DATA.

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 agreed period of validity 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.

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Name(s) _____

Capacity _____

**for the
Tenderer** _____

(Insert name and address of
organisation)

**Name &
signature of
witness** _____

Date _____

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.

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The terms of the contract, are contained in:

Part C1 Contract Data

Part C2 Pricing Data

Part C3 Scope of Work

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.

Deviations from and amendments to the draft contract 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 Fourteen (14) working days of receiving a completed copy of this agreement, including the Schedule of Deviations (if any), deliver to the Employer's agent (whose details are given in the Contract Data) proof of insurances, Safety, Health and Environmental Plans and any other documentation (except securities/ construction guarantees) to be provided in terms of the conditions of contract identified in the Contract Data. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement by the Contractor and the Employer shall be entitled at his discretion to terminate this agreement.

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The tenderer shall within Twenty one (21) working days of receiving a completed copy of this agreement, including the Schedule of Deviations (if any), deliver to the Employer's agent (whose details are given in the Contract Data) securities/ construction guarantees to be provided in terms of the conditions of contract identified in the Contract Data. Failure to fulfil this obligation in accordance with those terms shall constitute a repudiation of this agreement by the Contractor and the Employer shall be entitled at his discretion to terminate this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed copy of this document, including the Schedule of Deviations (if any). Unless the tenderer (now **Contractor**) within Five (5) 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**

(Insert name and address of
organisation)

**Name &
signature of
witness**

Date

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Schedule of Deviations

1 Subject: _____

Details: _____

2 Subject _____

Details: _____

3 Subject _____

Details: _____

4 Subject _____

Details: _____

5 Subject _____

Details: _____

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By the duly authorised representatives signing this agreement, the Employer and the Tenderer agree to and accept the foregoing schedule of deviations as the only deviations from and amendments to the documents listed in the Tender Data and addenda thereto as listed in the returnable 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 Agreement shall have any meaning or effect in the contract between the parties arising from this agreement.

Signature(s)

Name(s)

Capacity

**For the
Employer**

.....
(Insert name and address of organisation)

**Name and
signature of
witness**

Date

Signature ()

Name(s)

Capacity

**For the
Contractor**

**Name and
signature of
witness**

.....
(Insert name and address of organisation)

Date

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C.1.2 Contract Data

The Conditions of Contract are the **JBCC Series 2000 Principal Building Agreement (Edition 6.2, May 2018)**, published by the Joint Building Contracts Committee Inc. Copies of these documents may be obtained from the **Association of South African Quantity Surveyors (011) 315 4140**, the **Master Builders Association (011)205 9000**, the **South African Association of Consulting Engineers (011) 463 2022** or the **South African Institute of Architects (011) 486 0684**.

Each item of data given below is cross-referenced to the clause in the JBCC Principal Agreement to which it mainly applies.

Part 1: Data provided by the Employer

JBCC Clause	Data	
A 1.0	Works[1.1]: Condition Based Maintenance	
	Project Name:	ELLIOT MAGISTRATE COURT
	Reference Number:	CDC/163/25
	Works Description:	ELLIOT MAGISTRATE COURT: PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION
A 2.0	Site[1.1]: 34 Voortrekker Street, Khowa (Elliot)	
	Erf/ Stand Number	
	Township/ Suburb	Khowa (Elliot)
	Site Address	34 Voortrekker Street
	Local Authority	O.R Tambo District
A 3.0	Employer[1.1]:	
	Official Name of Organ of State /Public Sector Body	Coega Development Corporation (Pty) Ltd
	Business registration number	1982/003891/07
	VAT/GST number	403 011 9947
	Country	South Africa
	Employer's representative Name	Zine Mtanda
	Telephone number	
	E-mail	

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	Mobile number		
	Postal address	East London Office, Ground Floor, Harraway House, 12 Pearce Road, Berea, East London	
	Physical address	East London Office, Ground Floor, Harraway House, 12 Pearce Road, Berea, East London	
A 4.0	Principal Agent[1.1] :		
	Name	Clarence Bobie Incorporated	
	Legal entity of above	Quantity Surveyors	
	Country	South Africa	
	Contract Person		
	Telephone number		
	Mobile Number		
	E-mail		
	Postal address	90 Ebden Street, Queenstown	
	Physical address	90 Ebden Street, Queenstown	
A 5.0	Agent (1.1;6.2):	Discipline:	Architect
	Name	Helm Architects	
	Legal entity of above		
	Country	South Africa	
	Contract Person		
	Telephone number		
	Mobile Number		
	E-mail		
	Postal address	69 Prince Alfred Street, Queenstown	
	Physical address	69 Prince Alfred Street, Queenstown	
A 6.0	Agent (1.1;6.2):	Discipline:	Quantity Surveyor
	Name	Clarence Bobie Incorporated	
	Legal entity of above	Quantity Surveyors	
	Country	South Africa	
	Contract Person		
	Telephone number		
	Mobile Number		
	E-mail		
	Postal address	90 Ebden Street, Queenstown	
	Physical address	90 Ebden Street, Queenstown	

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A 7.0	Agent (1.1;6.2) :	Discipline:	Electrical & Mechanical Engineer
	Name	Eye Sizwe Consulting Engineers	
	Legal entity of above		
	Country	South Africa	
	Contract Person		
	Telephone number		
	Mobile Number		
	E-mail		
	Postal address		
	Physical address	16 Allenby Road, Selborne, East London	
A 8.0	Agent (1.1;6.2) :	Discipline :	Civil & Structural Engineer
	Name	HHO	
	Legal entity of above		
	Country	South Africa	
	Contract Person		
	Telephone number		
	Mobile Number		
	E-mail		
	Postal address		
	Physical address	14 St. Helena Road, Beacon Bay, East London	

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PART B - CONTRACT INFORMATION

JBCC Clause	DATA	
B 1.0	Definitions[1.1]	
	Bills of Quantities: System/Method of measurement	The Bills of Quantities were drawn up in accordance with the measurement system stated in Part C2: Pricing Data
	Contract Sum	The total offered price inclusive of VAT as stated and agreed to in the Form of Offer and Acceptance.
	Interest	The interest rates applicable on this contract, whether specifically indicated in the relevant clauses or not, will be the rate as determined by the Minister of Finance from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No 1 of 1999), calculated as simple interest, in respect of debts owing to the State, and will be the rate as determined by the Minister of Justice and Constitutional Development from time to time, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No 55 of 1975), calculated as simple interest, in respect of debts owing by the state
	Penalty	Penalty for late or non-completion (clause 24.0): For the whole works as per sub-clause 24.3.1: The penalty will be calculated at 7cents per 100 rand of the Contract Value per calendar day rounded up to the nearest R10.
B 2.0	Law, regulations and notices[2.0]	
	Law applicable to the works, state country [2.1]	The governing law is the law of the Republic of South Africa. The parties consent to the jurisdiction of the High Court for the purposes of this clause.
B 3.0	Offer and Acceptance[3.0]:	
	Agreement [3.2]	Currency applicable to this agreement: South African Rand (ZAR) The Form of Offer and Acceptance and Schedule of Deviations shall form part of the contract document and constitutes the tender acceptance and agreement
B 4.0	Documents [5.0]	
	Documents comprising the agreement[5.2]	The documents forming the agreement are to be taken as mutually explanatory of one another and for the purpose of interpretation, the priority of the documents shall be in accordance with the following sequence: (a) the Form of Offer and Acceptance. (b) the Schedule of Deviations. (c) this Contract Data. (d) the standard JBCC building agreement Ed 6.2 May 2018 (e) the Drawings. (f) the Specifications. (g) the Bills of Quantities. If an ambiguity or discrepancy is found in the documents, the Principal Agent shall issue any necessary clarification or instruction
	The original signed agreement is to be held by the principal agent , if not, indicate by whom[5.2]	Employer
	Number of copies of construction information issued to the contractor at no cos[5.6]t:	Three (3) copies of drawings and related technical data are to be supplied to the Contractor free of charge.
	Contract drawings	Contract drawings are contained in Part C3.2 (Book 1).

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B 5.0	Employer's Agent[6.0]:				
	Authority is delegated to the following agents to issue contract instructions and perform duties for specific aspects of the works [6.2]				
	Principal agent's and agents' interest or involvement in the works other than a professional interest [6.3]				
B6.0	INSURANCES[10.0]: In the event of a claim the Contractor is liable for the deductible/excess amount. Insurances shall be in place for the construction period until issue of the Practical Completion Certificate.				
	Insurances by Contractor <table border="1"> <tr> <td>Yes/No?</td> <td>Yes</td> </tr> </table>		Yes/No?	Yes	Amount including tax Deductible amount including tax
	Yes/No?	Yes			
	Contracts works insurance to be effected by: CONTRACTOR		Contract sum plus 20% with deductible of 5%		
	Supplementary/special insurance to be affected by[10.1.2]: CONTRACTOR		Contract sum plus 20% with deductible of 5%		
	Public liability insurance to be affected by[10.1.3]: CONTRACTOR		R 5 000 000.00 with deductible of 5%		
	Removal of lateral support insurance to be affected by: Not applicable[10.1.4]		N/A N/A		
Other insurances to be affected by[10.1.5]: Not applicable		N/A N/A			
B7.0	Obligations of the employer[12.1]:				
	Existing premises will be in use and occupied [12.1.2]		Yes/No? Yes		
	If Yes, description	The Site will be live during the construction phase with some temporary offices being provided for the staff.			
	Restriction of working hours [12.1.2]		Yes/No? Yes		
	If Yes, description	N/A			
	Natural features and known services to be preserved by the contractor [12.1.3]		Yes/No? No		
	If Yes, description	N/A			
	Restrictions to the site or areas that the contractor may not occupy [12.1.4]		Yes/No? Yes		
	If Yes, description	N/A			
	Supply of free issue [12.1.10]		Yes/No? No		
	If Yes, description	N/A			
B8.0	Nominated Subcontractor's[14.0]:				
	Yes/no?	Yes	If yes, description of specialisation		
	Specialisation 1		Cell Door Locksets		
B9.0	Selected Subcontractor's[16.0]:				
	Yes/no?	Yes	If yes, description of specialisation		
	Specialization 1		Structural Steel Canopy Installation		

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	Specialization 2		Signage
	Specialization 3		Stair Lift
	Specialization 4		Collector Tanks
	Specialization 5		Temporary Accommodation
	Specialization 6		Training
	Specialization 7		ICT and Security Installations
B9.0	Direct Subcontractor's[16.0]:		
	Yes/no?	No	If yes, description of extent of works
	Extent of works [12.1.11]		n/a
			n/a
B10.0	Description of sections[20.1]:		
	Sectional work completion?	Yes	If yes, description of sections
	Section No.1		New toilet block, security offices & magistrate office
	Section No.2		Holding cells & staff ablutions
	Section No.3		Court room B, offices and magistrate office
	Section No. 4		Court room A and temporary store
B11.0	Possession of site[12.1.5]:		
	Intended date of possession of the site Refer B17.0 [12.1.5; 12.2.22]		Possession of site shall be given to the Contractor after submission by the Contractor of the documents indicated in the Form of Offer and Acceptance and approval of the Contractor's Safety, Health and Environmental Plan.
	Practical Completion (Works as a whole):		
	Yes/No?		Yes
	Period for inspection by the principal agent [19.0] [19.3]		24 Months
	The date for practical completion shall be the period as indicated below from the date of possession of the site by the contractor [12.2.7; 24.1]		For works as a whole: The date for practical completion is 24 calendar months from the date of the site handover/possession which shall include the December builder's holidays.
	Penalty[24.0]:		
	Penalty for late completion [24.1]		The penalty per calendar day shall be 1.25cents / R100 of the contract amount excluding VAT.
	Practical Completion (Sectional) [19.0]:		
	Yes/No?		No

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	Period for inspection by the principal agent [19.3]	Section No.1:	N/A	
		Section No.2:	N/A	
		Section No.3:	N/A	
		Section No.4:	N/A	
B11.0	The date for practical completion shall be the period as indicated below from the date of possession of the site by the contractor [12.2.7; 24.1]	Section No.1:	N/A	
		Section No.2:	N/A	
		Section No.3:	N/A	
		Section No.4:	N/A	
	Penalty[24.0]:			
	Penalty for late completion [24.1]	Section No.1	N/A	
		Section No.2 :	N/A	
		Section No.3 :	N/A	
		Section No.4 :	N/A	
	Criteria to achieve practical completion not covered in the definition of practical completion [12.2.7]	N/A		
	Defects liability period:			
	Extended defects liability period: Refer [21.0]		Yes/No	Yes
	If yes, description of applicable elements	13.1 CCTV Intercom & Access Control 13.2 Standby Generator 13.3 Electrical Installation : see item 1.2 in Electrical Spec. 13.4 Booster Pump, Fire Detection 13.5 HVAC Installation		
B12	Payments:			
	Date of month for issue of regular payment certificates [25.2]		The interim payment certificate is to be issued by the 20th day of each month	
	Contract price adjustment / Cost fluctuations [25.3.4; 26.9.5]		The contract value shall be adjusted according to CPAP if the construction period is more than 1 year. The base month for the application of CPAP is the month of closing of the tender.	
	If yes, method to calculate		Haylett Formula	
	Employer shall pay the contractor within: [25.10]		Thirty (30) Calendar days	
B13.0	Dispute resolution:			
	Adjudication [30.6.1; 30.10]		N/A	
	Name of nominating body			
	Applicable rules for adjudication [30.6.2]		N/A	
	Arbitration [30.7.4; 30.10]		Yes/No?	Yes

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	If Yes, name of nominating body * If No, then dispute will be referred to litigation		The dispute resolution body shall be the Association of Arbitrators (Southern Africa).	
	Applicable rules for arbitration [30.7.5]		Association of Arbitrators: Rules for Conduct of Arbitrators as amended from time to time.	
B14.0	JBCC® General Preliminaries - Selections:			
	Provisional bills of quantities [P2.2]		Yes/No?	No
	Availability of construction information [P2.3]		Yes/No?	Yes
	Previous work - dimensional accuracy - details of previous contract(s) [P3.1]		N/A	
	Previous work - defects - details of previous contract(s) [P3.2]		N/A	
	Inspection of adjoining properties - details [P3.3]		N/A	
	Handover of site in stages - specific requirements [P4.1]		N/A	
	Enclosure of the works - specific requirements [P4.2]		YES	
	Geotechnical and other investigations - specific requirements [P4.3]		YES	
	Existing premises occupied - details [P4.5]		YES	
	Services - known - specific requirements [P4.6]		N/A	
	Water [8.1]	By Contractor	Yes/No?	Yes
		By Employer	Yes/No?	No
		By Employer – metered	Yes/No?	No
	Electricity [8.2]	By Contractor	Yes/No?	Yes
		By Employer	Yes/No?	No
		By Employer – metered	Yes/No?	No
	Ablution and welfare facilities [8.3]	By Contractor	Yes/No?	Yes
		By Employer	Yes/No?	No
	Communication facilities - specific requirements [P8.4]		YES	
	Protection of the works - specific requirements [P11.1]		YES	
Protection / isolation of existing works and works occupied in sections - specific requirements [P11.2]		YES		
Disturbance - specific requirements [P11.5]		YES		

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	Environmental disturbance - specific requirements [P11.6]	YES
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B15.0	Changes made to JBCC® documentation
1.0	<p>Definitions</p> <p>AGREEMENT: The completed Form of Offer and Acceptance, the completed JBCC® Principal Building Agreement and JBCC® contract data for organs of state and other public sector bodies, the contract drawings, the priced document and any other documents reduced to writing and signed by the authorized representatives of the parties</p> <p>CONSTRUCTION PERIOD: The period commencing on the date of possession of the site by the contractor and ending on the date of practical completion</p> <p>CONTRACT DATA FOR ORGANS OF STATE AND OTHER PUBLIC SECTOR BODIES: The document listing the Organs of State and other Public Sector Bodies' requirements and the project specific information</p> <p>INTEREST: The interest rates applicable on this contract, whether specifically indicated in the relevant clauses or not, will be the rate as determined by the Minister of Finance from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No 1 of 1999), calculated as simple interest, in respect of debts owing to the State, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No 55 of 1975), calculated as simple interest, in respect of debts owing by the State</p> <p>PRINCIPAL AGENT: The person or entity appointed by the employer and named in the contract data for organs of state and other public sector bodies. In the event of a principal agent not being appointed, then all the duties and obligations of a principal agent as detailed in the agreement shall be fulfilled by the employer's representative as named in the contract data for organs of state and other public sector bodies</p>
3.0	<p>Offer and Acceptance</p> <p>Amend 3.3 to read as follows:</p> <p>This agreement shall come into force on the date as stated on the Form of Offer and Acceptance and continue to be of force and effect until the end of the latent defects liability period [22.0] notwithstanding termination [29.0] or the certification of final completion [21.0] and final payment [25.0]</p>
6.0	<p>Employer's Agents</p> <p>Add the following as 6.7:</p> <p>In terms of the clauses listed hereunder, the employer has retained its authority and has not given a mandate to the principal agent. The employer shall sign all documents in relation to clauses 4.2, 14.1.2, 14.1.4, 14.4.1, 14.6, 23.1, 23.2, 23.3, 23.7, 23.8, 26.1, 26.7, 26.12 and 28.4</p>
9.0	<p>Indemnities</p> <p>9.2.7: Add the following to the end of the first sentence: "... due to no fault of the contractor"</p>
10.0	<p>Insurances</p> <p>Add the following as 10.1.5.1:</p> <p>High Risk Insurance</p> <p>In the event of the project being executed in a geological area classified as a "High Risk Area", that is an area which is subject to highly unstable sub-surface conditions that might result in catastrophic ground movement evident by sinkhole or doline formation the following will apply:</p>

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	<p>10.1.5.1.1 Damage to the works</p> <p>The contractor shall, from the date of possession of the site until the date of the certificate of practical completion, bear the full risk of and hereby indemnifies and holds harmless the employer against any damage to and/or destruction of the works consequent upon a catastrophic ground movement as mentioned above. The contractor shall take such precautions and security measures and other steps for the protection of the works as he may deem necessary</p> <p>When so instructed to do so by the principal agent, the contractor shall proceed immediately to remove and/or dispose of any debris arising from damage to or destruction of the works and to rebuild, restore, replace and/or repair the works, at the contractor's own costs</p> <p>10.1.5.1.2 Injury to persons or loss of or damage to property</p> <p>The contractor shall be liable for and hereby indemnifies and holds harmless the employer against any liability, loss, claim or proceeding arising at any time during the period of the contract whether arising in common law or by statute, consequent upon personal injuries to or the death of any person whomsoever resulting from, arising out of or caused by a catastrophic ground movement as mentioned above</p> <p>The contractor shall be liable for and hereby indemnifies the employer against any and all liability, loss, claim or proceeding consequent upon loss of or damage to any moveable, or immovable property, or personal property, or property contiguous to the site, whether belonging to or under the control of the employer or any other body or person whomsoever arising out of or caused by a catastrophic ground movement, as mentioned above, which occurred during the period of the contract</p> <p>10.1.5.1.3</p> <p>It is the responsibility of the contractor to ensure that he has adequate insurance to cover his risk and liability as mentioned in 10.1.5.1.1 and 10.1.5.1.2. Without limiting the contractor's obligations in terms of the contract, the contractor shall, within twenty-one (21) calendar days of the date of possession of the site, but before commencement of the works, submit to the employer proof of such insurance policy, if requested to do so</p> <p>10.1.5.1.4</p> <p>The employer shall be entitled to recover any and all losses and/or damages of whatever nature suffered or incurred consequent upon the contractor's default of his obligations as set out in 10.1.5.1.1; 10.1.5.1.2 and 10.1.5.1.3. Such losses or damages may be recovered from the contractor or by deducting the same from any amounts still due under this contract or under any other contract presently or hereafter existing between the employer and the contractor and for this purpose all these contracts shall be considered one indivisible whole</p>
11.0	<p>Securities</p> <p>Amend 11.10 to read as follows:</p> <p>There shall be no lien or right of retention held by any contractor in respect of the works executed on site</p>
12.0	<p>Obligations of the Parties</p> <p>Amend 12.1.5 to read as follows:</p> <p>Give possession of the site to the contractor within ten (10) working days of the contractor complying with the terms of 12.2.22</p> <p>12.2.2: Not applicable</p> <p>Add the following as 12.2.22:</p> <p>Within fifteen (15) working days of the date of the agreement submit to the principal agent an acceptable health and safety plan, required in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993)</p>
19.0	<p>Practical Completion</p> <p>19.5: Delete the words "subject to the contractor's lien or right of continuing possession of the works where this has not been waived"</p>

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21.0	Defects Liability Period and Final Completion Add the following as 21.13: The ninety (90) calendar days defects liability period for the works [21.1 is applicable]
25.0	Payment 25.7.5: Not applicable 25.10: Delete the words "and/or compensatory interest " 25.14.2: Not applicable
27.0	Recovery of Expense and/or Loss 27.1.5: Not applicable
29.0	Termination Add the following after 29.1.3: or where ... 29.1.4: The contractor's estate has been sequestrated, liquidated or surrendered in terms of the insolvency laws in force within the Republic of South Africa 29.1.5: The contractor has engaged in corrupt or fraudulent practices in competing for or in executing the contract

C.1.2 Contract Data

The Contractor is advised to read the **JBCC Series 2000 Principal Building Agreement (Edition 6.2 May 2018)** published by the Joint Building Contracts Committee, in order to understand the implications of this Data which is required to be completed. Copies of these documents may be obtained from the **Association of South African Quantity Surveyors (011) 315 4140, the Master Builders Association (011) 205 9000, the South African Association of Consulting Engineers (011) 463 2022 or the South African Institute of Architects (011) 486 0684.**

Each item of data given below is cross-referenced to the clause in the JBCC Principal Agreement to which it mainly applies.

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Part 2: Data provided by the Contractor

JBCC Clause	Data				
D1.0	SECURITIES				
	Guarantee for construction: Select Option A or B[11.0] <input type="text"/> Select A or B				
	Option A Guarantee for construction (variable) by contractor [11.1.1]				
	Option B Guarantee for construction (fixed) by contractor [11.1.2]				
	Guarantee for payment by employer - Not applicable [11.5.1;11.10]				
	Advance payment, subject to a guarantee for advance payment - Not applicable[11.2.2; 11.3]				
D2.0	Contractor's annual holiday periods during the construction period				
	Year 1 contractor's annual holiday period	Start date	<input type="text"/>	End date	<input type="text"/>
	Year 2 contractor's annual holiday period	Start date	<input type="text"/>	End date	<input type="text"/>
	Year 3 contractor's annual holiday period	Start date	<input type="text"/>	End date	<input type="text"/>
D3.0	Payment of preliminaries [25.0]				
	Contractor's selection: Select Option A or B <input type="text"/> Select A or B				
	Where the contractor does not select an option, Option A shall apply :				
	<p>Payment methods :</p> <p><u>Option A :</u></p> <p>The preliminaries shall be paid in accordance with an amount prorated to the value of the works executed in the same ratio as the amount of the preliminaries to the contract sum, which contract sum shall exclude the amount of preliminaries. Contingency sum(s) and any provision for cost fluctuations shall be excluded for the calculation of the aforesaid ratio</p> <p><u>Option B :</u></p> <p>The preliminaries shall be paid in accordance with an amount agreed by the principal agent and the contractor in terms of the priced document to identify an initial establishment charge, a time-related charge and a final dis-establishment charge. Payment of the time-related charge shall be assessed by the principal agent and adjusted from time to time as may be necessary to take into account the rate of progress of the works</p> <p>Lump sum contract :</p> <p>Where the amount of preliminaries is not provided it shall be taken as 7.5% (seven and a half per cent) of the contract sum, excluding contingency sum(s) and any provision for cost fluctuations</p>				
	Adjustment of preliminaries [26.9.4]				
	Contractor's selection: Select Option A or B <input type="text"/> Select A or B				
	<p>Provision of particulars</p> <p>The contractor shall provide the particulars for the purpose of the adjustment of preliminaries in terms of his selection. Where completion in sections is required, the contractor shall provide an apportionment of preliminaries per section</p>				

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D4.0	<p><u>Option A :</u></p> <p>An allocation of the preliminaries amounts into Fixed, Value-related and Time-related amounts as defined for adjustment method Option A below, within fifteen (15) working days of the date of acceptance of the tender</p> <p><u>Option B :</u></p> <p>A detailed breakdown of the preliminaries amounts within fifteen (15) working days of possession of the site. Such breakdown shall include, inter alia, the administrative and supervisory staff, the use of construction equipment, establishment and dis-establishment charges, insurances and guarantees, all in terms of the programme</p> <p>Adjustment methods</p> <p>The amount of preliminaries shall be adjusted to take account of the effect which changes in time and/or value have on preliminaries. Such adjustment shall be based on the particulars provided by the contractor for this purpose in terms of Options A or B, shall preclude any further adjustment of the amount of preliminaries and shall apply notwithstanding the actual employment of resources by the contractor in the execution of the works</p> <p><u>Option A :</u></p> <p>The preliminaries shall be adjusted in accordance with the allocation of preliminaries amounts provided by the contractor, apportioned to sections where completion in sections is required</p> <p>Fixed - An amount which shall not be varied</p> <p>Value-related - An amount varied in proportion to the contract value as compared to the contract sum. Both the contract sum and the contract value shall exclude the amount of preliminaries, contingency sum(s) and any provision for cost fluctuations</p> <p>Time-related - An amount varied in proportion to the number of calendar days extension to the date of practical completion to which the contractor is entitled with an adjustment of the</p> <p>contract value [23.2; 23.3] as compared to the number of calendar days in the initial construction period [26.9.4]</p> <p><u>Option B :</u></p> <p>The adjustment of preliminaries shall be based on the number of calendar days extension to the date of practical completion to which the contractor is entitled with an adjustment of the contract value [23.2; 23.3] as compared to the number of calendar days in the initial construction period [26.9.4]</p> <p>The adjustment shall take into account the resources as set out in the detailed breakdown of the preliminaries for the period of construction during which the delay occurred</p> <p>Failure to provide particulars within the period stated</p> <p><u>Option A :</u></p> <p>Where the allocation of preliminaries amounts for Option A is not provided, the following allocation of preliminaries amounts shall apply:</p> <p>Fixed - Ten per cent (10%)</p> <p>Value-related - Fifteen per cent (15%)</p> <p>Time-related - Seventy-five per cent (75%)</p> <p>Where the apportionment of the preliminaries per section is not provided, the categorized amounts shall be prorated</p> <p><u>Option B:</u></p>
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Where the detailed breakdown of **preliminaries** amounts for Option B is not provided, Option A shall apply

Lump sum contract

Where the amount of **preliminaries** is not provided it shall be taken as 7.5% (seven and a half per cent) of the **contract sum**, excluding contingency sum(s) and any provision for cost fluctuations

C 1.3 Construction Guarantee (Pro-Forma Forms)

TO BE COMPLETED BY THE SUCCESSFUL TENDERER (AFTER THE AWARD)

C 1.3.1 CONSTRUCTION GUARANTEE

The **Contractor** shall have the right to choose the Construction Guarantee as stated in the Contract Data

The Construction Guarantee options are:

i. Variable Construction Guarantee of 10% of the Contract Sum. Yes ☐
No ☐

ii. Fixed construction guarantee and Payment Reduction Yes ☐
No ☐

A Signed letter of Intent to be submitted with the returnable document

NB. Guarantees submitted must be issued by either an insurance company duly registered in terms of the Short-Term Insurance Act, 1998 (Act 35 of 1998) or by a bank duly registered in terms of the Banks Act, 1990 (Act 94 of 1990) on the pro-forma referred to below. No alterations or amendments of the wording of the pro-forma will be accepted.

The security guarantee to be provided shall not contain an expiry date.

C1.3 CONSTRUCTION GUARANTEE (PRO-FORMA)

GUARANTOR DETAILS AND DEFINITIONS

Guarantor means

Physical address

.....

Guarantor's signatory 1 Capacity

Guarantor's signatory 2 Capacity

Employer means **Coega Development Corporation (Pty) Ltd**

Contractor means

Principal Agent means

Works means.

Site means.

Agreement means **The JBCC Series 2000 Principal Building Agreement and Annexures**

Contract Sum means The accepted amount inclusive of tax of R.....

Amount in words.....

Guaranteed Sum means The maximum aggregate amount of R

Amount in words.....

Construction Guarantee (Insert Variable or Fixed).....

AGREEMENT DETAILS

Sections: Total sections (*No or n/a*)

Last section (*No / Identification or n/a*).....

Principal Agent issues: Interim payment certificates, Final payment certificate, Practical completion certificate/s and Final completion certificate/s

VARIABLE CONSTRUCTION GUARANTEE

1.1 Where a variable Construction Guarantee in terms of the Agreement has been selected this 1.0 with 3.0 to 13.0 shall apply. The Guarantor's liability shall be limited to the diminishing amounts of the Guaranteed Sum as follows:

GUARANTOR'S LIABILITY

1.1.1 Maximum Guaranteed Sum (not exceeding 10.0% of the contract sum) in the amount of:

.....

Amount in words.....

PERIOD OF LIABILITY

From and including the date of issue of this Construction Guarantee and up to and including the date of the interim payment certificate certifying in excess of 50% of the contract sum

GUARANTOR'S LIABILITY

1.1.2 Reducing to the Guaranteed Sum (not exceeding 6.0% of the contract sum) in the amount of:

.....

Amount in words.....

PERIOD OF LIABILITY

From and including the day after the date of the aforesaid interim payment certificate and up to and including the date of the only practical completion certificate or last practical completion certificate where there are sections

GUARANTOR'S LIABILITY

1.1.3 Reducing to the Guaranteed Sum (not exceeding 4.0% of the contract sum) in the amount of:

.....

Amount in words.....

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PERIOD OF LIABILITY

From and including the day after the date of the applicable practical completion certificate and up to and including the date of the only final completion certificate or last final completion certificate where there are sections

GUARANTOR'S LIABILITY

1.1.4 Reducing to the Guaranteed Sum (not exceeding 2.0% of the contract sum) in the
amount of:
Amount in words.....

PERIOD OF LIABILITY

From and including the day after the date of the applicable final completion certificate and up to and including the date of the final payment certificate where payment is due to the Contractor, whereupon this Construction Guarantee shall expire. Where the final payment certificate reflects payment due to the Employer, this Construction Guarantee shall expire upon payment of the full amount certified

1.2 For avoidance of doubt the Guarantor's liability limits set out in 1.1.1 to 1.1.4 shall apply in respect of any claim received by the Guarantor during the period in question

2.0 FIXED CONSTRUCTION GUARANTEE

2.1 Where a fixed Construction Guarantee in terms of the Agreement has been selected this 2.0 with 3.0 to 13.0 shall apply. The Guarantor's liability shall be limited to the amount of the Guaranteed Sum as follows:

GUARANTOR'S LIABILITY

1.1.1 Maximum Guaranteed Sum (not exceeding 5.0% of the contract sum) in the amount
of:.....
Amount in words.....

PERIOD OF LIABILITY

From and including the date of issue of this Construction Guarantee and up to and including the date of the only final completion certificate or the last final completion certificate where there are sections, upon which this Construction Guarantee shall expire

3.0 The Guarantor hereby acknowledges that:

3.1 Any reference in this Guarantee to the Agreement is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship.

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- 3.2 Its obligation under this Guarantee is restricted to the payment of money.
- 4.0 Subject to the Guarantor's maximum liability referred to in 1.0 or 2.0, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:
- 4.1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Principal Agent in an interim or final payment certificate has not been made in terms of the Agreement and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2
- 4.2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) calendar days has elapsed since the first written demand in terms of 4.1 and that the sum certified has still not been paid therefore the Employer calls up this Construction Guarantee and demands payment of the sum certified from the Guarantor
- 4.3 A copy of the said payment certificate which entitles the Employer to receive payment in terms of the Agreement of the sum certified in 4.0
- 5.0 Subject to the Guarantor's maximum liability referred to in 1.0 or 2.0 , the Guarantor undertakes to pay the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the Employer to the Guarantor at the Guarantor's physical address calling up this Construction Guarantee stating that:
- 5.1 The Agreement has been terminated due to the Contractor's default and that the Construction Guarantee is called up in terms of 5.0. The demand shall enclose a copy of the notice of termination; or
- 5.2 A business rescue, provisional sequestration or liquidation OFFICE order has been granted against the Contractor and that the Construction Guarantee is called up in terms of 5.0. The demand shall enclose a copy of the OFFICE order or Practitioner's notice of termination of business rescue or rejection of business rescue plan in terms of the Companies Act
- 6.0 It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4.0 and 5.0 shall not exceed the Guarantor's maximum liability in terms of 1.0 or 2.0
- 7.0 Where the Guarantor is a registered insurer and has made payment in terms of 5.0, the Employer shall upon the date of issue of the final payment certificate submit an expense account to the Guarantor showing how all monies received in terms of the Construction Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Construction Guarantee shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund
- 8.0 Payment by the Guarantor in terms of 4.0 or 5.0 shall be made within seven (7) calendar days upon receipt of the first written demand to the Guarantor

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- 9.0 The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer deems fit and the Guarantor shall not have the right to claim his release from this Construction Guarantee on account of any conduct alleged to be prejudicial to the Guarantor
- 10.0 The Guarantor chooses the physical address as stated above for all purposes in connection herewith
- 11.0 This Construction Guarantee is neither negotiable nor transferable and shall expire in terms of either 1.1.4 or 2.1, or payment in full of the Guaranteed Sum whichever is the earlier, where after no claims will be considered by the Guarantor. The original of this Construction Guarantee shall be returned to the Guarantor after it has expired
- 12.0 This Construction Guarantee, with the required demand notices in terms of 4.0 or 5.0, shall be regarded as a liquid document for the purpose of obtaining a COURT order
- 13.0 Where this Construction Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's OFFICES Act No 32 of 1944, as amended, to the jurisdiction of the Magistrate's OFFICE of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's OFFICE

Signed at Date

Guarantor's Signatory 1 Guarantor's Signatory 2

Witness Witness

Guarantor's seal or stamp

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C 1.3.2. AGREEMENT IN TERMS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT NO 85 OF 1993)

THIS AGREEMENT made at

on this the day of in the year

between Coega Development Corporation (Pty) Ltd (hereinafter called "the Employer") of the one part,
herein represented by

in his capacity as

and

(hereinafter called "the Mandatory") of the other part, herein represented by

.....

in his capacity as

WHEREAS the Employer is desirous that certain works be constructed, **"ELLIOT MAGISTRATE COURT: PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION"**(BID NO: **CDC/163/25**) and has accepted a Tender by the Mandatory for the construction, completion and maintenance of such Works and whereas the Employer and the Mandatory have agreed to certain arrangements and procedures to be followed in order to ensure compliance by the Mandatory with the provisions of the Occupational Health and Safety Act, 1993 (Act 85 of 1993);

NOW THEREFORE THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. The Mandatory shall execute the work in accordance with the Contract Documents pertaining to this Contract.
2. This Agreement shall hold good from its Commencement Date, which shall be the date of a written notice from the Employer or Principal Agent requiring him to commence the execution of the Works, to either
 - (a) the date of the Certificate of Practical Completion issued in terms of Sub-Clause 24.4 of the JBCC Series 2000 Principal Building Agreement (Edition 6.2, May 2018), or
 - (b) the date of termination of the Contract in terms of Clause 26.6 of the JBCC Series 2000 Principal Building Agreement (Edition 6.2, May 2018),
3. The Mandatory declares himself to be conversant with the following:
 - (a) All the requirements, regulations and standards of the Occupational Health and Safety Act (Act 85 of 1993), hereinafter referred to as "The Act", together with its amendments and with special reference to the following Sections of The Act:

- (i) Section 8 : General duties of employers to their employees;

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- (ii) Section 9 : General duties of employers and self-employed persons to persons other than employees;
 - (iii) Section 37 : Acts or omissions by employees or mandatories, and
 - (iv) Sub-section 37(2) relating to the purpose and meaning of this Agreement.
 - (b) The procedures and safety rules of the Employer as pertaining to the Mandatory and to all his subcontractors.
4. The Mandatory agrees to execute all the Works forming part of this Contract and to operate and utilise all machinery, plant and equipment in accordance with the Act.
5. The Mandatory is responsible for the compliance with the Act by all his subcontractors, whether or not selected and/or approved by the Employer.
6. The Mandatory warrants that all his and his subcontractors' workmen are covered in terms of the Compensation for Occupational Injuries and Diseases Act, 1993 which cover shall remain in force whilst any such workmen are present on site. A letter of good standing from the Compensation Commissioner to this effect must be produced to the Employer upon signature of the agreement.
7. The Mandatory undertakes to ensure that he and/or subcontractors and/or their respective employers will at all times comply with the following conditions:
- (a) The Mandatory shall assume the responsibility in terms of Section 16.1 of the Occupational Health and Safety Act. The Mandatory shall not delegate any duty in terms of Section 16.2 of this Act without the prior written approval of the Employer. If the Mandatory obtains such approval and delegates any duty in terms of section 16.2 a copy of such written delegation shall immediately be forwarded to the Employer.
 - (b) All incidents referred to in the Occupational Health and Safety Act shall be reported by the Mandatory to the Department of Labour as well as to the Employer.
 - (c) The Employer will further be provided with copies of all written documentation Relating to any incident
 - (d) The Employer hereby obtains an interest in the issue of any formal inquiry conducted in terms of section 32 of the Occupational Health and Safety Act into any incident involving the Mandatory and/or his employees and/or his subcontractors.

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In witness thereof the parties hereto have set their signatures hereon in the presence of the subscribing witnesses:

SIGNED FOR AND ON BEHALF OF THE EMPLOYER:

WITNESS 1 2

NAME 1 2

(IN CAPITALS)

SIGNED FOR AND ON BEHALF OF THE MANDATORY:

WITNESS 1 2

NAME 1 2

(IN CAPITALS)

1.3.3 Certificate of Authority for Signatory to Agreement in terms of OHS Act (85 of 1993)

The signatory for the company that is the Contractor in terms of the above-mentioned Contract and the Mandatory in terms of the above-mentioned Act shall confirm his or her authority thereto by attaching to this page a duly signed and dated copy of the relevant resolution of the Board of Directors.

An example is given below:

"By resolution of the Board of Directors passed at a meeting held on 202.....,

Mr/Ms whose signature

appears below, has been duly authorised to sign the AGREEMENT in terms of THE

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 of 1993) on behalf of

.....

SIGNED ON BEHALF OF THE COMPANY :

IN HIS/HER CAPACITY AS :

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DATE :

SIGNATURE OF SIGNATORY :

WITNESS: 1 2.

NAME (in capitals): 1 2.

PART C2: PRICING DATA

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C2.1 Pricing Instructions

1. The JBCC Series 2000 Principal Building Agreement (Edition 6.2, May 2018) Conditions of Contract, the Special Conditions of Contract, the Specifications, the Model Preambles for Trades and Description of Materials and Workmanship to All Trades and the Drawings shall be read in conjunction with the Bills of Quantities.

2 The Bills of Quantities comprise items covering the Contractor's profit and costs of general liabilities and of the construction of all Temporary and Permanent Works.

Although the Tenderer is at liberty to insert a rate of his own choosing for each item in the Bills of Quantities, he should note the fact that the Contractor is entitled, under various circumstances, to payment for additional work carried out and that the Engineer is obliged to base his assessment of the rates to be paid for such additional work on the rates the Contractor inserted in the Bills of Quantities.

3 Descriptions in the Bills of Quantities may differ from those in the Standardized and Project Specifications. The descriptions and specifications in the Bills of Quantities will however take preference over these specifications. No consideration will be given to any claim by the Contractor submitted on such a basis. Except for SANS 1200 A and 1200 AB all measurement and payment clauses (clause 8) of the standard specifications are deleted. The Bills of Quantities have been drawn up generally in accordance with the latest issue of Standard System of Measuring Building Work ¹. Should any requirement of the measurement and payment clause of the appropriate Standardized or Project Specification(s) be contrary to the terms of the Bills of Quantities or, when relevant, to the Standard System of Measuring Building Work, the requirement of the Standard System of Measuring Building Work shall prevail.

4 Unless stated to the contrary, items are measured net in accordance with the Drawings without any allowance having been made for waste.

5 The amounts and rates to be inserted in the Bills of Quantities shall be the fully inclusive amounts to the Employer for the work described under the several items. Such amounts shall cover all the costs and expenses that may be required in and for the construction of the work described, and shall cover the costs of all general risks, profits, taxes (but excluding value-added tax), liabilities and obligations set forth or implied in the documents on which the Tender is based.

6 An amount or rate shall be entered against each item in the Bills of Quantities, whether or not quantities are stated. An item against which no amount or rate is entered will be considered to be covered by the other amounts or rates in the Bills of Quantities.

The Tenderer shall also fill in a rate against the items where the words "rate only" appear in the amount column. Although no work is foreseen under these items and no quantities are consequently given in the quantity column, the tendered rates shall apply should work under these items actually be required.

Should the Tenderer group a number of items together and tender one sum for such group of items, the single tendered sum shall apply to that group of items and not to each individual item, or should he indicate against any item that full compensation for such item has been included in another item, the rate for the item included in another item shall be deemed to be nil.

The tendered rates, prices and sums shall, subject only to the provisions of the Conditions of Contract, remain valid irrespective of any change in the quantities during the execution of the Contract.

7 The quantities of work as measured and accepted and certified for payment in accordance with the Conditions of Contract, and not the quantities stated in the Bills of Quantities, will be used to determine payments to the Contractor. The validity of the Contract shall in no way be affected by differences between the quantities in the Bills of Quantities and the quantities certified for payment.

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The standard system of measurement of building work published by the Association of South African Quantity Surveyors

Ordering of materials is not to be based on the Bills of Quantities, but only on information issued for construction purposes.

- 8 For the purposes of this Bills of Quantities, the following words shall have the meanings hereby assigned to them:

Unit	:	The unit of measurement for each item of work as defined in the Standard System of Measuring Builders Work
Quantity	:	The number of units of work for each item
Rate	:	The payment per unit of work at which the Tenderer tenders to do the work
Amount	:	The quantity of an item multiplied by the tendered rate of the (same) item
Item or Sum	:	An amount tendered for an item or sum, the extent of which is described in the Bills of Quantities, the Specifications or elsewhere, but of which the quantity of work is not measured in units

- 9 The units of measurement indicated in the Bills of Quantities are metric units. The following abbreviations may appear in the Bills of Quantities:

Item	=	1 off
No	=	Units measured in number
mm	=	millimetre
m	=	metre
km	=	kilometre
m ²	=	square metre
m ³	=	cubic metre
m ³ -km	=	cubic metre-kilometre
t	=	ton (1 000 kg)
PC Sum	=	Prime Cost Sum
Prov Sum	=	Provisional Sum

- 10 The Tenderer shall enter extended totals for each summary page and final summary in the Bills of Quantities in black ink.
- 11 These Bills of Quantities contain pages numbered consecutively in each Bill as indicated in the Index. Before the Contractor submits his Tender he should check the number of pages in every Bill and if any are found missing or duplicated, or the figures or writing indistinct, or the Bills of Quantities contain any obvious errors, he should apply to the Engineer at once and have same rectified, as no liability whatsoever will be admitted by the Engineer in the respect of errors in the Tender due to the foregoing.
- 12 No alteration, erasure or addition is to be made in the text of the Bills of Quantities. Should any alteration, erasure or addition be made, it will not be recognized but the original wording of the Bills of Quantities will be adhered to.
- 13 Quantities where indicated as provisional are measured provisional and are subject to re-measure on completion of the project.
- 14 The totals (Value Added Tax excluded) on the final summaries are to be transferred to the Final Summary of the Provisional Bills of Quantities in Volume 2 for inclusion in the Total Tender Sum.

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- 15 Completed Bills of Quantities for all trades clearly filled in, legible and in permanent ink are to be submitted with the tender offer

C2.2 Bill of Quantities

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<u>Item</u>	<u>Amount</u>
<p><u>SECTION NO. 1</u></p> <p><u>BILL NO. 1</u></p> <p><u>PRELIMINARIES</u></p> <p><u>MEANING OF TERMS "TENDER / TENDERER"</u></p> <p>Any reference to the words "Tender" or "Tenderer" herein and/or in any other documentation shall be construed to have the same meaning as the words "Bid" or "Bidder"</p> <p><u>BUILDING AGREEMENT AND PRELIMINARIES</u></p> <p>The JBCC Principal Building Agreement (Edition 6.2 - May 2018) prepared by the Joint Building Contracts Committee shall be the applicable building agreement, amended as hereinafter described</p> <p>The JBCC Principal Building Agreement contract data form an integral part of this agreement</p> <p>The JBCC General Preliminaries (May 2018) published by the Joint Building Contracts Committee for use with the JBCC Principal Building Agreement (Edition 6.2 - May 2018) shall be deemed to be incorporated in these bills of quantities, amended as hereinafter described</p> <p>The contractor is deemed to have referred to the abovementioned documents for the full intent and meaning of each clause</p> <p>The clauses in the abovementioned documents are hereinafter referred to by clause number and heading only</p> <p>Where any item is not relevant to this agreement such item is marked N/A signifying "not applicable"</p> <p>Where standard clauses or alternatives are not entirely applicable to this agreement such amendments, modifications, corrections or supplements as will apply are given under each relevant clause heading and such amendments, modifications, corrections or supplements shall take precedence notwithstanding anything to the contrary contained in the abovementioned documents</p>	
<p style="text-align: right;">Carried to Collection</p> <p>Section No. 1 - Preliminaries Bill No. 1 Preliminaries</p>	<p style="text-align: center;">R</p>

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<u>Item</u>		<u>Amount</u>
	<p><u>PREAMBLES FOR TRADES</u></p> <p><u>PREAMBLES</u></p> <p>For Preambles refer to "Department of Public Works: PW371 - A Edition 2.0 - Construction Works, General Specifications" as published by the Department of Public Works (2nd Edition July 2013) shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said General Preambles will be entertained.</p> <p>Supplementary preambles and/or specifications are incorporated in these bills of quantities to satisfy the requirements of this project. Such supplementary preambles and/or specifications shall take precedence over the provisions of the General Preambles</p> <p>The contractor's prices for all items throughout these bills of quantities shall take account of and include where applicable for all of the obligations, requirements and specifications given in the General Preambles and in any supplementary preambles and/or specifications</p> <p><u>STRUCTURE OF THIS PRELIMINARIES BILL</u></p> <p>Section A : A recital of the headings of the individual clauses in the aforementioned JBCC Principal Building Agreement</p> <p>Section B : A recital of the headings of the individual clauses in the aforementioned JBCC General Preliminaries</p> <p>Section C : Any special clauses to meet the particular circumstances of the project</p> <p><u>PRICING OF PRELIMINARIES</u></p> <p>Should the contractor select Option A in the contract data for the adjustment of preliminaries, the amounts entered against the relevant items in these preliminaries are to be divided into one or more of the three categories provided namely fixed (F), value related (V) and time related (T)</p> <p><u>SECTION A: PRINCIPAL BUILDING AGREEMENT</u></p> <p><u>Interpretation (A1-A7)</u></p> <p>1 Clause 1.0 - Definitions and interpretation</p> <p>Clause 1.1 Definition of "Agreement" is amended by replacing it with the following:</p> <p style="text-align: right;">Carried to Collection</p> <p>Section No. 1 - Preliminaries Bill No. 1 Preliminaries</p>	R

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<u>Item</u>	<u>Amount</u>
<p>"AGREEMENT" means the completed Form of Offer and Acceptance, the completed JBCC Principal Building Agreement and JBCC contract data for organs of state and other public sector bodies, the contract drawings, the priced document and any other documents reduced to writing and signed by the authorised representatives of the parties.</p> <p>Clause 1.1 Definition of "Construction Period" is amended by replacing it with the following:</p> <p>"CONSTRUCTION PERIOD" means the period commencing on the date of possession of the site by the contractor and ending on the date of practical completion</p> <p>Clause 1.1 Definition of "Interest" is amended by replacing it with the following:</p> <p>"INTEREST" means the interest rates applicable on this contract, whether specifically indicated in the relevant clauses or not, will be the rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), calculated as simple interest, in respect of debts owing to the State, and will be the rate as determined by the Minister of Justice and Constitutional Development from time to time, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No 55 of 1975), calculated as simple interest, in respect of debts owing by the State</p> <p>Clause 1.1 Definition of "Principal Agent" is amended by replacing it with the following:</p> <p>"PRINCIPAL AGENT" means the person or entity appointed by the employer and named in the contract data for organs of state and other public sector bodies. In the event of a principal agent not being appointed, then all the duties and obligations of a principal agent as detailed in the agreement shall be fulfilled by the employer's representative as named in the contract data for organs of state and other public sector bodies</p> <p>Pricing of bills of quantities</p> <p>The contractor is to allow opposite each item for all costs in connection therewith. All prices to include, unless otherwise stated, for all materials, fabrication, conveyance and delivery, unloading, storing, unpacking, hoisting, labour, setting, fitting and fixing in position, cutting and waste (except where to be measured in accordance with the standard system of measurement), patterns, models and templates, plant, temporary works, returning of packaging, duties, taxes (other than Value Added Tax), imposts, establishment charges, overheads, profit and all other obligations arising out of this agreement. Value Added Tax (VAT) is to be separately stated on the summary page of these bills of quantities</p> <p>Items left unpriced will be deemed to be covered in prices against other items throughout these bills of quantities and no claim for any extras arising out of the contractor's omission to price any item will be entertained</p>	
Carried to Collection	R
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<u>Item</u>	<u>Amount</u>
<p>Prices for all construction equipment, temporary works, services and other items shall include for the supply, maintenance, operating cost and subsequent removal and making good as necessary</p> <p>Abbreviated descriptions</p> <p>The items in these bills of quantities utilise abbreviated descriptions. It is the intention that the abbreviated descriptions be fully described when read with the applicable measuring system and the relevant preambles and/or specifications. However, should the full intent and meaning of any description not be clear, the contractor shall, before submission of his tender, call for a written directive from the principal agent, failing which it shall be assumed that the contractor has allowed in his pricing for materials and workmanship in terms of international best practice</p> <p>Legal status of contractor</p> <p>If the contractor constitutes a joint venture, consortium or other unincorporated grouping of two or more persons then:</p> <ol style="list-style-type: none"> 1. These persons are deemed to be jointly and severally liable to the employer for the performance of this agreement 2. These persons shall notify the employer of their leader who has assigned authority to bind the contractor and each of these persons 3. The contractor shall not alter its composition or legal status without the prior written consent of the employer <p>F:..... V:..... T:.....</p> <p><u>Clause 2.0 - Law, regulations and notices</u></p> <p>Clause 2.0</p> <p>F:..... V:..... T:.....</p> <p><u>Clause 3.0 - Offer and acceptance</u></p> <p>Clause 3.0</p> <p style="text-align: right;">Carried to Collection</p> <p>Section No. 1 - Preliminaries Bill No. 1 Preliminaries</p>	<p style="text-align: center;">R</p>

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<u>Item</u>		<u>Amount</u>
1	<p>Amend 3.3 to read as follows:</p> <p>This agreement shall come into force on the date as state on the Form of Offer and Acceptance and continue to be of force and effect until the end of the latent defects liability period [22.0] notwithstanding termination [29.0] or the certification of final completion [21.0] and final payment [25.0]</p> <p>F:..... V:..... T:.....</p> <p><u>Clause 4.0 - Cession and assignment</u></p> <p><u>F:..... V:..... T:.....</u></p>	
2	<p>Clause 4.0</p> <p>F:..... V:..... T:.....</p> <p><u>Clause 5.0 - Documents</u></p> <p>Value Added Tax</p> <p>Provision is made in the summary page of these bills of quantities for the inclusion of Value Added Tax (VAT)</p> <p>F:..... V:..... T:.....</p> <p><u>Clause 6.0 - Employer's agents</u></p> <p>Clause 6.0</p> <p>Add the following as 6.7:</p> <p>In terms of the clauses listed hereunder, the employer has retained its authority and has not given a mandate to the principal agent. The employer shall sign all documents in relation to clauses 4.2, 14.1.2, 14.1.4, 14.4.1, 14.6. 23.1, 23.2, 23.3, 23.7, 23.8, 26.1, 26.7, 26.12 and 28.4.</p> <p>The authority of the principal agent to issue contract instructions [17.1] and perform duties for specific aspects of the works is delegated to agents as follows [6.2].</p> <p>1. <u>Architect</u></p>	
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<u>Item</u>	<u>Amount</u>
<p>1.1 Duties [6.2] :</p> <p>The architect is responsible for the architectural design, functional design and quality inspection of the works</p> <p>1.2 Contract instructions [6.2; 17.1] :</p> <p>1.2.1 No contract instructions delegated to the architect</p> <p>2. <u>Quantity Surveyor and Principal Agent</u></p> <p>2.1 Duties [6.2] :</p> <p>The quantity surveyor is responsible for all measurements, valuations, financial assessments and all other quantity surveying and cost control functions of the works, including quality inspection.</p> <p>2.2 Contract instructions [6.2; 17.1] :</p> <p>2.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement</p> <p>2.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works</p> <p>2.2.3 The site [13.0]</p> <p>2.2.4 Compliance with the law, regulations and bylaws [2.1]</p> <p>2.2.5 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works</p> <p>2.2.6 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]</p> <p>2.2.7 Removal or re-execution of work</p> <p>2.2.8 Removal or substitution of any materials and goods</p> <p>2.2.9 Protection of the works</p> <p>2.2.10 Making good physical loss and repairing damage to the works [23.2.2]</p> <p>2.2.11 Rectification of defects [21.2]</p>	
Carried to Collection	R
<p>Section No. 1 - Preliminaries</p> <p>Bill No. 1</p> <p>Preliminaries</p>	

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Item	Amount
2.2.12 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion , a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion	
2.2.13 Expenditure of budgetary allowances, prime cost amounts and provisional sums	
2.2.14 Appointment of a subcontractor [14.0; 15.0]	
2.2.15 Work by direct contractors [16.0]	
2.2.16 On suspension or termination, protection of the works , removal of construction equipment and surplus materials and goods [29.0]	
3. Civil and structural engineer	
3.1 Duties [6.2] :	
The civil and structural engineer is responsible for all aspects of civil and structural engineering design and quality inspection of the works	
3.2 Contract instructions [6.2; 17.1] :	
3.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement	
3.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works	
3.2.3 The site [13.0]	
3.2.4 Compliance with the law , regulations and bylaws [2.1]	
3.2.5 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works	
3.2.6 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]	
3.2.7 Removal or re-execution of work	
3.2.8 Removal or substitution of any materials and goods	
3.2.9 Protection of the works	
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<u>Item</u>	<u>Amount</u>
3.2.10 Making good physical loss and repairing damage to the works [23.2.2]	
3.2.11 Rectification of defects [21.2]	
3.2.12 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion , a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion	
3.2.13 Expenditure of budgetary allowances , prime cost amounts and provisional sums	
4. Mechanical engineer	
4.1 Duties [6.2] :	
The mechanical engineer is responsible for all aspects of mechanical engineering design and quality inspection of the works and, where appointed by the employer for quantity surveying services in respect of the mechanical installations, for all measurements, valuations, financial assessments and all other quantity surveying and cost control functions	
4.2 Contract instructions [6.2; 17.1] :	
4.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement	
4.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works	
4.2.3 Compliance with the law , regulations and bylaws [2.1]	
4.2.4 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works	
4.2.5 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]	
4.2.6 Removal or re-execution of work	
4.2.7 Removal or substitution of any materials and goods	
4.2.8 Protection of the works	
4.2.9 Making good physical loss and repairing damage to the works [23.2.2]	
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Item	Amount
4.2.10 Rectification of defects [21.2]	
4.2.11 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion , a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion	
4.2.12 Expenditure of budgetary allowances, prime cost amounts and provisional sums	
5. <u>Electrical engineer</u>	
5.1 Duties [6.2] :	
The electrical engineer is responsible for all aspects of electrical engineering design and quality inspection of the works and, where appointed by the employer for quantity surveying services in respect of the electrical installations, for all measurements, valuations, financial assessments and all other quantity surveying and cost control functions	
5.2 Contract instructions [6.2; 17.1] :	
5.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement	
5.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works	
5.2.3 Compliance with the law , regulations and bylaws [2.1]	
5.2.4 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works	
5.2.5 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]	
5.2.6 Removal or re-execution of work	
5.2.7 Removal or substitution of any materials and goods	
5.2.8 Protection of the works	
5.2.9 Making good physical loss and repairing damage to the works [23.2.2]	
5.2.10 Rectification of defects [21.2]	
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<u>Item</u>	<u>Amount</u>
5.2.11 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion , a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion	
5.2.12 Expenditure of budgetary allowances, prime cost amounts and provisional sums	
6. Wet services engineer	
6.1 Duties [6.2] :	
The wet services engineer is responsible for all aspects of wet services engineering design and quality inspection of the works	
6.2 Contract instructions [6.2; 17.1] :	
6.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement	
6.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works	
6.2.3 Compliance with the law , regulations and bylaws [2.1]	
6.2.4 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works	
6.2.5 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]	
6.2.6 Removal or re-execution of work	
6.2.7 Removal or substitution of any materials and goods	
6.2.8 Protection of the works	
6.2.9 Making good physical loss and repairing damage to the works [23.2.2]	
6.2.10 Rectification of defects [21.2]	
6.2.11 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion , a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion	
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<u>Item</u>	<u>Amount</u>
6.2.12 Expenditure of budgetary allowances, prime cost amounts and provisional sums	
7. Fire consultant	
7.1 Duties [6.2] :	
The fire consultant is responsible for all aspects of rational fire design and quality inspection of the works	
7.2 Contract instructions [6.2; 17.1] :	
7.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the agreement other than in the JBCC Principal Building Agreement	
7.2.2 Alteration to design, standards or quantity of the works provided that such contract instructions shall not substantially change the scope of the works	
7.2.3 Compliance with the law , regulations and bylaws [2.1]	
7.2.4 Provision and testing of samples of materials and goods and/or of finishes and assemblies of elements of the works	
7.2.5 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]	
7.2.6 Removal or re-execution of work	
7.2.7 Removal or substitution of any materials and goods	
7.2.8 Protection of the works	
7.2.9 Making good physical loss and repairing damage to the works [23.2.2]	
7.2.10 Rectification of defects [21.2]	
7.2.11 A list for practical completion specifying outstanding or defective work to be rectified to achieve practical completion , a list for completion and a list for final completion specifying outstanding or defective work to be rectified to achieve final completion	
7.2.12 Expenditure of budgetary allowances, prime cost amounts and provisional sums	
8. Health and safety consultant	
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<u>Item</u>		<u>Amount</u>
	<p>8.1 Duties [6.2] :</p> <p>The health and safety consultant is responsible for all aspects of health and safety of the works. Without derogating from the generality thereof, the health and safety consultant will perform the following specific functions and duties in respect of the health and safety aspects of the works. They shall:</p> <p>8.1.1 Act as the employer's agent in terms of the Construction Regulations issued in terms of the Occupational Health and Safety Act, 1993 as amended</p> <p>8.1.2 Prepare and update the health and safety specification for the works</p> <p>8.1.3 Agree with the contractor the health and safety plan for the works</p> <p>8.1.4 Carry out regular audits to ensure adherence to the safety plan and compliance with the act and regulations</p> <p>8.1.5 Stop the execution of the works where the agreed specification or plan is not adhered to</p> <p>F:..... V:..... T:.....</p>	
1	<p>Clause 7.0 - Design responsibility</p> <p>F:..... V:..... T:.....</p> <p><u>Insurances and securities (A8-A11)</u></p>	
2	<p>Clause 8.0 - Works risk</p> <p>F:..... V:..... T:.....</p>	
3	<p>Clause 9.0 - Indemnities</p> <p>F:..... V:..... T:.....</p>	
4	<p>Clause 10.0 - Insurances</p> <p>Add the following as 10.1.5.1:</p> <p>Hi Risk Insurance</p> <p>In the event of the project being executed in a geological area classified as a "High Risk Area", that is an area which is subject to highly unstable sub-surface conditions that might result in catastrophic ground movement evident by sink-holes or doline formation the following will apply:</p>	
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<u>Item</u>	<u>Amount</u>
<p>10.1.5.1.1 Damage to the works</p> <p>The contractor shall, from the date of possession of the site until the date certificate of practical completion, bear the full risk of and hereby indemnifies and holds harmless the employer against any damage to and/or destruction of the works consequent upon a catastrophic ground movement as mentioned above. The contractor shall take such precautions and security measures and other steps for the protection of the works as he may deem necessary</p> <p>When so instructed to do so by the principal agent, the contractor shall proceed immediately to remove and/or dispose of any debris arising from damage to or destruction of the works and to rebuild, restore, replace and/or repair the works, at the contractor's own costs</p> <p>10.1.5.1.2 Injury to persons or loss of or damage to property</p> <p>The contractor shall be liable for and hereby indemnifies and holds harmless the employer against any liability, loss, claim or proceeding arising at any time during the period of the contract whether arising in common law or by statute, consequent upon personal injuries to or the death of any person whomsoever resulting from, arising out of or caused by a catastrophic ground movement as mentioned above</p> <p>The contractor shall be liable for and hereby indemnifies the employer against any and all liability, loss, claim or proceeding consequent upon loss of or damage to any moveable, or immovable property, or personal property, or property contiguous to the site, whether belonging to or under the control of the employer or any other body or person whomsoever arising out of or caused by a catastrophic ground movement, as mentioned above, which occurred during the period of the contract</p> <p>10.1.5.1.3</p> <p>It is the responsibility of the contractor to ensure that he has adequate insurance to cover his risk and liability as mentioned in 10.1.5.1.1 and 10.1.5.1.2. Without limiting the contractor's obligations in terms of the contract, the contractor shall, within twenty-one (21) calendar days of the date of possession of the site, but before commencement of the works, submit to the employer proof of such insurance policy, if requested to do so</p> <p>10.1.5.1.4</p> <p>The employer shall be entitled to recover any and all losses and/or damages of whatever nature suffered or incurred consequent upon the contractor's default of his obligations as set out in 10.1.5.1.1, 10.1.5.1.2 and 10.1.5.1.3. Such losses or damages may be recovered from the contractor or by deducting the same from any amounts still due under this contract or under any other contract presently or hereafter existing between the employer and the contractor and for this purpose all these contracts shall be considered one indivisible whole</p>	
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	F:..... V:..... T:.....	
1	<p>Clause 11.0 - Securities</p> <p>Extension of waiver of lien</p> <p>Clause 11.0</p> <p>Amend 11.10 to read as follows:</p> <p>There shall be no lien or right of retention held by any contractor in respect of the works executed on site</p> <p>F:..... V:..... T:.....</p> <p><u>Execution (A12 - A17)</u></p>	
2	<p>Clause 12.0 - Obligations of the parties</p> <p>Clause 12.0</p> <p>Amend 12.1.5 to read as follows:</p> <p>Give possession of the site to the contractor within ten (10) working days of the contractor complying with the terms of 12.2.22</p> <p>12.2.22: Not applicable</p> <p>Add the following as 12.2.18:</p> <p>Office accommodation</p> <p>The contractor shall provide, maintain and remove on practical completion air conditioned office accommodation with suitable tables and chairs for meetings to be held on the site. Such offices shall be kept clean and fit for use at all times</p> <p>Notice board</p> <p>The contractor shall erect in a position approved by the principal agent, maintain and remove on practical completion a notice board recommended by the South African Institute of Architects and as approved by the principal agent listing the names and logos of the employer, the contractor and the professional consultants. No subcontractor or supplier notice boards may be erected unless permission is granted by the principal agent for such notice boards to be erected</p> <p>Statutory and other notices</p>	
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	<p>The contractor shall submit and/or comply with all statutory and other notices that may be required by any local or other authority in order not to cause any delay to the commencement of the works by the contractor. The contractor shall pay all deposits or fees in this regard.</p> <p>Add the following as 12.2.22:</p> <p>Within fifteen (15) working days of the date of the agreement submit to the principal agent an acceptable health and safety plan, required in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993)</p> <p>It is, however, specifically recorded that the employer shall be responsible for the timeous approval of building plans by any local or other authorities and the payment of any fees or charges related thereto</p> <p>F:..... V:..... T:.....</p>	
1	<p>Clause 13.0 - Setting out</p> <p>F:..... V:..... T:.....</p>	
2	<p>Clause 14.0 - Nominated subcontractors</p> <p>F:..... V:..... T:.....</p>	
3	<p>Clause 15.0 - Selected subcontractors</p> <p>F:..... V:..... T:.....</p>	
4	<p>Clause 16.0 - Direct contractors</p> <p>Attendance on direct contractors</p> <p>In respect of direct contractors the contractor shall:</p> <ol style="list-style-type: none"> 1. Designate an area for the direct contractor to establish a temporary office and workshop and storage of equipment and materials 2. Allow the use of personnel welfare facilities, where provided 3. Provide water, lighting and single phase electric power to a position within 50m of the place where the direct contract work is to be carried out, other than fuel or power for commissioning of any installation 	
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	<p>4. Permit the direct contractor to use erected scaffolding, hoisting facilities, etc provided by the contractor, in common with others having the like right, while it remains erected on the site [16.1]</p> <p>F:..... V:..... T:.....</p>	
1	<p>Clause 17.0 - Contract instructions</p> <p>Site instructions</p> <p>Instructions issued on site are to be recorded in a A4 site instruction book which is to be supplied and maintained on site by the contractor</p> <p>F:..... V:..... T:.....</p> <p><u>Completion (A18 - A24)</u></p>	
2	<p>Clause 18.0 - Interim completion</p> <p>Clause 18.0 "To be deleted"</p>	
3	<p>Clause 19.0 - Practical completion</p> <p>Clause 19.0</p> <p>Amend 19.5: Delete the works "subject to the contractor's lien or right of continuing possession of the works where this has not been waived"</p> <p>F:..... V:..... T:.....</p>	
4	<p>Clause 20.0 - Completion in sections</p> <p>F:..... V:..... T:.....</p>	
5	<p>Clause 21.0 - Defects liability period and final completion</p> <p>Clause 21.0</p> <p>Add the following as 21.13:</p> <p>The ninety (90) calendar days defects liability period for the works [21.1] is replaced with a period of three hundred and sixty-five (365) calendar days in respect of the listed applicable elements</p> <p>F:..... V:..... T:.....</p>	
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<u>Item</u>		<u>Amount</u>
1	<p>Clause 22.0 - Latent defects liability period</p> <p>F:..... V:..... T:.....</p>	
2	<p>Clause 23.0 - Revision of the date for practical completion</p> <p>Substitution of materials and goods</p> <p>The removal or substitution of any materials and goods which do not conform to the specification or the contract drawings shall not constitute grounds for the extension of the construction period nor for the adjustment of the contract value [17.1.8; 23.1 & 2]</p> <p>F:..... V:..... T:.....</p>	
3	<p>Clause 24.0 - Penalty for late or non-completion</p> <p>F:..... V:..... T:.....</p> <p><u>Payment (A25 - A27)</u></p>	
4	<p>Clause 25.0 - Payment</p> <p>25.7.5: Not applicable</p> <p>25.10: Delete the words "and/or compensatory interest"</p> <p>25.14.2: Not applicable</p> <p>Prices submitted</p> <p>Where prices are submitted by the contractor or subcontractor during the progress of the works in respect of contract instructions or in regard to a claim under the terms of this agreement and notwithstanding the fact that such prices may be used in an interim payment certificate, there is to be no presumption of acceptance. Should the principal agent wish to accept any such prices prior to the issue of the certificate of final completion, it shall be in writing</p> <p>F:..... V:..... T:.....</p>	
5	<p>Clause 26.0 - Adjustment of the contract value and final account</p>	
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<p>Should the contractor be instructed to do so he shall execute this work under the conditions pertaining to this agreement on the basis that a separate amount for preliminaries appurtenant to this work (if applicable) is agreed to between the contractor and the principal agent and on condition that instruction to proceed with such work is given to him within a period of three (3) calendar months after the date of practical completion of the works</p> <p>The employer reserves the right to omit such work without compensation to the contractor for loss of profit or any other loss which the contractor may suffer as a result of such omission</p> <p>Cost of claims</p> <p>All costs incurred by the contractor in the preparation of claims shall be borne by the contractor. This provision shall not preclude an adjudicator or an arbitrator appointed in terms of this agreement [30.6 & 7] from making a determination on costs</p> <p>Claims from subcontractors</p> <p>The contractor shall review, assess and adjudicate any claims received by him from any subcontractor and thereafter submit same to the principal agent with a recommendation in order to assist the principal agent in adjudicating the claim [26.6]</p> <p>F:..... V:..... T:.....</p>	
<p>1 Clause 27.0 - Recovery of expense and/or loss</p> <p>27.1.5: Not applicable</p> <p>F:..... V:..... T:.....</p>	
<p><u>Suspension and termination (A28 - A29)</u></p> <p>2 Clause 28.0 - Suspension by the contractor</p> <p>F:..... V:..... T:.....</p>	
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1	<p>Clause 29.0 - Termination</p> <p>Add the following after 29.1.3:</p> <p>or where ...</p> <p>29.1.4: The contractor's estate has been sequestrated, liquidated or surrendered in terms of the insolvency laws in force within the Republic of South Africa</p> <p>29.1.5: The contractor has engaged in corrupt or fraudulent practices in competing for or in executing the contract</p> <p>F:..... V:..... T:.....</p> <p><u>Dispute resolution (A30)</u></p>	
2	<p>Clause 30.0 - Dispute resolution</p> <p>F:..... V:..... T:.....</p> <p><u>CONTRACT VARIABLES (A31)</u></p>	
3	<p>Clause 31.0 - The Schedule (C1.2 Contract Data)</p> <p>Tenderers are referred to C1.2 Contract Data for variables pertaining to this contract</p> <p><u>Contract data</u></p> <p>Before submission of this tender the contractor is to complete the tenderers' selections in the contract data</p> <p>F:..... V:..... T:.....</p> <p><u>SECTION B: GENERAL PRELIMINARIES</u></p> <p><u>Definitions and interpretation (B1)</u></p>	
4	<p>Clause 1.1 - Definitions</p> <p>F:..... V:..... T:.....</p>	
5	<p>Clause 1.2 - Interpretation</p> <p>F:..... V:..... T:.....</p>	
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<u>Documents (B2)</u>	
1	Clause 2.1 - Checking of documents
	F:..... V:..... T:.....
2	Clause 2.2 - Provisional bills of quantities
	F:..... V:..... T:.....
3	Clause 2.3 - Availability of construction information
	F:..... V:..... T:.....
4	Clause 2.4 - Ordering of materials and goods
	F:..... V:..... T:.....
<u>Previous work and adjoining properties (B3)</u>	
5	Clause 3.1 - Previous work - dimensional accuracy
	F:..... V:..... T:.....
6	Clause 3.2 - Previous work - defects
	F:..... V:..... T:.....
7	Clause 3.3 - Inspection of adjoining properties
	F:..... V:..... T:.....
<u>The site (B4)</u>	
8	Clause 4.1 - Handover of site in stages
	F:..... V:..... T:.....
9	Clause 4.2 - Enclosure of the works
	F:..... V:..... T:.....
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1	Clause 4.3 - Geotechnical and other investigations F:..... V:..... T:.....	
2	Clause 4.4 - Encroachments F:..... V:..... T:.....	
3	Clause 4.5 - Existing premises occupied F:..... V:..... T:.....	
4	Clause 4.6 - Services - known F:..... V:..... T:.....	
	<u>Management of contract (B5)</u>	
5	Clause 5.1 - Management of the works F:..... V:..... T:.....	
6	Clause 5.2 - Progress meetings F:..... V:..... T:.....	
7	Clause 5.3 - Technical meetings F:..... V:..... T:.....	
	<u>Samples, shop drawings and manufacturer's instructions (B6)</u>	
8	Clause 6.1 - Samples of materials F:..... V:..... T:.....	
9	Clause 6.2 - Workmanship samples F:..... V:..... T:.....	
10	Clause 6.3 - Shop drawings F:..... V:..... T:.....	
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1	Clause 6.4 - Compliance with manufacturer's instructions F:..... V:..... T:..... <u>Deposits and fees (B7)</u>	
2	Clause 7.1 - Deposits and fees F:..... V:..... T:..... <u>Temporary services (B8)</u>	
3	Clause 8.1 - Water Option A (by contractor) YES Option B (by employer - free of charge) NO Option C (by employer - metered) NO F:..... V:..... T:.....	
4	Clause 8.2 - Electricity Option A (by contractor) YES Option B (by employer - free of charge) NO Option C (by employer - metered) NO F:..... V:..... T:.....	
5	Clause 8.3 - Ablution and welfare facilities Option A (by contractor) YES Option B (by employer) NO F:..... V:..... T:.....	
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<u>Item</u>		<u>Amount</u>
1	<p>Clause 8.4 - Communication facilities</p> <p>Telephone YES</p> <p>Facsimile NO</p> <p>E-mail NO</p> <p>F:..... V:..... T:.....</p> <p><u>Prime cost amounts (B9)</u></p>	
2	<p>Clause 9.1 - Responsibility for prime cost amounts</p> <p>Where details of materials for which prime cost amounts are to be allowed are readily available, the quantity surveyor may elect to insert the relevant prime cost amounts in measured items, which measured items shall contain sufficient detail for the contractor to price for fixing and installation, waste, etc</p> <p>F:..... V:..... T:.....</p> <p><u>Attendance on subcontractors (B10)</u></p>	
3	<p>Clause 10.1 - General attendance</p> <p>F:..... V:..... T:.....</p>	
4	<p>Clause 10.2 - Special attendance</p> <p>F:..... V:..... T:.....</p> <p><u>General (B11)</u></p>	
5	<p>Clause 11.1 - Protection of the works</p> <p>F:..... V:..... T:.....</p>	
6	<p>Clause 11.2 - Protection/isolation of existing works and works occupied in sections</p> <p>F:..... V:..... T:.....</p>	
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<u>Item</u>		<u>Amount</u>
1	<p>Clause 11.3 - Security of the works</p> <p>F:..... V:..... T:.....</p>	
2	<p>Clause 11.4 - Notice before covering work</p> <p>F:..... V:..... T:.....</p>	
3	<p>Clause 11.5 - Disturbance</p> <p>Disturbance</p> <p>All work is to be carried out in such a manner as to cause no unacceptable or unreasonable dust, noise, vibrations, nuisance, inconvenience, annoyance and the like to the public, others, other properties and traffic in so far as they exceed the permissible limitations set by government legislation or by the local authority. Any delays, stoppages and the like arising from or in order to comply with the above will not constitute grounds for an adjustment to the construction period or contract value whatsoever</p> <p>F:..... V:..... T:.....</p>	
4	<p>Clause 11.6 - Environmental disturbance</p> <p>Controlling all forms of pollution</p> <p>The contractor shall be responsible for and take all precautions in controlling by whatever means necessary all forms of pollution emanating from the site during the construction period due inter alia to noise, artificial light, wind-blown sand, dust, deposits of mud, etc</p> <p>The contractor is to ensure that all roads which border the site and are used by the contractor during the execution of the works are kept clean and free of any dirt or debris caused by the execution of the works</p> <p>F:..... V:..... T:.....</p>	
5	<p>Clause 11.7 - Works cleaning and clearing</p> <p>F:..... V:..... T:.....</p>	
6	<p>Clause 11.8 - Vermin</p> <p>F:..... V:..... T:.....</p>	
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<u>Item</u>		<u>Amount</u>
1	<p>Clause 11.9 - Overhand work</p> <p>F:..... V:..... T:.....</p>	
2	<p>Clause 11.10 - Tenant installations</p> <p>F:..... V:..... T:.....</p>	
3	<p>Clause 11.11 - Advertising</p> <p>F:..... V:..... T:.....</p>	
	<u>SECTION C: SPECIFIC PRELIMINARIES</u>	
4	<p>C1 GUARANTEES</p> <p>Where guarantees are called for, the contractor shall obtain a written guarantee, addressed to the employer, from the firm supplying the materials and/or doing the work and shall deliver same to the principal agent not later than the works completion date.</p> <p>The guarantee shall state that workmanship, materials and installation are guaranteed for a specified period from the date of final completion of the contract, and that any defects that may arise during the specified period shall be made good at the expense of the firm supplying the materials and/or doing the work, upon written notice from the principal agent to do so.</p> <p>This guarantee will not be enforced if the work is damaged by defects in the construction of the building in which case the responsibility for replacement shall rest entirely with the contractor.</p> <p>The principal agent shall be the sole judge of the cause responsible for defects in the work and his decision shall be final and binding in terms of clause 40.2 of the agreement.</p>	
5	<p>C2 OVERTIME</p> <p>Should overtime be required to be worked for any reason whatsoever, the costs of such overtime is to be borne by the contractor unless the principal agent has specifically authorised, in writing, prior to execution thereof, that costs for such overtime are to be borne by the employer.</p>	
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<u>Item</u>		<u>Amount</u>
1	<p>C3 CONFIDENTIALITY</p> <p>The contractor undertakes to maintain in confidence any and all information regarding this project and shall obtain appropriate similar undertakings from all subcontractors and suppliers. Such information shall not be used in any way except in connection with the execution of the works.</p> <p>No information regarding this project shall be published or disclosed without the prior written consent of the employer.</p>	
2	<p>C4 CONTRACT DRAWINGS</p> <p>The drawings issued with the tender documents do not comprise the complete set but serve as a guide only for tendering purposes and for indicating the scope of the work to enable the tenderer to acquaint himself with the nature and extent of the works and the manner in which they are to be executed.</p> <p>Should any part of the drawings not be clearly intelligible to the tenderer he shall, before submitting his tender, obtain clarification in writing from the principal agent</p> <p>Fixed: _____ Value related: _____ Time related: _____</p>	
3	<p>C5 TRADE NAMES</p> <p>Wherever a trade name for any product has been described in the bills of quantities / lump sum document, the renderers attention is drawn to the fact that any other product of equal quality may be used subject to the written approval of the principal agent being obtained prior to the closing date for submission of tenders</p> <p>If prior written approval for an alternative product is not obtained, the product described shall be deemed to have been tendered for</p> <p>Fixed: _____ Value related: _____ Time related: _____</p>	
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<u>Item</u>		<u>Amount</u>
1	<p>C6 LOCAL PRODUCTION AND CONTENT</p> <p>Where imported items are listed in the tender documents, the tenderer shall provide all the information called for, failing which the price of any such item, materials or equipment shall be excluded from currency fluctuations. (refer to Schedule of Local Production and Content (SBD 6.2) to be completed by tenderer)</p> <p>Notwithstanding any provisions elsewhere regarding the adjustment of contract prices, the price of any item, material or equipment listed in terms of this clause shall be excluded from the Contract Price Adjustment Provisions (if applicable)</p> <p>Fixed: _____ Value related: _____ Time related: _____</p> <p>C7 HIV/AIDS AWARENESS</p> <p>It is required of the contractor to thoroughly study the HIV/AIDS Specification (PW 1544) of the Department that must be read together with and is deemed to be incorporated under this Section of the Bills of Quantities / lump sum document. Provision for pricing of HIV/AIDS awareness is made under items C10.1 to C10.5 hereafter and it is explicitly pointed out that all requirements of the aforementioned specification are deemed to be priced hereunder, as the said items represent the only method of measurement and no additional items or extras to the contract in this regard shall be entertained</p> <p>The contractor must take note that compliance with the HIV/AIDS Specification is compulsory. In the event of partial or total non-compliance, the principal agent, notwithstanding the provisions of Clause A 31.0 of Section A or any other clause to the contrary, reserves the right to delay issuing any progress payment certificate until the contractor provides satisfactory proof of compliance. The contractor shall not be entitled to any compensation of whatsoever nature, including interest, due to such delay of payment</p>	
2	<p>C7.1 AWARENESS CHAMPION</p> <p>Selection, appointment, briefing and making available of an Awareness Champion including provision of all relevant services, all in accordance with the HIV/AIDS Specification</p> <p>Fixed: _____ Value related: _____ Time related: _____</p>	
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<u>Item</u>		<u>Amount</u>
1	C7.2 AWARENESS WORKSHOPS Selection and appointment of a competent Service Provider approved by the principal agent , provision of a Service Provider Workshop Plan and a suitable venue, conducting of awareness workshops by means of traditional and/or modern multi-media techniques, including follow-up courses, making available all tuition material and performing assessment procedures, all in accordance with the HIV/AIDS Specification Fixed: _____ Value related: _____ Time related: _____	
2	C7.3 POSTERS, BOOKLETS, VIDEOS, ETC. Provision, displaying, maintaining and replacing when necessary of four plastic laminated posters, booklets and educational videos, etc. for the duration of the construction period , all in accordance with the HIV/AIDS Specification Fixed: _____ Value related: _____ Time related: _____	
3	C7.4 ACCESS TO CONDOMS Provision and maintenance of condom dispensers fixed in position, including male and female condoms, replenishing male and female condoms on a daily basis as required for the duration of the construction period , all in accordance with the HIV/AIDS Specification Fixed: _____ Value related: _____ Time related: _____	
4	C7.5 MONITORING Monitoring HIV/AIDS awareness of workers, providing the principal agent with access to information including making available all reports, thoroughly completed and reflecting the correct information, for the duration of the construction period and close out, all in accordance with the HIV/AIDS Specification Fixed: _____ Value related: _____ Time related: _____	
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<u>Item</u>		<u>Amount</u>
1	<p>C8 : OCCUPATIONAL HEALTH AND SAFETY ACT</p> <p>The contractor shall comply with all the requirements set out in the Construction Regulations, 2014 issued under the Occupational Health and Safety Act, 1993 (Act No 85 of 1993).</p> <p>It is required of the contractor to thoroughly study the Health and Safety Specification (Book 1 - Part C3 - Item 3.3) that must be read together with and is deemed to be incorporated under this Section of the bills of quantities / lump sum document</p> <p>The contractor must take note that compliance with the Occupational Health and Safety Act, Construction Regulations and Health and Safety Specification is compulsory. In the event of partial or total non-compliance, the principal agent, notwithstanding the provisions of clause A31.0 of Section A or any other clause to the contrary, reserves the right to delay issuing any progress payment certificate until the contractor provides satisfactory proof of compliance. The contractor shall not be entitled to any compensation of whatsoever nature, including interest, due to such delay of payment.</p> <p>Provision for pricing of the Occupational Health and Safety Act, Construction Regulations and Health and Safety Specification is made under this clause and it is explicitly pointed out that all requirements of the aforementioned are deemed to be priced hereunder and no additional claims in this regard shall be entertained</p> <p>Fixed: _____ Value related: _____ Time related: _____</p>	
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<u>Item</u>		<u>Amount</u>
1	<p>C9 : COVID 19</p> <p>The contractor shall comply with all the requirements set out in the Construction Regulations, 2003 issued under the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) and the Disaster Management, 2002 (Act 57 of 2002) It is required of the contractor to thoroughly study the Covid 19 Additional Health and Safety Specification (Book 1 - Part C3 - Item 3.3) that must be read together with and is deemed to be incorporated under this Section of the Bills of Quantities / Lump Sum Document.</p> <p>The contractor must take note that compliance with the Additional Covid 19 Occupational Health and Safety Act Requirements, Construction Regulations, Disaster Management Act and Health and Safety Specification is compulsory.</p> <p>In the event of partial or total non-compliance, the principal agent, notwithstanding the provisions of clause A31.0 of Section A or any other clause to the contrary, reserves the right to delay issuing any progress payment certificate until the contractor provides satisfactory proof of compliance.</p> <p>The contractor shall not be entitled to any compensation of whatsoever nature, including interest, due to such delay of payment.</p> <p>Provision for pricing of the Additional Covid 19 Occupational Health and Safety Act Requirements, Construction Regulations, Disaster Management Act and Health and Safety Specification is made under this clause and it is explicitly pointed out that all requirements of the aforementioned are deemed to be priced hereunder and no additional claims in this regard shall be entertained.</p> <p>Fixed:_____ Value related:_____ Time related:_____</p> <p><u>SUMMARY OF CATEGORIES</u></p> <p>Category : Fixed R.....</p> <p>Category : Value R.....</p> <p>Category : Time R.....</p> <p style="text-align: right;">Carried to Collection R</p> <p>Section No. 1 - Preliminaries Bill No. 1 Preliminaries</p>	

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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 2</u>			
<u>BILL NO. 1</u>			
<u>DEMOLITIONS AND ALTERATIONS (PROVISIONAL)</u>			
<u>PREAMBLES</u>			
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary products in descriptions</u>			
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent			
<u>NOTE:</u>			
Tenderers are advised to visit the site and to satisfy themselves, in conjunction with the drawings of the nature and extent of the works to be done.			
The Contractor is advised to check all dimensions and heights on site affecting the existing buildings against those indicated on the plans as he will be held responsible for all new work being of the correct sizes. Should any discrepancies be found he is to refer them to the Architect for correction before proceeding with the work.			
Special care is to be exercised not to interfere with any electric light, power or telephone wires and due notice must be given to the Architect for any disconnections that are necessary, and the Contractor is to afford every facility to the Electrician when making new connections.			
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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p>In taking down and removing existing work, the utmost care is to be observed to avoid any structural or other damage to the remaining portion of the building. The Contractor must protect all work not removed, such as walls, floors, doors, windows or other joinery or fittings, etc., from damage during the progress of the work and provide all necessary material for so doing.</p> <p>The Contractor will be held solely responsible for any damage to persons or property and for the safety of the portions of the existing buildings throughout the whole of the Contract, and must make good at his own expense any damage that may occur.</p> <p>The materials to be used and the work to be done are to be similar in all respect to that described for new work in so far as they occur.</p> <p>Old materials from the pulling down are to remain the property of the contractor unless otherwise stated. Old materials for re-use are to be carefully taken out, stored and protected from injury and made good as required before being refixed. Old materials described to be handed over are to be carefully removed and neatly stacked on site where directed. The remainder of the old materials and all rubbish are to be immediately carted away and the site left clean and unencumbered. None of the old bricks from the demolition are to be re-used for any new work unless otherwise described or directed.</p> <p>For the purpose of this contract and to avoid misunderstanding, phrases stated hereunder have been defined and the Contractor is advised to study them as no claim whatsoever will be entertained as a result of him not so doing.</p> <p>a)"Forming New Openings" shall include all labour and materials forming opening, cut toothings and bonding for and plumbing and flushing up reveals, cutting for and forming precast concrete, or reinforced brick lintol over including necessary turning pieces, reinforcement, etc.</p>			
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<p>b)"Bricking up Openings" shall include for all preparatory work, cut toothings and bond new brickwork to existing and preparing top of existing surface for raising upon and pinning up new brickwork to underside of existing.</p> <p>c)"Making Good" shall include all labour and materials required to match existing work and is to include making good new work up to existing and labours to plaster, etc.</p> <p>d)"Shoring" is not specifically mentioned in each item, however prices are to include for all shoring, needling, strutting, deadwork, etc., required.</p>			
	<p><u>CPAP WORK GROUP</u></p> <p>Unless otherwise stated all items in this bill will be Work Group 102</p> <p><u>DEMOLITIONS</u></p>			
1	<p>Demolish carefully <u>1 x Storage/Toilet Block</u> complete, size approximately 2.4m x 2.4m wide on plan (single storey), consisting of 540mm brick and sandstone walls timber trusses and corrugated iron sheeting etc. including backfilling where foundations removed and filling trenches and holes, cart away all material which is not required by the client and handover all material as to be instructed on site.</p>	No	1	
2	<p>Demolish carefully <u>1 x Holding Cell</u> complete, size approximately 4.6m x 3.2m wide on plan (single storey), consisting of 220mm brick and 200mm thick slab, etc. including backfilling where foundations removed and filling trenches and holes, cart away all material which is not required by the client and handover all material as to be instructed on site.</p>	No	2	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Demolish carefully 1 x Delivery Yard Structure complete, size approximately 6.0m x 5.6m wide on plan (single storey), consisting of 220mm brick and steel poles supported wire mesh covering, etc. including backfilling where foundations removed and filling trenches and holes, cart away all material which is not required by the client and handover all material as to be instructed on site.	No	1	
	<u>Breaking up and removing reinforced concrete</u>			
2	Average 480 x 150mm Stormwater channel	m	58	
	<u>Breaking up and removing mass concrete</u>			
3	100 mm Thick mesh reinforced concrete surface beds, paving, etc.	m2	540	
4	Concrete steps	m3	1	
5	Concrete footings average 600mm deep	m3	1	
	<u>Excavate and cart away ground filling under slabs</u>			
6	Ground filling	m3	23	
	<u>Breaking down and removing brickwork, etc.</u>			
7	Half brick wall	m2	50	
8	One brick wall	m2	136	
9	380mm Sandstone wall	m2	39	
10	540mm Brick/Sandstone wall	m2	5	
11	50mm Concrete pavers	m2	177	
12	220 x 160 x 30mm steel air brick.	No	10	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Taking out and removing doors, windows, etc., including thresholds, sills, etc. (building up openings elsewhere)</u>			
1	Carefully remove and set aside for reuse, glazed timber window, including surrounds, stone and timber cills size 1150 x 1800mm high from 540mm brick wall and brick up openings (elsewhere)	No 3		
2	Remove glazed steel window, size 533 x 654mm high from 220mm brick wall	No 12		
3	Timber single door and steel frame 900 x 2 100 mm high overall from 270 mm brick wall	No 9		
4	Carefully remove and set aside timber single door and timber fanlight frame 879 x 2 860 mm high overall from 540 mm brick wall	No 4		
5	Timber double glazed top garage door and frame overall size 2700 x 3600 mm high overall from 380 mm sandstone walls	No 2		
	<u>Taking down and removing roofs, floors, panelling, ceilings, partitions, etc.</u>			
6	Tongued and grooved timber suspended floors including, joists, bearers, floor covering, skirtings, etc complete	m2 151		
7	38 x 114mm Rafters	m 74		
8	50 x 76mm Purlins	m 74		
9	50 x 250mm Beams	m 20		
10	Corrugated iron roof covering, Rafters,purlins, rain water goods, eaves closers, fascia and barge boards, ceilings, etc.complete (Mono pitched roofs)	m2 121		
11	Corrugated iron roof covering (Measured on slope, existing trusses and purlins to remain)	m2 31		
12	Eaves gutters	m 163		
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1	Fibre cement fascias	m	163	
2	Timber cornices	m	194	
3	Gypsum plasterboard ceilings including cornices, timber brandering, etc.	m2	434	
4	Drywall partitioning comprising timber formed top, bottom and vertical framing with butt jointed boards	m2	53	
	<u>Taking out and removing joinery fittings, etc.</u>			
5	Take out timber skirting 140 mm high.	m	239	
6	Timber sink cupboard 1 500 x 500 x 900 mm high, including disconnecting waste pipe (new trap and connecting to new waste pipe elsewhere)	No	2	
	<u>Removal of strong room shelving</u>			
7	Disassemble and remove, timber shelving 4000mm high	m	24	
	<u>Removal of Cash hall fittings</u>			
8	Disassemble and remove, Cash hall writing counter, approximate overall size 3500 x 350mm wide.	No	1	
9	Disassemble and remove, entire reception counter and bullet proof glazing and frame, approximate overall size 6500 x 700 x 900mm high.	No	1	
	<u>Removal of Courtroom fittings</u>			
	<u>Court Room A</u>			
10	Disassemble and remove, existing court magistrate bench, approximate overall size 5000 x 2000 x 1500mm high.	No	1	
11	Disassemble and remove, existing witness stands, approximate overall size 1600 x 1600 x 800mm high.	No	2	
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1	Disassemble and remove, existing accused stands, approximate overall size 4000 x 1600 x 800mm high.	No	1		
2	Disassemble and remove, existing court public sit benches, approximate overall size 3000 x 500 x 750mm high.	No	18		
3	Disassemble and remove, existing court timber partitions, approximate 900mm high.	m	7		
4	Disassemble and remove, existing court tables, approximate overall size 1500 x 900 x 750mm high.	No	6		
<u>Court Room B</u>					
5	Disassemble and remove, existing court magistrate bench, approximate overall size 4200 x 2300 x 1500mm high.	No	1		
6	Disassemble and remove, existing witness stands for repairs to floor, approximate overall size 2000 x 900 x 1100mm high.	No	1		
7	Disassemble and remove, existing accused bench for repairs to floor, approximate overall size 3000 x 900 x 1100mm high.	No	1		
8	Disassemble and remove, existing court public sit benches, approximate overall size 3000 x 500 x 750mm high.	No	6		
9	Disassemble and remove, existing court timber partitions, approximate 1100mm high.	m	4		
10	Disassemble and remove, existing court tables, approximate overall size 1500 x 900 x 750mm high.	No	3		
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Removal of prosecutor room fittings</u>				
1	Disassemble and remove, counter desk, approximate overall size 4000 x 900 x 900mm high.	No	1		
2	Remove existing built in cupboard, approximate overall size 2800 x 600 x 1600mm high.	No	1		
	<u>Taking out and removing ironmongery (LI)</u>				
3	Mortice lock and striking plate from timber door and steel/timber frame	No	17		
4	Standard door hinges	No	51		
	<u>Taking out and removing glass and mirrors including carting away</u>				
5	Glass from existing timber windows	m2	50		
6	Glass from existing timber fanlights	m2	7		
	<u>Taking up and removing vinyl floor coverings, carpeting, etc.</u>				
7	Vinyl tile floor covering.	m2	360		
8	Carpet tile floor covering.	m2	21		
	<u>Hacking up/off and removing granolithic, screeds, plaster, etc. from concrete or brickwork and preparing surfaces for new screeds, plaster, etc.</u>				
9	Internal plaster from walls and columns	m2	803		
10	External plaster from walls and columns	m2	50		
11	Plaster to soffits of slabs	m2	33		
12	30 mm Screeds from existing surface beds.	m2	127		
13	Average 30mm plaster skirting average 300mm high.	m	45		
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PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
ADDITIONAL ACCOMMODATION**

Item		Quantity	Rate	Amount
<u>Taking out/off and removing sundry metalwork and handover to employer</u>				
1	Steel security gate 1 000 x 2 032 mm high	No	2	
2	Roll Up shutter size 1300 x 1900mm high	No	3	
<u>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)</u>				
3	Rainwater downpipes	m	165	
4	15 mm Copper piping including fittings and brackets	m	35	
5	22 mm Copper piping including fittings and brackets	m	18	
6	50 mm PVC pipe and fittings.	m	25	
7	110 mm PVC pipe and fittings	m	16	
8	Standpipe and tap	No	2	
9	Stainless steel urinal 1600 x 1 200 mm high including breaking up and removing 340 mm wide concrete urinal step	No	1	
10	Vitreous china wash hand basin	No	8	
11	Vitreous china WC pan with cistern	No	10	
Carried to Collection				R
Section No. 2 - Demolitions and Alterations Bill No. 1 Demolitions and Alterations (Provisional)				

Section 2

Bill No. 1

Demolitions and Alterations (Provisional)

**CDC/163/25 ~ ELLIOT MAGISTRATES COURT
PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
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ADDITIONAL ACCOMMODATION**

Item	Quantity	Rate	Amount
<u>SECTION NO. 3</u>			
<u>BILL NO. 1</u>			
<u>EARTHWORKS</u>			
<u>FOUNDATIONS (PROVISIONAL)</u>			
<u>PREAMBLES</u>			
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary products in descriptions</u>			
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent			
<u>Nature of material to be excavated</u>			
The material to be excavated is assumed to be predominantly of a composition that will allow excavation in "earth" as specified, but including a percentage of excavation in "soft rock" and "hard rock"			
<u>Carting away of excavated material</u>			
Descriptions of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations, or alternatively, from stock piles situated on the building site			
Carried to Collection			R
Section No. 3 - New Works			
Bill No. 1			
Earthworks (Provisional)			

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>Dewatering of excavations</u>				
The Contractor shall allow for removing seepage and other water from subterranean sources from the excavations by pumping, baling or otherwise				
Accurate records of all such dewatering shall be kept to determine the total volume of water so removed and a clear distinction shall be made between water from subterranean sources and other water				
<u>Density testing on filling</u>				
Rates for filling, etc. shall include for all density and soil type testing to prove that the specified compaction is achieved				
When additional testing is done on instruction of the Principal Agent and these tests are successful, they will be paid for additionally				
<u>EARTHWORKS</u>				
<u>Excavations</u>				
<u>Excavate in pickable material not exceeding 2 m deep below natural or reduced ground level (Labour-intensive)</u>				
1	150mm Deep over site between buildings, retaining walls, etc to remove top soil and depositing excavated material in prescribed stock piles on site	m3	47	
2	Surface trenches.	m3	224	
3	Reduce levels under surface beds	m3	93	
<u>Extra over trench and hole excavations in earth for excavation in</u>				
4	Soft rock	m3	22	
5	Hard rock	m3	11	
Carried to Collection				R
Section No. 3 - New Works				
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Earthworks (Provisional)				

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Item		Quantity	Rate	Amount
<u>Garden soil filling obtained from the excavations and/or prescribed stock piles on site</u>				
1	Spread over site	m3	47	
<u>Extra over all excavations for carting away:</u>				
2	Extra over all excavations for carting surplus excavated material and spreading, levelling and lightly compacting on site where directed average 150 m from the excavations (Measured Nett - No Allowance made for bulking).	m3	314	
<u>Compaction of surfaces</u>				
3	Compaction of ground surface under floors, etc including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% Mod AASHTO density	m2	552	
<u>Risk of collapse of excavations:</u>				
4	Sides of trench and hole excavations not exceeding 1,5m deep.	m2	722	
<u>Keeping excavations free of water:</u>				
5	Keeping excavations free from mud and all water including subterranean sources.	Item		
<u>FILLING, ETC</u>				
<u>19mm Crushed stone dressing evenly spread with larger stones around outlets</u>				
6	150mm Thick on waterproofing under floors	m2	259	
<u>G7 earth filling supplied by the contractor compacted to 93% Mod AASHTO density:</u>				
7	Backfilling to trenches, holes, etc.	m3	98	
Carried to Collection				R
Section No. 3 - New Works				
Bill No. 1				
Earthworks (Provisional)				

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Under concrete surface beds in accordance with SABS 1200 DM compacted in max 150mm thick layers to 93% Mod AASHTO density.	m3	348	
	<u>G5 earth filling supplied by the contractor compacted to 95% Mod AASHTO density:</u>			
2	Under concrete surface beds in accordance with SABS 1200 DM compacted in 150mm thick layers to 95% Mod AASHTO density.	m3	109	
	<u>Coarse river sand filling</u>			
3	Under floors, etc	m3	31	
	<u>Prescribed density tests on filling:</u>			
4	Allow for compaction tests by an approved laboratory to determine density of filling material.	No	22	
Carried to Collection				R
Section No. 3 - New Works				
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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 3</u>			
<u>BILL NO. 2</u>			
<u>CONCRETE, FORMWORK AND REINFORCEMENT (PROVISIONAL)</u>			
<u>PREAMBLES</u>			
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary products in descriptions</u>			
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent			
<u>Cost of tests</u>			
Descriptions of concrete items shall be deemed to include for all necessary testing of concrete components and trail mixes			
The costs of making, storing and testing of concrete test cubes as required shall include the cost of providing cube moulds necessary for the purpose, for testing costs and for submitting reports on the tests to the architect. The testing shall be undertaken by an independent firm or institution nominated by the contractor to the approval of the Principal Agent. (Test cubes are measured separately)			
<u>CPAP WORK GROUP</u>			
Unless otherwise stated all items in this bill will be Work Group 110			
<u>UNREINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES</u>			
Carried to Collection			
Section No. 3 - New Works			
Bill No. 2			
Concrete, Formwork & Reinforcement (Provisional)			

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PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
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ADDITIONAL ACCOMMODATION

<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>15MPa/19mm concrete</u>				
1	Surface blinding under footings and bases	m3	12		
	<u>REINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES</u>				
	<u>25MPa/19mm concrete:</u>				
2	Footings to walls (Provisional).	m3	65		
	<u>REINFORCED CONCRETE CAST ON/IN FORMWORK</u>				
	<u>25MPa/19mm concrete:</u>				
3	Surface beds on waterproofing	m3	93		
	<u>Thicken out surface beds, etc.</u>				
4	Thicken out 125 mm surface beds to a total thickness of 250 mm for a width of 500 mm under walls, including all necessary excavation, surface preparation, additional concrete and formwork, etc.	m	20		
	<u>REINFORCED CONCRETE CAST ON/IN FORMWORK</u>				
	<u>30 MPa/19mm concrete</u>				
5	Slabs, including beams and inverted beams	m3	33		
6	Extra over slabs for breaking out 300mm high x 105mm deep in existing stone/ brickwork to creating casting pocket for slab ends	m	12		
7	Wall beams	m3	25		
	<u>CONCRETE TESTS</u>				
	<u>Test blocks:</u>				
8	Making and testing 150 x 150 x 150 mm concrete strength test cube (Provisional)	No	25		
	<u>CONCRETE SUNDRIES</u>				
	Carried to Collection			R	
	Section No. 3 - New Works				
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	Concrete, Formwork & Reinforcement (Provisional)				

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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Finishing top surfaces of concrete smooth with a wood float:</u>				
1	Surface beds, slabs, etc	m2	563		
	<u>Finishing top surfaces of concrete smooth with a steel trowel</u>				
2	Surface beds, slabs, etc.	m2	10		
	<u>SMOOTH FORMWORK (DEGREE OF ACCURACY II)</u> <u>(CPAP Work Group No 111)</u>				
	<u>Smooth Formwork to Sides:</u>				
3	Edges, risers, ends and reveals not exceeding 300mm high or wide.	m	164		
	<u>Smooth Formwork to Sides and Soffits:</u>				
4	Beams propped up exceeding 1,5m high and not exceeding 3,5m high.	m2	237		
	<u>Smooth Formwork to Soffits:</u>				
5	Slabs propped up exceeding 1,5m high and not exceeding 3,5m high.	m2	157		
	<u>Extra on smooth formwork to soffits for boxing or blocking in or boxing out to form:</u>				
6	110mm Diameter opening through 150mm thick slab (Provisional).	No	24		
	<u>MOVEMENT JOINTS ETC</u>				
	<u>CPAP WORK GROUP 111</u>				
	<u>SLIP JOINTS BETWEEN CONCRETE AND BRICKWORK</u>				
	<u>Two layers of 3 ply maltoid on and including 10mm mortar layer in 1:3 mix:</u>				
7	Not exceeding 300mm wide.	m	246		
	Carried to Collection				
	Section No. 3 - New Works				
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				R	

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>ISOLATION JOINTS</u>			
	<u>Isolation Joints</u>			
1	Low density (33kg/m³), cross linked, closed cell, expanded polyethylene joint former, size 100 x 12mm thick with tear off strip fitted to isolation joints in concrete surface with adhesive as per adhesive manufacturer's recommendation.	m	482	
	<u>Approved polyurethane elastometric adhesive/sealant colour Concrete Grey applied in accordance with the manufacturer's instructions.</u>			
2	12 x 10mm Deep in isolation joints in floors or walls including raking out expansion joint filler as necessary.	m	482	
	<u>CONSTRUCTION JOINTS</u>			
	<u>Horizontal construction joints through concrete including bond breaker on interface (lime wash or similar)</u>			
3	Form construction joint in concrete surface bed not exceeding 100mm thick including inserting of diamond dowel 114 x 114 x 8mm thick plates at 500mm centres including all necessary formwork and coating full face of concrete with a debonding agent.	m	72	
	<u>Saw cut joints</u>			
4	6 x 25mm Deep saw cut joints in top of construction joints in concrete surface beds	m	72	
	<u>Surface to be clean, dry and sound. Mix two components thoroughly to form a homogenous mixture and apply Masterflex® 320 flexible epoxy joint filler to joint with a minimum depth of 20mm over a 3-5mm layer of silica at the base of the joint using a closed barrel gun, all in accordance with manufacturer's recommendations.</u>			
5	6 x 20mm Deep in saw cut joints to construction joints.	m	72	
	<u>SAW CUT JOINTS</u>			
	Carried to Collection			R
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Saw cut joints</u>				
1	3 x 30mm Deep saw cut joints in top of concrete surface beds	m	17		
	<u>Approved polysulphide sealing compound including backing cord, bond breaker, primer etc.:</u>				
2	3 x 10mm Deep in saw cut joints between concrete surfaces.	m	17		
	<u>REINFORCEMENT (PROVISIONAL)</u>				
	<u>CPAP WORK GROUP 114</u>				
	<u>Fabric reinforcement in surface beds:</u>				
3	Type 193 standard square fabric mesh reinforcement in surface beds, slabs, etc, nominal mass 1,93 kg/m ² with nominal 5.6mm thick wires and 200 x 200mm pitch, complying with SANS 1024/2006 requirements, in sheets 2,4 x 6m long. (measured net)	m2	716		
4	Type 245 standard square fabric mesh reinforcement in surface beds, slabs, etc, nominal mass 2,45 kg/m ² with nominal 6,3mm thick wires and 200 x 200mm pitch, complying with SANS 1024/2006 requirements, in sheets 2,4 x 6m long.	m2	8		
	<u>Fabric reinforcement in walls:</u>				
5	Type 617 standard square fabric mesh reinforcement in surface beds, slabs, etc, nominal mass 6,17 kg/m ² with nominal 10mm thick wires and 200 x 200mm pitch, complying with SANS 1024/2006 requirements, in sheets 2,4 x 6m long.	m2	58		
	<u>Mild steel reinforcement to structural concrete work:</u>				
6	Steel rod reinforcement of varying diameters to bottom, walls and slab	kg	1,112		
	Carried to Collection			R	
	Section No. 3 - New Works				
	Bill No. 2				
	Concrete, Formwork & Reinforcement (Provisional)				

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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 3</u>			
<u>BILL NO. 3</u>			
<u>MASONRY</u>			
<u>PREAMBLES</u>			
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary products in descriptions</u>			
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent			
<u>BRICKWORK</u>			
<u>Sizes in descriptions</u>			
Where sizes in descriptions are given in brick units, "one brick" shall be the length and "half brick" the width of a brick			
<u>Cement mortar</u>			
Unless otherwise described, all brickwork shall be built in 1:6 cement mortar			
<u>Face bricks</u>			
Bricks shall be ordered timeously to obtain uniformity in size and colour			
<u>Pointing</u>			
Descriptions of recessed pointing to fair face brickwork and face brickwork shall be deemed to include square recessed, hollow recessed, weathered pointing, etc			
Carried to Collection			R
Section No. 3 - New Works			
Bill No. 3			
Masonry			

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>Samples, etc</u>				
Rates for brickwork, faced brickwork, etc shall include for all required samples				
<u>CPAP WORK GROUP</u>				
Unless otherwise stated all items in this bill will be Work Group 116				
<u>BRICKWORK</u>				
<u>BRICKWORK IN FOUNDATIONS (PROVISIONAL)</u>				
<u>14MPa nominal compressive strength Imperial NFX loadbearing perforated plaster brick, size 222 x 73 x 106mm, manufactured in accordance with SANS 227:2007, laid in foundations walls to single storey building and bedded and jointed in Class I mortar. Mortar in accordance with SANS 50197-1:2002 Cement Part 1: Composition, specification and conformity criteria for common cements, in mortar Class 1 to be mixed to the ratio of 1 part cement : 4 parts sand, (sand to conform to SANS 1083:2006) to highly stressed masonry, incorporating high structural units.</u>				
1	One brick walls.	m2	433	
2	280mm Wide cavity walls of two half brick skins including wire butter fly ties at a rate of 10no. per square metre.	m2	34	
3	330mm hollow walls of two half brick skins with and including wire butter fly ties at a rate of 10no. per square metre.	m2	35	
<u>BRICKWORK IN SUPERSTRUCTURE</u>				
Carried to Collection				R
Section No. 3 - New Works				
Bill No. 3				
Masonry				

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>14MPa nominal compressive strength Imperial NFX loadbearing perforated plaster brick, size 222 x 73 x 106mm, manufactured in accordance with SANS 227:2007, laid in superstructure walls to single storey building and bedded and jointed in Class I mortar. Mortar in accordance with SANS 50197-1:2002 Cement Part 1: Composition, specification and conformity criteria for common cements, in mortar Class 1 to be mixed to the ratio of 1 part cement : 4 parts sand, (sand to conform to SANS 1083:2006) to highly stressed masonry, incorporating high structural units.</u>			
1	Half brick walls in beamfilling.	m2	47	
2	Half brick walls.	m2	65	
3	One brick walls.	m2	1,208	
4	380mm Brick walls	m2	32	
5	330mm hollow walls of two half brick skins with and including wire butter fly ties at a rate of 5no. per square metre.	m2	149	
6	220mm Brick walls in bricking up openings where windows and doors removed.	m2	4	
7	380mm Brick walls in bricking up openings where windows and doors removed.	m2	9	
	<u>SANDSTONE ETC WALL LININGS ETC</u>			
	<u>Allow the Prime cost amount of R900/m2 for supply and delivery of 600 x 300 x 110mm thick sandstone wall linings</u>			
8	Approved sandstone wall linings 600 x 300 x 110mm thick square edge in cement mortar finished fair and pointed both sides as described.	m2	43	
9	Approved sandstone wall linings 220 x 73 x 105mm thick square edge in cement mortar finished fair and pointed both sides as described.	m2	49	
	Carried to Collection			R
	Section No. 3 - New Works			
	Bill No. 3			
	Masonry			

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SANDSTONE WALLS</u>				
1	Extra over brick walls for sandstone facings externally size 220 x 73 x 105mm Wide in cement mortar finished fair and pointed both sides as described.	m2	930	
2	115 x 230 mm Projection sandstone facings projection externally in cement mortar finished fair and pointed both sides and face as described.	m	114	
3	Closing 110mm cavity of hollow wall vertically with one course of sandstone brickwork.	m	6	
4	165 x 160mm Sandstone lintel in cement mortar finished fair and pointed both sides as described.	m	94	
5	165 x 160mm Sandstone cill with 115mm wide x 10mm deep rebate along length and with window width, splayed and filleted rebate, in cement mortar finished fair and pointed both sides as described.	m	70	
6	165 x 250 x 50/35mm Sandstone capping with drip groove along 165mm edge, in cement mortar finished fair and pointed both sides as described.	No	30	
<u>BRICKWORK SUNDRIES</u>				
7	Splayed mortar fillet one course high in 110mm cavity	m	39	
<u>CONCRETE</u>				
<u>15MPa/19mm concrete</u>				
8	Infill to 60mm wide cavities of 280mm brick walls in foundations.	m3	3	
9	Infill to 110mm wide cavities of 330mm brick walls in foundations.	m3	4	
<u>Brickwork reinforcement:</u>				
10	75mm Wide reinforcement built in horizontally.	m	343	
11	150mm Wide reinforcement built in horizontally.	m	6,428	
Carried to Collection			R	
Section No. 3 - New Works				
Bill No. 3				
Masonry				

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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Ditto, but in foundations (Provisional).	m	6,040		
	<u>Prestressed fabricated lintels:</u>				
2	110 x 75mm Lintels in lengths not exceeding 3m.	m	152		
	<u>Turning pieces:</u>				
3	100mm Wide turning piece to lintels etc.	m	105		
4	200mm Wide turning piece to lintels etc.	m	16		
	<u>Galvanised wire ties etc:</u>				
5	4mm Diameter roof tie 2m girth bent double, with one end built into brick/blockwork and other end fixed to timber.	No	142		
	<u>Cramps, ties, etc:</u>				
6	30 x 2mm Galvanized door frame tie 350mm long with one end fixed to timber and other built into brickwork or concrete.	No	384		
7	30 x 2mm Galvanized brick tie 350mm long with one end fixed to existing brick wall and other built into brickwork or concrete.	No	16		
	<u>Natural grey sills in single lengths bedded in class I mortar including metal fixing lugs etc:</u>				
8	10 x 175mm Wide sills set flat and slightly projecting.	m	22		
	<u>Sundries:</u>				
9	Building ends of timber beams into brick walls and caulk with cement mortar.	No	7		
	<u>Plain Coping bedded and jointed in Class II mortar and pointed on all exposed faces.</u>				
10	300 x 85mm Thick precast concrete coping to top of 220mm brick wall bedded and jointed in cement mortar and pointed on top and both sides as described.	m	8		
Carried to Collection					R
Section No. 3 - New Works					
Bill No. 3					
Masonry					

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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	410 x 85mm Thick precast concrete coping to top of 330mm brick wall bedded and jointed in cement mortar and pointed on top and both sides as described.	m	39		
	<u>Air bricks etc:</u>				
2	220 x 160 x 50mm Cement vermin proof grey air brick.	No	12		
Carried to Collection					R
Section No. 3 - New Works					
Bill No. 3					
Masonry					

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 3</u>				
<u>BILL NO. 4</u>				
<u>WATERPROOFING</u>				
<u>PREAMBLES</u>				
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"				
<u>SUPPLEMENTARY PREAMBLES</u>				
<u>Proprietary products in descriptions</u>				
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent				
<u>CPAP WORK GROUP</u>				
Unless otherwise stated all items in this bill will be Work Group 120				
<u>DAMPPROOFING OF WALLS AND FLOORS</u>				
<u>One layer of 375 micron embossed damp proof course</u>				
1	In walls	m2	116	
<u>One layer of 250 micron USB green waterproof sheeting sealed at laps with pressure sensitive tape</u>				
2	Under surface beds	m2	852	
<u>4mm "Derbigum SP" waterproofing</u>				
3	On flat roofs	m2	73	
4	Additional membrane at 110mm diameter outlet	No	22	
<u>PROTECTIVE STONE DRESSING</u>				
Carried to Collection				R
Section No. 3 - New Works				
Bill No. 4				
Waterproofing				

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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>19mm Crushed stone dressing evenly spread with larger stones around outlets</u>				
1	80mm Thick on waterproofing to flat roofs	m2	41		
	<u>JOINT SEALANTS, ETC</u>				
	<u>Sealing around window frames</u>				
2	Expandite Sealastic gun applied sealing compound in joint sealing and pointing all round external window frames	m	334		
Carried to Collection					R
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[illegible]

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<u>SECTION NO. 3</u>			
<u>BILL NO. 5</u>			
<u>ROOF COVERINGS, ETC</u>			
<u>PREAMBLES</u>			
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary products in descriptions</u>			
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent			
<u>Fixing</u>			
Fixing shall be done according to SABS 1200HB with minimum 225mm end laps			
<u>Guarantee</u>			
The contractor will be required to provide a written guarantee, stating that :			
1. The roof sheeting is of the specified thickness			
2. The client is indemnified against any defects, including colour deterioration for a minimum period of 15 years			
<u>CPAP WORK GROUP</u>			
Unless otherwise stated all items in this bill will be Work Group 124			
<u>EXISTING PROFILED METAL SHEETING AND ACCESSORIES</u>			
Carried to Collection			
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Existing average 0,80mm thick ISQ300 Z275 spelter galvanised steel roof sheeting with painted finish to one side fixed to timber purlins or rails at 1100mm centres</u>			
1	Examine existing sheet iron roofing sheets, ridges, hips, valleys, etc. for leaks, holes, etc. and make good including securing purlins with approved purlin fasteners and tapping down/replacing roof screws, etc. and leaving roof completely weatherproof.	m2	622	
	<u>NEW PROFILED METAL SHEETING</u>			
	<u>Corrugated 0,58mm thick ISQ300 Z275 spelter galvanised steel roof sheeting fixed to timber purlins or rails (elsewhere measured) at 1100mm centres with and including 63 mm tex or top speed screws incorporating 19 mm bonded washers.</u>			
2	Roof covering with pitch not exceeding 25°	m2	31	
	<u>0,58mm Thick standing seam profile interlocking roof sheeting with approved colour finish one side and standard grey backing coat, fixed to timber intermediate purlins at 800mm centres, ridge purlins at 800mm from intermediate purlins and eaves purlins at 800mm from intermediate purlins using 1,15mm thick approved clips secured to purlins at 407mm centres with 2No. 65mm ring shank nails, all in accordance with manufacturer's recommendations.</u>			
3	Roof covering with pitch not exceeding 10°	m2	639	
	<u>0,8mm Nominal thickness ditto, but flashings:</u>			
4	Roll top ridge, girth 462mm, fixed in accordance with manufacturer's specifications.	m	6	
5	Extra over for junction of ridge with two hips.	No	2	
6	Extra on last, for closed end.	No	2	
7	Roll top hip, girth 462mm, fixed in accordance with manufacturer's specifications.	m	8	
8	Extra on last, for closed end.	No	2	
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Gable/barge flashing, girth 462mm, fixed in accordance with manufacturer's specifications.	m	290		
2	Valley flashing, girth 462mm, fixed in accordance with manufacturer's specifications.	m	12		
3	Sidewall flash, girth 308mm, fixed in accordance with manufacturer's specifications.	m	15		
4	Counter flash, girth 154mm, fixed in accordance with manufacturer's specifications.	m	15		
<u>INSULATION</u>					
5	Approved Heavy duty, durable, double sided, reflective foil laminate incorporating advanced fire retardant properties, tested for conformance with SANS 1381-4:2009, with a Class 1 fire rating in accordance with SANS 10177 - 3:2005, ASTM E84 and BS 476 part 5, 6 and 7, laid under purlins on top of rafters; overlapped longitudinally by 150mm with overlap ends taped; on and including 1.6mm galvanised straining wire spaced at 275mm; all in accordance with the manufacturers specifications.	m2	639		
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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 3</u>			
<u>BILL NO. 6</u>			
<u>CARPENTRY AND JOINERY</u>			
<u>PREAMBLES</u>			
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary products in descriptions</u>			
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent			
<u>Roof trusses</u>			
The truss system shall be designed by an Engineer and the Contractor shall complete and submit a certificate of confirmation. This certificate will state that the trusses have been designed, manufactured and erected in accordance with the relevant SABS code. The details of the registered engineer certifying this will appear on the certificate			
<u>Joinery</u>			
Descriptions of frames shall be deemed to include frames, transoms, mullions, rails, etc			
Descriptions of hardwood joinery shall be deemed to include pelleting of bolt holes			
<u>Fixing</u>			
All nailing of timber roof trusses, purlins, etc shall be done with galvanised nails. In coastal areas, copper, aluminium or stainless steel nails shall be used			
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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p>Items described as "nailed" shall be deemed to be fixed with hardened steel nails or shot pins to brickwork or concrete</p> <p>Where items are described as "bolted" the bolts have been measured elsewhere</p> <p><u>CPAP WORK GROUP</u></p> <p>Unless otherwise stated all items in this bill will be Work Group 126</p> <p><u>ROOFS, ETC</u></p> <p><u>Prefabricated roof trusses:</u></p> <p>Prefabricated timber roof trusses shall be constructed of South African pine by a firm of specialist designer manufacturer's as approved by the Architect.</p> <p>The truss system shall be designed by an Engineer and the Contractor shall complete and submit a certificate of confirmation. This certificate will state that the trusses have been designed, manufactured and erected in accordance with the relevant SABS code. The details of the registered engineer certifying this will appear on the certificate</p> <p>Prices must include for all cross and windbracing according to the manufacturer's instruction.</p> <p>Prices must include for the design, plans and approval of all timber trusses and no claim shall be considered.</p> <p>Pre-fabricated timber roof trusses shall comply with the requirements of SANS Specification 0163 and 0160 and to be constructed of South African pine as described in clause 8.5 to the designs shown on the Manufacturer's detail drawings. The timber shall be of cross-sectional dimensions shown, cut to correct lengths with ends square or at the required angle.</p>			
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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p>Trusses shall be assembled in truss fabricating jigs with the truss having the proper camber, all tightly clamped together with joints secured using approved connector plates of galvanised steel sheet. Connector plates shall be pressed into the timber simultaneously from both sides of the truss with a hydraulic press capable of exerting such pressure as will ensure complete penetration of the teeth into the timber.</p> <p>The connector plates shall be of such size as will ensure that the joints so made will adequately withstand the forces exerted on the joints.</p> <p>In coastal areas connector plates in buildings without ceilings shall be painted with two coats of epoxy tar complying with SABS Specification 801 Type 2, or rust neutralising paint.</p> <p>Approval of pre-fabricated roofing systems, whether measured as an alternative or not, shall be subject to the following requirements:</p> <p>(a) The Manufacturer of the pre-fabricated trusses shall hold a certificate of competence issued by the Insitute for Timber Construction.</p> <p>(b) A polyester print, size A1 having a minimum thickness of 0,5mm, shall be submitted by the Contractor to the Regional Representative at an early stage for approval by the Directorate: Structural Engineering Services.</p> <p>(c) The drawings shall be signed by a Registered Professional Engineer whose name appears on the Departmental panel for structural work.</p> <p>(d) In the case of systems buildings, approval shall be given with submission of the contract drawings on acceptance of the tender.</p> <p>The following minimum information shall be shown on the drawings:</p> <p>(a) Details of the roof system with the position of the rafters and purlins indicated thereon as well as typical elevations.</p>			
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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
(b) Bracing as recommended by the Institute for Timber Construction.			
(c) Sizes and grading of the timber components.			
(d) Truss sizes, e.g. height of ridge or angle of pitch.			
(e) Plate sizes for every construction point. (Code numbers only are deemed insufficient).			
(f) Seperate connection details for hip, valley and jack rafters.			
(g) Maximum spacing for purlins and branderling to ceilings shall be according to Subclauses 7.6.1 and 7.6.2 and Clauses 7.8, 7.9 and 9.5.			
(h) The type of roof covering as well as the design load. Over and above the supervision undertaken by the Representative / Agent, the Truss Fabricator or his Design Engineer shall inspect the completed roof structure and issue a certificate of confirmation to the Department that: "The roof structure(s) has (have) been erected in accordance with the Design Engineer's drawings, as accepted by the Department, and the relevant details given in the manual "THE ERECTION AND BRACING OF TIMBER ROOF TRUSSES" issued by the National Timber Research Institute and the Institute for Timber Construction".			
<u>Joinery:</u> Descriptions of frames shall be deemed to include frames, transomes, mullions, rails, etc. Descriptions of hardwood joinery shall be deemed to include pelleting of bolt holes.			
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Item	Quantity	Rate	Amount
<p><u>Fixing:</u></p> <p>All nailing of timber roof trusses, purlins, etc shall be done with galvanised nails. In coastal areas, copper, aluminium or stainless steel nails shall be used.</p> <p>Items described as "nailed" shall be deemed to be fixed with hardened steel nails or shot pins to brickwork or concrete.</p> <p>Where items are described as "bolted" the bolts have been measured elsewhere.</p> <p><u>The following trusses shall be approved engineering designed roof trusses manufactured from sawn softwood and suitable for corrugated iron covering and gypsum plasterboard ceilings on 38 x 50mm softwood bracing</u></p> <p><u>(NOTE :The contractor will be required to provide a certificate of approval signed by a registered engineer certifying that the trusses have been designed, manufactured and installed in accordance with the relevant SABS specifications)</u></p> <p><u>ROOFS, ETC</u></p> <p><u>Sawn softwood</u></p> <p><u>Plate nailed timber roof truss construction.</u></p> <p><u>The following budgetary allowances are for work to be executed by the Contractor</u></p>			
1	Provide the amount of R755,000.00 (Seven Hundred and Fifty Five Thousand Rand) for the manufacturing and supply, of roof trusses, bracing, etc. measuring approximately 670m2 on plan	Item	755,000.00
2	Labour on above for hoisting in place and fixing of roof trusses, bracing, etc.	Item	
<p><u>Sawn softwood grade 4</u></p>			
3	50 x 76 mm Purlins in repairs to existing structure.	m	74
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	38 x 114 mm Rafters in repairs to existing structure.	m	74	
2	38 x 50mm Bearer eaves ceiling support (Provisional) plugged to walls with and including approved brass screws at 500mm centres	m	163	
3	38 x 114mm Bearer fascia support (Provisional) fixed between rafters feet with and including approved hurricane clips.	m	427	
	<u>Laminated S. A. pine</u>			
4	50 x 250mm beam.	m	20	
	<u>EAVES, VERGES, ETC</u>			
	<u>Pressed fibre cement</u>			
5	12 x 225mm Fascias boards drilled and brass screwed to and including 38 x 50 x 114mm long SAP cleats screwed to rafter feet including galvanised steel H-profile jointing strips between lengths	m	427	
6	Extra on last for apex mitre	No	38	
	<u>SKIRTINGS</u>			
	<u>Wrought softwood</u>			
7	Approved pine skirting, size 25mm x 150mm high, with approved profile to one edge, plugged and countersunk screwed and pelleted to wall at 400mm centres, with and including hardwood quadrant, size 19 x 19mm planted on at 400mm centres. All joints and corners to be mitred, all installed to manufacturers specifications.	m	443	
	<u>WINDOWS</u>			
	<u>Wrought meranti windows</u>			
8	Type H purpose made top hung window 533 x 654mm high	No	12	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>EXISTING TIMBER WINDOWS</u>				
<u>Service existing timber sash windows.</u>				
1	Service existing timber sash window size 1000 x 975 mm by replacing or repairing all damaged sash fasteners, sash lifts, sash rollers, nylon guides, guidelines etc. including replacing all damaged stiles and transoms, top and bottom rebated and grooved rails, cills, glazing beads etc. and easing all opening sections leaving window fully operational and functional.	No	1	
2	Service existing timber sash window size 600 x 1800 mm by replacing or repairing all damaged sash fasteners, sash lifts, sash rollers, nylon guides, guidelines etc. including replacing all damaged stiles and transoms, top and bottom rebated and grooved rails, cills, glazing beads etc. and easing all opening sections leaving window fully operational and functional.	No	1	
3	Service existing timber sash window size 1150 x 1800 mm by replacing or repairing all damaged sash fasteners, sash lifts, sash rollers, nylon guides, guidelines etc. including replacing all damaged stiles and transoms, top and bottom rebated and grooved rails, cills, glazing beads etc. and easing all opening sections leaving window fully operational and functional.	No	23	
<u>EXISTING TIMBER DOORS, ETC</u>				
<u>Servicing of existing external doors</u>				
4	Service existing solid external single doors and frames average door size 825 x 2 100 mm high by, neatly glueing in timber where door damaged, servicing existing hinges and easing door, leaving door and frame in perfect working order. (New lock sets and new hinges elsewhere measured)	No	11	
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Item		Quantity	Rate	Amount
<u>Servicing of existing internal doors</u>				
1	Service existing solid and semi solid internal single doors and frames average door size 825 x 2 092 mm high by, neatly glueing in timber where door damaged, servicing existing hinges and easing door, leaving door and frame in perfect working order. (New lock sets and new hinges elsewhere measured)	No	6	
<u>DOORS ETC</u>				
<u>ANTI BANDIT DOORS</u>				
2	Level G1 bullet resistant anti-bandit door with 100 x 50 x 2mm gauge mild steel frame, overall size 930 x 2095mm high in Sapele veneer with 250 x 500mm high viewing panel glazed in 28mm thick clear glass supplied with 5-pin CISA dead lock with an additional light duty magnetic lock and striker including key switch and surface mounted casing, 6 Amp power supply, push buttons and interlock system, continuous roton type hinge, aluminium slam bar with an approved light duty door closer and D-style pull handles.	No	1	
<u>Solid flush doors with 3,2mm standard hardboard covering on both sides and concealed edges hung to timber frames</u>				
3	44mm Single door size, 813 x 2032mm high all as per Architects Detail "Door Type H" attached to the back of the Bills of Quantities. (Ironmongery elsewhere measured)	No	8	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Wrought meranti doors hung to timber frames</u>			
1	44 mm Framed, ledged and braced door, size 813 x 2 032 mm high of 44 x 108 mm top rail and stiles, 22 x 220mm middle ledge and bottom rail, 19 x 108mm braces, filled in with 22 x 70mm tongue and groved V-jointed one side boarding and covered on other side with 3 mm plywood with veneer to match door let into and including rebates all round as per Architects Detail (Type F) attached to the back of the Bills of Quantities. (All door furniture elsewhere measured)	No	5	
2	44 mm Framed, ledged and braced door, size 914 x 2 032 mm high of 44 x 108 mm top rail and stiles, 22 x 220mm middle ledge and bottom rail, 19 x 108mm braces, filled in with 22 x 70mm tongue and groved V-jointed one side boarding and covered on other side with 3 mm plywood with veneer to match door let into and including rebates all round as per Architects Detail (Type G) attached to the back of the Bills of Quantities. (All door furniture elsewhere measured)	No	2	
3	44mm Solid Meranti hardwood horizontal slatted single door, size 813 x 2 032mm high overall, all as per Architects Detail "Door Type K" attached to the back of the Bills of Quantities. (Ironmongery elsewhere measured)	No	24	
4	44mm Solid Meranti hardwood horizontal slatted single door, size 813 x 2 032mm high overall, all as per Architects Detail "Door Type P" attached to the back of the Bills of Quantities. (Ironmongery elsewhere measured)	No	4	
5	44mm Solid Meranti hardwood four panel single door, size 813 x 2 032mm high overall, all as per Architects Detail "Door Type R" attached to the back of the Bills of Quantities. (Ironmongery elsewhere measured)	No	1	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	44 mm Framed, ledged and braced double door 1 612 x 2 032 mm high with rebated meeting stiles and glass pane top, each leaf of 44 x 146 mm top rail and stiles, 22 x 146 mm middle ledge and braces and 22 x 222 mm bottom rail filled in with 22 mm V-jointed one side boarding and covered on other side with 3 mm plywood with veneer to match door let into and including rebates all round all as per Architects Detail "Door Type J" attached to the back of the Bills of Quantities. (Ironmongery elsewhere measured)	No	4	
	<u>FRAMED FRAMES ETC</u>			
	<u>Wrought meranti</u>			
2	76 x 50mm Rebated framed frame	m	251	
3	220 x 19 mm Door liner jamb plugged	m	15	
4	120 x 19 mm Door architrave plugged	m	31	
	<u>BEADS, ARCHITRAVES, ETC</u>			
	<u>Wrought meranti</u>			
5	19mm Quadrant moulding planted on	m	53	
6	32 x 44mm Weather boards including rebates in doors	m	24	
	<u>NOTICE BOARDS, KEYBOARDS, DUCKBOARDS, ETC</u>			
7	Key cabinet type KEY01 445 x 580 x 105 mm deep overall plugged and screwed to wall, of 16 mm "Melawood" melamine faced chipboard sides, top and bottom, 19 x 32 mm wrought meranti frame, 22 mm blockboard backboard with hardwood veneer and 16 mm "Supawood" door 400 x 534 mm high (ironmongery elsewhere)	No	2	
	<u>JOINERY FITTINGS</u>			
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Foyer</u>				
1	Lightly sand the entire notice board in finer grades of sand paper until all marks are removed and the solid timber members are clean and smooth. Apply two coats of matt polyurethane varnish, lightly sanding between coats, approximate overall size 800 x 800mm high.		Item		
2	Lightly sand the entire pin board frame in finer grades of sand paper until smooth. Apply two coats of universal undercoat and two coats plascon eggshell enamel paint (colour white), approximate overall length 7200mm not exceeding 150mm girth		Item		
	<u>Lobby</u>				
3	Lightly sand the entire notice board in finer grades of sand paper until all marks are removed and the solid timber members are clean and smooth. Apply two coats of matt polyurethane varnish, lightly sanding between coats, approximate overall size 1200 x 1200mm high.		Item		
	<u>Security Control Room</u>				
4	Cash hall writing counter 5500 x 750mm wide (Refer to drawing 1052/50-22 Detail 45)	No	1		
	<u>Cash hall fittings</u>				
5	Table 1,802 x 0,850m wide (Refer to drawing 1052/50-21)	No	8		
6	Cash hall writing counter 3 000 x 300mm wide (Refer to drawing 1052/50-22 Detail 45)	No	1		
7	4,850mm Long on elevation Cash hall counter, writing counter and 28mm bullet resistant glass into aluminium frame complete (Refer to drawing 1052/50-22 detail 44)	No	1		
8	"Mutual Austen Safes" or similar approved 135mm deep stainless steel bank type transfer tray let into 32mm post formed Oak counter top	No	3		
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Accused stand</u>				
1	4,000m Long Accused stand unit complete (Refer to drawing 1052/50-19 Detail 41)	No	1		
2	2,770m Long Accused stand unit complete (Refer to drawing 1052/50-20 Detail 42)	No	1		
3	Dividing wall extended from accused complete (Refer to drawing 1052/50-20 Detail 42)	m	5		
4	Extra over dividing wall for access door complete (Refer to drawing 1052/50-20 Detail 42)	No	2		
	<u>Public seating benches</u>				
5	1,650m Long Bench complete including varnish (Refer to drawing 1052/50-17)	No	5		
6	2,40m Long Bench complete including varnish (Refer to drawing 1052/50-17)	No	6		
	<u>Public waiting benches</u>				
7	1,540mm long slatted bench with backrest (Refer to drawing 1020/50-02)	m	3		
8	2,040mm long slatted bench with backrest (Refer to drawing 1020/50-02)	m	6		
	<u>Magistrates benches</u>				
9	4,284m Wide desk unit complete (Refer to drawing 1052/50-14 and 15)	No	1		
10	7,290m Wide desk unit complete (Refer to drawing 1052/50-18)	No	1		
11	"Mutual Austen Safes WL3 " or similar approved 295 X 250mm stainless steel records type safe bolted to floor with 4 x M16 rawl bolts	No	2		
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Witness stand</u>				
1	1,666m Wide witness stand complete (Refer to drawing 1052/50-16 Detail 35)	No	2		
	<u>Courtroom tables</u>				
2	Table 1,660 x 0,750m wide (Refer to drawing 1052/50-16 Detail 34)	No	4		
3	L-Shaped Lectern table 3,690mm x 1,464mm x 0,750m wide complete (Refer to drawing 1052/50-12)	No	1		
	<u>Book shelving</u>				
4	Book shelving unit 2100 x 380mm deep x 1200mm wide (Refer to drawing 1052/50-13 Detail 29)	No	9		
5	Book shelving unit 2100 x 450mm deep x 1200mm wide (Refer to drawing 1052/50-13 Detail 30)	No	15		
	<u>Acoustic Panelling</u>				
6	Framed Acoustic Panel size 1,542m x 3.000m High fixed to walls (Refer to drawing 1052/50-27)	No	1		
7	Framed Acoustic Panel size 4,284m x 3.000m High fixed to walls (Refer to drawing 1052/50-27)	No	1		
8	Framed Acoustic Panel size 4,330m x 3.000m High fixed to walls (Refer to drawing 1052/50-27)	No	1		
9	Framed Acoustic Panel size 4,920m x 3.000m High fixed to walls (Refer to drawing 1052/50-27)	No	1		
10	Framed Acoustic Panel size 5,790m x 3.000m High fixed to walls (Refer to drawing 1052/50-27)	No	1		
	<u>Ablution Fittings</u>				
11	3,572m x 0,615m wide Basin vanity (Refer to drawing 1052/50-09 Detail 26)	No	2		
	Carried to Collection			R	
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	1,810m x 0,615m wide Basin vanity (Refer to drawing 1052/50-11 Detail 22)	No	2		
2	2,425 x 0.700m wide Baby change counter (Refer to drawing 1052/50-01 Detail 2)	No	1		
	<u>Security and SOS</u>				
3	Security desk, including shop fronts to sides of turnstiles, cladding finish to brick wall, worktop and sub frame, security panel frames, frameless safety glass and lower level bulkheads (Refer to drawing 1052/50-23, 24 and 25)				
	(Turnstiles, metal detector, x-ray scanner, disabled door and sidelights elsewhere measured)	No	1		
4	1,859 x 0.600m deep Office cabinet (Refer to drawing 1052/50-09 Detail 17)	No	4		
5	Book shelving unit 2100 x 450mm deep x 2000mm wide (Refer to drawing 1052/50-13 Detail 30)	No	4		
	<u>Magistrates Offices</u>				
6	1,700 x 0.600m deep Toilet cabinet (Refer to drawing 1052/50-09 Detail 13)	No	2		
7	3,062 x 0.600m deep Office cabinet (Refer to drawing 1052/50-09 Detail 16)	No	2		
8	1,400 x 0.600m deep Kitchen cupboard including 0.7m x 0.45m deep microwave shelf (Refer to drawing 1052/50-09 Detail 56)	No	2		
9	1,200 x 0.600m deep Wardrobe (Refer to drawing 1052/50-09 Detail 12)	No	2		
	<u>Kitchenette</u>				
10	L-Shaped kitchen cupboard 1,833mm x 1,461mm x 0,600m wide complete (Refer to drawing 1052/50-11 Detail 21)	No	1		
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Item	Quantity	Rate	Amount
<u>SECTION NO. 3</u>			
<u>BILL NO. 7</u>			
<u>CEILINGS, PARTITIONS AND ACCESS FLOORING</u>			
<u>PREAMBLES</u>			
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary products in descriptions</u>			
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent			
<u>Descriptions</u>			
Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins or shot pinned to brickwork or concrete			
<u>CPAP WORK GROUP</u>			
Unless otherwise stated all items in this bill will be Work Group 129			
<u>CEILINGS, ETC</u>			
<u>NAILED UP CEILINGS</u>			
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>4mm Thick fibre cement plain ceiling boards, manufactured in accordance with SANS 9001:2000 carrying SANS 803:2005 mark, fixed to 38 x 50mm battens</u>			
1	Ceilings consisting of 38 x 50mm battens fixed to timber tie beams at 400mm centres, ceiling boards fixed to battens using 32 x 2,5mm serrated ceiling nails at 150mm centres, minimum of 12mm from edge of board. All joints to be covered with and including 8 x 40mm wrought meranti cover strips, all in accordance with the manufacturer's recommendations.	m2	319	
2	Raked ceilings consisting of 38 x 50mm battens fixed to timber tie beams at 400mm centres, ceiling boards fixed to battens using 32 x 2,5mm serrated ceiling nails at 150mm centres, minimum of 12mm from edge of board. All joints to be covered with and including 8 x 40mm wrought meranti cover strips, all in accordance with the manufacturer's recommendations.	m2	124	
3	Extra over ceiling for opening for 900 x 900mm trap door complete with trimmers, frame, cross branders, ceiling board, hinges, etc	No	8	
	<u>SUSPENDED CEILINGS</u>			
	<u>Vinyl cladding lay-in grid ceiling system with 595 x 595 x 6mm thick straight edged Embossed White vinyl clad tiles, laid on double stitched slotted 38 mm white main tees at 600mm centres and white 38 mm cross tees at 600 mm centres, including all necessary grids, suspension plates, clips and holding down clips, fire expansion punch outs to main tees, etc. Suspend main tees using approved Pre-stretched Galvanised Hanger wire 2.5mm thick or approved hanger strap 19mm at 1200mm centres fixed to timber rafters at not exceeding 1 200 mm centres. Ceiling perimeter to be finished with white recessed wall angles, all in accordance with the manufacturer's recommendations.</u>			
4	6mm Ceilings suspended not exceeding 1 000 mm below timber trusses.	m2	225	
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Item		Quantity	Rate	Amount
1	Forming side of horizontal bulkheads, size 250mm deep, suspended not exceeding 1 000 mm below timber trusses.	m	64	
<u>EAVES, VERGES, ETC.</u>				
<u>6mm thick fibre cement plain ceiling boards, manufactured in accordance with SANS 9001:2000 carrying SANS 803:2005 mark, fixed to 38 x 50mm battens</u>				
2	Eaves , Verges and Verandah Ceilings consisting of 38 x 50mm battens fixed to timber tie beams at 450mm centres, ceiling boards fixed to battens using 32 x 2,5mm serrated ceiling nails at 150mm centres, minimum of 12mm from edge of board. All joints to be covered with and including 8 x 40mm wrought meranti cover strips, all in accordance with the manufacturer's recommendations.	m2	193	
<u>Gypsum plasterboard cornice</u>				
3	125mm Cove consisting of a fire resistant gypsum plaster core encased in special paper, nailed with galvanised nails at 300mm centres to the wall and at 450mm centres through the board into the branderling. The head of the nail must not break the paper of the cove.	m	361	
4	Hardwood standard skirting as cornice, size 19 x 76mm plugged and countersunk screwed and pelleted to wall at 400mm centres at intersection of slabs .	m	202	
<u>RAISED ACCESS FLOORING</u>				
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>SABS Approved computer room heavy duty standard raised access floor of 600 x 600 x 35mm modular interchangeable steel panels with a concentrated load of 567kg</u>			
1	Raised access floor system consisting of 600 x 600 x 35mm modular and interchangeable steel panels, all supported by steel understructure consisting of a snap-on stringer system raised minimum 200mm above floor level	m2	18	
	<u>INSULATION</u>			
	<u>Non-combustible polyester fibre thermal insulation blanket with a minimum R-Value of 3.37</u>			
2	145mm thick polyester thermal insulation (density 11.5 kg/m³) laid over ceiling bracing closely fitted between rafters.	m2	862	
	<u>DRYWALL PARTITIONS, ETC.</u>			
	<u>Steel stud partitioning with firestop board on both sides and fibreglass blanket between (1 hour fire rating)</u>			
3	1hr fire rating (A) partitioning system comprising steel studding formed of 63,5mm top and bottom tracks with vertical studs at maximum 600mm centres, friction fitted or pop riveted to the top and bottom tracks with similar additional vertical studs as necessary at abutments, ends, etc and covered as described with 12,5mm Fire stop Taper edge boards screwed to studding with "Drywall" screws at maximum 220mm centres. Boards are to be butt jointed and finished with "Fibatape" and "Rhinoglide" jointing compound all in accordance with the manufacturer's instructions. Intersections and abutments are measured separately and descriptions shall be deemed to include any additional studs, corner beads, jointing compound, tape etc.			
	In cavity install 63mm thick self-supporting non-combustible lightweight, glass tissue faced Glasswool 'cavitybatt insulation,' offering a thermal resistance value of 1.66m² K/W for heat and acoustic control. Install strictly in accordance to manufacturers specifications.	m2	170	
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>NATURAL ANODISED ALUMINIUM</u>					
1	Extra over partition for aluminium vertical abutment	m	45		
2	Extra over partition for aluminium corner	m	10		
3	Extra over partition for aluminium T-intersection	m	24		
4	Extra over partition for aluminium channel profile size, 63,5 x 30 x 2 mm thick around reveals of door and window openings to receive aluminium door and window frames.	m	35		
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 3</u>				
<u>BILL NO. 8</u>				
<u>FLOOR COVERINGS, WALL LININGS, ETC</u>				
<u>PREAMBLES</u>				
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"				
<u>SUPPLEMENTARY PREAMBLES</u>				
<u>Proprietary products in descriptions</u>				
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent				
<u>Cleaning</u>				
Rates for floor covering shall include for stripping and proper cleaning on competition				
<u>CPAP WORK GROUP</u>				
Unless otherwise stated all items in this bill will be Work Group 130				
<u>FLOOR COVERINGS</u>				
<u>VINYL FLOOR TILES</u>				
<u>Approved semi flexible vinyl floor tiles, size 300 x 300 x 2.5mm thick, manufactured in accordance with SANS 581, laid in approved acrylic adhesive spread with a trowel fitted with an A2 notched blade at a rate of between 5.5m² and 6.5m² per litre on suitably prepared sub floor (elsewhere specified) in accordance with SANS 10070, using approved Self Leveller when required and rolled with 68kg three section metal roller on completion.</u>				
1	On smooth screeded floors.	m2	274	
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Approved, size 608 x 608 x 2mm directional static dissipative vinyl tile laid in approved antistatic/conductive adhesive spread with a notched trowel on suitably prepared cement screed (elsewhere measured) with a hygrometer reading showing a moisture content of less than 70% and rolled with 68kg articulated floor roller, all in accordance with manufacturer's recommendations.</u>				
1	On floors	m2	27		
	<u>Approved 2mm Thick fully flexible vinyl sheeting with welded joints, laid in an approved adhesive spread with a notched trowel on suitably prepared cement screed (elsewhere measured) using approved self leveller when required, with a hygrometer reading showing a moisture content of less than 70% and rolled with 68kg articulated floor roller, all in accordance with manufacturer's recommendations.</u>				
2	On floors	m2	130		
	<u>POLISH, SEALERS, ETC</u>				
	<u>Scrub down with neutral detergent complying with SABS 825 and three coats water based floor dressing complying with SABS 1042 to:</u>				
3	Vinyl floor tiling.	m2	430		
	<u>CARPETING</u>				
	<u>Carpet Tiles</u>				
	<u>Approved Stainproof Eco Fibre blend Tufted Multi-Scroll Loop Pile SABS Class 2 fire rating grade general / medium commercial carpet tiles, size 500 x 500 x 7mm thick, all installed by approved installer in accordance with SANS 10186:2010, the code of practice for textile floor coverings.</u>				
4	On floors	m2	149		
	<u>SKIRTINGS, NOSINGS, ETC</u>				
	<u>Sundries</u>				
5	25 mm natural anodised cover strips fixed to concrete	m	45		
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	10mm "M-trim SMJ100" or similar approved heavy duty stainless steel movement joint with 6mm wide polyurethane infill	m	35		
2	39mm "M-trim ASSJ390" or similar approved heavy duty stainless steel structural joint with 38mm wide PVC infill, plugged and screwed to floor base on one side of expansion joints	m	40		
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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 3</u>			
<u>BILL NO. 9</u>			
<u>IRONMONGERY</u>			
<u>PREAMBLES</u>			
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary products in descriptions</u>			
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent			
<u>Finishes to ironmongery</u>			
Where applicable finishes to ironmongery are indicated by suffixes in accordance with the following list			
BS Satin bronze lacquered CP Chromium plated SC Satin chromium plated SE Silver enamelled 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			
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>Fixing</u>					
Descriptions of wall mounted and floor standing ironmongery items shall be deemed to include for fixing in position and all fixing accessories					
Descriptions of proprietary items shall be deemed to include fixing in position and all fixing accessories as specified by the manufacturer					
<u>CPAP WORK GROUP</u>					
Unless otherwise stated all items in this bill will be Work Group 132					
<u>HINGES, BOLTS, ETC</u>					
<u>"Dorma or similar approved" ironmongery</u>					
1	DBB-SS-009 102 x 75 x 3mm stainless steel two ball bearing butt hinge	No	207		
2	DFB-SC-180/150 150mm Satin Chrome flush bolt with heel	No	26		
3	TS71/EN3-4 standard arm door closer - non hold open	No	18		
4	TS73V EN2-4 variable spring strength regular arm door closer	No	14		
5	TS73N/EN3-4 parallel arm door closer - DELAYING CLOSING - push side fitting	No	22		
6	BTS75R/EN2-5 Single action hold open floor spring complete with stainless steel cover plate 7411/56 bottom strap 7481 cover cap (handed) 7411K/56 top centre with 7483 cover caps for timber doors	No	8		
<u>LOCKS</u>					
7	DPL 1000 47mm Padlock MKD	No	12		
8	D032D bathroom/WC dead lock SS	No	9		
9	D036S euro-profile cylinder sash lock SS	No	56		
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	D038R Rebate conversion kit for euro-profile locks SS	No	4		
2	DDC056501 NP 65mm five pin euro-profile double cylinder	No	56		
3	DWC-006 SS WC indicator with 79mm turn knob for physically impaired	No	2		
	<u>HANDLES</u>				
4	CB75 lever handle on rectangular Euro cylinder backplate, 61mm centres	No	112		
5	DPH301C 150 x 19mm stainless steel "D" shaped straight bolt through pull handle	No	18		
6	DPH213 350 x 32mm stainless steel "D" shaped straight back-to-back pull handles	No	4		
	<u>CATCHES, CABIN HOOKS, ETC</u>				
7	"Halstead" 166 cabin hook 150mm	No	9		
8	"Halstead" 401 floor mounted door holder	No	52		
9	DCE-002 SS euro-profile escutcheon	No	112		
10	DHC-SS-031B SS hat and coat hook with rubber buffer	No	26		
11	DJW Concealed fixing black rubber doorstop fitted to wall or floor	No	9		
12	"HOWICK" H057 Aluminium Robe hook	No	26		
	<u>SUNDRIES</u>				
13	10 x 100mm Long dowels let half way into timber frames and fixed to concrete floors	No	94		
14	3 x 25mm Brass dividing strip	m	58		
15	DSS1 "Male" pictogram on 76mm diameter stainless steel plate	No	2		
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	DSS2 "Female" pictogram on 76mm diameter stainless steel plate	No	2		
2	DSS-135 stainless steel 150 x 150mm TEA CUP sign	No	1		
3	DSS3 "MALE/FEMALE" pictogram on 76mm diameter stainless steel plate	No	2		
4	DSS4 "Wheelchair" pictogram on 76mm diameter stainless steel plate	No	2		
5	DKP-22-164 300 x 150 x 1,2mm blank polished stainless steel push plate	No	49		
6	914 x 300 x 1,2mm blank polished stainless steel kick plate	No	4		
<u>BATHROOM FITTINGS (SANS APPROVED)</u>					
7	Grade 304 32mm diameter 18/10 stainless steel grab rails with fine grip, size 550mm x 95mm deep, plugged and screwed to the wall with stainless steel screws.	No	4		
8	32mm diameter Grade 304 18/10 stainless steel cistern back grab rail, size 750 x 206mm wide with Fine Grip surface, plugged and screwed to the wall with stainless steel screws.	No	4		
9	32mm diameter Grade 304 18/10 stainless steel angle bars, size 256 x 618 x 95mm deep with Fine Grip surface, plugged and screwed to the wall with stainless steel screws.	No	4		
10	Standard stainless steel lockable two roll toilet paper dispenser	No	14		
11	Franke or similar approved 1,2mm Grade 304 18/10 stainless steel recessed type toilet roll holder (Code:2120037), size 155mm diameter x 260mm deep, unit recessed into wall and bolted with 2No. M10 threaded bolts.	No	3		
12	Standard stainless steel paper towel dispenser	No	18		
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Standard stainless steel soap dispenser	No	12		
2	Stainless steel sanitary bin with double flip lid, removable cartridge, disposable insert and locking mechanism, overall size 180 x 345 x 520mm high plugged and screw to wall with stainless steel screws.	No	4		
3	Standard vanity shelf to disabled toilet	No	4		
4	600 x 600 x 0.9mm Thick bright annealed mirrored stainless steel wall mirror, plugged and screwed to walls with chromed screws with and including screw caps	No	21		
	<u>Venetian Blinds</u>				
5	0.60 x 0.60m 25 mm Venetian blinds (standard colour range) complete with strong and flexible snapback slats, head and bottom rails and colour co-ordinated rail, cords and components fixed to wall in window and door reveals.	No	2		
6	1.00 x 0.98m 25 mm Venetian blinds (standard colour range) complete with strong and flexible snapback slats, head and bottom rails and colour co-ordinated rail, cords and components fixed to wall in window and door reveals.	No	1		
7	0.60 x 1.80m 25 mm Venetian blinds (standard colour range) complete with strong and flexible snapback slats, head and bottom rails and colour co-ordinated rail, cords and components fixed to wall in window and door reveals.	No	1		
8	0.90 x 1.80m 25 mm Venetian blinds (standard colour range) complete with strong and flexible snapback slats, head and bottom rails and colour co-ordinated rail, cords and components fixed to wall in window and door reveals.	No	12		
9	1.15 x 1.80m 25 mm Venetian blinds (standard colour range) complete with strong and flexible snapback slats, head and bottom rails and colour co-ordinated rail, cords and components fixed to wall in window and door reveals.	No	23		
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	0.90 x 2.10m 25 mm Venetian blinds (standard colour range) complete with strong and flexible snapback slats, head and bottom rails and colour co-ordinated rail, cords and components fixed to wall in window and door reveals.	No	2	
	<u>SIGNAGE</u>			
	<u>Information Signs</u>			
2	Approved engraved grade 304 Stainless Steel information sign, size 150 x 150 x 1,2mm with "Male" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	2	
3	Approved engraved grade 304 Stainless Steel information sign, size 150 x 150 x 1,2mm with "Female" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	2	
4	Approved engraved grade 304 Stainless Steel information sign, size 150 x 150 x 1,2mm with "Male & Female" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	2	
5	Approved engraved grade 304 Stainless Steel information sign, size 150 x 150 x 1,2mm with "Disabled" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	2	
6	Approved engraved grade 304 Stainless Steel information sign, size 150 x 150 x 1,2mm with "Tea Cup" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	1	
7	Approved engraved grade 304 Stainless Steel information sign, size 150 x 150 x 1,2mm with "Electrical" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	1	
8	Approved engraved grade 304 Stainless Steel information sign, size 150 x 150 x 1,2mm with "Telkom" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	1	
	Carried to Collection			R
	Section No. 3 - New Works			
	Bill No. 9			
	Ironmongery			

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PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Approved engraved grade 304 Stainless Steel information sign, size 150 x 150 x 1,2mm with "Cleaner" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	1		
2	Approved engraved grade 304 Stainless Steel information sign, size 150 x 150 x 1,2mm with "No Entry" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	6		
3	Approved grade 304 Stainless Steel single sided landscape information sign, 450mm long x 80mm high with counter-sunk fixing holes plugged and screwed with aluminium screws to wall with bottom edge 2200 mm above floor level.	No	8		
4	Approved grade 304 Stainless Steel single sided landscape information sign, 600mm long x 80mm high with counter-sunk fixing holes plugged and screwed with aluminium screws to wall with bottom edge 2200 mm above floor level.	No	8		
5	Approved grade 304 Stainless Steel single sided landscape information sign, 800mm long x 80mm high with counter-sunk fixing holes plugged and screwed with aluminium screws to wall with bottom edge 2200 mm above floor level.	No	6		
6	Approved grade 304 Stainless Steel single sided landscape information sign, 600mm wide x 300mm high, suspended from ceiling with stainless steel cables 2200mm above finished floor level.	No	8		
7	Approved grade 304 Stainless Steel single sided landscape information sign, 600mm wide x 450mm high, suspended from 63mm stainless steel round tube with stainless steel cables 1000mm above ground level.	No	4		
<u>Escape Signs</u>					
8	Approved photo luminescent escape route signage, size 290 x 290mm, in SABS 1186 certified ABS plastic, with natural anodized aluminium frame hung from ceiling with stainless steel chains or cables.	No	6		
Carried to Collection					R
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Approved engraved grade 304 Stainless Steel escape sign size 150 x 150 x 1,2mm with "Man running right" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	6		
2	Approved engraved grade 304 Stainless Steel escape sign, size 150 x 150 x 1,2mm with "Man running left" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	6		
	<u>Fire signs</u>				
3	Approved photo luminescent fire signage, size 290 x 290mm, in SABS 1186 certified ABS plastic, with natural anodized aluminium frame, drilled, plugged and screwed with non-corrosive screws.	No	11		
4	Approved engraved grade 304 Stainless Steel fire sign, size 150 x 150 x 1,2mm with "Fire hose reel" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	5		
5	Approved engraved grade 304 Stainless Steel fire sign, size 150 x 150 x 1,2mm with "Fire extinguisher" engraving with counter-sunk fixing holes plugged and screwed with aluminium screws.	No	11		
	<u>Artwork to Signage</u>				
	<u>30mm High, approved non-reflective self adhesive material, all in accordance with SANS 1519, colour black "ARIAL" bold font in capital letters or numerals, fitted to stainless steel plates.</u>				
6	Four letters or numerals	No	3		
7	Five letters or numerals	No	3		
8	Six letters or numerals	No	2		
9	Seven letters or numerals	No	2		
10	Eight letters or numerals	No	5		
11	Nine letters or numerals	No	5		
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Item		Quantity	Rate	Amount
1	Eleven letters or numerals	No	4	
2	Thirteen letters or numerals	No	3	
3	Fourteen letters or numerals	No	3	
4	Eighteen letters or numerals	No	3	
5	Nineteen letters or numerals	No	2	
6	Twenty letters or numerals	No	5	
7	Twenty One letters or numerals	No	2	
8	Twenty Two letters or numerals	No	2	
9	Twenty Four letters or numerals	No	2	
10	Twenty Five letters or numerals	No	3	
	<u>100mm High, approved non-reflective self adhesive material, all in accordance with SANS 1519, colour black "ARIAL" bold font in capital letters or numerals, fitted to stainless steel plates.</u>			
11	Twenty Five letters or numerals	No	1	
	<u>Welded signage support frames with one shop coat red oxide</u>			
12	63mm Diameter x 3mm thick mild steel hollow section post framework, 3,700mm long twice bent to form arch and fitted with 2(no) 150 x 150 x 8mm flange plate welded to bottom and embedded in 300 x 300 x 500mm mass concrete (15 MPa) base to protrude 50mm above ground level including all excavations and backfilling (total weight of framework = 19.50kg)	No	1	
	<u>SIGNAGE</u>			
	SELECTED SUB-CONTRACTS The following selected sub-contract amounts are for work to be carried out in terms of Clause 21 of the Principal Building Agreement - -----			
	Carried to Collection		R	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Allow the sum of R25,000.00 (Twenty Five Thousand Rand) for the Supply and Installation of DOJ signage to be executed complete by a specialist subcontractor.	Item		25,000.00
2	Allow for profit.	Item		
3	Allow for attendance.	Item		
Carried to Collection				R
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Section 3
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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 3</u>			
<u>BILL NO. 10</u>			
<u>METALWORK</u>			
<u>PREAMBLES</u>			
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary products in descriptions</u>			
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent			
<u>Descriptions</u>			
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 of concrete			
Metalwork described as "holed for bolt(s)" shall be deemed to exclude the bolts unless otherwise described			
<u>CPAP WORK GROUP</u>			
Unless otherwise stated all items in this bill will be Work Group 136			
<u>WELDED SCREENS, GATES, ETC</u>			
Carried to Collection			
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Metalwork			

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Purpose made burglar bars</u>			
1	Approved hot dip galvanised fixed external burglar guard, size 1400 x 800mm high comprising 25 x 25mm square tube frame, 12 x 12mm square tubing vertical bars and flights at maximum 100mm centres including all necessary extension pieces, flights, etc. fixed 100mm proud of wall with S37 coach bolts with snap-off nuts.	No	2	
	<u>Screenex or similar approved galvanised steel mesh overhead grilles (Refer to SAPS 5-Star drawing No. POL 2006/G1)</u>			
2	Horizontal Security screens, overall size 1700 x 1400mm complete, including angle iron frame, steel beam supports, bracket supports, etc. (Refer to drawing POL 2012/G1)	No	1	
3	Horizontal Security screens, overall size 3000 x 5700mm complete, including angle iron frame, steel beam supports, bracket supports, etc. (Refer to drawing POL 2012/G1)	No	1	
4	Horizontal Security screens, overall size 9500 x 3700mm complete, including angle iron frame, steel beam supports, bracket supports, etc. (Refer to drawing POL 2012/G1)	No	1	
5	Horizontal Security screens, overall size 11000 x 1400mm complete, including angle iron frame, steel beam supports, bracket supports, etc. (Refer to drawing POL 2012/G1)	No	1	
	<u>SUNDRY METALWORK</u>			
	<u>"Vitrex System 2000" or similar approved</u>			
6	Approved 2,50 x 1,50m Standard enamelled magnetic whiteboard, complete with aluminium frame and fixing brackets, fixed to walls as per manufacturers specification	No	5	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Approved standard 2.5 x 1.5m pinning board, complete with aluminium frame and fixing brackets, fixed to walls as per manufacturers specification	No	16	
	<u>SABS approved</u>			
2	200 x 200 x 300mm Internal dimensioned handgun safe with 2-key lock system	No	4	
	<u>DUCT COVERS</u>			
	<u>Purpose made duct covers</u>			
3	494 x 3005mm High duct cover complete, including barrel bolt and keep (Refer to drawing 1052/50-06 (Duct screens detail 9)	No	2	
4	1194 x 3005mm High overall duct cover complete, including barrel bolt and keep (Refer to drawing 1052/50-06 (Duct screen detail 9)	No	1	
	<u>DOORS</u>			
	<u>Doors</u>			
5	Service and reuse existing strongroom door	No	1	
	<u>GATES</u>			
6	Access control Gate, size 925 x 2000mm High Single Gate complete with all necessary ironmongery (Refer to drawing 1052/50-05 access Controlled Gate)	No	4	
7	Security Gate, size 1070 x 2100mm High Single Gate with fixed screened fanlight size 1300 x 900mm high complete with all necessary ironmongery (Refer to drawing 1052/50-05 Gate 2)	No	2	
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Item		Quantity	Rate	Amount
<u>TURNSTILES</u>				
1	Turnstar Triumph or similar approved 4-arm single full height turnstile electrical bi-directional revolving turnstile, overall size 1400 x 2125mm high in UV resistant polyester exterior powder coated mild steel finish colour Grey with 50mm diameter tube arms and rotation locking mechanism and perpetual base bearing, bolted to 25MPa concrete surface beds with 12No. M12 x 75mm countersunk anchor bolts and connected to 220V AC single phase power supply.	No	2	
<u>ROLLER SHUTTER DOORS</u>				
<u>Galvanised steel roller shutter doors:</u>				
<u>Note: The contractor is to check on site measurements before placing of order.</u>				
2	Approved galvanised and powder coated fixed gearbox operated steel roller shutter for opening 3000 x 3000 mm high opening (min. Headroom 350mm) with 130mm (normal) wide on free side and 220mm wide (normal) on operator side, with 0,8mm thick slats, 75mm wide side guides, with crank handle (radius 325mm), with neoprene weather strip to bottom edge and two barrel bolts and with slatted canopy cover..	No	1	
<u>WINDOWS</u>				
<u>Safety glazed visitors windows</u>				
3	Type G Visitors panel 0,70 x 1,00m high, including 6,38mm laminated safety glass, complete	No	1	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Cell steel windows</u>			
1	All prison windows are to be manufactured in accordance with the South African Police Services specifications and the Department of Public Works.Windows are to have a pressed metal surround.Internal and external security screens are to be included.Windows NEED NOT to be supplied with Manganese bars, prepared in accordance with given specifications.Steel cell window and frame size 850 x 940 mm high overall including internal and external fixed screens, mild steel lugs, glazing, padlocks, etc. as per Architects Window type F attached to the back of the Bills of Quantities.	No 10		
	<u>Hot dipped galvanised solid steel cell doors, grille gates and windows, all in accordance with SABS Specifications 763 - see PW 371 Section 13 Clause 13.1 to 13.3</u>			
2	All prison cell doors and grille gates are to be manufactured in accordance with the Department of Public Works specifications. Solid steel door, frame and grille gate, overall size 1 018 x 2 020mm high as per standard SAPS project 5 star detail drawing no. POL 2012/D1, D2, D3, D4 & D5 installed strictly to manufacturers specification in 220mm thick solid brick walls as per Architects Door Type L attached to the back of the Bills of Quantities. (Locks by others)	No 3		
	<u>CELL DOOR AND GATE LOCKSETS</u>			
3	Allow the sum of R25,000.00 (Twenty Five Thousand Rand) for the Supply and Installation of cell locksets to be executed complete by a specialist subcontractor.	Item		25,000.00
4	Contractors profit and attendance on above item	Item		
	<u>STEEL, STRONG ROOM DOORS VENTILATORS, ETC</u>			
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Item		Quantity	Rate	Amount
<u>Hot Dipped Galvanised Strong Room Doors etc suitable for 220mm walls fixed to brickwork or concrete:</u>				
1	Double ended strong room ventilator built into wall.	No	1	
<u>GALVANISED STEEL TRANSFORMER ROOM DOOR LOUVRED UNITS.</u>				
2	Approved Single steel transformer room unit door with 3x heavy duty brass hinges and mild steel louvre grey oxide primed, overall size 815 x 2032mm high, fixed in accordance to manufacturers recommendations, to suit wall 230mm thick.	No	1	
<u>STAIR LIFT</u>				
SELECTED SUB-CONTRACTS The following selected sub-contract amounts are for work to be carried out in terms of Clause 21 of the Principal Building Agreement - -----				
3	Allow the sum of R630,000.00 (Six Hundred and Thirty Thousand Rand) for the Supply and Installation of stair lifts to be executed complete by a specialist subcontractor.		Item	630,000.00
4	Allow for profit.		Item	
5	Allow for attendance.		Item	
<u>ALUMINIUM</u>				
The contractor is to make due allowance in his prices for complying with the following requirements.				
<u>General:</u>				
All aluminium windows and door frames are to meet the recommended performance requirements of (Class designation A2) as set out by the Association of Architectural Aluminium Manufactures of South Africa, and proof of this is to be provided in the form of an AAAMSA performance certificate for each product.				
Carried to Collection				R
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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p><u>Preliminary and Shop Drawings:</u></p> <p>The contractor shall submit preliminary design drawings showing basic system sections for the Architect's approval.</p> <p>After approval and prior to fabrication detailed shop drawings shall be prepared and submitted to the Architect for approval.</p> <p><u>Fixing:</u></p> <p>The contractor is to take special note of all fixing details of all aluminium elements and must allow in his price for properly securing the aluminium sections to the structure with and including all necessary steel brackets, rails, timber grounds and sub-frames, including all necessary holing and bolting, etc. This fixing is to be adequately spaced and securely fixed to ensure total stiffness of the door frames, windows, etc. as no sagging causing improper functioning of the windows and doors will be accepted.</p> <p><u>Deflection of structure:</u></p> <p>The contractor is advised to make adequate provision for the design deflection of the structure.</p> <p><u>Tolerances:</u></p> <p>Sizes are approximate only and measurements on site must be taken before fabrication. Due allowance must be made for tolerances in accordance with the Architect's details.</p> <p><u>Protection:</u></p> <p>The contractor will be required to protect his work during the course of construction, which protection shall be adequate for the purpose and to the full approval of the Architect.</p> <p>Such protection shall only be removed after a written instruction from the Architect.</p>			
Carried to Collection			
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<p><u>Cleaning:</u></p> <p>All work must be cleaned down upon completion. Glazing as installed will not be accepted as clean glass and the contractor must allow for polishing glass as and when instructed by the Architect.</p>			
	<p><u>ALUMINIUM WINDOWS, DOORS, ETC.</u></p> <p><u>Aluminium windows able to meet the mechanical performance requirements of SANS 613 for wind loads of up to 2000Pa with surfaces to receive 60-80µm Charcoal Grey powder coating (for architectural applications), supplied by a manufacturer complying with SANS 1578 and applied in accordance with SANS 1796 by an approved applicator, glazing shall be "Smartglass" or similar approved X1 Residential Standard 6.38mm thick laminated safety glass and executed strictly in conformance with glass manufacturer's recommendations and SANS 10137:2011 all in accordance with SANS 10400 Parts B, N, XA, fitted in accordance with Casement 36 system</u></p>			
1	Aluminium top hung aluminium window including 20 x 10mm aluminium rectangular tubing burglar proofing to opening sections, size 1200 x 600mm, plugged and screwed to brickwork or concrete, all as per architects detail "Type A" attached to the back of the Bills of Quantities.	No	12	
2	Aluminium top hung aluminium window including 20 x 10mm aluminium rectangular tubing burglar proofing to opening sections, size 600 x 600mm, plugged and screwed to brickwork or concrete, all as per architects detail "Type B" attached to the back of the Bills of Quantities.	No	2	
	Carried to Collection			R
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Aluminium top hung aluminium window including 20 x 10mm aluminium rectangular tubing burglar proofing to opening sections, size 600 x 600mm, plugged and screwed to brickwork or concrete, all as per architects detail "Type C" attached to the back of the Bills of Quantities.	No	8	
2	Aluminium top hung aluminium window including 20 x 10mm aluminium rectangular tubing burglar proofing to opening sections, size 900 x 1800mm, plugged and screwed to brickwork or concrete, all as per architects detail "Type D" attached to the back of the Bills of Quantities.	No	12	
3	Aluminium top hung aluminium window including 20 x 10mm aluminium rectangular tubing burglar proofing to opening sections, size 900 x 2100mm, plugged and screwed to brickwork or concrete, all as per architects detail "Type E" attached to the back of the Bills of Quantities.	No	2	
4	Aluminium fixed pane aluminium window, size 1715 x 400mm, plugged and screwed to brickwork or concrete, all as per architects detail "Type M" attached to the back of the Bills of Quantities.	No	3	
5	Aluminium fixed pane aluminium window, size 1300 x 2860mm, plugged and screwed to brickwork or concrete, all as per architects detail "Type N" attached to the back of the Bills of Quantities.	No	6	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 3</u>				
<u>BILL NO. 11</u>				
<u>PLASTERING (PROVISIONAL)</u>				
<u>PREAMBLES</u>				
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"				
<u>SUPPLEMENTARY PREAMBLES</u>				
<u>Proprietary products in descriptions</u>				
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent				
<u>CPAP WORK GROUP</u>				
Unless otherwise stated all items in this bill will be Work Group 142				
<u>SCREEDS</u>				
<u>Screeds on concrete</u>				
<u>Floor screed mix for concrete surface beds, composed of 1 part cement and 3 parts sand in thickness as indicated to concrete surface beds. Cement is to be manufactured in accordance with SANS 50197-1.</u>				
1	30 mm Thick on floors	m2	281	
2	35 mm Thick on floors	m2	432	
3	Screeds average 75mm thick laid to falls and currents	m2	48	
<u>GRANOLITHIC</u>				
Carried to Collection				R
Section No. 3 - New Works Bill No. 11 Plastering (Provisional)				

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Untinted granolithic on concrete: Granolithic mix for surface beds, composed of 1 part cement 2 parts sand and 1 part 5mm granite aggregate finished with a steel trowel in thickness as indicated to surface beds. Cement is to be manufactured in accordance with SANS 50197-1. Granolithic finish to be laid in panels of not more than 20 square metres with v-joints between panels and as necessary forming reedings to stair treads and landings.</u>			
1	30mm Granolithic screed to floors	m2	1	
2	40 mm Thick on floors to falls and currents	m2	141	
3	75mm on Existing external concrete floors	m2	46	
4	25 x 250mm High grano plaster skirting with rounded corners	m	160	
	<u>INTERNAL PLASTER</u>			
	<u>Crack and surface to be clean, sound and dry, insert injection nipples and seal crack with epidermix 372 and inject epidermix 389 into crack, all in accordance with the manufacturer's instructions.</u>			
5	In hairline cracks in existing walls, including chipping out of cracks in preparation for application	m	70	
	<u>All surfaces should be clean, sound and free from contamination, laitance, loose particles. Spalling or flaking material must be removed by thorough wire brushing followed by the removal of debris by means of a soft brush. Suspect surfaces may be mechanically keyed down to virgin surfaceS (randomly), which will ensure good bonding. Fix chicken mesh to the wall with 4-5mm rawl-plugs at 300mm c/c. Coat the surface with a bonding agent. Whilst the bonding agent is still wet, apply a scratch coat of lime plaster. Lime plaster dry mix ratio: 1 : 1 Plaster lime plaster mix 10mm - 20mm thick, finished with a wood float. Manufacturer's mix to take precedence. Cement is to be manufactured in accordance with sans 50197-1 and sand to conform to sans 1083:1994.</u>			
	<u>Render in cement plaster with a steel trowel on:</u>			
6	Existing walls in patches including keying out mortar joints in preparation.	m2	606	
	Carried to Collection			R
	Section No. 3 - New Works			
	Bill No. 11			
	Plastering (Provisional)			

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Existing walls including keying out mortar joints in preparation.	m2	191	
2	Existing walls in narrow widths not exceeding 300 mm wide.	m	1	
	<u>Plaster in accordance with SANS 50197-1:2002 Cement Part 1: Composition, specification and conformity criteria for common cements, in plaster with smooth finish to be mixed to the ratio of 1 part cement: 3 parts sand, (sand to conform to SANS 1083:2006) to interior dry brickwork.</u>			
	<u>Render in cement plaster with a steel trowel</u>			
3	Walls.	m2	1,628	
4	Walls in narrow widths not exceeding 300 mm wide.	m2	74	
	<u>Cement plaster on concrete</u>			
5	On soffits of slabs	m2	189	
6	On exposed sides of concrete beams	m2	129	
	<u>Gyproc CreteStone applied to concrete surface. Wash concrete surfaces with a cleansing agent to remove grease and oil. Rinse with water until all traces of cleansing agent are removed. Apply first coat of Grippon plaster bonding liquid using a paint roller. Allow it to dry. Apply a second coat of Grippon plaster bonding liquid using a paint roller. While the second coat of Grippon plaster bonding liquid is still tacky/wet apply Apply Gyproc CreteStone to a minimum thickness of 3mm to 6mm thick and finish off with steel trowel.</u>			
7	On underside of concrete ceiling.	m2	189	
	<u>EXTERNAL PLASTER</u>			
	<u>Crack and surface to be clean, sound and dry, insert injection nipples and seal crack with epidermix 372 and inject epidermix 389 into crack, all in accordance with the manufacturer's instructions.</u>			
8	In hairline cracks in existing walls, including chipping out of cracks in preparation for application	m	52	
	Carried to Collection			R
	Section No. 3 - New Works			
	Bill No. 11			
	Plastering (Provisional)			

**CDC/163/25 ~ ELLIOT MAGISTRATES COURT
PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
ADDITIONAL ACCOMMODATION**

[illegible]

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Section 3

Bill No. 11

Plastering (Provisional)

COLLECTION

Total from page

Page

Amount

116

117

118

119

Carried to Summary of Section 3

R

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 3</u>				
<u>BILL NO. 12</u>				
<u>TILING</u>				
<u>PREAMBLES</u>				
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"				
<u>SUPPLEMENTARY PREAMBLES</u>				
<u>Proprietary products in descriptions</u>				
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent				
<u>Fixing</u>				
Tiling shall be fixed with an approved tile adhesive to a plaster backing. Plaster backing is measured elsewhere				
<u>CPAP WORK GROUP</u>				
Unless otherwise stated all items in this bill will be Work Group 144				
<u>WALL TILING</u>				
<u>Allow the Prime cost amount of R180.00/m2 for the supply of Ceramic wall Tile, fixed to wood floated screed (elsewhere) with and including an approved tile adhesive mixed with an approved bonding liquid in lieu of water, with minimum 2 mm joints continuous in both directions grouted with and including an approved tile grout with minimum 3 mm expansion joints at perimeter, all structural expansion and construction joints at maximum 5 m centres internally and at 3 m centres externally, in both directions.</u>				
1	Walls	m2	556	
Carried to Collection				R
Section No. 3 - New Works Bill No. 12 Tiling				

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Item			Quantity	Rate	Amount
1	Walls in narrow widths not exceeding 300 mm wide.	m2	19		
<u>FLOOR TILING</u> <u>Allow the Prime cost amount of R180.00/m2 for the supply of Ceramic Floor Tile, fixed to wood floated screed (elsewhere) with and including an approved tile adhesive mixed with an approved bonding liquid in lieu of water, with minimum 2 mm joints continuous in both directions grouted with and including an approved tile grout with minimum 3 mm expansion joints at perimeter, all structural expansion and construction joints at maximum 5 m centres internally and at 3 m centres externally, in both directions.</u>					
2	On floors	m2	139		
3	Skirtings 150mm high	m	210		
Carried to Collection					R
Section No. 3 - New Works					
Bill No. 12					
Tiling					

[illegible]

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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 3</u>			
<u>BILL NO. 13</u>			
<u>PLUMBING AND DRAINAGE (PROVISIONAL)</u>			
<u>PREAMBLES</u>			
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary products in descriptions</u>			
G7 Natural gravel in layers not exceeding 150 mm with a CBR of less than 15 and a maximum particle size of 100 mm, compacted to 95% Modified AASHTO density at optimum moisture content			
<u>Fixing</u>			
Descriptions of wall mounted, floor standing, drop-in, etc type sanitary fittings shall be deemed to include fixing in position and all fixing accessories			
Descriptions of proprietary items shall include fixing in position and all fixing accessories as specified by the manufacturer			
<u>Chasing</u>			
Chasing pipes into new walls shall be regarded as "building in" and is not measured separately. The cost of chasing and making good shall be included in the rates for pipes			
<u>Stainless steel sanitary fittings</u>			
Units shall have standard aprons on all exposed edges and tiling keys against walls where applicable			
Carried to Collection			R
Section No. 3 - New Works			
Bill No. 13			
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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>Waste unions</u> Descriptions of waste unions shall be deemed to include rubber or vulcanite plugs and chains fixed to fittings			
Carried to Collection		R	
Section No. 3 - New Works Bill No. 13 Plumbing And Drainage (Provisional)			

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>RAINWATER DISPOSAL</u>			
	<u>CPAP WORK GROUP</u>			
	Unless otherwise stated all items in this bill will be Work Group 148			
	<u>Seamless powder-coated aluminium rainwater gutters, etc, fixed strictly in accordance with manufacturer's instructions</u>			
1	150mm x 100mm x 0.80mm Thick "Ogee" eaves gutters, on and including gutter brackets at not exceeding 600mm centres.	m	259	
2	Extra over eaves gutter for closed end.	No	30	
3	Extra over eaves gutter for internal and external bends.	No	16	
4	Extra over eaves gutter for outlet with nozzle for 105 x 70mm pipe.	No	45	
5	105 x 70mm x 0.80mm Thick rectangular fluted rainwater downpipes, fixed with and including holderbats to walls at not exceeding 1,5m centres.	m	218	
6	Extra over downpipes for 600 mm eaves projection.	No	15	
7	Extra over downpipes for 300 mm eaves projection.	No	30	
8	Extra over rainwater pipe for bend	No	45	
9	Extra over rainwater pipe for shoe.	No	45	
10	Approved galvanised iron wire balloon grating in 105 x 70mm outlet of gutter	No	45	
	<u>2mm Thick galvanised mild steel rainwater goods</u>			
11	Box gutter two times bent to approximately 1 050mm girth with welded joints including fixing in position on top chord of truss and including approved metal brackets.	m	34	
12	Extra over box gutter for closed end.	No	8	
	Carried to Collection			R
	Section No. 3 - New Works			
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Extra over box gutter for outlet with nozzle for 150mm diameter PVC pipe.	No	5		
	<u>SANITARY FITTINGS</u>				
	<u>Stainless steel</u>				
2	<p>Franke Projectline or similar approved Model PLN611 Grade 304 18/10 polished stainless steel single end bowl inset sink (Code: 1990030), overall size 800 x 460mm with one 340 x 370 x 140mm deep bowl.</p> <p><u>Sink to include:</u></p> <p>1 x 32mm chrome plated basin waste and plug with chain with 62mm diameter flange, 78mm long shank.</p> <p>1 x Hansgrohe logis Chrome or similar approved 160 kitchen mixer (Code: 71832003) with a maximum flow rate of 7.00 L/min</p> <p>1 x 32mm chrome plated bottle trap with 75mm deep re-seal, adjustable telescopic pipe and 32mm outlet.</p> <p>2 x Angle regulating valves with 350mm long flexi tube, chrome plated</p>	No	3		
	<u>Vandal-Proof Stainless Steel</u>				
3	OVE Model OSPA1 or similar approved vandalproof W.C. manufactured in 1,2 mm Grade 304 AISI (18/10) stainless steel with a 180 grid No. 4 satin finish, with 100 mm diameter full flow "P" trap, 38mm diameter flush pipe (through 540mm walls) and approved junior type flushmaster, brass back entry non hold open flush valve with integral vacuum flush pipe, bend and pan connector, all connections external, including fixing toilet pan to floor and against walls with sleeve anchors, all in accordance to manufacturers instructions.	No	3		
	Carried to Collection			R	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	OVE Model OSB1A/125 or similar approved 1,2mm Grade 304 18/10 stainless steel SAPSDF combination wash hand basin & drinking fountain (Code:2520011), size 370 x 125 x 490mm high with 40mm concealed waste outlet, unit recessed 125mm into wall, complete with Hansgrohe Chrome S shut-off valve for concealed installation (Code: 15972000) or similar approved push action type valve and 38mm CP brass waste outlet, built into wall with front face lining up with the wall finish in accordance with manufacturers instructions.	No	3	
	<u>Vitreous China</u>			
2	Approved vitreous china wall hung basin colour White, overall size 510 x 405mm with three semi-punched tap holes including integrated overflow and chain stay hole, bolted to wall with 2No.10mm bolts and sealed with silicone sealant where basin meets wall. <u>Wash hand basin to include:</u> 1 x 32mm chrome plated basin waste and plug with chain with 62mm diameter flange, 78mm long shank. 2 x 15mm chrome plated square elbow action pillar tap, cast fixed outlet, mounting kit and angle valves, manufactured in accordance with SANS 226:2004 Type 2 (BS 5412). 1 x 32mm chrome plated bottle trap with 75mm deep re-seal, adjustable telescopic pipe and 32mm outlet. 2 x Angle regulating valves with 350mm long flexi tube, chrome plated	No	4	
	Carried to Collection		R	
	Section No. 3 - New Works Bill No. 13 Plumbing And Drainage (Provisional)			

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	<p>Duravit Philippe Starck 3 wash hand basin or similar approved colour White (Code: 030055 0000), size 550 x 430 x 190mm deep with taphole, overflow, fixed with screws and washers to plugs in wall and sealed with abe Dow Corning 785 acetoxysilicone sealant where basin meets wall.</p> <p><u>Wash hand basin to include:</u></p> <p>1 x 32mm chrome plated basin waste and plug with chain with 62mm diameter flange, 78mm long shank.</p> <p>1 x Hansgrohe logis Chrome 100 or similar approved Single lever basin mixer without waste set (Code: 71101003) with a maximum flow rate of 5.00 L/min.</p> <p>1 x 32mm chrome plated bottle trap with 75mm deep re-seal, adjustable telescopic pipe and 32mm outlet.</p> <p>2 x Angle regulating valves with 350mm long flexi tube, chrome plated</p>	No	2	
2	<p>Duravit Starck 2 drop in vanity basin colour White-00 (Code: 2327480000) or similar approved, overall size 485 x 485 x 190mm, installed in accordance with the manufacturers recommendations.</p> <p><u>Wash hand basin to include:</u></p> <p>1 x 32mm chrome plated basin waste and plug with chain with 62mm diameter flange, 78mm long shank.</p> <p>1 x Hansgrohe logis Chrome 100 or similar approved Single lever basin mixer without waste set (Code: 71101003) with a maximum flow rate of 5.00 L/min.</p> <p>1 x 32mm chrome plated bottle trap with 75mm deep re-seal, adjustable telescopic pipe and 32mm outlet.</p> <p>2 x Angle regulating valves with 350mm long flexi tube, chrome plated</p>	No	12	
Carried to Collection				R
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Vaal Sanitary ware Protea Paraplegic vitreous china floor mounted paraplegic wash down suite colour White (Code: 750246), comprising 90° outlet pan (Code: 750200) and matching 9 litre cistern, including lid, fitments (Code: 710631) and purpose-made chromium plated side flush lever and BEMIS 7500 economy double flap thermoset seat.	No	4	
2	Duravit or similar approved Philippe Starck 3 WC colour White (Code: 012409 0000), size 360 x 560mm with SoftClose seat (Code: 006389 0000), screwed with stainless steel screws to plugs in floor with foot of bowl sealed to floor with abe acetoxo silicone sealant, with and including Geberit or similar approved pneumatic duct cistern (Article No. 110.792.00.1) including Sigma standard cover plate (Article No. 115.768.46.1) in matt chrome plated finish, with Type 01 round single-flush pneumatic actuator (Article No. 116.041.46.1) in matt chrome plated finish, to be fixed with included fastening materials, all to manufacturers specification and conditional guarantee.	No	10	
3	Duravit Starck 3 Urinal colour White Alpin (Code: 082725 0000) or similar approved size 245 x 300mm, fixed to wall with 2No. 8 x 120mm mounting bolts with and including GROHE 20mm diameter Chrome Rondo Control Cap Urinal Flush Valve or similar approved with integrated stop valve for exposed installation (Code: 37342000) with control cap, 1 - 4L flush volume, 0,5 - 5 bar flow pressure, flow rate adjustment, escutcheon, integrated stop valve and water supply connection to and including plastic flush pipe.	No	4	
	<u>Brass</u>			
4	15mm Bibcock with hose union	No	4	
	<u>SANITARY PLUMBING</u>			
	<u>uPVC pipes</u>			
5	50mm Pipes	m	76	
Carried to Collection				R
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Item			Quantity	Rate	Amount
1	110mm Pipes	m	60		
	<u>Extra over uPVC pipes for uPVC fittings</u>				
2	50mm Bend	No	55		
3	50mm Access bend	No	24		
4	50mm Access junction	No	12		
5	110mm Access bend	No	17		
6	110mm Pan connector	No	17		
7	110mm Junction	No	17		
8	110mm "GI two-way" vent valve	No	7		
	<u>Sundries</u>				
9	Testing waste pipe system		Item		
	<u>WATER SUPPLIES</u>				
	<u>Class 460/2 copper pipes</u>				
10	15mm Pipes	m	176		
11	22mm Pipes	m	54		
12	28mm Pipes	m	36		
	<u>Extra over class 460/2 copper pipes for conex compression fittings</u>				
13	15mm Fittings	No	184		
14	22mm Fittings	No	18		
15	28mm Fittings	No	18		
	<u>TESTING</u>				
16	Testing water pipe system		Item		
	Carried to Collection				R
Section No. 3 - New Works					
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>ELECTRIC WATER HEATERS</u>				
1	Zip or similar approved white powder coated 10 litre Hydro boil (Code: 2610012), size 340 x 205 x 630mm high with instant boiling water, two way tap control, SK3 drip tray (Code: 2120112) with SK3 bracket (Code: 2120114), connected to 15mm cold water supply and 220 volt 15 amp electrical power supply, plugged and screwed to wall and fitted under 1 year guarantee.	No	3	
<u>FIRE APPLIANCES, ETC</u>				
2	Standard 4,5 kg dry powder rechargeable, to comply with SANS 1910 complete with approved lockable break glass fibreglass box, installed, maintained and serviced by competent persons with SANS 1475-1 and SANS10105-1 9as stated in SANS 10400-T:2011), plugged and screwed	No	11	
<u>LAGGING</u>				
<u>"Thermaflex" pipe insulation</u>				
3	Insulation to 28mm pipe and couplings	m	36	
4	Extra for wrapping around fittings	No	18	
Carried to Collection				R
Section No. 3 - New Works				
Bill No. 13				
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Section 3

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 3</u>				
<u>BILL NO. 14</u>				
<u>GLAZING</u>				
<u>PREAMBLES</u>				
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"				
<u>SUPPLEMENTARY PREAMBLES</u>				
<u>Proprietary products in descriptions</u>				
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent				
<u>CPAP WORK GROUP</u>				
Unless otherwise stated all items in this bill will be Work Group 150				
<u>GLAZING TO WOOD WITH PINNED ON BEADS</u> <u>(BEADS ELSEWHERE)</u>				
<u>6,38mm thick Smartglass or similar approved residential</u> <u>standard laminated safety glass, complying with SANS</u> <u>1263 Part 1, 2 or 3 with name of the manufacturer</u> <u>permanently marked on each sheet visible after glazing,</u> <u>glazed in accordance with NBR N schedule 1 and SABS</u> <u>0137.</u>				
1	Panes exceeding 0.1 and not exceeding 0.5m2	m2	58	
2	Panes exceeding 0.5 and not exceeding 1m2	m2	10	
Carried to Summary of Section 3				R
Section No. 3 - New Works				
Bill No. 14				
Glazing				

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Item	Quantity	Rate	Amount
<u>SECTION NO. 3</u>			
<u>BILL NO. 15</u>			
<u>PAINTWORK (PROVISIONAL)</u>			
<u>PREAMBLES</u>			
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary products in descriptions</u>			
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent			
<u>CPAP WORK GROUP</u>			
Unless otherwise stated all items in this bill will be Work Group 152			
<u>PAINTWORK TO PREVIOUSLY PAINTED WORK</u>			
<u>Plascon paint or other approved</u>			
<u>ON PLASTER</u>			
Carried to Collection			R
Section No. 3 - New Works Bill No. 15 Paintwork (Provisional)			

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	On previously painted Internal plastered walls.	m2	621	
	Strip existing coating to bare surface, brush and sand area with wire brush and sandpaper. Remove surface contaminants using Sugar Soap solution. For stubborn contaminants use hot water in the above mix and a bristle broom or scrubbing brush. Rinse with tap water to remove all traces of sugar soap and allow to dry. Ensure surfaces are clean, dry and sound. Moisture content not more than 8%. Prime with one coat approved Plaster Primer with an over coating time of 16 hours and finish with two coats Wall & All or approved equivalent with 2 hours drying time between coats, for a maintenance cycle of 10 years in a C1 - inland environment.			
2	On previously painted external plastered walls.	m2	39	
	Strip existing coating to bare surface, brush and sand area with wire brush and sandpaper. Remove surface contaminants using Sugar Soap solution. For stubborn contaminants use hot water in the above mix and a bristle broom or scrubbing brush. Rinse with tap water to remove all traces of sugar soap and allow to dry.Ensure surfaces are clean, dry and sound. Moisture content not more than 8%. Prime with one coat approved Plaster Primer with an over coating time of 16 hours and finish with two coats Micatex or approved equivalent with 2 hours drying time between coats, for a maintenance cycle of 10 years in a C1 - inland environment.			
<u>ON WOOD</u>				
Carried to Collection				R
Section No. 3 - New Works Bill No. 15 Paintwork (Provisional)				

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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Remove loose and peeling paint by scraper or hand sanding. Feather edges and dust off. Spot prime bare areas with approved wood primer (unthinned). Ensure surfaces are clean, dry and sound. To determine the moisture content, use a Doser Hygrometer scale A1 - A5 (or equivalent) depending on generic wood type. Measurements should be <14% before painting. Sand wood to a smooth finish with 150 grit paper in direction of grain. Dust off.</u> <u>Prime with one coat approved undercoat with an over coating time of 8 hours and finish with two coats approved super universal enamel paint with 16 hours drying time between coats, for a maintenance cycle of 10 years in a C1 - inland environment.</u>				
1	On general surfaces of existing exposed trusses	m2	47		
2	On existing doors	m2	60		
3	On existing windows	m2	99		
4	On frames, skirtings, rails, etc not exceeding 300mm girth	m	457		
	<u>ON METAL</u>				
	<u>Clean previously painted surfaces using a scrubbing brush with Polycell Sugar Soap solution - 500g Polycell Sugar Soap Powder (501703) dissolved in 5 litres water to remove surface contaminants. Rinse with water to remove all traces of Sugar Soap and allow drying. Sand previously painted gloss surfaces to a matt finish and dust off.</u> <u>Apply one coat of Metal Primer (UC 170) to achieve a continuous film. Allow 36 hours to dry and finish with two coats Velvagio Water Based (VLW) (Colour : Charcoal Grey) with 4 hours drying time between coats, for a maintenance cycle of 7 years in a C1 - inland environment.</u>				
5	On strongroom doors and frames	m2	8		
6	On steel gates, grilles, burglar screens, balustrades, etc. (both sides measured over the full flat area).	m2	99		
	Carried to Collection			R	
	Section No. 3 - New Works				
	Bill No. 15				
	Paintwork (Provisional)				

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Item		Quantity	Rate	Amount
	<p><u>Plascon Nuroof Cool Acrylic Roof Paint to existing coated exterior galvanised steel</u> <u>Clean entire surface with Sugar Soap using bristle brooms or brushes or pads to remove all surface contaminants, rinse with tap water and allow to dry. Remove loose and flaky paint and sand surface to a firm edge, feather edges and dust off. Emery paper any rust areas to bright metal and remove dust. Spot prime bare areas with approved red oxide and allow 1 hour to dry. Finish with two coats Nuroof Cool Acrylic Roof Paint Ashen sky (TRP 214) with 2 hours drying time between coats, for a maintenance cycle of 12 years in a C1 - inland environment.</u></p>			
1	On corrugated iron roof sheeting (measured on slope)	m2	622	
	<u>PAINTWORK ETC TO NEW WORK</u>			
	<u>Plascon paint or other approved</u>			
	<u>ON PLASTERED SURFACES</u>			
	<p><u>Surface to be dry, sound and clean and cured for a minimum of 14 days, with a moisture content measured with a Doser Hygrometer (or equivalent), of BD 2 scale - 8% or less.</u></p> <p><u>Prime with one coat approved Plaster Primer with an over coating time of 16 hours and finish with two coats Wall & All or approved equivalent with 2 hours drying time between coats, for a maintenance cycle of 10 years in a C1 - inland environment.</u></p>			
2	On internal walls.	m2	1,574	
	<u>Prepare and apply two coats approved epoxy enamel coating including approved primer for porous surfaces, all in accordance with the manufacturer's instructions.</u>			
3	On internal plastered walls	m2	307	
4	On soffits of concrete slab.	m2	124	
	Carried to Collection			R
	Section No. 3 - New Works			
	Bill No. 15			
	Paintwork (Provisional)			

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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Surface to be dry, sound and clean and cured for a minimum of 14 days, with a moisture content measured with a Doser Hygrometer (or equivalent), of BD 2 scale - 8% or less.</u>				
	<u>Prime with one coat approved Plaster Primer with an over coating time of 16 hours and finish with two coats Micatex or approved equivalent with 2 hours drying time between coats, for a maintenance cycle of 10 years in a C1 - inland environment.</u>				
1	On external walls.	m2	531		
2	On exposed sides and soffits of plastered concrete beams.	m2	16		
	<u>Surface to be dry, sound and clean and cured for a minimum of 14 days, with a moisture content measured with a Doser Hygrometer (or equivalent), of BD 2 scale - 8% or less.</u>				
	<u>Prime with one coat Plaster Primer (UC56) with an overcoating time of 16 hours and finish with two coats Wall & All (WAA 1) (Colour: White) with 2 hours drying time between coats, for a maintenance cycle of 10 years in a C1 - inland environment.</u>				
3	On soffits of concrete slab.	m2	65		
	<u>ON FIBRE-CEMENT</u>				
	<u>Surface to be dry, sound and clean, with a moisture content, measured with a Doser Hygrometer (or equivalent), of BD 2 scale - 8% or less.</u>				
	<u>Prime with one coat Plaster Primer (UC 56) with an overcoating time of 16 hours and finish with two coats Polvin Super Acrylic (EPL) with 1 hour drying time between coats, for a maintenance cycle of 5 years in a C1 - inland environment on:</u>				
4	On ceilings and cornices.	m2	637		
5	On sills not exceeding 300mm girth.	m	17		
6	On fascias and barge boards.	m2	201		
	Carried to Collection			R	
	Section No. 3 - New Works				
	Bill No. 15				
	Paintwork (Provisional)				

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Item	Quantity	Rate	Amount
<u>ON WOOD</u>			
<u>Surface to be dry, sound and clean. Wash knots and resinous areas with lacquer thinners and coat with approved knot sealer and apply one coat of approved wood pretreatment, over coated within 48 hours with a moisture content, measured with a Doser Hygrometer (or equivalent), of BD 2 scale (A1-A5) < 14% or less.</u>			
<u>Prime with one coat approved undercoat with an over coating time of 8 hours and finish with two coats approved super universal enamel paint with 16 hours drying time between coats, for a maintenance cycle of 10 years in a C1 - inland environment.</u>			
1	On doors (all surfaces measured).	m2	196
2	On windows (all surfaces measured).	m2	8
3	On frames, skirtings, rails, etc not exceeding 300mm girth	m	894
4	On general surfaces of timbers at eaves.	m2	12
<u>Two coats wood primer on:</u>			
5	On backs of frames, linings, etc not exceeding 300mm wide.	m	894
<u>ON SMOOTH CONCRETE</u>			
<u>Woodoc 45 or similar approved Tile and Cement Sealer to new exterior concrete. Ensure surfaces are clean from dust, oil, wax, grout or other sealer. If washed, let surface dry completely (at least 8 hours). Apply three coats Woodoc 45, with 24 hours drying time between coats, for a maintenance cycle of 12 - 18 months in a C1 - inland environment.</u>			
6	On wood floated floors.	m2	46
<u>ON PVC PIPES</u>			
Carried to Collection			R
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<p><u>Lightly sand with abrasive paper, leaving surface clean and dust free.</u></p> <p><u>Prime surface with one coat Supergrip (Code: D35) with an overcoating time of 12 hours and finish with two coats Gloss Enamel (Code: D27) with an overcoating time of 18 hours.</u></p>			
1	<p>On posts, rails, bars, pipes, etc. not exceeding 300mm girth</p> <p><u>ON METAL</u></p> <p><u>Surface to be dry, sound and clean. Apply Galvanised Iron Cleaner (GIC 1) to all bare galvanised areas. Allow to react for 1 minute and rinse off with tap water using bristle brush or Scotch Brite pads to remove all surface contaminants, until surface is water break-free.</u></p> <p><u>Prime with one coat Galvanised Iron Primer (GIP 1) with an overcoating time of 24 hours and finish with two coats Super Universal Enamel (NY 1/G) with 16 hours drying time between coats, for a maintenance cycle of 3 years in a C1 - inland environment on:</u></p>	m	120	
2	<p>On steel gates, grilles, burglar screens, balustrades, etc. (both sides measured over the full flat area).</p> <p><u>Surface to be clean and dry. Remove surface contaminants using Metalcare Aquasolv Degreaser (GR 1) with bristle brush or Brillo pads. Rinse thoroughly with tap water until surface is water break-free. Remove rust and millscale by abrasive blasting to ISO 8501 - 01:1988 - Sa2½ or by hand/mechanical wire brushing to St3 of the same standard. Allow to dry completely and prime within 4 hours of cleaning.</u></p> <p><u>Prime with one coat Metalcare Metal WB Primer (MWP1) with an overcoating time of 8 hours and finish with two coats Velvagio Water Based (VLW) Colour : Black) with 4 hours drying time between coats, for a maintenance cycle of 5 years in a C1 - inland environment.</u></p>	m2	92	
3	<p>On strong room doors and frames</p>	m2	5	
Carried to Collection				R
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Section 3

Bill No. 15

Paintwork (Provisional)

COLLECTION

Total from page

Page

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 4</u>				
<u>BILL NO. 1</u>				
<u>STORMWATER DRAINAGE (PROVISIONAL)</u>				
<u>PREAMBLES</u>				
For Preambles see "Specification of materials and methods to be used - PW 371"				

<u>NOTE:</u>				
Where items in this Bill are identical to those in the previous Bills, the descriptions have been shortened, and the full descriptions in the Trades concerned are to be referred to for the full meaning and intent of each item				
<u>SURFACE DRAINAGE</u>				
<u>Precast or in-situ concrete (Class 25) size 500 x 275mm open stormwater channels with 300 x 125mm deep half round-shaped waterway formed in top, finished smooth on all exposed surfaces and with angles rounded, cast in suitable lengths (not exceeding 1000mm), and reinforced as necessary for handling if precast, including all formwork, moulds, shallow excavation, filling and ramming, laying to falls, bedding and pointing in (3:1) cement mortar</u>				
1	Concrete stormwater channel, on suitable 150mm subbase material compacted to 95% Mod A.A.S.H.T.O. density, including all necessary excavations, formwork, compaction, grading, carting away, etc.	m	53	
2	Extra over for angle.	No	4	
3	Extra over for outlet	No	2	
Carried to Collection				R
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>In-situ concrete (25MPa) open stormwater channels having V-shaped waterway formed in top, finished smooth on all exposed surfaces and with angles rounded, cast in suitable lengths (not exceeding 2,000mm), including all formwork, moulds, shallow excavation, filling and ramming, laying to falls, bedding and pointing in (3:1) cement mortar</u>			
1	1000mm wide x 100mm 25Mpa open concrete stormwater channel with 1000mm wide x 50mm deep 'V' channel, on suitable 150mm subbase material compacted to 95% Mod A.A.S.H.T.O. density, including all necessary excavations, formwork, compaction, grading, carting away, etc.	m	19	
2	1200mm wide x 100mm 25Mpa open concrete stormwater channel with 1200mm wide x 50mm deep 'V' channel, on suitable 150mm subbase material compacted to 95% Mod A.A.S.H.T.O. density, including all necessary excavations, formwork, compaction, grading, carting away, etc.	m	10	
3	1200mm wide x 125mm 25Mpa open concrete stormwater channel with 1200mm wide x 75mm deep 'V' channel, on suitable 150mm subbase material compacted to 95% Mod A.A.S.H.T.O. density, including all necessary excavations, formwork, compaction, grading, carting away, etc.	m	53	
4	1000mm wide x 150mm 25Mpa open concrete stormwater channel with 1000mm wide x 100mm deep 'V' channel, on suitable 150mm subbase material compacted to 95% Mod A.A.S.H.T.O. density, including all necessary excavations, formwork, compaction, grading, carting away, etc.	m	46	
5	Extra over for angles, intersections, ends, dressing into sides of catchpits, etc	No	19	
6	Extra over for widening concrete to form grouted pitching spreader 2000mm wide extreme, for a length of 1000mm and bedding 120mm diameter stone in concrete to falls including brushing concrete between stones.	No	2	
	Carried to Collection			R
	Section No. 4 - External Works			
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>In-situ concrete (30MPa) open stormwater duct channels overall size 600 x 200mm having 400 x 100mm deep rectangular waterway formed in top. finished smooth on all exposed surfaces and with angles rounded, cast in suitable lengths (not exceeding 1500mm), including all formwork, moulds, shallow excavation, filling and ramming, laying to falls, bedding and pointing in (3:1) cement mortar</u>			
1	Concrete stormwater channel, on suitable 150mm subbase material compacted to 95% Mod A.A.S.H.T.O. density, including all necessary excavations, formwork, compaction, grading, carting away, etc.	m	31	
2	Extra over for angles, intersections, ends, dressing into sides of catchpits, etc	No	1	
3	Extra over for widening concrete to form grouted pitching spreader 1200mm wide extreme, for a length of 1000mm and bedding 120mm diameter stone in concrete to falls including brushing concrete between stones.	No	1	
	<u>Movement Joints, etc</u>			
	<u>Joint forming material in movement joints:</u>			
4	10mm Bitumen impregnated fibre board built in vertically or horizontally between concrete (Provisional).	m2	4	
	<u>Approved two-part grey polysulphide sealing compound including backing cord, bond breaker, primer, etc</u>			
5	10mm Joints in floors or walls including raking out expansion joint filler as necessary (Provisional)	m	22	
Carried to Collection				R
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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p><u>UNDER GROUND DRAINAGE</u></p> <p><u>Note : Work measured under this bill includes all plumbing and drainage outside the building perimeters.</u></p> <p><u>Trenching, Laying, backfilling, bedding, etc. of pipes</u></p> <p>The depth of the trenches shall be a minimum of 1000mm below the finished road, paved or ground surface to the top of pipe plus the pipe diameter plus a minimum of 100mm deep below bottom of pipe.</p> <p>The width of the trench shall be a minimum of the pipe diameter plus 300mm to either side of the pipe. The contractors should make allowance for working space should it be required.</p> <p><u>Compacted selected bedding:</u> Compaction to 93% MOD AASHTO. Material to SABS 1200LB with a maximum aggregate size to be 6mm. Depth of bedding minimum 100mm below pipe plus radius of pipe.</p> <p><u>Compacted selected fill blanket:</u> Compaction to 93% MOD AASHTO. Material to SABS 1200LB with a maximum aggregate size to be 10mm. Depth of bedding minimum 300mm above pipe plus radius of pipe.</p> <p><u>Compacted selected backfill:</u> Compaction to 93% MOD AASHTO. Material to SABS 1200DB 3.2 with a maximum aggregate size to be 63mm. Depth of bedding minimum 650mm.</p> <p>Pipes shall be trenched, laid, bedded and carefully backfilled.</p>			
Carried to Collection		R	
Section No. 4 - External Works			
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Stormwater drainage pipes to be uPVC Class 34 heavy duty drain pipe with seal ring socket joint complying with SANS 791:1986, laid to falls in ground including excavation of trenches, bedding, backfilling and compaction and disposal of surplus material. Trenches not exceeding 1 m deep shall be taken of such width as to provide a clearance of 300 mm on each side of the pipe or group of pipes. The width of the trench shall be increased by 100 mm for each successive depth of 1 m to a maximum width which provides a clearance of 500 mm on each side of the pipe or group of pipes.</u>			
1	160 mm Pipe not exceeding 1000 mm deep.	m	14	
2	Ditto exceeding 1000 mm not exceeding 2000 mm deep.	m	7	
	<u>uPVC drainage channels</u>			
3	160 mm Half round channel in bottom of inspection chamber.	m	1	
	<u>Extra over 160 mm uPVC pipe for:</u>			
4	160mm diameter x 22,5° long radius bend with socket joint with Anger-Lock seal.	No	2	
	<u>INSPECTION CHAMBERS, CATCHPITS, SUMPS, ETC. (gratings and covers elsewhere)</u> Note : Prices for headwalls, sumps, catch pits, inspection chambers, inlets, etc. shall be deemed to include for all excavation, building in of pipe work, risk of collapse, backfilling and compaction. -----			
	Carried to Collection		R	
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	Stormwater drainage (Provisional)			

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Catch pits</u>			
1	Excavate for and build catchpit overall size 740 x 740 mm, exceeding 1000mm and not exceeding 2000mm deep internally with one brick sides in extra hard burnt stock bricks in (3:1) cement mortar on 740 x 740 x 100mm thick concrete (20 MPa) bottom slab, rendered out internally in (3:1) cement plaster with bottom benched up to self cleaning falls, including 740 x 740 x 100/75mm thick in-situ or precast concrete (30 MPa) surround, sloped inwards and rebated to receive 300 x 300mm grey iron grating and frame (elsewhere measured) finished smooth on all exposed surfaces with cement plaster laid flush with adjacent paving or finished ground level, including formwork, etc.	No	2	
	<u>GRATINGS, COVERS, ETC.</u>			
2	Light duty grey iron square dish grating cover and frame, size 300 x 300mm.	No	2	
	<u>Sundries</u>			
3	Medium duty VP4 Lifting key size x 1kg	No	1	
Carried to Collection				R
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Stormwater drainage (Provisional)				

Section 4
Bill No. 1
Stormwater drainage (Provisional)

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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p><u>SECTION NO. 4</u></p> <p><u>BILL NO. 2</u></p> <p><u>SOIL DRAINAGE (PROVISIONAL)</u></p> <p><u>PREAMBLES</u></p> <p>For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary products in descriptions</u></p> <p>Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent</p>			
<p>Carried to Collection</p>		R	
<p>Section No. 4 - External Works</p> <p>Bill No. 2</p> <p>Soil drainage (Provisional)</p>			

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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p><u>NOTES:</u></p> <p>All reference to SANS specifications and code of practice, or any other standard specifications or codes of practice, including National Building Regulations, shall be as per the latest issues of such specifications and codes.</p> <p>All dimensions indicated on the layout drawing are in metres unless otherwise indicated.</p> <p>Construction of sewer mains and connections as per SANS 1200 DB, LB & LD, project specifications and details as indicated.</p> <p>All sewer PVC-U pipes and fittings to be heavy duty class 34 per SANS 791.</p> <p>Air test required on all constructed sewer pipe lines in accordance with SANS 1200 7.2.1 air test to be done once 300mm backfill above pipe has been completed.</p> <p>Sewer pipes connecting washbay and refuse yard to the grease trap which fall under paved areas are to be concrete encased with 15 MPa/19mm concrete. 330x330mm for 110mm pipe and 48x480mm for 160mm pipe.</p> <p>Concrete pipes Pipes shall be jointed with ogee joints with rubber collars or socket and spigot joints with rubber rings.</p> <p>uPVC pipes and fittings Sewer and drainage pipes and fittings shall be jointed and sealed with butyl rubber rings in compliance with SABS 791.</p> <p>uPVC pressure pipes and fittings Pipes for water supply shall be of the class stated in compliance with SABS 966. Pipes of 40mm diameter and smaller shall be plain ended with solvent welded uPVC loose sockets and fittings. Pipes of 50mm diameter and greater shall have sockets and spigots with push-in type integral rubber ring joints. Bends shall be uPVC and all other fittings shall be cast iron, all with similar push-in type joints.</p>			
Carried to Collection		R	
<p>Section No. 4 - External Works</p> <p>Bill No. 2</p> <p>Soil drainage (Provisional)</p>			

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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p>Copper pipes</p> <p>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.</p> <p>Only compression fittings shall be used in ground.</p> <p>Brick inspection chambers, catchpits, etc. Descriptions of brick inspection chambers, catchpits, etc. shall be deemed to include excavations, concrete base/s, concrete coverslabs, brickwork, finishes internally and externally, channels, channel bends, channel junctions, concrete benching and step irons (where required), jointing to drains and backfilling, compaction, etc.</p>			
Carried to Collection		R	
<p>Section No. 4 - External Works</p> <p>Bill No. 2</p> <p>Soil drainage (Provisional)</p>			

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SOIL DRAINAGE</u>				
<u>Note : Work measured under this bill includes all plumbing and drainage outside the building perimeters.</u>				
<u>Trenching, Laying, backfilling, bedding, etc. of pipes</u>				
The depth of the trenches shall be a minimum of 1000mm below the finished road, paved or ground surface to the top of pipe plus the pipe diameter plus a minimum of 100mm deep below bottom of pipe.				
The width of the trench shall be a minimum of the pipe diameter plus 300mm to either side of the pipe. The contractors should make allowance for working space should it be required.				
<u>Compacted selected bedding:</u> Compaction to 93% MOD AASHTO. Material to SABS 1200LB with a maximum aggregate size to be 6mm. Depth of bedding minimum 100mm below pipe plus radius of pipe.				
<u>Compacted selected fill blanket:</u> Compaction to 93% MOD AASHTO. Material to SABS 1200LB with a maximum aggregate size to be 10mm. Depth of bedding minimum 300mm above pipe plus radius of pipe.				
<u>Compacted selected backfill:</u> Compaction to 93% MOD AASHTO. Material to SABS 1200DB 3.2 with a maximum aggregate size to be 63mm. Depth of bedding minimum 650mm.				
Pipes shall be trenched, laid, bedded and carefully backfilled.				
<u>REMOVAL OF EXISTING WORK</u>				
<u>Break up, disinfect and remove manholes pipes, etc.</u>				
1	Manhole size 500 x 1200 mm x not exceeding 1m deep internally to invert level formed of hard burnt one brick sides and including 150 mm thick mass concrete bottom benching, kerb on top including cast iron double seal cover and frame including all necessary filling of holes and compacting.	No	3	
Carried to Collection				R
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Excavate for and remove existing 110mm diameter PVC sewer pipe average 800mm below surface, including backfilling trenches, etc.	m	70	
	<u>SEWER PIPES (SABS 1200 LD)</u>			
	<u>Earthworks</u>			
	<u>Site Clearance</u>			
2	Digging up and removing rubbish, debris, vegetation, hedges, shrubs and trees not exceeding 200mm girth, bush, etc	m2	118	
	<u>Soil drainage pipes to be uPVC Class 34 heavy duty sewer drain pipe with seal ring socket joint complying with SANS 791:1986, laid to falls in ground including excavation of trenches, bedding, backfilling and compaction and disposal of surplus material. Trenches not exceeding 1 m deep shall be taken of such width as to provide a clearance of 300 mm on each side of the pipe or group of pipes. The width of the trench shall be increased by 100 mm for each successive depth of 1 m to a maximum width which provides a clearance of 500 mm on each side of the pipe or group of pipes.</u>			
3	110mm Pipes vertically or ramped to cleaning eyes, etc. (no excavation)	m	21	
4	110 mm Pipe not exceeding 1000 mm deep.	m	147	
5	110 mm Pipe exceeding 1000 mm not exceeding 2000 mm deep.	m	44	
	<u>Extra over 110 mm uPVC pipe for:</u>			
6	Bend.	No	33	
7	Junction	No	38	
	Carried to Collection			R
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>uPVC drainage channels</u>				
1	110 mm Half round channel in bottom of inspection chamber.	m	7		
	<u>Sundries</u>				
2	50 mm Precast concrete marker block size 300 x 300 mm, finished in untinted cement paving with letters "IE" sunk in same and setting flush with ground or pavings.	No	6		
	<u>INSPECTION CHAMBERS, CATCHPITS, SUMPS, ETC. (gratings and covers elsewhere)</u>				
	Note : Prices for headwalls, sumps, catch pits, inspection chambers, inlets, etc. shall be deemed to include for all excavation, risk of collapse, backfilling and compaction. -----				
	<u>Sewer Inspection Chambers etc</u>				
3	Manhole size 890 x 1040 mm x not exceeding 1m deep internally to invert level formed of hard burnt (14MPa) one brick sides in 1:3 cement mortar on and including 150 mm thick mass concrete (20 MPa at 28 days in 19 mm stone) bottom projecting 75 mm beyond sides and mass concrete (15 MPa at 28 days in 12 mm stone) benching, rendered internally in 1:3 cement plaster with 200/150 mm thick mass concrete (20 MPa at 28 days in 19 mm stone) top slab with and including Y10 bars placed at bottom at 100mm centres in both directions, rebated for and fitted with and including 600 x 450mm cast iron double seal cover and frame type 9D in accordance with SANS 50124/EN124, bedded in 1:3 cement mortar and sealed in tallow including all necessary vitrified clay channels and fittings, excavations, formwork, holes through sides for pipes, etc	No	2		
	Carried to Collection			R	
	Section No. 4 - External Works				
	Bill No. 2				
	Soil drainage (Provisional)				

CDC/163/25 ~ ELLIOT MAGISTRATES COURT
PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
ADDITIONAL ACCOMMODATION

<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Manhole size 890 x 1040 mm x exceeding 1m and not exceeding 2m deep internally to invert level formed of hard burnt (14MPa) one brick sides in 1:3 cement mortar on and including 150 mm thick mass concrete (20 MPa at 28 days in 19 mm stone) bottom projecting 75 mm beyond sides and mass concrete (15 MPa at 28 days in 12 mm stone) benching, rendered internally in 1:3 cement plaster with 200/150 mm thick mass concrete (20 MPa at 28 days in 19 mm stone) top slab with and including Y10 bars placed at bottom at 100mm centres in both directions, rebated for and fitted with and including 600 x 450mm cast iron double seal cover and frame type 9D in accordance with SANS 50124/EN124, bedded in 1:3 cement mortar and sealed in tallow including all necessary vitrified clay channels and fittings, excavations, formwork, holes through sides for pipes, etc	No	2	
2	Manhole size 1040 x 1340 mm x not exceeding 1m deep internally to invert level formed of hard burnt (14MPa) one brick sides in 1:3 cement mortar on and including 150 mm thick mass concrete (20 MPa at 28 days in 19 mm stone) bottom projecting 75 mm beyond sides and mass concrete (15 MPa at 28 days in 12 mm stone) benching, rendered internally in 1:3 cement plaster with 200/150 mm thick mass concrete (20 MPa at 28 days in 19 mm stone) top slab with and including Y10 bars placed at bottom at 100mm centres in both directions, rebated for and fitted with and including 600 x 450mm cast iron double seal cover and frame type 9D in accordance with SANS 50124/EN124, bedded in 1:3 cement mortar and sealed in tallow including all necessary vitrified clay channels and fittings, excavations, formwork, holes through sides for pipes, etc	No	1	
Carried to Collection				R
Section No. 4 - External Works				
Bill No. 2				
Soil drainage (Provisional)				

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PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
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ADDITIONAL ACCOMMODATION

<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Manhole size 1040 x 1340 mm x exceeding 1m and not exceeding 2m deep internally to invert level formed of hard burnt (14MPa) one brick sides in 1:3 cement mortar on and including 150 mm thick mass concrete (20 MPa at 28 days in 19 mm stone) bottom projecting 75 mm beyond sides and mass concrete (15 MPa at 28 days in 12 mm stone) benching, rendered internally in 1:3 cement plaster with 200/150 mm thick mass concrete (20 MPa at 28 days in 19 mm stone) top slab with and including Y10 bars placed at bottom at 100mm centres in both directions, rebated for and fitted with and including 600 x 450mm cast iron double seal cover and frame type 9D in accordance with SANS 50124/EN124, bedded in 1:3 cement mortar and sealed in tallow including all necessary vitrified clay channels and fittings, excavations, formwork, holes through sides for pipes, etc	No	2	
	<u>Covers etc</u>			
2	600 x 400 x 250/200mm thick precast or insitu concrete collar slab support block with and including cast iron 45 degree cleaning eye to suit 110mm sewer pipe including all excavations, bedding , etc.	No	7	
	<u>Manholes, gulley traps, etc:</u>			
3	110mm uPVC Gulley trap and hopper with grid not exceeding 1000mm deep all set and encased in (20MPa) mass concrete to form kerb, finished smooth with plaster.	No	11	
	<u>Sundries</u>			
4	Medium duty VP4 Lifting key size x 1kg	No	2	
5	Manhole stepiron size 255 x 155mm x 1,7kg	No	14	
6	Excavate for, cut into existing manhole 900 mm deep to invert and insert 160 to 110 mm reducer.	No	1	
7	Extra over excavation for sewer trenches, manholes etc. in pickable material for excavation in soft rock.	m3	5	
8	Ditto in hard rock.	m3	1	
	Carried to Collection			R
	Section No. 4 - External Works			
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	Soil drainage (Provisional)			

**CDC/163/25 ~ ELLIOT MAGISTRATES COURT
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ADDITIONAL ACCOMMODATION**

Item		Quantity	Rate	Amount
1	Unreinforced concrete encasing to 110mm horizontal pipe	m3	0.50	
2	Unreinforced concrete encasing to 110mm vertical pipe	m3	0.30	
<u>Sewer connection</u>				
3	Search for, locate, inspect and clean municipal sewer manhole connection point	No	1	
<u>TESTING, ETC.</u>				
4	Provide all necessary apparatus, water, etc. for and test the sewer reticulation to the satisfaction of the Architect/Engineer and Local Authorities.		Item	
Carried to Collection				R
Section No. 4 - External Works				
Bill No. 2				
Soil drainage (Provisional)				

CDC/163/25 ~ ELLIOT MAGISTRATES COURT
PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
ADDITIONAL ACCOMMODATION

Section 4

Bill No. 2

Soil drainage (Provisional)

COLLECTION

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Section No. 4 - External Works

Bill No. 2

Soil drainage (Provisional)

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PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
ADDITIONAL ACCOMMODATION

<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p><u>SECTION NO. 4</u></p> <p><u>BILL NO. 3</u></p> <p><u>WATER SUPPLIES (PROVISIONAL)</u></p> <p><u>PREAMBLES</u></p> <p>For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary products in descriptions</u></p> <p>Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent</p> <p>SUPPLEMENTARY PREAMBLESNote : Work measured under this bill includes all plumbing and drainage outside the building perimeters.</p>			
Carried to Collection		R	
Section No. 4 - External Works Bill No. 3 Water supplies (Provisional)			

CDC/163/25 ~ ELLIOT MAGISTRATES COURT
PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
ADDITIONAL ACCOMMODATION

<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>NOTES:</u>			
All reference to SANS specifications and code of practice, or any other standard specifications or codes of practice, including National Building Regulations, shall be as per the latest issues of such specifications and codes.			
All dimensions indicated on the layout drawing are in metres unless otherwise indicated.			
Construction of domestic mains and connections as per SANS 1200 DB, L & LB, project specifications and details as indicated.			
Construction of concrete anchor and thrust blocks at bends, tee pieces, ends caps as per SANS 1200 L5.5 and as per typical water details C5574/123.			
All domestic reticulation HDPE PE100 PN10 (SDR 17) pipes as per SANS 4427-5/ISO 4427-5.			
All domestic reticulation pipe types and sizes indicated on the layout drawings.			
HDPE pipes shall be jointed using mechanical-joint compression fitting as per SANS 14236/ISO 14236, class of fittings to suit relevant pipe class.			
Cast iron fittings for PVC-U pipes as per SANS 52842/EN 12842.			
Cast iron pipe saddles for PVC-U pipes as per SANS 1808-44.			
Contractor to locate existing water mains to be connected to.			
Temporary isolating valves, to suit proposed water mains size and class, to be installed as indicated by the Civil Engineer on site once connections to existing water mains have been completed.			
Hydraulic pipeline test to be done in accordance with SANS 1200 L. Pipes are to be tested 1.5 times the pipe pressure class measured at the lowest point of the pipeline.			
Carried to Collection			R
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Water supplies (Provisional)			

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PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
ADDITIONAL ACCOMMODATION

<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>WATER SUPPLIES</u>				
<u>Note :</u>				
<u>Work measured under this bill includes all plumbing outside the building perimeters.</u>				
<u>Trenching, Laying, backfilling, bedding, etc. of pipes</u>				
The depth of the trenches shall be a minimum of 1000mm below the finished road, paved or ground surface to the top of pipe plus the pipe diameter plus a minimum of 100mm deep below bottom of pipe.				
The width of the trench shall be a minimum of the pipe diameter plus 300mm to either side of the pipe. The contractors should make allowance for working space should it be required.				
<u>Compacted selected bedding:</u> Compaction to 93% MOD AASHTO. Material to SABS 1200LB with a maximum aggregate size to be 6mm. Depth of bedding minimum 100mm below pipe plus radius of pipe.				
<u>Compacted selected fill blanket:</u> Compaction to 93% MOD AASHTO. Material to SABS 1200LB with a maximum aggregate size to be 10mm. Depth of bedding minimum 300mm above pipe plus radius of pipe.				
<u>Compacted selected backfill:</u> Compaction to 93% MOD AASHTO. Material to SABS 1200DB 3.2 with a maximum aggregate size to be 63mm. Depth of bedding minimum 650mm.				
Pipes shall be trenched, laid, bedded and carefully backfilled to the satisfaction of the Engineer.				
<u>HDPE PE100 PN10 (SDR 17) pressure pipes</u>				
1	32mm Pipes laid in and including trenches	m	89	
<u>HDPE PE100 PN10 (SDR 17) pressure pipes</u>				
2	50mm Pipes laid in and including trenches	m	279	
Carried to Collection				R
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PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
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Item		Quantity	Rate	Amount
<u>Extra over HDPE pressure pipes for (class 16) HDPE mechanical joint compression fittings</u>				
1	32mm x 90° Elbow	No	2	
2	32mm x 1" x 90degree Female threaded elbow (with reinforced ring)	No	5	
3	32mm x 1¼" x 90degree Elbow with male threaded off take	No	2	
4	32 x 32mm Equal tee	No	2	
5	32mm End cap	No	1	
6	50mm 90° Elbow	No	9	
7	50mm x 2" x 90° Elbow with male threaded off take	No	1	
8	50mm x 2" Female adaptor (with reinforced ring)	No	20	
9	50mm x 2" Flange adaptor with metal ring	No	2	
10	50mm x 1¼" Clamp saddle for HDPE and uPVC pipes with female threaded off take (with reinforced ring)	No	2	
11	90mm x 2" Clamp saddle for HDPE and uPVC pipes with female threaded off take (with reinforced ring)	No	1	
12	50 x 50mm Equal tee	No	1	
13	50 x 32mm Reducing tee	No	6	
14	50mm Coupling	No	1	
15	50mm End cap	No	3	
16	1¾" BSP Threaded end cap	No	1	
17	2" BSP Threaded end cap	No	1	
18	Making good fitting, 1¼" BSP Threaded Plug	No	2	
Carried to Collection				R
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Water supplies (Provisional)				

CDC/163/25 ~ ELLIOT MAGISTRATES COURT
PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Galvanised Mild Steel (GMS)/Cast Iron pipes and fittings as described to meter boxes, valve boxes and low level water tanks</u>			
1	150mm Long 50NB GMS medium duty pipe (SANS 62-1) flanged (DRILLING TABLE 1600/3 SANS 1123) on both ends	No 2		
2	500mm Long 50NB GMS Medium duty pipe (SANS 62-1) flanged (DRILLING TABLE 1600/3 SANS 1123) on the one end and threaded (SANS 1109-1 / ISO 7-1) on the other end	No 2		
3	500mm Long 50NB GMS Medium duty pipe (SANS 62-1) threaded (SANS 1109-1 / ISO 7-1) on both ends	No 17		
4	500mm Long 40NB GMS Medium duty pipe (SANS 62-1) threaded (SANS 1109-1 / ISO 7-1) on both ends	No 1		
5	500mm Long 20NB GMS Medium duty pipe (SANS 62-1) threaded (SANS 1109-1 / ISO 7-1) on both ends	No 1		
6	500mm Long 25NB GMS Medium duty pipe (SANS 62-1) threaded (SANS 1109-1 / ISO 7-1) on both ends	No 1		
7	20mm Galvanised Union-cone faced malleable cast iron fitting	No 1		
8	20mm Galvanised Hexagon nipple malleable cast iron fitting	No 2		
9	25mm Galvanised Union-cone faced malleable cast iron fitting	No 1		
10	25mm Galvanised Hexagon nipple malleable cast iron fitting	No 2		
11	40mm Galvanised Union-cone faced malleable cast iron fitting	No 1		
12	40mm Galvanised Hexagon nipple malleable cast iron fitting	No 2		
	Carried to Collection		R	
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PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
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ADDITIONAL ACCOMMODATION

<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	50mm Galvanised Union-cone faced malleable cast iron fitting	No	17		
2	50mm Galvanised Hexagon nipple malleable cast iron fitting	No	32		
3	50 x 50mm Galvanised Equal tee malleable cast iron fitting	No	3		
4	50 x 20mm Galvanised Reducing tee malleable cast iron fitting	No	1		
5	50 x 25mm Galvanised Reducing tee malleable cast iron fitting	No	1		
6	50 x 40mm Galvanised Reducing tee malleable cast iron fitting	No	1		
	<u>Cast iron/Brass fittings as described to meter boxes, valve boxes and low level water tanks</u>				
7	50DN Cast iron flanged (DRILLING TABLE 1600 SANS 1123) ELSTER KENT H4010 or similar approved in line stainer with corrosion-resistant coating	No	1		
8	50DN Cast iron flanged (DRILLING TABLE 1600 SANS 1123) ELSTER KENT HELIX H4000 or similar approved bulk water meter with a corrosion-resistant coating	No	1		
9	50DN Cast iron flanged (DRILLING TABLE 1600 SANS 1123) mechanical back-flow prevention device (non-return valve) with a corrosion-resistant coating	No	1		
10	50DN Cast iron flanged (DRILLING TABLE 1600 SANS 1123) resilient seal waterworks or similar approved gate valve, with corrosion-resistant coating, right hand closing with non-rising spindle and hand wheel top.	No	1		
11	20mm Brass gate valve (female threaded ends)	No	1		
12	25mm Brass gate valve (female threaded ends)	No	1		
13	40mm Brass gate valve (female threaded ends)	No	1		
14	50mm Brass gate valve (female threaded ends)	No	14		
	Carried to Collection			R	
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PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Concrete (15 mPa) encasing around pipes</u>			
1	50mm Pipe horizontal	m3	1	
2	Unreinforced concrete in thrust blocks at bends, tees, etc., including necessary extra excavation, formwork, etc.	m3	1	
	<u>Valve boxes including excavations, concrete bottoms, brick sides, concrete cover slabs and cast iron covers and frames</u>			
3	Valve box size 750 x 750 mm not exceeding 1000mm deep internally to invert level formed of 150mm thick cast insitu base slab and walls steel floated (25 MPa at 28 days in 19 mm stone) with ref 617 steel mesh reinforcing to centre of walls and base including lapping 400mm into base slab, fitted with and including ductile iron 450 x 450mm lockable cover and frame, cast into insitu concrete and bedded in 1:3 cement mortar and sealed in tallow including all necessary fittings, excavations, formwork, holes through sides for pipes, etc	No	7	
4	Water meter box size 1860 x 1040 mm not exceeding 1000mm deep internally to invert level formed of hard burnt one brick sides in 1:3 cement mortar on and including 150 mm thick mass concrete (25 MPa at 28 days in 19 mm stone) bottom projecting 75 mm beyond sides with 150/120 mm thick mass concrete (30 MPa at 28 days in 19 mm stone) top slab with Y10 reinforcing bars at 100mm centres both ways place 30mm from bottom of slab, rebated for and fitted with and including cast iron Type 9E light duty cover and frame size 600 x 900mm accordance with SANS 558, bedded in 1:3 cement mortar and sealed in tallow including all necessary fittings, excavations, formwork, holes through sides for pipes, etc	No	1	
	<u>Sundries</u>			
5	Excavate and search for existing water supply points and expose pipe and prepare for new connection.	No	1	
6	Extra over excavation in earth for pipe trenches, chambers, etc. for excavation in soft rock	m3	0.4	
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Item		Quantity	Rate	Amount
1	Extra over excavation in earth for pipe trenches, chambers, etc. for excavation in hard rock	m3	0.3	
<u>COLD WATER SUPPLIES</u>				
<u>Class 3 copper pipes</u>				
2	28mm Pipe in ground.	m	24	
3	32mm Pipe in ground.	m	6	
<u>Extra over class 3 copper pipes for compression fittings</u>				
4	28mm Adaptor coupling	No	3	
5	28mm Pillar tap adaptor coupling	No	2	
6	28mm Bent adaptor coupling	No	3	
7	28mm Bent adaptor coupling with wall plate	No	2	
8	28mm Elbow	No	10	
9	28mm Tee	No	12	
10	28mm Reducing coupling	No	6	
11	28 x 28 x 22mm Reducing tee	No	6	
<u>Class 2 copper pipes</u>				
12	25mm stand pipe.	m	2	
<u>Extra over 25mm copper pipes for</u>				
13	Wallplate elbow.	No	2	
<u>Valves, etc. including joints to galvanised steel pipes.</u>				
14	22 mm Brass bibtap.	No	2	
Carried to Collection				R
Section No. 4 - External Works				
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Water supplies (Provisional)				

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Item	Quantity	Rate	Amount
<u>TESTING, ETC.</u>			
1	Provide all necessary apparatus, water, etc. for and test the water reticulation system to the satisfaction of the Architect/Engineer and Local Authorities.	Item	
<u>COLLECTOR TANKS AND SLABS</u>			
SELECTED SUB-CONTRACTS The following selected sub-contract amounts are for work to be carried out in terms of Clause 21 of the Principal Building Agreement - -----			
2	Allow the sum of R65,000.00 (Sixty Five Thousand Rand) for the Supply and Installation of a Water Collector Tank and Concrete Base to be executed complete by a specialist subcontractor.	Item	65,000.00
3	Allow for profit.	Item	
4	Allow for attendance.	Item	
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Section 4

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Water supplies (Provisional)

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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 4</u>			
<u>BILL NO. 4</u>			
<u>ROADS, PARKING AND WALKWAYS(PROVISIONAL)</u>			
<u>PREAMBLES</u>			
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary products in descriptions</u>			
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent			
APPLICABLE STANDARDIZED SPECIFICATIONS1.			
SANS 1200 -Standardised Specifications for Civil Engineering			
Construction* SANS 1200 A 1986	Section A:		
GeneralSANS 1200 C 1980	Section C: Site		
Clearance SANS 1200 D 1988	Section D:		
Earthworks SANS 1200 DB 1989	Section DB:		
Earthworks (pipe trenches) SANS 1200 DK 1996	Section DK:		
Gabions and pitching SANS 1200 DM 1981	Section DM: Earthworks (roads, subgrade)		
SANS 1200 G 1982	Section G: Concrete (structural)		
SANS 1200 L 1983	Section L: Medium-pressure pipe		
lines SANS 1200 LB 1983	Section LB: Bedding		
(pipes) SANS 1200 LC 1981	Section LC: Cable		
ducts SANS 1200 LD 1982	Section LD: Sewers		
SANS 1200 LE 1982	Section LE: drainage		
Stormwater SANS 1200 LF 1983	Section LF: Erf connections		
(water) SANS 1200 M 1996	Section M: Roads		
Carried to Collection			R
Section No. 4 - External Works			
Bill No. 4			
Roads,Walkways and steps (Provisional)			

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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p>(general) SANS 1200 ME 1981 Section ME: Subbase SANS 1200 MJ 1984 Section MJ: Segmented paving SANS 1200 MK 1983 Section MK: Kerbing and channelling2. SANS Standard Specifications*3. OW 371 - Specification of Materials and Methods to be used. Fourth Revision, October 1993.*** Not issued with this document, but available at the Contractor's expense from the S A Bureau of Standards, Private Bag x 191, PRETORIA, 0001.** Not issued with this document, but available on the web-site of the Director General, Department of Public Works, <http://www.publicworks.gov.za>PROJECT SPECIFICATION CLAUSESFEATURES REQUIRING SPECIAL ATTENTIONSSANS SPECIFICATIONS AND CODES OF PRACTICEIn this document all reference to South African National Standards specifications and codes of practice, or any other standard specifications or codes of practice, including National Building Regulations, shall will deemed to be references to the latest issues of such specifications and codes.TESTING AND QUALITY CONTROLThe Contractor shall engage the services of an approved independent laboratory or other institution as applicable for quality testing, in order to ensure that his work complies with the specifications.No separate payment will be made for such testing, the cost will be deemed to be included in the Contractor's rates for the items of work that require testing in accordance with the Specifications.The onus to produce work that conforms to the requirements of the Specifications and Drawings regarding quality and accuracy of detail, rests upon the Contractor and he will, at his own expense, institute a quality-control system and provide experienced engineers, foremen, surveyors, materials technicians, other technicians and technical staff, together with all transport, instruments and equipment to ensure adequate supervision and positive control of the Works at all times.The cost of supervision and process control, including testing carried out by the Contractor, will be deemed to be included in the rates bid for the related items of work. The Contractor's attention is drawn to the provisions of the various Specifications regarding the minimum frequency of testing required. The Contractor shall increase this frequency at his own discretion, to ensure adequate control where necessary.On completion and submission</p> <p style="text-align: right;">Carried to Collection</p> <p>Section No. 4 - External Works Bill No. 4 Roads,Walkways and steps (Provisional)</p>			
		R	

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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p>of every part of the work to the Engineer for examination, the Contractor shall furnish the Engineer with the results of the relevant tests to indicate compliance with the Specifications.</p> <p>USE OF EXPLOSIVESThe use of explosives for breaking up rock and hard material is not allowed due to the close proximity of existing buildings.</p> <p>WORK IN RESTRICTED AREASNotwithstanding any reference in any specification to work in restricted areas, no additional payment will be made for work in restricted areas. The Contractor will be deemed to have included any cost relating to work in restricted areas in the tendered rates.</p> <p>WORKMANSHIP AND QUALITY CONTROLThe onus to produce work that conforms to the requirements of the Specifications and Drawings regarding quality and accuracy of detail, rests upon the Contractor and he will, at his own expense, institute a quality-control system and provide experienced engineers, foremen, surveyors, materials technicians, other technicians and technical staff, together with all transport, instruments and equipment to ensure adequate supervision and positive control of the Works at all times. The cost of supervision and process control, including testing carried out by the Contractor, will be deemed to be included in the rates tendered for the related items of work. The Contractor's attention is drawn to the provisions of the various Specifications regarding the minimum frequency of testing required. The Contractor shall, at his own discretion, increase this frequency to ensure adequate control where necessary.</p> <p>On completion and submission of every part of the work to the Engineer for examination, the Contractor shall furnish the Engineer with the results of the relevant tests to indicate compliance with the Specifications.</p> <p>GENERAL MATERIALS QUALITY"All manufactured materials supplied shall be new materials unless the contrary is specified. All materials specified in accordance with SABS Specifications shall bear the SABS mark, whether so specified or not."</p> <p>ORDERING OF MATERIALSThe quantities set out in the Bill of Quantities have been carefully determined from calculations based on data available at the time and should therefore be considered to be approximate quantities only. Before ordering materials of any kind, the Contractor shall check with the Engineer whether or not the scope of the work for which the materials are required is likely to change substantially. No liability or responsibility whatsoever shall be attached to the</p>			
Carried to Collection		R	
<p>Section No. 4 - External Works</p> <p>Bill No. 4</p> <p>Roads, Walkways and steps (Provisional)</p>			

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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p>Employer for materials ordered by the Contractor except when ordered in accordance with written confirmation issued by the Engineer."CONSTRUCTIONPROTECTION OF OVERHEAD AND UNDERGROUND SERVICESLOCATION AND PROTECTION OF EXISTING SERVICESLocation of existing servicesBefore underground or excavation work is carried out, the Contractor shall ascertain the presence and position of all services likely to be damaged or interfered with by his activities. The Contractor shall determine the exact position of such services by means of suitable detecting equipment and afterwards by careful hand excavation where necessary in order to expose the services at the positions of possible interference by his activities. This procedure shall also be followed in respect of services not shown on the plans but believed to be present.All such services, the positions of which have been located at the critical points, shall be designated as 'known' services and their positions shall be indicated on a separate set of Drawings, a copy of which shall be furnished to the Engineer.While he is occupying the Site, the Contractor shall be liable for all damage caused by him to known services as well as for consequential damage, whether caused directly by his operations or by the lack of proper protection.Protection during repair modification and maintenance workThe Contractor will exercise all the necessary care to prevent damage to known services. Major excavating equipment and other plants will not be operated dangerously close to these services. Where necessary, excavation in close proximity to these services shall be carefully carried out with suitable hand tools, excluding picks wherever their use could damage the services. No additional payment will apply to such more difficult work.Services left exposed shall be suitably protected from damage.Alterations and repairs to existing servicesUnless the contrary is clearly specified or ordered, the Contractor shall not carry out alterations to existing services. When this is necessary, the Contractor shall inform the Engineer, who will either make arrangements for such work to be executed by the owner of the service, or instruct the Contractor to make such arrangements himself.When existing services are damaged by the Contractor, he shall immediately inform the Engineer, or when this is not possible, the relevant authority, and obtain instructions as to who should carry out repairs. In urgent cases, the Contractor shall take</p>			
Carried to Collection		R	
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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p>the necessary steps to minimise damage to and interruption of the service. No repairs of telecommunication cables or electric power lines and cables shall be attempted. The Employer will accept no liability for damages due to a delay in having such alterations or repairs affected. The Contractor shall provide all reasonable opportunity, access and assistance to persons carrying out alterations or repairs of existing services. TOLERANCES GENERAL No guarantee is given that the full specified tolerances will be available independently of each other, and the Contractor is cautioned that the liberal or full use of any one or more of the tolerances may deprive him of the full or any use of tolerances relating to other aspects of the work. Except where the contrary is specified or when clearly not applicable, all quantities for measurement and payment shall be determined from the 'authorised' dimensions. These are specified dimensions or those shown on the Drawings or, if changed, as finally prescribed by the Engineer, without any allowance for the specified tolerances. Except if otherwise specified, all measurements for determining quantities for payment will be based on the 'authorised' dimensions. If the work is therefore constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, quantities will be based on the 'authorised' dimensions regardless of the actual dimensions to which the work has been constructed. When the work is not constructed in accordance with the 'authorised' dimensions plus or minus the tolerances allowed, the Engineer may nevertheless, at his sole discretion, accept the work for payment. In such cases no payment shall be made for quantities of work or material in excess of those calculated for the 'authorised' dimensions, and where the actual dimensions are less than the 'authorised' dimensions minus the tolerance allowed, quantities for payment shall be based on the actual dimensions as constructed." TESTING "The Contractor shall obtain the services of an independent testing laboratory at his own expense (refer PS1.2 of the Project Specifications) to carry out the checks prescribed in the various Standardised Specifications."</p> <p><u>ROADSWAYS, PARKING AND WALKWAYS</u></p> <p><u>CONCRETE WALKWAYS</u></p> <p style="text-align: right;">Carried to Collection</p> <p>Section No. 4 - External Works Bill No. 4 Roads, Walkways and steps (Provisional)</p>			
		R	

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>EARTHWORKS</u>			
	<u>Excavations</u>			
	<u>Excavate in pickable material not exceeding 2 m deep below natural or reduced ground level (Labour-intensive)</u>			
1	Trenches.	m3	92	
2	Reduce levels under surface beds.	m3	66	
3	150mm Deep over site between buildings, retaining walls, etc to remove top soil and depositing excavated material in prescribed stock piles on site	m3	66	
	<u>Extra over trench and hole excavations in earth for excavation in:</u>			
4	Soft rock.	m3	9	
5	Hard rock.	m3	5	
	<u>Garden soil filling obtained from the excavations and/or prescribed stock piles on site</u>			
6	Spread over site	m3	66	
	<u>Extra over all excavations for carting away:</u>			
7	Extra over all excavations for carting surplus excavated material and spreading, levelling and lightly compacting on site where directed average 150 m from the excavations (Measured Nett - No Allowance made for bulking).	m3	158	
	<u>Compaction of surfaces</u>			
8	Compaction of ground surface under floors, etc including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% Mod AASHTO density	m2	531	
	Carried to Collection			R
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Risk of collapse of excavations:</u>				
1	Sides of trench and hole excavations not exceeding 1,5m deep.	m2	294		
	<u>Keeping excavations free of water:</u>				
2	Keeping excavations free from mud and all water including subterranean sources.		Item		
	<u>FILLING, ETC</u>				
	<u>G7 Earth filling supplied by the contractor compacted to 95% Mod AASHTO density:</u>				
3	Backfilling to trenches, holes, etc.	m3	39		
4	Under concrete surface beds in accordance with SABS 1200 DM compacted in max 150mm thick layers to 93% Mod AASHTO density.	m3	178		
	<u>G5 earth filling supplied by the contractor compacted to 95% Mod AASHTO density:</u>				
5	Under concrete surface beds in accordance with SABS 1200 DM compacted in 150mm thick layers to 95% Mod AASHTO density.	m3	66		
	<u>Prescribed density tests on filling</u>				
6	"Modified AASHTO Density" test on fill material.	No	25		
	<u>REINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES AND FORMWORK</u>				
	<u>Concrete mix for general concrete works, composed of 1 part cement ; 3 parts sand and 3 parts 19mm stone producing a strength of 20-29MPa using 60L water per 2 bags cement. Cement is to be manufactured in accordance with SANS 50197-1.</u>				
	<u>25 MPa/19mm concrete</u>				
7	Surface beds cast in panels to falls and ramps.	m3	57		
	Carried to Collection			R	
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Footings to walls (Provisional).	m3	28		
2	Concrete infill to cavity walls cast in cavities of 250mm brick walls	m3	4		
3	Stairs including landings, beams and inverted beams	m3	4		
	<u>Thicken out surface beds, etc.</u>				
4	Thicken out edge of 100mm thick apron to a total thickness of 142mm for a width of 300mm, including all necessary excavation, surface preparation, additional concrete and formwork (formwork to exposed edges elsewhere measured).	m	48		
	<u>CONCRETE SUNDRIES</u>				
	<u>Finishing top surfaces of concrete to an evenly ribbed non-slip surface (broom finish):</u>				
5	Surface beds to falls.	m2	438		
	<u>SMOOTH FORMWORK (DEGREE OF ACCURACY II)</u> <u>(CPAP Work Group No 111)</u>				
	<u>Smooth Formwork to Sides:</u>				
6	Stepped outer edges of stairs	m2	1		
7	Edges, risers, ends and reveals not exceeding 300mm high or wide.	m	36		
	<u>MOVEMENT JOINTS, ETC.</u>				
	<u>ISOLATION JOINTS</u>				
	<u>Isolation Joints</u>				
8	Low density (33kg/m³), cross linked, closed cell, expanded polyethylene joint former, size 100 x 12mm thick with tear off strip fitted to isolation joints in concrete surface with adhesive as per adhesive manufacturer's recommendation.	m	336		
Carried to Collection				R	
Section No. 4 - External Works					
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Approved polyurethane elastometric adhesive/sealant colour Concrete Grey applied in accordance with the manufacturer's instructions.</u>				
1	12 x 10mm Deep in isolation joints in floors or walls including raking out expansion joint filler as necessary.	m	336		
	<u>CONSTRUCTION JOINTS</u>				
	<u>Vertical construction joints through concrete including thick cement slurry to one face:</u>				
2	Surface beds not exceeding 300mm thick.	m	18		
	<u>EXPANSION JOINTS</u>				
	<u>Joint forming material in movement joints:</u>				
3	12mm Bitumen impregnated fibre board built in vertically or horizontally between brick skins (Provisional).	m2	9		
	<u>Approved two-part grey polysulphide sealing compound including backing cord, bond breaker, primer, etc</u>				
4	12mm joints in floors or walls including raking out expansion joint filler as necessary (Provisional)	m	41		
	<u>REINFORCEMENT(Provisional)</u>				
	<u>Fabric reinforcement in surface beds:</u>				
5	Type 395 standard square fabric mesh reinforcement in surface beds, slabs, etc, nominal mass 3,95 kg/m ² with nominal 8mm thick wires and 200 x 200mm pitch, complying with SANS 1024/2006 requirements, in sheets 2,4 x 6m long. (measured net)	m2	438		
	<u>Fabric reinforcement in walls:</u>				
6	Type 617 standard square fabric mesh reinforcement in surface beds, slabs, etc, nominal mass 6,17 kg/m ² with nominal 10mm thick wires and 200 x 200mm pitch, complying with SANS 1024/2006 requirements, in sheets 2,4 x 6m long.	m2	203		
	Carried to Collection			R	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Mild steel reinforcement to structural concrete work:</u>			
1	Steel rod reinforcement of varying diameters to bottom, walls and slab	kg 555		
	<u>High tensile steel reinforcement to structural concrete work:</u>			
2	Steel rod reinforcement of varying diameters to bottom, walls and slab	kg 2,125		
	<u>CONCRETE TESTING</u>			
3	Making and testing 150 x 150 x 150 mm concrete strength test cube (Provisional).	No 25		
	<u>BRICKWORK</u>			
	<u>BRICKWORK IN FOUNDATIONS (PROVISIONAL)</u>			
	<u>Brickwork of NFX bricks (14 MPa nominal compressive strength) in Class II mortar:</u>			
4	250mm hollow walls of two half brick skins with and including 200mm long x 100mm wide wire butterfly ties centrally placed and staggered at 5 ties per metre squared of face.	m2 203		
	<u>SANDSTONE WALLS</u>			
5	Extra over brick walls for sandstone facings externally size 220 x 73 x 105mm Wide in cement mortar finished fair and pointed both sides as described.	m2 125		
	<u>DAMPPROOFING OF WALLS AND FLOORS</u>			
	<u>One layer of 250 micron USB green waterproof sheeting sealed at laps with pressure sensitive tape</u>			
6	Under surface beds	m2 460		
	<u>PAINTWORK</u>			
	<u>BALUSTRADES</u>			
	Carried to Collection		R	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Mild steel balustrades</u>			
1	Balustrade, 1000mm high, formed of 50 x 5mm stainless steel flat bar posts welded and bolted with 100 x 150 x 6mm thick stainless steel base plate bolted to concrete, 2 x 50 x 25mm thick rectangular hollow section horizontal rails welded with 20 x 20mm stainless steel square hollow section vertical rails at 120mm centres welded and 50mm diameter x 2,5mm thick handrail welded (Refer to drawing 1052/50-07)	m	128	
	<u>PRECAST CONCRETE PARKING AND WALKWAYS</u>			
	<u>EARTHWORKS</u>			
	<u>Excavation not exceeding 2m deep</u>			
2	150mm Deep over site between buildings, retaining walls, etc to remove top soil and depositing excavated material in prescribed stock piles on site	m3	21	
3	Over site between buildings, retaining walls, etc to reduce levels and depositing excavated material in prescribed stock piles on site	m3	42	
	<u>Extra over bulk excavation in earth for excavation in</u>			
4	Soft rock	m3	5	
5	Hard rock	m3	5	
	<u>Garden soil filling obtained from the excavations and/or prescribed stock piles on site</u>			
6	Over site	m3	21	
	<u>Extra over all excavations for carting away</u>			
7	Surplus material from stock piles on site to a dumping site to be located by the contractor	m3	42	
	Carried to Collection			R
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Keeping excavations free of water</u>			
1	Keeping excavations free of all water other than subterranean water	Item		
	<u>Road bed preparation</u>			
	<u>Compaction of surfaces</u>			
2	Compaction of reduced ground surface under pavings etc including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% Mod AASHTO density	m2	141	
	<u>LAYERWORK</u>			
	<u>Selected layer</u>			
3	G7 Selected layer in accordance with SABS 1200 M TABLE 3B imported by the contractor in layers not exceeding 150 mm, compacted to 93% Modified AASHTO maximum density.	m3	42	
	<u>Subbase</u>			
4	C3 Stabilised Subbase in accordance with SABS 1200 M TABLE 7 consisting of G5 quality material imported by the contractor in layers not exceeding 150 mm, stabilise with 2.5% by mass of stabilising agent (32.7N Cement) and compacted to 96% Modified AASHTO maximum density.			
	General guide: Based on G5 material as 2050kg/m3 Cement required = 51.25kg/m3	m3	21	
	<u>Prescribed density tests on filling</u>			
5	"Modified AASHTO Density" test on fill material	No	15	
6	"Field Density" test including "Optimum Moisture Content" (four readings per test) on layer work	No	2	
	Carried to Collection			R
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Precast concrete block road surfacing</u>			
	<u>Paving is to be laid in accordance with SABS 1200 MJ, SABS 1058 and the Concrete Masonry Association's specifications</u>			
1	60mm Thick Class 30/2.0 (SANS 1058:2012) S-D concrete paving blocks laid to strecher bond pattern on 20mm (thickness after final compaction) clean river bedding sand (SANS 1200MJ 3.3).	m2	141	
	<u>Paving Sundries</u>			
2	Clean sand is to be swept into joints between paving blocks.	m2	141	
	<u>BUILDERS WORK TO GENERATOR PLINTH</u>			
	<u>CONCRETE SLAB</u>			
	<u>EARTHWORKS</u>			
3	Reduce levels under surface beds.	m3	2	
	<u>Road bed preparation</u>			
4	Scarify in-situ road bed surface to a depth of 150 mm and compact to 93% Modified AASTO density at optimum moisture content.	m2	10	
	<u>G6 Earth filling supplied by the contractor compacted to 95% Mod AASHTO density:</u>			
5	Backfilling to trenches, holes, etc.	m3	2	
	<u>Sundries</u>			
6	Cart away surplus excavated material.	m3	2	
	<u>Prescribed density tests on filling</u>			
7	"Modified AASHTO Density" test on fill material.	No	3	
	Carried to Collection			R
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Concrete mix for general concrete works, composed of 1 part cement ; 3 parts sand and 3 parts 19mm stone producing a strength of 20-29MPa using 60L water per 2 bags cement. Cement is to be manufactured in accordance with SANS 50197-1.</u>			
	<u>25 MPa/19mm concrete</u>			
1	Slabs, including beams and inverted beams	m3	4	
	<u>Test blocks:</u>			
2	Making and testing 150 x 150 x 150 mm concrete strength test cube (Provisional)	No	6	
	<u>CONCRETE SUNDRIES</u>			
	<u>Finishing top surfaces of concrete to an evenly ribbed non-slip surface (broom finish):</u>			
3	Surface beds to falls.	m2	16	
	<u>SMOOTH FORMWORK (DEGREE OF ACCURACY II) (CPAP Work Group No 111)</u>			
	<u>Smooth Formwork to Sides:</u>			
4	Edges, risers, ends and reveals not exceeding 300mm high or wide.	m	13	
	<u>Smooth Formwork to Sides and Soffits:</u>			
5	Ground beams	m2	6	
	<u>Extra on smooth formwork to soffits for boxing or blocking in or boxing out to form:</u>			
6	110mm Diameter opening through 150mm thick slab (Provisional).	No	2	
	<u>Boxing in smooth formwork to form:</u>			
7	25 x 25mm Chamfer along top edge.	m	35	
	Carried to Collection			
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Galvanised pipes</u>				
1	25mm Drain pipe	m	1		
2	22 mm Brass bibtap.	No	1		
	<u>REINFORCEMENT(Provisional)</u>				
	<u>Fabric reinforcement</u>				
3	Type 395 standard square fabric mesh reinforcement in surface beds, slabs, etc, nominal mass 3,95 kg/m ² with nominal 8mm thick wires and 200 x 200mm pitch, complying with SANS 1024/2006 requirements, in sheets 2,4 x 6m long. (measured net)	m2	10		
	<u>High tensile steel reinforcement to structural concrete work:</u>				
4	Steel rod reinforcement of varying diameters to bottom, walls and slab	kg	188		
	<u>GENERAL BUILDERS WORK TO ELECTRICAL INSTALLATIONS</u>				
	<u>Supply, deliver and install cable sleeves and slow bends in concrete surface beds and or trenches as specified.</u>				
5	110 mm diameter (UPVC) sleeves including trenching, backfilling, etc. 800mm deep x 500mm wide	m	90		
6	110 mm diameter (UPVC) Slow Bend	No	8		
7	50 mm diameter (UPVC) including trenching, backfilling, etc. 800mm deep x 500mm wide	m	60		
8	50 mm diameter (UPVC) Slow Bend	No	4		
9	32 mm diameter (UPVC) including trenching, backfilling, etc. 800mm deep x 500mm wide	m	40		
10	32 mm diameter (UPVC) Slow Bend	No	10		
11	100 mm diameter (Galvanised) sleeves including trenching, backfilling, etc. 800mm deep x 500mm wide	m	40		
	Carried to Collection			R	
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Item		Quantity	Rate	Amount
1	Allow for core drilling through existing 540mm thick sandstone/brick walls for new 50mm sleeves	No	10	
2	Allow for core drilling through existing 540mm thick sandstone/brick walls for new 110mm sleeves	No	5	
3	Allow for breaking up concrete floors for new 110mm sleeves	m	5	
	<u>Inspection manholes including excavations, concrete bottoms, brick sides, concrete cover slabs and cast iron covers and frames</u>			
4	Manhole size 750 x 750 mm not exceeding 1000mm deep internally to invert level formed of 150mm thick cast insitu base slab and walls steel floated (25 MPa at 28 days in 19 mm stone) with ref 617 steel mesh reinforcing to centre of walls and base including lapping 400mm into base slab, fitted with and including ductile iron 450 x 450mm lockable cover and frame, cast into insitu concrete and bedded in 1:3 cement mortar and sealed in tallow including all necessary fittings, excavations, formwork, holes through sides for pipes, etc	No	4	
	<u>STRUCTURAL STEEL CANOPIES</u>			
	SELECTED SUB-CONTRACTS The following selected sub-contract amounts are for work to be carried out in terms of Clause 21 of the Principal Building Agreement - -----			
5	Allow the sum of R450,000.00 (Four Hundred and Fifty Thousand Rand) for the Supply and Installation of the structural steel canopies to be executed complete by a specialist subcontractor.	Item		450,000.00
6	Allow for profit.	Item		
7	Allow for attendance.	Item		
	Carried to Collection		R	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 4</u>				
<u>BILL NO. 5</u>				
<u>LANDSCAPING AND FENCING (PROVISIONAL)</u>				
<u>PREAMBLES</u>				
For Preambles see "Specification of materials and methods to be used - PW 371"				

<u>REMOVAL OF EXISTING WORK</u>				
<u>Taking down and removing</u>				
1	Palisade fence 2.4m high complete fixed between brick columns	m	176	
2	Precast concrete boundary wall average 2,0m high including concrete posts	m	43	
3	Remove existing single palisade gate	No	1	
4	Remove existing double palisade gate	No	2	
<u>PALISADE FENCING (PROVISIONAL)</u>				
<u>EXCAVATION, ETC</u>				
<u>Excavation in earth not exceeding 2m deep</u>				
5	Surface trenches and ground beams	m3	10	
6	Bases	m3	14	
<u>Extra over trench and hole excavations in earth for excavation in</u>				
7	Soft rock	m3	2	
8	Hard rock	m3	1	
Carried to Collection				R
Section No. 4 - External Works				
Bill No. 5				
Landscaping and Fencing (Provisional)				

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Item		Quantity	Rate	Amount
<u>Extra over all excavations for carting away</u>				
1	Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor	m3	23	
<u>Risk of collapse of excavations</u>				
2	Sides of trench and hole excavations not exceeding 1,5m deep	m2	68	
<u>Keeping excavations free from water</u>				
3	Keeping excavations free from mud and all water other than from subterranean sources	Item		
<u>FILLING, ETC</u>				
<u>G7 Earth filling supplied by the contractor compacted to 93% Mod AASHTO density</u>				
4	Backfilling to trenches, holes, etc	m3	10	
<u>REINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES</u>				
<u>25 MPa/19mm concrete</u>				
5	Strip footings(Provisional)	m3	3	
6	Bases.	m3	7	
<u>CONCRETE TESTING</u>				
7	Making and testing 150 x 150 x 150 mm concrete strength test cube (Provisional)	No	6	
<u>REINFORCEMENT(Provisional)</u>				
<u>Mild steel reinforcement to structural concrete work:</u>				
8	10mm Diameter bars.	kg	185	
Carried to Collection				R
Section No. 4 - External Works				
Bill No. 5				
Landscaping and Fencing (Provisional)				

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PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
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		Quantity	Rate	Amount
<u>High tensile steel reinforcement to structural concrete work:</u>				
12mm Diameter bars.	kg	125		
10mm Diameter bars.	kg	68		
<u>BRICKWORK IN FOUNDATIONS (PROVISIONAL)</u>				
<u>14MPa nominal compressive strength Imperial NFX loadbearing perforated plaster brick, size 222 x 73 x 106mm, manufactured in accordance with SANS 227:2007, laid in foundations walls to single storey building and bedded and jointed in Class I mortar. Mortar in accordance with SANS 50197-1:2002 Cement Part 1: Composition, specification and conformity criteria for common cements, in mortar Class 1 to be mixed to the ratio of 1 part cement : 4 parts sand, (sand to conform to SANS 1083:2006) to highly stressed masonry, incorporating high structural units.</u>				
Piers	m3	1		
One brick walls	m2	14		
<u>BRICKWORK IN SUPERSTRUCTURE</u>				
<u>14MPa nominal compressive strength Imperial NFX loadbearing perforated plaster brick, size 222 x 73 x 106mm, manufactured in accordance with SANS 227:2007, laid in superstructure walls to single storey building and bedded and jointed in Class I mortar. Mortar in accordance with SANS 50197-1:2002 Cement Part 1: Composition, specification and conformity criteria for common cements, in mortar Class 1 to be mixed to the ratio of 1 part cement : 4 parts sand, (sand to conform to SANS 1083:2006) to highly stressed masonry, incorporating high structural units.</u>				
Piers	m3	3		
One brick walls	m2	8		
<u>Facings Externally</u>				
Carried to Collection				R
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Facebricks prime cost R 7 250.00 per thousand excluding VAT delivered to the site pointed with flush horizontal and vertical joints</u>			
1	Extra over ordinary brickwork for facing in stretcher bond and pointing as described in foundations.	m2	5	
2	Extra over ordinary brickwork for facing in stretcher bond and pointing as described.	m2	45	
	<u>Brick-on-edge header course copings, sills, etc with recessed joints on all exposed faces:</u>			
3	220mm Wide brick on edge course to top of one brick wall bedded and jointed in cement mortar and pointed on top and both sides as described.	m	16	
	<u>Brick reinforcement</u>			
4	Approved high tensile steel brick reinforcement 155 mm wide well lapped at all angles and passings and built into brick walls every fourth course	m	269	
	<u>BRICKWORK SUNDRIES</u>			
	<u>Joint forming material in movement joints</u>			
5	12mm Bitumen impregnated fibre board built in vertically between brick skins	m2	2	
	<u>JOINT SEALANTS, ETC</u>			
	<u>Two-part grey polysulphide sealing compound including backing cord, bond breaker, primer, etc</u>			
6	10 x 10mm In expansion joints in floors or walls including raking out expansion joint filler as necessary (Provisional)	m	13	
	<u>DAMPPROOFING OF WALLS AND FLOORS</u>			
	<u>One layer of 375 micron embossed damp proof course</u>			
7	In walls	m2	5	
	Carried to Collection			R
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Item		Quantity	Rate	Amount
<u>PRECAST CONCRETE COPINGS, SILLS, ETC</u>				
<u>Approved standard uncoloured blocks finished smooth, including bedding on brickwork, jointing and pointing on all exposed surfaces</u>				
1	540 x 540 x 200 mm Thick overall copings four times weathered on top to 100 mm thick along both edges with drip groove in bottom along all edges refer to drawing No. 2.01	No	6	
<u>CLEARVU FENCING OR SIMILAR APPROVED</u>				
<u>Galvanised and coated mild steel security fencing</u>				
2	ClearVu or similar approved high density anti-climbing and anti-cut pressed mesh panel fencing 2,4m high fitted between existing brick columns , formed of 3mm diameter horizontal and 4mm diameter vertical high tensile wires galvanised with coating with aperture size 76,2mm x 12,7mm and panels reinforced with 4 x 50mm deep V formation horizontal recessed bands and 2 x 75mm 70 degree flanges along sides, bolted with vandal resistant bolts and clamping plates to 85 - 45mm Taper locking post 2,4m including Locking Recess Mechanism at 3,382m centres with UV stabilised polymer sealed end caps and 30 x 3mm x 250mm long angle section base anchors. Top of fence fitted with approved 100mm high coated 'shark tooth' type spike.	m	164	
Carried to Collection				R
Section No. 4 - External Works Bill No. 5 Landscaping and Fencing (Provisional)				

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	<p>ClearVu or similar approved high density anti-climbing and anti-cut pressed mesh panel fencing 2,4m high, formed of 3mm diameter horizontal and 4mm diameter vertical high tensile wires galvanised with coating with aperture size 76,2mm x 12,7mm and panels reinforced with 4 x 50mm deep V formation horizontal recessed bands and 2 x 75mm 70 degree flanges along sides, bolted with vandal resistant bolts and clamping plates to 85 - 45mm Taper locking post 3,0m including Locking Recess Mechanism at 3,382m centres with UV stabilised polymer sealed end caps and 30 x 3mm x 250mm long angle section base anchors with posts bedded in 15MPa concrete bases size 600 x 400 x 650mm deep with bitumen coated 600mm under-dig.</p> <p>Top of fence fitted with approved 100mm high coated 'shark tooth' type spike.</p> <p><u>Gates</u></p>	m	72	
2	<p>Single pedestrian gate size 1030 x 2300mm high formed of coated colour Black 76 x 76 x 2mm wall thickness square section framing covered with ClearVu or similar approved Marine Fusion Bond coating colour Dark Grey Reinforced high density anti-climbing and anti-cut pressed mesh panel fencing size 878 x 2 148 mm high and horizontal flatbar with 2 x 75mm 70° flanges along sides and 2 x 30° flanges along top and toe, all bolted with vandal resistant bolts and clamping plates to frame; the gate fitted with three eyebolt hinges, stops and one 16mm diameter solid galvanised mild steel locking padbolt and with 76 x 76 x 2mm wall thickness square section framing welded around locking bar to gate for fixing of wire mesh, including drilling gate post for keep hole, etc.</p> <p>Top of gate fitted with approved 100mm high coated 'shark tooth' type spike.</p>	No	2	
Carried to Collection				R
Section No. 4 - External Works				
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Double vehicle gate overall size 3069 x 2350mm high in two equal leafs, each leaf formed of coated colour Black 40 x 40 x 3mm wall thickness square section framing covered with ClearVu or similar approved coating colour Dark Grey Reinforced high density anti-climbing and anti-cut pressed mesh panel fencing size 1537 x 2270mm high and horizontal flatbar with 2 x 75mm 70° flanges along sides and 2 x 30° flanges along top and toe, all bolted with vandal resistant bolts and clamping plates to frame; each gate leaf to be fitted with two eyebolt hinges, stops and one 16mm diameter solid galvanised mild steel locking padbolt with 40 x 40 x 3mm wall thickness square section framing welded around locking bar to gate for fixing of wire mesh, and 16mm diameter x 450mm long galvanised towerbolt fixed to bottom of gate including all drilling of gate post for keep hole, etc., fixed to existing brick columns				
	Top of gate fitted with approved 100mm high coated 'shark tooth' type spike.	No	1		
2	Sliding gate overall size 3354 x 2300mm high formed of coated colour Black 76 x 76 x 2mm wall thickness square section framing covered with ClearVu or similar approved coating colour Dark Grey Reinforced high density anti-climbing and anti-cut pressed mesh panel fencing ; gate fitted with and including a pair of suitable gate wheels on fixing brackets welded to bottom rail and one 16mm diameter solid galvanised mild steel locking padbolt with 76 x 76 x 2mm wall thickness square section framing welded around locking bar to gate for fixing of wire mesh, and 16mm diameter x 450mm long galvanised towerbolt fixed to bottom of gate including all drilling of gate post for keep hole, etc.				
	Top of gate fitted with approved 100mm high coated 'shark tooth' type spike.	No	2		
Carried to Collection					R
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Sliding gate overall size 4863 x 2300mm high formed of coated colour Black 76 x 76 x 2mm wall thickness square section framing covered with ClearVu or similar approved coating colour Dark Grey Reinforced high density anti-climbing and anti-cut pressed mesh panel fencing ; gate fitted with and including a pair of suitable gate wheels on fixing brackets welded to bottom rail and one 16mm diameter solid galvanised mild steel locking padbolt with 76 x 76 x 2mm wall thickness square section framing welded around locking bar to gate for fixing of wire mesh, and 16mm diameter x 450mm long galvanised towerbolt fixed to bottom of gate including all drilling of gate post for keep hole, etc.			
	Top of gate fitted with approved 100mm high coated 'shark tooth' type spike.	No	1	
2	Approved heavy duty padlock	No	6	
3	500 x 500 x 750mm Deep 20MPa mass concrete keep block with two 19mm diameter x 100mm long galvanised locating sleeve cast into top, including all necessary excavation, formwork, etc	No	4	
<u>LANDSCAPING</u>				
<u>Grassing of sods</u>				
4	"Kikuyu" grass in sods approximately 300 x 300 x 75mm thick, closely packed and top dressed as necessary to even surfaces.	m2	300	
<u>Maintenance</u>				
5	Maintenance of grassed areas for a period of 6 months including regularly weeding and irrigating as necessary.	Item		
<u>REMOVAL OF TREES, ETC.</u>				
<u>Cutting down and removing, grubbing up roots and filling in holes</u>				
6	Tree exceeding 200mm and not exceeding 500mm girth	No	2	
Carried to Collection				R
Section No. 4 - External Works				
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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Tree exceeding 500mm and not exceeding 1000mm girth	No	3		
2	Tree exceeding 1000mm and not exceeding 1500mm girth	No	4		
3	Tree exceeding 1500mm and not exceeding 2000mm girth	No	4		
Carried to Collection					R
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ADDITIONAL ACCOMMODATION**

<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 4</u>				
<u>BILL NO. 6</u>				
<u>DECANTING ~ TEMPORARY ACCOMMODATION (PROVISIONAL)</u>				
<u>PREAMBLES</u>				
For Preambles refer to "Department of Public Works: Specification of materials and methods to be used - PW371"				
<u>SUPPLEMENTARY PREAMBLES</u>				
<u>Proprietary products in descriptions</u>				
Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent				
<u>TEMPORARY ACCOMMODATION</u>				
SELECTED SUB-CONTRACTS The following selected sub-contract amounts are for work to be carried out in terms of Clause 21 of the Principal Building Agreement - -----				
<u>The following in approved prefabricated stand alone mobile unit type offices and containers placed on jacks on concrete pads</u>				
1	Allow the sum of R450,000.00 (Four Hundred and Fifty Thousand Rand) for the Supply and Installation of temporary units to be executed complete by a specialist subcontractor.	Item		450,000.00
2	Allow for profit.	Item		
3	Allow for attendance.	Item		
Carried to Summary of Section 4			R	
Section No. 4 - External Works Bill No. 6 Decanting (Provisional)				

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Item	Quantity	Rate	Amount
<u>SECTION NO. 4</u>			
<u>BILL NO. 7</u>			
<u>FLAGPOLES, ETC</u>			
<u>FLAGPOLES</u>			
<u>EARTHWORKS (PROVISIONAL)</u>			
<u>Site Clearance</u>			
1	Digging up and removing rubbish, debris, vegetation, hedges, shrubs and trees not exceeding 200mm girth, bush, etc	m2	5
<u>Excavation in earth not exceeding 2m deep</u>			
2	Surface trenches and ground beams	m3	1
<u>Extra over trench and hole excavations in earth for excavation in</u>			
3	Soft rock	m3	0.1
<u>Extra over all excavations for carting away</u>			
4	Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor	m3	1
<u>Risk of collapse of excavations</u>			
5	Sides of trench and hole excavations not exceeding 1,5m deep	m2	4
<u>Keeping excavations free from water</u>			
6	Keeping excavations free from mud and all water other than from subterranean sources	Item	
Carried to Collection			R
Section No. 4 - External Works			
Bill No. 7			
Flagpoles, etc			

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<u>Item</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Flagpole bed preparation</u>				
1	Scarify in-situ paved surface to a depth of 150 mm and compact to 93% Modified AASHTO density at optimum moisture content	m2	5		
	<u>Subbase</u>				
2	Hardcore filling imported by the contractor in layers not exceeding 150 mm, with a CBR less than 15 and a maximum particle size of 100 mm, compacted to 95% Modified AASHTO density at optimum moisture content	m3	2		
	<u>Subgrade</u>				
3	Selected fill (Sand) in layers not exceeding 150 mm compacted to 93% Modified AASHTO density at optimum moisture content	m3	1		
	<u>25/19MPa Mesh Reinforced concrete</u>				
4	Bases	m3	1		
	<u>Unreinforced Concrete</u>				
5	Flagpole bases	m3	0.2		
6	Mesh reinforcing Ref 245	m2	2		
	<u>Screed to flagpole base</u>				
7	25mm Screed	m2	6		
	<u>Sundries</u>				
8	25mm Stone/ loose gravel	m3	1		
9	10mm saw cuts including sealing with an approved bitumen sealant	m	4		
10	220 x 110 x 50mm brick on edge edging including 25Mpa concrete haunching approximately 500 x 200mm thick	m	27		
	<u>FLAGPOLES</u>				
	Carried to Collection			R	
	Section No. 4 - External Works				
	Bill No. 7				
	Flagpoles, etc				

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Item		Quantity	Rate	Amount
<u>Galvanised approved flagpoles</u>				
1	6m Long flagpole including pully and ropes	No	2	
<u>PAVING</u>				
	Approved clay brick paving			
2	220 x 110 x 50mm Brick-on-edge edging in paved surfaces	m2	9	
Carried to Collection				R
Section No. 4 - External Works				
Bill No. 7				
Flagpoles, etc				

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Bill No. 7
Flagpoles, etc
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1	Stormwater drainage (Provisional)	150		
2	Soil drainage (Provisional)	160		
3	Water supplies (Provisional)	170		
4	Roads,Walkways and steps (Provisional)	187		
5	Landscaping and Fencing (Provisional)	197		
6	Decanting (Provisional)	198		
7	Flagpoles, etc	202		
Carried to Final Summary			R	
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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 5</u>				
<u>BILL NO. 1</u>				
<u>EMPLOYMENT OF LOCAL RESOURCES - PROVIDE EMPLOYMENT OPPORTUNITIES TO TARGETED LABOUR (PROVISIONAL)</u>				
<u>(BOOK 1 - PART C3 - C3.6) DELIVERABLE L1</u>				
<u>LOCAL RESOURCES AND LABOUR</u>				
<p><u>It is an express condition of Contract that only local people (resident within the Elliot area) may be employed on the contract. Provided that adequate labour is not available from the local area, other labour may be employed/imported subject to satisfactory proof being provided that every effort was made to employ local residents. The contractor shall liaise with the CLO and local authorities, and negotiate with them about the employment of local labour in the building process. The contractor shall in general maximize the involvement of local communities.</u></p> <p><u>The above-mentioned condition does not apply to the contractors permanent managerial staff, and specialist related work, eg. blasting of rock, etc.</u></p> <p><u>Detailed records of actual labour employed on site shall be submitted to the Principal Agent on a monthly basis.</u></p>				
<u>L1.1 LABOUR RISK ASSESSMENT</u>				
1	Compilation of the risk assessment report required including all handling costs and profit.	Item		
<u>L1.2 EMPLOYMENT</u>				
2	Management and execution obligations for the employment, job forecast scheduling and monthly update submissions required, including all handling costs and profit.	months	24	
Carried to Collection			R	
Section No. 5 - Socio-Economic Deliverables (CSDG Incl Bill No. 1 Local Labour (Provisional)				

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Item		Quantity	Rate	Amount
<u>L1.3 RECRUITMENT</u>				
1	Management and execution obligations for the targeted recruitment process, monthly labour requisitions and achieving of minimum employment targets required, including all handling costs and profit.	months	24	
<u>L1.4 WAGES</u>				
2	Management and execution obligations for the compilation of job & wage schedules and wage payment processes required, including all handling costs and profit.	months	24	
<u>L1.5 EMPLOYMENT CONTRACTS</u>				
3	Management and execution obligations for employment contracts, including all handling costs and profit.	months	24	
<u>L1.6 LABOUR MOBILISATION & DEMOBILISATION</u>				
4	Management and provisions for mobilisation and demobilisation costs of employed personnel, including all handling costs and profit.	months	24	
Carried to Collection				R
Section No. 5 - Socio-Economic Deliverables (CSDG Incl Bill No. 1 Local Labour (Provisional)				

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SECTION NO. 5</u>				
<u>BILL NO. 2</u>				
<u>EMPLOYMENT OF A COMMUNITY LIAISON OFFICER (PROVISIONAL)</u>				
<u>(BOOK 1 - PART C3 - C3.6) DELIVERABLE L2</u>				
<u>COMMUNITY LIAISON OFFICER</u>				
<u>Immediately prior to site establishment, the Main Contractor must employ the services of a Community Liaison Officer (CLO) on a full-time basis for the full duration of the construction contract, through a recruitment process facilitated by the Implementing Agent.</u>				
<u>COMMUNITY LIAISON OFFICER:</u>				
1	Allowance for the remuneration of a Community Liaison Officer. (R 8500.00 per month for 24 months + 13th Cheques)	Item		425,000.00
2	Allowance for the CLO Statutory Contributions.	Item		115,000.00
3	Management and provision of all necessary tools of trade for the Community Liaison Officer, by the contractor, including all handling costs and profit.	24	months	
Carried to Summary of Section 5			R	
Section No. 5 - Socio-Economic Deliverables (CSDG Incl Bill No. 2 Community Liaison Officer (Provisional)				

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<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p><u>SECTION NO. 5</u></p> <p><u>BILL NO. 3</u></p> <p><u>TRAINING AND DEVELOPMENT INTERVENTIONS (PROVISIONAL)</u></p> <p><u>(BOOK 1 - PART C3 - C3.6) DELIVERABLE L3.1</u></p> <p><u>DEVELOPING SKILLS THROUGH INFRASTRUCTURE CONTRACTS</u></p> <p><u>Implementation of the Standard for Developing Skills through Infrastructure Contracts (CSDG), for contractors, to achieve full compliance to the Construction Industry Development Board Act, 2000 (Act no. 38 of 2000), published in Gazette Notice 48491 of 28 April 2023.</u></p> <p><u>This standard establishes a minimum contract skills development goal to be achieved in the performance of a contract in relation to the provision of different types of workplace opportunities, linked to work associated with a contract culminating in or leading to:</u></p> <p><u>Method 1 : structured workplace learning opportunities for learners towards the attainment of a part or a full occupational qualification.</u></p> <p><u>Method 2 : structured workplace learning opportunities for apprentices and/or other artisan learners towards the attainment of a trade qualification leading to a listed trade (GG No. 35625, 31 August 2012), subject to at least 60% of the Artisan Learners being holders of public TVET college qualifications.</u></p> <p><u>Method 3 : work integrated learning opportunities for University of Technology or Comprehensive University students completing their National Diplomas.</u></p> <p><u>Method 4 : structured workplace learning opportunities for candidates towards registration in a professional category by a statutory council.</u></p>			
Carried to Collection		R	
Section No. 5 - Socio-Economic Deliverables (CSDG Incl Bill No. 3 Training and Development Interventions (Provisional)			

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Employed learners may not account for more than 33 percent of the contract skill development goal.</u>			
	<u>Not more than one method may be applied to any individual concurrently in the calculation of the contract skills development goal.</u>			
	<u>The Standard for Skills Development is set at a maximum development support of 0.5% of the projects contract value as per the cidb B.U.I.L.D programme.</u>			
	<u>PROVISIONS</u>			
1	Provisions for Stipends	Item		80,000.00
2	Provision for Mentorship	Item		50,000.00
3	Provision for addition costs (PPE, Medical Assessments, Course Fee, Assessments and Monitoring)	Item		50,000.00
4	Management and provision of all necessary tools of trade for the learners, by the contractor, including all handling costs and profit.			
	months	9		
	<u>(BOOK 1 - PART C3 - C3.6) DELIVERABLE L3.2</u>			
	<u>CIDB STANDARD FOR INDIRECT TARGETING FOR ENTERPRISE DEVELOPMENT</u>			
	<u>Implementation of the CIDB Standard for Indirect Targeting for Enterprise Development through Construction Works Contracts (CPGs), published in Gazette Notice No. 36190 of 25 February 2013, and is applicable to contracts in cidb Grades 7 to 9, in the General Building (GB) and Civil Engineering (CE).</u>			
	<u>The standard establishes Contract Participation Goals (CPGs) for development of targeted enterprises, to promote enterprise development by providing for a minimum of 5% of the total project value on selected contracts to be undertaken by joint-venture partners or to be sub-contracted to developing contractors. The standard requires the lead partner, or the main contractor dedicate a minimum of 5% of the total project value and to</u>			
	Carried to Collection		R	
	Section No. 5 - Socio-Economic Deliverables (CSDG Incl Bill No. 3 Training and Development Interventions (Provisional)			

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 ADDITIONAL ACCOMMODATION

<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p><u>provide developmental support to a targeted sub-contractor/s and JV partners.</u></p> <p><u>General</u></p> <ul style="list-style-type: none"> • <u>The main contractor shall within 30 days of the contract coming into effect or the issuing of an order, submit to the employer's representative a contract compliance baseline training plan, taking into account the skills mix and type of workers that are to be engaged;</u> • <u>At intervals, not exceeding three (3) months, submit to the employer's representative interim contract compliance training reports; and</u> • <u>Shall within 30 days of reaching completion, end of the service, the delivery date for all work required or practical completion in the case of professional service, design and construct contracts, and engineering and construction works contracts, respectively, submit to the employer's representative a final contract compliance training report.</u> • <u>The information contained in the final contract compliance training report shall include the contract skills development goal achieved (in Rands or in hours) in the performance of the contract and a breakdown of the goal achieved.</u> • <u>The contractor shall keep records of the hours worked and registration particulars in compliance with this standard. The contractor shall allow the employer's representative to inspect or audit such training records at any time.</u> • <u>The employer's representative shall undertake suitable random audits on records to confirm compliance with requirements.</u> • <u>The learners shall be directly employed by the contractor or SDA and the contractor may enter into a contract agreement with the</u> 			
Carried to Collection		R	
Section No. 5 - Socio-Economic Deliverables (CSDG Incl Bill No. 3 Training and Development Interventions (Provisional)			

CDC/163/25 ~ ELLIOT MAGISTRATES COURT
PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
ADDITIONAL ACCOMMODATION

<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<p><u>cidb SDAs, training provider or skills development facilitator of their choice, participating in the implementation of this standard.</u></p> <ul style="list-style-type: none"> • <u>The main contractor shall also submit to the Implementing Agent, monthly CSDG compliance training reports, as well as a final CSDG compliance training report within 15 days of reaching practical completion.</u> • <u>The selection and placement of appropriate trainees/ learners/ candidates shall be in line with the Target Areas identified above. The initial search shall be made from the Project Job Seekers' Database managed by the Implementing Agent.</u> <p><u>PROVISIONS</u></p>			
1	<p>Management and execution of the obligations for the targeted contract spend process, selection of targeted enterprises, contract agreement compliances, monthly requisitions and achieving of the standard required, including all handling costs and profit.</p>	months	24	
	Carried to Collection			R
	Section No. 5 - Socio-Economic Deliverables (CSDG Incl Bill No. 3 Training and Development Interventions (Provisional)			

Section 5
Bill No. 3
Training and Development Interventions (Provisional)

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ADDITIONAL ACCOMMODATION

<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p><u>SECTION NO. 5</u></p> <p><u>BILL NO. 4</u></p> <p><u>EMPLOYMENT AND TRAINING OF LABOUR ON THE EPWP-NYS (PROVISIONAL)</u></p> <p><u>PREAMBLES</u></p> <p>For Preambles refer to and study the Additional Specification SL:Employment and Training of Labour on the Expanded Public Works Programme (EPWP) Infrastructure Projects: National Youth Service, as bound elsewhere in the Bills of Quantities, and then price this Bill accordingly</p>			
<p>Carried to Collection</p>		R	
<p>Section No. 5 - Socio-Economic Deliverables (CSDG Incl Bill No. 4 Employment and Training of Labour on the EPWP-NYS (</p>			

CDC/163/25 ~ ELLIOT MAGISTRATES COURT
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FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
ADDITIONAL ACCOMMODATION

<u>Item</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<p>Monthly reporting and administration of the EPWP system including submission of EPWP Reporting System (ERS) beneficiary registration tool to the principal agent on a monthly cycle to reflect employment on a government construction site. Records will include that of reflection of all labour employed by the main contractor personally as well as all the subcontractors on site. A separate sheet, although the same format, will be completed for Local Labour beneficiaries for the sub-contractor (if applicable).</p> <p><u>TRAINING OF YOUTH WORKERS</u> <u>(TARGET: 15 YOUTH WORKERS)</u></p> <p><u>Life skills development and Technical training:</u></p> <p>1 Life Skills development training for youth workers for an average of 5 days (ref. SL 11.01.01) Provisional</p>			
	Item		105,000.00
		R	
<p>Carried to Collection</p> <p>Section No. 5 - Socio-Economic Deliverables (CSDG Incl Bill No. 4 Employment and Training of Labour on the EPWP-NYS (</p>			

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<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Main Contractors Profit and Attendance	Item		
2	Technical Skills and training for youth workers for an average of 45 days (ref. SL 11.01.02)	Item		375,000.00
3	Main Contractors Profit and Attendance	Item		
	<p>The above item is only applicable if DoL does not fund the Technical Training PRIOR to site handover.</p> <p>Payment reduction due to not meeting the target as in SL 11.01.02</p> <p>(An amount of R 2000.00 (Two Thousand Rand) will be deducted per youth worker)</p> <p><u>TRAVELLING AND ACCOMMODATION DURING OFF SITE TRAINING:</u></p> <p><u>Life skills training for 5 days (ref. SL 11.02.01)</u></p>			
4	Travelling (based on R150 / day return trip/facilitator.)	Item		750.00
5	Accommodation (based on 5 nights / week and R800 / facilitator / night)	Item		4,000.00
	<u>Technical training for 45 days (ref. SL 11.02.02):</u>			
6	Travelling (based on R150 / day return trip/facilitator.)	Item		6,750.00
7	Accommodation (based on 5 nights / week and R800 / facilitator (x1) / 39 nights)	Item		36,000.00
	Carried to Collection		R	
	Section No. 5 - Socio-Economic Deliverables (CSDG Incl Bill No. 4			
	Employment and Training of Labour on the EPWP-NYS (

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ADDITIONAL ACCOMMODATION

<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Tests for Medical Fitness (ref. SL 11.02.03)</u>			
1	Provision of General Medical Practitioner or Clinic to examine EPWP youth workers on medical fitness before and after appointment (including COVID 19 PPE).	No	15.00	
2	Main Contractors Profit and Attendance	Item		
	<u>ALTERNATIVE WORKERS FOR THE PERIOD OF OFF-SITE TRAINING:</u>			
3	Life skills training for 5 days (ref. SL 11.03.01)	Item		10,000.00
4	Technical training for youth workers for 45 days (ref. SL 11.03.02)	Item		65,000.00
	<u>EMPLOYMENT OF YOUTH WORKERS:</u>			
	The unit of measurement shall be the number of youth workers at the Ministerial Determination labour rates multiplied by the period employed in months and the rate tendered shall include full compensation for all costs associated with the employment of youth workers and for complying with the conditions of contract. The cost for the training shall be excluded from this item. This item is based on maximum of 9 months appointment for youth workers			
5	Employment of youth workers (off - site training)	Item		130,000.00
6	Main Contractors Profit and Attendance	Item		
	Carried to Collection		R	
	Section No. 5 - Socio-Economic Deliverables (CSDG Incl Bill No. 4			
	Employment and Training of Labour on the EPWP-NYS (

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ADDITIONAL ACCOMMODATION

<u>Item</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
1	Employment of youth workers (on - site training)	Item		400,950.00
2	Main Contractors Profit and Attendance	Item		
	<u>PROVISION OF EPWP PPE, BRANDED OVERALLS & T-SHIRT/GOLF SHIRTS TO YOUTH WORKERS</u>			
3	Supply 2 x EPWP/NYS branded overalls, safety shoes, 1 x hard hats, 2 x PWP/NYS branded T-shirts, etc to youth workers (ref. SL 11.05.01) (SABS Branded)	Item		24,000.00
4	Main Contractors Profit and Attendance	Item		
	<u>PROVISION OF SMALL TOOLS FOR YOUTH WORKERS</u>			
5	Supply of small tools to all youth workers. Specification to be supplied by the EPWP-NYS Service Provider for the respective trades. (ref. SL 11.06.02) These tools will become the property of the youth workers after the completion of the programme.	Item		27,000.00
6	Main Contractors Profit and Attendance	Item		
	<u>PROVISION OF CATERING FOR EXIT WORKSHOP</u>			
7	Sourcing of catering company for provision of meals during NYS EXIT Workshop and arrangement of hiring venue for the workshop.	Item		15,000.00
	<u>APPOINTMENT OF YOUTH TEAM LEADER/S</u>			
8	Appointment of Youth Team Leader/s for the duration of the contract (ref. SL 11.07)	Item		40,000.00
	Carried to Collection		R	
	Section No. 5 - Socio-Economic Deliverables (CSDG Incl Bill No. 4 Employment and Training of Labour on the EPWP-NYS (

**CDC/163/25 ~ ELLIOT MAGISTRATES COURT
PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
ADDITIONAL ACCOMMODATION**

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**CDC/163/25 ~ ELLIOT MAGISTRATES COURT
PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
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SPECIALIST WORK SPECIFICATIONS AND PRICING SCHEDULES

COEGA DEVELOPMENT CORPORATION (PTY) LTD

ELLIOT MAGISTRATE COURT : PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION

(BID NO: CDC/163/25)

C2.3a

CCTV, Intercom & Access Control Installation

Specification and Pricing Schedule



public works
Department:
Public Works
REPUBLIC OF SOUTH AFRICA

COEGA DEVELOPMENT CORPORATION (PTY) LTD

FOR

**REPAIRS AND ADDITIONS TO
ELLIOT MAGISTRATE COURT**

CCTV, INTERCOM & ACCESS CONTROL

SPECIFICATION AND PRICING SCHEDULE

<u>PREPARED FOR:</u> Coega Development Corporation (Pty) Ltd Harraway House, No 12 Pearce Street Berea East London 5241	<u>PREPARED BY:</u> Eye Sizwe Consulting Engineers 16 Allenby Road Selborne East London 5213
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NAME OF TENDERER: _____

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STANDARD CONDITIONS IN RESPECT OF THE SUPPLY, DELIVERY AND INSTALLATION OF ELECTRICAL AND MECHANICAL EQUIPMENT, PLANT AND MATERIALS

1 Tests and Final Delivery

1.1 Tests

After completion of the Works and before **Practical Completion**, a full test will be carried out on the installation for a period of sufficient duration to determine the satisfactory work thereof. During this period the whole of the Works will be inspected and the Contractor shall make good to the satisfaction of the Representative / Agent or Main Contractor, any deficiencies that may arise.

The Contractor shall provide all instruments and equipment required for the testing as well as any water, power and fuel required for the commissioning and testing of installations at completion.

1.2 Completion

The Final delivery shall be twelve (12) months from **Practical Completion** for the following installations :

- (i) Emergency generating sets
- (ii) Lifts, escalators and hoists
- (iii) No-break power supply systems
- (iv) Electronic and all security systems (CCTV, Intercom, Intruder Alarm and Access Control)
- (v) Mechanical installations
- (vi) Fire protection systems
- (vii) Electrical installation and equipment

2 Contractor's Liability in respect of Defects

2.1 Period of liability

As prescribed in clause 1.2 above the period shall be regarded as **twelve months**.

2.2 Maintenance of installations

With effect from the date of the **Practical Completion** Certificate the Contractor shall at his own expense undertake the regular servicing of the installation during the period stated in clause 2.1 hereof and shall make all adjustments necessary for the correct operation thereof.

If during the said period the installation is not in working order for any reason for which the Contractor can be held responsible, or if the installation develops defects, he shall immediately upon being notified thereof take steps to remedy the defects or faults or to make any necessary adjustments.

Should such stoppages however be so frequent as to become troublesome, or should the installation otherwise prove unsatisfactory during the said period the Contractor shall, if called upon by the Representative / Agent or the Director-General, at his own expense replace the whole installation or such parts thereof as the Representative / Agent or the Director-General may deem necessary with apparatus specified by the Representative / Agent or the Director-General.

3 Compliance With Regulations

3.1 The installation shall be erected and tested in accordance with the following Acts and Regulations :

- i) The latest issue of SANS 10142: "Code of Practice for the Wiring of Premises",
- ii) The Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended,
- iii) The Local Government Ordinance 1939 (Ordinance 17 of 1939) as amended and the municipal by-laws and any special requirements of the local supply authority,
- iv) The Fire Brigade Services Act 1993 Act 99 of 1987 as amended,
- v) The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as amended,
- vi) The Post Office Act 1958 (Act 44 of 1958) as amended,
- vii) The Electricity Act 1984 (Act 41 of 1984) as amended and
- viii) The Regulations of the local Gas Board where appli

SPECIFICATION FOR CCTV, INTERCOM AND ACCESS CONTROL

PART 1 : GENERAL

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2	Maintenance of Installations	1.1
3	Regulations	1.1
4	Schedule of Fittings	1.2
5	Quality of Materials	1.2
6	Workmanship and Staff	1.2
7	Test Certificate	1.2

SPECIFICATION FOR CCTV, INTERCOM AND ACCESS CONTROL

PART 1 : GENERAL

1 Tests

After completion of the works and before Practical Completion is taken, a full test will be carried out on the installation for a period of sufficient duration to determine the satisfactory working thereof. During this period the installations will be inspected and the Contractor shall make good, to the satisfaction of the Representative / Agent, any defects which may arise.

The Contractor shall provide all instruments and equipment required for testing and any water, power and fuel required for the commissioning and testing of the installations at completion.

2 Maintenance of Installations

With effect from the date of the **Practical Completion** Certificate the Contractor shall at his own expense undertake the regular servicing of the installation during the maintenance period and shall make all adjustments necessary for the correct operation thereof.

The maintenance period shall be **twelve (12) months** from the date of the **Practical Completion** Certificate including the following:

- (i) Emergency generating sets
- (ii) Lifts, escalators and hoists
- (iii) No-break power supply systems
- (iv) Electronic and all security systems (CCTV, Intercom, Intruder Alarm and Access Control)
- (v) Mechanical installations
- (vi) Fire protection systems
- (vii) Electrical installation and equipment

If during the said period the installation is not in working order for any reason for which the Contractor is responsible, or if the installations develop defects, he shall immediately upon being notified thereof take steps to remedy the defects and make any necessary adjustments.

Should such stoppages however be so frequent as to become troublesome, or should the installations otherwise prove unsatisfactory during the said period the Contractor shall, if called upon by the Representative / Agent or the Director-General, at his own expense replace the whole of the installations or such parts thereof as the Representative/Agent or the Director-General may deem necessary with apparatus specified by the Representative / Agent or the Director-General.

During this maintenance period the contractor shall undertake to arrange that the systems be inspected at regular intervals (whatever number of visits the contractor deems necessary to fully maintain the equipment, but minimum of every 3 months) by a qualified member of his staff who shall:-

- a) Check the soundness of all equipment;
- b) Check and adjust all the settings of the system (voltage, frequency, control voltages, etc.);
- c) Take control measurements on the major system components and record these measurements;
- d) Replace all defective components;
- e) Service batteries;
- f) Check cooling of the equipment;
- g) Clean all equipment as required;
- h) Provide standby Maintenance and repairs, Contractor shall respond within 36 hours to rectify reported faults.

Note: At each visit, which shall be arranged in advance with the client's representative, a record of maintenance carried out shall be kept. The time and date of visits shall be entered in a logbook, which shall be kept in the control room, or room agreed with the User Client.

3 Regulations and Standards

The installation shall be erected and tested in accordance with the following Acts, regulations and standards:

- i) The latest issue of SANS 10142: "Code of Practice for the Wiring of Premises",
- ii) The Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended,

- iii) The Local Government Ordinance 1939 (Ordinance 17 of 1939) as amended and the municipal by-laws and any special requirements of the local supply authority,
- iv) The Fire Brigade Services Act 1993 Act 99 of 1987 as amended,
- v) The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as amended,
- vi) The Post Office Act 1958 (Act 44 of 1958) as amended,
- vii) The Electricity Act 1984 (Act 41 of 1984) as amended and
- viii) The Regulations of the local Gas Board where applicable.
- ix) SANS 10222-1 Electrical Security Installations – Part 1: General
- x) SANS 10222-2 Electrical Security Installations – Part 2: Access Control
- xi) SANS 10222-5 Electrical Security Installations – Part 5-1-1: CCTV installations - CCTV surveillance systems for use in security applications - Operational requirements
- xii) SANS 10222-5 Electrical Security Installations – Part 5-1-2: CCTV installations - CCTV surveillance systems for use in security applications - System design requirements
- xiii) SANS 10222-5 Electrical Security Installations – Part 5-1-3: CCTV installations - CCTV surveillance systems for use in security applications - Installation, planning and implementation requirements
- xiv) SANS 10222-5 Electrical Security Installations – Part 5-1-4: CCTV installations - CCTV surveillance systems for use in security applications - Testing, commissioning and hand-over requirements
- xv) SANS 10222-5 Electrical Security Installations – Part 5-1-5: CCTV installations - CCTV surveillance systems for use in security applications - Maintenance requirements
- xvi) SANS 10222-5 Electrical Security Installations – Part 5-2: CCTV installations - Application guidelines
- xvii) SANS 2220 Parts 1.1 to 1.7 Electrical security systems: Intruder Alarm
- xviii) SANS 2220 Parts 2.1 to 2.7 Electrical security systems: Access Control
- xix) PWD: Standard Electrical Specification : Section A
- xx) PWD: Standard Electrical Specification : Section B
- xxi) PWD: Standard Electrical Specification : Section C Quality Specifications for Materials and Equipment of Electrical Installations
- xxii) PWD: Standard Specification for Security Equipment: Reference F.P.O. 9E:

It shall be assumed that the Contractor is conversant with the above-mentioned requirements. Should any requirements, by-law or regulation, which contradicts the requirements of this document, apply or become applicable during erection of the installation, the contractor shall immediately inform the Engineer of such a contradiction. Under no circumstances shall the Contractor carry out variations to the installation in terms of such contradictions without obtaining the written permission to do so from the Engineer.

In addition the Contractor shall at his cost issue all notices in respect of the installation to the local authorities, and shall exempt the Client from all losses, costs or expenditures which may arise as a result of the contractor's failure to comply with the requirements of the regulations enumerated above.

4 Schedule of Fittings

In all instances where schedules of equipment are attached to or included on the drawings, these schedules are to be regarded as forming part of the specification.

5 Quality of Materials

Only materials of first class quality shall be used and all materials shall be subject to the approval of the Department. Departmental specifications for various materials to be used on this Contract are attached to and form part of this specification.

Wherever applicable the material is to comply with the relevant South African Bureau of Standards, specifications, or to British Standard Specifications, where no SABS Specifications exist.

Materials wherever possible, must be of South African manufacture.

6 Workmanship and Staff

The workmanship shall be of the highest grade and to the satisfaction of the Department.

All inferior work shall, on indication by the Department's inspecting officers, immediately be removed and rectified by and at the expense of the Contractor.

7 Test Certificate

On completion of the service, a test certificate must be issued to the Department's Representative / Agent indicating that the installation functioned properly in terms of the design and specification.

SPECIFICATION FOR CCTV, INTERCOM AND ACCESS CONTROL

PART 2 : INSTALLATION DETAILS

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SPECIFICATION FOR CCTV, INTERCOM AND ACCESS CONTROL

PART 2 : INSTALLATION DETAILS

1 SCOPE OF WORKS - CCTV, INTERCOM AND ACCESS CONTROL SYSTEMS

This specification forms an integral part of the contract documentation and shall be read in conjunction with the conditions of contract, the General Technical Specification for the CCTV, Intercom and Access Control Systems Installation of the Department of Public Works, the Schedules, the bills of quantities and the drawings. Any contradictions shall be referred to the Engineer for final ruling.

The scope of the CCTV, Intercom and Access Control work is described in detail in this document, drawings and schedules, shall cover the supply, delivery, off-loading, storage installation, commissioning testing, handing over and free maintenance for the period of 12 months from date of practical completion, of all specified equipment and materials for these installations as required.

The onus is on the Tenderer to ascertain any local conditions or peculiarities which might affect the contract and which are not shown in the drawing.

The integrated CCTV, Intercom and Access Control systems shall comprise of the following:

- IP Video Surveillance System and Network Video recording system, with Licensing.
- IP Access Control System.
- IP Intercom system
- Control Room Equipment
- 1 x X-Ray Machine (including operating Licence)
- 1 x Walk Through Metal Detector at the public entrance.
- Motorised gate systems
- Fixed panic button alarm integrated with the Access Control System.
- All cabling power supplies and routing (Wireways supplied by others)
- UPS installation.
- Coordination with other contractors
- On site Training
- Commissioning of the system
- Production of As Built Drawings
- Production of Operational and Maintenance Manuals
- 12 Month guarantee and defects liability
- Any other equipment, software, licence and programming necessary for the complete operation of an integrated system. Further details as indicated under CCTV, Intercom and Access control introduction / overview.

2 ACCREDITATION AND EXPERIENCE

All contractors are to be registered with PSIRA (Private Security Industrial Regulation Authority) and all work to be carried out by suitably qualified installers. All Contractors shall have a minimum of Five years experience in the various fields of these installations.

3 MATERIALS AND WORKMANSHIP

The work throughout shall be executed to the highest standards and to the entire satisfaction of the Representative/Agent who shall interpret the meaning of the Contract Document and shall have the authority to reject any work and materials, which, in his judgement, are not in full accordance therewith. All rejected material and workmanship shall be replaced or rectified as directed and approved by the Engineer;

- All work shall be executed in a first-class manner by qualified technicians;
- The Contractor shall warrant that the materials and workmanship shall be of the highest grade, that the equipment shall be installed in a practical and first-class manner in accordance with the best practices and ready and complete for full operation. It is specifically intended that all material or labour which is usually provided as part of such equipment as is called for and which is necessary for its proper completion and operation shall be

provided without additional cost whether or not shown or described in the Contract Document;

- The Contractor shall thoroughly acquaint himself with the work involved and shall verify on site all measurements necessary for proper installation work. The Contractor shall also be prepared to promptly furnish any information relating to his own work as may be necessary for the proper installation work and shall co-operate with and co-ordinate the work of others as may be applicable;
- All components and their respective adjustment, which do not form part of the equipment installation work, but influence the optimum and safe operation of the equipment shall be considered to form part of, and shall be included in the Contractor's scope of works;
- All systems equipment and serviceable items shall be installed and positioned such that they will be accessible and maintainable;
- The Contractor shall make sure that all safety regulations and measures are applied and enforced during the installation and guarantee periods to ensure the safety of the public and the User Client; and
- The Contractor is to include for all scaffolding required to complete the works.

4 SUBMISSION OF INFORMATION AND BROCHURES

Detailed brochures of all equipment offered shall be presented together with the tender documents

In addition to the above, the following information shall accompany the tender documents:

- a) The information requested in the Schedule of Information;
- b) A paragraph by paragraph schedule of compliance with detailed descriptions of any deviations from this specification;
- c) If alternative systems are offered, a clear description of the operating characteristics and special features of the equipment along with a motivation for offering the alternative. The right is reserved to reject any equipment which does not, in the opinion of the Engineer, conform to specification or which is of an inferior quality.
- d) Descriptive and illustrated brochures and other information pertaining to the software and field equipment;
- e) A list of successful installations completed in the Republic of South Africa with full contactable references.
- f) Certificate of Registration with the Private Security Industry Regulatory Authority

5 CERTIFICATE OF COMPLIANCE OF THE CCTV, INTERCOM AND ACCESS CONTROL SYSTEM INSTALLATION

Before any inspection or hand over of the CCTV, Intercom and Access Control Systems takes place, the contractor will present a Certificate of compliance of the system installation or part of the installation. This to be handed to the Engineer and is to confirm the systems are fully operational.

6 ITEMS FOR APPROVAL

The right is reserved to reject any equipment which does not, in the opinion of the Engineer, conform to specification or which is of an inferior quality. Should such equipment be rejected, the contractor shall at his own expense provide for alternative equipment offered in strict adherence with the requirements of this specification.

In certain cases the contractor may be required to submit samples and where necessary, tests will be preformed, as required by the Engineer, by the supplying contractor to establish the quality of the material offered.

7 QUALITY AND QUALITY CONTROL DURING THE EXECUTION OF THE CONTRACT.

All material and equipment supplied for this contract shall be new and current. All new materials and equipment supplied, shall comply fully with the requirements laid down in the specification. The whole of the works shall be executed in accordance with best practice and to the approval of the Engineer. The equipment shall comply with the latest issues of the standards and regulations.

Day by day inspections of the Works shall be carried out by the contractor or his authorized representative to ensure that all work is executed in accordance with the drawings, specifications and regulations. These inspections will be monitored by the Engineer or his duly authorized representative. If the quality of the installation suffers due to a lack of supervision, the Engineer will request a site agent to ensure that a high standard of workmanship is maintained. The full cost of such a step shall be for the CCTV, Intercom and Access Control contractor's account.

8 INSPECTION AND TESTING.

The Tenderer shall supply to the Engineer a proposed set of tests to be adopted as an agreed Acceptance Test Plan. The proposed test plan shall reflect the expected measurement values and allowable tolerances. These tests shall be consistent with SANS 2220-2-7 Electrical Security Installations - Access Control Systems and SANS 110222-5 Electrical Security Installations – CCTV Installations

On completion of the entire installation or any particular section thereof, as may be decided by the Engineer, tests shall be carried out in the presence of the Engineer or his authorized representative.

The following tests are to be carried out:

- a) After completion of the works and before first delivery is taken, full tests in accordance with an agreed Acceptance Test Plan will be carried out on each of the system installations to determine the satisfactory working thereof. During these tests the installations will be monitored and the results recorded. The contractor shall make good, to the satisfaction of the Representative/Agent, any defects which may arise;
- b) The Contractor shall provide all instruments and equipment required for testing of the installations during commissioning and again at completion; and
- c) Test reports of both tests as specified under (a) and (b) are to be submitted to the DOJ

9 DELIVERY PERIODS.

Once the Engineer has inspected the complete installation and satisfied himself that all testing has been completed and the contract is complete in all respects, he will issue a letter to the Client stating that Practical Completion has been taken. Once the retention period has expired, the installation shall be inspected for final delivery.

10 LABELING.

Labels.

All security equipment shall be provided with a unique number inscribed on a label and fixed to the equipment. These numbers shall correspond with that on the drawings and in the manuals. The numbering system shall be determined in conjunction with the engineer.

Blocked Site Plan

A framed site layout drawing shall be fixed to the wall next to the security information cabinet and kept up to date with changed information on the security system. The drawing shall contain at least the following:

- The building name as shown outside the building otherwise as known by the users of the building.
- A symbol list of all the symbols used on the drawing.
- The drawing shall be at least A1 size but large enough to contain all the required information. The drawing shall be mounted behind glass or other suitable cover with an aluminium frame.

11 WIREWAYS

The Electrical Contractor shall be responsible for the supply and installation of all sleeves, conduits and wireways as indicated on the drawings and described in this specification, The CCTV, INTERCOM and ACCESS control system contractor must liaise and coordinate with the electrical contractor what sleeves are required and the position and method of installation required. **The correct coordination and final positioning is the CCTV, Intercom and Access control tenderers responsibility.**

All wiring shall be installed into conduits, sleeves and / or on cable basket / trays.

12 POWER SUPPLIES

Suitable true on line rack mounted UPS's (Size indicated in the bill of Quantities) shall be installed in the Cabinet at the Control Room and shall feed the CCTV, Intercom and Access Control installations. The Electrical contractor shall install the required power points. The CCTV, Intercom and Access Control contractor shall be responsible for the coordination thereof with the electrical contractor.

13 TRAINING AND ON SITE SUPERVISION

The tenderer shall allow for all literature, visual aids and suitable amount of time for the complete training of a minimum of 12 representatives on site for all the installations as follows:

Training 1 – Full training and operation of the systems with the personnel

Training 2 – Repeat of training 1 on a different date as dictated by the user department

The tenderer shall supply all documentation for both training dates. The manuals shall include all operating procedures for the clients personnel to operate and maintain the installations properly as per the manufacturers guidelines and good practices.

The tenderer shall make allowance for a suitably qualified person to carryout ad hoc on site supervision of the CCTV, Intercom and Access control installations when called upon by the user client.

Contractor to allow for separate visits to site including all travelling and accommodation costs if required.

The visit to site shall cover Maintenance on the system, Software updates, problem solving, additional training and supervision of the complete CCTV, Intercom & Access Control systems by a qualified technician.

This shall be on an adhoc basis, when called for by the user client. This is to be undertaken after Practical Completion

Contractor shall obtain a signed site visit confirmation by a designated representative from the client and submitted to the engineer for payment.

14 OPERATING AND MAINTENANCE MANUALS

4 copies of Comprehensive Operating and Maintenance Manuals for all the installations must be supplied at the date of training or practical completion (Which ever occurs sooner)

It must contain:

- General description of system.
- Full operating instructions.
- Full list of all equipment supplied with their Serial No, IP address and position on the As-Built drawings
- All features available on the system.
- All installation requirements.
- Technical Specification of the system.
- Details of all adjustments on the system.
- All wiring diagrams, connection diagrams.
- Fault finding and repairs
- Correct Maintenance procedures
- Recommended spares list
- Names and contact details of suppliers

Over and above what is specified, the Operating and Maintenance Manual to be compiled shall be structured and shall at least include the following for each sub system and security equipment. Please adapt and add as required.

Master manuals and manuals for each sub systems and security equipment shall be prepared containing extracts from the master manuals. A complete listing of the entire configuration and programming information of the control panels and computers. Enough information must be supplied so that a person not knowledgeable of the site can reconfigure the control panels and computers.

Complete drawings showing the positions of all the sub systems and security equipment devices connected to the system and schematic connection diagrams. Complete design information containing at least:

Refer to the requirements as described for each sub security system and security devices.

A full description of the sub systems and security equipment installed.

- All available operating and maintenance documentation
- A complete set of drawings.

- Basic operating instructions.
- The complete design information.
- The record book.
- Configuration and programming information

15 CONTRACT DRAWINGS

The drawings accompanying this specification are as stipulated in the Index. The construction drawings of the contract shall, however, consist of:

The CCTV, Intercom and Access control drawings

The Architects drawings

The Structural Engineer's drawings as applicable

The Engineer's drawings of other disciplines as applicable

The drawings of other service installations that are relevant for co-ordination and installation purposes

The installation drawings of other sub – contractors, where applicable

All drawings and layouts shall be regarded as diagrammatic and all positions and dimensions shown on drawings shall be verified on site with the engineer. The drawings do not show every minute detail of the work to be executed. The Sub – contractor shall check with the Builder before putting work in hand on any section of the work, that he is in possession of the latest drawings and should any discrepancy be found between the Sub – contractor's drawings as issued by the Engineer and those of the Builder, the matter shall be referred to the Engineer for clarification. No extra cost / time will be allowed for alterations or making good resulting from lack of verification.

16 Drawings and As Built Drawings

As soon as possible after the awarding of the contract, but within 6 weeks, the successful tenderer shall at his expense submit to the Engineer for approval, three prints of:

- a) All general arrangement drawings;
- b) Detailed dimensioned drawings of all system hardware and equipment; and
- c) Complete wiring diagrams and block schematic diagrams.

A list of all equipment including their Serial numbers and IP Address and shown on the AS-Built Drawings.

The approval of drawings shall not relieve the successful Tenderer of his liability to carry out work in accordance with the terms of the contract.

On completion of the contract, a complete set of machine readable copies of all drawings in a format acceptable to the Engineer, shall be handed to the Engineer at the expense of the successful Tenderer. These final drawings shall include:

- a) A proper and accurate "As-Built" plan of the complete installation showing all equipment with applicable numbers and cable/ wiring routing;
- b) An overview schematic diagram clearly showing functions and relation of all equipment
- c) A material list showing make, model and characteristics of all items of equipment
- d) A detailed schedule of all wiring

The contractor shall supply detailed marked up As-Built drawings of the complete installation including cable routes to the Engineer. The Drawings shall be utilised to update the Engineers electronic drawings for issuing to the client.

The contract shall be deemed incomplete until all drawings have been received by the Engineer.

17 LOCATION AND SERVICE CONDITIONS

The systems are to be installed at the new Elliot Magistrate Court, Elliot. The exact location details are to be obtained from the Main contractor.

Site Conditions

Ambient Temperature	-3 °C minimum to 45° maximum
Altitude	±1493 m
Lightning and dust	Severe
Nominal LV supply	415/240 V, 4-wire, 3-phase, with the neutral earthed
Frequency	50 Hz

18 CCTV, INTERCOM AND ACCESS CONTROL INTRODUCTION / OVERVIEW

The minimum equipment requirements are outlined, but do not cover all the details of design and construction. Such details are recognised as being the exclusive responsibility of the contractor.

In all cases where a device or part of the equipment is referred to in the singular, it is intended that such reference shall apply to as many devices as are required to complete the installation.

All work and equipment shall be in accordance with the requirements of the Department of Justice and shall comply with the Occupation Health and Safety Act, No 85 of 1993 and current regulations of all other codes applicable to this work. The Tenderer shall, at the time of tendering, draw the Engineer's attention to any omissions or discrepancy between the specification and the drawings and request from him clarification of details or responsibilities.

If a limited allowance or special conditions are made for the Tender Sum for the supply or erection of any item of the installation, the limit or special conditions shall be defined at the time of tendering.

It is the sole responsibility of the Contractor to ensure that all quotations obtained from manufactures and suppliers are complete in their entirety and shall include all equipment and accessories necessary for compliance with current practice and the efficient and proper functioning of the installation.

Equipment will be subjected to corrosive air and shall be manufactured of such a quality to resist corrosion where practically possible, including mounting brackets.

The equipment is to be installed in a high security area, as such equipment exposed to traffic must be vandal resistant, however, must be aesthetically pleasing.

The Contractor shall before tendering, study existing systems used by the Department of Justice (DOJ) & the Department of Public Works (DPW) and offer the same or similar system which shall be fully compatible with the existing DOJ system to ensure that the systems are fully integrated and function properly after the new system is tested and commissioned.

The systems should also meet all requirements as laid out by the relevant Departments. The onus shall rest solely with the Contractor to obtain all the necessary information with regards to the above from the relevant Departments.

The system shall have demonstrated proven operation in a similar environment and a list of reference sites shall be provided as part of the tender response. The selected Contractor would have to make the necessary provisions in his rates to take the Client, User Client, Principal Agent and Engineer to a selected reference site, of the Engineer's choice, to demonstrate live functionality and operation of the system.

The Integrated CCTV, Intercom and Access Control systems shall be integrated on a single Security Management System platform Software and shall provide operators with an automated event based response to alarms and events triggered within the subsystem hardware.

Operators are automatically presented with necessary information when an event occurs. Event based response incorporates Black Screen Technology, whereby images which are relevant to the current alarms are presented to the Operators.

The system shall also work in accordance to the National Security Infrastructure – Principles of operation.

18.A THE SECURITY SYSTEM IS BASED ON THE FOLLOWING THREE PRINCIPLES:

- Deter — Prevention is better than cure
- Detect — Remove the element of surprise
- Delay — Time is of the essence

18.B THE SYSTEMS ARE TO BE APPLIED TO THE FOLLOWING AREAS:

- 1 Perimeter & Entrances of the Court Building.**
- 2 Cash Office and Records Department.**
- 3 Prisoner and Awaiting Trial Acceptance Routes.**

4 Individual Court Rooms.

5 Local, Provincial & National Control Rooms

The individual components of the site systems will operate on a Local Area Network, with all the Intercoms and Biometric Readers being directly Addressable whilst the CCTV Surveillance system will make use of IP Cameras. This document outlines the reasons for applying security measures to these areas along with the general principles of operation, describing the systems and outline standards that will be employed to achieve the security goals.

18.B.1 The Perimeter of the Court Building.

The main reason for securing the perimeter is to prevent prisoners, and those awaiting trial, from escaping whilst at the court building. The secondary reason is to prevent those with criminal intent from entering the property, or if they do so to detect the event. The measures that are employed to prevent prisoners, and those awaiting trial, from escaping are based on a 'Lock Down' of the court perimeter.

This means that all pedestrian and vehicle gates are controlled and locked by the system and can only be opened by an authorised official. To ensure a verifiable audit trail the system is operated by way of Biometric Fingerprint readers so that anyone opening a gate can be positively identified. It also means that the system can be set up to allow control over the authority of the staff that use the system, i.e. a person may be allowed to open a maintenance gate but not the main entrance gate.

In the case of the Main Public Entrances there will be full height turnstiles to moderate and control the flow of people into and out of the court. These can also be 'Locked Down' by the system in case of emergency.

Access Gates for wheel chair users or maintenance access will be closed using Magnetic Locks that can only be opened by authorised staff.

At all the entry and exit points there will be CCTV Cameras to monitor and record activity and additionally there will be Pan, Tilt, Zoom, Cameras that can be used to follow suspects and respond when a gate is opened.

18.B.2 The Cash Office and Record Department

Relatively soft targets, both these areas will be covered by CCTV Cameras to cover the offices themselves and the approach to them.

They will also be fitted with Fixed or Remote Panic Alarms, so that in the event of an incident occurring, the alarm can be raised immediately.

This will automatically notify the Control Room who can implement the 'Lock Down' preventing the perpetrators from leaving the court facility and will activate the surveillance system. All CCTV Cameras to be recording at their full resolution and frame rate.

18.B.3 The Prisoner and' waiting Trial Acceptance Routes.

3.1 Prisoner Acceptance Route

This covers the point where the SAPS deliver the prisoner(s) and those awaiting trial to the court holding cells, and as such demands a high degree of security.

The approach to the holding cells will be covered by CCTV Cameras monitored by the On-Site Control Room.

Where there is an underground passage between an SAPS facility and the court holding cells this will be subject to similar security measures.

Fixed Panic Alarm Buttons will be installed along the route to enable officials to raise the alarm in the event of an incident.

3.2 Prisoner Hearing Route

This is the path taken to deliver the prisoner from the holding cells to the court room.

Fixed Panic Alarm Buttons will be installed along the route to enable officials to raise the alarm in the event of an incident.

18.B.4. The Individual Court Rooms

Each courtroom will be fitted with Fixed or Remote Panic Alarms, so that in the event of an incident occurring, the alarm can be raised immediately.

This will automatically notify the Control Room who can implement the 'Lock Down' and will activate the surveillance system. All CCTV Cameras to be recording at their full resolution and frame rate.

18.B.5 The On-Site Operational Control Room

These provide pro-active management and control of the security systems installed at the court facility. The operator(s) will be able to monitor the cameras and supervise and/or control access through gates.

There is a large degree of automation, with images from the CCTV Cameras automatically being displayed onto monitors when someone enters or leaves through a controlled gate.

To achieve a high degree of integrity, and minimize the possibility of collusion or coercion, access through gates can be managed using a Dual Key' System, i.e. the person using the gate must have the appropriate permission on the system to be allowed to go through it and the Operator(s) must also verify the action.

By having comprehensive CCTV Camera coverage of the risk areas the On-Site Operator(s) can see the 'Big Picture' and respond to what may appear to be unrelated events by those officers on the ground.

They are also immediately alerted to events on alarm and must respond in line with whatever Standing Orders and Operating Procedures are in place.

Not only are all transactions, images and events recorded by the system but the response of the Operator(s) is also recorded in an Electronic Occurrence Book.

18.C LOCAL, PROVINCIAL & NATIONAL CONTROL ROOMS

The systems offered shall be able to provide the following which may be required by the client at practical completion:

A Tiered Management Structure, that provides for Local, Provincial and National Control Rooms, affords the Department of Justice (DOJ) the opportunity to use the Security Management System to its maximum potential, coordinating the effective use of the system and enabling extensive Reports, Trends and Analysis to be conducted on the data, images and incidents collected by all the Local Sites .

By using a Tiered Management Structure the various layers of management control can be applied to the system to ensure that it delivers the best results at every stage of its operation.

Security Systems are basically complex data capture systems that can provide the DOJ with a wealth of information to better manage their security operations identifying training needs, analysing trends and incidents, monitoring compliance to processes and procedures and assisting in the management of the entire security policy.

18.C1 Local Control Room

Typically the Local Tier of Control is where the system is Micro-Managed by the Control Room Staff, monitoring cameras to identify possible threats and activities, responding to alarm events and access control exceptions and detailing each and every incident that occurs into an Electronic Occurrence Book.

Recording of Data, Events and Images takes place at this local level giving the DOJ Security Site Management access to information to enhance their role in maintaining the day to day security of the site. Site Specific reports are also available in Real Time to assist in this process.

This Local Tier of Control Room Management reduces the need for excessive Network Bandwidth by only reporting incidents and events Upstream to the Provincial And National Levels. (The minimum bandwidth required at each site is typically 1-2 Mbps)

This should not be considered as limiting the access to information by the Provincial and National Levels as at any

stage and any time they can connect into the Local Sites to view images, monitor events, examine incidents and their associated data or reports and generally operate and control the Local Site as if it were their own.

In the event that the Local Control Room is compromised the Provincial or National Control Rooms will be capable of assuming full control and management of the site systems over the Virtual Private Network (Supplied by Client).

18.C2 Provincial Control Rooms

The Provincial Tier of Control is best served as a Watch Dog function providing a more experienced layer of Management and Control than at the Local Level. This could reflect in the overall coordination of manned and electronic security resources at different facilities in response to scheduled arrivals and departure of convicted and awaiting trial prisoners.

It also generates statistical and incident reports in a manner that is appropriate to the Provincial Level of the DOJ security structures, whilst coordinating the activities of the Local Level Control Rooms and their operators. Dependent upon the number of Local Control Rooms reporting to the Provincial Level, bandwidth requirements will vary from an estimated 2 to 4 Mbps.

18.C3 National Control Room

Operators at the National Tier perform high level control and coordination to ensure that Standing Orders & Operating Procedures are applied with adherence to National Guidelines and expectations.

This makes the operation of the Provincial and Local Tiers more efficient, managing the reporting of incidents to deadlines and escalating events to the appropriate level and personnel at the right time.

The National Control Tier Level is generally expected to provide the following:

- Managed Reaction to Events & Incidents
- The Escalation of Incidents to the Right People
- Post Event Analysis of incidents
- Storage and Management of Historical Data on Events
- Report on the Operational Status of all Systems
- Analyze & Identify Trends to the DoJ Security Management

Operating Procedures implemented in a National Control Room environment need to be in line with the DOJ Standing Orders & Operating Procedures.

The application of a Security Management System to control the operation of an electronic security system will generally require these Standing Orders & Procedures to be modified to incorporate the differing operational methods applied when these systems are implemented.

This provides the DOJ with an opportunity to revisit their processes to ensure that the benefit of the Security Management System takes full effect and enables the Standing Orders & Operating Procedures to be monitored, applied and evaluated at Local, Provincial and National Levels.

18.D NETWORK INFRASTRUCTURE

Site Based Local Area Network (LAN)

This will be an independent LAN using Gigabit Network Switches to transmit Voice, Data and Video over an IP Network from the various end devices to the Local Control Room.

Typically the end devices will be grouped together in specific areas, e.g. the Main Entrance, Police Drop Off, Vehicle Entrance Gates, etc. and in these cases the end devices will be connected to a Local Switch via Cat6 Ethernet Cable up to a maximum distance of 90m.

In turn the Local Switches will be routed in a star configuration to the 'On Site' Control Room and in this way connect in to the Access Control, Intercom and Video Servers.

This LAN will be completely independent of the ISM Infrastructure and is dedicated to the security systems to ensure integrity, reliability and accountability

Virtual Private Network (VPN) – (System must be able to offer the following).

This will form a Wide Area Network (WAN) connecting the Local Tier Control Rooms to the Provincial and National Control Rooms.

This provides a high degree of management control over the local sites and affords extensive resilience, enabling alarm notification to the Provincial & National Control Rooms along with affording them access to any of the Local Sites to retrieve data, voice or video, as well as assuming remote control of the facility should the need arise. Where possible this can be incorporated into the Departments existing Network Infrastructure, however, the bandwidth requirements of 128Kbps per site and between 2 and 32 Mbps for the Provincial & National Control Rooms may dictate that an independent VPN is utilized.

18.E ADMITANCE TO CONTROLLED AREAS

18.E1 Public and staff entrance/exit

These will be the Main entrances into the building complex where the general public and staff will gain access into the building. There is a separate staff entrance which will not have a security check point.

- i) Declaration of items – everyone entering the premises shall declare all electronic items upon entering, and all the necessary serial numbers etc. shall be recorded by the security guards on duty.
- ii) All persons shall pass through the metal detector and parcels shall be scanned through the X-Ray machine.
- iii) Lockdown push button - an emergency push button shall be erected below the security desk. This must lock all turnstiles to ensure that containment is possible.
- iv) Cameras – the cameras are placed to capture high quality images of targets entering or leaving the premises. The purpose of the observation is to recognize and identify the target.

18.E2 Magistrate entrance/exit

This entrance will be used mainly by Magistrates.

- i) Magistrates will enter the building via the motorized gate and staircase.
- ii) To enter and exit – a Magistrate will utilize the biometric reader and the door will unlock.
- iii) Cameras – the cameras are placed to capture high quality images of targets entering or leaving the premises. The purpose of the observation is to recognize and identify the target.

18.E3 Vehicle entrance/exit

These entrances will be used mainly used by the Magistrates and Staff.

- i) To enter - the staff member will produce their proximity access card or utilize the biometric reader and the motorized gate will open.
- ii) To exit – similar sequence of events shall follow.
- iii) Cameras – These are placed strategically to capture more detailed information, in terms of a clear shot of the face and car registration plate for anyone entering or leaving the premises

18.E4 Car park and Public vehicle entrances

The car park areas and public vehicle entrances will be monitored with cameras to detect incidents that may occur such as vandalism or theft.

19 CCTV INSTALLATION

19.A USER REQUIREMENTS

The CCTV system shall cover entrances / exits, passage ways, secure areas, guard house, selected offices, perimeter fence and limited external coverage. The 24hr CCTV control and monitoring will be at the control room. All CCTV camera footage shall be recorded.

It is a specific requirement of the contract that the installation of the CCTV be done by specialists who are experienced with this type of work. All contractors are to have a minimum of 5 years experience with this type of installation. CCTV contractors shall furnish the engineer with suitable experience of past projects and expertise. Inexperienced sub contractors shall not be accepted.

The system is to record on motion detection or alarm activation, recording 10sec pre-motion/alarm activation and 15 seconds post motion/alarm activation so that events leading up to the trigger can also be seen clearly. The system must store a minimum of 30 days recording. The Network Video Recorder along with all switches shall be rack mounted and positioned in the control room.

The events of the CCTV system will be monitored in a staffed Control Room on operators' workstations and video wall, on which the live views will be displayed. The operators will be dedicated personnel whose sole responsibility will be to operate the system and respond to the events.

The monitoring system shall make provision for connection to multiple 3rd party systems for monitoring within the organization without compromising on its primary function of recording all video streams.

The surveillance system proposed for the installation shall have a proven record of reliability and maintainability. The system shall comprise the following main components:

- a) HD IP cameras
- b) Servers
- c) POE switch
- d) Video Management System with Recorder
- e) LED Monitors
- f) Software
- g) Cables and accessories
- h) Required user interfaces (Keyboard, Mouse etc)

The viewing angle and clarity etc. shall be shown to the Engineer at each location through a local small test monitor before finalizing the angle. The specifications of various components shall be as per given project specifications or better

19.B VIDEO MANAGEMENT SYSTEM (IP)

The video management system shall comply with the Standard Specification below.

Video Management System shall be inclusive of all required software and transferable licenses.

VMS specification is based on the HikCentral Professional V2.5.1 or latest suitable package.

VMS package to be complete with licenses for CCTV Cameras and to allow for video intercom integration.

Similar and approved equal VMS conforming to the specification may be accepted.

HikCentral Professional is a software platform provided by Hikvision for integrating and managing security systems. It is designed to meet a variety of security challenges on a single platform. With HikCentral Professional, you can manage multiple individual systems with ease, such as video security, access control, security alarms, and more, as well as explore cross-system functionalities.

Daily operations become more efficient while protection of people and property improve all around. Users of all kinds are making smarter decisions.

Key Features

Light and Efficient

- Lightweight architecture features reduced consumption of system resources
- Capable of managing multiple systems of varying sizes with consistent efficiency

Unified and Flexible

- Supports combining various application plug-ins under a unified, on-demand architecture for collaboration across business segments
- New plug-ins can be continuously developed to meet new business needs

Integrated and Open

- Compatible with virtually all Hikvision products and their abundance of applications, including deep-learning-based analytics and statistics
- Open architecture permits easy integration with third-party systems and hardware

Software Specification

The following table shows the maximum performance of the SYS (System Management Server). For other detailed data and performance, refer to *Software Requirements and Performance*.

Features		Maximum Performance
General		
Manageable Resource	Managed Devices <i>*Including Encoding Devices, Access Control Devices, Elevator Control Devices, Security Control Devices, Digital Signage Terminals, Interactive Flat Panels, Remote Sites, Guidance Terminals, and IP Speakers</i>	2,048
	Video Intercom Devices	5,000
	Guidance Screens	512
	Visitor Terminals	32
	Dock Stations	1,500
	Network Transmission Devices	128
	Mobile Devices	1,000
	Entrance/Exit Stations	40
	Query Terminals	16
	DeepinMind Server	64
	Recording Servers	64
	Streaming Servers	64
	Areas	3,000
	Cameras	10,000 With RSM: 100,000
	Alarm Inputs	5,000
	Alarm Outputs	3,000
	Security Radars and Radar PTZ Cameras	30
	Zones of Security Control Partitions	2,048
	Security Control Partitions (Areas)	256
	DS-5600 Series Face Recognition Terminals When Applied with Hikvision Turnstiles	32
	ANPR Cameras	3,000
	People Counting Cameras	Recommended: 300
	Heat Map Cameras	Recommended: 70
	Thermal Cameras	Recommended: 20 ⁽¹⁾
	Queue Management Cameras	Recommended: 300
	Cameras per Area	256
	Alarm Inputs per Area	256
	Alarm Outputs per Area	256
Event & Alarm	Event and Alarm Rules	10,000
	Storage of Events or Alarms Without Pictures	1,000/s
	Storage of Events or Alarms with Pictures	20/s (Stored in SYS) 80/s (Stored in Recording Server)
	Events or Alarms Sent to Clients <i>*The clients include Control Clients and Mobile Clients.</i>	120/s 100 Clients/s
	Combined Alarm	10/s
	User-Defined Events	10,000
User and Role	Concurrent Accesses via Web Clients and Control Clients	100
	Concurrent Accesses via Mobile Clients	100
	Users	3,000
	Roles	3,000
	Users for Double Authentications	50
Person	Person Group	3,000

	Person Group Hierarchies	10
	Size of a Profile Picture	300 KB
	Total Size of Profile Pictures	300 GB
Data Storage	Data Retention Period	Stored for 3 Years
	People Counting	5 million
	Heat Map	0.25 million
	ANPR Records	60 million
	Events	60 million
	Alarms	60 million
	Access Records	1.4 billion
	Attendance Records	55 million
	Visitor Records	10 million
	Operation Logs	5 million
	Service Information Logs	5 million
	Service Error Logs	5 million
	Recording Tags	60 million
	Scheduled Report Rules of Event and Alarm	100
Report	Event or Alarm Rules in One Event/Alarm Report Rule	32
	Records in One Sent Report	10,000 or 10 MB
	Resources Selected in One Report <i>*With this limitation, you can generate a neat and clear report via the Control Client and it costs less time.</i>	20
Video & Intelligent Analysis		
Recording	Recording Schedule	30,000
	Recording Schedule Template	200
Face Comparison	Face Pictures for Comparison	1,000,000
	Face Comparison Groups	64
	Persons in One Face Comparison Group	1,000,000
	Storage of Face Comparison Events Without Pictures	1,000/s
	Storage of Face Comparison Events with Pictures	100/s (Stored in Recording Server)
Intelligent Recognition	Intelligent Analysis Groups	1,000
	Resources in One Group	64
	Persons for Intelligent Recognition	1000,000
Evidence Management	Evidences	100,000
	Evidence Files	5,000,000
Smart Wall	Decoding Devices	32
	Smart Walls	32
	Views	1,000
	View Groups	100
	Views in One View Group	10
Streaming Server	Cameras in One View	256
	Video Input Bandwidth per Streaming Server	200 × 2 Mbps
	Video Output Bandwidth per Streaming Server	200 × 2 Mbps
Access Control & Time and Attendance & Visitor		
Access Control	Persons with Credentials for Access Control	50,000
	Total Credentials (Card + Fingerprint)	250,000
	Cards	250,000
	Fingerprints	100,000
	Profiles	50,000
	Access Points (Doors + Floors)	1,024
	Access Levels	512
	Access Schedules	32
	Templates for Card Printing	32
Time and Attendance	Persons for Time and Attendance	10,000
	Shift Schedules	128
	Major Leave Types	64

	Minor Leave Types of One Major Type	128
	Holidays	32
	Break Timetable	128
	Custom Rules for T&A Status on Device	128
Visitor Management	Visitors	20,000
	Visitor Check-In or Reservation Records	100,000
	Visitor Email Templates	20
	Entities in Watch List	10,000
Vehicle and Parking Management		
Vehicles per List		5,000
Vehicles		500,000
Custom Vehicle Types		10
Under Vehicle Surveillance Systems (UVSSs)		4
Vehicle Undercarriage Pictures		3,000
Storage of ANPR Alarm Without Pictures		1,000/s
Storage of ANPR Alarm with Picture		20/s (Stored in SYS) 100/s (Stored in Recording Server)
Parking Lots		10
Lanes		Total: 40 In One Parking Lot: 32
Parking Spaces		Total: 3,000 In One Floor: 1,024
Floors in All Parking Lots		128
Cards Linked with Vehicles		250,000
Temporary Cards in One Parking Lot		10,000
Vehicle Passing Frequency in Each Lane		1 Vehicle/s
Mobile Monitoring		
Fence Rules for One Vehicle		4
Vehicles Can Be Located in One Client		64
Retention Period of GPS Data		6 Months
Retention Period of Statistics Data		3 Years
Digital Signage		
Materials		10,000
Programs		2,000
Schedules		1,000
Release Records		1,000
Video Walls		512
Applications for Interactive Flat Panel		1,000
Security Inspection		
Analyzers		8
Walk-Through Metal Detectors		64
Security Inspection Channels		1,000
Broadcast		
Broadcast Group		128
Media Libraries		100

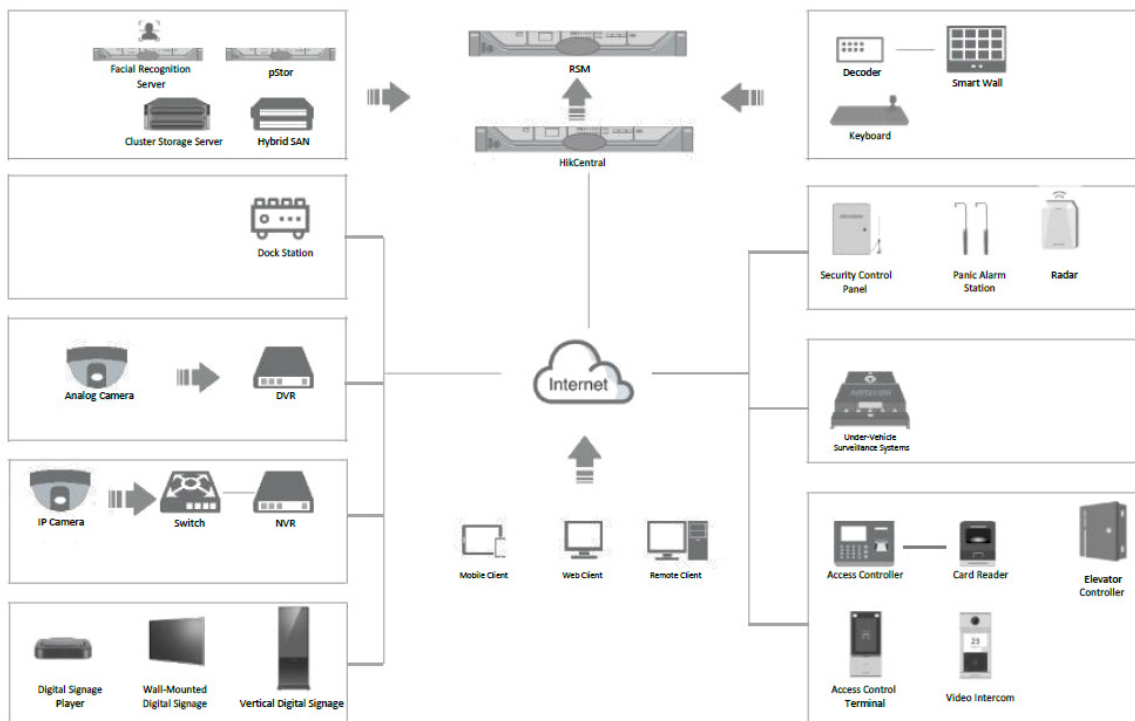
①: This recommended value refers to the number of thermal cameras connected to the system directly. It depends on the maximum performance (data processing and storage) in the situation when the managed thermal cameras uploading temperature data to the system. For thermal cameras connected to the system via NVR, there is no such limitation.

System Requirement

* For high stability and good performance, the following system requirements must be met.

OS for HikCentral Professional Server	Microsoft® Windows 11 64-bit Microsoft® Windows 10 64-bit Microsoft® Windows 8.1 64-bit* Microsoft® Windows 7 SP1 64-bit Microsoft® Windows Server 2019 64-bit Microsoft® Windows Server 2016 64-bit Microsoft® Windows Server 2012 R2 64-bit Microsoft® Windows Server 2012 64-bit Microsoft® Windows Server 2008 R2 SP1 64-bit CentOS 7.2 64-bit** CentOS 7.4 64-bit** CentOS 7.6 64-bit** *For Windows 8.1 and Windows Server 2012 R2, make sure it is installed with the rollup (KB2919355) updated in April, 2014. ** Special Version edition to support LINUX environment installation, contact Hikvision technical center for more details
OS for Control Client	Microsoft® Windows 11 64-bit Microsoft® Windows 10 64-bit Microsoft® Windows 8.1 64-bit Microsoft® Windows 7 SP1 64-bit Microsoft® Windows Server 2019 64-bit Microsoft® Windows Server 2016 64-bit Microsoft® Windows Server 2012 R2 64-bit Microsoft® Windows Server 2012 64-bit Microsoft® Windows Server 2008 R2 SP1 64-bit *For Windows 8.1 and Windows Server 2012 R2, make sure it is installed with the rollup (KB2919355) updated in April, 2014.
Browser Version	Google Chrome® 84 and above Firefox® 84 and above Safari® 11 and above Microsoft® Edge 89 and above Internet Explorer® 11 and above
Database	PostgreSQL V11.8
OS for Mobile Client	iOS 10.0 and above Android 6.0 and above
Virtual Machine	VMware® ESXi™ 6.x Microsoft® Hyper-V with Windows Server 2012/2012 R2/2016 (64-bit) *The Control Client cannot run on the virtual machine. *Refer to the Deployment Guide of HikCentral Professional on VMware Virtual Machines for how the streaming server running on the virtual machine. *Virtual server migration is not supported.

Typical Application



19.C NETWORK VIDEO RECORDER (NVR) AND STORAGE (IP)

NVR specification is based on the HIKVISION DS-9632NXI-I8/S Network Video Recorders including 3 x 4 TB SATA SSD drives (Similar and approved equal NVR's conforming to the specification may be accepted).

Key Feature

- H.265+/H.265/H.264+/H.264 video formats
- Intelligent analytics based on deep learning algorithm
- Up to 4-ch perimeter protection
- Up to 1-ch facial recognition for video stream, or up to 4-ch facial recognition for face picture
- Up to 16/32/64-ch IP camera inputs
- Up to 16-ch 1080p decoding capability
- Up to 320 Mbps incoming bandwidth

Compression and Recording

- H.265+ compression effectively reduces the storage space by up to 75%
- Full channel IP cameras connection
- Adopt stream over TLS encryption technology which provides more secure stream transmission service
- Support double verification for playback and downloading

HD Video Output

- Provide independent HDMI and VGA outputs
- HDMI video output at up to 4K resolution

Storage and Playback

- Up to 8 SATA interfaces for HDD connection
- 16-ch synchronous playback at up to 1080p resolution

Smart & POS Function

- Support multiple VCA (Video Content Analytics) events
- Smart search for the selected area in the video, and smart playback to improve the playback efficiency
- POS information overlay on live view and playback
- POS triggered recording and alarm

Network & Ethernet Access

- 2 self-adaptive 10/100/1000 Mbps Ethernet interfaces
- Hik-Connect & DDNS (Dynamic Domain Name System) for easy network management
- Smooth streaming technology
- Support web access without plug-in

Facial Recognition and Face Picture Comparison

- Modeling and analyzing face pictures captured by cameras. Realize blacklist alarm and stranger alarm via face picture library.
- Search target people by picture and name features.

Perimeter Protection

- Adopt deep learning algorithm to reduce false alarm, effectively reduces the false alarm caused by tree branches, leaves, shadow, light, vehicles, small animals, etc

Specification

Model		DS-9632NXI-I8/S		
Facial Recognition ¹				
Facial detection and analytics	Face picture comparison, human face capture, face picture search			
Face picture library	Up to 16 face picture libraries, with up to 10,000 face pictures in total (each picture ≤ 15KB, total capacity ≤ 150 MB)			
Face picture comparison	4-ch face picture comparison alarm			
Performance of facial detection and analytics	1-ch human face capture (HD network camera, up to 8 MP, H.264/H.265)			
Perimeter Protection ¹				
False alarm reduction	Up to 4-ch 2 MP (H.264/H.265) video analysis for human and vehicle recognition; Up to 16-ch false alarm reduction Up to 12 rules in total			
Video and Audio				
IP video input	16-ch	32-ch	64-ch	
	Up to 12 MP resolution *: 32 MP and 24 MP is only available for channel 1 when ultra HD resolution mode is enabled.			
Incoming bandwidth	320 Mbps			
Outgoing bandwidth	256 Mbps			
HDMI1 output	4K (3840 × 2160)/60Hz, 4K (3840 × 2160)/30Hz, 2K (2560 × 1440)/60Hz, 1920 × 1080/60Hz, 1600 × 1200/60Hz, 1280 × 1024/60Hz, 1280 × 720/60Hz, 1024 × 768/60Hz			
HDMI2 output	1920 × 1080/60Hz, 1280 × 1024/60Hz, 1280 × 720/60Hz, 1024 × 768/60Hz			
VGA output	1-ch, 1920 × 1080/60Hz, 1280 × 1024/60Hz, 1280 × 720/60Hz, 1024 × 768/60Hz			
Video output mode	HDMI1/VGA simultaneous output, HDMI2/VGA independent output			
Audio output	2-ch, RCA (Linear, 1 KΩ)			
Two-way audio input	1-ch, RCA (2.0 Vp-p, 1 KΩ)			
Decoding				
Video decoding format	H.265+/H.265/H.264+/H.264/MPEG4			
Recording resolution	32 MP/24 MP/12 MP/8 MP/6 MP/5 MP/4 MP/3 MP/1080p/UXGA/720p/VGA/4CIF/DCIF/2CIF/CIF/QCIF *: 32 MP and 24 MP is only available for channel 1 when ultra HD resolution mode is enabled.			
Synchronous playback	16-ch	32-ch	64-ch	
Capability	16-ch@1080p (30 fps)			
Dual stream recording	Support			
Stream type	Video, Video & Audio			
Audio compression	G.711ulaw/G.711alaw/G.722/G.726/MP2L2/AAC			
Network				
Remote connections	128			
Network protocol	TCP/IP, DHCP, IPv4, IPv6, DNS, DDNS, NTP, RTSP, SADP, SMTP, SNMP, NFS, iSCSI, ISUP, UPnP™, HTTP, HTTPS			

Network interface	2, RJ-45 10/100/1000 Mbps self-adaptive Ethernet interface
Auxiliary interface	
Serial port	RS-485 (full-duplex), RS-232, Keyboard
SATA	8 SATA interfaces
Capacity	Up to 10 TB capacity for each disk
eSATA	1 eSATA interface
Alarm in/out	16/8
USB interface	Front panel: 2 × USB 2.0; Rear panel: 1 × USB 3.0
General	
Power supply	100 to 240 VAC, 50 to 60 Hz
Consumption (without HDD)	≤ 30 W
Working temperature	-10 °C to 55 °C (14 °F to 131 °F)
Working humidity	10% to 90%
Chassis	2U chassis
Dimension (W × D × H)	442 × 459 × 92 mm (17.4"× 18" × 3.6")
Weight (without HDD)	≤ 8.7 kg (19.2 lb.)
Certification	
Obtained Certification	CE, FCC, IC
CE	EN 55032:2015, EN 61000-3-2, EN 61000-3-3, EN 50130-4
FCC	Part 15 Subpart B, ANSI C63.4-2014

1: Facial recognition and perimeter protection cannot be enabled at the same time. Enable one function will make the other one unavailable.

19.D CCTV CAMERA SPECIFICATION (IP)

19.D1 Camera Type 1 – Indoor mini dome IP camera (4MP) with 2.8mm lens, IK10 and IP67

Camera specification is based on the HIKVISION DS-2CD3146G2H-LIS. (Similar and approved equal cameras conforming to the specification may be accepted).

Camera is used internally for passages and general usage Cameras shall be capable of high quality facial recognition.

- Supports Hikvision Embedded Open Platform (HEOP) and importing third party applications
- Supports 1.5 Tops computing power, 60 MB system memory, 400 MB smart RAM, and 2 GB eMMC storage for sharing resources
- High quality imaging with 4 MP resolution
- Smart Dual-Light: advanced technology with long range
- Clear imaging against strong back light due to 130 dB WDR technology
- Efficient H.265+ compression technology
- Focus on human and vehicle classification based on deep learning
- Water and dust resistant (IP67) and vandal resistant (IK10))

• Specification

Camera	
Image Sensor	1/3" Progressive Scan CMOS
Max. Resolution	2688 × 1520
Min. Illumination	Color: 0.001 Lux @ (F1.0, AGC ON), 0 Lux with light
Shutter Time	1/3 s to 1/100,000 s
Day & Night	IR cut filter
Angle Adjustment	Pan: 0° to 355°, tilt: 0° to 75°, rotate: 0° to 355°
Lens	
Lens Type	Fixed focal lens, 2.8 and 4 mm optional
Focal Length & FOV	2.8 mm, horizontal FOV 100.2°, vertical FOV 54.7°, diagonal FOV 119.7° 4 mm, horizontal FOV 81.1°, vertical FOV 44.7°, diagonal FOV 94.6°
Lens Mount	M12
Iris Type	Fixed
Aperture	F1.0
Depth of Field	2.8 mm: 1.9 m to ∞ 4 mm: 2.5 m to ∞
DORI	
DORI	2.8mm: D: 63 m, O: 25 m, R: 12 m, I: 6 m 4mm: D: 78 m, O: 31 m, R: 15 m, I: 7 m
Illuminator	
Supplement Light Type	IR, White Light
Supplement Light Range	Up to 40 m
Smart Supplement Light	Yes
IR Wavelength	850 nm
HEOP	
Open Resources	Memory: 60 MB, Smart RAM: 400 MB, eMMC: 2 GB
Computing Power	1.5 TOPS
Open Capability	HEOP 2.0 OpendevSDK
Deep Learning Structure	Caffe, PyTorch, TensorFlow, PaddlePaddle, ONNX
Programming Language	C, C++
Video	
Main Stream	50 Hz: 25 fps (2688 × 1520, 1920 × 1080, 1280 × 720) 60 Hz: 30 fps (2688 × 1520, 1920 × 1080, 1280 × 720)
Sub-Stream	50 Hz: 25 fps (1280 × 720, 640 × 480, 640 × 360) 60 Hz: 30 fps (1280 × 720, 640 × 480, 640 × 360)
Third Stream	50 Hz: 10 fps (1920 × 1080, 1280 × 720, 640 × 480, 640 × 360) 60 Hz: 10 fps (1920 × 1080, 1280 × 720, 640 × 480, 640 × 360) *The third stream is supported under certain settings.
Fourth Stream	50 Hz: 10 fps (1280 × 720, 640 × 480, 640 × 360) 60 Hz: 10 fps (1280 × 720, 640 × 480, 640 × 360) *The fourth stream is supported under certain settings.

Video Compression	Main stream: H.265/H.264/H.264+/H.265+, Sub-stream: H.265/H.264/MJPEG, Third stream: H.265/H.264, Fourth stream: H.265/H.264/MJPEG, *The third stream and the fourth stream are supported under certain settings.
Video Bit Rate	32 Kbps to 8 Mbps
H.264 Type	Baseline Profile, Main Profile, High Profile
H.265 Type	Main Profile
Bit Rate Control	CBR, VBR
Scalable Video Coding (SVC)	H.264 and H.265 encoding
Region of Interest (ROI)	5 fixed regions for main stream and sub-stream
Target Cropping	Yes
Audio	
Audio Compression	G.711/G.722.1/G.726/MP2L2/PCM/MP3/AAC-LC
Audio Bit Rate	64 Kbps (G.711ulaw/G.711alaw)/16 Kbps (G.722.1)/16 Kbps (G.726)/32 to 192 Kbps (MP2L2)/8 to 320 Kbps (MP3)/16 to 64 Kbps (AAC-LC)
Audio Sampling Rate	8 kHz/16 kHz/32 kHz/44.1 kHz/48 kHz
Environment Noise Filtering	Yes
Network	
Protocols	TCP/IP, ICMP, HTTP, HTTPS, FTP, DHCP, DNS, DDNS, RTP, RTSP, NTP, UPnP, SMTP, IGMP, 802.1X, QoS, IPv4, IPv6, UDP, Bonjour, SSL/TLS, PPPoE, SFTP, ARP, SNMP, WebSocket, WebSockets, SRTP
Simultaneous Live View	Up to 6 channels
API	Open Network Video Interface (Profile S, Profile G, Profile T), ISAPI, SDK, ISUP
User/Host	Up to 32 users 3 user levels: administrator, operator, and user
Security	Password protection, complicated password, HTTPS encryption, 802.1X authentication (EAP-TLS, EAP-LEAP, EAP-MD5), watermark, IP address filter, basic and digest authentication for HTTP/HTTPS, WSSE and digest authentication for Open Network Video Interface, RTP/RTSP over HTTPS, control timeout settings, security audit log, TLS 1.1/1.2/1.3, host authentication (MAC address)
Network Storage	NAS (NFS, SMB/CIFS), Auto Network Replenishment (ANR), Together with high-end Hikvision memory card, memory card encryption and health detection are supported.
Client	iVMS-4200, Hik-Connect, Hik-Central
Web Browser	Plug-in required live view: IE 10, IE 11, Plug-in free live view: Chrome 57.0+, Firefox 52.0+, Edge 89+, Local service: Chrome 57.0+, Firefox 52.0+, Edge 89+
Image	
Image Parameters Switch	Yes
Image Settings	Rotate mode, saturation, brightness, contrast, sharpness, gain, white balance, adjustable by client software or web browser
Day/Night Switch	Day, Night, Auto, Schedule
Image Enhancement	BLC, HLC, 3D DNR, Defog
SNR	≥ 52 dB
Wide Dynamic Range (WDR)	130 dB

Privacy Mask	4 programmable polygon privacy masks
Interface	
Ethernet Interface	1 RJ45 10 M/100 M self-adaptive Ethernet port
On-Board Storage	Built-in memory card slot, support microSD/microSDHC/microSDXC card, up to 512 GB
Built-in Microphone	-U: Yes
Audio	1 input (line in), two-core terminal block, max. input amplitude: 3.3 Vpp, input impedance: 4.7 K Ω , interface type: non-equilibrium, 1 output (line out), two-core terminal block, max. output amplitude: 3.3 Vpp, output impedance: 100 Ω , interface type: non-equilibrium
Alarm	1 input, 1 output (max. 12 VDC, 30 mA)
Reset Key	Yes
Power Output	12 VDC, max. 100 mA
Event	
Basic Event	Motion detection (support alarm triggering by specified target types (human and vehicle)), video tampering alarm, exception
Linkage	Upload to FTP/NAS/memory card, notify surveillance center, send email, trigger recording, trigger capture, trigger alarm output, audible warning
Smart Event	Unattended baggage detection, object removal detection, scene change detection, audio exception detection, defocus detection
Deep Learning Function	
Face Capture	Yes
People Counting	Yes
Perimeter Protection	Line crossing detection, intrusion detection, region entrance detection, region exiting detection, Support alarm triggered by specified target types (human and vehicle)
General	
Power	12 VDC \pm 25%, 0.6 A, max. 7.2 W, \varnothing 5.5 mm coaxial power plug, reverse polarity protection, PoE: IEEE 802.3af, Class 3, max. 8.5 W
Material	Metal
Dimension	\varnothing 121.4 mm \times 97.7 mm (\varnothing 4.8" \times 3.8")
Package Dimension	150 mm \times 150 mm \times 141 mm (5.9" \times 5.9" \times 5.6")
Weight	Approx. 550 g (1.2 lb.)
With Package Weight	Approx. 800 g (1.8 lb.)
Storage Conditions	-30 $^{\circ}$ C to 60 $^{\circ}$ C (-22 $^{\circ}$ F to 140 $^{\circ}$ F). Humidity 95% or less (non-condensing)
Startup and Operating Conditions	-30 $^{\circ}$ C to 60 $^{\circ}$ C (-22 $^{\circ}$ F to 140 $^{\circ}$ F). Humidity 95% or less (non-condensing)
General Function	Heartbeat, mirror, anti-banding, flash log, password reset via email, pixel counter
Language	33 languages: English, Russian, Estonian, Bulgarian, Hungarian, Greek, German, Italian, Czech, Slovak, French, Polish, Dutch, Portuguese, Spanish, Romanian, Danish, Swedish, Norwegian, Finnish, Croatian, Slovenian, Serbian, Turkish, Korean, Traditional Chinese, Thai, Vietnamese, Japanese, Latvian, Lithuanian, Portuguese (Brazil), Ukrainian

Approval	
EMC	CE-EMC: EN 55032: 2015, EN 61000-3-2:2019, EN 61000-3-3: 2013+A1:2019, EN 50130-4: 2011 +A1: 2014, RCM: AS/NZS CISPR 32: 2015, IC: ICES-003: Issue 7
Safety	UL: UL 62368-1, CB: IEC 62368-1: 2014+A11, CE-LVD: EN 62368-1: 2014/A11: 2017, BIS: IS 13252 (Part 1): 2010/IEC 60950-1: 2005, LOA: IEC/EN 60950-1
Environment	CE-RoHS: 2011/65/EU
Protection	IP67: IEC 60529-2013, IK10: IEC 62262:2002

19.D2 Camera Type 2 – Indoor mini dome IP camera (4MP) with 4mm lens, IK10 and IP67

Camera specification is based on the HIKVISION DS-2CD3146G2H-LIS. (Similar and approved equal cameras conforming to the specification may be accepted).

Camera is used internally for passages and shall be capable of high quality facial recognition.

- Supports Hikvision Embedded Open Platform (HEOP) and importing third party applications
- Supports 1.5 Tops computing power, 60 MB system memory, 400 MB smart RAM, and 2 GB eMMC storage for sharing resources
- High quality imaging with 4 MP resolution
- Smart Dual-Light: advanced technology with long range
- Clear imaging against strong back light due to 130 dB WDR technology
- Efficient H.265+ compression technology
- Focus on human and vehicle classification based on deep learning
- Water and dust resistant (IP67) and vandal resistant (IK10))

• Specification

Camera	
Image Sensor	1/3" Progressive Scan CMOS
Max. Resolution	2688 × 1520
Min. Illumination	Color: 0.001 Lux @ (F1.0, AGC ON), 0 Lux with light
Shutter Time	1/3 s to 1/100,000 s
Day & Night	IR cut filter
Angle Adjustment	Pan: 0° to 355°, tilt: 0° to 75°, rotate: 0° to 355°
Lens	
Lens Type	Fixed focal lens, 2.8 and 4 mm optional
Focal Length & FOV	2.8 mm, horizontal FOV 100.2°, vertical FOV 54.7°, diagonal FOV 119.7° 4 mm, horizontal FOV 81.1°, vertical FOV 44.7°, diagonal FOV 94.6°
Lens Mount	M12
Iris Type	Fixed
Aperture	F1.0
Depth of Field	2.8 mm: 1.9 m to ∞ 4 mm: 2.5 m to ∞
DORI	
DORI	2.8mm: D: 63 m, O: 25 m, R: 12 m, I: 6 m 4mm: D: 78 m, O: 31 m, R: 15 m, I: 7 m
Illuminator	
Supplement Light Type	IR, White Light
Supplement Light Range	Up to 40 m
Smart Supplement Light	Yes
IR Wavelength	850 nm
HEOP	
Open Resources	Memory: 60 MB, Smart RAM: 400 MB, eMMC: 2 GB
Computing Power	1.5 TOPS
Open Capability	HEOP 2.0 OpendevSDK
Deep Learning Structure	Caffe, PyTorch, TensorFlow, PaddlePaddle, ONNX
Programming Language	C, C++
Video	
Main Stream	50 Hz: 25 fps (2688 × 1520, 1920 × 1080, 1280 × 720) 60 Hz: 30 fps (2688 × 1520, 1920 × 1080, 1280 × 720)
Sub-Stream	50 Hz: 25 fps (1280 × 720, 640 × 480, 640 × 360) 60 Hz: 30 fps (1280 × 720, 640 × 480, 640 × 360)
Third Stream	50 Hz: 10 fps (1920 × 1080, 1280 × 720, 640 × 480, 640 × 360) 60 Hz: 10 fps (1920 × 1080, 1280 × 720, 640 × 480, 640 × 360) *The third stream is supported under certain settings.
Fourth Stream	50 Hz: 10 fps (1280 × 720, 640 × 480, 640 × 360) 60 Hz: 10 fps (1280 × 720, 640 × 480, 640 × 360) *The fourth stream is supported under certain settings.

Video Compression	Main stream: H.265/H.264/H.264+/H.265+, Sub-stream: H.265/H.264/MJPEG, Third stream: H.265/H.264, Fourth stream: H.265/H.264/MJPEG, *The third stream and the fourth stream are supported under certain settings.
Video Bit Rate	32 Kbps to 8 Mbps
H.264 Type	Baseline Profile, Main Profile, High Profile
H.265 Type	Main Profile
Bit Rate Control	CBR, VBR
Scalable Video Coding (SVC)	H.264 and H.265 encoding
Region of Interest (ROI)	5 fixed regions for main stream and sub-stream
Target Cropping	Yes
Audio	
Audio Compression	G.711/G.722.1/G.726/MP2L2/PCM/MP3/AAC-LC
Audio Bit Rate	64 Kbps (G.711ulaw/G.711alaw)/16 Kbps (G.722.1)/16 Kbps (G.726)/32 to 192 Kbps (MP2L2)/8 to 320 Kbps (MP3)/16 to 64 Kbps (AAC-LC)
Audio Sampling Rate	8 kHz/16 kHz/32 kHz/44.1 kHz/48 kHz
Environment Noise Filtering	Yes
Network	
Protocols	TCP/IP, ICMP, HTTP, HTTPS, FTP, DHCP, DNS, DDNS, RTP, RTSP, NTP, UPnP, SMTP, IGMP, 802.1X, QoS, IPv4, IPv6, UDP, Bonjour, SSL/TLS, PPPoE, SFTP, ARP, SNMP, WebSocket, WebSockets, SRTP
Simultaneous Live View	Up to 6 channels
API	Open Network Video Interface (Profile S, Profile G, Profile T), ISAPI, SDK, ISUP
User/Host	Up to 32 users 3 user levels: administrator, operator, and user
Security	Password protection, complicated password, HTTPS encryption, 802.1X authentication (EAP-TLS, EAP-LEAP, EAP-MD5), watermark, IP address filter, basic and digest authentication for HTTP/HTTPS, WSSE and digest authentication for Open Network Video Interface, RTP/RTSP over HTTPS, control timeout settings, security audit log, TLS 1.1/1.2/1.3, host authentication (MAC address)
Network Storage	NAS (NFS, SMB/CIFS), Auto Network Replenishment (ANR), Together with high-end Hikvision memory card, memory card encryption and health detection are supported.
Client	iVMS-4200, Hik-Connect, Hik-Central
Web Browser	Plug-in required live view: IE 10, IE 11, Plug-in free live view: Chrome 57.0+, Firefox 52.0+, Edge 89+, Local service: Chrome 57.0+, Firefox 52.0+, Edge 89+
Image	
Image Parameters Switch	Yes
Image Settings	Rotate mode, saturation, brightness, contrast, sharpness, gain, white balance, adjustable by client software or web browser
Day/Night Switch	Day, Night, Auto, Schedule
Image Enhancement	BLC, HLC, 3D DNR, Defog
SNR	≥ 52 dB
Wide Dynamic Range (WDR)	130 dB

Privacy Mask	4 programmable polygon privacy masks
Interface	
Ethernet Interface	1 RJ45 10 M/100 M self-adaptive Ethernet port
On-Board Storage	Built-in memory card slot, support microSD/microSDHC/microSDXC card, up to 512 GB
Built-in Microphone	-U: Yes
Audio	1 input (line in), two-core terminal block, max. input amplitude: 3.3 Vpp, input impedance: 4.7 K Ω , interface type: non-equilibrium, 1 output (line out), two-core terminal block, max. output amplitude: 3.3 Vpp, output impedance: 100 Ω , interface type: non-equilibrium
Alarm	1 input, 1 output (max. 12 VDC, 30 mA)
Reset Key	Yes
Power Output	12 VDC, max. 100 mA
Event	
Basic Event	Motion detection (support alarm triggering by specified target types (human and vehicle)), video tampering alarm, exception
Linkage	Upload to FTP/NAS/memory card, notify surveillance center, send email, trigger recording, trigger capture, trigger alarm output, audible warning
Smart Event	Unattended baggage detection, object removal detection, scene change detection, audio exception detection, defocus detection
Deep Learning Function	
Face Capture	Yes
People Counting	Yes
Perimeter Protection	Line crossing detection, intrusion detection, region entrance detection, region exiting detection, Support alarm triggered by specified target types (human and vehicle)
General	
Power	12 VDC \pm 25%, 0.6 A, max. 7.2 W, \varnothing 5.5 mm coaxial power plug, reverse polarity protection, PoE: IEEE 802.3af, Class 3, max. 8.5 W
Material	Metal
Dimension	\varnothing 121.4 mm \times 97.7 mm (\varnothing 4.8" \times 3.8")
Package Dimension	150 mm \times 150 mm \times 141 mm (5.9" \times 5.9" \times 5.6")
Weight	Approx. 550 g (1.2 lb.)
With Package Weight	Approx. 800 g (1.8 lb.)
Storage Conditions	-30 $^{\circ}$ C to 60 $^{\circ}$ C (-22 $^{\circ}$ F to 140 $^{\circ}$ F). Humidity 95% or less (non-condensing)
Startup and Operating Conditions	-30 $^{\circ}$ C to 60 $^{\circ}$ C (-22 $^{\circ}$ F to 140 $^{\circ}$ F). Humidity 95% or less (non-condensing)
General Function	Heartbeat, mirror, anti-banding, flash log, password reset via email, pixel counter
Language	33 languages: English, Russian, Estonian, Bulgarian, Hungarian, Greek, German, Italian, Czech, Slovak, French, Polish, Dutch, Portuguese, Spanish, Romanian, Danish, Swedish, Norwegian, Finnish, Croatian, Slovenian, Serbian, Turkish, Korean, Traditional Chinese, Thai, Vietnamese, Japanese, Latvian, Lithuanian, Portuguese (Brazil), Ukrainian

Approval	
EMC	CE-EMC: EN 55032: 2015, EN 61000-3-2:2019, EN 61000-3-3: 2013+A1:2019, EN 50130-4: 2011 +A1: 2014, RCM: AS/NZS CISPR 32: 2015, IC: ICES-003: Issue 7
Safety	UL: UL 62368-1, CB: IEC 62368-1: 2014+A11, CE-LVD: EN 62368-1: 2014/A11: 2017, BIS: IS 13252 (Part 1): 2010/IEC 60950-1: 2005, LOA: IEC/EN 60950-1
Environment	CE-RoHS: 2011/65/EU
Protection	IP67: IEC 60529-2013, IK10: IEC 62262:2002

19.D3 Camera Type 3 – Indoor mini dome IP camera (4MP) with 2.8mm lens, IK08 and IP67

Camera specification is based on the HIKVISION DS-2CD2546G2-IS. (Similar and approved equal cameras conforming to the specification may be accepted).

Camera is to be used at cashier tellers and cash hall safe.

Empowered by deep learning algorithms, technology to bring human and vehicle targets classification alarms to front- and back-end devices. The system is to focus on human and vehicle targets, vastly improving alarm efficiency and effectiveness.

- High quality imaging with 4 MP resolution
- Excellent low-light performance with powered-by-DarkFighter technology
- Focusing on human and vehicle classification based on deep learning
- Clear imaging against strong back light due to 120 dB WDR technology
- Efficient H.265+ compression technology
- -S: audio and alarm interface available
- -Water and dust resistant IP67 and vandal proof IK08)

• Specification

Camera	
Image Sensor	1/3" Progressive Scan CMOS
Max. Resolution	2688 × 1520
Min. Illumination	Color: 0.003 Lux @ (F1.4, AGC ON), B/W: 0 Lux with IR
Shutter Speed	1/3 s to 1/100,000 s
Day & Night	IR cut filter
Angle Adjustment	Pan: -30° to 30°, tilt: 0° to 75°, rotate: 0° to 360°
Lens	
Lens Type	Fixed focal lens, 2.8 and 4 mm optional
Focal Length & FOV	2.8 mm, horizontal FOV 102.7°, vertical FOV 55.2°, diagonal FOV 122.5° 4 mm, horizontal FOV 82.8°, vertical FOV 45.3°, diagonal FOV 97.7°
Lens Mount	M12
Iris Type	Fixed
Aperture	F1.4
Depth of Field	2.8 mm: 1.6 m to ∞ 4 mm: 2.1 m to ∞
DORI	
DORI	2.8 mm: D: 64 m O: 26 m R: 13 m I: 6 m 4 mm: D: 77 m O: 31 m R: 16 m I: 8 m
Illuminator	
Supplement Light Type	IR
Supplement Light Range	Up to 30 m
Smart Supplement Light	Yes
IR Wavelength	850 nm
Video	
Main Stream	50 Hz: 25 fps (2688 × 1520, 1920 × 1080, 1280 × 720) 60 Hz: 30 fps (2688 × 1520, 1920 × 1080, 1280 × 720)
Sub-Stream	50 Hz: 25 fps (1280 × 720, 640 × 480, 640 × 360) 60 Hz: 30 fps (1280 × 720, 640 × 480, 640 × 360)
Third Stream	50 Hz: 10 fps (1920 × 1080, 1280 × 720, 640 × 480, 640 × 360) 60 Hz: 10 fps (1920 × 1080, 1280 × 720, 640 × 480, 640 × 360) *Third stream is supported under certain settings.
Video Compression	Main stream: H.265/H.264/H.265+/H.264+ Sub-stream: H.265/H.264/MJPEG Third stream: H.265/H.264 *Third stream is supported under certain settings.

Video Bit Rate	32 Kbps to 8 Mbps
H.264 Type	Baseline Profile/Main Profile/High Profile
H.265 Type	Main Profile
Bit Rate Control	CBR/VBR
Scalable Video Coding (SVC)	H.264 and H.265 encoding
Region of Interest (ROI)	1 fixed region for main stream and sub-stream
Audio	
Audio Type	Mono sound/2 channels/stereo
Environment Noise Filtering	Yes/No
Audio Sampling Rate	8 kHz/16 kHz/32 kHz/44.1 kHz/48 kHz
Audio Compression	G.711/G.722.1/G.726/MP2L2/PCM/MP3
Audio Bit Rate	64 Kbps (G.711)/16 Kbps (G.722.1)/16 Kbps (G.726)/32 to 192 Kbps (MP2L2)/32 Kbps (PCM)/8 to 320 Kbps (MP3)
Network	
Simultaneous Live View	Up to 6 channels
API	Open Network Video Interface (PROFILE S, PROFILE G, PROFILE T), ISAPI, SDK
Protocols	TCP/IP, ICMP, HTTP, HTTPS, FTP, DHCP, DNS, DDNS, RTP, RTSP, NTP, UPnP, SMTP, IGMP, 802.1 (except for -W model), QoS, IPv4, IPv6, UDP, Bonjour, SSL/TLS, PPPoE, SNMP, ARP, WebSocket, WebSockets
User/Host	Up to 32 users. 3 user levels: administrator, operator and user
Security	Password protection, complicated password, HTTPS encryption, IP address filter, Security Audit Log, basic and digest authentication for HTTP/HTTPS, TLS 1.1/1.2, WSSE and digest authentication for Open Network Video Interface
Network Storage	NAS (NFS, SMB/CIFS), auto network replenishment (ANR) Together with high-end Hikvision memory card, memory card encryption and health detection are supported
Client	iVMS-4200, Hik-Connect, Hik-Central
Web Browser	Plug-in required live view: IE 10, IE 11 Plug-in free live view: Chrome 57.0+, Firefox 52.0+, Edge 89+ Local service: Chrome 57.0+, Firefox 52.0+, Edge 89+
Wi-Fi	
Encryption Mode	-W: 64/128-bit WEP, WPA-EAP/WPA2-EAP, WPA-PSK/WPA2-PSK
Wi-Fi Protocol	-W: 802.11b: CCK, QPSK, BPSK 802.11g/n: OFDM
Frequency Range	-W: 2.4 GHz to 2.4835 GHz
Channel Bandwidth	-W: 20/40 MHz
Modulation	-W: 802.11b: CCK, QPSK, BPSK 802.11g/n: OFDM
Transfer Rate	-W: 802.11b: 11 Mbps 802.11g: 54 Mbps 802.11n: up to 300 Mbps
Wireless Range	-W: Up to 80 m (The performance varies based on actual environment)

Image	
Wide Dynamic Range (WDR)	120 dB
SNR	≥ 52 dB
Day/Night Switch	Day, Night, Auto, Schedule
Image Enhancement	BLC, HLC, 3D DNR
Image Parameters Switch	Yes
Image Settings	Rotate, saturation, brightness, contrast, sharpness, gain, white balance adjustable by client software or web browser
Interface	
Ethernet Interface	1 RJ45 10 M/100 M self-adaptive Ethernet port
On-Board Storage	Built-in memory card slot, support microSD card, up to 512 GB
Built-in Microphone	Yes
Audio	-IS/IWS: 1 input (line in), two-core terminal block, max. input amplitude: 3.3 Vpp, input impedance: 4.7 KΩ, interface type: non-equilibrium 1 output (line out), two-core terminal block, max. output amplitude: 3.3 Vpp, output impedance: 100 Ω, interface type: non-equilibrium
Alarm	-IS/IWS: 1 input, 1 output (max. 12 VDC, 20 mA)
Reset Key	Yes
Event	
Basic Event	Motion detection (human and vehicle targets classification), video tampering alarm, exception
Linkage	Upload to FTP/NAS/memory card, notify surveillance center, trigger recording, trigger capture, send email
Smart Event	Line crossing detection, intrusion detection, region entrance detection, region exiting detection Scene change detection
Deep Learning Function	
Face Capture	Yes
Perimeter Protection	Line crossing, intrusion, region entrance, region exiting Support alarm triggering by specified target types (human and vehicle)
General	
Power	-IS: 12 VDC ± 25%, 0.45 A, max. 5.5 W, Ø5.5 mm coaxial power plug, reverse polarity protection PoE: 802.3af, Class 3, 36 V to 57 V, 0.18 A to 0.11 A, max. 6.5 W -IWS: 12 VDC ± 25%, 0.5 A, max. 6 W, Ø5.5 mm coaxial power plug, reverse polarity protection PoE: 802.3af, Class 3, 36 V to 57 V, 0.19 A to 0.12 A, max. 7 W
Material	Base: aluminum, cover: plastic
Dimension	Ø110 mm × 57.4 mm (Ø 4.3" × 2.3")
Package Dimension	134 mm × 134 mm × 108 mm (5.3" × 5.3" × 4.3")
Weight	Approx. 380 g (0.8 lb.)
With Package Weight	Approx. 620 g (1.4 lb.)

Storage Conditions	-30 °C to 60 °C (-22 °F to 140 °F). Humidity 95% or less (non-condensing)
Startup and Operating Conditions	-30 °C to 60 °C (-22 °F to 140 °F). Humidity 95% or less (non-condensing)
Language	33 languages: English, Russian, Estonian, Bulgarian, Hungarian, Greek, German, Italian, Czech, Slovak, French, Polish, Dutch, Portuguese, Spanish, Romanian, Danish, Swedish, Norwegian, Finnish, Croatian, Slovenian, Serbian, Turkish, Korean, Traditional Chinese, Thai, Vietnamese, Japanese, Latvian, Lithuanian, Portuguese (Brazil), Ukrainian
General Function	Anti-flicker, heartbeat, mirror, privacy mask, flash log, password reset via email, pixel counter
Approval	
RF	-W: FCC ID (FCC Part 15.247(BT or 2.4G)); CE-RED (EN 301489-1 V2.1.1(BT or 2.4G); EN 301489-17 V3.1.1(BT or 2.4G); EN 300328 V2.1.1(BT or 2.4G); EN 62311:2008(BT or 2.4G))
EMC	FCC (47 CFR Part 15, Subpart B) CE-EMC (EN 55032: 2015, EN 61000-3-2: 2019, EN 61000-3-3: 2013+A1: 2019, EN 50130-4: 2011+A1: 2014) RCM (AS/NZS CISPR 32: 2015) IC (ICES-003: Issue 7) KC (KN32: 2015, KN35: 2015)
Safety	UL (UL 62368-1) CB (IEC 62368-1: 2014+A11) CE-LVD (EN 62368-1: 2014/A11: 2017) LOA (IEC/EN 60950-1)
Environment	CE-RoHS (2011/65/EU) WEEE (2012/19/EU) Reach (Regulation (EC) No 1907/2006)
Protection	IP67 (IEC 60529-2013) IK8 (IEC 62262:2002)

19.D4 Camera Type 4 – Outdoor wall mounted IP camera (4MP) with 2.7-13.5mm lens, IK10 and IP67. Complete with Cable Managed Housing/Bracket and all accessories needed for operation.

Camera specification is based on the HIKVISION DS-2CD3646G2HT-LIZS(2.7-13.5mm) -(Moderate Protection). (Similar and approved equal cameras conforming to the specification may be accepted).

Camera is to be used outdoors mounted to walls and steel poles

- Supports Hikvision Embedded Open Platform (HEOP) and importing third party applications
- Supports 1.5 Tops computing power, 60 MB system memory, 400 MB smart RAM, and 2 GB eMMC storage for sharing resources
- High quality imaging with 4 MP resolution
- Smart Hybrid Light: advanced technology with long range
- Efficient H.265+ compression technology
- Clear imaging against strong back light due to 130 dB WDR technology
- Motorized varifocal lens for easy installation and monitoring
- Focus on human and vehicle classification based on deep learning
- Water and dust resistant (IP67) and vandal resistant (IK10)
- Motorized varifocal lens for easy installation
- Water and dust resistant (IP67) and vandal-resistant (IK10)

• Specification

Camera	
Image Sensor	1/1.8" Progressive Scan CMOS
Max. Resolution	2688 × 1520
Min. Illumination	Color: 0.001 Lux @ (F1.2, AGC ON), 0 Lux with light
Shutter Time	1/3 s to 1/100,000 s
Day & Night	IR cut filter
Angle Adjustment	Pan: 0° to 355°, tilt: 0° to 90°, rotate: 0° to 360°
Lens	
Lens Type	Varifocal lens, motorized lens, 2.7 to 13.5 mm
Focal Length & FOV	2.7 to 13.5 mm, horizontal FOV 114.6° to 41.8°, vertical FOV 59.3° to 23.6°, diagonal FOV 141.3° to 48.1°
Lens Mount	Integrated
Focus	Auto, Semi-auto, Manual
Iris Type	DC iris
Aperture	F1.2
Depth of Field	1 m to ∞
DORI	
DORI	Wide: D: 60.0m, O: 23.8 m, R: 12.0 m, I: 6.0 m Tele: D: 149 m, O: 59.1 m, R: 29.8 m, I: 14.9 m
Illuminator	
Supplement Light Type	IR, White Light
Supplement Light Range	Up to 60 m
Smart Supplement Light	Yes
IR Wavelength	850 nm
HEOP	
Open Resources	Memory: 60 MB, Smart RAM: 400 MB, eMMC: 2 GB
Computing Power	1.5 TOPS
Open Capability	HEOP 2.0 OpendevSDK
Deep Learning Structure	Caffe, PyTorch, TensorFlow, PaddlePaddle, ONNX
Programming Language	C, C++
Video	
Main Stream	50 Hz: 25 fps (2688 × 1520, 1920 × 1080, 1280 × 720) 60 Hz: 30 fps (2688 × 1520, 1920 × 1080, 1280 × 720)
Sub-Stream	50 Hz: 25 fps (1280 × 720, 640 × 480, 640 × 360) 60 Hz: 30 fps (1280 × 720, 640 × 480, 640 × 360)
Third Stream	50 Hz: 10 fps (1920 × 1080, 1280 × 720, 640 × 480, 640 × 360) 60 Hz: 10 fps (1920 × 1080, 1280 × 720, 640 × 480, 640 × 360) *Third stream is supported under certain settings.
Fourth Stream	50 Hz: 10 fps (1280 × 720, 640 × 480, 640 × 360) 60 Hz: 10 fps (1280 × 720, 640 × 480, 640 × 360) *Fourth stream is supported under certain settings.

Video Compression	Main stream: H.265/H.264/H.264+/H.265+, Sub-stream: H.265/H.264/MJPEG, Third stream: H.265/H.264, Fourth stream: H.265/H.264/MJPEG, *Third stream and fourth stream are supported under certain settings.
Video Bit Rate	32 Kbps to 8 Mbps
H.264 Type	Baseline Profile, Main Profile, High Profile
H.265 Type	Main Profile
Bit Rate Control	CBR, VBR
Scalable Video Coding (SVC)	H.264 and H.265 encoding
Region of Interest (ROI)	5 fixed regions for main stream and sub-stream
Target Cropping	Yes
Audio	
Audio Compression	G.711ulaw/G.711alaw/G.722.1/G.726/MP2L2/PCM/MP3/AAC-LC
Audio Bit Rate	64 Kbps (G.711ulaw/G.711alaw)/16 Kbps (G.722.1)/16 Kbps (G.726)/32 to 192 Kbps (MP2L2)/8 to 320 Kbps (MP3)/16 to 64 Kbps (AAC-LC)
Audio Sampling Rate	8 kHz/16 kHz/32 kHz/44.1 kHz/48 kHz
Environment Noise Filtering	Yes
Network	
Protocols	TCP/IP, ICMP, HTTP, HTTPS, FTP, DHCP, DNS, DDNS, RTP, RTSP, NTP, UPnP, SMTP, IGMP, 802.1X, QoS, IPv4, IPv6, UDP, Bonjour, SSL/TLS, PPPoE, SFTP, ARP, SNMP, WebSocket, WebSockets, SRTP
Simultaneous Live View	Up to 6 channels
API	Open Network Video Interface (Profile S, Profile G, Profile T), ISAPI, SDK, ISUP
User/Host	Up to 32 users 3 user levels: administrator, operator, and user
Security	Password protection, complicated password, HTTPS encryption, 802.1X authentication (EAP-TLS, EAP-LEAP, EAP-MD5), watermark, IP address filter, basic and digest authentication for HTTP/HTTPS, WSSE and digest authentication for Open Network Video Interface, RTP/RTSP over HTTPS, control timeout settings, security audit log, TLS 1.1/1.2/1.3, host authentication (MAC address)
Network Storage	NAS (NFS, SMB/CIFS), Auto Network Replenishment (ANR), Together with high-end Hikvision memory card, memory card encryption and health detection are supported.
Client	iVMS-4200, Hik-Connect, Hik-Central
Web Browser	Plug-in required live view: IE 10, IE 11, Plug-in free live view: Chrome 57.0+, Firefox 52.0+, Edge 89+, Local service: Chrome 57.0+, Firefox 52.0+, Edge 89+
Image	
Image Parameters Switch	Yes
Image Settings	Rotate mode, saturation, brightness, contrast, sharpness, gain, white balance, adjustable by client software or web browser
Day/Night Switch	Day, Night, Auto, Schedule
Wide Dynamic Range (WDR)	130 dB
Image Enhancement	BLC, HLC, 3D DNR, Defog

SNR	≥ 52 dB
Privacy Mask	4 programmable polygon privacy masks
Interface	
Ethernet Interface	1 RJ45 10 M/100 M self-adaptive Ethernet port
On-Board Storage	Built-in memory card slot, support microSD/microSDHC/microSDXC card, up to 512 GB
Audio	1 input (line in), two-core terminal block, max. input amplitude: 3.3 Vpp, input impedance: 4.7 KΩ, interface type: non-equilibrium, 1 output (line out), two-core terminal block, max. output amplitude: 3.3 Vpp, output impedance: 100 Ω, interface type: non-equilibrium
Alarm	2 inputs, 2 outputs (max. 24 VDC/24 VAC, 1 A)
Reset Key	Yes
Power Output	12 VDC, max. 100 mA
Event	
Basic Event	Motion detection (support alarm triggering by specified target types (human and vehicle)), video tampering alarm, exception
Smart Event	Unattended baggage detection, object removal detection, scene change detection, audio exception detection, defocus detection
Linkage	Upload to FTP/NAS/memory card, notify surveillance center, send email, trigger recording, trigger capture, trigger alarm output, audible warning
Deep Learning Function	
Face Capture	Yes
People Counting	Yes
Perimeter Protection	Line crossing detection, intrusion detection, region entrance detection, region exiting detection, Support alarm triggered by specified target types (human and vehicle)
General	
Power	12 VDC ± 25%, 1.21 A, max. 14.5 W, Ø5.5 mm coaxial power plug, reverse polarity protection, PoE: IEEE 802.3at, Class 4, max. 18 W
Material	Front cover: Metal, body: Metal, bracket: Metal
Dimension	334 mm × 97.9 mm × 95.7 mm (13.2" × 3.9" × 3.8")
Package Dimension	386 mm × 190 mm × 180 mm (15.2" × 7.5" × 7.1")
Weight	Approx. 1085 g (2.4 lb.)
With Package Weight	Approx. 1639 g (3.6 lb.)
General Function	Heartbeat, anti-banding, mirror, flash log, password reset via email, pixel counter
Storage Conditions	-30 °C to 60 °C (-22 °F to 140 °F). Humidity 95% or less (non-condensing)
Startup and Operating Conditions	-30 °C to 60 °C (-22 °F to 140 °F). Humidity 95% or less (non-condensing)
Language	33 languages: English, Russian, Estonian, Bulgarian, Hungarian, Greek, German, Italian, Czech, Slovak, French, Polish, Dutch, Portuguese, Spanish, Romanian, Danish, Swedish, Norwegian, Finnish, Croatian, Slovenian, Serbian, Turkish, Korean, Traditional Chinese, Thai, Vietnamese, Japanese, Latvian, Lithuanian, Portuguese (Brazil), Ukrainian
Approval	
EMC	CE-EMC: EN 55032: 2015, EN 61000-3-2:2019, EN 61000-3-3: 2013+A1:2019, EN 50130-4: 2011 +A1: 2014

Safety	UL: UL 62368-1, CB: IEC 62368-1: 2014+A11, CE-LVD: EN 62368-1: 2014/A11: 2017
Environment	CE-RoHS: 2011/65/EU
Protection	IP67: IEC 60529-2013, IK10: IEC 62262:2002
Anti-Corrosion Protection	-Y: NEMA 4X (NEMA 250-2018)

19.D5 Camera Type 5 – External wall mounted TandemVu PTZ camera (6MP) with 6-105mm lens, IK10 and IP67) with wall mount bracket (DS-1603ZJ-P) and power supply.

Camera specification is based on the HIKVISION DS-2SF8C425MXG-EL/26. (Similar and approved equal cameras conforming to the specification may be accepted).

Camera is used outdoors for coverage of large areas and controlled from the control room.

- Captures a large area and great details at the same time
- High quality imaging with 6 MP resolution for bullet channel
- 24/7 colorful imaging and excellent low-light performance with DarkFighter technology
- Panoramic channel tilt adjustable from 12° to 24°
- Secures an expansive area with 25 × optical zoom and 16 × digital zoom
- Expansive night view with up to 30 m white light distance and 300 m IR distance
- Supports deep learning functions
- Water and dust resistant (IP67) and vandal resistant (IK10)

• Specification

Camera	
Image Sensor	[Panoramic channel] 1/1.8" Progressive Scan CMOS, [PTZ channel] 1/1.8" Progressive Scan CMOS
Min. Illumination	[PTZ channel] Color: 0.0005 Lux @ (F1.3, AGC ON), B/W: 0.0001 Lux @ (F1.3, AGC ON), 0 lux with IR, [Panoramic channel] Color: 0.005 Lux @ (F1.4, AGC ON), B/W: 0.001 Lux @ (F1.4, AGC ON), 0 Lux with light
Shutter Speed	1 s to 1/30000 s
Slow Shutter	Yes
Day & Night	[Panoramic channel] Color, [PTZ channel] IR cut filter
Zoom	[PTZ channel] 25 × optical, 16 × digital
Max. Resolution	[Panoramic channel] 3632 × 1632, [PTZ channel] 2560 × 1440
Lens	
FOV	[Panoramic channel] horizontal field of view: 190° ± 5°, vertical field of view: 80° ± 5°, [PTZ channel] horizontal field of view: 58.5° to 3.1°, vertical field of view: 34° to 1.7°, diagonal field of view: 65.8° to 3.5°
Zoom Speed	[Panoramic channel] No, [PTZ channel] approx. 5.6 s
Focus	Auto, semi-auto, manual
Focal Length	[Panoramic channel] 2.8 mm, [PTZ channel] 6 to 150 mm
Aperture	[Panoramic channel] F1.0, [PTZ channel] F1.6
Illuminator	
Supplement Light Range	[Panoramic channel] white light: up to 30 m, [PTZ channel] IR: up to 300 m
Smart Supplement Light	Yes
PTZ	
Movement Range (Pan)	360° endless
Movement Range (Tilt)	[Panoramic channel] 12° to 24°, [PTZ channel] -20° to 90°
Pan Speed	[PTZ channel] pan speed: configurable from 0.1° to 160°/s, preset speed: 240°/s
Tilt Speed	[PTZ channel] tilt speed: configurable from 0.1° to 120°/s, preset speed 200°/s, [Panoramic channel] tilt speed configurable
Proportional Pan	[Panoramic channel] No, [PTZ channel] Yes
Presets	300
Patrol Scan	8 patrols, up to 32 presets for each patrol
Pattern Scan	4 pattern scans, record time over 10 minutes for each scan
Power-off Memory	Yes
Park Action	Preset, pattern scan, patrol scan, auto scan, tilt scan, random scan, frame scan, panorama scan
3D Positioning	Yes
PTZ Status Display	Yes
Preset Freezing	Yes
Scheduled Task	Preset, pattern scan, patrol scan, auto scan, tilt scan, random scan, frame scan, panorama scan, dome reboot, dome adjust, aux output
Video	
Main Stream	[PTZ channel] 50 Hz: 25 fps (2560 × 1440, 1920 × 1080, 1280 × 960, 1280 × 720), 60 Hz: 30 fps (2560 × 1440, 1920 × 1080, 1280 × 960, 1280 × 720), [Panoramic channel] 50 Hz: 25 fps (3680 × 1656, 3632 × 1632), 60 Hz: 30 fps (3680 × 1656, 3632 × 1632)

Sub-Stream	[PTZ channel] 50 Hz: 25 fps (704 × 576, 640 × 480, 352 × 288), 60 Hz: 30 fps (704 × 576, 640 × 480, 352 × 288),[Panoramic channel] 50 Hz: 25 fps (1200 × 536, 960×432), 60 Hz: 30 fps (200 × 536, 960 × 432)
Third Stream	[PTZ channel] 50 Hz: 25 fps (1920 × 1080, 1280 × 960, 1280 × 720, 704 × 576, 640 × 480, 352 × 288), 60 Hz: 30 fps (1920 × 1080, 1280 × 960, 1280 × 720, 704 × 480, 640 × 480, 352 × 240),[Panoramic channel] No
Video Compression	Main stream: H.265+/H.265/H.264+/H.264, Sub-stream: H.265/H.264/MJPEG, Third stream: H.265/H.264/MJPEG
Video Bit Rate	32 Kbps to 16 Mbps
H.264 Type	Baseline profile,Main profile,High profile
H.265 Type	Main profile
Scalable Video Coding (SVC)	H.264 and H.265 encoding
Region of Interest (ROI)	8 fixed regions for each stream
Audio	
Audio Compression	G.711,G.722.1,G.726,MP2L2,PCM,AAC-LC
Audio Bit Rate	32 to 192 Kbps (MP2L2),16 to 64Kbps (AAC-LC)
Audio Sampling Rate	8 kHz,16 kHz,32 kHz,48 kHz
Environment Noise Filtering	Yes
Network	
API	ISAPI,SDK,ISUP,ONVIF
Network Storage	NAS (NFS, SMB/CIFS),auto network replenishment (ANR)
Protocols	IPv4/IPv6,HTTP,HTTPS,802.1X,QoS,SMTP,UPnP,SNMP,DNS,DDNS,NTP,RTSP,RTCP,RTP,TCP/IP,UDP,IGMP,ICMP,DHCP,PPPoE,Bonjour,FTP
Simultaneous Live View	Up to 20 channels
User/Host	Up to 32 users. 3 user levels: administrator, operator, and user
Security	Password protection,complicated password,IP address filter,HTTPS encryption,802.1X authentication (EAP-TLS, EAP-LEAP, EAP-MD5),host authentication (MAC address),watermark
Client	iVMS-4200,HikCentral Pro,Hik-Connect
Web Browser	IE 10+, Chrome 57+, Firefox 52+, Safari 12+
Image	
Wide Dynamic Range (WDR)	[Panoramic channel] 120 dB, [PTZ channel] 120 dB
Day/Night Switch	Day,night,auto,schedule
Image Enhancement	HLC,3D DNR
Privacy Mask	[Panoramic channel] 8 programmable polygon privacy masks, [PTZ channel] 24 programmable polygon privacy masks; mask color or mosaic configurable
Defog	Optical defog,Digital defog
Image Stabilization	EIS (Built-in gyroscope to improve EIS performance)
Regional Exposure	Yes
Regional Focus	[Panoramic channel] No, [PTZ channel] Yes
Image Settings	Saturation, brightness, contrast, sharpness, gain, and white balance adjustable by client software or web browser
Image Parameters Switch	Yes
SNR	≥ 52 dB

Supplement Detection	
Satellite Positioning	No
Gyroscope	Yes
Compass	No
Interface	
Ethernet Interface	1 RJ45 100M self-adaptive Ethernet port
On-board Storage	Built-in memory card slot, support microSD/microSDHC/microSDXC card, up to 256 GB
Alarm	7 input(s), 2 output(s)
Audio	1 input (line in), max. input amplitude: 2-2.4 vpp, input impedance: 1 K Ω \pm 10%, 1 output (line out), line level, output impedance: 600 Ω
RS-485	1 RS-485 (Half duplex, HIKVISION, Pelco-P, Pelco-D, self-adaptive)
Reset	Yes
Event	
Basic Event	[PTZ channel & panoramic channel] alarm input and output, exception,[PTZ channel] video tampering alarm
Smart Event	[Panoramic channel] line crossing detection, intrusion detection, region entrance detection, region exiting detection,[PTZ channel] line crossing detection, intrusion detection, region entrance detection, region exiting detection
Linkage	[Panoramic channel] Upload to FTP/NAS/memory card, notify surveillance center, send email, trigger alarm output, trigger recording, audible warning, white light flashing, [PTZ channel] Upload to FTP/NAS/memory card, notify surveillance center, send email, trigger alarm output, trigger recording, and PTZ actions (such as preset, patrol scan, pattern scan)
Smart Tracking	[PTZ channel] yes
Smart Linkage	Manual tracking, tracking takeover, linked tracking capture
Deep Learning Function	
Multi-Target-Type Detection	[PTZ channel] Supports simultaneous detection and capture of human body and face
Perimeter Protection	PTZ and Panoramic channel both support
General	
General Function	mirror,password protection
Power	36 VDC \pm 25%, max. 60 W, Hi-PoE,including max. 6 W for heater and max. 3 W for supplement light of panoramic channel, and max. 6 W for heater and max. 12 W for supplement light of PTZ channel
Operating Condition	-40 $^{\circ}$ C to 70 $^{\circ}$ C (-40 $^{\circ}$ F to 158 $^{\circ}$ F). Humidity 95% or less (non-condensing),For speaker: -30 $^{\circ}$ C to 55 $^{\circ}$ C (-22 $^{\circ}$ F to 131 $^{\circ}$ F)
Wiper	No
Demist	Yes
Material	ADC12
Dimension	\varnothing 290 mm \times 453.2 mm (\varnothing 11.42" \times 17.84")
Weight	Approx. 10.5 kg (23.15 lb.)
Language	33 languages: English, Russian, Estonian, Bulgarian, Hungarian, Greek, German, Italian, Czech, Slovak, French, Polish, Dutch, Portuguese, Spanish, Romanian, Danish, Swedish, Norwegian, Finnish, Croatian, Slovenian, Serbian, Turkish, Korean, Traditional Chinese, Thai, Vietnamese, Japanese, Latvian, Lithuanian, Portuguese (Brazil), Ukrainian

Approval	
EMC	FCC (47 CFR Part 15, Subpart B),CE-EMC (EN 55032: 2015, EN 61000-3-2: 2019, EN 61000-3-3: 2013 + A1: 2019, EN 50130-4: 2011 + A1: 2014),RCM (AS/NZS CISPR 32: 2015),IC (ICES-003: Issue 7),KC (KN 32: 2015, KN 35: 2015)
Safety	UL (UL 62368-1),CB (IEC 62368-1: 2014 + A11),CE-LVD (EN 62368-1: 2014/A11: 2017),BIS (IS 13252 (Part 1): 2010/IEC 60950-1: 2005),LOA (IEC/EN 60950-1)
Environment	CE-RoHS (2011/65/EU),WEEE (2012/19/EU),Reach (Regulation (EC) No 1907/2006)
Protection	IP67 (IEC 60529-2013),TVS 6000 V lightning protection, surge protection and voltage transient protection,IK10 (IEC 62262:2002)

▪ DORI

The DORI (detect, observe, recognize, identify) distance gives the general idea of the camera ability to distinguish persons or objects within its field of view. It is calculated based on the camera sensor specification and the criteria given by EN 62676-4: 2015.

DORI	Detect	Observe	Recognize	Identify
Definition	25 px/m	63 px/m	125 px/m	250 px/m
[Bullet channel] Distance	77.0m	30.5m	15.4m	7.7m
[PTZ channel] Distance (Tele)	2965.5m	1176.8m	593.1m	296.6m

19.D6 IP PTZ Keyboard Controller – Desk top Keyboard controller for PTZ Camera

Keyboard Controller specification is based on the HIKVISION DS-1005KI USB Keyboard controller for PTZ camera. (Similar and approved equal cameras conforming to the specification may be accepted).

Key Features

- Power supply and communication by USB port directly.
- 3D PTZ control and 2 joystick control buttons.
- Up to 15 programmable buttons are available.
- Support digital tube to display the input content.
- Support indicators to show the operation status of keyboard.
- Compatible with a various kinds of client software and platform software.
- Support USB HID protocol.

Specifications

Model	DS-1005KI
Compatible System	Window XP/7/8/8.1
Interface Type	USB 2.0, DirectX
Control	Joystick (3-axis control, rotating zoom)
Dimensions	167*177.5*116(mm)
Operating Temperature	-10 °C ~+55 °C
Operating Humidity	10% ~ 90% (Non-condensing)
Power Supply	5V DC via USB
Consumption	≤ 5W

19.G NETWORK SWITCHES (LAYER 3 MANAGED POE WITH SURGE PROTECTION)

Layer 3 Managed 48 or 24 port 10/100/1000 Ethernet Switches (Power-over-Ethernet capabilities supplied and installed in Cabinets with all brackets and accessories. The switch shall be capable of cascading for expansion purposes and shall provide support for a range of backbone options including fast ethernet over fibre, Gigabit Ethernet.

The switch must have surge protection

19.H CONTROL ROOM WORKSTATIONS MONITORS AND ACCESSORIES

The Control Room shall have three Operator Work Stations running Security Management System functions. These workstations shall be connected to a Video Wall where operators drag and drop video images on the video wall.

Log-on to the work stations shall be by means of biometric readers mounted next to the console, which will ensure operator accountability. All operator commands and system events are logged against a time and date stamp. The operator workstation shall provide a single operator interface which will concentrate all the functions required to control Security System

19.H1 Operator servers for control room

- Precision Tower Workstation PC
- Intel Core i7 - 14700
- HDD :1 x 1TB SSD
- RAM – 16 GB DDR5 RAM;
- Intel Graphics Nvidia T1000 4 GB GDDR
- Ports – 1 Parallel, 2 Serial, 6USB (2 at front & 4 at back with USB 3.0 support),
- 4 x HDMI, Front and rear USB type A & C
- DVD ROM;
- LAN Card : Integrated 10/100/1000
- MBPS Fast Ethernet with Wake on LAN Support;
- Integrated Audio Controller;
- Multimedia Internet ready Keyboard USB Optical Scroll Mouse;
- Windows 10 Pro
- Power supply Unit

The Workstation is based on the Dell Precision 3680 Tower Workstation PC. All workstations shall be able powerful to run the systems specified seamlessly. (Similar and approved equal workstations conforming to the above specification may be accepted).

19.H2 Video Wall Mounted Display Monitors (Video Wall)

The monitor is based on the Hikvision DS-D2046LU-Y LCD display, suitable for continuous 24 hour operation. (Similar and approved equal displays conforming to the specification below, may be accepted).

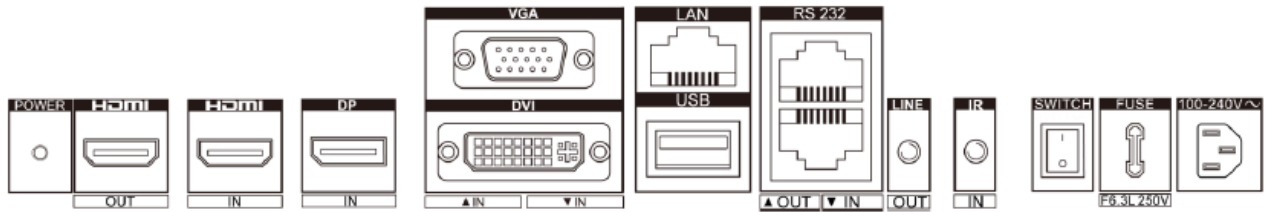
- 4K signal input, auto loop up to 30 screens with HDMI interfaces
- Switching between three picture modes: Monitoring, Meeting, and Movie
- Factory calibration for color and brightness uniformity
- Direct-lit LED backlight with uniform brightness and no boundary shadows
- 1920 × 1080 resolution, 178° viewing angle
- Ultra-narrow 3.5 mm bezel design
- Anti-glare, high definition, high brightness, high color gamut, and vivid images with rich colors
- Stable and 24-hour continuous working
- Metal casing for preventing from radiation and magnetic & electric field interference
- Wall-mount and modular brackets available to meet various installation requirements

• Specification

	Model	D5-D2046LU-Y
Display	Screen Size	46 inch
	Active Display Area	1018.08 (H) mm × 572.67 (V) mm
	Backlight	Direct-lit LED backlight
	Pixel Pitch	0.53 mm
	Physical Seam	3.5 mm
	Bezel Width	2.3 mm (top/left), 1.2 mm (bottom/right)
	Resolution	1920 × 1080@60 Hz (downward compatible)
	Brightness	500 cd/m ²
	Viewing Angle	Horizontal 178°, vertical 178°
	Color Depth	8 bit, 16.7 M
	Contrast Ratio	1200:1
	Response Time	8 ms
	Color Gamut	72% NTSC
	Surface Treatment	Haze 25%, 3H
Interface	Video & Audio Input	VGA × 1, HDMI × 1, DVI × 1, DP × 1, USB × 1
	Video & Audio Output	HDMI × 1
	Control Interface	RS-232 IN × 1, RS-232 OUT × 1
Power	Power Supply	100-240 VAC, 50/60 Hz
	Power Consumption	≤ 200 W
	Standby Consumption	≤ 0.5 W
Working Environment	Working Temperature	0 °C to 40 °C (32°F to 104°F)
	Working Humidity	10% to 80% RH (non-condensing)
	Storage Temperature	-20 °C to 60 °C (-4°F to 140°F)
	Storage Humidity	10% to 90% RH (non-condensing)
General	Casing Material	SGCC
	VESA	600 (H) mm × 400 (V) mm
	Product Dimension (W × H × D)	1022.18 (W) mm × 576.77 (H) mm × 72.48 (D) mm (40.24" × 22.7" × 2.85")
	Package Dimension (W × H × D)	1218 (W) mm × 788 (H) mm × 206 (D) mm (47.95" × 31.02" × 8.11")
	Net Weight	17.0 ± 0.5 kg (37.5 ± 1.1 lb) for single display
	Gross Weight	32.8 ± 0.5 kg (72.3 ± 1.1 lb) for carton with a single display
	Packing List	Carton with a single display: LCD display × 1, power cable × 1, network cable × 1, 2-meter HDMI cable × 1, screw × 4, remote control × 1, IR receiver × 1, RS-232 converter × 1, quick start guide (multilingual) × 1, quick start guide (English) × 1

- **Physical Interface**

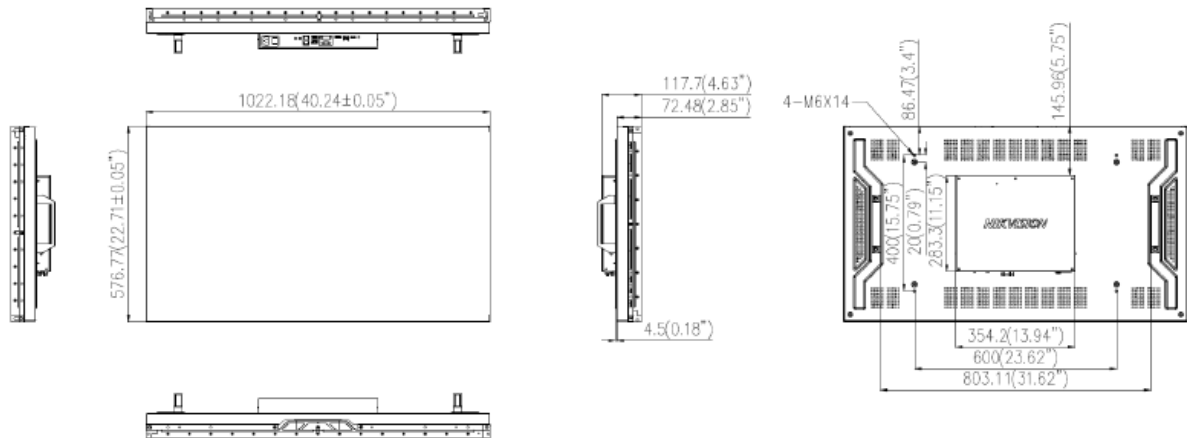
Interface	Description	Interface	Description
POWER	Power indicator	DVI IN	DVI-I input interface for digital signals
LINE OUT	Audio output interface for analog signals	RS 232 OUT	Serial loopback output interface
HDMI OUT	HDMI output interface for digital signals	RS 232 IN	Serial input interface
HDMI IN	HDMI input interface for digital signals	USB	USB interface
DP IN	DP input interface for digital signals	IR IN	IR input interface
VGA IN	VGA input interface for analog signals	SWITCH	Switch button
100-240V~	Power input		



- Available Model

DS-D2046LU-Y

- Dimension



Unit: mm (inch)

19.H3 Desk mounted Monitors

The monitor is based on the Hikvision DS-D5024FN10 24 Inch FHD Borderless, Monitor, suitable for continuous 24 hour operation. (Similar and approved equal monitors conforming to the specification below, may be accepted).

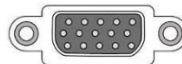
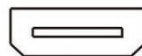
- Ultra-thin device body with ultra-thin border for 3 sides.
- 8 bit LVDS HD (1920 × 1080) display.
- 178° ultra-wide view screen.
- 3D noise reduction.
- Low blue light design for eye care.

• Specification

Model		DS-D5024FN10
Display	Screen Size	23.8 inch
	Active Display Area	527.04 mm (H) × 296.46 mm (V)
	Resolution	1920 × 1080
	Backlight	E-LED
	Pixel Pitch	0.2745 (H) mm × 0.2745 (V) mm
	Brightness	250 cd/m ²
	Viewing Angle	178° (H)/178° (V)
	Color Depth	8 bit
	Contrast Ratio	4000 : 1
	Response Time	6.5 ms (typ) (G to G) OD 5 ms
	Refresh Rate	60 Hz
	Haze	Anti-Glare, 3H (Without Haze)
	Reliability	7 × 24 H
	Color Gamut	72% NTSC
Interface	Video & Audio Input	HDMI 1.4 × 1, VGA × 1
	Video & Audio Output	None
	Data Transmission Interface	None
	Control Interface	None
Power	Power Supply	DC 12 V, 2.5 A
	Power Consumption	≤ 30 W
	Standby Consumption	≤ 0.5 W
Working Environment	Working Temperature	0 °C to 40 °C (32 °F to 104 °F)
	Working Humidity	20% to 80% RH (Non-Condensing)
	Storage Temperature	-20 °C to 60 °C (-4 °F to 140 °F)
	Storage Humidity	20% to 80% RH (Non-Condensing)
General	Casing Material	Plastic
	VESA	100 mm × 100 mm (4-M4 × 10 mm)
	Bezel Width	1.8 mm (top/left/right), 21.4 mm (bottom)
	Product Dimensions (W × H × D)	538.40 (W) mm × 326.35 (H) mm × 37.50 (D) mm (without stand) 538.40 (W) mm × 407.10 (H) mm × 186.37 (D) mm (with stand)
	Package Dimensions (W × H × D)	600 (W) mm × 408 (H) mm × 94 (D) mm
	Net Weight	2.634 ± 0.5 kg
	Gross Weight	3.340 ± 0.5 kg
	Packing List	Monitor × 1, Base component × 1, Power adapter (12 V, 2.5 A) × 1, HDMI cable (1.5 m) × 1, User manual × 1, Multilingual manual × 1
	Remarks	If the appearance and parameters in this specification vary from the actual product, the later prevails. You can also consult local sale staff.

• Physical Interface

Interface	Description	Interface	Description
HDMI	HDMI 1.4 digital signal input interface	VGA	VGA analog signal input interface
DC	DC 12 V, 2.5 A		



19.H4 SAPS Office Video Decoder and Display Monitor.

The SAPS office shall have 1 x 24 inch **Commercial** LED viewing monitor as per specification above, suitable for continuous 24 hour operation and 16 Chanel IP Split Screen Decoder. This shall allow for the remote viewing of selected cameras at this office from the central control room. The cameras to be viewed shall be the entrances and exits to the offloading facilities and on site selected cameras. This is to assist with the control of the accused movements.

Contractor shall supply, install and commission the complete system including interconnecting cable, software and programming from the Central control room to the SAPS control office.

19.I Wiring

Each camera is to be fed via Blue Cat 6e UTP cable installed in conduits / trunking / cable basket – Indoors and Cat 6e UTP Ruggedized UV protected outdoor network cable – Black for outdoor cameras mounted on gates / poles. All cabling shall include terminations to switches / equipment and to conform to the applicable SANS standards / manufacturers requirements.

The wireways and cable basket shall be installed by the electrical contractor under the guidance and coordination of the CCTV installer.

20 ACCESS CONTROL INSTALLATION - IP

The access control system is based on the ZKteco ZKAccess 3.5 or updated version at time of tender close. Other similar and approved equal systems may be accepted.

As a professional access control software, ZKAccess3.5 is designed to manage all ZKTeco's access control panels and standalone access control terminals.

The software can simultaneously manage access control and generate attendance report.

It's a desktop software which is suitable for small and medium businesses application.

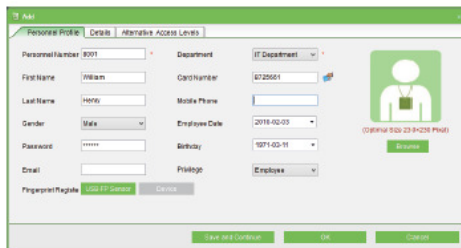
The brand new at GUI design and humanized structure of new ZKAccess3.5 will make your daily management more pleasant and convenient

Software Specification

Default Database: Microsoft Office Access (support SQL server2005 and above.)

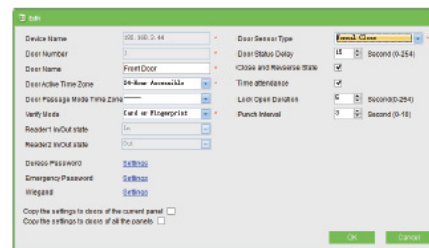
Supported OS: Windows 7/8/8.1/10 32/64 bit.

Software Features



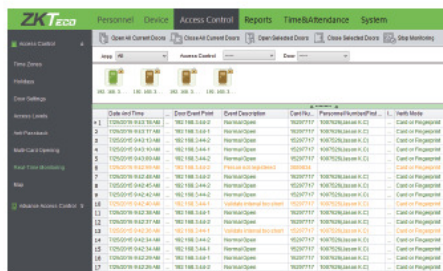
Easy to Configure and Use

- Menu-driven dashboard display
- Embedded fingerprint registration tool for registering and uploading templates to the terminals
- Quick start links for common operations



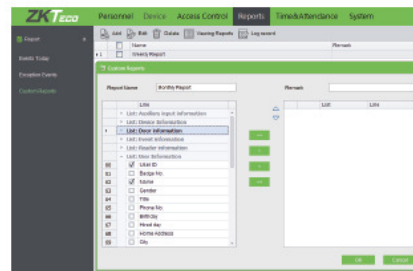
Door Management

- Individual door configuration for unlock duration, Weigand format and request to exit mode
- Set anti-passback and interlocks between doors
- Door interlocks for mantrap control
- In and out reader configuration
- Programming of duress password



Real-Time Monitoring

- Real-time event monitoring with door status icon
- Photo pop-ups of users and visual verification
- Remote opening/closing of an individual or all doors



Maps, Reports and Maintenance

- Import maps and floor plans for site-specific door management
- Reports with customized search engine
- Multiple export formats for event logs
- One-click database backup
- All system changes are logged

20.A SCOPE

The system shall address the following requirements:

- a) The need for access control to entry / exit from secure areas, both in respect of entry to the building at specific locations and between designated zones within the building, by a system of high integrity and reliability with real-time speed of response consistent with any plausible imposed demand.
- b) All transaction and system status information is to be recorded and made available to designated categories of users of the system according to their needs, subject to necessary security controls.
- c) The importance of compatibility between the Access Control and the Surveillance systems and a common user interface for staff which is consistent with their functional needs.

The system shall comprise the following functional elements:

- a) A workstation computer server with secure Ethernet communication subsystem that supports the Access Control application software. The provisional location of this equipment is the Control Room. A local UPS to the system shall be incorporated. This UPS shall be fed from the building standby generator backed up supply;
- b) A client processor equipped with take-on reader and associated equipment and supporting software, to be located at the Control Room in the main building. Separate Biometric registration reader must be provided.
- c) A graphical user interface;
- d) Each controlled access door is to be equipped with:
 - An IP addressable controller with local battery backup power supply;
 - An approved high security magnetic door lock fitted with alarm escape facilities and
 - Readers for card input for both in and out directions
- e) Green Break Glass units (resettable plastic) for emergency use on secure sides of door;
- f) Comprehensive status display and reporting with search capability; and
- g) The core design of the system and the application software shall provide flexible configuration options to be selected with reference to the Engineer during detail design. Facilities for custom written extensions to the application software to meet additional future Client requirements will be available.
- h) Operator workstation, shall be accessed via a Biometric fingerprint reader installed at the workstation.

The building is to receive an IP networked access control system, which will manage the movement of personnel and visitors as shown on the drawings. This would be by means of magnetic door locks including door reclosers, controlled by means of proximity card readers or dual biometric / card readers on either side of the door. The doors are to have provision to be connected to the Fire Detection System and must be released in a fire condition (Fire alarm from Fire Detection System). Fire Detection system is to be installed under the mechanical contractors work, which is part of the overall project. The computer system and software shall be housed in the central control room. The personnel are to be issued with personalized access cards to operate the doors. The controlling system must have the ability to identify a card user through the system and keep a movement data sheet of at least two weeks. The system must allow access only to people with valid cards or valid biometric.

The access Control Doors need to be self-closing. The self closing mechanisms to be supplied and installed as part of this contract. The Access Control Sub Contractor will fit Maglocks into the top of each opening leaf of these doors. The access doors shall be able to be overridden by green emergency break glass units. All access control doors forming part of the emergency exit rout, shall be overridden in the event of a fire with a signal from the fire detection system.

It is a specific requirement of the contract that the installation of the Access Control be done by specialists who are conversant with this type of work.

The system must only allow access to people with valid cards. The system must cater for the capture of new users as well as their cancellation if not allowed in the building.

This access system must be user friendly and no other programs other than windows 7 must be required to operate

the system. Database to be ODBC compliant.

A party line configuration, which relies on regular polling of the reader station, shall not be utilized.

20.B ACCESS CONTROL HARDWARE

20.B1 IP-Based Biometric Door Access Control Panel;

**Specification is based on ZKTeco inBio-series IP-based Biometric Door Access Control Panel
Similar and approved equal control panel conforming to the specification may be accepted**

The Controller shall be complete with integrated 3A power supply including battery back up (7AH battery) in housing)

Truly Internal Biometric Identification

inBIO carries out the matching of fingerprints on the panels. The FR Series of readers transmit fingerprint templates to inBIO via RS485 for fast and accurate matching with templates stored in the database. Wiegand inputs are also provided for traditional RFID readers

Communication

inBIO controllers can be installed easily on your network and support both TCP/IP and RS-485 communication. Auto-discovery tool allows setting and modification of network parameters directly and easily.

Capacity

Support up to 3000 fingerprint templates, 30,000 badge users and store up to 10,000 events and transactions. Data is preserved if power is lost. Controller continues to operate if network connection is interrupted.

Lowest Total Cost of Ownership

Save cost. Controller firmwares can be upgraded without any advanced tools. New features can extend and expand the value of your investment.

More than Door Control

Access additional control and interface. After programming, auxiliary relays can be functioned as lights, alarms and intrusion detection panels. Extra locking devices or gate controllers can be accessed.

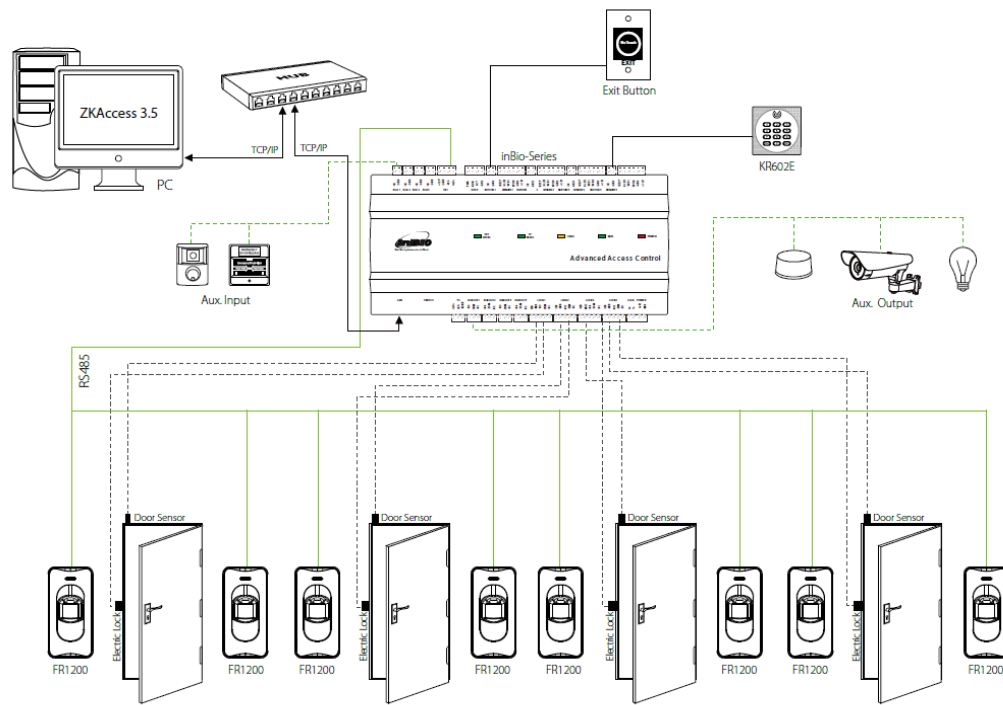
Options


inBIO controllers come in 3 sizes to suit project needs and reduce the cost of unused capacity. 1-door, 2-door, and 4-door models can be mixed and matched in an optimized system architecture.

Advanced Access Control Built-In

Anti-Passback, First-Card Opening, Multi-Card Opening, Duress Password Entry, and Auxiliary input/output linkages are built into controller firmware.

Typical Installation



<div> inBio-160/260/460 Package B <div>  </div> </div>	Item	Description	Quantity
	inBio160/260/460	Control Panel	1 ea
	Case01	Metal Case	1 ea
	ZKPSM030B	Power Supply, DC12V/3A, Available to Charge for Battery Back-up	1 ea
	FR107	Diode for Lock	1 ea
	Key	Key for Metal Case	2 ea
	ZKAccess CD	Access Software for Control Panel, User Manual	1 ea
	Gross Weight	3.6-3.7kg	
	Size	350(L)×90(H)×300(W)mm	

Specifications

	inBio-160	inBio-260	inBio-460
Number of doors controller	1 Door	2 Door	4 Door
Numbers of readers supported	4(2 RS-485 Reader, 2 26-bit wiegand reader)	8(4 RS-485 Reader, 4 26-bit wiegand reader)	12 (8 RS-485 Reader, 4 26-bit wiegand reader)
Types of readers supported	26-bit Wiegand and RS485 FR Series Reader	26-bit Wiegand and RS485 FR Series Reader	26-bit Wiegand and RS485 FR Series Reader
Number of Inputs	3(exit Device and Door Status, 1 AUX)	6(2 Exit Device, 2 Door Status, 2 AUX)	12(4 Exit Device, 4 Door Status, 4 AUX)
Number of Outputs	2 (1-Form C Relay for Lock and One Form C Relay for Aux Output)	4 (2-Form C Relay for Lock and 2-Form C Relay for Aux Output)	8 (4-Form C Relay or Lock and 4-Form C Relay for Aux Output)
Card holders Capacity	30,000	30,000	30,000
Fingerprint Capacity	3,000	3,000	3,000
Log Events Capacity	100,000	100,000	100,000
Communication	TCP/IP and RS-485	TCP/IP and RS-485	TCP/IP and RS-485
Package Dimension	350(L)×90(H)×300(W)mm	350(L)×90(H)×300(W)mm	350(L)×90(H)×300(W)mm
Package Weight	3.6kg	3.6kg	3.7kg
CPU	32 bit 400MHz CPU	32 bit 400MHz CPU	32 bit 400MHz CPU
RAM	32M	32M	32M
Flash Memory	128M	128M	128M
Power	9.6V-14.4V DC	9.6V-14.4V DC	9.6V-14.4V DC
Operating Temp	0-45 °C	0-45 °C	0-45 °C
Operating Humidity	20% to 80%	20% to 80%	20% to 80%

20.B2 Access Control Reader (Finger Print & RFID)

Specification is based on ZKTeco FR150 –WP Flush mounted RS-485 Finger print and RFID reader (Outdoor Capable), Complete with cable management bracket.

Similar and approved equal readers conforming to the specification may be accepted

Features

- Single gang Standard junction box installation.
- Flush-Mounted Design for neat installation.
- RS-485 Communication Interface.
- BioID Fingerprint Sensor; SilkID Fingerprint Sensor (Optional).
- Stainless Steel Front casing.
- Fingerprint Protective Cover.
- IP65 Waterproof

Specifications

Additional Info

Working Temperature: -10 °C ~ 45 °C
 Working Humidity: 20 ~ 95%
 Dimensions(LxWxH): 121.3 × 77.3 × 38 mm
 Algorithm: ZKFinger v10.0

Power Supply

Operating Voltage 12VDC
 Stand-by Mode Power Consumption: 12V*60mA=0.72W
 Peak Current of Fingerprint scanning: 140mA

Hardware

1.0 GHz CPU
 ZKBioID Sensor
 Buzzer Prompt
 Three-color Indicator Light

Standard Features

125KHz RFID Card

Communication

RS485

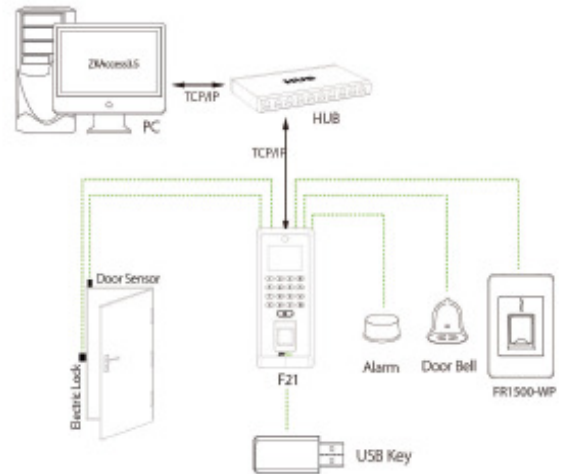
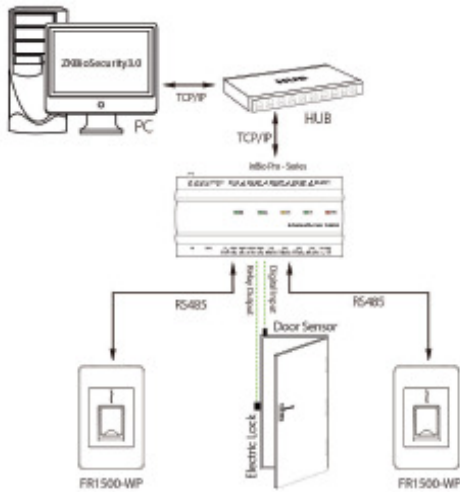
Compatibility

InBio/InBioPro Controllers
 Standalone Fingerprint Devices

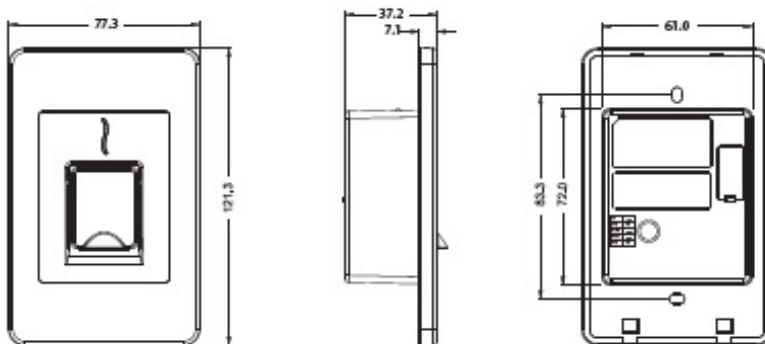
Optional Features

125KHz HID Prox Card
 13.56MHz MifareCard(S50 / S70)
 13.56MHz HID Iclass Card

Configuration



Dimensions (mm)



20.B3 Door Locks

Electronic door locks shall be of the types specified hereunder. Fitment of the units shall be part of the security scope of works.

Magnetic locks and plates shall be used to hold all access control doors closed. The Access Control Contractor shall supply and install all such locks. Lock kits are to be complete with appropriate cover and tamper proof screws, all "Z" brackets, ensuring that no access can be gained and that they are vandal proof. Each single door or normal opening leaf of a double door shall be fitted with a 300kg strength magnetic lock. The locks shall operate on a 12volt supply.

The contractor shall be responsible for all fixing materials, brackets, co-ordination etc. to successfully and aesthetically mount the locks in the doors. It is important to note that the contractor shall obtain the engineer's approval of his mounting detail before installation commences. No claims in this regard shall be considered after installation without approval

The locks shall release:

- On acceptance of a valid card or by Biometric Reader
- Via override switch (Green Break glass unit) or future fire detection system signal.

The Access Control Contractor shall submit shop drawings of the proposed methods of fixing such locks to the doors and door frames, for the approval of the Engineer and Architect, prior to fitting any such locks

Failure to comply may result in the Access Control Contractor having to re-fit and or replace doors and magnetic locks at his own cost.

a) Magnetic Lock

- Minimum pressure rating of 300kg;
- Slim-line;
- Monitoring contacts;
- 12V DC; and
- Wiring and connections to be concealed.

b) High Security Swing door electric Lock

- Latchbolt has full 3/4" throw;
- Slam-locking with automatic mechanical deadlock;
- Lock status switch indicates deadlocked latchbolt;
- Keyed one or two sides;
- Nickel plated Strike/Keeper fitted with tamper resistant screws;
- Factory wired field-side pigtail;
- Stainless steel faceplate fitted with tamper resistant screws; and
- The security contractor is to ensure that these are fitted to the manufacturers specifications (door gap, etc)

c) Heavy duty electric lock

A high quality (zinc plated steel case and striker) electric and key operated lock for the pedestrian gate which shall be pull resistant up to 2000kg, tested for one million cycles. The lock shall be capable of either inward or outward opening and for either left or right handed doors. (exact type of opening to be confirmed by gate manufacturer). The lock shall be electrically operated by access control system or keys. Lock shall be supplied with six (6) keys. The lock shall be suitable for mounting and control of Steel Gates.

20.B4 Access Control Host PC

- Precision Tower Workstation PC
- Intel Core i7 - 14700
- HDD :1 x 1TB SSD
- RAM – 16 GB DDR5 RAM;
- Intel Graphics Nvidia T1000 4 GB GDDR
- Ports – 1 Parallel, 2 Serial, 6USB (2 at front & 4 at back with USB 3.0 support),
- 4 x HDMI, Front and rear USB type A & C

- DVD ROM;
- LAN Card : Integrated 10/100/1000
- MBPS Fast Ethernet with Wake on LAN Support;
- Integrated Audio Controller;
- Multimedia Internet ready Keyboard USB Optical Scroll Mouse;
- Windows 10 Pro
- Power supply Unit

The Workstation is based on the Dell Precision 3680 Tower Workstation PC. All workstations shall be able powerful to run the systems specified seamlessly. (Similar and approved equal workstations conforming to the above specification may be accepted).

20.C CABLES

All communications cables shall be copper, twisted pair cables of minimum cross-sectional area of 0.22 mm² and shall have Mylar screening.

All current carrying conductors shall be stranded copper and correctly sized to operate within the parameters of the security and access control equipment.

Guideline of Cabling allowed is as follows

- Cat 6e UTP for biometric readers to network switch (Indoors)
- Cat 6e UTP Ruggedized UV protected outdoor network cable – Black – (Outdoor gate and fence mounted)
- 0.5mm² Twin Flex for magnetic locks and break glass units


20.D POWER SUPPLIES AND BATTERY BACKUP

Specification is based on ZKTeco inBio - Power supply control panel

Similar and approved equal control panel conforming to the specification may be accepted

The Controller shall be metal case complete with integrated 3A power supply including Lithium (LiFePO4) 12.8V 7AH battery back up.

Each power supply shall be allocated a unique number permanent tag. One tag to be mounted to the enclosure and the other to the ceiling below the enclosure. The ceiling tag shall be visible from underneath.

	Item	Description	Quantity
	inBio160/260/460	Control Panel	1 ea
	Case01	Metal Case	1 ea
	ZKP5M030B	Power Supply, DC12V/3A, Available to Charge for Battery Back-up	1 ea
	FR107	Diode for Lock	1 ea
	Key	Key for Metal Case	2 ea
	ZKAccess CD	Access Software for Control Panel, User Manual	1 ea
	Gross Weight	3.6-3.7kg	
	Size	350(L)×90(H)×300(W)mm	

20.E DOOR MONITORING SWITCHES

Doors shall be monitored by means of magnetic type read switch with a high security bias balanced magnetic read switch type with operating and release distances of 12mm and 15mm respectively, installed on top of the doors or door sets. Care shall be taken to ensure that the switches are mounted in such a manner and position to limit interference from the magnetic locks.

20.F EMERGENCY RELEASE BREAK GLASS UNITS

Re-settable green break plastic units with glass inserts and plastic front cover shall be installed on the secure side at each access controlled door, wired to release the door strike / magnetic lock and raise an alarm when the unit is activated.

20.H TURNSTYLES

The Main Entrance shall have an entrance and separate Exist turnstile. The turnstyles shall be supplied and installed by the Main Contractor. The turnstile shall have a bidirectional locking mechanism. The turnstyles shall form part of the lock down facility. During normal operation the turnstyles shall allow free flow to people entering and exiting. If in lock down mode, a green breakglass unit shall be able to override the turnstyles in case of fire emergency.

20.I LOCK DOWN FACILITY

Access control system shall have the facility to activate the lock down of all or any access control doors. This shall include all perimeter doors, turnstyles, disabled entrance doors and all motorised vehicle gates.

20.I1 Panic Buttons

Panic buttons shall consist of robust surface mounted micro switch push button.. The device shall be mounted on a standard 100mm by 50mm box. These panic buttons are required in all court rooms where contact between Judges and court attendees may occur and various other high risk areas.

20.I2 Activation

Activation of any push button shall sound an audible tone in the associated control room and cause the associated icon on the operator control console to flash. The audible tone may be silenced from the control console causing the icon to remain steady with a red colour. The emergency condition of the icon shall only be reset once the latched button has been reset with the key release. All panic condition are time and date stamped and logged within the operator workstation together with the current operator detail. The lock down facility shall be managed and controlled in the security control room via the access control system. All CCTV Cameras to be recording at their full resolution and frame rate. Further details regarding the Lock down is contained in "CCTV, Intercom and Access Control Introduction" section.

21 INTERCOM INSTALLATION - IP

The Intercom system and components is based on Hikvision Video IP Intercom System. Similar and approved equal VMS conforming to the specification may be accepted.

The IP intercoms to be integrated with the CCTV VMS - HikCentral Professional V2.5.1 or latest suitable package. VMS package to be complete with licenses for IP intercoms.

HikCentral Professional is a software platform provided by Hikvision for integrating and managing security systems. It is designed to meet a variety of security challenges on a single platform. With HikCentral Professional, you can manage multiple individual systems with ease, such as video security, access control, security alarms, and more, as well as explore cross-system functionalities.

21.A Master Station

The Master station is based on the HIKVISION DS-KM9503 video intercom master station (Similar and approved equal equipment conforming to the General specification and the specification below may be accepted).

DS-KM9503 main station, designed with 10-inch touch screen, is mainly applied in the property center, security guard, etc., which can receive real-time alarm from the residents, start video intercom with the residents, and open door remotely for the visitor. The main station is equipped with tempered glass panel and wire drawing frame, which contributes to the simple appearance and sense of technology. With the visible information, the friendly interactive interface, and the touchable operation method, the information is always within reach.

- 10.1-inch IPS touch screen with 1280 × 800 resolution
- Built-in SIP private server, up to 10,000 video intercom devices accessesUp to 128 network cameras can be added to the device
- Supports more than 2 speakers and microphones: Connects to external earphone (3.5 mm), external goose neck microphone
- Displays operation pages via HDMI
- Supports standard PoE & 12 VDC power supply
- Video intercom and access control functions: Call waiting, call priority configuration, call across buildings

• Specification

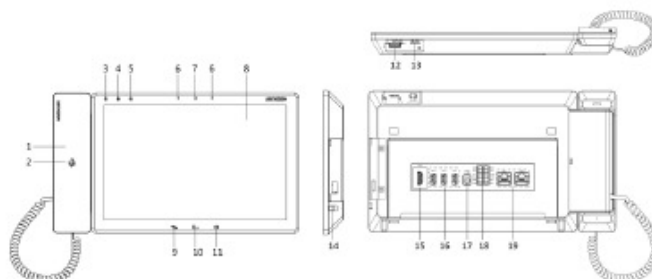
System parameters	
Operation system	Android 7.1
ROM	8 GB
RAM	2 GB
Processor	Embeded high performance processor
Display parameters	
Screen size	10.1-inch
Operation method	Capacitive touch screen
Type	Colorful IPS
Resolution	1280 × 800
Video parameters	
Lens	/
Resolution	2 MP
FOV	Horizontal: 64.1°, Vertical: 48.1°, Diagonal: 80.2°
Wide dynamic range (WDR)	/
Supplement light	/
Video compression standard	Main stream: H.264; Sub-stream: H.264
Audio parameters	
Audio input	Built-in omnidirectional microphone, external speaker, external goose neck microphone, external earphone (3.5 mm)
Audio compression standard	G.711U, G.711A
Audio output	Built-in loudspeaker, external speaker, external voice box or earphone (3.5 mm)
Audio compression bitrate	64 Kbps
Audio quality	Noise suppression and echo cancellation
Volume adjustment	Adjustable
Capacity	
Linked network camera capacity	128
Linked intercom device capacity	10,000
Network parameters	
Network protocol	TCP/IP, SIP, RTSP
Wi-Fi	/
3G/4G	/
Zigbee	/
Device interfaces	
Alarm input	2 (reserved)
Network interface	2
TAMPER	/
RS-485	1 (reserved)
USB	3
TF card	Support TF card, up to 128 G
Lock control	2 relays (reserved)
General	
Button	3 touch buttons

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Installation	Table mounting & wall mounting
Indicator	3
Weight	Net weight: 1.285 kg (2.8 lb) Gross weight: 2.305 kg (5.0 lb)
Protective level	/
Working humidity	10% to 90% (no-condensing)
Dimension (W × H × D)	292 mm × 166 mm × 31 mm (11.5" × 6.5" × 1.2")
Battery	/
Power supply	12 VDC, standard PoE (LAN1)
Application environment	Indoor
Power consumption	≤ 12 W
Language	English, French, Portuguese (Europe), Spanish (Europe), Russian, German, Italian, Polish, Arabic, Turkish, Vietnamese, Hungarian, Dutch, Romanian, Czech, Bulgarian, Ukrainian, Croatian, Serbian, Lithuanian, Estonian, Latvian, Norwegian, Greek, Danish

• Physical Interface

No.	Description	No.	Description
1	Phone	11	Speaker Button
2	Phone Indicator(Reserved)	12	Goose Neck Microphone Interface
3	Power Indicator	13	TF Card Slot
4	Alarm Indicator	14	Earphone Interface
5	Information Indicator	15	HDMI
6	Microphone	16	USB Interface
7	Camera	17	Power Interface
8	Screen	18	Terminals
9	Answer/Hang Up Button	19	Network Interface
10	Unlock Button		



Headquarters
• Available Model
DS-KM9503
www.hikvision.com

Follow us on social media to get the latest product and solution information.



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21.B Network Indoor Station

The Network Indoor Station is based on the HIKVISION DS-KH6320-WTE1 (Similar and approved equal equipment conforming to the General specification and the specification below may be accepted).

The KH6 series IP indoor station, with 7-inch touch screen and Android system, brings you a fluent video and audio communication. By considering the difficulty of deployment of the traditional video intercom, the device has improved the design and can deploy the whole video intercom system by itself independently, without extra devices or configurations, which reduces the deployment time and cost. You can view, chat with, and send permission for the visitor via mobile phone in anywhere. The device can also link other control systems, such as CCTV system, etc

Key Feature

- 7-inch TFT touch screen with 1024 × 600 resolution
- Convenient Hik-Connect APP Mobile Control
- Receive calls, open the door and live view remotely
- Easy to use without PC
- Easy wizard for quick set up
- Configure the whole system on one touch screen
- Live view of the door station and cameras in public areas
- Support voice messages when no response from the indoor station
- Receive alarms by linkage with a alarm system and notify the center to handle in time

• Specification

System parameters	
Operation system	Linux
ROM	32 MB
RAM	128 MB
Processor	Embeded high performance processor
Display parameters	
Screen size	7-inch
Operation method	Capacitive touch screen
Type	Colorful TFT
Resolution	1024 × 600
Video parameters	
Lens	/
Resolution	/
FOV	/
Wide dynamic range (WDR)	/
Video compression standard	/
Focal length	/
Audio parameters	
Audio input	1 built-in omnidirectional microphone
Audio compression standard	G.711U/G.711A
Audio output	1 built-in loudspeaker
Audio compression bitrate	64 Kbps
Audio quality	Noise suppression and echo cancellation
Volume adjustment	Adjustable
Capacity	
Message capacity	TF card inser ted: 200 captured pictures, 200 alarm records Without TF card: 2 MB RAM for picture storage; The storage number is decided by the picture size, 200 alarm records
Notice capacity	200
Linked indoor extensions capacity	16
Linked doorphone capacity	17
Linked network camera capacity	16
Network parameters	
Network protocol	TCP/IP, SIP, RTSP
Wi-Fi	2.4 GHz, IEEE802.11b, IEEE802.11g, IEEE802.11n
Bluetooth	/
3G/4G	/
Zigbee	/
Device interfaces	
Alarm input	8
Network interface	1 RJ-45 10/100 Mbps self-adaptive
TAMPER	/



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RS-485	1 RS-485 (Half duplex)
USB	/
TF card	Support TF card, up to 128 G
Alarm output	2
Lock control	2 relays, Max. 30 VDC 0.3 A
General	
Button	/
Installation	Surface mounting
Indicator	/
Weight	Net weight: 355 g (0.8 lb) Gross weight: 683 g (1.5 lb)
Protective level	/
Working temperature	-10 °C to 55 °C (14 °F to 131 °F)
Working humidity	10% to 90% (no-condensing)
Dimension (W × H × D)	200 mm × 140 mm × 15.1 mm (7.9" × 5.5" × 0.6")
Battery	/
Application environment	Indoor
Power consumption	≤ 5 W
Language	English, Russian, Bulgarian, Hungarian, Greek, German, Italian, Czech, Slovak, French, Polish, Dutch, Portuguese (Brazil), Spanish, Hebrew, Romanian, Turkish, Estonian, Danish, Swedish, Norwegian, Finnish, Vietnamese, Croatian, Slovenian, Serbian, Arabic, Portuguese (Portugal), Lithuanian, Uzbek, Kazakh, Mongolian, Ukrainian

21.C IP Video Intercom Module Door Station

The door station is based on the HIKVISION DS-KD8003-IME1/S video intercom (Similar and approved equal equipment conforming to the General specification and the specification below may be accepted).

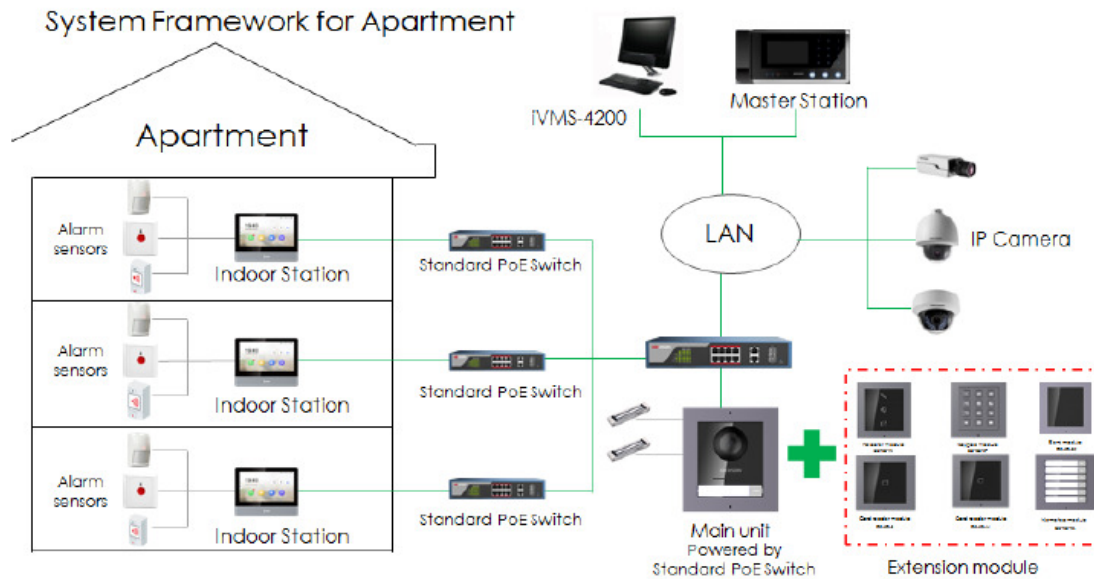
Key Feature

- MP HD video intercom function
- Access control function
- Noise suppression and echo cancellation
- H.264 video compression
- Low illumination
- Tampering alarm supported
- Fisheye camera with IR supplement light
- Supports sub-modules' access (max. 8)
- Nametag customization
- Easy to and extend

Specification

Model		DS-KD8003-IME1
System parameters	Processor	Embedded MCU Processor
	Operation system	Embedded Linux Operation System
	Operation method	Physical Button
Video parameters	Camera	Low Illumination 2 MP HD IR Camera
	Video compression standard	H.264
	Resolution	Main Stream: 1920 × 1080 Sub Stream: 720 × 480
	BLC	Supported
	DNR	Supported
	WDR	Supported
	Anti-flicker	50 Hz, 60 Hz
	Field of View	Horizontal: 180° Vertical: 96°
Audio parameters	Audio input	Built-in Omnidirectional Microphone
	Audio output	Built-in Loudspeaker(More than 85 dB within 20 cm)
	Audio compression standard	G.711 U
	Audio compression rate	64 Kbps
	Audio quality	Noise Suppression and Echo Cancellation
Light supplement	Light supplement mode	IR Supplement
Network parameters	Ethernet	10/100 Mbps Self-Adaptive Ethernet
	Network protocol	TCP/IP, RTSP
Alarm parameters	Tampering alarm	1
Interfaces	Module-connecting	1
	I/O input	4
	Debug	1
	Relay	2 (30 V, 1 A)
General	Physical button	1
	Power Supply	12 VDC/PoE (IEEE 802.3af)
	Power consumption	≤10 W
	Working temperature	-40° C to +60° C (-40° F to 140° F)
	Working humidity	10% to 95%
	IP protection level	IP65
	Installation	Flush Mounting, Surface Mounting
	Dimensions (L × W × H)	98 mm × 99.8 mm × 43.9 mm (3.86" × 3.93" × 1.73")

Typical Application



Available Model

DS-KD8003-IME1

22 MOTORISED GATES AND OPERATIONS

The following is the operation of the motorised gate systems to be provided as indicated on the drawings.

1. Motorised entrance gate "1" and "Check in Lobby" gate 2 to have gate closing sensors and interlocked.
2. Motorised entrance gate "1" can only operate if Check in Lobby" gate 2 is closed and vice versa. (Gate operation is interlocked)
3. A green break glass unit installed in the SAPS office shall override the interlock of gate 1 and 2 in case of a fire emergency.
4. Each gate forms part of the Lock Down.
5. Motorised gates 3 and 4 shall form part of the Lock Down
6. Each gate shall have intercoms linked to the control room. The control room shall operate the opening and closing of the gates. Intercoms measured elsewhere.

The contractor shall allow for all the equipment, wiring, installation and commission of the system as described above and specified below including any additional equipment not specifically mentioned in order to attain the desired operation.

The following specifications relate to the equipment to be provided.

22.A Heavy Duty Motorised Gates – Sliding – D20 Smart

The Motorised gate is based on the Centurion D20 Smart. All motorised gates must be equivalent and approved equal.

The motorised gate unit shall be suitable for an industrial gate with a weight of up to 2000kg

A protective wired safety beams to be installed onto the pillars.

The motorised gate shall be complete with all Steel racks (7m), batteries etc.

A galvanised antitheft bracket is to be installed over the motor and is to have a tamper proof lock fitted with two spare keys.

TECHNICAL SPECIFICATIONS

Technical Data	D20-SMART	
Input voltage	90V - 240V AC +/-10% @ 50Hz ¹	
Current consumption (Mains)	250mA	
Battery charger current output	1.8A @ 27.4V +/-1%	
Maximum number of operations per day	750 ^{2,5}	
Duty cycle - Mains present ^{2,3}	45%	
Motor voltage	24V DC	
Motor power supply	Battery-driven (Standard Capacity - 2x 7.2Ah) ³	
Current consumption (motor at rated load)	9A	
Input / Output sink currents (Max accessory current draw)		
I/O 1-4	100mA (12/24V)	
I/O 5 and 6	3A (12/24V) 10sec Pulse	
Motor push force - starting	52kgf	
Motor push force - rated	39kgf	
Gate mass - maximum	2000kg	
Gate length - maximum	25m	
Gate speed (varies with load) ^{2,5}	Up to 18m/min ³	
Manual Override	Lockable lever with key release	
Drive Pinion	13T Module 4	
Operations in standby with 2x 7.2Ah batteries	Operating Mode	
	Power Saving 15m/min 20kgf	Normal 18m/min 20kgf
	Half day ^{2,3,4}	55
	Full day ^{2,3,4}	45
Collision Sensing	Electronic	
Operating temperature range	-15°C to +50°C	
Onboard receiver type	CENTURION rolling code (Keelog encryption) multichannel	
Receiver code storage capacity	1500 Remotes ⁶	
Receiver frequency	433.92MHz	
Degree of protection	IP54	
Mass of unit packed (with standard kit, but excl. rack and battery)	13kg	
Packaging dimensions (with standard kit, but excl. rack and battery)	350mm wide x 282mm deep x 470mm high	

1. Can operate off a solar supply, consult your local dealer for assistance

2. Based on 25°C ambient temperature and unit not in direct sunlight

3. Based on a motor push force of less than 50% of rated (Starting and Running forces)

4. Gate opening and closing speeds can be configured to run slower depending on the requirements of individual installations

5. Can increase battery capacity for longer standby times

6. Based on 4m gate, excluding all accessories

7. Multiple buttons per remote can be used

22.B Motorised Gates – Double Leaf Rotary swing gates – Centurion R6

The Motorised Rotary Double swing gate is based on the Centurion R6. All motorised gates must be equivalent and approved equal

The motorised swing gate units shall be suitable for light industrial gate with a weight up to 250kg per leaf.

A protective wired safety beams to be installed onto the pillars.

The Motorised Rotary Double swing gate shall be complete with :

- Wireless receiver
- Controller Wall box (Weatherproof)

- Drive arms and Mounting kits
- Mounting Pedestals (Ground Mount)
- Batteries - Lithium (LiFePO4) 12.8V 7AH.

The motorised gate shall be complete with all accessories.

TECHNICAL SPECIFICATIONS

	R6			
Input Voltage CP13E CP84SM	220V - 240V AC +/-10% @ 50Hz ¹ 90V - 240V AC +/-10% @ 50Hz ¹			
Motor voltage	12V DC			
Current Consumption (mains) CP13E CP84SM	80mA 170mA			
Maximum DC Current Draw	16A			
Maximum Output Torque Standard-torque operator High-torque operator	300Nm 390Nm			
Power Supply ² Domestic Light-industrial Industrial	0.8A CP13E, 7.2Ah Battery 1.8A CP84SM, 7.2Ah Battery 1.8A CP84SM, 33Ah Battery			
Maximum Daily Operations	Mains present		Back-up ²	
	Double leaf	Single leaf	Double leaf	Single leaf
	20	30	20	30
	250	250	40	60
	250	250	250	250
Maximum Daily Continuous Operations	Mains present			
	Double leaf		Single leaf	
	20		30	
	50		50	
	100		100	
Typical Gate Operating Time Standard-torque operator High-torque operator	12s 15s			
Mass of Motor Kit ⁴ (excluding pedestal or wall bracket)	15kg			
Collision Sensitivity	Electronic - Adjustable			
Temperature Range	-15°C to +50°C			
Housing Protection	IP55			

1: Can operate off a solar supply, please consult Centurion Systems (Pty) Ltd for assistance.

2: These values are based on fully charged batteries, derate accordingly based on connected ancillaries.

3: Choose appropriate variation based on site requirements.

4: The weight of an operator kit (regardless of Master or Slave).

GATE SPECIFICATIONS

R6 Standard-Torque Operator									R6 High-Torque Operator								
Gate Length (m)	1.5	2	2.5	3 ²	3.5 ²	4 ²	4.5 ²	5 ²	Gate Length (m)	1.5	2	2.5	3 ²	3.5 ²	4 ²	4.5 ²	5 ²
Gate Height (m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	Gate Height (m)	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Max Mass (Kg)	500	500	480	330	240	185	145	120	Max Mass (Kg)	750	750	620	430	315	240	190	155
Allowable Wind Speed For 25% Clad (Km/h) ¹	114	84.7	67.3	56.9	49.2	43.2	38.6	34.8	Allowable Wind Speed For 25% Clad (Km/h) ¹	128.4	95	76.3	64.6	55.9	49.2	43.9	39.6
Allowable Wind Speed For 100% Clad (Km/h) ¹	57	42.4	33.6	28.5	24.6	21.6	19.3	17.4	Allowable Wind Speed For 100% Clad (Km/h) ¹	64.2	47.5	38.1	32.3	27.9	24.6	21.9	19.8

1: No wind opening time ~ 12s. Gate opening and closing times will increase as wind speed increases.

2: Fit an electric gate lock if the leaf width is greater than 3 metres.

1: No wind opening time ~ 15s. Gate opening and closing times will increase as wind speed increases.

2: Fit an electric gate lock if the leaf width is greater than 3 metres.

23 UNINTERRUPTABLE POWER SUPPLIES (UPS)

2kVA / 3kVA True on line double conversion UPS – Rack Mount complete with brackets and batteries.

The UPS must conform to the following:

Be suitable for operation on a generator supply
Double Conversion true on line UPS System
Pure Sine Wave
Internal Batteries
Output power factor 0.8
LCD display
Generator Compatible
Local design, manufacture and support

The UPS is based on the Mercury Plus RT2KVA & Mercury Plus RT3KVA (Similar and approved equal equipment conforming to the General specification and the specification below may be accepted).

MODEL	Mercury Plus RT1KVA		Mercury Plus RT2KVA	Mercury Plus RT3KVA
Phase	Single phase			
Capacity	1000 VA / 800 W	2000 VA / 1600 W		3000 VA / 2400 W
INPUT				
Nominal voltage	230VAC			
Input voltage range	160-280VAC at 100% load			
Frequency range	50Hz-70Hz			
Power factor	≥0.99 @ nominal Voltage (100% load)			
OUTPUT				
Output voltage	230VAC			
Voltage regulation	±1%			
Frequency range (batt. mode)	50Hz ± 0.25Hz			
Current crest ratio	3:1			
Harmonic Distortion	≤3%THD (linear load), ≤6%THD (non-linear load)			
Transfer	AC mode to Batt mode	Zero		
Time	Inverter to bypass	4ms (typical)		
Waveform (batt mode)	Pure Sinewave			
EFFICIENCY				
AC mode	88%	89%	90%	
Battery mode	83%	87%	80%	
BATTERY				
Battery type	12V / 7AH			
Numbers	2	4	6	
Typical recharge time	4 hours recover to 90% capacity			
Charging current	1.0A			
Charging voltage	27.4VDC ±1%	54.7VDC±1%	82.1VDC±1%	
INDICATORS				
LCD panel	UPS status, load level, battery level, input/output voltage, discharge timer, fault conditions			
ALARM				
Battery mode	Sounding every 4 seconds			
Low battery	Sounding every second			
Overload	Sounding twice every second			
Fault	Continuously sounding			
PHYSICAL				
Dimension DxWxH (mm)	310x440x88 (2U)	410x440x88 (2U)	630x440x88 (2U)	
Weight (kgs)	12	19	29.3	
ENVIRONMENT				
Humidity	20-90% RH @ 0-40°C (non-condensing)			
Noise level	Less than 50dB @ 1metre			
MANAGEMENT				
Smart RS-232 / USB	Supports Windows 2000/2003/XP/Vista/2008, Windows 7/8/10, Linux and MAC			
Optional SNMP	Power management from SNMP manager and web browser			
SUITABLE APPLICATION Commercial medical, IT Applications				

24 X-Ray Machines and Walk through metal detectors

24.A X-Ray Machine

One X-ray machine shall be placed in the foyer in front of the entrance turnstile. The screen of the X-ray machine shall be placed at the counter of the security personnel.

The X-ray machine is based on a ZKTECO - DUAL ENERGY X-Ray Inspection System (ZKX6550) or similar and approved equal type of X-Ray machine may be accepted. The X-Ray machine supplier shall have a national foot print for supplies, repairs and maintenance. All suppliers shall be in existence of 5 years or more. All spare parts shall be readily available in South Africa. Suppliers shall have client references using x-ray machines in the Eastern Cape.

The X-ray machine shall conform to the minimum DPW technical specification below.

Specifications

Tunnel Size	W650mm × H500mm
Speed	0.20 m/s
Height of Transmission Belt	700 mm
Maximum Load	≤180 kg (Adequate distribution)
Wire Resolution	38 AWG (0.102mm metal wire)
Space Definition	Horizontal Φ1.0mm \ Vertical Φ2.0mm
Penetrate Definition	34 AWG
Penetration	38mm Steel board
Monitor	21.5 inch LED
System Function	High density alarm, Explosive/Drug auxiliary detect, TIP, Luggage counter, System running timer, X-ray emitting timer, Training, 64 times continuous zoom in
Film Safety	ASA/ISO1600 standard of film safety

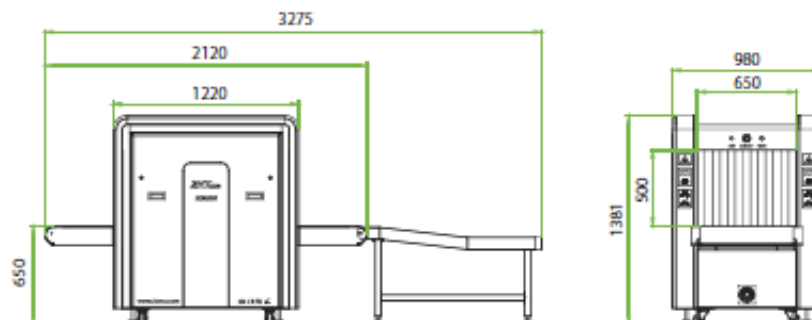
X-ray System

Tube Voltage	140 KV
Cooling	Seal oil cooling / 100%
Single Inspection Dosage Rate	≤1.0 μ Gy
Radiation Leak Dosage	0.1 μ Gy/h (5cm from the surface)

Installation Specification

Size	L2120mm × W980mm × H1381mm
Package Size	L2240mm × W1170mm × H1755mm
Console Desk Size	L805mm × W900mm × H1320mm
Package Weight	680KG+105KG (Console desk)
Power Consumption	1 kVA
Noise	53.8 dB(A)

Dimension



The X-ray machine shall conform to the minimum DPW technical specification below.

24.B Metal Detector

One walk through metal detector shall be placed at the front Public Entrance. The public shall be channeled through the walk through metal detector.

The metal detector supplier shall have a national foot print for supplies, repairs and maintenance. All suppliers shall be in existence of 5 years or more. All spare parts shall be readily available in South Africa. Suppliers shall have client references using x-ray machines in the Eastern Cape

The Walk-through metal detector has to be a Multi Zone with minimum of 33 distinct pinpoint zones, world renowned, offering high throughput with fewer unnecessary alarms. Targeted objects, such as guns and knives, are consistently and accurately detected, while personal items such as keys, coins, belt buckles and eyeglasses can pass through without causing an alarm. The uniform detection field is unique and state-of art. The machine must find threat objects regardless of their orientation. Because the unit is continuously active, at no time will it possible to toss, pass or slide a weapon through without detection

24.B1 Specifications:

The walkthrough metal detector is based on the ZKTeco – ZK-D4330 Walk Through Metal Detector. Similar and approved equal metal detectors may be accepted.

Features

- 33 detection zones
- 7" touch screen
- Remote control
- Simple installation and use
- In and out count
- TCP/IP communication
- Excellent anti-interference ability and stability
- Each zone has 500 adjustable sensitivity level
- Supports various language interface customization
- Higher accuracy and verification speed
- Pass count and Alarm count memory function

Walk Through Metal Detector shall conform to the minimum DPW technical specification below.

TECHNICAL SPECIFICATION
FOR
X-RAY INSPECTION UNIT

CLAUSE	DESCRIPTION	STATE DETAILS OF OFFER
1.1	<u>GENERAL</u>	
1.1.1	A licence for the X-ray machine, issued in terms of the Hazardous Substances Act (Act 15 of 1973), must be submitted with the tender, failing which the tender will not be considered. Plus the ID No's and SANS BIN No. of the service technicians registered to carry out the servicing of the X-ray machines in accordance with the requirements of the SANS.	_____ _____
	Name and tel. No. of the tenderer's contact person to make arrangements with:	
	Name: _____	
	Tel. No. _____	
1.1.2	The X-ray inspection unit shall complete with:	
	- Dual Energy Detector system (Multi Energy Imaging)	_____
	- Colour monitor (remotely operated)	_____
	- Conveyor belt	_____
	- Screening for full profile of inspection tunnel	_____
1.2	<u>GENERAL SPECIFICATION</u>	
1.2.1	<u>Construction Details</u>	
1.2.1.1	The unit must incorporate a facility to be controlled either from the right or the left-hand side.	_____
1.2.1.2	In addition a facility must be incorporated so that, the operating keyboard and monitor can be operated remotely, at least 5m from the unit.	_____
1.2.1.3	Maximum height including the tunnel shall not exceed 1400mm from the floor level.	_____
1.2.1.4	The unit must be quiet when in operation.	_____
1.2.1.5	X-ray high voltage generator, shall be rated at 160kV and operate at 140kV	_____
1.2.1.6	Ambient conditions, under which the unit must operate: -0°C to 40°C -relative humidity 95%, non-condensing	_____ _____
1.2.1.7	Control elements (pushbuttons, switches, etc.) are to be of sturdy design, selected for severe operating conditions.	_____
1.2.1.8	The unit must be of steel base construction on roller castors and not exceeding 700kg in total weight.	_____

1.2.1.9	Discharge rollers to be included with the unit. The discharge roller platform shall be long enough to prevent articles being X-rayed from falling off before it is recovered by the owner.	
1.2.1.10	The conveyor belt must be designed for 24 hour, heavy-duty operation.	
1.2.1.11	The unit shall not be longer than 900mm wide and 2600mm in overall length, including the conveyor belt platform.	
1.2.2	<u>Power ratings</u>	
1.2.2.1	The unit has to operate from 230V $\pm 5\%$, 50 Hz, single phase power supply.	
1.2.2.2	The maximum running current shall be less than 5A.	
1.2.2.3	A suitable power point will be provided on the site by others.	
1.2.3	<u>Image presentation</u>	
1.2.3.1	Objects of the following dimensions must be able to be passed through the tunnel without any obstruction: <div style="margin-left: 40px;"> - Height: at least 400mm - Width: at least 600mm - Length: unlimited </div> Monitor display shall cover not less than 500mm of the object length. Full scan volume must be seen on the screen, <u>without any corner cut-off</u> . This is a firm requirement.	
1.2.3.2	Imaging scale of all objects should be constant with the minimum distortion.	
1.2.3.3	A zoom facility is essential. The optimum requirement is for the push-button selection of at least 9, independent zoom sectors. The selected sector must be identified by light frame before zoom is activated.	
1.2.3.4	A colour monitor (non-interlaced), screen size of at least 34cm, is required. Parallel operation of additional monitors, without modification to the unit, must be available.	
1.2.3.5	The image on the monitor screen must be flicker free.	
1.2.3.6	Control of brightness and of contrast must be provided on the front panel of the monitor.	
1.2.3.7	Possibility of switching over from "POSITIVE" to "NEGATIVE" image should be available as an option.	
1.2.3.8	A digital memory is essential.	
1.2.3.9	The capacity of the digital memory must exceed 1Mbyte.	
1.2.3.10	The number of solid state detectors shall be not less than 1152.	
1.2.3.11	Dual (Multi) energy colour system with a four (4) colour (Industry Standard) is a firm requirement.	
1.2.3.12	Organic/Inorganic colour stripping.	

1.2.3.13	High and low penetration.	<hr/>
1.2.3.14	Variable colour stripping and variable gamma edge enhancement.	<hr/>
1.2.3.15	Automatic density (variable) threat alert.	<hr/>
1.2.3.16	Automatic organic material threat alert.	<hr/>
1.2.3.17	Operator log-in identification facility.	<hr/>
1.2.3.18	Video output capabilities for recording of images shall be included.	<hr/>
1.2.3.19	Voltage stabiliser must be included.	<hr/>
1.2.3.20	UPS shall be included to provide 10 – 15 minutes back-up.	<hr/>
1.2.4	<u>Resolution and penetration</u>	
1.2.4.1	A sample wire with diameter of 0.16mm (AWG 34) must be distinguished on a monitor, and 30AWG wire must be visible behind 21mm of aluminium.	<hr/>
1.2.4.2	The image quality on the monitor must be uniform, without distortion in the centre or the edges.	<hr/>
1.2.4.3	Penetration of 25mm steel minimum must be guaranteed.	<hr/>
1.2.4.4	A pre-selectable density threat level must be a feature of the equipment, with a visual and/or audible alarm if any item being screened exceeds that pre-selected density.	
1.3	<u>CONTROL OPERATION – MINIMUM REQUIREMENTS</u>	
1.3.1	<u>Controls</u>	
1.3.1.1	A mains key switch for 230V main power supply is required.	<hr/>
1.3.1.2	Push button – power “ON”.	<hr/>
1.3.1.3	3 Push buttons for conveyor control, “GO”, “STOP” & “REVERSE”.	<hr/>
1.3.1.4	As a minimum, 9 push button keyboard for zoom sector selection and a separate push button for zoom activation is required.	<hr/>
1.3.1.5	A robust, RED, emergency stop push button, fitted in a prominent position on the keyboard, as well as on the X-ray unit.	<hr/>
1.3.1.6	Light symbols indicating “X-ray on”.	<hr/>
1.3.1.7	X-ray warning signs, in accordance with the requirements of the SA Radiation Board, must be attached to each end of the tunnel in a visible position.	<hr/>
1.3.1.8	Easy operation of the unit is essential.	<hr/>
1.3.2	<u>Passage of luggage through X-ray unit</u>	
1.3.2.1	Objects must be able to be conveyed through the unit in any orientation.	<hr/>

1.3.2.2 All objects, also those which is only partially lying flat on the conveyor belt (e.g. guitars, etc.) must be fully screened.

1.3.3 **Object representation**

1.3.3.1 The conveyor belt speed should be such that each point of an object, when passing through the unit, will be visible for at least 5 seconds

1.4 **CONVEYOR BELT**

1.4.1 **Loading**

1.4.1.1 At least 75kg overall weight

1.4.1.2 The conveyor belt must be driven by an almost noiseless drum-motor.

1.4.2 **Dimensions**

1.4.2.1 Belt length: < 2100mm

1.4.2.2 The height of the top of the conveyor belt above floor level shall be not less than 600mm, but shall not exceed 800mm

1.4.3 **Speed and duty cycle**

1.4.3.1 Conveyor belt speed: approximately 0.2 m/sec.

1.4.3.2 Up to 2400 objects must be screened per hour.

1.4.4 **Operation**

1.4.4.1 Normal: Continuous operation in forward direction.

1.4.4.2 Stop:

1.4.4.3 Reverse: Intermitted operation by pressing the reverse button.

1.4.4.4 Duty cycle: no warm-up period will be accepted.

1.5 **SAFETY**

1.5.1 **X-ray dose: Screened object**

1.5.1.1 Standard –0.1 mrem per inspection. Lower dose units may be offered as an alternative.

1.5.2 **Radiation leakage to surrounding**

1.5.2.1 Less than 0.5 mrem/h at any point on the surface, 5cm from the surface

1.5.2.2 The unit must comply with all ruling international safety regulations such as the German TUV, Swiss SEV, UK NRPB or USA FDA.

1.5.3 **Conveyor belt**

1.5.3.1 The feed and discharge ends of the conveyor belt are to be of such design that fingers, etc. cannot be caught during normal operation.

1.5.4 **Operation under fault conditions**

1.5.4.1 The X-ray tube shall be automatically de –energised when conveyor belt is stopped.

1.5.4.2 X-ray radiation shall only be switched on with the moving conveyor belt, before the object passes through the unit.

1.5.4.3 X-ray radiation shall be automatically switched off if the radiation shielding covers are removed.

1.5.5 **Film safety**

1.5.5.1 Tenderers must guarantee the unconditional safety of photographic material of professional quality.

1.5.5.2 Typical standards must allow for highly sensitive films of 1000 ASA to be irradiated at least 30 times without damage.

1.6 **PLACING IN POSITION AND ASSEMBLING**

1.6.1 The unit shall be placed in position and assembled on site by the successful tenderer.

NOTE: The final placing will be determined on site.

1.7 **BROCHURES**

1.7.1 Brochures, furnishing description and technical specification, etc. of the unit offered, shall be submitted with the tender. If the brochures have information, which does not comply with the specification, the tenderer must submit a covering letter listing all brochure items, which do not comply and confirm that the equipment offered will comply with the specification, referring to these items.

1.7.2 The following information is also required:

Manufacturer:

ISO Rating:

Country of origin:

Model number of the unit offered

Date of manufacture

1.8 **MAINTENANCE, SERVICE AND REPAIR**

1.8.1 The unit design must be of the low maintenance type and with minimum future service. **A statement confirming this is required from the tenderer, together with a copy of the service/maintenance schedule.**

1.8.2 An overall design of modular type is preferred.

1.8.3 Electronic modules must be easily exchanged.

1.8.4 All sub-assemblies in the unit must be of such a design that, maintenance and repair can be carried out by a single person, including removal and exchange of the X-ray generator tanks.

1.8.5 Spare parts must be locally stocked and availability guaranteed for a ten-year period, starting from the date of delivery.

1.9 **GUARANTEE AND SERVICE**

1.9.1 The successful tenderer shall guarantee and service the complete unit for a period of twelve (12) months from the date of delivery to site, and successful commissioning of the unit.

1.9.2 During the period of guarantee, the successful tenderer shall, at his own expense, carry out all necessary repair work, including material and labour, (excluding work required due to damage by others) in order to maintain the unit in a working condition.

1.9.3 The successful tenderer shall, during the period of guarantee, repair the unit to the satisfaction of the Department, within 24 hours after he has been notified that the unit is not operating.

1.10 **TRAINING**

1.10.1 The successful tenderer shall thoroughly train and instruct all the operators and supervisors, designated by the User Department in the operation of the unit.

1.11 **ONBOARD COMPUTER**

1.11.1 Video Memory: at least 64MB

1.11.2 Processor Speed: at least 3.2GHz

1.11.3 Storage Capacity: At least 160GB

1.11.4 A two part training programme must be incorporated in the system.

1.11.4.1 Part 1 – Initial training

Pre-loaded images must be recalled by the computer, some without and some with threats. The operator must detect the threats and his progress is logged.

1.11.4.2 Part 2 – Ongoing training

The system must merge fake threat images into real time images and the performance of the operator must be logged.

1.12 **MANUALS**

Three complete sets of manuals, each with the following information shall be handed over to the Department when the unit is delivered to site:

(a) Operating instructions

(b) Technical description with diagrams and instructions for maintenance and repairs.

1.13 **DEVIATIONS FROM SPECIFICATION AS ALTERNATIVE (STATE BRIEFLY)**

1.14 **DELIVERY ADDRESS**

Elliot Magistrate Court

2. **TECHNICAL INFORMATION**

State the following information of the unit offered:

- | | | |
|------|---|-------|
| 2.1 | Total height above floor level | <hr/> |
| 2.2 | Maximum X-ray voltage | <hr/> |
| 2.3 | Dimensions of the unit | |
| | Height | <hr/> |
| | Width | <hr/> |
| | Length (including conveyor belt) | <hr/> |
| 2.4 | Total running current | <hr/> |
| 2.5 | Maximum dimensions of objects: | |
| | Height | <hr/> |
| | Width | <hr/> |
| | Length | <hr/> |
| 2.6 | Number of detectors | <hr/> |
| 2.7 | Capacity of digital memory | <hr/> |
| 2.8 | Number of shades of grey | <hr/> |
| 2.9 | Maximum over-all loading on conveyor belt | <hr/> |
| 2.10 | Conveyor belt speed | <hr/> |
| 2.11 | X-ray dose per inspection | <hr/> |
| 2.12 | Radiation leakage at any point, 5cm away from surface | <hr/> |
| 2.13 | Multi-Energy mode – State colours for material discrimination | <hr/> |

TECHNICAL SPECIFICATION
FOR
ITEM - 2: ONE METAL DETECTOR

CLAUSE	DESCRIPTION	STATE DETAILS OF OFFER
3.1	<u>GENERAL</u>	
3.1.1	In addition to complying with the specification, the metal detector shall meet the requirements of this Specification.	
	Name and tel. no. of the tenderer's contact person to make arrangements with:	_____
	Name: _____	
	Tel. No.: _____	
3.1.2	The metal detector shall consist of a free standing walk-through frame with an integral control unit, and shall be suitable to detect metallic objects on a person by means of the magnetic field principle.	_____
3.1.3	The metal detector shall be suitable to detect ferrous and non-ferrous metals.	_____
3.1.4	The metal detector shall be equipped to eliminate false alarms.	_____
3.1.5	The metal detector shall scan the entire area of the walk through area and detect metal objects on a person passing through to the levels as specified.	_____
3.1.6	The metal detector will incorporate self-test button to confirm that the system is operating correctly.	_____
3.1.7	The metal detector shall be completely tamper proof.	_____
3.1.8	The programme and sensitivity push buttons shall be so arranged that tampering by unauthorised persons is entirely eliminated.	_____
3.1.9	The metal detector shall not be adversely affected by stationary metal bars or structures in the vicinity of the unit or moving metal near the archway.	_____
3.1.10	The metal detector shall be capable of operating adjacent to an X-Ray inspection unit.	_____
3.1.11	The detector is intended for indoor use at an altitude of up to 1800m above sea level.	_____
3.1.12	The detector shall be capable of operating in the following conditions:	
3.1.12.1	Min. temperature: 0°C	_____
3.1.12.2	Max. temperature: 40°C	_____
3.1.12.3	Max. relative humidity: 80%	_____

3.1.13	The operation of the metal detector shall not be adversely affected by repositioning of the frame within certain limits of its original adjusted position.	
3.2	<u>CONSTRUCTION</u>	
3.2.1	The metal detector shall comprise a free standing walk-through frame containing the detector coils and the control unit, complete with a 5m length of flexible cable and 16A 3-pin plug top. The cord and plug top shall comply with the relevant SABS specifications.	
3.2.2	The frame and the control unit shall be of robust construction and the base of the frame shall be designed to ensure rigidity.	
3.2.3	The unit shall be able to execute a full body scan and detect metal objects down to the lower feet level within the settings specified.	
3.2.4	The finish shall be durable and maintenance free.	
3.2.5	The type of material used for the construction of the frame and control unit must be stated by tenderers.	
3.2.6	The colour range in which the metal detectors are available must be stated by tenderers. The Department will select a colour finish to suit the environment.	
3.2.7	All material consisting of metal shall be treated against corrosion.	
3.2.8	The approximate internal dimensions of the frame shall be as follows:	
3.2.8.1	Walk-through height : 2m	
3.2.8.2	State Walk-through width	
3.3	<u>CONTROL SYSTEM</u>	
3.3.1	The system shall operate by means of automatic level control adjustable to environmental changes, Without the need to reset.	
3.3.2	The control unit shall be equipped with the following:	
3.3.2.1	"ON-OFF" main switch and "MAINS ON" indicator light.	
3.3.2.2	Selector switch with at least ten sensitivity settings, with a maximum sensitivity to consistently detect metal at least the size of a R5, 00 coin.	
	The sensitivity settings shall be consistent at average walking speed.	

3.3.2.3 Visual indication in the form of an LED Bar graph indicator having at least five green lights and five red lights representing the "PROCEED" and "ALARM" zones respectively. The indicator shall give an indication of the volume of metal on a person in accordance with the sensitivity settings of the selector switch. When the "ALARM" zone is activated it shall simultaneously activate an audible alarm having a continuous tone and adjustable volume. The alarm system will automatically reset after the metal has passed through the frame.

3.3.2.4 The system shall be modular to facilitate maintenance and repairs.

3.4 **SAFETY FEATURES**

3.4.1 All electronic and electrical components shall be protected by lockable panels.

3.4.2 The detectors shall not have any effect on heart pacemakers.

3.4.3 The detector shall not effect magnetic storage media or camera film.

3.5 **ELECTRICAL SUPPLY SYSTEM**

3.5.1 The detectors shall be designed for connection to a 230V +/- 5%, 50Hz, single phase, three wire (phase, neutral and earth) power supply.

3.5.2 The existing connection points on site comprises standard 16A, 3-pin, socket outlets.

3.5.3 A suitable and efficient battery back-up system to facilitate power failures of up to 1 hour must be incorporated in the detectors.

3.6 **THROUGHPUT**

The system shall accept a passage of at least 50 persons per minute without functional overload.

3.7 **PLACING IN POSITION AND TESTING**

3.7.1 The detector shall be placed in position, tested, commissioned and adjusted to the user Department's requirements by the successful tenderer.
NOTE: The final positioning will be determined on site.

3.7.2 The system must be arranged so that the traffic-flow is channelled through the metal detector.

3.8 **BROCHURES**

3.8.1 Brochures furnishing descriptions and technical specifications, etc., of the unit offered shall be submitted with the tender.

3.8.2 The following information is also required:

Manufacturer _____

Year of manufacture _____

Country of origin _____

Model number _____

3.9 **MAINTENANCE**

3.9.1 The unit must be relatively maintenance-free and with minimum future service. A statement confirming this is required from the tenderer.

3.9.2 Electronic modules must be easily exchangeable.

3.9.3 Spare parts must be locally stocked and availability guaranteed for a ten year period starting from date Of delivery.

3.10 **GUARANTEE AND SERVICE**

3.10.1 The successful tenderer shall guarantee and service the complete unit for a period of twelve (12) months from date of delivery of every unit to site.

3.10.2 During the period of guarantee the successful tenderer shall at his own expense, carry out all necessary repair work including material and labour (excluding work required due to damage by others) in order to maintain the unit in a working condition.

3.10.3 The successful tenderer shall, during the period of guarantee, repair the unit to the satisfaction of the Department within 24 hours after he has been notified that the unit is not operating.

3.10.4 After the lapse of the initial twelve-month period of servicing under the guarantee, the successful tenderer may be required to enter into a service agreement with the Department.

3.11 **TRAINING**

The successful tenderer shall thoroughly train and instruct operators designated by the user Department in the operation of the unit.

3.12 **MANUALS**

Two complete sets of manuals, each with the following information shall be handed over to the Department when the unit is delivered to site:

(a) Operating instructions

(b) Technical description with diagrams and Instructions for maintenance and repairs.

3.13 **DEVIATIONS FROM SPECIFICATION AS ALTERNATIVE (STATE BRIEFLY)**

3.13 **DELIVERY ADDRESS**

Elliot Magistrate Court

SPECIFICATION FOR CCTV, INTERCOM & ACCESS CONTROL

ANNEXURES

Annexure A

Material Schedule Returnable

ANNEXURE A**MATERIAL SCHEDULE RETURNABLE**

The contractor shall complete the following schedules and submit them to the Representative / Agent within 5 days of the date requested by the Principal Agent. The schedules shall be used in the adjudication and risk analysis of tenderers.

The schedules will be scrutinised by the Representative / Agent and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

1 CCTV MATERIAL RETURNABLES**1.1 DETAILS OF MANUFACTURER OF CCTV SURVEILLANCE VIDEO MANAGEMENT SYSTEM**

1	Manufacturer	
2	Make or trade name of equipment	
3	Contact Number	
4	Country of Origin	
5	Manufacture's Type / Model No	
6	Does it comply with the specifications (Yes / No)	
7	Is Tenderer an accredited agent? (Yes / No)	
8	Furnish details of maintenance and repair service facilities which can be rendered	
9	Closest town from project with accredited spares supplier	

1.2 DETAILS OF MANUFACTURER OF CCTV NETWORK VIDEO RECORDERS

1	Manufacturer	
2	Make or trade name of equipment	
3	Contact Number	
4	Country of Origin	
5	Manufacture's Type / Model No	
6	Does it comply with the specifications (Yes / No)	
7	Is Tenderer an accredited agent? (Yes / No)	
8	Furnish details of maintenance and repair service facilities which can be rendered	
9	Closest town from project with accredited spares supplier	

ELLIOT MAGISTRATE COURT: CCTV, INTERCOM AND ACCESS CONTROL INSTALLATIONS

1.3 DETAILS OF CCTV SURVEILLANCE SYSTEM OPERATOR COMPUTER EQUIPMENT WORKSTATIONS

1	Manufacturer	
2	Make or trade name of equipment	
3	Contact Number	
4	Country of Origin	
5	Manufacture's Type / Model No	
6	Does it comply with the specifications (Yes / No)	
7	Is Tenderer an accredited agent? (Yes / No)	
8	Furnish details of maintenance and repair service facilities which can be rendered	
9	Closest town from project with accredited spares supplier	
10	Server CPU Type	
11	Ram Size	
12	Hard Drive Capacity	
13	Monitor Make	
14	Model	
15	Size	

1.4 DETAILS OF CCTV CAMERAS

	MATERIAL	MAKE	MODEL	MATERIAL TO SPECIFICATION
1	Camera Type 1			
2	Camera Type 2			
3	Camera Type 3			
4	Camera Type 4.			
5	Camera Type 5			

1.5 DETAILS OF NETWORK SWITCHES

	MATERIAL	MAKE	MODEL	MATERIAL TO SPECIFICATION
1	Switch - Power over ethernet 48 port network switch			
2	Switch - Power over ethernet 24 port network switch			

ELLIOT MAGISTRATE COURT: CCTV, INTERCOM AND ACCESS CONTROL INSTALLATIONS

1.6 CCTV MISCELLANEOUS ITEMS

	MATERIAL	MAKE	MODEL	MATERIAL TO SPECIFICATION
1	46 inch monitor complete for wall mounting			
2	24 inch Monitor complete for desk mounting			
3	Universal digital keyboard/Joystick controller for PTZ cameras			
4	47U cabinet complete			
5	12U wall mounted swing frame cabinet			
6	2kVA True online double conversion, Pure Sine Wave, Rack mount UPS			
7	3kVA True online double conversion, Pure Sine Wave, Rack mount UPS			
8	Cat 6e Cable			
9	Cat 6e UTP Ruggedized UV protected outdoor network cable			
10				
11				

2 ACCESS CONTROL MATERIAL RETURNABLES

2.1 DETAILS OF MANUFACTURER OF ACCESS CONTROL SYSTEM SOFTWARE

1	Manufacturer	
2	Make or trade name of equipment	
3	Contact Number	
4	Country of Origin	
5	Manufacture's Type / Model No	
6	Does it comply with the specifications (Yes / No)	
7	Is Tenderer an accredited agent? (Yes / No)	
8	Furnish details of maintenance and repair service facilities which can be rendered	
9	Closest town from project with accredited spares supplier	

2.2 DETAILS OF ACCESS CONTROL SYSTEM COMPUTER EQUIPMENT

1	Manufacturer	
2	Make or trade name of equipment	
3	Contact Number	
4	Country of Origin	
5	Manufacture's Type / Model No	
6	Does it comply with the specifications (Yes / No)	
7	Is Tenderer an accredited agent? (Yes / No)	
8	Furnish details of maintenance and repair service facilities which can be rendered	
9	Closest town from project with accredited spares supplier	
10	Server CPU Type	
11	Ram Size	
12	Hard Drive Capacity	
13	Monitor Make	
14	Model	
15	Size	

2.3 DETAILS OF MANUFACTURER OF X-RAY MACHINE

1	Manufacturer	
2	Make or trade name of equipment	
3	Contact Number	
4	Country of Origin	
5	Manufacture's Type / Model No	
6	Does it comply with the specifications (Yes / No)	
7	Is Tenderer an accredited agent? (Yes / No)	
8	Furnish details of maintenance and repair service facilities which can be rendered	
9	Closest town from project with accredited spares supplier	

TECHNICAL INFORMATION – X RAY UNIT

State the following information of the unit offered:

- | | | |
|----|---|-------|
| 10 | Total height above floor level | _____ |
| 11 | Maximum X-ray voltage | _____ |
| 12 | Dimensions of the unit | |
| | Height | _____ |
| | Width | _____ |
| | Length (including conveyor belt) | _____ |
| 13 | Total running current | _____ |
| 14 | Maximum dimensions of objects: | |
| | Height | _____ |
| | Width | _____ |
| | Length | _____ |
| 15 | Number of detectors | _____ |
| 16 | Capacity of digital memory | _____ |
| 17 | Number of shades of grey | _____ |
| 18 | Maximum over-all loading on conveyor belt | _____ |
| 19 | Conveyor belt speed | _____ |
| 20 | X-ray dose per inspection | _____ |
| 21 | Radiation leakage at any point, 5cm away from surface | _____ |

2.4 DETAILS OF MANUFACTURER OF WALK THROUGH METAL DETECTOR

1	Manufacturer	
2	Make or trade name of equipment	
3	Contact Number	
4	Country of Origin	
5	Manufacture's Type / Model No	
6	Does it comply with the specifications (Yes / No)	
7	Is Tenderer an accredited agent? (Yes / No)	
8	Furnish details of maintenance and repair service facilities which can be rendered	
9	Closest town from project with accredited spares supplier	

2.5 ACCESS CONTROL MISCELLANEOUS ITEMS

	MATERIAL	MAKE	MODEL	MATERIAL TO SPECIFICATION
1	Card Registration Reader			
2	Biometric Registration Reader			
3	IP Door Controller			
4	Access Control Readers			
5	Card Printer			
6	Door Recloser			
7	Power Supplies			
8	Break Glass Door Release			
9	Motorised Gate (Sliding)			
11	Motorised Gate (Swing)			
12	Magnetic Door Lock			
13	Hand held Metal Detector			

3 INTERCOM SYSTEM MATERIAL RETURNABLES

3.1 DETAILS OF MANUFACTURER OF INTERCOM SYSTEM SOFTWARE

1	Manufacturer	
2	Make or trade name of equipment	
3	Contact Number	
4	Country of Origin	
5	Manufacture's Type / Model No	
6	Does it comply with the specifications (Yes / No)	
7	Is Tenderer an accredited agent? (Yes / No)	
8	Furnish details of maintenance and repair service facilities which can be rendered	
9	Closest town from project with accredited spares supplier	

3.2 INTERCOM SYSTEM MISCELLANEOUS ITEMS

	MATERIAL	MAKE	MODEL	MATERIAL TO SPECIFICATION
1	Intercom Master Station			
2	Network Indoor Station			
3	Indoor Station			
4	Outdoor Station			
5				
6				
7				
8				
9				

NOTE:

Should the contractor wish to supply materials other than that originally offered, prior written approval must be obtained from the Representative/Agent before any orders are placed.

CONTRACTOR :

SIGNED: _____

DATE: _____

**BILL OF QUANTITIES
(PROVISIONAL)**

1. The descriptions in this Bill of Quantities shall be read in conjunction with the specification.
2. The unit rate for each item in the Price Schedules shall include for all materials, labour, profit, transport, etc., everything necessary for the execution and complete installation of the work in accordance with the description.
3. All material covered by this Specification shall, wherever possible, be of South African manufacture
4. Each item shall be priced and extended to the Total column by the Tenderer. If the Tenderer omits to price any item in the bill of quantities then the cost of the work of each item shall be considered as included in the prices given for the other items.
5. The quantities of work and material set forth in the bill of quantities are estimates only and are not to be considered as limiting nor as extending the amount of work to be done and material to be supplied by the Contractor and the work and material set forth in the bill of quantities will be re measured. The Contractor shall ascertain the correct quantities before ordering. Items will only be paid for insofar as they have been supplied and installed. Excessive quantities or wastage shall not be paid for.
6. No alterations , erasure or addition is to be made in the text of the Document . Any alteration, erasure or addition made will not be recognized and the original working of the Document will be adhered to.
7. The prices quoted shall be exclusive of VAT as applicable.
8. All rates and amounts tendered in the bill of quantities shall be in Rand.
9. Tenderers shall check their calculations for arithmetical errors as the total Tender Price, as submitted , will remain fixed.

REPAIRS AND ADDITIONS TO ELLIOT MAGISTRATE COURT**CCTV, INTERCOM & ACCESS CONTROL INSTALLATIONS****SUMMARY OF BILL OF QUANTITIES**

	DESCRIPTION	TENDER AMOUNT
	BILL N° 1 - PRELIMINARY AND GENERAL	
	BILL N° 2 - ACCESS CONTROL I	
	BILL N° 2 - ACCESS CONTROL II	
	BILL N° 2 - ACCESS CONTROL III	
	BILL N° 2 - ACCESS CONTROL IV	
	BILL N° 2 - ACCESS CONTROL V	
	BILL N° 3 - INTERCOM I	
	BILL N° 3 - INTERCOM II	
	BILL N° 4 - CCTV I	
	BILL N° 4 - CCTV II	
	BILL N° 4 - CCTV III	
	BILL N° 4 - CCTV IV	
	BILL N° 4 - CCTV V	
	BILL N° 5 - GENERAL - CCTV, INTERCOM & ACCESS CONTROL	
TOTAL TENDER AMOUNT EXCLUDING VAT CARRIED FORWARD TO BOQ SUMMARY PAGE		

ITEM	DESCRIPTION	UNIT	QTY	RATE	TENDER AMOUNT
	BILL N° 1 - PRELIMINARY AND GENERAL				
1	PRELIMINARY AND GENERAL A Preliminary and General item is provided to cover the Contractor's charges for compliance with the Conditions of Contract and this Specification, including the provision, maintenance and removal of his site establishment, etc.				
1.1	FIXED CHARGES				
1.1.1	Site Establishment	Sum	1		
1.1.2	Removal of Site Establishment	Sum	1		
1.1.3	Other Fixed-charge Obligations	Sum	1		
1.2	VALUE RELATED ITEMS				
1.2.1	Provision of Sureties	Sum	1		
1.2.2	Insurances	Sum	1		
1.2.3	Third Party Insurance	Sum	1		
1.2.4	Guarantee of the Works	Sum	1		
1.2.5	Provide Test Results	Sum	1		
1.2.6	All OHSA Requirements including safety equipment and clothing	Sum	1		
1.2.7	All HIV / AIDS Specification Requirements	Sum	1		
1.2.8	Other Value Related Obligations	Sum	1		
1.3	TIME-RELATED ITEMS				
1.3.1	Contractual Requirements	Sum	1		
1.3.2	Operation and Maintenance of Site Establishment	Sum	1		
1.3.3	Supervision for the Duration of Contract	Sum	1		
1.3.4	Other Time-Related Obligations	Sum	1		
TOTAL FOR BILL N° 1 - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 2 - ACCESS CONTROL I	UNIT	QTY	RATE	TENDER AMOUNT
2.1	ACCESS CONTROL SYSTEM				
2.1.1	Supply, installation and commissioning of the access control system complete with all required software (integrated with security / CCTV Management Software), complete as specified in Part 2 Approved System: ZKteco ZKAccess3.5 or updated version	Item	1		
2.1.2	LICENCE ZKTeco BioCV-AC-10 Bio CVSecurity Access Module - 25 Door	Item	1		
2.2	ACCESS CONTROL WORKSTATION <ul style="list-style-type: none"> • Precision Tower Workstation PC • Intel Core i7 - 14700 • HDD :1 x 1TB SSD • RAM – 16 GB DDR5 RAM; • Intel Graphics Nvidia T1000 4 GB GDDR • Ports – 1 Parallel, 2 Serial, 6USB (2 at front & 4 at back with USB 3.0 support), • 4 x HDMI, Front and rear USB type A & C • DVD ROM; • LAN Card : Integrated 10/100/1000 • MBPS Fast Ethernet with Wake on LAN Support; • Integrated Audio Controller; • Multimedia Internet ready Keyboard USB Optical Scroll Mouse; • Windows 10 Pro • Power supply Unit Approved: Dell Precision 3680 Tower Workstation PC				
2.2.1	Supply	No	1		
2.2.2	Installation	No	1		
2.3	MONITOR - 24 Inch 24 inch Borderless LED Monitor complete for desk mounting including HDMI Cables Full HD (1920x1080 resolution), VGA and HDMI inputs, 75hz refresh monitor suitable for 24 hour operation Approved Monitor: Hikvision DS-D5024FN10 - 24 inch FHD VA Monitor				
2.3.1	Supply	No	1		
2.3.2	Installation	No	1		
2.4	CARD REGISTRATION READER Card registration read / write complete as specified in Part 2 - Installation Details Approved Reader: ZKTeco CR20E Enrollment registration reader - EM 125kHz - USB				
2.4.1	Supply	No	1		
2.4.2	Installation	No	1		
TOTAL FOR BILL N° 2 - ACCESS CONTROL I - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 2 - ACCESS CONTROL II	UNIT	QTY	RATE	TENDER AMOUNT
2.5	BIOMETRIC REGISTRATION READER Biometric registration reader complete as specified in Part 2 - Installation Details. Approved Reader: ZKTeco SLK20R USB Fingerprint scanner				
2.5.1	Supply	No	1		
2.5.2	Installation	No	1		
2.6	IP DOOR CONTROLLER AND ACCESSORIES IP Based Biometric one Door controller, Including Metal enclosure - 12VDC 3Amp PSU and Battery 12V 7.2Ah SLA. Approved equipment: ZKTeco InBio160Pro Door Controller - One Door - Green Label. ZKTeco Metal enclosure to suit				
2.6.1	Supply	No	16		
2.6.2	Installation	No	16		
2.7	ACCESS CONTROL READERS Finger print and card reader as specified Approved: ZKTeco FR1500 Fingerprint Reader - SilkID - EM 125kHz				
2.7.1	Supply	No	30		
2.7.2	Installation	No	30		
2.8	Cable management bracket for Readers Approved: ZKTeco Cable Management Bracket for FR1500-WP Reader				
2.8.1	Supply	No	30		
2.8.2	Installation	No	30		
2.9	Weather proof cover for Readers Approved: ZKTeco Rainshield for FR1500-WP Reader				
2.9.1	Supply	No	4		
2.9.2	Installation	No	4		
2.10	CARD PRINTER Colour Card Printer for printing access cards, complete with software, 2 Colour and 2 Black ribbons Approved: Zebra ZC300 Thermal Transfer Colour 300 x 300 DPI Plastic Card Printer Dye-sublimation ZC31-000C000EM00				
2.10.1	Supply	No	1		
2.10.2	Installation	No	1		
2.11	CARDS Printable RFID Cards (125kZ)	No	100		
2.12	MAGLOCK LOCK KIT AND DOOR RECLOSER Magnetic Door Lock kit (300kg's) and medium strength door recloser for 60 to 85kg Doors complete for single leaf door including Z Bracket.				
2.12.1	Supply	No	15		
2.12.2	Install	No	15		
TOTAL FOR BILL N° 2 - ACCESS CONTROL II - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 2 - ACCESS CONTROL III	UNIT	QTY	RATE	TENDER AMOUNT
2.13	SECURITY ELECTRIC LOCK (HEAVY DUTY) 12V Heavy duty electrically operated lock for steel doors / gates for both left and right hang doors, (2000kg 12VAC with Protective steel case), including 6 keys.				
2.13.1	Supply	No	1		
2.13.2	Install	No	1		
2.14	POWER SUPPLIES Power supply, 12VDC 3Amp PSU and Battery 12V 7.2Ah SLA battery backup complete with metal housing. Approved: ZKTeco inBio - Power supply control panel				
2.14.1	Supply	No	2		
2.14.2	Install	No	2		
2.15	DOOR MONITORING Magnetic Contact Wide Gap NC switches to monitor access through doors complete, to be linked to access control system. Alarm shall be shown on the Access control monitor				
2.15.1	Supply	No	16		
2.15.2	Install	No	16		
2.16	PANIC / PUSH BUTTON HEAVY DUTY Surface mounted Push Button - Heavy Duty R/ST-17 N/O. Wired into controllers.				
2.16.1	Supply	No	20		
2.16.2	Install	No	20		
2.17	BREAK GLASS DOOR RELEASES Green emergency break glass units with resettable element mounted at access control doors to override access control door in an emergency. Including suitable recessed box.				
2.17.1	Supply	No	17		
2.17.2	Install	No	17		
2.18	MOTORISED GATE SYSTEM (SLIDING) Heavy duty motorised gate system for sliding gate as specified in Part 2, including all the necessary equipment, base / foundation plate, minimum of 7m METAL racks (30x10mm), wireless receiver, anti theft bracket, same keyed lock and Centurion enclosure for 2 Stable Power Battery 12VDC 18Ah SLA included. Approved: Centurion D20 Smart				
2.18.1	Supply	No	2		
2.18.2	Installation	No	2		
2.19	MOTORISED GATE SYSTEM (SWING) Double leaf motorised gate system for swing gates as specified in Part 2, including all the necessary equipment, wireless receiver, controller wall box, drive arms, mounting kits, ground mounting pedestal, same keyed lock, battery back up. Swing gates shall include all interconnecting wiring for individual free standing gate motors. Approved: Centurion R6				
2.19.1	Supply	No	1		
2.19.2	Install	No	1		
TOTAL FOR BILL N° 2 - ACCESS CONTROL III - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 2 - ACCESS CONTROL IV	UNIT	QTY	RATE	TENDER AMOUNT
2.20	Gate loop detection to allow for automatic opening of gate - buried including cable				
2.20.1	Supply	No	2		
2.20.2	Install	No	2		
2.21	Set of wired infra red beams for anti closing complete with cable in 20mm PVC conduit per gate				
2.21.1	Supply	No	2		
2.21.2	Install	No	2		
2.22	U- shaped protection barrier (to protect gooseneck or motor) formed of 80mm x 80mm x 5mm square mild steel barrier welded in a square U-shape. Barrier shall be 600mm High with a 400mm horizontal. Protection barrier to be powder coated black with yellow reflective tape on each corner. Barrier to be suitable for casting into concrete plinth.				
2.22.1	Supply	No	4		
2.22.2	Install	No	4		
2.23	REMOTE CONTROLS				
2.23.1	Four button remote control with batteries and programmed for two gate operation	No	10		
2.24	GATE INTERLOCKING SYSTEM				
2.24.1	Gate interlocking system, including all contacts and controls as specified in Part 2. (Motorised accused gate 1 to have gate closing sensors interlocked with Roll up door entrance gate 2 sensors. Motorised gate 1 can only operate if the Roll up door gate 2 is closed and vice versa. (Gate operation is interlocked). Control Room to open and close the gates.	Item	1		
2.25	LOCK DOWN SYSTEM				
2.25.1	Emergency lock down systems utilising the Access Control system, as specified in Part 2. Control Room to operate the lockdown process.	Item	1		
2.26	X-RAY MACHINE DUAL ENERGY X-Ray Inspection System , conveyor belt, stand, entrance and exit rollers, remotely operated colour screen and keyboard, complete as per the X-Ray machine technical specifications specified in Part 2 - Installation Details. Approve: ZKTECO - DUAL ENERGY X-Ray Inspection System (ZKX6550)				
2.26.1	Supply	No	1		
2.26.2	Install	No	1		
2.27	LICENCE				
2.27.1	Application and completion of Licence for X-Ray Machine	Item	1		
2.28	GOODS TRAY				
2.28.1	Goods trays to pass through X-Ray Machine	No	3		
2.29	WALK THROUGH METAL DETECTOR Walk Through Metal Detector (Multi zone) complete as specified in Part 2 - Installation Details Approve: ZKTeco – ZK-D4330 Walk Through Metal Detector				
2.29.1	Supply	No	1		
2.29.2	Install	No	1		
TOTAL FOR BILL N° 2 - ACCESS CONTROL IV - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 2 - ACCESS CONTROL V	UNIT	QTY	RATE	TENDER AMOUNT
2.30	HAND HELD METAL DETECTOR				
2.30.1	Hand held metal detectors - Includeing Battery & Charger Approved: ZKTeco ZK-D160K Hand Held Metal Detector	No	2		
2.31	CABLE Rate to include for the supply, delivery, including installation, connection/termination and wastage in basket/conduit/trunking/sleeves.				
2.31.1	0.5mm² - Twin flex				
2.31.1.1	Supply	m	150		
2.31.1.2	Install	m	150		
2.31.2	Cat 6e UTP Yellow				
2.31.2.1	Supply	m	700		
2.31.2.2	Install	m	700		
2.31.3	Cat 6e UTP Ruggedized UV protected outdoor network cable - Black				
2.31.3.1	Supply	m	100		
2.31.3.2	Install	m	100		
2.32	OTHER MATERIALS				
2.32.1	Tenderer to make allowance for any further materials for the complete installation of the Access Control installation as per the Specification	Item	1		
2.33	COORDINATION OF INSTALLATION WITH OTHER SUB CONTRACTORS				
2.33.1	Allow for the onsite coordination of the required power points, conduits and wireways for the Access Control installation with the electrical sub contractor,.	Item	1		
2.34	COMMISIONING AND TESTING OF THE COMPLETE ACCESS CONTROL INSTALLATION				
2.34.1	Allow for the commissioning and testing of the complete installation including the issuing of test certificates.	Item	1		
TOTAL FOR BILL N° 2 - ACCESS CONTROL V - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 3 - INTERCOM I	UNIT	QTY	RATE	TENDER AMOUNT
3.1	INTERCOM INSTALLATION (IP VIDEO)				
3.1.1	Supply, installation and commissioning of the Intercom System system complete with all required software (integrated with security / CCTV Management Software), complete as specified. Approved System: HIKVISION VMS HikCentral	Item	1		
3.2	INTERCOM LICENCE Approved VMS: HikCentral Professional V2.5.1 HikCentral-P-IndoorStation-1Unit Video Intercom Indoor Station Expansion package.Prerequisite:Video Intercom Module Expansion package.Supported: 1 indoor station manageable.				
3.2.1	Supply	No	5		
3.2.2	Installation	No	5		
3.3	INTERCOM LICENCE Approved VMS: HikCentral Professional V2.5.1 HikCentral-P-OutdoorStation-1Unit Video Intercom Outdoor Station Expansion package Prerequisite:Access Control Base package Warranty:none Supported: -Access Control: 1 door manageable -Video Intercom: 1 outdoor station manageable.; Additional: Answering calls, Notice applying				
3.3.1	Supply	No	9		
3.3.2	Installation	No	9		
3.4	INTERCOM LICENCE HikCentral-P-ACS-2Door/Base/Promo - Delivery I, HikCentral access control base package - which includes prerequisites for door expanding, all fundamental features of ACS and 2 doors manageable.				
3.4.1	Supply	No	1		
3.4.2	Installation	No	1		
3.5	INTERCOM LICENCE HikCentral-P-ACS-1Door - HikCentral Access Control License, Single Door, Add on to the HikCentral Base Licence				
3.5.1	Supply	No	14		
3.5.2	Installation	No	14		
3.6	IP MASTER STATION IP Master Station complete as specified. Approved equipment: HIKVISION DS-KM9503 video intercom master station "				
3.6.1	Supply	No	1		
3.6.2	Installation	No	1		
3.7	NETWORK INDOOR STATION 'Network Indoor Station with 7inch Touch screen, complete as specified. Approved: HIKVISION DS-KH6320-WTE1				
3.7.1	Supply	No	1		
3.7.2	Installation	No	1		
3.8	GATE STATION - INDOOR 'IP Video Intercom Module Door Station for INDOOR use with surface mounted box, complete as specified. Approved: HIKVISION DS-KD8003-IME1/S video intercom				
3.8.1	Supply	No	5		
3.8.2	Installation	No	5		
3.9	GATE STATION : OUTDOOR 'IP Video Intercom Module Door Station for OUTDOOR use with custom made Stainless steel enclosure complete as specified. Approved: HIKVISION DS-KD8003-IME1/S video intercom				
3.9.1	Supply	No	9		
3.9.2	Installation	No	9		
TOTAL 'BILL N° 3 - INTERCOM I - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 3 - INTERCOM II	UNIT	QTY	RATE	TENDER AMOUNT
3.10	GOOSE NECK Free Standing Stainless steel Goose neck (910mm Total Height and 400mm overhang) with base for mounting to concrete, for intercom and access control reader installations. Including custom made stainless steel weather proof enclosure to house Intercom Door Station and Finger print and card reader. (Station and readers measured elsewhere).				
3.10.1	Supply	No	4		
3.10.2	Installation	No	4		
3.11	CABLE Rate to include for the supply, delivery, including installation, connection/termination and wastage in basket/conduit/trunking/sleeves.				
3.11.1	0.5mm² - Twin flex				
3.11.1.1	Supply	m	50		
3.11.1.2	Install	m	50		
3.11.2	Cat 6e UTP Yellow				
3.11.2.1	Supply	m	700		
3.11.2.2	Install	m	700		
3.11.3	Cat 6e UTP Ruggedized UV protected outdoor network cable - Black				
3.11.3.1	Supply	m	100		
3.11.3.2	Install	m	100		
3.12	PVC TRUNKING YT/3 40mm x 16mm compact PVC trunking and cover				
3.12.1	Supply	m	100		
3.12.2	Installation	m	100		
3.13	OTHER MATERIALS				
3.13.1	Tenderer to make allowance for any further materials for the complete installation of the Access Control installation as per the Specification	Item	1		
3.14	COORDINATION OF INSTALLATION WITH OTHER SUB CONTRACTORS				
3.14.1	Allow for the onsite coordination of the required power points, conduits and wireways for the Intercom installation with the electrical sub contractor,.	Item	1		
3.15	COMMISSIONING AND TESTING OF THE COMPLETE INTERCOM INSTALLATION				
3.15.1	Allow for the commissioning and testing of the complete installation including the issuing of test certificates.	Item	1		
TOTAL 'BILL N° 3 - INTERCOM II - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 4 - CCTV I	UNIT	QTY	RATE	TENDER AMOUNT
4.1	<u>CCTV INSTALLATION (IP)</u>				
4.1.1	VIDEO MANAGEMENT SYSTEM Complete Video Management System installed onto VMS Rack mount Server. Approved : HikCentral Professional V2.5.1 or latest suitable package	Item	1		
4.2	VMS LICENCE - 64 Channel Video Management System Base licence 64 Channels. Approved VMS: HikCentral Professional V2.5.0				
4.2.1	Supply	No	1		
4.2.2	Installation	No	1		
4.3	VMS LICENCE - 1 Channel Video Management System licence - 1 Channel Approved VMS: HikCentral Professional V2.5.1				
4.3.1	Supply	No	18		
4.3.2	Installation	No	18		
4.4	VMS LICENCE - Video Wall Module Smart Wall Base licence Approved VMS: HikCentral Professional V2.5.1				
4.4.1	Supply	No	1		
4.4.2	Installation	No	1		
4.5	CCTV CAMERAS Supply and install as specified, including all necessary fixing and mounting equipment (brackets etc) associated to their mounting positions as specified in Part 2 - Installation Details				
4.5.1	Camera Type 1 Indoor dome IP camera (4MP) with 2.8mm lens, IK10 and IP67. Complete with all accessories needed for operation. Approved camera: HIKVISION DS-2CD3146G2H-LIS.				
4.5.1.1	Supply	No	28		
4.5.1.2	Install	No	28		
4.5.2	Surface mounting junction box (DS-1280ZJ-DM46) for Camera Type 1 & 2. Complete with all accessories needed for operation.				
4.5.2.1	Supply	No	8		
4.5.2.2	Install	No	8		
4.5.3	Wall mount (DS-1272ZJ-120) for Camera Type 1 & 2. Complete with all accessories needed for operation.				
4.5.3.1	Supply	No	11		
4.5.3.2	Install	No	11		
4.5.4	Camera Type 2 Indoor dome IP camera (4MP) with 4mm lens, IK10 and IP67. Complete with all accessories needed for operation. Approved camera: HIKVISION DS-2CD3146G2H-LIS.				
4.5.4.1	Supply	No	11		
4.5.4.2	Install	No	11		
4.5.5	Camera Type 3 Indoor mini dome IP camera (4MP) with 2.8mm lens, IK08 and IP67. Complete with all accessories needed for operation. Approved camera: HIKVISION DS-2CD2546G2-IS.				
4.5.5.1	Supply	No	3		
4.5.5.2	Installation	No	3		
TOTAL 'BILL N° 4 - CCTV I - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 4 - CCTV II	UNIT	QTY	RATE	TENDER AMOUNT
4.5.6	Camera Type 4 Outdoor wall mounted IP camera (4MP) with 2.7-13.5mm lens, IK10 and IP67. Complete with Cable Managed Housing & Bracket and all accessories needed for operation (Wall or Pole Mounted) Approved camera: HIKVISION DS-2CD3646G2HT-LIZS (2.7-13.5mm) (Moderate Protection)				
4.5.6.1	Supply	No	37		
4.5.6.2	Installation	No	37		
4.5.7	Camera Type 5 External wall mounted PTZ camera, TandemVu PTZ camera (4MP), with wall mount bracket (DS-1603ZJ-P) and power supply, IK10 and IP67 Approved camera: HIKVISION DS-2SF8C425MXG-EL/26				
4.5.7.1	Supply	No	2		
4.5.7.2	Installation	No	2		
4.5.8	Universal digital keyboard/Joystick controller for PTZ cameras connected to workstations including cabling. Approved controller: DS-1005KI USB Keyboard				
4.5.8.1	Supply	No	1		
4.5.8.2	Installation	No	1		
4.6	VMS SERVER Intel Core i7 - 14700, 16gb DDRx Ram, 2x 2TB 3.5 inch SATA, Windows 10 Pro, Gigabit network port, 4x HDMI monitor Outputs, DVD Rom - USB keyboard and mouse Approved Server: Dell Rackmount Server R250				
4.6.1	Supply	No	1		
4.6.2	Installation	No	1		
4.7	NETWORK VIDEO RECORDERS 32 Channel Network Video Recorders including 3 x 4 TB SATA SSD drives as specified in Part 2 - Installation Details. Approved NVR: HIKVISION DS-9632NXI-I8/S Network Video Recorders				
4.7.1	Supply	No	3		
4.7.2	Installation	No	3		
4.8	NETWORK SWITCH Power over ethernet 48 port network switch installed in cabinet, managed layer 3, 6kV Surge protection, complete with 48Gbs Stacking module and stacking cable.				
4.8.1	Supply	No	1		
4.8.2	Installation	No	1		
4.9	NETWORK SWITCH Power over ethernet 24 port network switch installed in cabinet, managed layer 3, 6kV Surge protection, complete with 48Gbs Stacking module and stacking cable.				
4.9.1	Supply	No	4		
4.9.2	Installation	No	4		
TOTAL 'BILL N° 4 - CCTV II - CARRIED FORWARD TO SUMMARY (EXCL VAT)					









	BILL N° 4 - CCTV III	UNIT	QTY	RATE	TENDER AMOUNT
4.11	WORKSTATIONS, MONITORS AND ACCESSORIES CCTV Workstation PC • Precision Tower Workstation PC • Intel Core i7 - 14700 • HDD : 1x 1TB SSD • RAM – 16 GB DDR5 RAM; • Intel Graphics Nvidia T1000 4 GB GDDR • Ports – 1 Parallel, 2 Serial, 6USB (2 at front & 4 at back with USB 3.0 support), • 4 x HDMI, Front and rear USB type A & C • DVD ROM; • LAN Card : Integrated 10/100/1000 • MBPS Fast Ethernet with Wake on LAN Support; • Integrated Audio Controller; • Multimedia Internet ready Keyboard USB Optical Scroll Mouse; • Windows 10 Pro • Power supply Unit Approved: Dell Precision 3680 Tower Workstation PC				
4.11.1	Supply	No	3		
4.11.2	Installation	No	3		
4.12	MONITOR - 46 Inch 46 inch, 24 hour operation LCD monitor complete with wall mounting bracket as specified including 20m HDMI Cabling. Approved Monitor: HIKVISION DS-D2046LU-Y 46 inch				
4.12.1	Supply	No	3		
4.12.2	Installation	No	3		
4.13	MONITOR - 24 Inch 24 inch Borderless LED Monitor complete for desk mounting including HDMI Cables Full HD (1920x1080 resolution), VGA and HDMI inputs, 75hz refresh monitor suitable for 24 hour operation Approved Monitor: Hikvision DS-D5024FN10 - 24 inch FHD VA Monitor				
4.13.1	Supply	No	6		
4.13.2	Installation	No	6		
4.14	ANTI VIRUS Anti Virus Software to protect workstations on an open or closed network against viruses of an intentional or unintentional nature				
4.14.1	Supply	No	3		
4.14.2	Installation	No	3		
4.15	PRINTER A4 Mono Laser printer for reports / Alarms. Black with minimum of 19 ppm and 1200 x 1200DPI complete with software and 2 additional original cartridges.				
4.15.1	Supply	No	1		
4.15.2	Installation	No	1		
4.16	SAPS DESK MONITOR AND DECODER 16 Chanel IP Split Screen Video decoder complete in SAPS security office to allow for remote camera viewing of selected cameras, complete with cabling				
4.16.1	Supply	No	1		
4.16.2	Installation	No	1		
TOTAL 'BILL N° 4 - CCTV III - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 4 - CCTV IV	UNIT	QTY	RATE	TENDER AMOUNT
4.18	MONITOR - 24 Inch 24 inch Borderless LED Monitor complete for desk mounting including HDMI Cables Full HD (1920x1080 resolution), VGA and HDMI inputs, 75hz refresh monitor suitable for 24 hour operation Approved Monitor: Hikvision DS-D5024FN10 - 24 inch FHD VA Monitor				
4.18.1	Supply	No	1		
4.18.2	Installation	No	1		
4.19	CCTV SURGE PROTECTION				
4.19.1	Single Channel Gigabit Network and PoE Surge Protector mounted at outdoor cameras (Gigabit Single port RJ45 POE)				
4.19.1.1	Supply	No	45		
4.19.1.2	Install - Including Connecting to nearest earth point	No	45		
4.19.2	2.5 mm Green and Yellow Insulated Earth Wire				
4.19.2.1	Supply	m	200		
4.19.2.2	Install	m	200		
4.20	CCTV AND ACCESS CONTROL CABINETS				
4.20.1	47U Free Standing Cabinet 1m long, complete with 4 x Extraction fans, 2 x 5 Way surge protected plugs, all necessary shelves and blanking plates (No open slots allowed). Cabinet shall have heavy duty coasters.				
4.20.1.1	Supply	No	1		
4.20.1.2	Install	No	1		
4.20.2	12U wall mounted (Swing Frame and 100mm Collar) cabinet complete with 2 x Extraction fans, 1 x 5 Way surge protected plug.				
4.20.2.1	Supply	No	2		
4.20.2.2	Install	No	2		
4.21	UNINTERRUPTIBLE POWER SUPPLIES				
4.21.1	2kVA True online double conversion, Pure Sine Wave, Rack mount UPS with 4 x 12V / 9AH Battery				
4.21.1.1	Supply	No	2		
4.21.1.2	Install	No	2		
4.21.2	3kVA True online double conversion, Pure Sine Wave, Rack mount UPS with 6 x 12V / 9AH Battery				
4.21.2.1	Supply	No	1		
4.21.2.2	Install	No	1		
4.22	CCTV GALVANISED STEEL POLES Galvanised steel pole complete with brackets to allow for 4 CCTV cameras, mounting at a minimum of 3.5m above ground				
4.22.1	Supply	No	2		
4.22.2	Installation	No	2		
TOTAL 'BILL N° 4 - CCTV IV - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

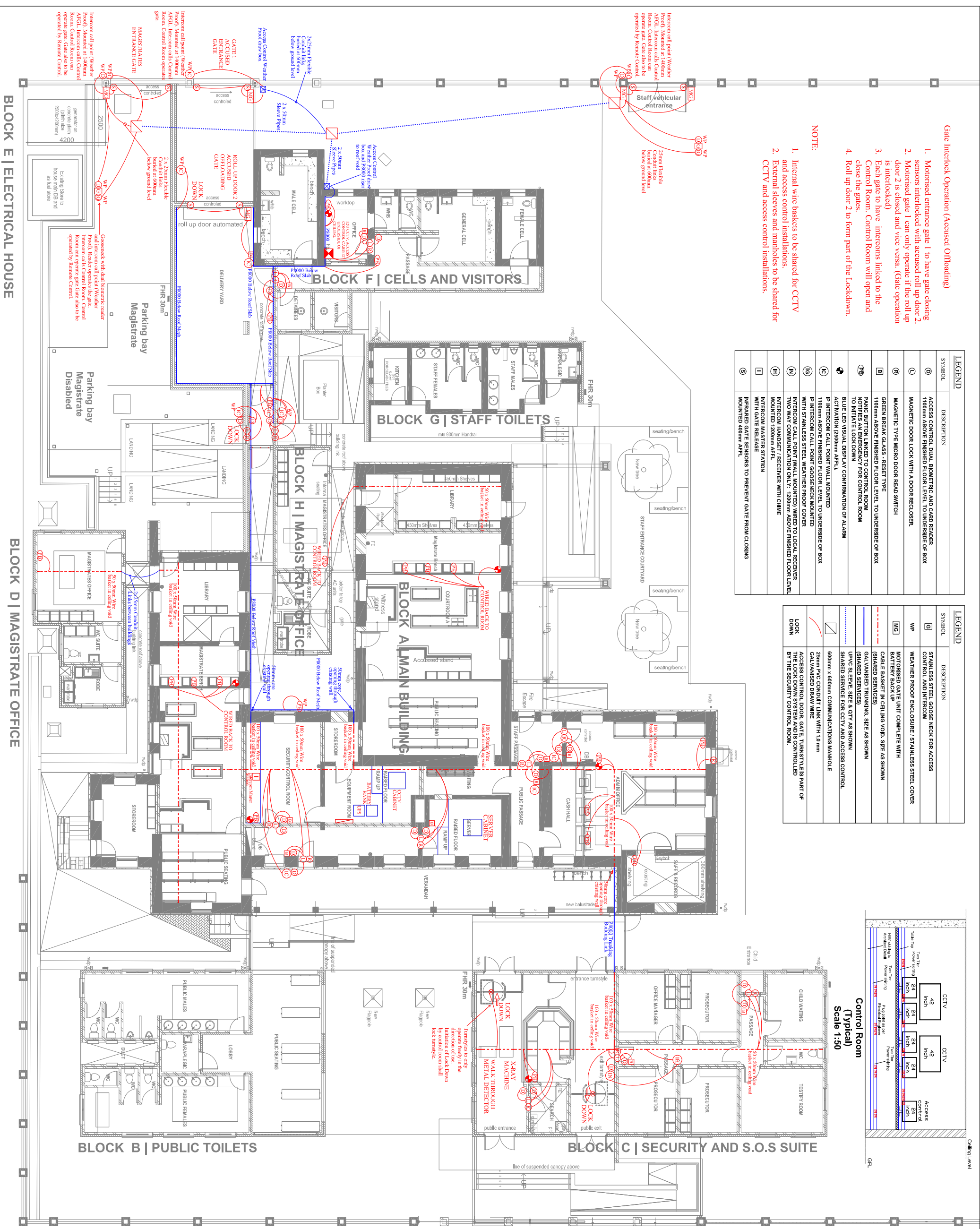
	BILL N° 4 - CCTV V	UNIT	QTY	RATE	TENDER AMOUNT
4.23	CABLE Rate to include for the supply, delivery, including installation, connection/termination and wastage in basket/conduit/trunking/sleeves.				
4.23.1	Cat 6e UTP Yellow				
4.23.1.1	Supply	m	2,000		
4.23.1.2	Install	m	2,000		
4.23.2	Cat 6e UTP Ruggedized UV protected outdoor network cable - Black				
4.23.2.1	Supply	m	400		
4.23.2.2	Install	m	400		
4.24	OTHER MATERIALS				
4.24.1	Tenderer to make allowance for any further materials for the complete installation of the Access Control installation as per the Specification	Item	1		
4.25	COORDINATION OF INSTALLATION WITH OTHER SUB CONTRACTORS				
4.25.1	Allow for the onsite coordination of the required power points, conduits and wireways for the CCTV installation with the electrical sub contractor,.	Item	1		
4.26	COMMISSIONING AND TESTING OF THE COMPLETE CCTV INSTALLATION				
4.26.1	Allow for the commissioning and testing of the complete installation including the issuing of test certificates.	Item	1		
TOTAL 'BILL N° 5 - CCTV V - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 5 - GENERAL - CCTV, INTERCOM & ACCESS CONTROL	UNIT	QTY	RATE	TENDER AMOUNT
5.1	<u>GENERAL - CCTV, INTERCOM & ACCESS CONTROL</u>				
5.2	GUARANTEE Allow for the Guarantee and Maintenance of all CCTV, Intercom and Access Control equipment installed for a period of 12 months as per the specification. Commencement date shall be from Practical Completion.	Item	1		
5.3	TRAINING FOR CCTV, INTERCOM AND ACCESS CONTROL INSTALLATIONS				
5.3.1	Training Session No 1 as specified	Item	1		
5.3.2	Additional Training Session No 2 as specified	Item	1		
5.4	AD HOC MAINTENANCE AND SUPERVISION OF THE CCTV INTERCOM & ACCESS CONTROL SYSTEMS On site Maintenance on the system, Software updates, problem solving, additional training and supervision of the complete CCTV, Intercom & Access Control systems by a qualified technician. This shall be on an adhoc basis, when called for by the user client. This is to be undertaken after Practical Completion.				
5.4.1	On site maintenance by qualified technician including travel costs (allow separate trips).	No	4		
5.5	OPERATING AND MAINTENANCE MANUALS Comprehensive Operating and Maintenance Manuals for all the installations, as specified, must be supplied at the date of training or practical completion (Which ever occurs sooner) It must contain a minimum of: • General description of system. • Full operating instructions. • Full list of all equipment supplied with their Serial No, IP address and position on the As-Built drawings • All features available on the system. • All installation requirements. • Technical Specification of the system. • Details of all adjustments on the system. • All wiring diagrams, connection diagrams. • Fault finding and repairs • Correct Maintenance procedures • Recommended spares list • Names and contact details of suppliers • All Equipment Guarantees				
5.5.1	Production and issuing of complete sets of Paper operating and maintenance manuals.	No	4		
5.5.2	The issuing of the complete Operating and Maintenance manuals electronically on a flash drive	No	1		
5.6	AS-BUILT DRAWINGS 'Comprehensive As Built Drawings of all the installations, as specified, must be supplied at the date of training or practical completion (Which ever occurs sooner) It must contain a minimum of: • Updated positions of all installed equipment with their serial number and IP Address • Updated cabling routes and circuitising • All general arrangement drawings; • Detailed drawings of all system hardware and equipment; • Complete wiring diagrams and block schematic diagrams. • A list of all equipment including their Serial numbers and IP Address	No	1		
5.7	LABELLING Labelling of all CCTV, Intercom and Access Control equipment. Labels to be permanent and waterproof.	Item	1		
TOTAL FOR BILL N° 5 - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

LEGEND	
SYMBOL	DESCRIPTION
Ⓚ	ACCESS CONTROL, DUAL BIOMETRIC AND CARD READER 1100mm ABOVE FINISHED FLOOR LEVEL, TO UNDERSIDE OF BOX
Ⓛ	MAGNETIC DOOR LOCK WITH A DOOR RECLOSER.
Ⓜ	MAGNETIC TYPE MICRO DOOR READER SWITCH GREEN BREAK GLASS - RESET TYPE 1100mm ABOVE FINISHED FLOOR LEVEL, TO UNDERSIDE OF BOX
Ⓟ	PAUSE BUTTON WIREED TO CONTROL ROOM MONTRES AN EMERGENCY FOR CONTROL ROOM TO INITIATE LOCK DOWN
Ⓡ	BLUE LED VISUAL DISPLAY CONFIGURATION OF ALARM ACTIVATION (1200mm AFFL)
Ⓢ	IP INTERCOM CALL POINT WALL MOUNTED 1100mm ABOVE FINISHED FLOOR LEVEL, TO UNDERSIDE OF BOX
Ⓣ	IP INTERCOM CALL POINT GOOSENECK MOUNTED WITH STAINLESS STEEL WEATHER PROOF COVER
Ⓤ	INTERCOM CALL POINT (WALL MOUNTED) WIRED TO LOCAL RECEIVER TWO WAY COMMUNICATION ONLY, 1200mm ABOVE FINISHED FLOOR LEVEL
Ⓡ	INTERCOM HANDSET / RECEIVER WITH CHIME MOUNTED 1200mm AFFL
Ⓛ	INTERCOM MASTER STATION WITH GATE RELEASE
Ⓢ	INFRARED GATE SENSORS TO PREVENT GATE FROM CLOSING MOUNTED 400mm AFFL

LEGEND	
SYMBOL	DESCRIPTION
	STAINLESS STEEL, GOOSE NECK FOR ACCESS CONTROL, AND INTERCOM
WP	WEATHER RATED ENCLOSURE / STAINLESS STEEL COVER
	MOTORIZED GATE UNIT COMPLETE WITH BATTERY BACKUP
	CABLE RACKET IN CEILING VOID, SITE AS SHOWN (SHARED SERVICES)
	GALVANIZED TRUNNING, VOID AS SHOWN (SHARED SERVICES)
	UPVC SLURVE, SIZE & QTY AS SHOWN
	SHARED SERVICE FOR CCTV AND ACCESS CONTROL
	60mm x 60mm COMMUNICATIONS RAINHOLE
	25mm PVC CONDUIT LINK WITH 1.0 mm GALVANISED DRAW WIRE
LOCK	ACCESS CONTROL DOOR, GATE, TURNSTILES PART OF THE LOCK DOWN SYSTEM AND IS CONTROLLED BY THE SECURITY CONTROL ROOM.

**Control Room
(Typical)
Scale 1:50**











Gate Interlock Operation (Accused Offloading)

1. Motorised entrance gate 1 to have gate closing sensors interlocked with accused roll up door 2
2. Motorised gate 1 can only operate if the roll up door 2 is closed and vice versa. (Gate operation is interlocked)
3. Each gate to have intercoms linked to the Control Room. Control Room will open and close the gates
4. Roll up door 2 to form part of the Lockdown.

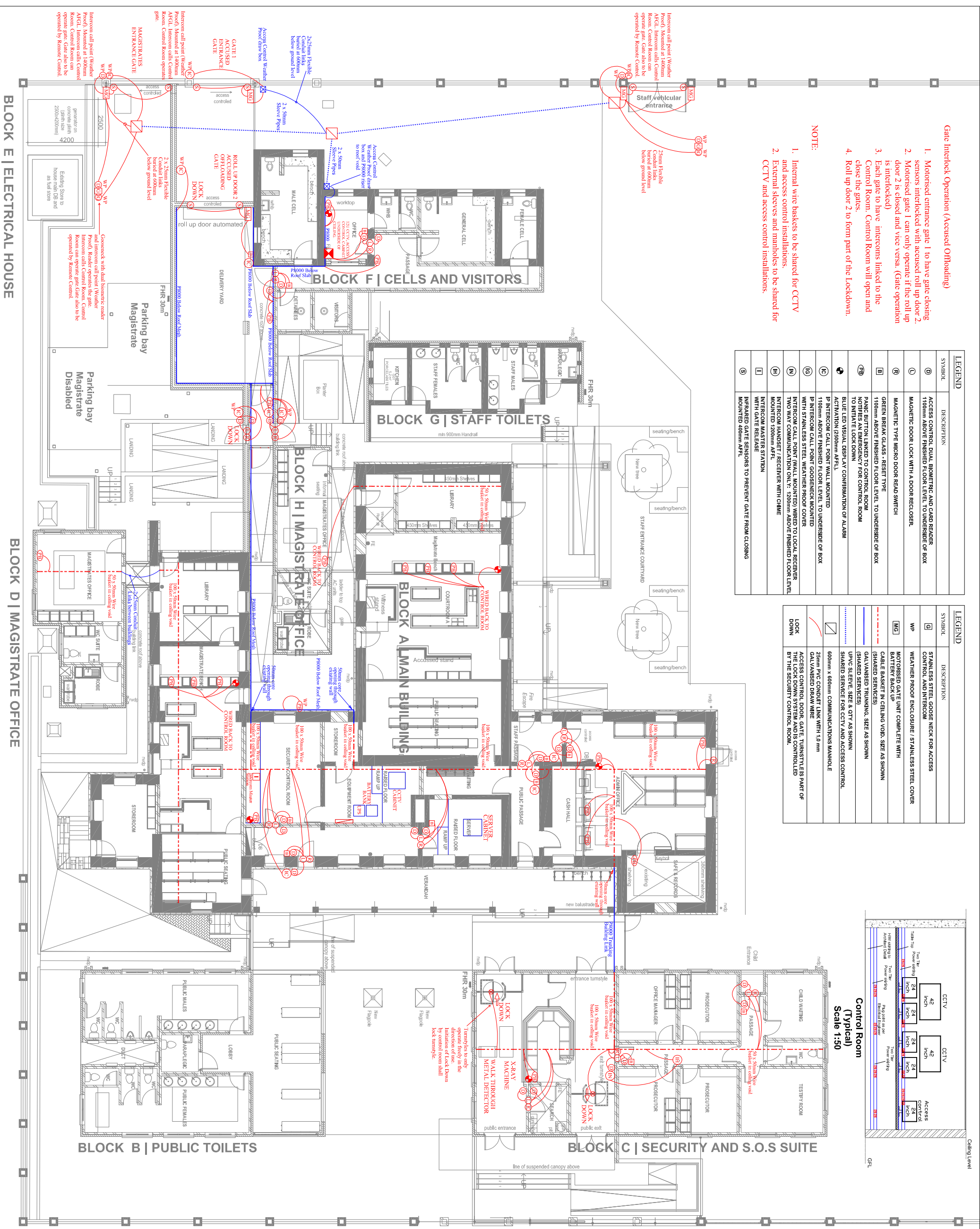
NOTE:

1. Internal wire baskets to be shared for CCTV and access control installations.
2. External sleeves and manholes to be shared for CCTV and access control installations.

LEGEND	
SYMBOL	DESCRIPTION
Ⓚ	ACCESS CONTROL DUAL BIOMETRIC AND CARD READER 1100mm ABOVE FINISHED FLOOR LEVEL, TO UNDERSIDE OF BOX
Ⓛ	MAGNETIC DOOR LOCK WITH A DOOR RECLOSEUR.
Ⓜ	MAGNETIC TYPE MICRO DOOR READER SWITCH GREEN BREAK GLASS - RESET TYPE 1100mm ABOVE FINISHED FLOOR LEVEL, TO UNDERSIDE OF BOX
Ⓟ	PAUSE BUTTON WIREED TO CONTROL ROOM MONTRES AN EMERGENCY FOR CONTROL ROOM TO INITIATE LOCK DOWN
Ⓢ	BLUE LED VISUAL DISPLAY CONFIGURATION OF ALARM ACTIVATION (1200mm AFFL)
Ⓣ	IP INTERCOM CALL POINT WALL MOUNTED 1100mm ABOVE FINISHED FLOOR LEVEL, TO UNDERSIDE OF BOX
Ⓤ	IP INTERCOM CALL POINT GOOSENECK MOUNTED WITH STAINLESS STEEL WEATHER PROOF COVER
Ⓡ	INTERCOM CALL POINT (WALL MOUNTED) WIRED TO LOCAL RECEIVER TWO WAY COMMUNICATION ONLY, 1200mm ABOVE FINISHED FLOOR LEVEL
Ⓡ	INTERCOM HANDSET / RECEIVER WITH CHIME MOUNTED 1200mm AFFL
Ⓛ	INTERCOM MASTER STATION WITH GATE RELEASE
Ⓢ	INFRARED GATE SENSORS TO PREVENT GATE FROM CLOSING MOUNTED 400mm AFFL

LEGEND	
SYMBOL	DESCRIPTION
	STAINLESS STEEL, GOOSE NECK FOR ACCESS CONTROL, AND INTERCOM
WP	WEATHER RATED ENCLOSURE / STAINLESS STEEL COVER
	MOTORIZED GATE UNIT COMPLETE WITH BATTERY BACKUP
	CABLE RACKET IN CEILING VOID. SITE AS SHOWN (SHARED SERVICES)
	GALVANIZED TRUNNING. VOID AS SHOWN (SHARED SERVICES)
	UPVC SLURFIE. SITE & QTY AS SHOWN
	SHARED SERVICE FOR CCTV AND ACCESS CONTROL.
	60mm x 60mm COMMUNICATIONS MANHOLE
	25mm PVC CONDUIT LINK WITH 1.5 mm GALVANISED DRAW WIRE
LOCK	ACCESS CONTROL DOOR, GATE, TURNSTILES PART OF THE LOCK DOWN SYSTEM AND IS CONTROLLED BY THE SECURITY CONTROL ROOM.

**Control Room
(Typical)
Scale 1:50**



NO.	DATE	AMENDMENT

Client	

Implementing Agent



COEGA
DEVELOPMENT CORPORATION


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Discipline

ELECTRICAL

Project Description

ELLIDT MAGISTRATE'S OFFICE;
REPAIRS AND MAINTENANCE
WCS 042521

Drawing Status

TENDER DRAWING

Drawing Title

CCTV LAYOUT

Ref: no E181

Scale A1 - 1:100









Date JUNE 2024

Drawing Number E181 E2.5

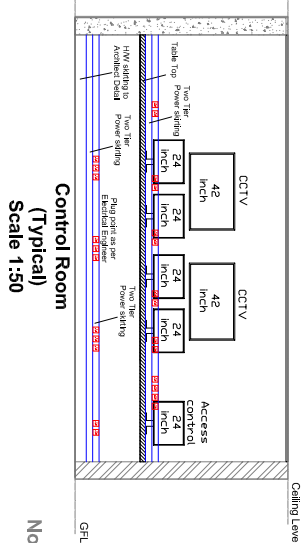
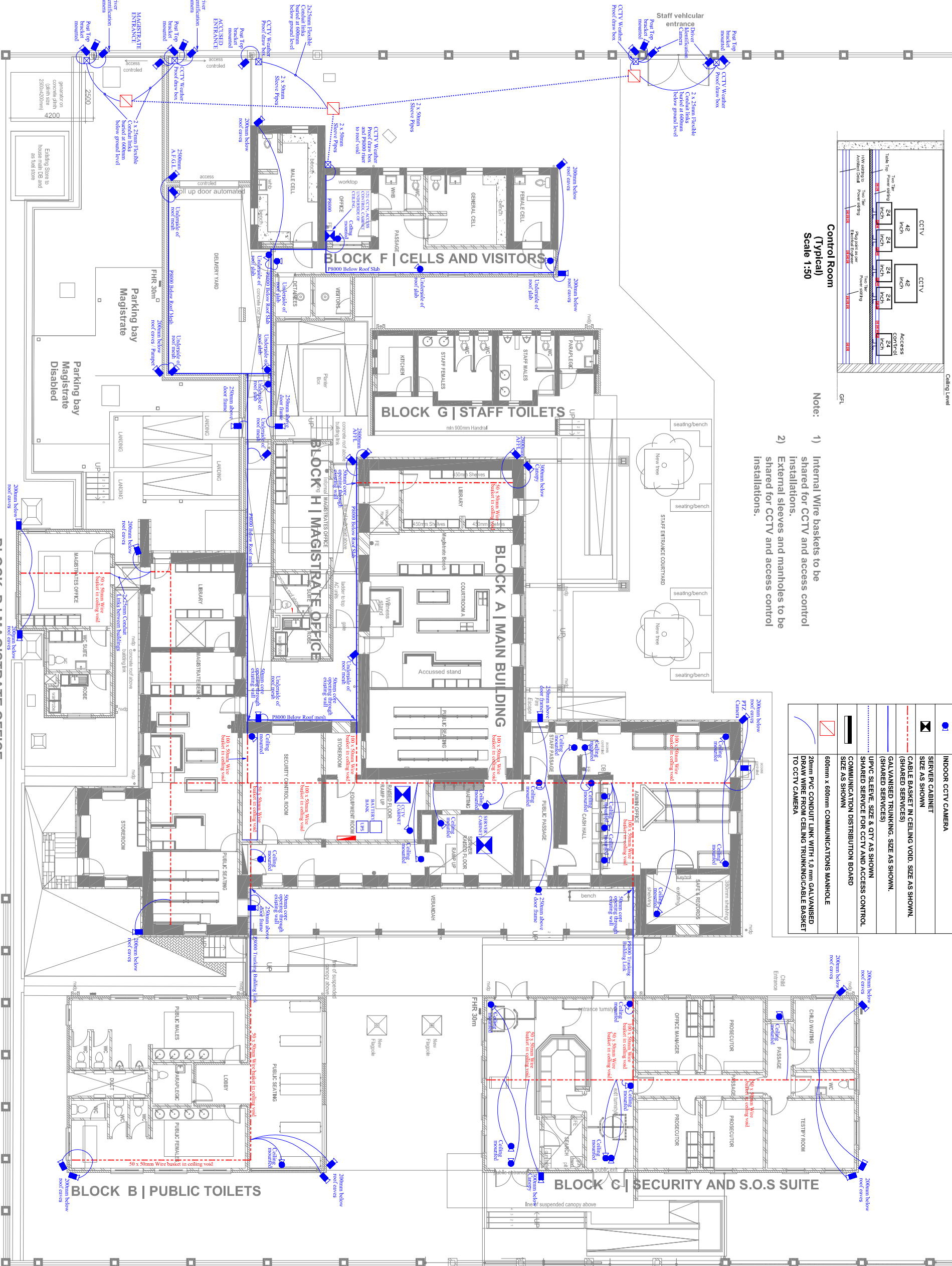
Designed M.P.

Drawn J.C.

Checked H.S.

LEGEND	
SYMBOL	DESCRIPTION
	OUTDOOR CCTV CAMERA
	INDOOR CCTV CAMERA
	SERVER CABINET SIZE AS SHOWN
	CABLE BASKET IN CEILING VOID. SIZE AS SHOWN. (SHARED SERVICES)
	UP/DC SLEEVE, SIZE & QTY AS SHOWN (SHARED SERVICES)
	SHARED SERVICE FOR CCTV AND ACCESS CONTROL COMMUNICATION DISTRIBUTION BOARD SIZE AS SHOWN
	600mm x 600mm COMMUNICATIONS MANHOLE
	20mm PVC CONDUIT LINK WITH 1.0mm GALVANISED DRAW WIRE FROM CEILING TRUNKING/CABLE BASKET TO CCTV CAMERA

- Note:
- Internal Wire baskets to be shared for CCTV and access control installations.
 - External sleeves and manholes to be shared for CCTV and access control installations.



BLOCK E | ELECTRICAL HOUSE

BLOCK D | MAGISTRATE OFFICE

COEGA DEVELOPMENT CORPORATION (PTY) LTD

ELLIOT MAGISTRATE COURT : PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION

(BID NO: CDC/163/25)

C2.3b

Standby Generator Installation

Specification and Pricing Schedule



public works
Department:
Public Works
REPUBLIC OF SOUTH AFRICA

COEGA DEVELOPMENT CORPORATION (PTY) LTD

FOR

**REPAIRS AND ADDITIONS TO
ELLIOT MAGISTRATE COURT**

STANDBY GENERATOR INSTALLATION

SPECIFICATION AND PRICING SCHEDULE

PREPARED FOR:

Coega Development Corporation (Pty) Ltd
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East London
5241

PREPARED BY:

Eye Sizwe Consulting Engineers
16 Allenby Road
Selborne
East London
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NAME OF TENDERER: _____

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SECTION 1 – GENERAL

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1. SECTION 1 – GENERAL

1.1. Intent of Specification

The specification is intended to cover the complete installation and commissioning of the generator plant. The minimum equipment requirements are outlined, but do not cover all the details of design and construction. Such details are recognised as being the exclusive responsibility of the contractor.

For the purposes of this document the following applies:

- Generator Contractor shall be referred to as the Generator Contractor or simply Contractor;
- The masculine includes the feminine;
- The singular includes the plural.

1.2. Standards and Codes

All standards referenced shall be the latest editions.

SANS 10142-1	the wiring of premises: Low Voltage Installations
SANS 8528	Reciprocating internal combustion engine driven alternating current generating sets.
SANS 60034	Rotating electrical Machines
SANS IEC 60947	Low Voltage Switchgear
OHSACT	Occupational Health and Safety Act.
Department of Public Works Quality Specification Parts A, B and C.	
Local municipality by-laws for generator installations. (To be obtained from local municipality)	

1.3. Compliance with Regulations

The installation shall be erected and tested in accordance with the following Acts and regulations:

- a) The Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended,
- b) The Local Government Ordinance 1939 (Ordinance 17 of 1939) as amended and the municipal by-laws and any special requirements of the local supply authority,
- c) The Fire Brigade services Act 1987 (Act 99 of 1987) as amended,
- d) The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as amended,
- e) The Electricity Act 1984 (Act 41 of 1984) as amended.
- f) The environmental Act and regulations

1.4. Scope of Work

Included in this Outdoor Generator Specification

Supply, delivery, installation and commissioning of the complete outdoor emergency generator inside an IP65 canopy/container set on a concrete plinth as specified in this document.

The successful tenderer shall supply, deliver and install a complete single enclosed diesel driven standby generator set in a position that will be determined on site. The machine shall be totally enclosed in a 3CR12 stainless steel housing powder coated or within 50km from the coast with grade 316 steel housing powder coated. The exhaust shall be manufactured from stainless steel.

The housing is to be provided on galvanized 3CR12 stainless steel skids so that the generator set can be transported to site and placed in position on a concrete plinth, casted by the successful tenderer. The skids must be of sufficient height to allow for the passage of storm water under the set.

1.5. Co-ordinating

The Contractor shall familiarise himself with the requirements of the other professional disciplines and shall examine the plans and specifications covering each of these sections.

The generator space, noise and vibration requirements shall be carefully checked with other professional disciplines to ensure that the equipment can be installed in the proper sequence in the space allotted.

1.6. Tests Certificates and Inspections

The following tests are to be carried out:

- a) At the supplier's premises, before the generating set will be delivered to site Representatives of the Department must be present during the test to satisfy themselves that the generating set complies with the specification and delivers the specified output. The test must be carried out in accordance with SANS 8528. The Representative/Agent must be timeously advised of the date for the test.
- b) After completion of the works and before practical completion is taken, a full test will be carried out on the installation for a period of sufficient duration to determine the satisfactory working thereof. During this period the installation will be inspected and the contractor shall make good, to the satisfaction of the Representative/Agent, any defects which may arise.
- c) The Contractor shall provide all instruments and equipment required for testing and any water, power and fuel required for the commissioning and testing of the installation at completion.
- d) Test reports of both tests as specified under (a) and (b) are to be submitted to the Representative/Agent.

The total costs for these test shall be included in the tendered amount.

In the event of the plant, equipment or installation not passing the test, the Representative/Agent shall be at liberty to deduct from the Contract amount all reasonable expenses incurred by the Employer and/or the Representative/Agent attending the test.

1.7. Operating and Maintenance Manuals

The Contractor shall be responsible for the compilation of a complete set of Operating and Maintenance manuals.

This shall be done in accordance with Section 4 – Operating and Maintenance manuals.

All information shall be recorded and reproduced in electronic format as well as supplying the Representative/Agent with three sets of hard copies.

Approval of the final Operating and Maintenance Manuals shall be a prerequisite for issuing of a Certificate of Practical Completion of the installation.

1.8. Guarantee

After works completion of the installation have been achieved, there will follow a 12-month free maintenance period.

During this period the generator contractor shall maintain the generator installation as per the requirements of the Occupational Health and Safety Act. This maintenance shall include systematic examinations, adjustments and lubrication of all generator equipment. Electrical and mechanical parts shall be repaired or replaced whenever it is required to maintain optimum performance without additional cost to the Department, unless the condition was caused by misuse or vandalism of the generator equipment or natural hazards/force majeure.

The work under this section shall be performed by competent, qualified accredited personnel under the supervision and in the direct employment of the Generator Contractor and shall not be transferred to any non-affiliated agent. Contract maintenance and repair work shall be done during normal working hours and shall further provide emergency call-back service twenty-four (24) hours a day, seven (7) days a week.

During the guarantee/maintenance period the Department will invite tenders for the comprehensive maintenance of the generator, which will commence after the final completion has taken place, i.e. after the twelfth month guarantee period is over and all defects are corrected.

1.9. Materials and Workmanship

- a) The work throughout shall be executed to the highest standards and to the entire satisfaction of the Representative/Agent who shall interpret the meaning of the Contract Document and shall have the authority to reject any work and materials, which, in his judgement, are not in full accordance therewith. All condemned material and workmanship shall be replaced or rectified as directed and approved by the Representative/Agent.
- b) All work shall be executed in a first-class manner by qualified accredited tradesman.
- c) The Contractor shall be fully responsible for his work and shall replace any of the work which may be damaged, lost or stolen. The Contractor shall protect the building and its contents against damage by him, his employees or sub-contractors and shall make good any damage thereto.
- d) The Contractor shall indemnify the Employer of all liability for damages arising from injuries or disabilities to persons or damage to property occasioned by any act or omission of the Contractor or any of his sub-contractors, including any and all expenses, legal or otherwise, which may be incurred by the Employer or Representative/Agent in the defence of any claim, action or suit.
- e) The Contractor shall warrant that the materials and workmanship shall be of the highest grade, that the equipment shall be installed in a practical and first-class manner in accordance with the best practices and ready and complete for full operation. It is specifically intended that all material or labour which is usually provided as part of such equipment as is called for and which is necessary for its proper completion and operation shall be provided without additional cost whether or not shown or described in the Contract Document.
- f) The Contractor shall thoroughly acquaint himself with the work involved and shall verify on site all measurements necessary for proper installation and commissioning work. The Contractor shall also be prepared to promptly furnish any information relating to his own work as may be necessary for the proper installation work and shall co-operate with and co-ordinate the work of others as may be applicable.
- g) The Contractor shall inspect and verify that the existing power feeder system is compatible with the equipment offered and any changes or upgrading of the electrical supply shall be brought to the attention of the Representative/Agent.
- h) Material and equipment damaged in transit shall be replaced with undamaged material without additional cost to the Department.
- i) All components and their respective adjustment, which do not form part of the equipment installation work, but influence the optimum and safe operation of the equipment shall be considered to form part of, and shall be included in the Contractor's scope of works.
- j) All control equipment and serviceable items shall be installed and positioned such that they will be accessible and maintainable.
- k) The Contractor shall make sure that all safety regulations and measures and environmental regulations are applied and enforced during the installation and guarantee period to ensure the safety of the public and the User Client.

1.10. Brochures

Detailed brochures of all equipment offered shall be presented together with the tender documents.

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2. SECTION 2 – EQUIPMENT REQUIREMENTS

2.1. Engine

2.1.1. General

The engine must comply with the requirements laid down in SANS 8528 and must be of the atomized injection, compression ignition type, running at a speed not exceeding 1500 r.p.m. The engine must be amply rated for the required electrical output of the set, when running under the site conditions. The starting period for either manual or automatic switching-on until the taking over by the generating set, in one step, of a load equal to the specified site electrical output, shall not exceed 15 seconds. This must be guaranteed by the Tenderer.

Turbo-charged engines will only be accepted if the Tenderer submits a written guarantee that the engine can deliver full load within the specified starting period.

Curves furnished by the engine makers, showing the output of the engine offered against the speed, for both intermittent and continuous operation as well as fuel consumption curves when the engine is used for electric generation, must be submitted with the Tender.

2.1.2. Rating

The set shall be capable of delivering the specified output continuously under the site Conditions, without overheating. The engine shall be capable of delivering an output of 110% of the specified output for one hour in any period of 12 hours consecutive running in accordance with SANS 8528.

2.1.3. De-Rating

The engine must be de-rated for the site conditions as set out in the Technical Specification, Section 3 of this document.

The de-rating of the engine for site conditions shall be strictly in accordance with SANS 8528 as amended to date. Any other methods of de-rating must have the approval of the Department and must be motivated in detail. Such de-rating must be guaranteed in writing and proved by the successful Tenderer at the site test.

2.1.4. Starting and Stopping

The engine shall be fitted with an electric starter motor and be easily started from cold, without the use of any special ignition devices under summer as well as winter conditions.

Tenderers must state what arrangements are provided to ensure easy starting in cold weather. Full details of this equipment must be submitted. In the case of water cooled engines, any electrical heaters shall be thermostatically controlled. The electrical circuit for such heaters shall be taken from the control panel, and must be protected by a suitable circuit breaker.

2.1.5. Starter Battery

The set must be supplied a fully charged lead-acid type or maintenance free type battery, complete with necessary electrolyte. The battery must have sufficient capacity to provide the starting torque stipulated by the engine manufacturer. The battery capacity shall not be less than 120 Ah and shall be capable of providing three consecutive start attempts from cold and thereafter a fourth attempt under manual control of not less than 20 seconds duration each. The battery must be of the heavy duty "low maintenance" type, housed in a suitable battery box.

2.1.6. Cooling

The engine may be either of the air or water cooled type. In the case of water-cooling, a built-on heavy duty, tropical type pressurised radiator must be fitted. Only stand-by sets that are water cooled shall have electric heaters.

For either method of cooling, protection must be provided against running at excessive temperatures. The operation of this protective device must give a visual and audible indication on the switchboard. Water-cooled engines shall in addition be fitted with a low water cut-out switch, installed in the radiator, to switch the set off in the event of a loss of coolant. The protection shall operate in the same way as the other cut-outs (e.g. low oil pressure). All air ducts for the cooling of the engine are to be allowed for. The air shall be supplied from the cooling fan cowling/radiator face to air outlet louvers in the enclosure.

2.1.7. Lubrication

Lubrication of the main bearings and other important moving parts shall be by forced feed system. An automatic low oil pressure cut-out must be fitted, operating the stop solenoid on the engine and giving a visible and audible indication on the switchboard.

2.1.8. Fuel Pump

The fuel injection equipment is suitable for operation with the commercial brands of diesel fuel normally available in South Africa.

2.1.9. Fuel Tank

The fuel tank shall be an integral part of the base frame of the generator set. The tank shall have sufficient capacity for standby sets to run the engine on full load for a period of 24 hours.

The diesel fuel storage system / tank which will be provided with the standby generator installation must be fitted with a fuel filtration and water separation system (filter & separator) which is entirely separate from the fuel supply line and line filter to the engine. This filtration and water separation system must be dedicated to purifying the content of the storage system / tank by way of the cleaning processes which are applied while circulating the fuel through the filter & separator unit.

The filtration system must be able to handle diesel fuel of “high” and of “low” sulphur content for an indefinite period. The suction line of the system must be connected to the lowest part of the storage system / tank. The return line must be connected in the top section of the storage system / tank in such a position and in such a way that the flow of fuel within the storage system / tank between the fuel return point and the fuel suction point will induce scouring of the bottom of the system / tank to effectively capture sediment and water in the to be filtered fuel.

The filtration unit must filter the diesel fuel, removing suspended particles of effective diameters down to 5 micron. In addition, it must separate all water from the fuel and the fuel storage system and automatically dispose of / dump such water into an open, removable receptacle for disposal at the installation or in a suitable position outside the building. Separation of the fuel and water must be sufficiently effective that the discharged water will meet the standard required for it to be disposed of into a municipal drain and sewer system.

The filter and water separator unit must draw its power from the DC batteries used to power the relevant generator set. The circulating pump shall be provided with a controller programmed to switch the pump through not more than three complete on and off cycles of equal time (i.e. 50% on; 50% off) , per hour, with a deviation of not more than 10 % \pm . The pump must be capable of a duty cycle of not less than 60% running time. The flow rate through the circulating pump must be between 1 L/min and 1.25 L /min.

The filter cartridge of the filter and water separator unit must be replaceable, and, in normal operational conditions, not require replacement within periods shorter than three months. The replacement units must be readily available.

The filtration & separator system may be mounted against the wall of the plant room or on the inside of a container, which may house the installation as may be specified elsewhere in this document.

The tank shall be fitted with a suitable filter, a full height gauge glass, "low fuel level" alarm, giving an audible and visible signal on the switchboard as well as a low-low fuel level cut-out.

An electrically operated pump with sufficient length of oil resistant hose to reach 2m beyond the door of the canopy/container, shall be supplied, for each set for filling the fuel tank/s from 200 litre drums.

The interconnection fuel piping shall consist of copper tubes and the connection to vibrating components shall be in flexible tubing with armoured covering.

The contractor shall allow for the supply and installation of a fuel shut off fusible link in the container. The fusible link shall shut off the fuel at a temperature of 130 degrees in an event of a fire in the self-contain enclosure. The fusible link shall be mounted above the engine and coupled to the shut off valve by means of a 2mm stainless steel cable. The cable shall be installed to the shut off valve without any possibility of kinking the cable which may cause malfunctioning of the protection device.

2.1.10. Governor

The speed of the engine shall be controlled by a governor in accordance with ECM of SANS 8528 if not otherwise specified in the Detailed Specification.

The permanent speed variation between no load and full load shall not exceed 4.5% of the nominal engine speed and the temporary speed variation shall not exceed 10%. External facilities must be provided on the engine, to adjust the nominal speed setting by $\pm 5\%$ at all loads between zero and rated load.

2.1.11. Flywheel

A suitable flywheel must be fitted, so that lights fed from the set will be free from any visible flicker.

The cyclic irregularity of the set must be within the limit laid down in SANS 8528.

2.1.12. Exhaust Silencer

It is essential to keep the noise level as low as possible. An effective exhaust silencing system of the residential type must be provided and shall be capable of providing 20 to 30 decibels of suppression.

The exhaust system shall consist of 3CR12 steel for inland areas (greater than 50km from the coast) or Grade 304 stainless steel in coastal areas.

The exhaust pipe shall be installed in such a way that the expelled exhaust fumes will not cause discomfort to the public. The exhaust pipe must be flexibly connected to the engine to take up vibrations transmitted from the engine, which may cause breakage. The exhaust piping and silencer shall be lagged and then clad in stainless steel sheet to reduce the heat and noise transmission in the generator enclosure and shall be protected against the ingress of driving rain at 45° to the horizontal. The exhaust pipe must extend 0,5m above the canopy.

2.1.13. Accessories

The engine must be supplied complete with all accessories, air and oil filters, 3 instruction manuals, spare parts lists, the first fill of all lubricating oils, fuel, etc.

2.1.14. Exhaust emissions

The exhaust emissions shall comply with US Tier III/EU stage III standards.

2.2. Alternator

2.2.1. General

The alternator shall be of the self-excited brushless type, with enclosed ventilated drip-proof housing and must be capable of supplying the specified output continuously with a temperature rise not exceeding the limits laid down in SANS 60034-1 for rotor and stator windings.

The alternator shall be capable of delivering an output of 110% of the specified output, for one hour in any period of 12 hours consecutive running.

Both windings must be fully impregnated for tropical climate and must have an oil resisting finishing varnish.

2.2.2. Regulation

The alternator must preferably be self-regulated without the utilisation of solid state elements. The inherent voltage regulation must not exceed plus or minus 5% of the nominal voltage specified, at all loads with the power factor between unity and 0,9 lagging and within the driving speed variations of 4,5% between no-load and full load.

2.2.3. Performance

The excitation system shall be designed to promote rapid voltage recovery following the sudden application of the load. The voltage shall recover to within 5% of the steady state within 300 milliseconds following the application of full load and the transient voltage dip shall not exceed 18%.

2.2.4. Coupling

The engine and alternator must be directly coupled by means of a high quality flexible coupling, ISO 9001:2000 approved and must be designed and manufactured to this quality system.

2.3. Switchboard

2.3.1. General

A switchboard must be supplied and installed to incorporate the equipment for the control and protection of the generating set and battery charging.

The switchboard must conform the specification as set out in the following paragraphs.

2.3.2. Construction

The switchboard shall be enclosed in the steel enclosure.

All equipment, connections and terminals shall be easily accessible from the front. The front panels may be either hinged or removable and fixed with studs and chromium-plated cap nuts. Self-tapping screws shall not be used in the construction of the board.

All pushbuttons, pilot lights, control switches, instrument and control fuses, shall be mounted on hinged panels with the control wires in flexible looms.

The steelwork of the boards must be thoroughly de-rusted, primed with zinc chromate and finished with two coats of signal red quality enamel, or a baked powder epoxy coating.

Suitably rated terminals must be provided for all main circuits and the control and protection circuits. Where cable lugs are used, these shall be crimped onto the cable strands. Screw terminals shall be of the type to prevent spreading of cable strands. All terminals shall be clearly marked.

For the control wiring, each wire shall be fitted with a cable or wire marker of approved type, and numbering of these markers must be shown on the wiring diagram on the switchboard. Control wiring shall be run in PVC trunking. The trunking shall be properly fixed to the switchboard steelwork. Adhesives shall not be acceptable for the fixing of trunking or looms.

The modular generator set controller and protection equipment shall be mounted on a separate easily replaceable panel.

All equipment on the switchboard, such as contactors, isolators, busbars, etc., shall have ample current carrying capacity to handle at least 110% of the alternator full load current.

Access to the cubicle will be such that all components can be conveniently reached for testing and maintenance purposes.

The necessary bushes and a screen over the terminals will be provided where the power feeds enter and leave the cubicle.

The cubicle will be so constructed that the ac and dc components are screened from one another.

2.3.3. Protection and Alarm Devices

All switchboards shall be equipped with protection and alarm devices as described below.

A circuit breaker and an adjustable current limiting protection relay must be installed for protection of the alternator. The protection relay shall be of the type with inverse time characteristics. The relay shall cause contactor to isolate the alternator and stop the engine.

Protection must be provided for overload, high engine temperature, low lubricating oil pressure, over speed, start-failure, and low water level.

Reset push buttons are required on the modular generator set controller and a visible signal are required and the engine must stop when any of the protective devices operate. In the case of manual operation of standby sets, it shall not be possible to restart the engine.

The indication on the modular generator set controller must be in ENGLISH.

"OVERLOAD"
"TEMPERATURE HIGH"
"OIL PRESSURE LOW"
"OVERSPEED"
"START FAILURE"
"LOW WATER LEVEL"

In addition an audible and visible flashing signal shall be provided, when:

- a) The fuel level in the service tank is low. The indication on the modular generator set controller shall be "FUEL LOW".
- b) The battery charger failed. The indication on the modular generator set controller shall be "CHARGER FAIL"

A low-low level sensor must be provided. At this level the engine must stop to prevent air entering the fuel system.

This is also applicable to the engine driven generator/alternator.

All alarm conditions must operate an alarm hooter. A pushbutton must be installed in the hooter circuit to stop the audible signal, but the fault indicating light on the control panel must remain lit until the fault has been rectified.

An on/off switch is not acceptable. After the hooter has been stopped, it must be re-set automatically, ready for a further alarm.

The hooter must be of the continuous duty and low consumption type. Both hooter and protection circuits must operate from the battery.

Potential free contacts from the alarm relay must be brought down to terminals for remote indication of alarm conditions.

A test pushbutton must be provided to test all indicators lamps.

2.3.4. Modular Generator Set controller

The modular generator set controller shall be an electronic unit to match those of the other modular generator set controllers and of a high quality i.e. Levato, Deep Sea Electronics, Circom. It must be provided with IO and communication facilities.

The modular generator set controller will be supplied with all its functions and shall be mounted on a separate easily replaceable panel with plug in termination blocks for easy installation and replacement.

The modular generator set controller interface will be implemented with relays, contactors etc.

The modular generator set controller will have a mimic display of the alternator/mains/ change over contactors configuration with LED's showing the status of the mains, alternator and change over contactors.

Configuration software shall be supplied with the system. The software will be capable of the following:

- Fault management (event log)
- Configuration management (software upgrades and function changes)
- Account management (energy management)
- Performance management (generator set point changes)
- Security management (passwords)

The modular generator set controller will have a standard RS 232/485 or Ethernet interface suitable for TCP I/P transport medium. All communication including configuration management will be done through this port. Equipment connected at each end of the RS 232 or Ethernet cable shall be adequately protected against transient over-voltages, lightning effects (particularly if the set and remote alarms are in separate buildings), switching surges, power system surges or mains and alternator borne noise/interference.

The controller will incorporate the following functions:

- Mains sensing
- Alternator output-voltage sensing
- Alternator over- frequency sensing
- Control of processor unit (self-diagnostics)
- Alarm/ Status indications
- Control selector and operation
- Phase rotation monitor

A 4- position control selector on the controller will be provided to facilitate the following modes of operation:

- OFF: Diesel/ alternator generator set switched off
- MANUAL: Mains bypassed: Diesel/ alternator will not take load

- AUTO: Diesel /alternator takes load on mains failure
- TEST: Diesel /alternator takes load on mains failure
- A standby failure alarm (SF) will be given on the controller and to the output alarms when “Not in Auto” is selected.

The modular generator set controller must monitor the following

When the voltage of the incoming mains varies by more than a pre-program value (default $\pm 10\%$) from the normal voltage on any phase, the controller will signal that the incoming mains will be disconnected and the engine-starting sequence initiated.

When the frequency of the incoming mains varies by more than pre- program value (default $\pm 5\%$) from the normal frequency, the controller will signal that the incoming mains will be disconnected and the engine-starting sequence initiated.

Upon restoration of the incoming mains to the pre-program value (default $\pm 10\%$) of the normal voltage on all phases, the monitor will signal that the load will be disconnected from the alternator and reconnected to the incoming mains.

If the alternator has been disconnected from the load and the incoming mains within the voltage limits of $\pm 10\%$ on all phases, the controller will signal that the load will be reconnected to the incoming mains.

Should the incoming mains fail or not in the specified limits while the engine is running under control of the cooling-off timer, the control for the cooling –off timer in the controller will be cancelled and the load connected to the alternator.

When the output voltage of the alternator varies by more than the pre-program value (default value $\pm 10\%$) on ANY phase, the controller will signal that the load will be disconnected from the alternator and the engine stopped.

A software over and under-frequency monitor will be provided in the controller if the frequency exceeds or drop below pre-programmed values. It will meet the requirements of class G2 governing. The monitor will not be influenced by harmonics.

Note: Software monitors will include adjustable overshoot and undershoot timers to be fully compatible with Class G2 governing.

All timers will be implemented in software.

Incoming supply failure timer

It is essential that incoming supply failures, occurring at short intervals, do not cause a series of starts and stops.

A timer adjustable from 1 s to 10 s required

The timer default value will be generator set to 3 s

The signal generated by the mains voltage monitor will start the timer. If the duration of the signal is less than the generator setting on the timer, the signal is suppressed so that the switching and starting sequence is initiated. However, if the duration of the signal is more than the generator setting on the timer, the signal will be transmitted to initiate the switching and starting sequence.

Incoming supply restoration timer

It is essential that incoming supply failures, occurring at short intervals, do not cause a series of starts and stops.

A timer adjustable from 1 s to 10 s required.

The timer default value will be generator set to 3 s.

The signal generated by the mains voltage monitor will start the timer. If the duration of the signal is less than 150 sec, the signal is suppressed and the timer is regenerator set. However, if the duration of the signal is more than 150 sec, the signal will be transmitted to initiate the switching sequence.

Alternator supply/ incoming supply change-over timer

It is essential that the supply be disconnected from the load before the incoming supply is reconnected to the load. This will be software generator settable in the controller with a minimum of 5 seconds and maximum of 20 seconds.

On receipt of the switching signal, the alternator supply will be disconnected from the load and timer started. After 5 sec, the incoming supply will be reconnected to the load.

Engine cooling-off timer

After the load has been transferred to the incoming supply the engine will run without load for a period to cool off and then stop.

A timer, software adjustable in the controller from 5 to 10 min is required.

Repeat- start control

A repeat- start control is required in the controller software adjustable so that in the event of the engine failing to start on the first start attempt, the starter motor will be released and repeat the start attempt.

The repeat-start attempt will be repeated 3 times.

The duration of each start attempt will be 6 sec with a period of 15 sec between successive start attempts.

Should the engine fail to start after the third start attempt, the controller will transmit a signal for alarm purposes.

In addition to the requirement for the switchboard instruments listed elsewhere in this document metering will also form part of the modular generator set controller and must be accessible on the software.

The modular generator set controller shall display the following alarm/status indications:

- High engine temperature.
- Low Oil pressure
- High/low alternator output voltage
- Over and under speed (frequency)
- Low water level
- Emergency stop activated
- Mains fail
- Battery charger fail
- Dummy load in operation
- Unit not in Auto
- Engine running
- Low fuel alarm
- Engine start failure

Conditions one to six above will stop the engine.

The Contractor shall provide a remote alarm mimic panel and the associated control wiring for the set. The panel shall be installed in the duty/security room at the entrance to the building approximately 70m from the generator set position.

The mimic panels must fit into furniture and blend with the design. Before manufacture, the Contractor shall submit and obtain the approval, from the Engineer, for the mimic panel.

The remote alarm must have potential free relay contacts which shall indicate the following on each set:

- 1) Mains on/off
- 2) Alternator running
- 3) Common fault alarm
- 4) Buzzer which can only be reset at the generator panel
- 5) Fuel low

The cable between the remote alarms is to be a signal cable with a screen and this option must be able to operate from a 12 / 24 V dc supply so that it can be powered from the generator set batteries.

A facility to originate a fault message should a warning or shutdown fault occur.

A facility to allow the mode of the control system to be changed to any of the four modes to allow the set to be run from a remote location.

A facility to originate a call to the control cellular and to transfer a fault message should a warning or shutdown fault occur. The alarm conditions above from the controller will be extended to four relays with a make and break contact and terminal strip to allow for remote monitoring of the following alarms:

- Mains fail
- Standby run
- Standby fail
- Low Fuel

A remote start facility must be supplied, software controllable in the controller.

All events relating to the status of the generator set shall be logged with date and time in a non-volatile memory (which can retain information for a period of 6 months in the absence of power to the controller) and the user shall be able to contain a hard copy on site.

The modular generator set controller system must be able to operate with a minimum DC supply voltage of 4 volts (without making use of either an internal or an external auxiliary battery) to allow cranking and starting under conditions of low battery capacity. Control cables between the set and the control panel shall be fitted with sockets for ease of undoing in the event the modular generator set controller has to be removed.

2.3.5. Manual Starting

Each switchboard shall be equipped with two pushbuttons marked "START" and "STOP" for manual starting and stopping of the set.

2.3.6. Battery Charging Equipment

Each switchboard shall be equipped with battery charging equipment.

The charger shall operate automatically in accordance with the state of the battery and shall generally consist of an air-cooled transformer, a full wave solid state rectifier, and the necessary automatic control equipment of the constant voltage system.

The charger must be fed from the mains. An engine driven alternator must be provided for charging the battery while the set is operational. Failure of this alternator must also activate the battery charger failure circuit.

The starter battery voltage will be software monitored by the modular generator set controller. The voltage will be digitally displayed.

2.3.7. Switchboard Instruments

Each generating set shall have a switchboard equipped as follows:

- a) One flush square dial voltmeter, reading the alternator voltage, scaled as follows:
 - (i) 0-300V for single phase generators.
 - (ii) 0-500V for three phase generator. In this case a six position and off selector switch must be installed for reading all phase and phase to neutral voltages.
- b) A flush square dial combination maximum demand and instantaneous ampere meter for each phase, with resettable pointer suitably scaled 20% higher than the alternator rating. A red arc stripe above scale markings from 0-20A and a red radial line through the scale at full-load current, shall be provided. This instruments shall be supplied complete with the necessary current transformer.
- c) One flush square dial vibrating type frequency meter, indicating the alternator frequency.
- d) A six digit running hour meter with digital counter, reading the number of hours the plant has been operating. The smallest figure on this meter must read 1/10 hour.
- e) Fuses or m.c.b.'s for the potential voltage circuits of the meters.
- f) One flush square dial ampere meter suitably scaled for the battery charging current.
- g) One flush square dial voltmeter with a spring loaded pushbutton or switch for the battery voltage.

2.3.8. Marking

All labels, markings or instructions on the switchgear shall be in English.

2.3.9. Earthing

An earth bar must be fitted in the switchboard, to which all non-current carrying metal parts shall be bonded.

The neutral point of the alternator must be solidly connected this bar by means of a removable link labelled "EARTH". Suitable terminals must be provided on the earth bar for connection of up to three earth conductors, which will be supplied and installed by others.

2.3.10. Operation Selector Switch

A four position selector switch must be provided on the switchboard marked "AUTO", "MANUAL", "and TEST" and "OFF".

With the selector on "AUTO", the set shall automatically start and stop, according to the mains supply being available or not.

With the selector on "TEST", it shall only be possible to start and stop the set with the pushbuttons, but the running set shall not be switched to the load.

With the selector on "MANUAL", the set must take the load when started with the pushbutton, but it must not be possible to switch the set on to the mains, or the mains onto the running set.

With the selector on "OFF", the set shall be completely disconnected from the automatic controls, for cleaning and maintenance of the engine.

2.3.11. Automatic Change-over System

A fully automatic change-over system must be provided to isolate the mains supply and connect the standby set to the outgoing feeder in case of a mains failure and reverse this procedure on return of the mains.

The contactors for this system must be electrically and mechanically interlocked.

2.3.12. By-pass Switch and Main Isolator

The switchboard shall be equipped with an on-load isolator to isolate the mains and a manually operated on-load 4 pole 4 position by-pass switch, which shall switch the connected loads as follows:

NORMAL: will allow for the normal connection i.e. connects the incoming mains to the Automatic control gear or directly to the outgoing feeder.

In the GEN BY-PASS position the switch will disconnect the automatic changeover control gear, and will connect the municipal mains directly to the essential supply busbar which will allow for the maintenance of either or both the generator and the automatic changeover equipment.

MAINS BY-PASS switching position would allow the generator to be connected directly to the essential supply busbar. This is when there is a problem with the automatic changeover equipment and there is no municipal power available.

The final position is an OFF position which will remove all power downstream of this switch.

It is required that this by-pass switch and mains isolator be mounted away from the automatic control gear, in a separate compartment, either on the side or in the lower portion of the switchboard cubicle, and that the switches are operated from the front of the compartment.

Contractor to note: The by-pass and mains isolator switch shall also break the main neutral.

2.3.13. Start Delay

Starting shall be automatic in event of a mains failure. A 0-15 second adjustable start delay timer shall be provided to prevent start-up on power trips or very short interruptions.

2.3.14. Stop Delay

A stop delay with timer is required for the set, to keep the set on load for an adjustable period of one to sixty seconds after the return of the mains supply, before changing back to the supply. An additional timer shall keep the set running for a further adjustable cooling period of 5 to 10 minutes at no-load before stopping.

2.4. Installation

Except for the supply of the incoming mains cable and outgoing feeder cables, the tenderer must include for the complete installation and wiring of the plant in running order, including the connection of the incoming cable and outgoing feeder cables.

The connecting of the cable and control cabling to the generator and the control terminals in the LV board remains the responsibility of the tenderer.

2.5. Warning Notices

Notices, in English, must be installed on the outside of the steel enclosure.

The successful tenderer must consult the Occupational Health and Safety Act 83 of 1993 and get approval of the wording from the Department's representative, prior to ordering the notices.

The notice shall be made of a non-corrodible and non-deteriorating material, preferable plastic, and must read as follows:

DANGER: This engine will start without notice. Turn selector switch on control board to "OFF" before working on the plant.

An engraved label shall be installed next to the fuel cap that indicates the following:

- Base Tank Capacity
- Bulk Tank Capacity (if provided)
- Full load litres per hour consumption

2.6. Construction

The engine and alternator of the set shall be built together on a common frame, which must be mounted on a skid base on anti-vibration mountings. The set must be placed inside an IP65 canopy/container. A drip tray must be fitted under the engine. The tray must be large enough to catch a drip from any part of the engine.

The frame must be of the 'DUPLEX' type.

2.7. Operation

The set is required to supply the lighting and power requirements in the case of a mains power failure.

The set shall be fully automatic i.e. it shall start when any one phase of the main supply fails or get switched and shall shut down when the normal supply is re-established. In addition it shall be possible to manually start and stop the set by means of pushbuttons on the switchboard.

The automatic control shall make provision for three consecutive starting attempts. Thereafter the set must be switched off, and the start failure relay on the switchboard must give a visible and audible indication of the fault.

To prevent the alternator being electrically connected to the mains supply when the mains supply is on and vice versa, a safe and fail proof system of suitably interlocked contactors shall be supplied and fitted to the changeover switchboard.

SECTION 3 – TECHNICAL SPECIFICATION

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3. SECTION 3 – TECHNICAL SPECIFICATION

3.1. General

Supply, deliver, install, commission, test and maintain an emergency generating set [at Elliot Magistrate Court - Elliot](#).

This installation must comply fully with all the sections and drawings of this document. This technical specification is supplementary to the Equipment Requirements, Section 2, and must be read together where they are at variance the Technical Specification shall apply.

Supply, delivery, installation and commissioning of the complete outdoor emergency generator set inside an IP65 canopy/container on a concrete plinth as specified in this document and indicated on the drawings.

Concrete plinth is [to be constructed by the Main Contractor](#).

The surface of the concrete plinth shall be 50mm higher than the existing ground level. The thickness and strength of the plinth shall be designed by the consulting engineer and are detailed on the drawings.

A tap to be provided to drain all the water that accumulates inside the bund wall. Final position of the tap will be determined on site. The bund wall shall contain 110% of the fuel, oil and water capacity of the generator. The bund wall shall not constrain the canopy doors from opening completely.

The generator contractor shall install an earthing system in the concrete plinth. The contractor shall install two (2) earth studs 1.8 meters long on opposite corners of the concrete plinth into the ground. The earth studs shall be connected by means of a 70mm² bare copper earth wire to the main earth bar in the control panel. The earth conductor shall be connected to the earth bar, canopy, base, skid and earth bar by means of suitably crimping lugs and brass bolts.

3.2. Site Information and Conditions

3.2.1. Location

The site is [at Elliot Magistrate Court – Elliot \(Eastern Cape\)](#).

3.2.2. Site Conditions

The following site conditions will be applicable and equipment shall be suitably rated to develop their assigned rating and duty at these conditions.

- | | |
|---|--------------|
| a) Height above sea level | : 1490 Meter |
| b) Maximum ambient temperature | : 40 °C |
| c) Maximum ambient humidity at lowest temperature | : 50 % |

3.3. Output and Voltage

After the de-rating factors for the engine and generator due to site conditions have been taken into account, the set must have a site output and voltage as follows: -

No load voltage	:	400/230 Volt
Rating	:	150kVA
Power at 0.9 power factor	:	135kW
Frequency	:	50Hz
Fault Level	:	6kA

3.4. Switchboard/Control Panel Unit

All switch- and control gear shall be rated for a fault current level of 6kA.

The switchboard/control panel unit shall be enclosed in the IP65 canopy/container.

3.5. Cables

The contractor will be responsible for all electrical cable connections associated with the complete generating set installation.

3.6. Engine

A sump drainpipe must be fitted with a shut-off valve placed in a convenient position outside the base frame to facilitate drainage.

Recommended oil types must be indicated on the engine, or base frames, by means of suitable labels.

All engine instruments shall have clear markings on the faceplates, indicating the normal operating zone(s), maximum and minimum allowable values/limits and danger zone(s).

The flywheel shall be covered by approved hoods.

3.7. Alternator

The Alternator shall be of the low harmonic type.

3.8. Load Acceptance

The generator set shall be capable of accepting 75% of the specified site electrical output 10 seconds after the starter motor is energised and the remaining 25%, 5 seconds thereafter, i.e. 100% load acceptance shall not exceed 15 seconds.

3.9. Enclosure

The standby set is a free standing unit and shall be mounted in an enclosure as detailed below:-

3.9.1 General

The enclosure, shall be completely vermin-proof, powder coated and shall be constructed of 3CR12 stainless steel or within 50km from the coast with grade 316 steel housing. Minimum thickness of ± 1.5 mm. Base Structures to be manufactured using minimum of 3.5mm thick 3CR Steel and powder coated matt black.

The enclosure shall allow easy access to the engine, alternator, radiator filler cap and control cubicle for maintenance purposes.

The door shall be flush with the rest of the canopy and of the side opening type. A minimum of four doors are required i.e. two on either side.

The door hinges and locking bars shall be of a heavy duty type and be manufactured of 3CR12 stainless steel or within 50km from the coast with grade 316 steel and shall be fitted with a grease nipple.

The doors and panels shall be suitably braced and stiffened to ensure rigidity and to prevent bending and warping.

Suitable door restraints shall be fitted to all the doors, enclosure including the control panel to prevent wind damage. The restraint shall consist of a steel rod in a steel groove or slide with a spring loaded catch, which is to be manually reset to close the door.

No flexible restraints will be accepted.

The diesel fuel level indicator and alternator rating plate shall be clearly visible with the doors open.

Unless specified the silencers shall be mounted within the enclosure.

Perforated sheeting shall be fitted over all the insulating material inside the canopy of all soundproof sets.

Rubber seals on doors shall be equal to or similar to rubber pinch weld, wind lace.

9.2 Design

The enclosure shall be designed to be weather-proof and sound-proofing as specified. Rivets or self-tapping screws will under no circumstances be allowed for fixing the various sections of the enclosure. Only cadmium coated nuts and bolts are acceptable.

9.3 Roof

The roof of the enclosure shall be constructed for proper drainage of water as per the drawing.

9.4 Lamp fitting

A lamp fitting and it's associated on/off door switch shall be provided inside the enclosure for illumination of the control panel. The power for the lamp shall be obtained from the starter battery.

9.5 Sound-proofing

The sound-proofing on canopy engine sets shall be such that the maximum noise level generated by the set under any load condition shall not exceed 65 dB measured in any direction at a distance of 5m from the centre of the set with the doors closed.

The supply and discharge air paths will require separate attenuators on soundproof sets.

9.6 Padlock and keys

The contractor shall supply padlocks and keys for all the doors of the enclosure. The padlock shall be off the "Viro A82 keyed alike with stainless steel shackles" type.

Suitable brass metal plates shall be installed behind each lock for the protection of the enclosure against scratching or damaging, where the locks are hanging.

3.10. Alarms

The successful tenderer must pay particular attention to the requirements of the alarms as described in the Equipment Requirements, Section 2.

One alarm hooter and red light shall be supplied and installed on the outside of the generator container in a position as indicated by the Department's Representative.

The hooter shall consist of an electronic unit similar and equal to a "Klaxon" - type SY2/725 hooter with a continuously rated output and 110 dB at a distance of 2 metres, and shall be IP55 weatherproof rated.

The warning light shall consist of a 40W flashing red light, which shall be mounted on a galvanised steel frame together with the hooter.

The hooter and light shall be switched on or off simultaneously after initiation or cancellation of an alarm condition. The supply and installation of the wiring between the control board and the alarm unit forms part of this contract.

The successful tenderer must ensure that the hooter control circuit resets automatically after cancellation due to a low fuel condition or battery charger failure, but the visible fault indication must remain, i.e. should the operator continue to run the set, the hooter must sound, should any other condition develop.

A remote alarm panel shall be supplied and installed by the contractor in the control room. This shall be of surface mounting, enamelled sheet metal (colour to approval), minimum depth construction, and shall incorporate a flashing red pilot alarm light, adjustable electronic sounder, and a silence push button. The silence button shall not switch off the pilot light - this shall only be switched off when the alarm is reset at the Generator Panel.

A 2,5mm² x 4-core PVC SWA PVC cable will be supplied, installed and terminated by others between the Generator Panel and the Charge Office. The Contractor shall connect this cable at both ends and shall supply and install all switch gear relays, etc. to ensure satisfactory operation of the Remote Alarm Panel.

3.11. Remote Control Generator Switch

A Remote Control Generator "ON/OFF/AUTO" switch will be supplied and installed by others in the control room, and a 2,5mm² x 4-core PVC SWA PVC cable will be supplied and installed by others between the control room and the Generator Panel.

The contractor shall connect this cable at both ends, and shall supply and install all switch gear, relays, etc. to ensure satisfactory operation of the remote control switch.

3.12. Fuel Drip Tray

A galvanized or 3CR 12 drip tray drip tray approximately 100mm deep shall be mounted below the generator and must be large enough to collect any fuel that drips from the generator fuel accessories. The thickness of the drip tray sheet steel shall not be less than 2mm.

3.13. Completion Time

The Generator Set is required to be commissioned in conjunction with the building contract.

3.14. Inform

The successful tenderer shall inform the Engineer when the set is ready for installation.

3.15. Fuel Supply Tank

The fuel tank shall be an integral part of the base frame of the generator set. The tank shall have sufficient capacity to run the engine on full load for a period of 24 hours. The base tank shall be an open channel self-bund walled type that shall be of sufficient capacity to contain a spillage equivalent to 110% in volume of the base tank. The containment tank shall be manufactured from black mild steel with a thickness of not less than 2mm.

A float level alarm connected to the generator controller shall be incorporated into the bund area located such that the alarm will be activated when 50% of the volume of the bund area has been reached in the event of any diesel fuel leakage.

3.16. Dummy Load

The contractor shall allow for the supply and installation of a dummy load to prevent the generator from free wheeling. The dummy load shall accommodate at least 40% of the rating of the generator, kVA, load of the generator. The dummy load may be a resistive or inductive load. The dummy load shall be divided into 4 stages and will automatically be activated to increase or decrease the dummy load depending on the required load of the installation at any given stage.

The dummy load may be installed in the generator container or in a 3 CR 12 container installed adjacent to the generator. The container shall be sufficiently ventilated to insure that the heat of the dummy load does not cause any damage to any components of the installation. The dummy load shall be wired in such a manner that the controller shall monitor the load of the generator and step-in the dummy load in 4 stages as required by the generator manufacturer.

The contractor shall install a suitable contactor, circuit breaker and controls for the dummy load in the changeover control panel..

SECTION 4 – SCHEDULES OF TECHNICAL INFORMATION
(TO BE FULLY COMPLETED BY TENDERER)

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4. SECTION 4 – SCHEDULES OF TECHNICAL INFORMATION

4.1. Engine

NO	ITEM	REMARKS
1.	Manufacturer's Name	
2.	Country of Origin	
3.	Manufacturer's model No. and year of manufacture	
4.	Continuous sea level rating after allowing for ancillary equipment : a) In b.h.p. b) In kW	
5.	Percentage de-rating for site conditions, in accordance with SANS 8528 a) For altitude b) For temperature c) For humidity d) Total de-rating	
6.	Net output on site in kW	
7.	Nominal speed in r.p.m.	
8.	Number of cylinders	
9.	Strokes per working cycle	
10.	Stroke in mm	
11.	Cylinder bore in mm	
12.	Swept volume in cm ³	
13.	Mean piston speed in m/min	
14.	Compression ratio	
15.	Cyclic irregularity	
16.	Fuel consumption of the complete generating set on site in l/h of alternator output at : a) Full load b) $\frac{3}{4}$ load c) $\frac{1}{2}$ load NOTE : A tolerance of 5% shall be allowed above the stated value of fuel consumption.	
17.	Make of fuel injection system.	
18.	Capacity of fuel tank in litres	
19.	Is gauge glass fitted to tank?	
20.	Is electric pump for filling the fuel tank included?	

NO	ITEM	REMARKS
21.	Method of starting	
22.	Voltage of starting system	
23.	Method of cooling	
24.	Type of radiator if water-cooled	
25.	Type of heater for warming cylinder heads	
26.	Capacity of heater in kW	
27.	Method of protection against high temperature	
28.	Method of protection against low oil pressure	
29.	Type of governor	
30.	Speed variation in % a. Temporary b. Permanent	
31.	Minimum time required for as assumption of full load in seconds	
32.	Recommended interval in running hours for : a. Lubricating oil change b. Oil filter element change c. Decarbonising	
33.	Type of base	
34.	Can plant be placed on solid concrete floor?	
35.	Are all accessories and ducts included?	
36.	Is engine naturally aspirated?	
37.	Are performance curves attached?	
38.	Diameter of exhaust pipe	
39.	Noise level in plant room in dBA	N/A
40.	Noise level at tail of exhaust pipe in dBA	
41.	BMEP (4 stroke) at continuous rating (kPa)	
42.	% Load acceptance to SANS 8528, with 10% transient speed drop	

4.2. Alternator

NO	ITEM	REMARKS
1.	Maker's name and model no.	
2.	Country of Origin and year of manufacture	
3.	Type of enclosure	
4.	Nominal speed in r.p.m.	
5.	Number of bearings	
6.	Terminal voltage	
7.	Sea level rating kVA at 0,9 power factor	
8.	De-rating for site conditions	
9.	Input required in kW	
10.	Method of excitation	
11.	Efficiency at 0,9 power factor and : a) Full load b) $\frac{3}{4}$ load c) $\frac{1}{2}$ load	
12.	Maximum permanent voltage variation in %	
13.	Transient voltage dip on full load	
14.	Voltage recovery on full load application in milli-seconds	
15.	Is alternator brushless?	
16.	Class of insulation of windings	
17.	Is alternator tropicalised?	
18.	Symmetrical short circuit current at terminals n Ampere	
19.	Type of Coupling	

4.3. Switchboard

NO	ITEM	REMARKS
1.	Maker's Name	
2.	Country of Origin	
3.	Is board floor mounted?	
4.	Finish of board	
5.	Make of volt, amp, and frequency meters	
6.	Dial size of meters in mm	
7.	Scale range of voltmeter	
8.	Scale range of ammeters	
9.	Ratio of current transformers	
10.	Make of hour meter	
11.	Range of cyclometer counter	
12.	Smallest unit shown on counter (Item 11)	
13.	Make of circuit breaker	
14.	Type of circuit breaker	
15.	Rating of circuit breaker in Amp and fault level in kA	
16.	Setting range of overload trips	
17.	Setting range of instantaneous trips	
18.	Make of change-over equipment	
19.	Make of voltage relay	
20.	Is control and protection equipment mounted on a small removable panel?	
21.	Type of control equipment	
22.	Make of mains isolator	
23.	Type of indicators for protective devices	
24.	Make of rectifier	
25.	Type of rectifier	
26.	Is battery charging	
27.	Are volt- and ammeters provided for charging circuit?	
28.	Is the alarm hooter of the continuous duty type?	
29.	Rating in Amps of : a. Change-over equipment b. Mains on load isolator c. By-pass switch d. Circuit breaker to outgoing feed	
30.	Is manufacture of switchboard/control panel to be sub-let?	

NO	ITEM	REMARKS
31.	If yes, state name and address of specialist manufacturer	

4.4. Battery

NO	ITEM	REMARKS
1.	Maker's Name	
2.	Country of Origin	
3.	Type of battery	
4.	Voltage of battery	
5.	Number of cells	
6.	Capacity in cold crank amp	

4.5. Dimensions

NO	ITEM	REMARKS
1.	Overall dimensions of set in mm	
2.	Overall mass	
3.	Is the canopy/container adequate for the installation of the set, switch board and fuel tank	

4.6. Deviation from the Specification as an Alternative (State Briefly)

NO	DESCRIPTION

4.7. Spare Parts and Maintenance Facilities

NO	ITEM	REMARKS
1	Approximate value of spares carried in stock for this particular diesel engine and alternator	
2	Where are these spares held in stock	
3	What facilities exist for the servicing of the equipment offered	
4	Where are these facilities available	

SECTION 5 – BILL OF QUANTITIES

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5. SECTION 5 – BILL OF QUANTITIES

5.1. General

- 1) The descriptions in this Bill of Quantities shall be read in conjunction with the specification.
- 2) The unit rate for each item in the Price Schedules shall include for all materials, labour, profit, transport, etc., everything necessary for the execution and complete installation of the work in accordance with the description.
- 3) All material covered by this Specification shall, wherever possible, be of South African manufacture.

5.2. Bill of Quantities

Item	Description	Unit	Quantity	Rate	Amount
	<p><u>STANDBY GENERATOR INSTALLATION</u></p> <p>(Provisional)</p> <p><u>PREAMBLES</u></p> <p>For Preambles refer to "Department of Public Works: Standard Electrical Specifications-PW354 "</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Specifications, drawings, etc:</u></p> <p>Tenderers are referred to the specification and drawings prepared by the Consulting Engineer, included in the tender package, for the full descriptions of all items which are to be read and priced in conjunction with the said specification and drawings.</p> <p>PRELIMINARIES AND GENERAL</p>				
1	Preliminaries and general required to comply with the conditions of contract, insurances and all regulations governing this contract.	Item	1		
2	<p>GENERATOR INSTALLATION</p> <p>150kVA (Prime) self contained sound proof canopy (3CR12 - Minimum 1.5mm Thickness and base Minimum 3.5mm Thickness) generator set complete with AMF Control Panel, Changeover, 4 Position By Pass Switch, stainless steel exhaust as specified, including fuel tank (for 24 hour operation). All offloading requirements to be included. Tenderers are to note that the AMF and electrical panels are to be compartmentilised with their own mains isolator. All ammeters/ volt meters/ battery charging and run hour meters etc must be supplied on the control panel in addition to the display readings from the AMF controller. Generator to incorporate all items detailed within the tender specification.</p>	Item	1		
3	4 Stage (40%) dummy load control system as per the specification. Rated as per generator suppliers specifications and ensuring the machine always runs under load conditions	Item	1		
4	Diesel Fuel	litres	300		
5	Heavy Duty 200l Diesel fuel storage drums	Nº	2		
6	All danger signage and painting as per Department of Public Works Standard Drawings	Item	1		
7	Electric Fuel Pump and related pipework inside generator canopy (15m of pipe)	Item	1		
8	Manual Fuel Pump	Item	1		
9	Remote Alarm Mimic Panel installed at the Security Control Room	Item	1		
	PAGE TOTAL CARRIED FORWARD TO NEXT PAGE			R	

Item	Description	Unit	Quantity	Rate	Amount
	AMOUNT BROUGHT FORWARD FROM PREVIOUS PAGE				R
10	Suitable Sized Screened Multi Core control cable with 2 spare pairs to connect to the Remote Alarm Mimic panel from the Genset to Mimic Panel in control room.	m	65		
11	Complete earthing of Generator set - (4 x 1.8m earth studs and interconnecting 70mm2 Bare Copper earth wire) as per the specification.	Item	1		
12	Padlocks - A82 brass padlocks with stainless steel shackle.	No	5		
13	Warning notices - Set of Warning Notices as per SANS and OHS specifications	Item	1		
14	Complete set Operation and Maintenance Manuals	No	4		
15	Complete On Site Testing and Commissioning of the generator by the specialist generator supplier/installer	Item	1		
16	12 Months Guarantee and Maintenance as specified.	Item	1		
17	On site service of the plant as per the manufacturer's requirements	No	4		
18	Full training of staff with all manuals and applicable documentation. Training date to be determined by User Department (2 Separate training sessions to be completed)	No	2		
	GENERATOR FACTORY INSPECTION				
19	Cost for on site inspection and testing of the standby generator at the suppliers factory by the Engineer. Tenderer to allow for all transport costs including Airfare and transport from Airport to the suppliers factory. Costs to be based from East London to the manufacturer and shall include accomodation cost if not a 1 day trip.	Item	1		
	GENERATOR ELECTRICAL CERTIFICATE OF				
20	Allow for the testing and issuing of an electrical certificate of compliance for the generator set.	Item	1		
	TOTAL TENDER AMOUNT EXCLUDING VAT CARRIED FORWARD TO BOQ SUMMARY PAGE				R

6. SECTION 6 – DRAWINGS

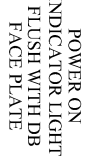
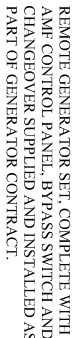
6.1. Drawings

Drawing Number	Drawing
E181 E4.1	SINGLE LINE DIAGRAM DB MAIN
E181 E4.13	SINGLE LINE DIAGRAM LEGEND
PUBLIC WORKS	TYPICAL GENERATOR SAFETY SIGNAGE

POSITION 1: NORMAL = 1 CONNECTED TO 2

POSITION 3: OFF = NO POWER TO LOAD

250A




NAME:DB-MAIN	VOLTAGE: 400/230V				
RATING-BUSBAR: 250A	FAULT:15KA				
SUPPLY: Bottom	<input checked="" type="checkbox"/>	Top	<input type="checkbox"/>	Side	<input type="checkbox"/>
FEEDERS: Bottom	<input checked="" type="checkbox"/>	Top	<input checked="" type="checkbox"/>	Side	<input type="checkbox"/>
MOUNTING: Free Standing	<input checked="" type="checkbox"/>	Floor	<input checked="" type="checkbox"/>		
Recessed	<input type="checkbox"/>	Surface	<input type="checkbox"/>		
DOORS: Yes	<input type="checkbox"/>	None	<input checked="" type="checkbox"/>	Lockable	<input type="checkbox"/>
COLOUR: White	<input type="checkbox"/>	Red	<input checked="" type="checkbox"/>	Cream	<input type="checkbox"/>
Orange	<input checked="" type="checkbox"/>	Grey	<input type="checkbox"/>	Other	<input type="checkbox"/>
SURGE ARRESTORS	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	
SPACE SPACE: 30%					

NAME: DB-MAIN E		VOLTAGE: 400/230V	
RATING-BUSBAR: 250A		FAULT: 15KA	
SUPPLY:	Bottom <input checked="" type="checkbox"/>	Top <input type="checkbox"/>	Side <input type="checkbox"/>
FEEDERS:	Bottom <input checked="" type="checkbox"/>	Top <input type="checkbox"/>	Side <input type="checkbox"/>
MOUNTING: Free Standing		<input checked="" type="checkbox"/>	Floor <input checked="" type="checkbox"/>
Recessed		<input type="checkbox"/>	Surface <input type="checkbox"/>
DOORS:	Yes <input type="checkbox"/>	None <input type="checkbox"/>	Lockable <input type="checkbox"/>
COLOUR:	White <input type="checkbox"/>	Red <input checked="" type="checkbox"/>	Cream <input type="checkbox"/>
	Orange <input type="checkbox"/>	Grey <input type="checkbox"/>	Other <input type="checkbox"/>
SURGE ARRESTORS		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
SPARE SPACE: 30%			

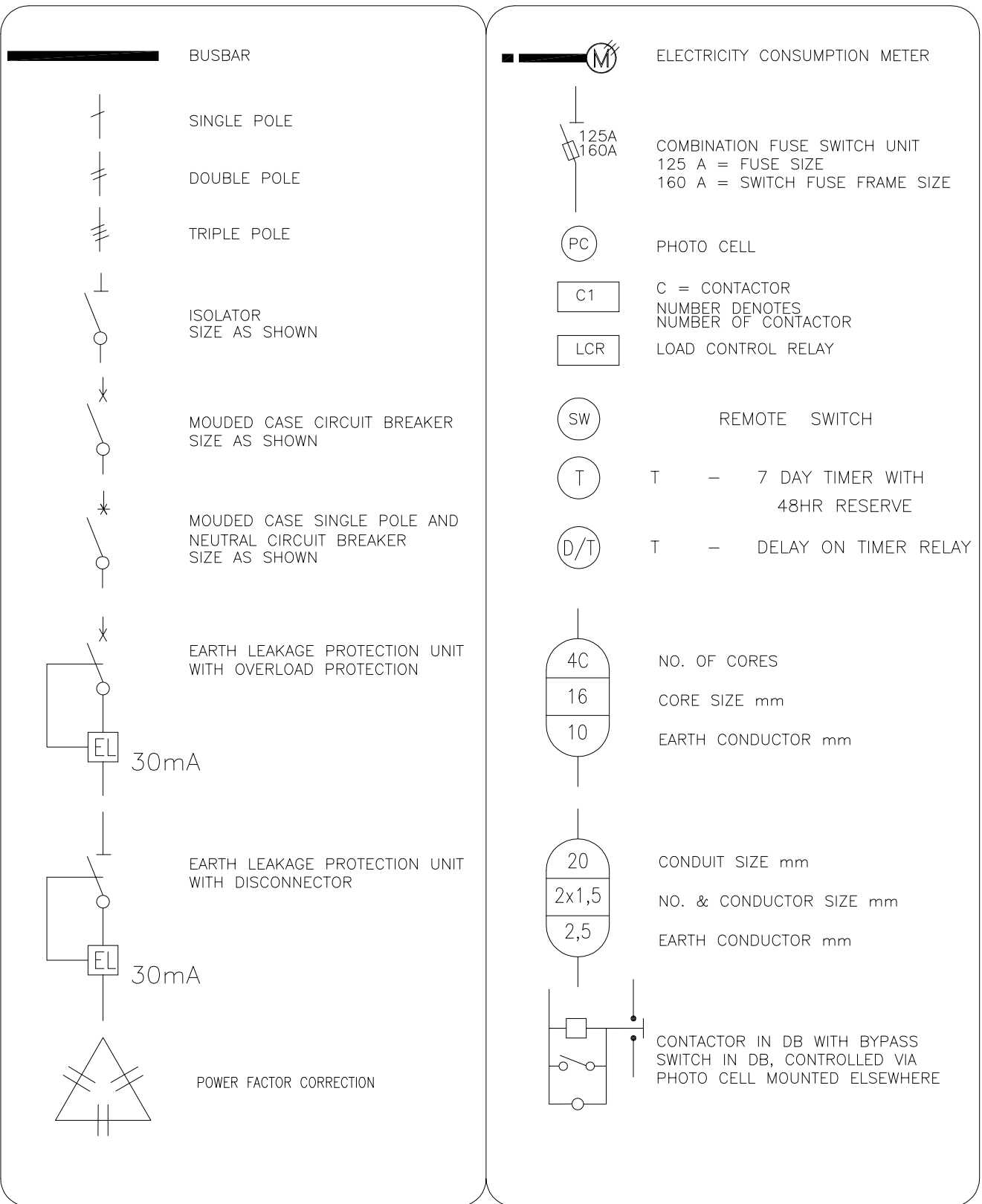
[illegible]


DRAWING NUMBER		E181-E4.1	
A4		REVISION / 0	


Eye Sizwe Consulting
Engineers

16 ALLENBY ROAD
SELBORNE
EAST LONDON
S213

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No.	DATE	DESCRIPTION	No.	DATE	DESCRIPTION
PROJECT			<div><div><div><div>Eye Sizwe Consulting Engineers</div><div>16 ALLENBY ROAD SELBORNE EAST LONDON 5213 TEL : + 27 (43) 7483830 EMAIL : petzerm@lantic.net</div></div></div></div>		
ELLIOT MAGISTRATE COURT					
SINGLE LINE DIAGRAM LEGEND					
DRAWING					
E181 E4.13 - SINGLE LINE DIAGRAM LEGEND					
DRAWN	DESIGNED	CHECKED	SCALE	DATE	
S.M.	M.P.	H.S.	N T S	5-6-2024	

1

DANGER

THIS MACHINE
STARTS
AUTOMATICALLY

4

2

ELECTRIC SHOCK TREATMENT

BEFORE ATTEMPTING ANY RESCUE OR ASSISTANCE, ALWAYS ENSURE YOUR OWN SAFETY

- DO NOT TOUCH CASUALTY WITH YOUR BARE HANDS WHILST HE IS IN CONTACT WITH THE LIVE WIRE.
 - SWITCH OFF CURRENT IF POSSIBLE.
- INSULATE YOURSELF BY STANDING ON A PIECE OF DRY WOOD OR THICK FOLDED BLANKET OR COAT.
- USING A DRY ROPE, BELT OR STICK MOVE THE WIRE FROM CASUALTY OR DRAG HIM AWAY FROM WIRE.

SEND FOR MEDICAL ASSISTANCE

- DO NOT GIVE STIMULANTS UNLESS ORDERED BY A DOCTOR
- APPLY STERILIZED DRESSING TO BURNS DO NOT REMOVE BURNT CLOTHING AND DO NOT BREAK BLISTERS.
- IF PATIENT IS BREATHING KEEP HIM WARM, COVER WITH BLANKETS OR COATS.
- IF PATIENT IS NOT BREATHING LOOK FOR ANY OBSTRUCTION WHICH MAY BE IN HIS MOUTH

TREATMENT

PERFORM MOUTH TO MOUTH ARTIFICIAL RESPIRATION

A THIN HANDKERCHIEF MAY BE PLACED OVER THE CASUALTY'S MOUTH OR NOSE IF DESIRED.

A.

PLACE THE CASUALTY ON HIS BACK AND SIT OR KNEEL ON THE SIDE OF HIS HEAD. HOLD THE HEAD IN HANDS, ONE PRESSING IT BACKWARDS THE OTHER PUSHING THE LOWER JAW UPWARDS AND FORWARD. THIS IS IMPORTANT TO ENSURE AN UNRESTRICTED PASSAGE TO THE CASUALTY'S LUNGS.

B.

PINCH THE CASUALTY'S NOSE CLOSED WITH ONE HAND.

C.

TAKE A DEEP BREATH, OPEN YOUR MOUTH WIDE AND SEAL YOUR LIPS AROUND THE CASUALTY'S MOUTH. BLOW AIR STEADILY ON TO THE CASUALTY'S LUNGS UNTIL HIS CHEST RISES.

D.

REMOVE YOUR MOUTH AND TURN YOUR FACE TO ONE SIDE TO TAKE ANOTHER BREATH. THE CASUALTY WILL AUTOMATICALLY BREATHE OUT THROUGH HIS MOUTH.

E.

SIX BREATHS SHOULD BE GIVEN AS QUICKLY AS POSSIBLE THEN REPEAT THE CYCLE AT 4 SECOND INTERVALS KEEP PATIENTS HEAD PASSED BACK AT ALL TIMES.

No.	DATE	AMENDMENT	D.P.W.
-----	------	-----------	--------

		<div><div>① Danger sign- Automated engine start without notice</div><div>② Electrical Shock Treatment Sign</div><div>③ Multilingual Danger sign</div><div>④ Electrical Hazard Sign</div></div>	

call file name

public works

Department
Public Works
REPUBLIC OF SOUTH AFRICA

DIRECTOR-GENERAL
MR. SIWE DOKONYAN

DANGER

ELECTRICAL
EQUIPMENT

AUTHORIZED
PERSONNEL ONLY

3

DANGER
GEVAAR
INGOZI

discipline	ELECTRICAL
service	TYPICAL GENERATOR LAYOUT DRAWING FOR GENERATORS UP TO 300kva.
WCS number	N/A
drawing title	TYPICAL GENERATOR SAFETY SIGNAGE
refno.	N/A
scale	1:25
date	25 JUNE 2012
drawn	M.I. SALAAM-HADATT
checked	F. VAN ZYL
Priv drawing number	N/A

COEGA DEVELOPMENT CORPORATION (PTY) LTD

ELLIOT MAGISTRATE COURT : PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION

(BID NO: CDC/163/25)

C2.3c

Electrical Installation

Specification and Pricing Schedule



public works
Department:
Public Works
REPUBLIC OF SOUTH AFRICA

COEGA DEVELOPMENT CORPORATION (PTY) LTD

FOR

**REPAIRS AND ADDITIONS TO
ELLIOT MAGISTRATE COURT**

ELECTRICAL INSTALLATION

SPECIFICATION AND PRICING SCHEDULE

PREPARED FOR:

Coega Development Corporation (Pty) Ltd
Harraway House, No 12
Pearce Street
Berea
East London
5241

PREPARED BY:

Eye Sizwe Consulting Engineers
16 Allenby Road
Selborne
East London
5213

NAME OF TENDERER: _____

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E181 E2.5	CCTV Layout
E181 E2.6	Access Control and Intercom Layouts
E181 E2.7	Lightning Protection Layout
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STANDARD CONDITIONS IN RESPECT OF THE SUPPLY, DELIVERY AND INSTALLATION OF ELECTRICAL AND MECHANICAL EQUIPMENT, PLANT AND MATERIALS

1 Tests and Final Delivery

1.1 Tests

After completion of the Works and before Practical Completion is taken, a full test will be carried out on the installation for a period of sufficient duration to determine the satisfactory work thereof. During this period the whole of the Works will be inspected and the Contractor shall make good to the satisfaction of the Representative / Agent or Main Contractor, any deficiencies that may arise.

The Contractor shall provide all instruments and equipment required for the testing as well as any water, power and fuel required for the commissioning and testing of installations at completion.

1.2 Completion

The Final delivery shall be twelve (12) months from Practical Completion for the following installations :

- (i) Emergency generating sets
- (ii) Lifts, escalators and hoists
- (iii) No-break power supply systems
- (iv) Electronic systems
- (v) Mechanical installations
- (vi) Fire protection systems
- (vii) Electrical reticulation equipment and cables

2 Contractor's Liability in respect of Defects

2.1 Period of liability

As prescribed in clause 1.2 above the period shall be regarded as twelve months.

2.2 Maintenance of installations

With effect from the date of the Practical Completion Certificate the Contractor shall at his own expense undertake the regular servicing of the installation during the period stated in clause 2.1 hereof and shall make all adjustments necessary for the correct operation thereof.

If during the said period the installation is not in working order for any reason for which the Contractor can be held responsible, or if the installation develops defects, he shall immediately upon being notified thereof take steps to remedy the defects or faults or to make any necessary adjustments.

Should such stoppages however be so frequent as to become troublesome, or should the installation otherwise prove unsatisfactory during the said period the Contractor shall, if called upon by the Representative / Agent or the Director-General, at his own expense replace the whole installation or such parts thereof as the Representative / Agent or the Director-General may deem necessary with apparatus specified by the Representative / Agent or the Director-General.

3 Compliance With Regulations

3.1 The installation shall be erected and tested in accordance with the following Acts and Regulations :

- i) The latest issue of SANS 10142: "Code of Practice for the Wiring of Premises",
- ii) The Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended,
- iii) The Local Government Ordinance 1939 (Ordinance 17 of 1939) as amended and the municipal by-laws and any special requirements of the local supply authority,
- iv) The Fire Brigade Services Act 1993 Act 99 of 1987 as amended,
- v) The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as amended,
- vi) The Post Office Act 1958 (Act 44 of 1958) as amended,
- vii) The Electricity Act 1984 (Act 41 of 1984) as amended and
- viii) The Regulations of the local Gas Board where applicable

SPECIFICATION FOR ELECTRICAL WORK

PART 1 : GENERAL

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SPECIFICATION FOR ELECTRICAL WORK

PART 1 : GENERAL

1 Tests

After completion of the works and before first delivery is taken, a full test will be carried out on the installation for a period of sufficient duration to determine the satisfactory working thereof. During this period the installations will be inspected and the Contractor shall make good, to the satisfaction of the Representative / Agent, any defects which may arise.

The Contractor shall provide all instruments and equipment required for testing and any water, power and fuel required for the commissioning and testing of the installations at completion.

2 Maintenance of Installations

With effect from the date of the Practical Completion Certificate the Contractor shall at his own expense undertake the regular servicing of the installation during the maintenance period and shall make all adjustments necessary for the correct operation thereof.

The maintenance period shall be **twelve (12) months** from the date of the Practical Completion Certificate including the following:

- (i) Emergency generating sets
- (ii) Lifts, escalators and hoists
- (iii) No-break power supply systems
- (iv) Electronic systems
- (v) Mechanical installations
- (vi) Fire protection systems
- (vii) Electrical reticulation equipment and cables

If during the said period the installation is not in working order for any reason for which the Contractor is responsible, or if the installations develops defects, he shall immediately upon being notified thereof take steps to remedy the defects and make any necessary adjustments.

Should such stoppages however be so frequent as to become troublesome, or should the installations otherwise prove unsatisfactory during the said period the Contractor shall, if called upon by the Representative / Agent or the Director-General, at his own expense replace the whole of the installations or such parts thereof as the Representative/Agent or the Director-General may deem necessary with apparatus specified by the Representative / Agent or the Director-General.

3 Regulations

The installation shall be erected and tested in accordance with the following Acts and regulations:

- i) The latest issue of SANS 10142: "Code of Practice for the Wiring of Premises",
- ii) The Occupational Health and Safety Act, 1993 (Act 85 of 1993) as amended,
- iii) The Local Government Ordinance 1939 (Ordinance 17 of 1939) as amended and the municipal by-laws and any special requirements of the local supply authority,
- iv) The Fire Brigade Services Act 1993 Act 99 of 1987 as amended,
- v) The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as amended,
- vi) The Post Office Act 1958 (Act 44 of 1958) as amended,
- vii) The Electricity Act 1984 (Act 41 of 1984) as amended and
- viii) The Regulations of the local Gas Board where applicable.

4 Notices and Fees

The Contractor shall give all notices required by and pay all necessary fees, including any inspection fees, which may be due to the local Supply Authority.

On production of the official account, the Department will refund the nett amount of the fee charged by the Supply Authority for connection of the installation to the supply mains, to the Contractor.

5 Schedule of Fittings

In all instances where schedule of light, socket outlet and power points are attached to or included on the drawings, these schedules are to be regarded as forming part of the specification.

6 Quality of Materials

Only materials of first class quality shall be used and all materials shall be subject to the approval of the Department. Departmental specifications for various materials to be used on this Contract are attached to and form part of this specification.

Wherever applicable the material is to comply with the relevant South African Bureau of Standards, specifications, or to British Standard Specifications, where no SABS Specifications exist.

Materials wherever possible, must be of South African manufacture.

7 Conduit and Accessories

The type of conduit and accessories required for the service, i.e. whether the conduit and accessories shall be of the plain-end type or of the non-metallic type and whether metallic conduit shall be black enamelled or galvanised, is specified in Part 2 of this specification.

Unless other methods of installation are specified for certain circuits, the installation shall be in conduit throughout. No open wiring in roof spaces or elsewhere will be permitted.

The conduit and conduit accessories shall comply fully with the applicable SABS specifications as set out below and the conduit shall bear the mark of approval of the South African Bureau of Standards.

- a) Plain-end metallic conduit and accessories: SABS 1065, parts 1 and 2
- b) Non-metallic conduit and accessories: SABS 950

All conduit fittings, except couplings, shall be of the inspection type. Where cast metal conduit accessories are used, these shall be of malleable iron. Zinc base fittings will not be allowed.

Bushes used for metallic conduit shall be brass and shall be provided in addition to locknuts at all points where the conduit terminates at switchboards, switch-boxes, draw-boxes, etc.

Draw-boxes are to be provided in accordance with the "Wiring Code" and wherever necessary to facilitate easy wiring.

For light and socket outlet circuits, the conduit used shall have an external diameter of 20 mm. In all other instances the sizes of conduit shall be in accordance with the "Wiring Code" for the specified number and size of conductors, unless otherwise directed in part 2 of this specification or indicated on the drawings.

Only one manufactured type of conduit and conduit accessories will be permitted throughout the installation.

Running joints in screwed conduit are to be avoided as far as possible and all conduit systems shall be set or bent to the required angles. The use of normal bends must be kept to a minimum with exception of larger diameter conduits where the use of such bends is essential.

All metallic conduits shall be manufactured of mild steel with a minimum thickness of 1,2 mm for plain-end conduit and 1,6 mm in respect of screwed conduit.

Under no circumstances will conduit having a wall thickness of less than 1,6 mm be allowed in screeding laid on top of concrete slabs.

Bending and setting of conduit must be done with special bending apparatus manufactured for the purpose and which are obtainable from the manufacturers of the conduit systems.

Damaged conduit resulting from the use of incorrect bending apparatus or methods applied must on indication by the Department's inspectorate staff, must be completely removed and rectified and any wiring already drawn into such damaged conduits must be completely renewed at the Contractor's expense.

Conduit and conduit accessories used for flameproof or explosion proof installations and for the suspension of luminaires as well as all load bearing conduit shall in all instances be of the metallic screwed type.

All conduit and accessories used in areas within 50 km of the coast shall be galvanised to SABS 763.

Tenderers must ensure that general approval of the proposed conduit system to be used is obtained from the local electricity supply authority prior to the submission of their tender. Under no circumstances will consideration be given by the Department to any claim submitted by the Contractor, which may result from a lack of knowledge in regard to the supply authority's requirements.

8 Conduit in Roof Spaces

Conduit in roof spaces shall be installed parallel or at right angles to the roof members and shall be secured at intervals not exceeding 1,5 m by means of saddles screwed to the roof timbers. Nails or "crampets" will not be allowed.

Where non-metallic conduit has been specified for a particular service, the conduit shall be supported and fixed with saddles with a maximum spacing of 450 mm. The Contractor shall supply and install all additional supporting timbers in the roof space as required.

Under flat roofs, in false ceilings or where there is less than 0,9 m of clearance, or should the ceilings be insulated with glass wool or other insulating material, the conduit shall be installed in such a manner as to allow for all wiring to be executed from below the ceilings.

Conduit runs from distribution boards shall, where possible terminate in fabricated sheet steel draw-boxes installed directly above or in close proximity to the boards.

9 Surface Mounted Conduit

Wherever possible, the conduit installation is to be concealed in the building work; however, where unavoidable or otherwise specified under Part 2 of the specification, conduit installed on the surface must be plumbed or levelled and only straight lengths shall be used.

The use of inspection bends is to be avoided and instead the conduit shall be set uniformly and inspection coupling used where necessary.

No threads will be permitted to show when the conduit installation is complete, except where running couplings have been employed.

Running couplings are only to be used where unavoidable, and shall be fitted with a sliced couplings as a lock nut.

Conduit is to be run on approved spaced saddles rigidly secured to the walls.

Alternatively, fittings, tees, boxes, couplings etc., are to be cut into the surface to allow the conduit to fit flush against the surface. Conduit is to be bedded into any wall irregularities to avoid gaps between the surface and the conduit.

Crossing of conduits is to be avoided; however, should it be necessary purpose-made metal boxes are to be provided at the junction. The finish of the boxes and positioning shall be in keeping with the general layout.

Where several conduits are installed side by side, they shall be evenly spaced and grouped under one purpose-made saddle.

Distribution boards, draw-boxes, industrial switches and socket outlets etc., shall be neatly recessed into the surface to avoid double sets.

In situations where there are no ceilings the conduits are to be run along the wall plates and the beams.

Painting of surface conduit shall match the colour of the adjacent wall finishes.

Only approved plugging materials such as aluminium inserts, fibre plugs, plastic plugs, etc., and round-head screws shall be used for fixing saddles, switches, socket outlets, etc., to walls, wood plugs and the plugging in joints in brick walls are not acceptable.

10 Conduit in Concrete Slabs

In order not to delay building operations the Contractor must ensure that all conduits and other electrical equipment, which are to be cast in the concrete columns and slabs, are installed in good time.

The Contractor shall have a representative in attendance at all times when the casting of concrete takes place.

Draw-boxes, expansion joint boxes and round conduit boxes are to be provided where necessary. Sharp bends of any nature will not be allowed in concrete slabs.

Draw and/or inspection boxes shall be grouped under one common cover plate, and must preferably be installed in passages or male toilets.

All boxes, etc., are to be securely fixed to the shuttering to prevent displacement when concrete is cast. The conduit shall be supported and secured at regular intervals and installed as close as possible to the neutral axis of concrete slabs and/or beams.

Before any concrete slabs are cast, all conduit droppers to switchboards shall be neatly spaced and rigidly fixed.

11 Flexible Connections for connecting up of Stoves, Machines, Etc.

Flexible tubing connections shall be of galvanised steel construction, and in damp situations of the plastic sheathed galvanised steel type. Other types may only be used subject to the prior approval of the Department's site electrical representative.

Connectors for coupling onto the flexible tubing shall be of the gland or screw-in types, manufactured of either brass or cadmium or zinc plated mild steel, and the connectors after having been fixed onto the tubing, shall be durable and mechanically sound.

Aluminium and zinc alloy connectors will not be acceptable.

12 Wiring

Except where otherwise specified in Part 2 of this specification, wiring shall be carried out in conduit throughout.

No wiring shall be drawn into conduit until the conduit installation has been completed and all conduit ends provided with bushes.

All conduits are to be clear of moisture and debris before wiring is commenced.

Unless otherwise specified in Part 2 of this specification or indicated on the service drawings, the wiring of the installation shall be carried out in accordance with the "Wiring Code". Further to the requirements concerning the installation of earth conductors to certain light points as set out in the "Wiring Code", it is a specific requirement of this document that where plain-end metallic conduit or non-metallic conduit has been used, earth conductors must be provided and drawn into the conduit with the main conductors to all points, including all luminaires and switches throughout the installation.

Wiring for lighting circuits is to be carried out with 1,5 mm² conductors and a 1,5 mm² earth conductor. For socket outlet circuits the wiring shall comprise 4 mm² conductors and a 2,5 mm² earth conductor.

In certain instances, as will be directed in Part 2 of this specification, the sizes of the aforementioned conductors may be increased for specified circuits. Sizes of conductors to be drawn into conduit in all other instances, such as feeders to distribution boards, power points etc., shall be as specified elsewhere in this specification or indicated on the drawings. Sizes of conductors not specified must be determined in accordance with the "Wiring Code".

The loop-in system shall be followed throughout, and no joints of any description will be permitted.

The wiring shall be done in PVC insulated 600/1000 V grade cable to SABS 150.

Where cable ends connect onto switches, luminaires etc., the end strands must be neatly and tightly twisted together and firmly secured. Cutting away of wire strands of any cable will not be allowed.

13 Switches and Socket Outlets

All switches and switch-socket outlet combination units shall conform to the Department Quality Specifications, which form part of this specification.

No other than 16Amp 3 pin sockets are to be used, unless other special purpose types are distinctly specified or shown on the drawings.

All light switches shall be installed at 1,4m above finished floor level and all socket outlets as directed in the Schedule of Fittings which forms part of this specification or alternatively the height of socket outlets may be indicated on the drawings.

14 Switchgear

Switchgear, which includes circuit breakers, iron-clad switches, interlocked switch-socket outlet units, contactors, time switches, etc., is to be in accordance with the Departmental Quality Specifications which form part of this specification and shall be equal and similar in quality to such brands as may be specified.

For uniform appearance of switchboards, only one approved make of each of the different classes of switchgear mentioned in the Quality Specifications shall be used throughout the installations.

15 Switchboards

All boards shall be in accordance with the types as specified, be constructed according to the detail or type drawings and must be approved by the Department before installation.

In all instances where provision is to be made on boards for the supply authority's main switch and/or metering equipment the contractor must ensure that all requirements of the authorities concerned in this respect are met.

Any construction or standard type board proposed as an alternative to that specified must have the prior approval of the Department.

All busbars, wiring, terminals, etc., are to be adequately insulated and all wiring is to enter the switchgear from the back of the board. The switchgear shall be mounted within the boards to give a flush front panel. Cable and boxes and other ancillary equipment must be provided where required.

Clearly engraved labels are to be mounted on or below every switch. The working of the labels in English and Afrikaans is to be according to the layout drawings or as directed by the Department's representative and must be confirmed on site. Flush mounted boards to be installed with the top of the board 2,0m above the finished floor level.

16 Workmanship and Staff

Except in the case of electrical installations supplied by a single-phase electricity supply at the point of supply, an accredited person shall exercise general control over all electrical installation work being carried out.

The workmanship shall be of the highest grade and to the satisfaction of the Department.

All inferior work shall, on indication by the Department's inspecting officers, immediately be removed and rectified by and at the expense of the Contractor.

17 Certificate of Compliance

On completion of the service, a certificate of compliance must be issued to the Department's Representative / Agent in terms of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).

18 Earthing of Installation

Main earthing

The type of main earthing must be as required by the supply authority if other than the Departments, and in any event as directed by the Department's representative, who may require additional earthing to meet test standards.

Where required an earth mat shall be provided, the minimum size, unless otherwise specified, being 1,0m x 1,0m and consisting of 4 mm diameter hard-drawn bare copper wires at 250 mm centres, brazed at all intersections.

Alternatively or additionally earth rods or trench earths may be required as specified or directed by the Department's authorised representative.

Installations shall be effectively earthed in accordance with the "Wiring Code" and to the requirements of the supply authority. All earth conductors shall be stranded copper with or without green PVC installation.

Connection from the main earth bar on the main board must be made to the cold water main, the incoming service earth conductor, if any and the earth mat or other local electrode by means of 12 mm x 1,60 mm solid copper strapping or 16 mm² stranded (not solid) bare copper wire or such conductor as the Department's representative may direct. Main earth copper strapping where installed below 3m from ground level, must be run in 20 mm diameter conduit securely fixed to the walls.

All other hot and cold water pipes shall be connected with 12 mm x 0,8 mm perforated for solid copper strapping (not conductors) to the nearest switchboard. The strapping shall be fixed to the pipework with brass nuts and bolts and against walls with brass screws at 150 mm centres.

In all cases where metal water pipes, down pipes, flues, etc., are positioned within 1,6m of switchboards an earth connection consisting of copper strapping shall be installed between the pipework and the board.

In vertical building ducts accommodating both metal water pipes and electrical cables, all the pipes shall be earthed at each distribution board.

Roofs, gutters and down pipes

Where service connections consist of overhead conductors, all metal parts of roofs, gutters and down pipes shall be earthed. One bare 10 mm² copper conductor shall be installed over the full length of the ceiling void, fixed to the top purlin and connected to the main earth conductor and each switchboard.

The roof and gutters shall be connected at 15m intervals to this conductor by means of 12 mm X 0,8 mm copper strapping (not conductors) and galvanised bolts and nuts. Self-tapping screws are not acceptable. Where service connections consist of underground supplies, the above requirements are not applicable.

Sub-distribution boards

A separate earth connection shall be supplied between the earth busbar in each sub-distribution board and the earth busbar in the Main Switchboard. These connections shall consist of a bare or insulated stranded copper conductors installed along the same routes as the supply cables or in the same conduit as the supply conductors. Alternatively armoured cables with earth continuity conductors included in the armouring may be utilised where specified or approved.

Sub-circuits

The earth conductors of all sub-circuits shall be connected to the earth busbar in the supply board in accordance with SANS 10142.

Ring Mains

Common earth conductors may be used where various circuits are installed in the same wire way in accordance with SANS 10142.

In such instances the sizes of earth conductors shall be equivalent to that of the largest current carrying conductor installed in the wire way, alternatively the size of the conductor shall be as directed by the Engineer.

Earth conductors for individual circuits branching from the ring main shall be connected to the common earth conductor with T-ferrules or soldered.

The common earth shall not be broken.

Non-metallic Conduit

Where non-metallic conduit is specified or allowed, the installation shall comply with the Department's standard quality specification for "conduit and conduit accessories".

Standard copper earth conductors shall be installed in the conduits and fixed securely to all metal appliances and equipment, including metal switch boxes, socket-outlet boxes, draw-boxes, switchboards, luminaires, etc. The securing of earth conductors by means of self-threading screws will not be permitted.

Flexible Conduit

An earth conductor shall be installed in all non-metal flexible conduits. This earth conductor shall not be installed externally to the flexible conduit but within the conduit with the other conductors.

The earth conductor shall be connected to the earth terminals at both ends of the circuit.

Connection

Under no circumstances shall any connection points, bolts, screws, etc., used for earthing be utilised for any other purpose. It will be the responsibility of the Contractor to supply and fit earth terminals or clamps on equipment and materials that must be earthed where these are not provided.

Unless earth conductors are connected to proper terminals, the end shall be tinned and lugged.

19 Mounting and Positioning of Luminaires

The Contractor is to note that in the case of board and acoustic tile ceilings, i.e. as opposed to concrete slabs, close co-operation with the building contractor is necessary to ensure that as far as possible the luminaires are symmetrically positioned with regard to the ceiling pattern.

The layout of the luminaires as indicated on the drawings must be adhered to as far as possible and must be confirmed with the Department's representative.

Fluorescent luminaires installed against concrete ceilings shall be screwed to the outlet boxes and in addition 2 x 6mm expansion or other approved type fixing bolts are to be provided. The bolts are to be $\frac{3}{4}$ of the length of the luminaires apart.

Fluorescent luminaires to be mounted on board ceilings shall be secured by means of two 40 mm x No. 10 round head screws and washers. The luminaires shall also be bonded to the circuit conduit by means of locknuts and brass bushes. The fixing screws are to be placed $\frac{3}{4}$ of the length of the fitting apart.

Earth conductors must be drawn in with the circuit wiring and connected to the earthing terminal of all fluorescent luminaires as well as other luminaires exposed to the weather in accordance with the "Wiring Code".

Incandescent luminaires are to be screwed directly to outlet boxes in concrete slabs. Against board ceilings the luminaires shall be secured to the bracing or joists by means of two 40 mm x No. 8 round head screws.

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ELECTRICAL WORK**SPECIFICATION FOR ELECTRICAL WORK****PART 2 : INSTALLATION DETAILS****1 Cable Sleeve Pipes**

Where cables cross under roadways, other services and where cables enter buildings, the cables shall be installed in high-density polyethylene pipes.

The ends of all sleeves shall be sealed with a non-hardening watertight compound after the installation of cables. All sleeves intended for future use shall likewise be sealed.

2 Notices

The Contractor shall issue all notices and make the necessary arrangements with Supply Authorities, the Postmaster-General, S.A. Transport Services, Provincial or National Road Authorities and other authorities as may be required with respect to the installation.

3 Electrical Equipment

All equipment and fittings supplied must be in accordance with the attached quality specification (Part 3 of this document), suitable for the relevant supply voltage, and frequency and must be approved by the Department's representative.

4 Drawings

The drawings generally show the scope and extent of the proposed work and shall not be held as showing every minute detail of the work to be executed.

The position of power points, switches and light points that may be influenced by built-in furniture must be established on site, prior to these items being built in.

5 Balancing of Load

The Contractor is required to balance the load as equally as possible over the multiphase supply.

6 Service Conditions

All plant shall be designed for the climatic conditions appertaining to the service.

7 Switches and Socket Outlets

The installation of switches and socket outlets must conform to clause 13 of Part 1 of this specification.

8 Light Fittings and Lamps

All fittings to be supplied by the Contractor shall have the approval of the Department. All lamps shall bear the approved mark of the SABS, and shall have the British light centre length.

The light fittings must be of the type specified in the Schedule of Light Fittings.

9 Earthing and Bonding

The Contractor will be responsible for all earthing and bonding of the building and installation. The earthing and bonding is to be carried out strictly as described in clause 18 of Part 1 of this specification and to the satisfaction of the Department's representative.

Consumer Earth DB (accessible earth) shall comprise of the following:

A 200mm long accessible earth bar and interconnecting 6mm² PVC earth wire back to the Electrical Distribution Board shall be installed in ceiling void next to the trap door where possible. The positions of the "Accessible Earth " to be finalised on site.

All earth bars are to be labelled correctly in accordance with SANS 10142.

Contractor to allow and install the required labelling indicating location of Consumer Earth Terminal.

Earthing of dedicated switch socket outlets

All dedicated switch socket outlets shall be earthed to a separate dedicated earth bar(s) of the respective sub-distribution boards, which shall in turn be connected to the main earth bar in each sub-distribution board with at least 2x16mm² green PVC insulated earth conductor.

The dedicated switch socket outlet earth conductor shall be green PVC insulated and not connected to any other sub circuit earth outlet or general earth metalwork (trays, powerskirting)

UPS Earthing

The main earth bar must be connected to the insulated earth bar of the UPS via a removable copper link bar.

All UPS boards must have insulated earth bars, separately earthed to a clean 1,2m earth spike by means of 70mm² insulated earth to obtain at least one ohm at the UPS board

10 Maintenance of Electrical Supply

All interruptions of the electrical supply that may be necessary for the execution of the work will be subject to prior arrangement between the Contractor and the user Department and the Department's representative.

11 Extent of Work

The work covered by this contract comprises the supply, installation, testing, commissioning and twelve (12) months guarantee, of the complete electrical installation, in working order, as shown on the drawings and as per this specification.

The Works involved and for which the Electrical Contractor must allow is briefly as follows, namely:-

- ♣ Isolation and removal of existing electrical Installation
- ♣ Upgrading of the Main Supply
- ♣ Refurbishment and new electrical installation
- ♣ Supply and installation of new distribution boards.
- ♣ Supply and installation of new LV cables, including any excavation work required.
- ♣ Supply and installation of new lighting and small power outlets as specified and shown on the drawings
- ♣ Refurbishment, supply and installation of area lighting
- ♣ Power supplies and isolators to air-conditioning and ventilation equipment
- ♣ Supply and Installation of occupancy sensors for the control of lighting and fans
- ♣ Supply and installation of conduiting, sleeves and cable tray for CCTV, Access Control, Intercom, Telephone and Data systems
- ♣ The co-ordination of the new 100kVA Supply point by Supply Authority.
- ♣ The Payment of connection fees and deposits for the upgraded supply point – 100kVA.
- ♣ All testing and provision of Certificates of Compliance for complete installation included in this specification
- ♣ Refurbishment and installation of Lightning Protection System
- ♣ Provision of Record drawings and operating and maintenance manuals
- ♣ All other materials, equipment, labour and services necessary for the complete, safe and efficient operation of the Works in full accordance with the specifications as laid down in this document

The following work is excluded and shall be executed by others, namely:-

- Patching and plastering conduit chases.
- Manholes

12 Site Conditions

Location

Elliot, Eastern Cape.

Access

To be obtained from the Principal Contractor.

13 Regulations and Standard Documentation

The electrical installation is to be based on the Department of Public Works Part 3: Quality specifications for materials and equipment of electrical installations and other relevant standard documentation.,

The installation shall be carried out in accordance with :

- (a) the latest issue of "SANS 10142 : Code of Practice for the Wiring of Premises", hereafter called the "Wiring Code".
- (b) the "Occupational Health and Safety Act" of 1993 as amended to date and hereafter called the "Act",
- (c) the Municipal By-Laws and any special requirements of the local Supply Authority;
- (d) the local Fire Office Regulations.
- (e) The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as amended
- (f) the latest issue of "SABS 03-1985 : Code of Practice for the protection of structures against lightning (SANS 10313)

14 Supply Authority

The Supply Authority in the area is Sakhisizwe Municipality. The electrical contractor shall be responsible for the coordination of upgrading the existing supply to the new 150kVA point of supply for the Court. The Electrical Engineer shall make the application to Sakhisizwe Municipality on behalf of the Client. The coordination and implementation of the supply and metering is part of the electrical installation.

The incoming supply from the municipality would be a 400V, 3 phase 50Hz

The old store shall become a LV room and would contain the Main DB. DB Main would feed the sub distribution boards within the building.

15 Programme

The Electrical Contractor shall submit a programme for the Works, within 14 days of site handover.

The Electrical Contractor will be expected to comply with the Main Contractor's programme.

The cost of overtime, additional labour and plant necessary for the completion of the Works in accordance with the programme shall be included in the Electrical Contractor's tender price for the Works.

16 Description of Buildings

The buildings are single brick and stone structures. The electrical contractor may not chase into any existing Stone walls as this is a heritage building. Further specific details to be obtained from the Main Contractor.

17 Supply Authority Boundary Kiosk

The Electrical contractor shall supply and install the main cable to the Supply Authority Boundary Kiosk and coordination thereof.

18 Electrical Distribution Boards

All distribution boards shall be supplied in accordance with Part C.17 Switchboards (Up to 1kV) of the Standard Electrical Specification – Section C: Quality Specifications for Materials and Equipment of Electrical Installations – September 2005. Document obtainable at <http://www.publicworks.gov.za/consultantguidelines.html>

All electrical distribution boards shall be purpose made boards, supplied and installed in accordance with the attached Standard Technical Specifications and the single line diagrams and shall comply to SANS 1042.

Each DB shall have sufficient ways for each circuit neutral and each circuit earth wire. Doubling up of circuits will not be accepted.

All Main Switches shall be clearly marked “MAIN SWITCH” and the necessary warning labels installed at the switch.

Each section of the DB shall be provided with a legend card holder with a clear perspex front. Each circuit breaker shall be clearly numbered. Corresponding numbers and circuit descriptions shall be typed on the legend cards.

The size of the distribution is to be calculated from the applicable single line diagram with an addition spare space of 25%. All boards [ie power or telkom] shall be flush mounted unless specified differently on the single line diagrams. The trays of the DB must be galvanised steel. All distribution boards are to be purpose made by reputable board manufacturers.

General

All the switchboards and distribution boards are to be supplied and installed by the Bidder in accordance with the single line diagrams and the Standard Specifications. In particular, Bidders will be required to adhere to the following procedure :

The Engineer shall be advised where the equipment is being manufactured and when it will be ready for inspection at the works. Equipment which is dispatched to site without the authorization of the Engineer may be rejected and all costs incurred in having it returned to the factory for modification and all liability for such delays, would be for the Bidders account.

A 12 month guarantee shall cover the sheet metal enclosure and all the equipment installed therein, against latent and patent defects in workmanship and materials. The guarantee period shall begin from the date of first delivery. Fair wear and tear of the equipment will be excluded from the guarantee.

Bidders must ensure that the Board Manufacturer used is au fait with and is in possession of the Eye Sizwe Consulting Engineers Standard Specification for the manufacturing of distribution boards. No manufacturing is to commence until the detailed drawings of the boards submitted for approval have been approved by the Engineer. Any boards delivered to site without the necessary approval will be rejected. Bidders must note that all internal wiring must be wired to terminals where applicable.

All cable terminations will comprise of the correctly sized gland to suit the particular cable. All gland plate holes are to be correctly drilled before the final finishes are applied. No filling of holes will be permitted on site.

The material to be used for external boards must be 2,0 mm 3CR12 suitably braced to withstand vandalism and the elements as it will be placed such that it will be exposed to the weather and must comply to the following minimum standard.

The material to be used for internal boards shall be 1,6 mm sheet metal. It is to be of the very best manufacture and the design must be approved by the Principal Agent.

The sections of the board consisting of a steel tray, inner steel frame sustaining equipment, braced sheet steel door and frame to be formed and pressed with joints welded.

The inner frame of the board is to comprise of spring clip metal holders supported and braced to contain circuit breakers specified. A multi-way tinned copper neutral busbar is to be supported on porcelain holders fixed to the bottom section of the metal tray. A multi-way copper earth terminal bar is to be fitted in this position but must be firmly braced to the metal.

A sheet metal cover is to be neatly cut to fit snugly over circuit breaker collars and screwed onto the main frame.

Blanking places to be provided where required.

All equipment is to be suitably labelled with plastic labels.

All metal used on the board must be clean and bonderised. The board is to receive an approved quality undercoat and then baked with an enamel orange finish both inside and outside. All nuts, bolts and washers are to be chrome or brass.

The overall finish is required to be of a very good standard.

All wiring is to be laced and taped where necessary.

The board is to be installed approximately 2,0m above floor level to the topside of the board in the position as indicated on the site.

All circuit breakers shall be of the Automatic Air Breaker type suitable for instantaneous operation under overload or short circuit conditions and must bear the SABS mark.

The board shall comply with SABS specifications as appropriate to the installation.

Marking and Labels

- (i) Distribution board is to be fitted with identification labels engraved with the reference logos indicated on the wiring diagrams. Labels are to be affixed to the front of the panels or in a similar prominent position; by drive screws or other approved method. Label must indicate the following:
 - a) Name of the distribution board eg, MDB, and fed from where.
 - b) The size and number of cores of the supply cable eg, "Supply cable 25mm² 2C"
 - c) The DB fault level eg, "Fault level 5kA"
- (ii) A label engraved with the corresponding diagram reference is to identify each individual item of equipment installed in the panels.
- (iii) Where an outgoing terminal block is provided for the connection of the external equipment, such terminal block shall be marked with corresponding reference numbers as indicated on the distribution board schematic wiring diagrams.
- (iv) Photocell bypass switch knob shall look different from both isolators and circuit breakers and shall be mounted on separate from the circuit breaker row and labelled .

Shop Drawings

Prior to manufacture the Sub-contractor is required to submit to the Engineer for approval three sets of shop drawings for each distribution board. The Engineer will retain one set and two shall be stamped and returned to the Sub-contractor with applicable notes. Request for relaxation of this requirement shall not be entertained.

Drawings must indicate the following minimum information:

- Outside distribution board dimensions,
- Notes giving detailed description of components and equipment in each board,
- General arrangement of installed equipment,
- Detailed list of equipment to be installed; details to include rating, make and type number,
- Distribution board labels
- Project name,
- Drawings number.

19 Conduit and Wiring

Conduit and conduit accessories shall be galvanised conduit or galvanised plain end conduit in accordance with SABS 162, 763 and 1007 respectively.

All conduit, regardless of the system employed, shall be installed strictly as described in the applicable paragraphs of clauses 5 to 10 of Part 1 of the specification. Wiring of the installation shall be carried out as directed in clause 12 of Part 1 of this specification.

Where fixed surface they shall be adequately secured using saddles screwed to the partition wall battens.

All LV single core conductors shall be of the PVC insulated type rated at 600 V general service duty, colours being red, white and blue for phases, black for neutrals and green/yellow for earth.

No openly installed “surfix” or twin and earth will be permitted unless otherwise authorized by the Engineer prior to installation.

Flexible tubing or other Engineer approved method shall be used for:-

- Expansion joint crossings
- Connections to hot water cylinders and stoves

No conduit smaller than 20 mm diameter shall be permitted. **All conduits shall pre-painted either electric orange for power services.** Only purpose made bends will be accepted for conduits of 32 diameter or larger. The conduit shall be installed using the loop-in method. Draw boxes in ceilings will not be accepted.

Joints in wiring are to be avoided as best as possible. Where unavoidable joints shall be made using ferrules crimped with a proper crimping tool and insulated with heat shrink insulation of the correct grade for the voltage and amperage of the system.

Conductors and cables must be standard copper core type with pre insulation to SABS 150. The Electrical Contractor shall use the wire sizes throughout this installation as indicated on the distribution board drawings (Single Line Diagrams).

The following conductor sizes shall be utilised

Description	Conductor Size
Power (Socket Outlets etc)	2.5 mm ²
Lighting	1.5mm ² and 2.5mm ²
Heaters	2.5mm ²
Air Conditioning	2.5mm ² and 4mm ²
Hydroboils (Instantaneous water heaters)	To suite hydroboil – Minimum 2.5mm ²
Hot Water Cylinders	4,0mm ²
Domestic Stoves	10,0mm ²

The Electrical Contractor must carry out the following tests and must ensure that the minimum requirements are met. On completion of these tests the Electrical Contractor shall supply, in terms of the OHS Act of 1993 (Certificate of Compliance for electrical installations).

TEST	MINIMUM REQUIREMENTS
Insulation Resistance	Whole installation better than 1 megaohm.
L.T. installation	Each sub distribution section : better than 5 megaohms.
Earth leakage on socket outlets	Better than 30 milli amps.
Earth Continuity	Better than 0,5 ohms.
Earth loop impedance	Better than 0,5 ohms.
Earth Electrode Resistance	Better than 5 ohms.

All test instruments and labour are to be supplied and included in the price of the installation.

20 Telephone and Data Installations

General

Where provisions for telephones and data outlets are shown on drawings or specified, the Electrical Sub-Contractor shall supply, install and fix all conduit, distribution boards, outlet boxes etc, as described here under.

Cable Sleeves

Where sleeves within the building are specified to be supplied, installed and fixed by the Electrical Sub-Contractor . The Electrical Sub-Contractor shall maintain full responsibility to ensure that such sleeves are installed in good time and their correct positions are adhered to. All sleeves shall be fitted with 2mm diameter galvanised mild steel draw wires. A minimum sleeve size of 50mm internal diameter shall be used.

Conduits, Power Skirting, Trunking and Wire Baskets

Unless otherwise specified or shown on drawings the Electrical Sub-Contractor shall supply, install and fix all conduits, Power Skirting, Trunking and Wire Baskets associated with telephone, data services or other systems of communications as per sizes and positions as specified. The conduit installation shall be installed to the same specifications as for the electrical requirements, and shall be fitted with 2mm diameter galvanised mild steel draw wires. A minimum conduit size of 25mm diameter shall be used.

Outlets

Unless otherwise specified all outlets for wall mounted telephone and data, shall consist of standard flush type pressed steel switched socket outlet boxes, generally mounted at a height above finished floor level of 300mm from bottom of box complete with a telephone and data outlet module.

Unless otherwise specified all outlets for power skirting mounted telephone and data, shall consist of the individual or combined module, complete with a telephone and/or data outlet with cover suitable for the specified power skirting.

In the event of other outlets being mounted in the same room and at the same height above finished floor level, care shall be taken to ensure that all such outlets are accurately lined up.

Coverplates

All outlets are to be fitted with metal/PVC coverplates of the same material and finish to match flush switched socket coverplates.

21 Excavations and Related Works

For further details refer to Part 3 clause B6 Installation of Cable.

PVC sleeves shall only be installed where the cable installation passes beneath paved walkways / parking area, etc., as indicated on the attached drawings.

The sleeves shall be manufactured from a high-density polyethylene with a double wall construction, allowing a corrugated outer wall finish and a smooth inner wall finish.

22 Low Voltage Cables and Earth Continuity Conductors

The Contractor shall supply and completely install all distribution cables as indicated on the drawings, and listed in the Schedule of Cables.

The storage, transportation, handling and laying of the cables shall be according to first class practice, and the contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to cables during such operations.

The cable-trenches shall be excavated to a depth of 0.7m deep below ground level and shall be 450 mm wide for one to three cables, and the width shall be increased where more than three cables are laid together so that the cables may be placed at least two cable diameters apart throughout the run. The bottom of the trench shall be level and clean and the bottom and sides free from rocks or stones liable to cause damage to the cable.

The Contractor must take all necessary precautions to prevent the trenching work being in any way a hazard to the personnel and public and to safeguard all structures, roads, sewage works or other property on the site from any risk of subsidence and damage.

In the trenches the cables shall be laid on a 75mm thick bed of earth and be covered with a 150mm layer of earth before the trench is filled in.

All joints in underground cables and terminations shall be made either by means of compound filled boxes according to the best established practice by competent cable jointers using first class materials or by means of approved epoxy-resin pressure type jointing kits such as "Scotchcast". Epoxy-resin joints must be made entirely in accordance with the manufacturer's instructions and with materials stipulated in such instructions. Low tension PVC SWA cables are to be made off with sealing glands and materials designed for this purpose, which must be of an approved, make. Where cables are cut and not immediately made off, the ends are to be sealed without delay.

The laying of cables shall not be commenced until the trenches have been inspected and approved. The cable shall be removed from the drum in such a way that no twisting, tension or mechanical damage is caused and must be adequately supported at intervals during the whole operation. Particular care must be exercised where it is necessary to draw cables through pipes and ducts to avoid abrasion, elongation or distortion of any kind. The ends of such pipes and ducts shall be sealed to approval after drawing in of the cables.

Backfilling (after bedding) of the trenches is to be carried out with a proper grading of the material to ensure settling without voids, and the material is to be tamped down after the addition of every 150 mm. The surface is to be made good as required.

On each completed section of the laid and jointed cable, the insulation resistance shall be tested to approval with an approved "Megger" type instrument of not less than 500V for low tension cables.

The third core in each cable shall be used as the earth continuity conductor for each building.

The cable installation shall be kept at a minimum distance of 0.5 mm from the edge of the foundation of the boundary wall and or building walls. Deviations from this, shall be confirmed by the Representative / Agent.

The cable installation shall be complete with concrete cable markers, positioned every 30 meters, or at every change in direction, whichever, is the lesser.

Cable warning tape ("skull and crossbones" danger tape) shall be installed 150mm above the cable installation.

23 Site Reticulation

All LV cabling to be tested and repaired where necessary as per Engineers instruction. LV cabling to be installed as per the site plan routes and the cable schedule. Final routes to be determined on site with the contractor and engineer present. The proposed cable routes are shown on the site plan.

24 Lighting

All light fittings shall be new as specified in the Light schedule below. Light fittings shall be securely fixed and new battens shall be provided where necessary for fixing.

25 Switched socket outlets

Switched socket outlets shall be new. SSO's shall be SABS approved. Socket outlets shall have PVC covers.

Dedicated

Dedicated red three pin 16A switched socket outlets with shaved earth to be installed in accordance with the drawing. All socket outlets are to be flush mounted in 100x100 galvanised box or within power skirting.

All socket outlets shall be suitably labelled showing the distribution board name and circuit number.

Normal

Standard white three pin 16A switched socket outlets to be installed in accordance with the drawing. All socket outlets are to be flush mounted in 100x100 galvanised box or within power skirting.

All socket outlets shall be suitably labelled showing the distribution board name and circuit number.

UPS

Blue three pin 16A switched socket outlets with shaved earth to be installed in server and security rooms where equipment shall be fed from UPS power. All socket outlets are to be flush mounted in 100x100 galvanised box or within power skirting.

All socket outlets shall be suitably labelled showing the distribution board name and circuit number.

26 Stove connections

The Electrical Contractor shall provide new stove connections comprising of a 60 amp DP flush isolator (Installed on one side of the Stove – not above the stove) complete with PVC cover and extension box. The Electrical Contractor shall also supply and install a new Cooker Plug installed centrally behind the stove and 400mm above finished floor level.

27 Electrical Distribution Boards

In addition to clause 14 and clause 15 of Part 1 of this specification the following shall be applicable to switchboards

required for this installation.

The Electrical Sub-contractor shall supply and install the electrical distribution boards complete with supplementary equipment and switchgear, as detailed on the attached drawings and single line diagrams and listed in the Distribution Board Schedule below. The electrical distribution boards shall comply with SANS 10142 and Part 3 of this specification.

28 Schedule of Electrical Distribution Boards

As per the Single Line Diagrams

29 Schedule of Cables

Supply, install and connect the following cables:

From	To	95 x4C	70 x4C	10 x4C	6x4C	4x4C	2.5 x 4C	16 x3C	10 x3C	6 x3C	4 x 3C	2.5 x 3C
Municipality	DB MAIN	20										
DB MAIN	GENERATOR	15										
GENERATOR	DB MAIN E	15										
GENERATOR	Remote switch						70					
DB MAIN E	DB A		70									
	DB D										35	
	DB F								28			
	DB G							38				
	KIOSK P (Pump)			85								
DB A	DB A1								28			
DB A	DB B										20	
DB A	DB S							15				
DB A	DB T							60				
DB A	DB C							45				
DB S	UPS IN							7				
DB S	UPS OUT							7				
DB F	DB E									23		
DB H	DB J									30		
DB MAIN	SL1										250	
DB A	AC 1					20						
DB A	AC 2				25							
DB A	AC 3					23						
DB A	AC 4a - Server											20
DB A	AC 4b - Server											20
DB A	AC 5a - Equipment											20
DB A	AC 5b - Equipment											20
DB P	I1					7						
DB P	I2					7						
TOTAL		50	70	85	25	57	70	172	56	53	305	80

30 Schedule of Switchgear and Circuits

As per the Single Line Diagrams attached with this document.

31 Schedule of Light Fittings**LED LIGHTS**

All Light fittings installed are to be of the LED type, unless otherwise stated.

The following international standard specifications and South-African Bureau of Standards shall apply to the LED luminaire specification:

SANS 475	Luminaires for interior lighting, street lighting and floodlighting – Performance and requirements
SANS 10114-1	Interior lighting part 1: Artificial lighting of interiors
SANS 10114-2	Interior lighting part 2: Emergency lighting
SANS 60598-1	Luminaires part 1: General requirements and tests
SANS 60598-2.1	Luminaires part 2: Particular requirements section 1 – Fixed general purpose luminaires.
SANS 60598-2.2	Luminaires part 2: Particular requirements section 2 – Recessed luminaires.
SANS 60598-2.3	Luminaires part 2: Particular requirements section 3 – Luminaires for road and street lighting.
SANS 60598-2.5	Luminaires part 2: Particular requirements section 5 – Flood lighting.
SANS 61347-1 to 13	Lamp control gear
SANS 62031	LED modules for general lighting – Safety specifications
SANS 62384	DC or AC supplied electronic control gear for LED modules – Performance requirements.
SANS 62560	Self-ballasted LED lamps for general lighting services with supply voltages > 50V – Safety specification.
SANS 62612	Self-ballasted LED lamps for general lighting services with supply voltages > 50V – Performance requirements
EN 55015	Limits and methods of measurement of radio disturbance of electrical lighting or equipment.
EN 61000-3.2	Electromagnetic compatibility (EMC) limits for harmonic current emissions.
EN 61000-3.3	Electromagnetic compatibility (EMC) limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems.
EN 61547	Equipment for general lighting purposes: EMC immunity requirements.
IEC-EN 62471	Photo biological safety of lamps and lamp systems for LEDs
IES LM-79-08	Approved method: Electrical and photometric measurement of solid-state lighting products.
IES LM-80	Approved method: Measuring lumen maintenance of LED light sources.

General requirements:

The luminaire shall be suitable for operation with mid-power LEDs.

The luminaire shall be suitable for operation on a 230V single phase 50Hz mains supply.

Power factor capacitors shall be supplied to correct the power factor to at least 0.95 of higher.

The luminaire shall be marked with identification labels stating the brand name and model and shall bear the SANS approval mark.

The driver shall comply with IEC 61347-1 and IEC 61347-2B as applicable and shall be suitable for operation on 230V +/- 10%, 50Hz single phase system and it must be insured that harmonics filter is provided as per SANS 61000-3-2. The drivers and LED circuitry shall be protected against lighting and power surges. Suitable surge arrestors with a 10kA rating shall be provided for indoor installations and 20kA for outdoor installations.

Colour rendering (Ra) shall be not less than 80 and lumen depreciation of not more than 30% L70 at 50 000 hours @ Tq 25°C. Colour temperature of the LED lamp shall be 4000K, unless otherwise stated.

Thermal requirements:

The luminaire must be able to withstand an ambient temperature of 35°C. Storage temperature of this luminaire should be able to handle -40°C < T < 60°C.

To this end internal electrical and mechanical components shall not be allowed to exceed their maximum temperature ratings of 75°C. Test reports from an independent authorised testing facility proving this requirement shall be made available on request.

Noise requirements:

The noise level emitted from the luminaire shall be kept as low as possible. Drivers/electronic components shall therefore fully comply with the latest edition of SANS 55015.

31.1 Type A – 1450mm 44W, 2 LED MODULE, DIFFUSED SURFACE FITTING

Approved Make: Genlux Alena LED linear, 44W, 2 LED module. Similar and approved equal conforming to the specification may be accepted.

LED TECHNICAL DATA

- Light source: High powered LED Light Engine.
- 5ft. (1450mm) – 2 LED Module
- 44W
- 5850 lm
- 99lm/W
- Colour temperature: -4000K
- LED life cycle: 50 000 hours
- Performance level: L80 B20
- Colour rendering index:
-> 80 CRI
-> 90 CRI on 4000K

LUMINAIRE TECHNICAL DATA

- IP rating: IP40 (Lamp and gear compartment).
- Housing material: UV stabilised and impact resistant white polycarbonate body.
- Diffuser: Translucent polycarbonate diffuser UV stabilized and impact resistant.
- Protection grade: IK10.
- Control gear - Standard (STD)
- Cable glands: White rubber
- Terminal Block: Push-in-type quick connect, three-pole (basic version), or traditional screw terminal block.
- Surge protection Device: External SPD 5kV.
- Operating temperature: -25°C to +35°C.
- Insulation classification: Class I
- Power supply: 220V to 240V AC 50/60 Hz.
- Constant current: 700mA.
- Insulation classification: Class I

COMPLIANCE STANDARD

- SABS
- EN 60598-1:09, EN 60598-2-1:97, EN 55015 ed.3:07+A1:08
+A2:09, EN 61547 ed.2:10, EN61000-3-2 ed.3.06+A1:10A2:10

WARRANTY

- 5 year warranty on external luminaire

- 3 year warranty on internal components

ALENA LED SURFACE



31.2 Type AE – EMERGENCY 1450mm 44W, 2 LED MODULE, DIFFUSED SURFACE FITTING

Luminaire shall be the same as Type A except it shall be complete with Suitable Self Testing Emergency kit as specified below:

Emergency Battery Back Up:

COSINE DEVELOPMENTS:

THX LED UNIVERSE SELF-TESTING EMERGENCY FOR LED LIGHTS

- > Maintained or non-maintained operation
- > Auto. self-testing feature with audible and visual tactics
- > Emergency lighting kit for 10 to 300Vdc LEDs
- > Emergency lighting for 1 - 3 hours
- > 5 year warrant

SPECIFICATIONS	
Battery Type	7.4V Li-ion
Dimensions (L x W x H)	250 x 45 x 35mm
Emergency Lighting Duration	Minimum 1 hour
Lamp Type	10 to 300Vdc LED modules
Mains Voltage	100 - 253Vac 50/60 Hz
Maximum Ambient Temperature	+45°C
Output Voltage	10 - 300Vdc

31.3 Type B – 600mm X 600mm Recessed LED Panel light, complete with driver, 5A plug top and 3m cord set

Approved Make: Osram/LEDVANCE LED ECO Panel 600x600 36W 840 Backlit Cool White. Similar and approved equal conforming to the specification may be accepted.

Brand	Osram/LEDVANCE
Color Temperature	4000K
Family Type	LED Panel
Lifetime	50000Hrs
Lumens	3240lm
Material	Steel
Wattage	36W
Colour	White
Height	34mm
Length	595mm
Width	595mm
Product Origin	Local (South Africa)



31.4 Type C – 12W LED Round Recessed Fitting, complete with driver, 5A plug top and 3m cord set.

Approved Make: Spazio Saturn, Colour temperature changing recessed 12W LED Downlight White, (4000K) Similar and approved equal conforming to the specification may be accepted.

- Includes integral LED Driver
- Polycarbonate body
- Polycarbonate diffuser
- Colour temperature changing
- Switch between: 3000K, 4000K or 6000K
- Wattage - 12W
- Class II
- IP 20
- Diameter 169mm
- Height 32mm



12W Recessed

Standard

2276.1231

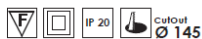
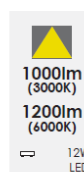
12W 230V LED

Dimmable

2276.1231D

12W 230V LED

|Includes integral LED driver



31.5 Type D - Round Bulkhead 17W LED

17W Round surface mounted LED Bulkhead.

Make : BekaSchreder 31 Bulkhead LED 17W. Similar and approved equal conforming to the specification may be accepted.

The luminaire shall consist of a high-pressure die-cast aluminium base and trim ring, and an opal high-impact acrylic diffuser. It shall be designed to operate LED control gear rated at 17W.

Lamp compartment: IP 65

All base castings shall be manufactured from high pressure die-cast aluminium, finished both outside and inside in white

epoxy powder coating for added protection and reflectivity. It shall be simple to install (four mounting holes provided outside the lamp compartment through lugs that form part of the base casting). The trim ring casting shall be mounted onto the base casting by stainless steel M5 Allen head screws, located outside the lamp compartment. The fixing holes will be supplied with stainless steel heli-coil inserts.

An opal non-discolouring high-impact acrylic injection moulded diffuser shall be used. It shall offer excellent vandal resistance, be highly translucent and shall not discolour even when subjected to UV environments. A silicon sponge gasket shall be fitted into a special groove in the diffuser to prevent damage to the gasket during installation and to achieve the certified ingress protection rating of IP 65.

The trim ring casting shall be manufactured from high-pressure die-cast aluminium and shall be finished in a special multi-stage epoxy powder surface coating.

The LED's useful lifetime shall be a minimum of 60 000hrs. The LED shall be an effective high-power LED, 4 000K at a colour rendering index of minimum 80.

The control gear shall be mounted directly onto the base casting, ensuring cool operation. It shall be suitable for operation with the specified rating of the lamp on a 230V +3%/-10% 50Hz single phase system. All inter-connecting wiring shall be Teflon® insulated with protective sleeving to prevent damage by possible abrasion. All external screws, bolts and metals shall be stainless steel or non-corrosive material. Mains connections shall be by means of a suitable screw terminal block with a wire clamping contact. The luminaire shall be power factor corrected to a minimum of 0.9. In the LED version, the diffuser shall be permanently sealed to the aluminium base and shall be supplied with a 300mm supply lead.

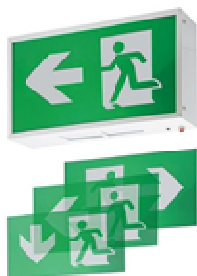


31.6 Type EX – LED Single Sided Emergency Exit Luminaire complete with battery backup for 3 Hours

Approved Make: Spazio Led Exit Sign, Green, wall mount with metal body and acrylic diffuser. Similar and approved equal conforming to the specification may be accepted.

Wall Mounted Emergency Exit Luminaire complete with 3H emergency backup.

LED exit sign with metal body and acrylic diffuser, includes LED driver and 4 pictograms (EXIT and Running Man).



31.7 Type F – 8W LED Round Recessed Fitting, complete with driver, 5A plug top and 3m cord set.

Approved Make: Osram/LEDVANCE LED ECO Downlight R40 8W 865 G2 Daylight, (6500K) including LED Driver.
Similar and approved equal conforming to the specification may be accepted.

Color Temperature	6500K
Family Type	Downlight
Lifetime	20000hrs
Lumens	600lm
Voltage	230V
Wattage	8W
Colour	White
Diameter	115mm
Height	34mm
Cut Out (mm)	100 (Round)
Product Origin	Local (South Africa)

**31.8 Type G: 52W LED surface vandal proof fitting (prison type luminaire). Luminaire to be complete for back entry)**

Approved Make: BekaSchreder Roughguard Vandal Resistant Linear LED Luminaire (Opaque Diffuser).
Similar and approved equal conforming to the specification may be accepted.






Key advantages

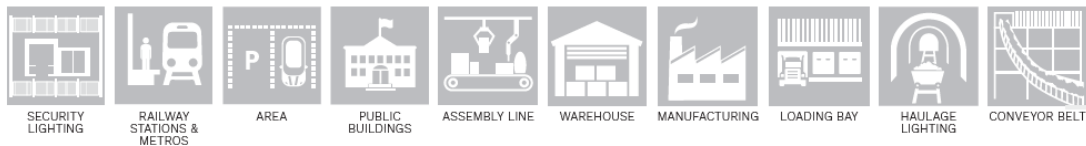
- Designed and manufactured in South Africa
- Vandal proof
- Available in two sizes for applications flexibility
- Available in a battery back-up version
- Designed to operate LED light sources of up to 52W in an ambient temperature (Tq) environment of up to 35°C, without reducing the useful lifetime of up to 50 000 hours, at a lumen depreciation of not more than 30% (L70B10)
- Corrosion-resistant high-pressure die-cast aluminium body
- One-piece injection-moulded clear polycarbonate diffuser
- Removable gear tray for ease of maintenance
- 3-year warranty (Terms and conditions apply)

Characteristics

GENERAL INFORMATION

Testing standard	SANS 60598, SANS 62262	
Housing	Marine grade high-pressure die-cast aluminium (EN 1706 AC-44300)	
Diffuser	Polycarbonate	
Housing finish	Pearl Light Grey (RAL 9022), Textured finish	
Standard mounting	Drill positions or bracket mounting	
Nominal voltage	198-277V – 50Hz	
Surge protection	10kV / 10kA	
Operating temperature range (Ta)	Standard version: -35°C up to +40°C	Battery back-up version: -35°C up to +40°C

ROUGHGUARD		2ft
Wattage (up to)		52W
Nominal flux (up to)		8,447lm
Luminaire output flux (up to)		7,349lm
Luminaire efficacy (up to)		141lm/W
Colour temperature	4000K (Neutral white 840) CRI ≥80	
Lifetime of the LEDs @Tq 25°C	50,000h - L70B10	
Lifetime of the Driver @Tq 25°C	90,000h ≤10% failure rate	



2ft version - opaque diffuser

31.9 Type H: 1270mm long 37W, 2 LED modules, corrosion proof surface luminaire, with stainless steel snap-lock latches

Approved Make: Lascon C10-37W-LED. Similar and approved equal conforming to the specification may be accepted.

LED driver average rated life – 100 000hrs

- LED Life - > 60 000hrs (L70 F10, TP 65°C)
- Luminaire efficiency: 88.12%
- 37W – System power 40.2W
- 5980 lm @ 65°C
- Power factor – 0.98
- High Colour rendering index CRI > 80
- Colour temperature: -4000K
- Tridonic LED module and driver
- Ambient temperature : -25 to +45 °C
- Self-extinguishing polycarbonate body
- UV stabilised, self-extinguishing polycarbonate diffuser with photoengraved interior and smooth outer surface
- Anti-tamper stainless steel snap-lock latches
- Hinge-able gear tray
- Complete with mounting accessories

**31.10 Type I: 61W Suspended LED Disk Light**

Approved Make: BekaSchreder LEDDISK Maxi Decorative suspended 61W LED pendant luminaire range. Similar and approved equal conforming to the specification may be accepted.

Contractor to note that scaffolding will be required for the installation of the light fittings.

Key advantages

- Designed and manufactured in South Africa
- Highly efficient and energy saving
- Slim, aesthetic design optimised for LED characteristics
- Halo effect
- Designed to operate LED light sources of up to 135W in an ambient temperature environment of up to 45°C, without reducing the useful lifetime of up to 98 000 hours, at a lumen depreciation of not more than 30% (L70B10)
- Long lifetime and low maintenance, no lamp replacement for more than 10 years
- Low glare lighting
- No upward lighting
- Easy to install
- Flicker-free lighting
- Colour rendering index ≥ 80
- 5 year warranty (Terms and conditions apply)
-



Low glare lighting with an aesthetically pleasing round PCB



Slim, aesthetic design optimised for LED characteristics

Characteristics

GENERAL INFORMATION

Recommended installation height	4m to 12m
Driver included	Yes
ROHS compliant	Yes
Testing standard	SANS 60598, SANS 62262

HOUSING AND FINISH

Housing	Heatsink: Marine grade high-pressure die-cast aluminium (EN 1706 AC-44300) Bottom spinning: Aluminium sheet Top spinning: Mild steel
Diffuser	Acrylic
Housing finish	White (RAL 9003), Textured finish
Tightness level	IP 20
Impact resistance	IK 08

WEIGHT AND MOUNTING

Weight (kg)	MIDI: 3.2 MAXI: 10
Standard mounting	Suspended

For options and accessories, please turn to page 5.

ELECTRICAL INFORMATION

Electrical class	EU class I
Nominal voltage	198-264V – 50Hz
Power factor	> 95% at full load
Electromagnetic compatibility (EMC)	SANS 55015:2013/A1:2015, SANS 61000-3-2:2014, SANS 61000-3-3:2013, SANS 61547:2009, SANS 62493:2015
Control options	DALI Schröder ITERRA

OPTICAL INFORMATION

LED colour temperature	4000K (Neutral white 840) 3000K (Warm white 830) (optional)
Colour rendering index (CRI)	≥ 80 (Neutral white 840) ≥ 80 (Warm white 830) (optional)

OPERATING CONDITIONS

Operating temperature range (Ta)	-30°C up to +45°C
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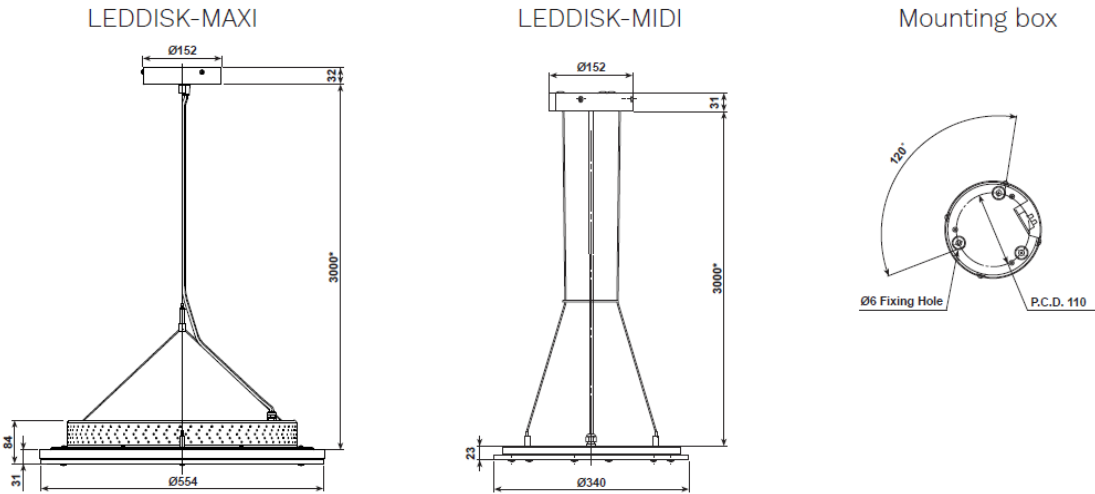
LIFETIME OF THE LEDS @ TQ 25°C

For all versions	98,000h - L70B10
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LIFETIME OF THE DRIVER @ TQ 25°C

For all versions	100,000h ≤10% failure rate
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Dimensions in mm



*Can be shortened to required length

Performance

				Nominal flux (lm) ^(*)	Power consumption (W)	Nominal efficacy (lm/W)	Luminaire output flux (lm)	Luminaire efficacy (lm/W)	Photometry ^(**)
Luminaire	Number of LEDs	Driver Current (mA)	Line Current (A)	Typical	Typical	Typical	Typical	Typical	
LEDDISK	MIDI	■	■	■	■	■	■	■	■
	160	240	0.27	10400	61	170	8632	142	4010 4160 4170
	MAXI	■	■	■	■	■	■	■	
	■	■	■	■	■	■	■	■	

Tolerance on LED flux is ± 7% and on total luminaire power ± 5%

(*) The nominal flux is an indicative LED flux @ Ts 85°C based on LED manufacturer's data. The real flux output of the luminaire depends on environmental conditions (e.g. temperature and pollution) and the optical efficiency of luminaire. The type of LED used is subject to change due to the ongoing rapid progress taking place in LED technology.

(**) Custom combinations of lenses/optics to suit the project are available on request.

31.11 Type J: Rectangular “Court in Session”

Surface LED fitting with a pictogram “Court in Session”. Fitting can be as per type EX without the emergency gear and with a printed pictogram “Court in Session”.

Fitting is to be switched on when the court is in session.

31.12 Type K: 50W LED Flood Light

Approved Make: Osram/LEDVANCE LED Performance Flood Light 50W 4000K Black. Similar and approved equal conforming to the specification may be accepted.

Quick Overview	LED Performance Flood Light 50W 4000K Black
Brand	Osram/LEDVANCE
Color Temperature	4000K
Family Type	Flood Light
Lamping	LED
Lifetime	50000Hrs
Lumens	120lm/w
Material	Die-cast Aluminum
Voltage	230V
Wattage	50W
Product Origin	Local (South Africa)

31.13 Type L – 18W Led Round Recessed Fitting, complete with driver, 5A plug top and 3m cord set

Approved Make: Spazio Saturn, Colour temperature changing recessed 18W LED Downlight White, (4000K) Including Driver. Similar and approved equal conforming to the specification may be accepted.

Quick Overview	Colour temperature changing recessed LED downlight with polycarbonate body and diffuser. 120° beam angle. Includes LED driver.
Brand	Spazio
Color Temperature	CTC - 3000K/4000K/6000K
Family Type	Downlight
Finish	Polycarbonate
Lamping	LED
Lumens	1700 - 2000lm
Material	Polycarbonate
Original SKUs	2276.1831D
Voltage	230V
Wattage	18W
Colour	White
Diameter	216mm
Height	32mm
Cut Out (mm)	95 (Round)
Product Origin	Local (South Africa)



31.14 Type M – Post Top Luminaire LED 37W (Symmetrical), mounted on 3.5m mounting height Fibre Glass pole

Approved Make: BekaSchreder Zela LED 37W/B/LV. Similar and approved equal conforming to the specification may be accepted.

Post top luminaire to consist of a high-pressure die-cast marine grade aluminium (EN 1706 AC-44300 base and gear plate, a top cover made of Acrylonitrile Styrene Acrylate (ASA) and a high-impact acrylic protector for durability and weather resistance. The luminaire emits a pleasant, glare-free light due to the highly efficient white reflector (symmetrical light distribution). The complete luminaire is sealed to IP 66. Electronic temperature monitoring prevents overheating of LEDs and power supply, positioned directly next to LEDs (Thermix®). It is designed for LED light sources between 19W and 55W.

Optical compartment tightness level: IP 66 (*)

Electronic compartment tightness level: IP 66 (*)

Impact resistance (polycarbonate): IK 08 (**)

Aerodynamic resistance (CxS): 0.082m²

Mounting height: 3-6m

Nominal voltage: 108-305V - 50Hz

Electrical class: I or II (*)

Operating temperature (Ta): -35°C to +35°C

Weight: 4.9kg

Standard colour: AZKO 900 grey, Textured finish

LED light sources

Correlated colour temperature (CCT): Neutral white
(4000K, CRI ≥ 70)

Wattage: 19W - 55W

Flux: 2163lm - 6490lm

Materials

Top cover: Acrylonitrile styrene acrylate (ASA)

Base and gear plate: High-pressure die-cast aluminium

Protector: High-impact acrylic



Symmetrical

Characteristics

GENERAL INFORMATION

Recommended installation height	3m to 6m
Driver included	Yes
ROHS compliant	Yes
Testing standard	SANS 60598, SANS 62262

HOUSING AND FINISH

Housing	Top cover - Acrylonitrile styrene acrylate (ASA) Base and gear plate - Marine grade high-pressure die-cast aluminium (EN 1706 AC-44300)
Protector	High-impact acrylic Polycarbonate (optional)
Housing finish	Light Grey (RAL 7047), Textured finish
Tightness level	IP 66
Impact resistance	High-impact acrylic: IK 08 Polycarbonate: IK 10

DIMENSIONS AND MOUNTING

AxB (mm)	578x324
Weight (kg)	4.9
Aerodynamic resistance (CxS) (m²)	0.08
Standard mounting (mm)	Bottom-entry Ø76
Spigot length (mm)	≥ 80

ELECTRICAL INFORMATION

Electrical class	EU class I or II
Nominal voltage	198-264V – 50Hz
Power factor	> 95% at full load
Surge protection	10kV / 10kA
Electromagnetic compatibility (EMC)	SANS 55015:2013/A1:2015, SANS 61000-3-2:2014, SANS 61000-3-3:2013, SANS 61547:2009, SANS 62493:2015

OPTICAL INFORMATION

LED colour temperature	4000K (Neutral white 740) 5700K (Cool white 757) (optional)
Colour rendering index (CRI)	≥ 70 (Neutral white 740) ≥ 70 (Cool white 757) (optional)
Upward Light Output Ratio (ULOR)	≤ 8%

OPERATING CONDITIONS

Operating temperature range (Ta)	-35°C up to +35°C
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LIFETIME OF THE LEDS @ TQ 25°C

For all versions	100,000h - L70B10
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LIFETIME OF THE DRIVER @ TQ 25°C

For all versions	80,000h ≤10% failure rate
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Performance



				Nominal flux (lm) ^(*)	Power consumption (W)	Nominal efficacy (lm/W)	Luminaire output flux (lm)	Luminaire efficacy (lm/W)	Photometry
Luminaire	Number of LEDs	Current (mA)	Line Current (A)	Typical	Typical	Typical	Typical	Typical	
ZELA									Symmetrical Asymmetrical
	20	600	0.17	5700	38	150	4560 / 2880 ⁽²⁾	120 / 76 ⁽²⁾	

Tolerance on LED flux is ± 7% and on total luminaire power ± 5%

^(*) The nominal flux is an indicative LED flux @ Ts 85°C based on LED manufacturer's data. The real flux output of the luminaire depends on environmental conditions (e.g. temperature and pollution) and the optical efficiency of luminaire. The type of LED used is subject to change due to the ongoing rapid progress taking place in LED technology.

31.15 Type MP – Glass Fibre reinforced polyester (GRP) Pole: 3.5m Mounting Height – overall pole length – 4.1m

Approved Make: BekaSchreder Pole K 18 76 35. Including hot dipped galvanized, base plate, spigot, terminal block and 5A circuit breaker. Similar and approved equal conforming to the specification may be accepted.

The pole shall be manufactured from glassfibre reinforced polyester utilising the glass filament winding process. The filament winding shall be continuously applied with uniform tension onto a rotating mandrel, resulting in a minimum mass glass to resin ratio of 70:30, for optimum rigidity. The pole shall be seamless and circular in shape with a continuous taper of 16 – 18mm diameter change per metre.

The pole surface shall be finished in a gel coat that complies with the requirements of SABS 141 and be applied to a uniform thickness of between 250 and 500 microns, achieving a smooth finish that provides a weatherproof, UV resistant, flame resistant and impact strong surface in the colour specified.

The minimum mechanical strength of the pole shall be designed for a fluctuating wind pressure of 500 Pa onto a wind surface area of 0.2m² under which a maximum deflection of 5% of its height above ground shall be permissible. The pole shall have a safety factor of 2.5 and be able to be manufactured to any other strength required.

The access door opening to be a 250mm x 80mm cut-out and shall be covered by a HEAVY DUTY access door cover manufactured from glass filled nylon impregnated in the same colour as that of the surface coat. It shall be fixed securely by two M4 stainless steel captive Allen head screws that locate into M4 brass nut inserts embedded in the pole. A heavy-duty access door cover with a minimum wall thickness of 3mm and fixed securely by a stainless steel bar slotted into the inner wall of the pole shall be available on request.

The pole shall be supplied complete with a hot dipped galvanised baseplate with a minimum size of 300 x 300 x 1.6mm, two hot dipped galvanised steel M8 hook bolts and nuts, a hot dipped galvanised glandplate suitable for gland No. 0 or No. 1 and a miniature circuit-breaker if required.

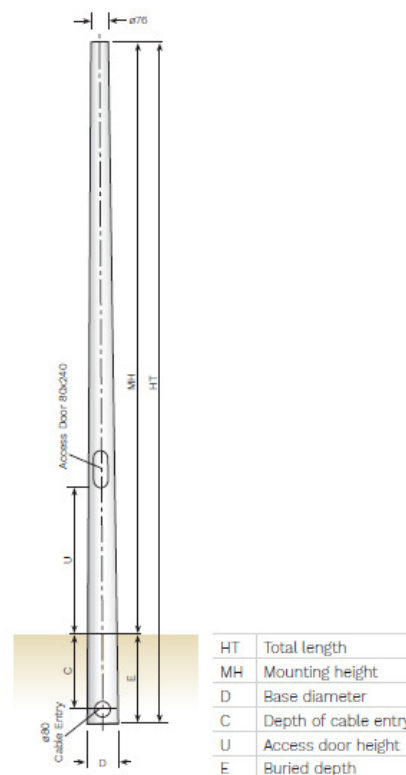
The standard colour of the pole shall be mineral grey, colour code K 913.

A cable entry of 80mm diameter shall be provided. The cable glandplate shall be complete with terminal block and two bores, suitable for gland No. 0 and gland No. 1 and sufficient spacings for two 5kA circuit breakers

All internal wiring shall be PVC insulated copper, 2.5mm² nominal area and rated at 600V

Description	MH m	HT m	E m	U m	D mm	C mm	Approx. weight (kg)
K 18 76 20	2.0	2.6	0.6	0.5	121	400	6.9
K 18 76 25	2.5	3.1	0.6	0.5	131	400	7.4
K 18 76 30	3.0	3.6	0.6	0.5	135	400	8.4
K 18 76 35	3.5	4.1	0.6	0.5	146	400	9.7
K 18 76 40	4.0	4.6	0.6	0.5	157	400	11.6
K 18 76 45	4.5	5.2	0.7	0.5	168	400	13.5
K 18 76 50	5.0	5.7	0.7	1.0	177	400	16
K 18 76 55	5.5	6.3	0.8	1.0	180	400	21
K 18 76 60	6.0	6.9	0.9	1.0	184	400	24.2
K 18 76 65	6.5	7.4	0.9	1.0	192	400	28.5
K 18 76 70	7.0	8.0	1.0	1.0	202	400	29
K 18 76 75	7.5	8.6	1.1	1.0	210	400	38.5
K 18 76 80	8.0	9.2	1.2	1.0	220	500	43.7
K 18 76 85	8.5	9.8	1.3	1.0	230	600	49
K 18 76 90	9.0	10.4	1.4	1.0	230	600	56
K 18 76 95	9.5	11.0	1.5	1.0	240	700	60.2
K 18 76 100	10.0	11.6	1.6	1.0	250	800	65.8
K 18 76 110	11.0	12.8	1.8	1.0	310	800	89.5
K 18 76 115	11.5	13.4	1.9	1.0	320	800	98.5
K 18 76 120	12.0	14.0	2.0	1.0	340	1 000	110

NOTE: All measurements are approximate



31.16 Type V – Vandal proof Round Bulkhead 17W LED with Tamper Proof Screws (Prison Type Luminaire) (LED)

17W Round surface mounted LED Bulkhead.

Make : BekaSchreder 31 Bulkhead LED 17W with Tamper Proof Screws (Prison Type Luminaire). Similar and approved equal conforming to the specification may be accepted.

The luminaire shall consist of a high-pressure die-cast aluminium base and trim ring, and an opal high-impact acrylic diffuser. It shall be designed to operate LED control gear rated at 17W.

Lamp compartment: IP 65

All base castings shall be manufactured from high pressure die-cast aluminium, finished both outside and inside in white epoxy powder coating for added protection and reflectivity. It shall be simple to install (four mounting holes provided outside the lamp compartment through lugs that form part of the base casting). The trim ring casting shall be mounted onto the base casting by stainless steel M5 Allen head screws, located outside the lamp compartment. The fixing holes will be supplied with stainless steel heli-coil inserts.

An opal non-discolouring high-impact acrylic injection moulded diffuser shall be used. It shall offer excellent vandal resistance, be highly translucent and shall not discolour even when subjected to UV environments. A silicon sponge gasket shall be fitted into a special groove in the diffuser to prevent damage to the gasket during installation and to achieve the certified ingress protection rating of IP 65.

The trim ring casting shall be manufactured from high-pressure die-cast aluminium and shall be finished in a special multi-stage epoxy powder surface coating.

The LED's useful lifetime shall be a minimum of 60 000hrs. The LED shall be an effective high-power LED, 4 000K at a colour rendering index of minimum 80.

The control gear shall be mounted directly onto the base casting, ensuring cool operation. It shall be suitable for operation with the specified rating of the lamp on a 230V +3%/-10% 50Hz single phase system. All inter-connecting wiring shall be Teflon® insulated with protective sleeving to prevent damage by possible abrasion. All external screws, bolts and metals shall be stainless steel or non-corrosive material. Mains connections shall be by means of a suitable screw terminal block with a wire clamping contact. The luminaire shall be power factor corrected to a minimum of 0.9. In the LED version, the diffuser shall be permanently sealed to the aluminium base and shall be supplied with a 300mm supply lead.



31.17 Type S – 15W pigmy safe light

Surface mounted light complete with 15W pigmy lamp and red diffuser to indicate safe is occupied.

31.18 Type UV – Wall mounted Ultra Violet Upper Air Sterilisation System

Approved Make: Lascon Technilamp TLR-31 UV / 180, Wall mounted. Similar and approved equal conforming to the specification may be accepted.

Wall mounted Upper Air Ultra-Violet Germicidal Irradiation fitting with 4 x Phillips PL-S 9W TUV (9W) lamp. The fitting shall provide an effective, environmentally friendly solution to indoor airborne micro-organisms. It shall deliver sterile air on a 24/7 basis for 24/7 protection with no use of chemicals. Each fitting shall be individually numbered and have a comprehensible waste disposal programme. The fitting shall have a removable Power Pack for the ease of Maintenance and a robust design offering a minimum 5 year life span.

The fitting shall comply with the following:

FITTINGS

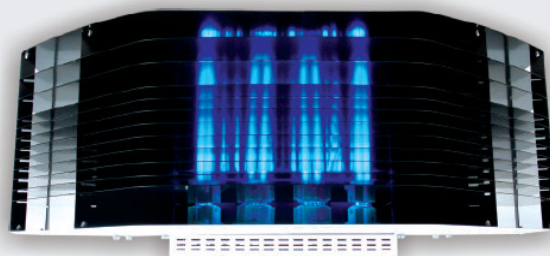
Area Coverage	TL R31 Area coverage of 25m ² (180 Degrees)
Durability	Lifespan of 5-7 years
Manufacturing	ISO9001 approval
Louvred system	13 Louvre
Electrical wiring	220/230V AC Supply: SANS 1042
Operating Temperature	29.3°C
UV-C Emission	High and consistent horizontal coherent beam of UV fluence rate.
Safety Features	The louvre shall be tested design to ensure that all the UV-C is concentrated in the upper-air surface area ensuring that no people are exposed to any UV-C

LAMPS

Lamp type and watt rating	Phillips PL-S 9W TUV (9W)
Mercury content	3mg
Ozone emitting or Not	The lamp must be a non-ozone emitting lamp
Lamp coatings	An inside coating to minimise mercury absorption and to ensure constant UV-C radiation over the 10 000 hour lifespan of the lamp
Glass Type	Sodium Barium Silicate
Lamp/Life / Replacement hours	8000 Hours

TL R 31

- Wall Mount - Covers 25m².
- Designed for hospital wards and passages.
- 4 x PL-S 9W lamps.



32 2 Compartment Metal Power Skirting

The power skirting shall be 0.8mm galvanised two compartment modular power skirting. Overall dimension shall be 165mm wide x 55 mm high. The power skirting shall be fully modular. The body shall be epoxy coated on top and on the front surfaces and there shall be no unprotected surfaces or spot welding. Covers shall be Epoxy coated 0.5mm galvanised snap in covers.

Colour –Grey

The top compartment would house the air conditioning, normal and dedicated power. The bottom compartment shall house data and telephone cabling.

The power skirting and components shall be installed as per the recommended manufacturer's procedure of installation. The cutting of the power skirting covers shall be with a suitable "hacksaw" and where required with the aid of a mitre box. All cut edges shall be cleaned from any shavings before being installed.

The power skirting shall be securely fixed by means of nail anchor fasteners at regular intervals as specified by the manufacturer, with additional fixings provided at bends, tees and intersections.

Power skirting shall be fixed to the perimeter wall, partition, or other medium with inserts and screws, or with expanding spring toggle screws into dry wall panels, at centres not exceeding 500mm. Skirting shall be set level.

33 Hot water cylinders.

The Electrical Contractor shall wire the HWC circuit and provide a double pole isolator adjacent to the new cylinder. Flexible conduit and heat resistant wire shall be used to wire between the isolator and the cylinder. All internal wiring shall be heat resistant.

34 Supervision.

The work shall at all times, for the duration of the contract be carried out under the supervision of a skilled and competent representative of the Contractor, who will be able and authorised to receive and carry out instructions on behalf of the Contractor. A sufficient number of workmen shall be employed at all times to ensure satisfactory progress of the work.

35 Power Factor Correction.

Enclosure

The power factor control panel must be the part of, or adjacent to the DB-Main, which will consist of a floor standing modular panel. Provision must be made for protected penetration from one panel for the mains cabling. Enclosure should conform to IEC (International Standard) specifications and be of a multi modular cubicle design. The cubicle must be suitably louvered to ensure adequate free air circulation and for systems exceeding 200kVAR each section must be fitted with fans to assist air movement. The capacitor section should be separate from the switch gear and incoming sections.

Main Isolator

The PFC panel shall be fitted with a door interlocking triple pole load break isolator, suitably rated for the system fault level and the kvar capacity of the capacitor bank. When using an isolator an auxiliary early break contact is to be fitted to the isolator to open circuit all contactors in the system.

Preference shall be given to a suitable fast acting high rupturing capacity circuit breaker instead of a fused unit.

Busbars

To be copper, rated at 2.5 times the full load of the total current capacitors, or to that of the circuit breaker feeding the PFC panel.

Contactors

Contactors shall be those specifically designed for capacitor switching, in particular those fitted with inrush limiting resistances or inductances.

Contactors without capacitor switching ratings shall be rated AC³ category at 1.8 times of the capacitor current. Two-pole switching is not acceptable.

A maximum of 75 kVAr switching at any one time will only be allowed.

If contactors specifically designed for capacitor switching with inrush limiting resistor or inductances are installed then the fuse rating can be reduced to 1.35 times the rated step current. These inrush limiting resistors must be removed automatically from circuit once the main contactor poles have closed

Fuses and Fuse Holders

3 pole din type or NS type fuse base and carriers, suitably rated shall only be used. Each capacitor step shall be supplied by one only triple pole HRC fuse base, for short circuit protection, busbar mounted fuses bases are preferred. A rating between 1.43 and 1.8 times the rated step current should be adopted. The fuses should be of slow blowing type owing to high momentary current at make.

Connecting cables should be designed for 1.5 times the rated current value, with bolt and nuts for wiring termination and to have barriers between phases.

Capacitors

Capacitors shall have a nominal voltage rating of 440 V with the kVAr outputs indicated also for 400 and 415V respectively. Only 3 phase capacitors are acceptable which are biodegradable, non toxic, and free of PCB and lead. Capacitors must have a high resilience to withstand harmonic interference. Not more than one capacitor in a single container will be acceptable and must be fitted on top with stud type terminal for wiring.

A minimum of 30 mm must be allowed between capacitors when mounted. The capacitors film must have a minimum thickness of 9 microns, with technical characteristics as detailed below.

Discharge resistors must be fitted to the capacitor terminal to reduce the voltage to 50V within 20 sec.

Dielectric	Metalised polypropylene
Frequency	50Hz
Temperature range	-40 to +45 degrees
Capacitance tolerance	-5 to +10%
Losses	<0.5 W/kVAr
Voltage overload	1.1Un
Current over load	1.5 In
Test voltage between terminals	4.3Un DC
Test voltage between earth & terminals	3kV AC 1 min
Specification	IEC70-70A, IEC 110, BS 1650, VDE 0560

Control Circuit Protection

To be single pole rail mounted

Reactive Relay

The control relay should be capable measuring both 5A and 1A.C.T. inputs and a voltage range of ± 50 - ± 700 V. It should also be capable of automatically identifying the location of the C.T. and measuring voltage.

The controller must be suitable for remote monitoring on a 24-hour basis (i.e. linked to a service provider by text.), should the system malfunction.

The control relay should be fully automatic and self programming.

Interruption of measuring voltage, and insufficient compensation fault conditions should be indicated, as well as a permanent digital display of the power factor required (bar graph not acceptable)

The relay should be capable of random selection of capacitor steps to achieve the target power factor as efficiently as possible with the minimum of stepping increments.

The relay must have the following LED indication features:

- Individual steps summoned
- Capacitive and inductive fields.
- Mode operation
- Fault indication
- Harmonic %
- P.F target shall be adjustable between 0,85 LAG and 0,98 Lead.
- On line monitoring facility i.e. RS 232 port for EPC 2000 Protocol converter

Harmonic Protection

Harmonic indication is required and must be part of the Reactive Relay

Harmonic Distortion must monitor the THD of the voltage, should the value exceed 5% the reactive relay must remove the capacitive steps one at a time and also be adjustable to increase the 5% if so desired for a higher THD %

Pilot Lights

Each capacitive step is to have pilot lights, (green) indication of the relevant contactor being energised, this must be achieved by an auxiliary contact on step contactor, and not directly across the LED cluster pilot lights are preferred. The appropriate panel cutouts must be provided in the system cubicle to accommodate at least one additional step.

Pilot light indication (red) is also required when the manual auto key switch is in the auto position.

Control Switches

Hand Off Auto switches

Hand Off Auto control switches must be fitted to each capacitive step. In the Auto Position the reactive relay will control the step operation.

In the Off Position the step will not energise, in the Hand Position the step will energise.

The hand off auto must be wired so that an alternative phase is connected in manual so that supplied in auto (i.e. by the reactive relay) This ensures that should the control fuse supplying the reactive relay fail, the steps will still operate in hand.

Manual Auto Key Switch

A key locking 2 position (manual /auto) is to be fitted and wired to prevent unauthorised switching of the capacitor steps (i.e. in the auto position the following must apply)

The Hand Off Auto switches are electrically disconnected.

(i.e. in the manual position the following must apply)

The, Hand /Off /Auto switch can be operated to control the capacitive steps.

The key must be retained in the manual position and removable in the auto position.

Indication of the mode of operation is also required (see pilot lights)

Wiring

Inductance coils between the contactor and the capacitor of 5 turns of 40mm diameter must be installed.

All control wiring must be a minimum of 1.5 mm panel wire, numbered on both ends of each wire Capacities of the main cables shall be to the following minimum rating and capacitor leads should be multi stranded flexible cable.

16mm wire- up to 30kVAR capacitors, 25mm wire up to 35 & 50 kVAR capacitors

35mm wire for 60kVAR capacitors.

Under no circumstance can “welding cable rating be applied.

Suitably rated Ferrules and lugs must be used on all capacitor and contactor terminations

36 Phase Rotation.

The Tenderer will be responsible for checking the phase rotation of the whole system and in particular the phase rotation of any electric motors to be connected, to ensure the correct running direction.

37 Lightning Protection.

The Sub-contractor will be responsible for the complete lightning protection system including the installation of all sleeves and conduits required for the lightning protection. The installation and relevant tests are to be carried out by a Specialist in accordance with the latest SABS code. The Sub-contractor shall obtain prices for the lightning protection installation from accredited specialist sub-contractor to design and install the lightning protection system (LPS) and include this cost as part of this tender. The lightning protection down conductors shall be installed in galvanised conduits and bonded to the metal roof. There is an existing LPS installation that shall be re-used as far as possible.

The LPS specialist is responsible for the design and the signing thereof on the safety Report.

The specialist shall conduct a full survey on site of the buildings to be protected prior to installation in order to evaluate the type of lightning protection proposed on the drawings and shall issue any amendments to the proposed design to the Engineer. This survey must be conducted in accordance with the latest following SANS codes of practice:

- (i) SANS 10313: Protection against lightning – Physical damage to structures & life hazard.
- (ii) SANS 62305-1: General Principles.
- (iii) SANS 62305-2: Risk management.
- (iv) SANS 62305-3: Physical damage to structures & life hazard.
- (v) SANS 62305-4: Electrical & electronic systems within structures.
- (vi) SANS 1063: Earth rods, couplers & connections.
- (vii) SANS 10199: The design & installation of earth electrodes.

The LPS specialist shall provide a risk analysis spread sheet to conclude the buildings classification.

The risk analysis shall take into account the following criteria.

Type of structure:

- (i) Construction of walls.
- (ii) Roof construction.
- (iii) Roof covering.
- (iv) Equipment on the roof.

Contents of the structure:

- (i) Risk of panic.
- (ii) Kind of contents.
- (iii) Value of contents
- (iv) Measures for reduction of damage.

Consequential losses:

- (i) Danger to the environment.
- (ii) Loss of services to the public.
- (iii) Other consequential losses.

Based on the above results and in conjunction with location and accepted annual frequency of lightning flashes the required protection level must be established. The design methodology (protective angle, grid or rolling sphere) used for the system must be stated and it must be shown with the use of drawings that the building / structure falls within the shielding offered by the LPS.

The LPS specialist shall also provide drawings to indicate the positions of the air termination system and down conductors. Where applicable the down conductors are to be installed in down pipes. Each down conductor should be bonded to the air termination system and be terminated to a 1,2m copper earth spike in the ground. The issue of a Certificate of Compliance for the Lightning Protection Systems is compulsory on completion of the installation

The Installation shall comply with the relevant requirements of the following specifications.

- (a) the latest issue of "SANS 10142 : Code of Practice for the Wiring of Premises", hereafter called the "Wiring Code";
- (b) The "Occupational Health Safety Act 85" of 1993 as amended to date and hereafter called the "Act";
- (c) The Municipal By-Laws and any special requirements of the local Supply Authority;
- (d) The local Fire Office Regulations.
- (e) The latest issue of "SABS 03-1985 : Code of Practice for the protection of structures against lightning;

In addition, the work is to be of high standard and to the satisfaction of the Engineer

a) **Drawings**

The contractor shall submit 3 copies of layout drawings for approval. No work shall begin until these drawings have been approved.

b) **Testing and Commissioning**

The entire installation shall be tested and commissioned in the presence of the clients representative and Engineer. On completion and handover 3 sets of operating and maintenance manuals and "As Built" drawings shall be handed over.

c) **Compliance Certificate / Safety Report**

On completion of the installation the accredited contractor shall issue the Engineer SANS prescribed LPS Safety Report / compliance certificate (Signed by the LPS specialist - Including Design portion) to SANS 10313:2010 as amended.

38 Other Contractors on Site.

Tenderers are advised that this is a domestic sub contract to the building contract which runs concurrently. Tenderers must be aware of the need for co-ordination with the Building Contractor and other sub contractors and must allow in their prices for all costs and difficulties associated with co-ordinating their works with the different Contractors. In addition, the Contractor will be required to carry out his works in a manner which does not cause unnecessary interference with the Building Contractors Works and progress on site

39 Air Conditioning and Ventilation Installations.

The electrical contractor shall install new Air Conditioning Isolators and DB's as indicated on the drawing and carryout all tests required for the issuing of the COC. The installation of the new Air conditioners shall be carried out by others.

The electrical sub contractor shall allow to work in close collaboration with the air conditioning and ventilation subcontractor.

All ventilation, heating and air conditioning equipment will be supplied and installed by others and final positions of these equipment and the power supply outlets shall be determined on site by the A/C subcontractor. It is the responsibility that the electrical sub contractor obtains the final positions from the A/C subcontractor, prior to installation.

Exterior mounted isolators shall be weatherproof to IP 65 standards.

The isolators shall be mounted within 1m of the unit terminals.

All final connections to the equipment shall form part of this sub contract.

All isolators are to be labelled to indicate the distribution board and circuit number to which it is connected.

40 Standby Diesel Emergency Generator.

A separate contract will allow for the supply, installation and commissioning of a containerised standby diesel generator locate near the DB Main. The electrical sub contractor shall install the required LV Cables and control cables from the

Generator to the DB Main. The generator shall be tested and commissioned in association with the generator sub contractor.

41 **Occupancy Sensors.**

The occupancy sensors shall be ceiling / wall mounted.

Type 1 : PIR Occupancy Sensor 360 Degree

Make: Schneider Argus Single Load PIR Occupancy Sensor (SAE_UE_MS_CSAWE) or similar and APPROVED equal.

Technical Characteristics

- Sensing Technology: PIR
- Angle of Detection: 360 °
- Type of Installation: Ceiling (Surface)
- Rated Voltage: 230VAC+/-10%, 50/60Hz
- Detection Range: 7 meters (diameter) at 2.5 meters height
- Weather Protection: Class II – IP 44
- Colour: White
- Suitable for the following light loads:
 - Fluorescent lamp: Max. 900VA/100µF
 - LV halogen lamp: Max. 1000VA
 - Incandescent lamp: max. 2000W
 - Energy saving lamp: Max. 80VA
 - Halogen lamp: Max. 1000W
- Blanking detection shroud to enable the detection field to be optimized.
- Lux adjustment (between 10-2000 lux),.
- Time delay adjustable from 5 sec to 30 min.
- 12 month standard warranty.



Picture for Illustration Purposes

42 **Existing Electrical Installation.**

The electrical contractor shall price for the removal, storage and making safe of the existing electrical installation. All Cabling, wiring and distribution boards shall be re-used and refurbished if possible. Contractor shall obtain written instruction from the Engineer of the scope for the removal of the existing installation before commencing. The existing installation shall be carefully removed for the possible re-use. The ownership of the existing installation remains with Department of Public Works, **until instructed differently by the Engineer.**

43 **Phasing of the Construction.**

The construction of the court is to be undertaken in 4 Phases. The electrical contractor is responsible to ensure the electrical installation is safe and compliant during all 4 phases. Temporary COC's to be issued for each completed phase before occupation. On completion, the electrical contractor shall complete the final testing of all four phases and issue the Final Certificates of Compliance (All 4 phases) for Practical Completion.

The electrical contractor shall supply and install a 12kVA Single phase input – Single phase output UPS in the Equipment Room. The UPS shall be utilised by the Security installations.

Approves : PSS GP 812 - 12kVA Power Series UPS

The 12kVA UPS shall conform to the following requirements:

- True on-line double conversion design providing all power protection
- Zero transfer time on AC mode to/from battery mode, AC mode to/from bypass mode
- IGBT inverter design
- Wide Input voltage windows
- Pure sine wave output with less than 3% THD
- Expandable backup time
- Generator compatible
- Cold start
- Load/Battery power meter display
- Overload, on-line, battery status
- LED/LCD display
- Advanced battery management
- Automatic charging in UPS off mode
- Smart RS-232 communication port
- Optional SNMP card and dry cardTransformer based
- Built for harsh power conditions
- Life span – expected more than 15 Years
- Dimensions 400 W, 692D, 938H
- Weight 109kg

[illegible]

INDICATION								
LCD	working mode, input and output voltage, input and output frequency, battery voltage, load percentage, UPS inner temperature							
LED	low battery, on-line, inverter, bypass, abnormal							
EFFICIENCY								
WHOLE UNIT	85%							
TRANSFER TIME								
MAINS TO INVERTER	0MS							
ENVIRONMENT								
NOISE	<55db							
TEMPERATURE	0 ~ 40°C							
HUMIDITY	0 - 95% (non-condensing)							
GENERAL								
NET/ GROSS WEIGHT (Kg)	99 / 109	102 / 112	108 / 118	105 / 115	115 / 130	125 / 140	180 / 202	200 / 222
DIMENSIONS (W x D x H) mm	230 x 580 x 720			305 x 585 x 864			409 x 798 x 1044	

45 UPS Battery

12V 100Ah Gel Battery:

Approved Make: 12V 100Ah PSS Gel Battery. Similar and approved equal conforming to the specification may be accepted

Sealed lead-acid battery consisting of a special lead-calcium alloy plates and high capability absorptive clapboards.

The battery to be valve-regulated, sealed and maintenance free.

Life Design: 10 Years

Dimensions: 73 X 406 X 219 (W-D-H)mm

Weight: 31 kG

Battery to carry a 1-year manufacturer's warranty against manufacturing defects

SPECIFICATION FOR ELECTRICAL WORK

PART 3 : STANDARD AND QUALITY SPECIFICATIONS FOR MATERIAL AND EQUIPMENT OF ELECTRICAL INSTALLATIONS (PW354)

The Standard (Section A & B) and Quality Specifications (Section C) are not bound into this document. They are available for scrutiny at the offices of the Consulting Electrical Engineer and The Department of Public Works. The documents may be downloaded from the internet as shown below”

http://www.publicworks.gov.za/PDFs/consultants_docs/General_Electrical_Specification_PartA_and_PartB.doc

http://www.publicworks.gov.za/PDFs/consultants_docs/General_Electrical_Specification_Part_C.doc

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SPECIFICATION FOR ELECTRICAL WORK
MATERIAL SCHEDULE

The contractor shall complete the following schedules and submit them to the Representative / Agent within 21 days of the date of the acceptance of the tender.

The schedules will be scrutinised by the Representative / Agent and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB: Only one manufacturer's name to be inserted for each item.

Item	Material	Make or trade name	SABS
1	Distribution boards		
2	Power Factor Correction		
3	Circuit breakers 1P, 2P, 3P		
4	On load isolators without trips		
5	Contactors 1P, 2P, 3P		
6	Earth leakage relays 1 & 3 phase		
7	Isolator – Weather proof		
8	Isolators		
9	PVC Conduit		
10	Galvanised Conduit		
11	Conduit boxes		
12	Light switches		
13	Watertight switches		
14	16A socket outlets		
15	16A dedicated socket outlets		
16	16A UPS socket outlets		
17	1 x 16A SANS 164-1 & 1 x SANS 164-2) Socket Outlet		
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19	Luminaires : Type AE		
20	Luminaires : Type B		
21	Luminaires : Type C		
22	Luminaires : Type D		
23	Luminaires : Type EX		
24	Luminaires : Type F		
25	Luminaires : Type G		
26	Luminaires : Type H		
27	Luminaires : Type I		
28	Luminaires : Type J		
29	Luminaires : Type K		
30	Luminaires : Type L		
31	Luminaires : Type M		
32	Luminaires : Type MP		
33	Luminaires : Type V		
34	Luminaires : Type S		
35	Luminaires : Type UV		
36	Power Skirting		

**BILL OF QUANTITIES
(PROVISIONAL)**

1. The descriptions in this Bill of Quantities shall be read in conjunction with the specification.
2. The unit rate for each item in the Price Schedules shall include for all materials, labour, profit, transport, etc., everything necessary for the execution and complete installation of the work in accordance with the description.
3. All material covered by this Specification shall, wherever possible, be of South African manufacture
4. Each item shall be priced and extended to the Total column by the Tenderer. If the Tenderer omits to price any item in the bill of quantities then the cost of the work of each item shall be considered as included in the prices given for the other items.
5. The quantities of work and material set forth in the bill of quantities are estimates only and are not to be considered as limiting nor as extending the amount of work to be done and material to be supplied by the Contractor and the work and material set forth in the bill of quantities will be re measured. The Contractor shall ascertain the correct quantities before ordering. Items will only be paid for insofar as they have been supplied and installed. Excessive quantities or wastage shall not be paid for.
6. No alterations , erasure or addition is to be made in the text of the Document . Any alteration, erasure or addition made will not be recognized and the original wording of the Document will be adhered to.
7. The prices quoted shall be exclusive of VAT as applicable.
8. All rates and amounts tendered in the bill of quantities shall be in Rand.
9. Tenderers shall check their calculations for arithmetical errors as the total Tender Price, as submitted , will remain fixed.

REPAIRS AND ADDITIONS TO ELLIOT MAGISTRATE COURT

ELECTRICAL INSTALLATION

SUMMARY OF BILL OF QUANTITIES

	DESCRIPTION	TENDER AMOUNT
	BILL N° 1 - PRELIMINARY AND GENERAL	
	BILL N° 2 - LV DISTRIBUTION BOARDS I	
	BILL N° 2 - LV DISTRIBUTION BOARDS II	
	BILL N° 3 - LV CABLES & RETICULATION I	
	BILL N° 3 - LV CABLES & RETICULATION II	
	BILL N° 3 - LV CABLES & RETICULATION III	
	BILL N° 4 - LIGHTING AND POWER I	
	BILL N° 4 - LIGHTING AND POWER II	
	BILL N° 4 - LIGHTING AND POWER III	
	BILL N° 4 - LIGHTING AND POWER IV	
	BILL N° 4 - LIGHTING AND POWER V	
	BILL N° 4 - LIGHTING AND POWER VI	
	BILL N° 4 - LIGHTING AND POWER VII	
	BILL N° 4 - LIGHTING AND POWER VIII	
	BILL N° 5 - MISCELLANEOUS I	
	BILL N° 5 - MISCELLANEOUS II	
	BILL N° 6 - LIGHTNING PROTECTION SYSTEM	
	BILL N° 7 - EARTHING SYSTEM	
	TOTAL TENDER AMOUNT EXCLUDING VAT CARRIED FORWARD TO BOQ SUMMARY PAGE	

ITEM	DESCRIPTION	UNIT	QTY	RATE	TENDER AMOUNT
	BILL N° 1 - PRELIMINARY AND GENERAL				
1	PRELIMINARY AND GENERAL A Preliminary and General item is provided to cover the Contractor's charges for compliance with the Conditions of Contract and this Specification, including the provision, maintenance and removal of his site establishment, etc.				
1.1	FIXED CHARGES				
1.1.1	Site Establishment	Sum	1		
1.1.2	Removal of Site Establishment	Sum	1		
1.2	VALUE RELATED ITEMS				
1.2.1	Provision of Sureties	Sum	1		
1.2.2	Insurances	Sum	1		
1.2.3	Third Party Insurance	Sum	1		
1.2.4	Guarantee of the Works	Sum	1		
1.2.5	All OHSA Requirements including safety equipment and clothing	Sum	1		
1.2.6	All HIV / AIDS Specification Requirements	Sum	1		
1.3	TIME-RELATED ITEMS				
1.3.1	Contractual Requirements	Sum	1		
1.3.2	Operation and Maintenance of Site Establishment	Sum	1		
1.3.3	Supervision for the Duration of Contract	Sum	1		
1.3.4	Other Time-Related Obligations	Sum	1		
TOTAL FOR BILL N° 1 - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 2 - LV DISTRIBUTION BOARDS I	UNIT	QTY	RATE	TENDER AMOUNT
2.1	DISTRIBUTION BOARDS 'Supply and install distribution board, including everything necessary as per the Distribution Board Slinge Line Diagrams. The installation shall include the installation, connection, earthing and conduit terminations.				
2.1.1	DB-MAIN as per single line diagram				
2.1.1.1	Supply	Nº	1		
2.1.1.2	Installation	Nº	1		
2.1.2	DB-A as per single line diagram				
2.1.2.1	Supply	Nº	1		
2.1.2.2	Installation	Nº	1		
2.1.3	DB-A1 as per single line diagram				
2.1.3.1	Supply	Nº	1		
2.1.3.2	Installation	Nº	1		
2.1.4	DB-B as per single line diagram				
2.1.4.1	Supply	Nº	1		
2.1.4.2	Installation	Nº	1		
2.1.5	DB-C as per single line diagram				
2.1.5.1	Supply	Nº	1		
2.1.5.2	Installation	Nº	1		
2.1.6	DB-D as per single line diagram				
2.1.6.1	Supply	Nº	1		
2.1.6.2	Installation	Nº	1		
2.1.7	DB-E as per single line diagram				
2.1.7.1	Supply	Nº	1		
2.1.7.2	Installation	Nº	1		
2.1.8	DB-F as per single line diagram				
2.1.8.1	Supply	Nº	1		
2.1.8.2	Installation	Nº	1		
2.1.9	DB-G as per single line diagram				
2.1.9.1	Supply	Nº	1		
2.1.9.2	Installation	Nº	1		
2.1.10	DB-P as per single line diagram				
2.1.10.1	Supply	Nº	1		
2.1.10.2	Installation	Nº	1		
2.1.11	DB-S as per single line diagram				
2.1.11.1	Supply	Nº	1		
2.1.11.2	Installation	Nº	1		
TOTAL FOR LV DISTRIBUTION BOARDS I - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 2 - LV DISTRIBUTION BOARDS II	UNIT	QTY	RATE	TENDER AMOUNT
2.1.12	DB-T as per single line diagram				
2.1.12.1	Supply	N°	1		
2.1.12.2	Installation	N°	1		
2.2	CONSUMER EARTH DISTRIBUTION BOARDS 'Rates to include for the supply, delivery and installation of distribution boards inclusive of all item's as detailed in the Installation Details.				
2.2.1	Accessible Earth DB - Surface 16 Way Distribution Board with doors and 200 x 26 x 6mm copper earth bar as specified in the installation details.				
2.2.1.1	Supply	N°	1		
2.2.1.2	Installation	N°	1		
2.2.2	Accessible Earth Bar - 200 x 26 x 6mm copper earth bar mounted in the Ceiling void on suitable insulators.				
2.2.2.1	Supply	N°	8		
2.2.2.2	Installation	N°	8		
2.3	LOW VOLTAGE 3CR12 KIOSKS Rates to include for the supply, delivery and installation of kiosks inclusive of all item's as detailed in the single line diagrams. Kiosk to be built in accordance with the Installation Details.				
2.3.1	KIOSK MUNIC as per single line diagram				
2.3.1.1	Supply	N°	1		
2.3.1.2	Installation	N°	1		
2.4	LOW VOLTAGE SWITCHGEAR Rates to include for the supply, delivery and installation of switchgear into distribution boards including 400mm PVC copper jumpers to match switchgear size.				
2.4.1	60A SP+N 5kA MCB (Curve 2)				
2.4.1.1	Supply	N°	1		
2.4.1.2	Installation	N°	1		
2.4.2	20A 1P 5kA MCB (Curve 2)				
2.4.2.1	Supply	N°	3		
2.4.2.2	Installation	N°	3		
2.4.3	10A 1P 5kA MCB (Curve 2)				
2.4.3.1	Supply	N°	3		
2.4.3.2	Installation	N°	3		
2.4.4	30mA, single phase earth leakage 60A isolator type 5kA.				
2.4.4.1	Supply	N°	1		
2.4.4.2	Installation	N°	1		
TOTAL FOR LV DISTRIBUTION BOARDS II - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 3 - LV CABLES & RETICULATION I	UNIT	QTY	RATE	TENDER AMOUNT
3.1	LV CABLES 1000/600 volt PVC/PVC/SWA/PVC copper cables. Rates to include for the supply, delivery and installation into cable sleeves and/or trenches excluding excavations, backfilling and cable terminations.				
3.1.1	95mm² 4c Cable				
3.1.1.1	Supply	m	50		
3.1.1.2	Installation	m	50		
3.1.2	70mm² 4c Cable				
3.1.2.1	Supply	m	70		
3.1.2.2	Installation	m	70		
3.1.3	10mm² 4c Cable				
3.1.3.1	Supply	m	85		
3.1.3.2	Installation	m	85		
3.1.4	6mm² 4c Cable				
3.1.4.1	Supply	m	25		
3.1.4.2	Installation	m	25		
3.1.5	2,5mm² 4c Cable				
3.1.5.1	Supply	m	70		
3.1.5.2	Installation	m	70		
3.1.6	16mm² 3c Cable				
3.1.6.1	Supply	m	172		
3.1.6.2	Installation	m	172		
3.1.7	10mm² 3c Cable				
3.1.7.1	Supply	m	56		
3.1.7.2	Installation	m	56		
3.1.8	6mm² 3c Cable				
3.1.8.1	Supply	m	53		
3.1.8.2	Installation	m	53		
3.1.9	4mm² 3c Cable				
3.1.9.1	Supply	m	305		
3.1.9.2	Installation	m	305		
3.1.10	2,5mm² 3c Cable				
3.1.10.1	Supply	m	80		
3.1.10.2	Installation	m	80		
3.1.11	1,5mm² 12c Cable (Multicore)				
3.1.11.1	Supply	m	12		
3.1.11.2	Installation	m	12		
TOTAL FOR LV CABLES & RETICULATION I - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 3 - LV CABLES & RETICULATION II	UNIT	QTY	RATE	TENDER AMOUNT
3.2	BARE COPPER EARTH WIRES Rates to include for the supply, delivery, termination and installation into cable sleeves and/or trenches excluding excavations, backfilling and cable terminations.				
3.2.1	70mm² BCE				
3.2.1.1	Supply	m	50		
3.2.1.2	Installation	m	50		
3.2.2	50mm² BCE				
3.2.2.1	Supply	m	70		
3.2.2.2	Installation	m	70		
3.2.3	6mm² BCE				
3.2.3.1	Supply	m	85		
3.2.3.2	Installation	m	85		
3.2.4	4mm² BCE				
3.2.4.1	Supply	m	25		
3.2.4.2	Installation	m	25		
3.2.5	2,5mm² BCE				
3.2.5.1	Supply	m	127		
3.2.5.2	Installation	m	127		
3.3	CABLE TERMINATIONS For PVC/PVC/SWA/PVC cables, shall include supply and fitting of the cable gland, neoprene shroud, making-off the cable, lugs, and fitting the gland to the board gland plate, switchgear or appliance and final connection of cable tails into board				
3.3.1	50 - 120mm² 4c Cable				
3.3.1.1	Supply	No	8		
3.3.1.2	Installation	No	8		
3.3.2	2,5 - 10mm² 4c Cable				
3.3.2.1	Supply	No	14		
3.3.2.2	Installation	No	14		
3.3.3	16 - 35mm² 3c Cable				
3.3.3.1	Supply	No	10		
3.3.3.2	Installation	No	10		
3.3.4	2,5 - 10mm² 3c Cable				
3.3.4.1	Supply	No	46		
3.3.4.2	Installation	No	46		
3.4	CABLE JOINT KITS Complete joint kit for PVC/SWA/PVC + ECC cables, shall include supply and installation				
3.4.1	6 - 16mm² 4c Cable				
3.4.1.1	Supply	No	2		
3.4.1.2	Installation	No	2		
TOTAL FOR LV CABLES & RETICULATION II - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 3 - LV CABLES & RETICULATION III	UNIT	QTY	RATE	TENDER AMOUNT
3.4.2	10 - 16mm² 3c Cable				
3.4.2.1	Supply	No	2		
3.4.2.2	Installation	No	2		
3.5	CABLE MARKER TAPE (320mm Wide) Supply, deliver and install PVC Cable warning tape laid 300mm above L.V. cables as specified				
3.5.1	Supply	m	400		
3.5.2	Installation	m	400		
3.6	CONCRETE CABLE ROUTE MARKERS Supply, deliver and install markers with aluminium directional plates showing directions of supply cables				
3.6.1	Supply	m	4		
3.6.2	Installation	m	4		
3.7	EXCAVATION AND BACKFILLING Excavate, backfill and compact in all materials including disposal of unsuitable/surplus material. Note this is measured in cubic meters.				
3.7.1	Soft and pickable (all materials) (1 cum = 4 Linear Meter)	C.U.M.	130.0		
3.7.2	Hard material (Provisional)	C.U.M.	10		
3.7.3	Rock (Compressor work Provisional)	C.U.M.	10		
3.7.4	Bedding Material (Provisional) Importation of bedding material as directed by the Engineer.	m³	20		
3.8	CABLE SLEEVES AND SLOW BENDS Supply, deliver and install cable sleeves and slow bends as specified.				
3.8.1	110mm Ø uPVC cable sleeves				
3.8.1.1	Supply	m	42		
3.8.1.2	Install	m	42		
3.8.2	50mm Ø uPVC cable sleeves				
3.8.2.1	Supply	m	170		
3.8.2.2	Install	m	170		
3.8.3	50mm Ø Galvanised cable sleeves				
3.8.3.1	Supply	m	18		
3.8.3.2	Install	m	18		
3.8.4	32mm Ø Galvanised				
3.8.4.1	Supply	m	18		
3.8.4.2	Install	m	18		
3.8.5	110mm Ø PVC Slow Bends				
3.8.5.1	Supply	m	6		
3.8.5.2	Install	m	6		
3.8.6	50mm Ø PVC Slow Bends				
3.8.6.1	Supply	m	12		
3.8.6.2	Install	m	12		
TOTAL FOR LV CABLES & RETICULATION III - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 4 - LIGHTING & POWER I	UNIT	QTY	RATE	TENDER AMOUNT
4	LIGHTING & POWER				
4.1	PVC CONDUIT PVC conduit including all accessories such as bends, elbows and saddles. Making good of chasing by others.				
4.1.1	20mm ø PVC conduit cast into concrete / chased into brickwork				
4.1.1.1	Supply	m	600		
4.1.1.2	Installation	m	600		
4.1.2	20mm ø PVC conduit fixed to timber /steel/concrete roof structure				
4.1.2.1	Supply	m	300		
4.1.2.2	Installation	m	300		
4.1.3	25mm ø PVC conduit fixed to timber /steel /concrete roof structure, including 1mm diameter galvanised drawwire				
4.1.3.1	Supply	m	90		
4.1.3.2	Installation	m	90		
4.1.4	25mm ø PVC conduit fixed to timber /steel /concrete roof structure, including 1mm diameter galvanised drawwire				
4.1.4.1	Supply	m	400		
4.1.4.2	Installation	m	400		
4.1.5	20mm ø flexible tubing (Kopex), including 1mm diameter galvanised drawwire				
4.1.5.1	Supply	m	400		
4.1.5.2	Installation	m	400		
4.2	CONDUIT BOXES Supply, deliver, accept, store and fix the following conduit boxes, complete with covers and screws for luminaire and communication systems terminations. (Note these are not for conduit draw boxes or for SSO and Light Switch boxes)				
4.2.1	20mm round PVC conduit box (Back or side entry, 1 to 4 Way)				
4.2.1.1	Supply	No	50		
4.2.1.2	Installation	No	50		
4.2.2	25mm round PVC conduit box (Back or side entry, 1 to 4 Way)				
4.2.2.1	Supply	No	50		
4.2.2.2	Installation	No	30		
4.2.3	100 x 100 x 50mm galvanised box and blank cover				
4.2.3.1	Supply	No	60		
4.2.3.2	Installation	No	60		
4.2.4	100 x 50 x 50mm galvanised box and blank cover				
4.2.4.1	Supply	No	30		
4.2.4.2	Installation	No	30		
TOTAL FOR LIGHTING & POWER I - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 3 - LIGHTING & POWER II	UNIT	QTY	RATE	TENDER AMOUNT
4.3	GALVANISED CONDUIT Galvaniised conduit including all accessories such as bends, elbows and saddles. Making good of chasing by others.				
4.3.1	20mm ø Galvanised conduit fixed to timber/steel/concrete roof structure				
4.3.1.1	Supply	m	1,500		
4.3.1.2	Installation	m	1,500		
4.3.2	20mm round Galvanised conduit box (1 to 4 Way).				
4.3.2.1	Supply	No	250		
4.3.2.2	Installation	No	250		
4.4	TRUNKING, DUCTING AND WIREWAYS Supply, deliver, store, erect and fix galvanised cable and wireways including all fixing, suspension hangers, brackets and threaded rods. Cable and wireways to be fixed to walls and suspended from steel-wood trusses / concrete ceilings. Galvanised channel rate shall be inclusive of end caps, bends, tee pieces and crossover.				
4.4.1	P8000 Galvanised channel and galvanised cover strip				
4.4.1.1	Supply	m	180		
4.4.1.2	Installation	m	180		
4.4.2	P8000 Galvanised channel T-Piece				
4.4.2.1	Supply	No	6		
4.4.2.2	Installation	No	6		
4.4.3	P8000 Galvanised channel Elbow				
4.4.3.1	Supply	m	6		
4.4.3.2	Installation	m	6		
4.4.4	P2000 Galvanised channel and galvanised cover strip				
4.4.4.1	Supply	No	12		
4.4.4.2	Installation	No	12		
4.4.5	P2000 Galvanised channel T-Piece				
4.4.5.1	Supply	No	2		
4.4.5.2	Installation	No	2		
TOTAL FOR LIGHTING & POWER II - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 3 - LIGHTING & POWER III	UNIT	QTY	RATE	TENDER AMOUNT
4.4.6	P2000 Galvanised Elbow				
4.4.6.1	Supply	No	4		
4.4.6.2	Installation	No	4		
4.4.7	100mm wide Galvanised Medium Duty - Welded Wire Mesh				
4.4.7.1	Supply	m	90		
4.4.7.2	Installation	m	90		
4.4.8	100mm wide 90° Horizontal Bend				
4.4.8.1	Supply	No	6		
4.4.8.2	Installation	No	6		
4.4.9	100mm wide Tee Piece				
4.4.9.1	Supply	m	10		
4.4.9.2	Installation	m	10		
4.4.10	50mm wide Galvanised Medium Duty - Welded Wire Mesh				
4.4.10.1	Supply	m	150		
4.4.10.2	Installation	m	150		
4.4.11	50mm wide 90° Horizontal Bend				
4.4.11.1	Supply	No	6		
4.4.11.2	Installation	No	6		
4.4.12	50mm wide Tee Piece				
4.4.12.1	Supply	No	4		
4.4.12.2	Installation	No	4		
4.4.13	YT/2 25mm x 16mm compact PVC trunking and cover				
4.4.13.1	Supply	m	30		
4.4.13.2	Installation	m	30		
TOTAL FOR LIGHTING & POWER III - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 3 - LIGHTING & POWER IV	UNIT	QTY	RATE	TENDER AMOUNT
4.5	POWER SKIRTING Supply, deliver, store and fix power skirting complete with covers and everything necessary.				
4.5.1	165 x 55mm Metal two compartment power skirting with powder coated finish, fixed to wall, complete including internal partition, covers (colour grey)				
4.5.1.1	Supply	m	120		
4.5.1.2	Installation	m	120		
4.5.2	Power Skirting Internal angle				
4.5.2.1	Supply	No	10		
4.5.2.2	Installation	No	10		
4.5.3	Power Skirting End Cap				
4.5.3.1	Supply	No	22		
4.5.3.2	Installation	No	22		
4.6	CONDUCTORS (COPPER) PVC 600/1000V insulated copper conductors drawn into Conduits and Wireways				
4.6.1	1.5 mm² PVC insulated				
4.6.1.1	Supply	m	4,000		
4.6.1.2	Install	m	4,000		
4.6.2	2.5 mm² PVC insulated				
4.6.2.1	Supply	m	5,000		
4.6.2.2	Install	m	5,000		
4.6.3	4.0 mm² PVC insulated				
4.6.3.1	Supply	m	30		
4.6.3.2	Install	m	30		
4.6.4	1.5mm² PVC insulated Twin and Earth				
4.6.4.1	Supply	m	200		
4.6.4.2	Install	m	200		
4.6.5	2.5mm² PVC insulated Twin and Earth				
4.6.5.1	Supply	m	100		
4.6.5.2	Install	m	100		
TOTAL FOR LIGHTING & POWER IV - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 3 - LIGHTING & POWER V	UNIT	QTY	RATE	TENDER AMOUNT
4.7	SWITCHES Supply, deliver, accept, store, fix, connect and commission the following switches, complete with 100mm x 50mm galvanised box, PVC cover, metal screws and LABELING as specified.				
4.7.1	1 lever, 1 way, flush mounted switch complete with galvanised box and metal cover (16 Amp)				
4.7.1.1	Supply	No	44		
4.7.1.2	Installation	No	44		
4.7.2	2 lever, 1 way, flush mounted switch complete with galvanised box and metal cover (16 Amp)				
4.7.2.1	Supply	No	12		
4.7.2.2	Installation	No	12		
4.7.3	3 lever, 1 way, flush mounted switch complete with galvanised box and metal cover (16 Amp)				
4.7.3.1	Supply	No	3		
4.7.3.2	Installation	No	1		
4.7.4	1 lever, 1 way Rotary Weather Proof Switch (16 Amp)				
4.7.4.1	Supply	No	2		
4.7.4.2	Installation	No	2		
4.7.5	1 lever, 2 way, flush mounted switch complete with galvanised box and metal metal cover (16 Amp)				
4.7.5.1	Supply	No	2		
4.7.5.2	Installation	No	2		
4.7.6	16 Amp, 1 lever, 1 way bell press flush mounted switch complete with galvanised box and metal metal cover				
4.7.6.1	Supply	No	1		
4.7.6.2	Installation	No	1		
4.8	SOCKET OUTLETS Supply, deliver, accept, store, fix, connect and commission the following socket outlets, complete with 100mmx100mmx50mm galvanised box where required, metal covers, metal screws and LABELING as specified				
4.8.1	Surface mounted combination switch socket outlet (1 x 16A SANS 164-1 & 1 x SANS 164-2), complete with galvanised box and cover. (Metal Cover)				
4.8.1.1	Supply	No	28		
4.8.1.2	Installation	No	28		
4.8.2	Flush mounted double switched socket outlet complete with galvanised box and cover (16 Amp) (Metal Cover)				
4.8.2.1	Supply	No	4		
4.8.2.2	Installation	No	4		
4.8.3	Single switched socket outlet for power skirting complete with cradle and cover (16 Amp)				
4.8.3.1	Supply	No	45		
4.8.3.2	Installation	No	45		
4.8.4	SANS 164-2 socket outlet for Power Skirting complete with cradle and cover (16 Amp) - Red				
4.8.4.1	Supply	No	18		
4.8.4.2	Installation	No	18		
TOTAL FOR LIGHTING & POWER V - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 3 - LIGHTING & POWER VI	UNIT	QTY	RATE	TENDER AMOUNT
4.8.5	Single Dedicated switched socket outlet for power skirting complete with cradle and cover (16 Amp) - Red				
4.8.5.1	Supply	No	60		
4.8.5.2	Installation	No	60		
4.8.6	Flush mounted double Dedicated switched socket outlet complete with galvanised box and cover (16 Amp) (Metal Cover) - Red				
4.8.6.1	Supply	No	4		
4.8.6.2	Installation	No	4		
4.8.7	Single UPS switched socket outlet for power skirting complete with cradle and cover (16 Amp) - Blue				
4.8.7.1	Supply	No	29		
4.8.7.2	Installation	No	29		
4.8.8	Flush mounted double UPS switched socket outlet complete with galvanised box and cover (16 Amp) (Metal Cover) - Blue				
4.8.8.1	Supply	No	18		
4.8.8.2	Installation	No	18		
4.8.9	5A Unswitched socket outlet complete with round box				
4.8.9.1	Supply	No	140		
4.8.9.2	Installation	No	140		
4.8.10	RJ45 Connector with cradle / cover for power skirting (Including termination)				
4.8.10.1	Supply	No	20		
4.8.10.2	Installation	No	20		
4.9	ISOLATORS Supply, deliver, accept, store, fix, connect and commission the following isolators, complete with metal/PVC enclosures and metal screws and LABELING as specified				
4.9.1	20 Amp double pole isolator				
4.9.1.1	Supply	No	31		
4.9.1.2	Installation	No	31		
4.9.2	20 Amp double pole surface mounted weather proof isolator complete - IP 67. Isolator inside a weather proof box WILL NOT be accepted.				
4.9.2.1	Supply	No	11		
4.9.2.2	Installation	No	11		
4.9.3	30 Amp double pole surface mounted weather proof isolator complete - IP 67. Isolator inside a weather proof box WILL NOT be accepted.				
4.9.3.1	Supply	No	5		
4.9.3.2	Installation	No	5		
4.9.4	30 Amp triple pole surface mounted weather proof isolator complete - IP 67. Isolator inside a weather proof box WILL NOT be accepted.				
4.9.4.1	Supply	No	3		
4.9.4.2	Installation	No	3		
TOTAL FOR LIGHTING & POWER VI - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 3 - LIGHTING & POWER VII	UNIT	QTY	RATE	TENDER AMOUNT
4.10	LUMINAIRES The following luminaires are to be supplied, delivered, accepted and stored, complete with lamps AS SPECIFIED in Part 2 : Installation details They are to be erected, fixed, connected and commissioned, including scaffold costs and any additional supports which may be required. Luminaires may not be suspended by PVC boxes.				
4.10.1	Type A				
4.10.1.1	Supply	No	24		
4.10.1.2	Installation	No	24		
4.10.2	Type AE				
4.10.2.1	Supply	No	6		
4.10.2.2	Installation	No	6		
4.10.3	Type B				
4.10.3.1	Supply	No	8		
4.10.3.2	Installation	No	8		
4.10.4	Type C				
4.10.4.1	Supply	No	36		
4.10.4.2	Installation	No	36		
4.10.5	Type D				
4.10.5.1	Supply	No	54		
4.10.5.2	Installation	No	54		
4.10.6	Type EX				
4.10.6.1	Supply	No	13		
4.10.6.2	Installation	No	13		
4.10.7	Type F				
4.10.7.1	Supply	No	57		
4.10.7.2	Installation	No	57		
4.10.8	Type G				
4.10.8.1	Supply	No	3		
4.10.8.2	Installation	No	3		
4.10.9	Type H				
4.10.9.1	Supply	No	2		
4.10.9.2	Installation	No	2		
4.10.10	Type I				
4.10.10.1	Supply	No	6		
4.10.10.2	Installation	No	6		
TOTAL FOR LIGHTING & POWER VII - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 3 - LIGHTING & POWER VIII	UNIT	QTY	RATE	TENDER AMOUNT
4.10.11	Type J				
4.10.11.1	Supply	No	2		
4.10.11.2	Installation	No	2		
4.10.12	Type K				
4.10.12.1	Supply	No	2		
4.10.12.2	Installation	No	2		
4.10.13	Type L				
4.10.13.1	Supply	No	27		
4.10.13.2	Installation	No	27		
4.10.14	Type M				
4.10.14.1	Supply	No	14		
4.10.14.2	Installation	No	14		
4.10.15	Type MP – Glass Fibre reinforced polyester (GRP) Pole				
4.10.15.1	Supply	No	14		
4.10.15.2	Installation including excavation and compaction	No	14		
4.10.16	Type V				
4.10.16.1	Supply	No	20		
4.10.16.2	Installation	No	20		
4.10.17	Type S				
4.10.17.1	Supply	No	1		
4.10.17.2	Installation	No	1		
4.10.18	Type UV				
4.10.18.1	Supply	No	5		
4.10.18.2	Installation	No	5		
4.11	PHOTO ELECTRIC CELL Photo electric cell complete with Dummy bulkhead				
4.11.1	Supply	No	8		
4.11.2	Installation	No	8		
TOTAL FOR LIGHTING & POWER VIII - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 5 - MISCELLANEOUS I	UNIT	QTY	RATE	TENDER AMOUNT
5.1	UNINTERRUPTABLE POWER SUPPLY Supply, installation and commissioning of UPS and separate battery enclosures including all wiring and connections, AS SPECIFIED in the Detailed Specification				
5.1.1	12kVA UPS - 1P/1P True on-line double conversion, galvanic isolation transformer UPS as specified				
5.1.1.1	Supply	Item	1		
5.1.1.2	Installation	Item	1		
5.1.2	Battery Enclosure complete with 16 x 12V100AH GEL batteries				
5.1.2.1	Supply	Item	2		
5.1.2.2	Installation	Item	2		
5.2	AUDIBLE ALARM Supply and install Audible buzzer alarm at strong and record rooms. Alarm to be switched from bell press inside safe room.				
5.2.1	Supply	m	1		
5.2.2	Installation	m	1		
5.3	OCCUPANCY SENSORS Supply, deliver, accept, store, fix, connect and commission occupancy sensors as specified for the control of lights.				
5.3.1	Supply	No	22		
5.3.2	Installation	No	22		
5.4	HAND DRYERS Supply and install 1500W, 220-240V, 50Hz Wall mounted automatic stainless steel hand dryer suitable for bathroom installation (SANS approved)				
5.4.1	Supply	No	4		
5.4.2	Installation	No	4		
5.5	ELECTRICAL SUPPLY CO ORDINATION				
5.5.1	Contractor to allow for the coordination with the municipality to upgrade the supply to 150kVA, including relocation of an overhead line wooden pole blocking the Magistrate new entrance (Provisional Sum to pay the municipality is allowed under main Contract)	Sum	1		
5.6	AS INSTALLED DRAWINGS				
5.6.1	Allow for the marking up of prints for the production of "as installed" records by the Engineer.	Sum	1		
5.7	OPERATION AND MAINTENANCE MANUALS				
5.7.1	Allow for the submission of 4 sets of Operation and Maintenance manuals of all equipment installed (Including Basic maintenance and list of replacement equipment for ordering purposes)	Sum	1		
5.8	TRAINING				
5.8.1	Allow for training (Electrical and UPS installations.)	Sum	1		
TOTAL FOR MISCELLANEOUS I - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 5 - MISCELLANEOUS II	UNIT	QTY	RATE	TENDER AMOUNT
5.9	CERTIFICATES OF COMPLIANCE				
5.9.1	Allow for the testing of the electrical installation carried out and issuing of Certificates of Compliance for Phase 1 of construction. COC to be issued before Phase 1 can be occupied.	Sum	1		
5.9.2	Allow for the testing of the electrical installation carried out and issuing of Certificates of Compliance for Phase 2 of construction. COC to be issued before Phase 2 can be occupied.	Sum	1		
5.9.3	Allow for the testing of the electrical installation carried out and issuing of Certificates of Compliance for Phase 3 of construction. COC to be issued before Phase 3 can be occupied.	Sum	1		
5.9.4	Allow for the testing of the electrical installation carried out and issuing of Certificates of Compliance for Phase 4 of construction. COC to be issued before Phase 4 can be	Sum	1		
5.9.5	Allow for the Final testing of the complete electrical installation carried out and issuing of Final Certificates of Compliance (All 4 phases) for Practical Completion.	Sum	1		
5.10	ATTENDANCE ON OTHER SUB CONTRACTORS				
5.10.1	Allowance for the attendance and co-ordination of the HVAC, Generator, CCTV, Intercom and Access control installations to be carried out by other Specialist Sub Contractors. This would include coordinating of conduits and wireways, power supply requirements and coordination of there services with the electrical services, including coordination of drawings (ceiling and wall layouts). Specialist sub contractor requirements are shown on the tender drawings.	Sum	1		
5.11	DEMOLITIONS Demolition work to be undertaken in 4 phases of construction	Sum	1		
5.11.1	Isolate and make safe the existing electrical intallation to allow for refurbishment in four phases.	Sum	1		
5.11.2	Removal and and storage of existing lights as directed by the engineer. Material to remain the property of the Department of Public Works / Justice.	Sum	1		
5.11.3	Removal and and storage of existing plugs and isolators (including wiring for possible re-use) as directed by the engineer. Material to remain the property of the Department of Public Works / Justice.	Sum	1		
5.11.4	Removal and and storage of existing conduits (including wiring for possible re-use) as directed by the engineer. Material to remain the property of the Department of Public Works / Justice.	Sum	1		
5.11.5	Removal and and storage of existing DB's with switchgear (for possible re-use) as directed by the engineer. Material to remain the property of the Department of Public Works / Justice.	Sum	1		
5.11.6	Removal and and storage of existing LV cable within buildings (for possible re-use) as directed by the engineer. Material to remain the property of the Department of Public Works / Justice.	Sum	1		
5.12	COMMUNICATION DISTRIBUTION BOARDS AND DRAW BOXES Supply, deliver, store and fix distibution boards and drawboxes complete including any chasing of walls - making good will be by others.				
5.12.1	600 x 400mm flush Telephone / Comms board c/w architrave door and soft wooden backing.				
5.12.1.1	Supply	No	1		
5.12.1.2	Installation	No	1		
5.12.2	450 x 450mm flush Telephone / Comms board c/w architrave door and soft wooden backing.				
5.12.2.1	Supply	No	2		
5.12.2.2	Installation	No	2		
TOTAL FOR MISCELLANEOUS II - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

	BILL N° 6 - LIGHTNING PROTECTION SYSTEM	UNIT	QTY	RATE	TENDER AMOUNT
6.1	LIGHTNING PROTECTION SYSTEM 1. The Contractor shall price and make allowance for the complete Lightning Protection System to the Installation including the required soil resistivity survey to be carried out on site, the issuing of the final design of the earthing system, the submitting of same for approval, the supply, installation, testing, commissioning, issuing of a SABS approved earthing certificate / test report and the required guarantee of the system for 12 months. 2. The Contractor shall ensure that the general bonding of the buildings electrical installation is carried out to Clause 6.13 of SANS 10147 Bonding Lightning Protection System to Structures. Where applicable all steel roof sheeting to the structure shall be suitably earthed to the special earth systems. 3. Grade "A" type earth electrodes (earth spikes of at least 1,5m in length) shall be driven into the ground where required. The earth electrode shall be installed at least 1m from the building's perimeter and shall clear all aprons and water channels. These earth spikes must be driven into the ground to at least 500mm below the finished ground level. 4. In each instance these earth spikes must be interconnected by means of approved earth spike clamps and 50mm² insulated copper earth conductor to a height of 500mm AGL, where it is joined in a 102 x102 x 77mm poly carbonate weather proof Inspection Box, by means of a Bi-metal lug to an 8mm round aluminium conductor which through a 25mm GALVANISED conduit exits 200mm below the roof covering where it is terminated and sealed off by means of silicon sealer. ALL ITEMS TO BE PRICED FOR SUPPLY AND INSTALLATION				
6.1.1	LPS specialist contractor to carryout the required earth resistivity tests / surveys on site, <u>final design</u> for the proposed LPS and <u>completion of the LPS Risk Assessment</u> . All to be submitted to Engineer for approval.	Sum	1		
6.1.2	1,5m long (16mm Diameter) Cadweld type copper electrodes driven into the ground 500 mm BGL	No	45		
6.1.3	50mm² insulated copper earth conductor from earth electrode to inspection box connection	m	120		
6.1.4	Complete termination arrangement of the 50mm² insulated copper earth conductors to earth electrode.	No	45		
6.1.5	Complete termination arrangement of the 50mm² insulated copper earth conductors to the 8mm round Aluminium conductor including <u>bi metal lugs</u> .	No	45		
6.1.6	110x70x80 heavy duty polycarbonate inspection box with screw lid.	m	45		
6.1.7	8mm round aluminium conductor from roof termination to inspection box	m	155		
6.1.8	Complete termination of 8mm round aluminium conductor to roof sheeting	No	45		
6.1.9	8mm Round Aluminium conductor fixed to concrete IBR or Corrugated Roof Sheeting at 500mm centres with SABS holder and epoxy glue.	m	200		
6.1.10	Roof Conductor link comprising of 2x stainless bolts and nuts (8x20), 2x bimetal lugs (50x8) and 1m of 8mm roundconductor to link two roofs.	No	6		
6.1.11	Air Termination for Roof (Crows foot type).	M	6		
6.1.12	25mm galvanised conduit fixed to stone wall	m	80		
6.1.13	25mm diameter PVC Conduit built into walls	m	70		
6.1.14	Cutting of existing concrete aprons for installation of earth and making good with concrete fill (500mm Long x 35mm Wide x 150mm Deep)	No	45		
6.1.15	Testing of the completed system and the issue of a SANS prescribed LPS Safety Report / compliance certificate (<u>Signed by the LPS specialist - Including Design portion</u>)	Sum	1		
TOTAL FOR LIGHTNING PROTECTION SYSTEM - CARRIED FORWARD TO SUMMARY (EXCL VAT)					

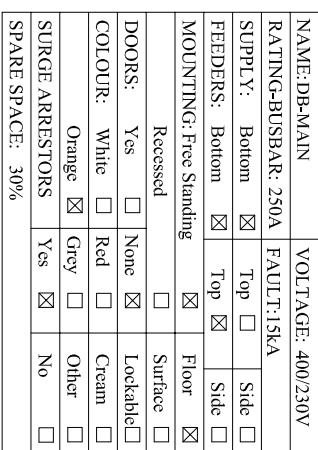
	BILL N° 7 - EARTHING SYSTEM	UNIT	QTY	RATE	TENDER AMOUNT
7.1	Earthing complete system as detailed in the detailed specification including all sundry materials and connections /terminations. Exclude: Excavation and backfilling. ALL ITEMS TO BE PRICED FOR SUPPLY AND INSTALLATION				
7.1.1	Earth rod (1.8m long including clamps and bonds)	No	10		
7.1.2	50mm² BARE COPPER EARTH WIRE	m	35		
7.1.3	Earth resistivity test and earth electrode resistance test for complete earth system, including measurement certificates.	Item	1		
7.1.4	Bond the proposed water main to the adjacent down conductor. All water pipes, hand basins, sinks, baths, gutters and rain water pipes shall be bonded.	Item	1		
7.1.5	Complete earthing of Generator set - (4 x 1.8m earth studs and interconnecting 70mm² Bare Copper earth wire) as per the specification.	Item	1		
TOTAL FOR EARTHING SYSTEM - CARRIED FORWARD TO SUMMARY (EXCL VAT)					


POSITION 1: NORMAL = 1 CONNECTED TO 2

POSITION 2: GEN BY-PASS = 1 CONNECTED 3

POSITION 3: OFF = NO POWER TO LOAD

POSITION 4: MAINS BYPASS = GENERATOR DIRECTLY TO ESSENTIAL MCB

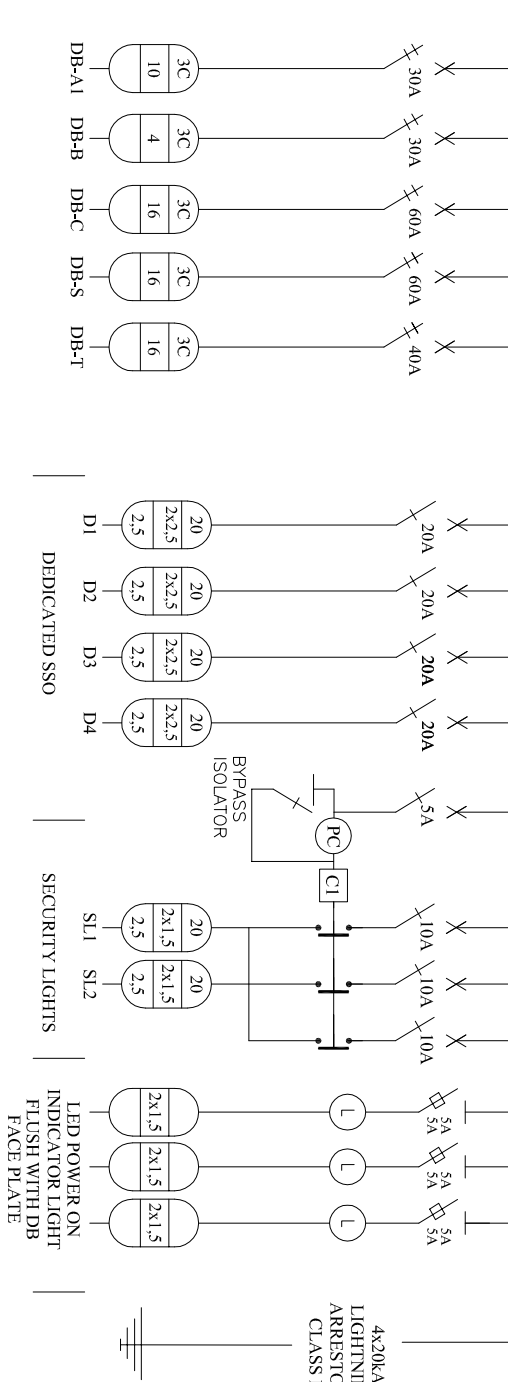
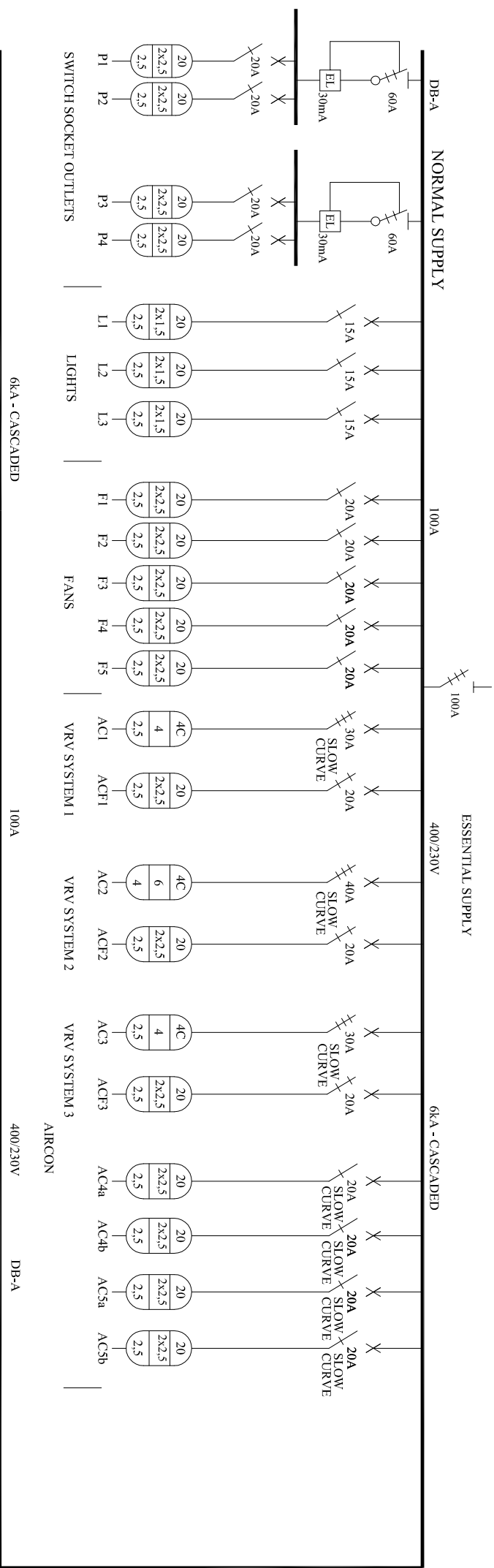



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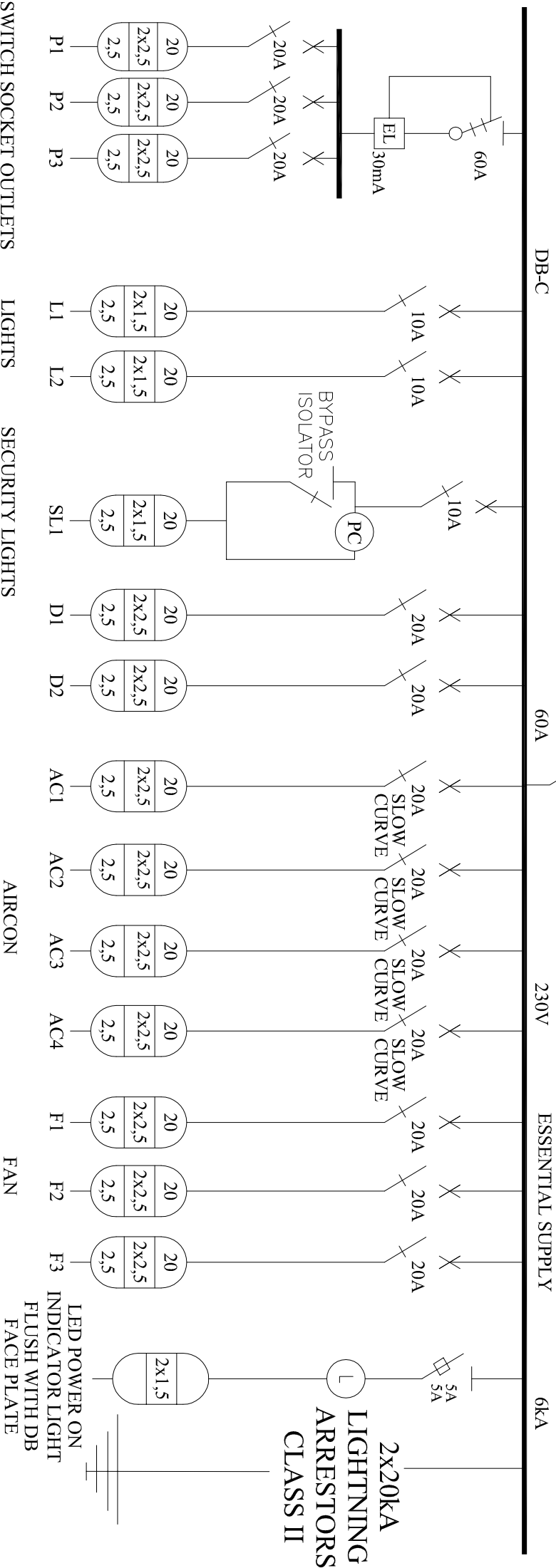
FROM DB-MAIN E



NAME: DB-A		VOLTAGE: 400/230V	
RATING:-BUSBAR: 100A		FAULT:6KA	
SUPPLY:	Bottom	<input checked="" type="checkbox"/> Top	<input type="checkbox"/> Side
FEDERS:	Bottom	<input checked="" type="checkbox"/> Top	<input type="checkbox"/> Side
MOUNTING: Free Standing		<input type="checkbox"/> Floor	<input checked="" type="checkbox"/> Surface
Recessed		<input type="checkbox"/> Surface	<input checked="" type="checkbox"/> Lockable
DOORS:	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input checked="" type="checkbox"/> Cream	<input type="checkbox"/> Other
COLOUR:	White <input type="checkbox"/> Orange <input type="checkbox"/>	Red <input type="checkbox"/> Grey <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
SURGE ARRESTORS			
SPARE SPACE: 30%			

[illegible]

FROM DB-A

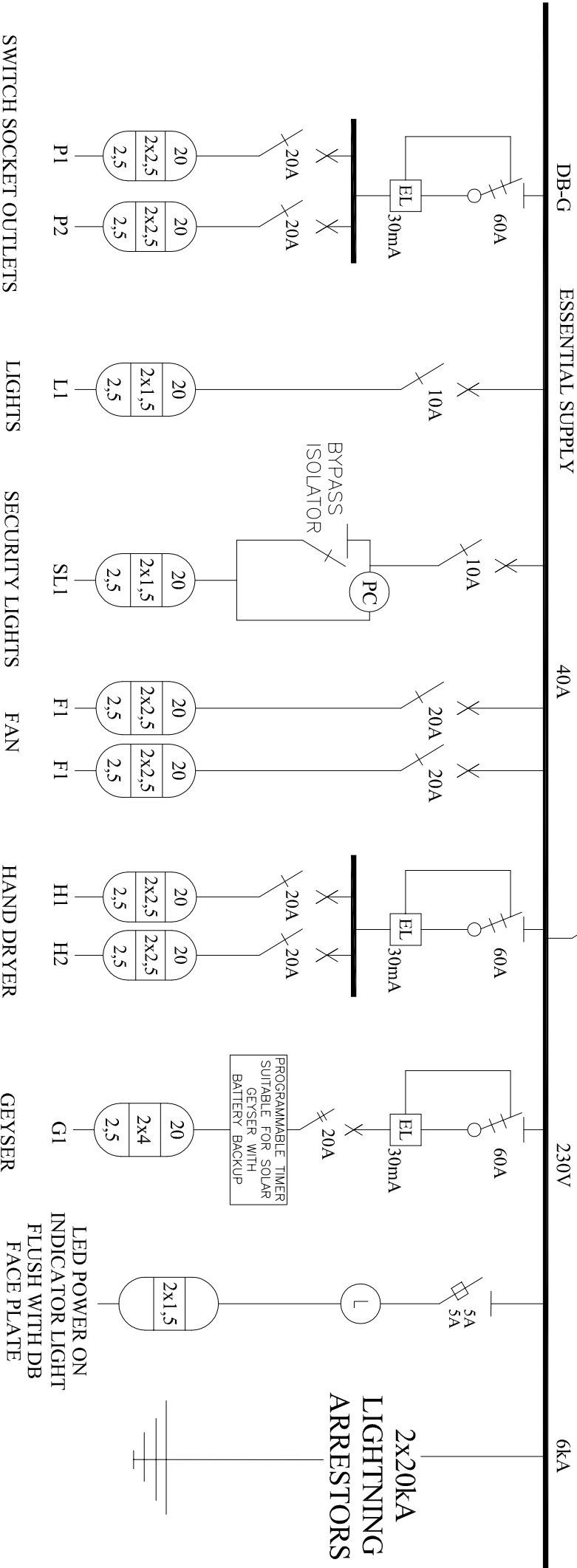


NAME: DB-C		VOLTAGE: 230V				
RATING-BUSBAR: 60A		FAULT: 6kA				
SUPPLY:	Bottom	<input checked="" type="checkbox"/>	Top	<input type="checkbox"/>	Side	<input type="checkbox"/>
FEEDERS:	Bottom	<input checked="" type="checkbox"/>	Top	<input checked="" type="checkbox"/>	Side	<input type="checkbox"/>
MOUNTING: Free Standing		<input type="checkbox"/>	Floor	<input type="checkbox"/>		
Recessed		<input checked="" type="checkbox"/>	Surface	<input type="checkbox"/>		
DOORS:	Yes	<input checked="" type="checkbox"/>	None	<input type="checkbox"/>	Lockable	<input checked="" type="checkbox"/>
COLOUR:	White	<input type="checkbox"/>	Red	<input checked="" type="checkbox"/>	Cream	<input type="checkbox"/>
	Orange	<input type="checkbox"/>	Grey	<input type="checkbox"/>	Other	<input type="checkbox"/>
SURGE ARRESTORS		Yes	<input checked="" type="checkbox"/>	No		<input type="checkbox"/>
SPARE SPACE: 30%						

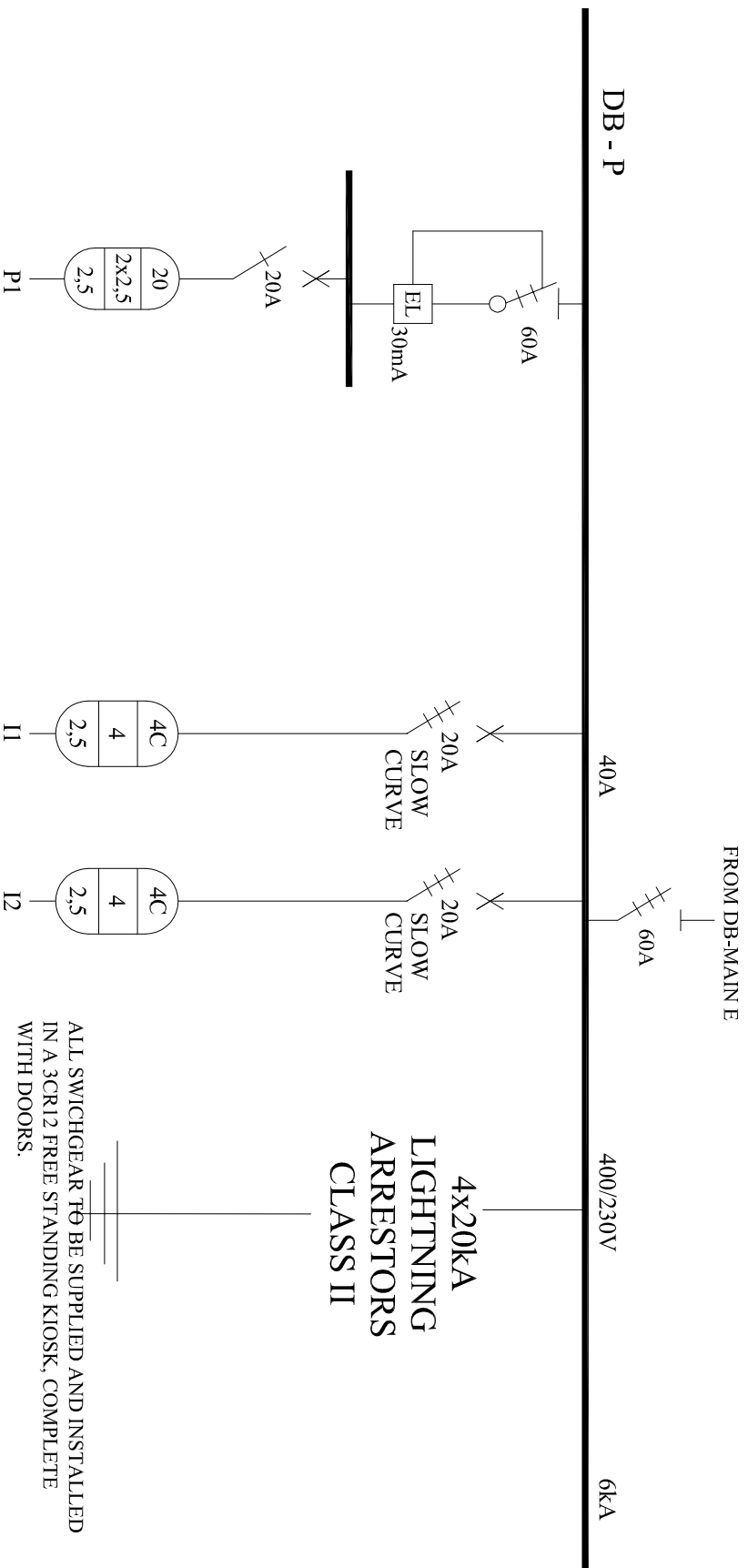
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NAME: DB-G	VOLTAGE: 230V		
RATING-BUSBAR: 50A	FAULT:6kA		
SUPPLY: Bottom	<input checked="" type="checkbox"/>	Top <input type="checkbox"/>	Side <input type="checkbox"/>
FEEDERS: Bottom	<input checked="" type="checkbox"/>	Top <input checked="" type="checkbox"/>	Side <input type="checkbox"/>
MOUNTING:Free Standing	<input type="checkbox"/>	Floor <input type="checkbox"/>	
<div>Recessed</div>	<input checked="" type="checkbox"/>	Surface <input type="checkbox"/>	
DOORS: Yes	<input checked="" type="checkbox"/>	None <input type="checkbox"/>	Lockable <input checked="" type="checkbox"/>
COLOUR: White	<input type="checkbox"/>	Red <input checked="" type="checkbox"/>	Cream <input type="checkbox"/>
Orange <input type="checkbox"/>	Grey <input type="checkbox"/>	Other <input type="checkbox"/>	
SURGE ARRESTORS	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
SPARE SPACE: 30%			

FROM DB-MAIN E



REV.		DESCRIPTION	DATE	APPROD	COPYRIGHT AND USE OF THIS DRAWING IS RESERVED BY EYE SIZE	DRAWING NUMBER	E181-E4.9	A4	REVISION	0
-	-		-		DESIGNED	M.P.	APPROVED	SCALE	ELLIOT MAGISTRATES COURT SINGLE LINE DIAGRAM DB-G	
-	-		-		DRAWN	S.M.	PROJECT MANAGER	N.T.S.		
-	-		-		CHECKED	H.S.		DATE		
-	-		-					5-6-2024		
-	-		-				DIRECTOR			



NAME:	DB-P
TYPE:	Normal
VOLTAGE:	400/230V
RATING-BUSBAR:	30A
FAULT:	6kA
SUPPLY:	Bottom
FEEDERS:	Bottom
	Top
MOUNTING:	Free Standing
DOORS:	Yes
	Lockable
COLOUR:	Grey
MATERIAL	3CR12
SPARE SPACE:	30%

SWITCH SOCKET OUTLET
MOUNTED INSIDE KIOSK

PUMPS

4x20kA
LIGHTNING
ARRESTORS
CLASS II

ALL SWITCHGEAR TO BE SUPPLIED AND INSTALLED IN A 3CR12 FREE STANDING KIOSK, COMPLETE WITH DOORS.

ELLIOT MAGISTRATES COURT

SINGLE LINE DIAGRAM DB - P

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DESCRIPTION

DATE _____

APPENDIX

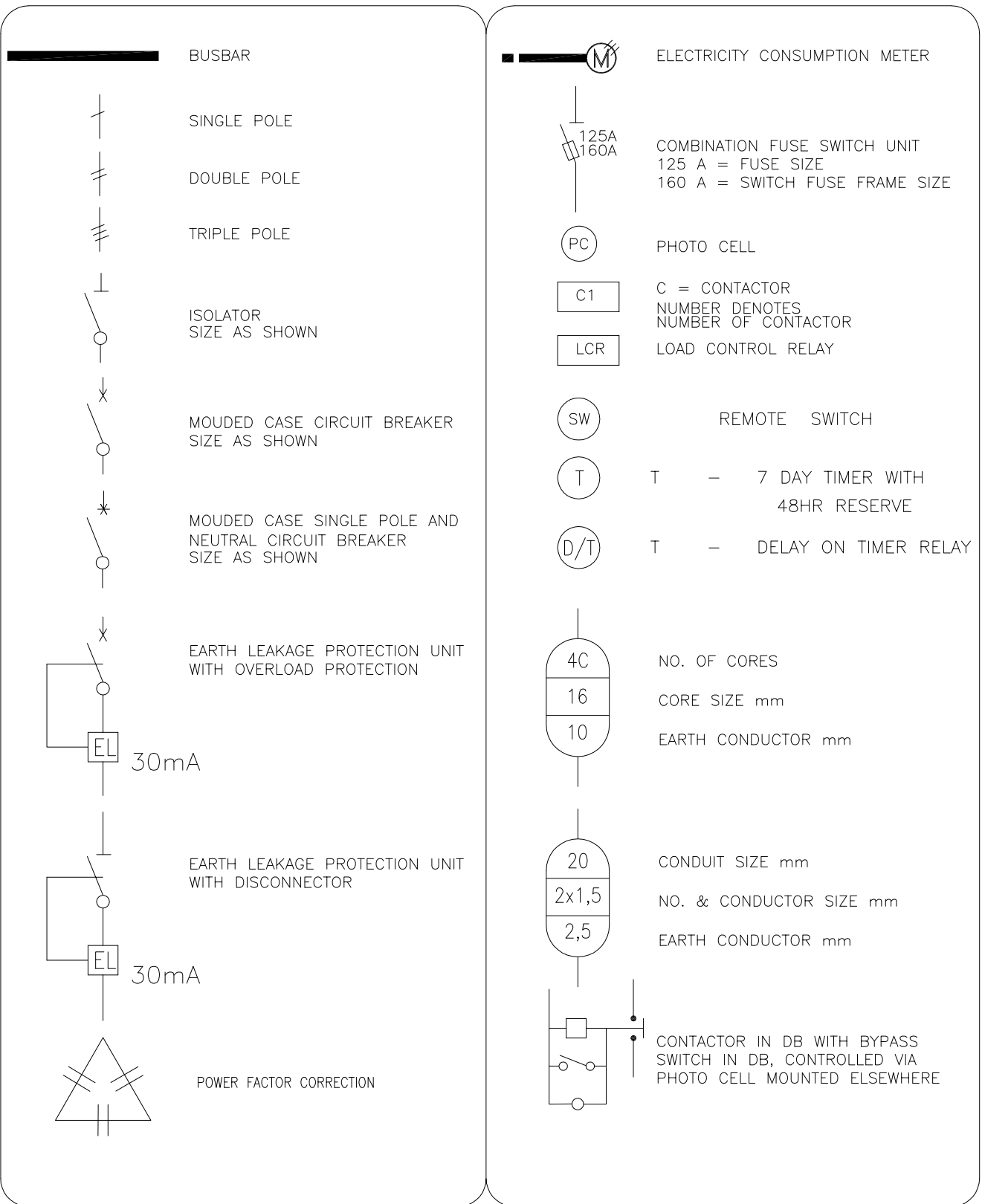
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DRAWING NUMBER

E181-E4.12

A4

REVISION ☒



No.	DATE	DESCRIPTION	No.	DATE	DESCRIPTION
PROJECT			<div><div><i>Eye Sizwe Consulting Engineers</i></div><div>16 ALLENBY ROAD SELBORNE EAST LONDON 5213 TEL : + 27 (43) 7483830 EMAIL : petzerm@lantic.net</div></div>		
ELLIOT MAGISTRATE COURT					
SINGLE LINE DIAGRAM LEGEND					
DRAWING					
E181 E4.13 - SINGLE LINE DIAGRAM LEGEND					
DRAWN	DESIGNED	CHECKED	SCALE	DATE	
S.M.	M.P.	H.S.	N T S	5-6-2024	

NO.	DATE	AMENDMENT

Client

Implementing Agent



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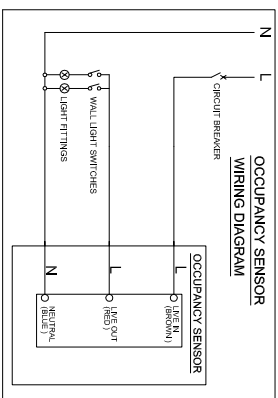
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Discipline	ELECTRICAL		
Project Description	ELLIDIT MAGISTRATE'S OFFICE; REPAIRS AND MAINTENANCE WCS 042521		
Drawing Status	TENDER DRAWING		
Drawing Title	SITE PLAN - ELECTRICAL LAYOUT		
Ref.no	E178	Designed	MP.
Scale	A0 - 1:100	Drawn	J.C.
Date	JUNE 2024	Checked	H.S.
Drawing Number	E181 E1.1		

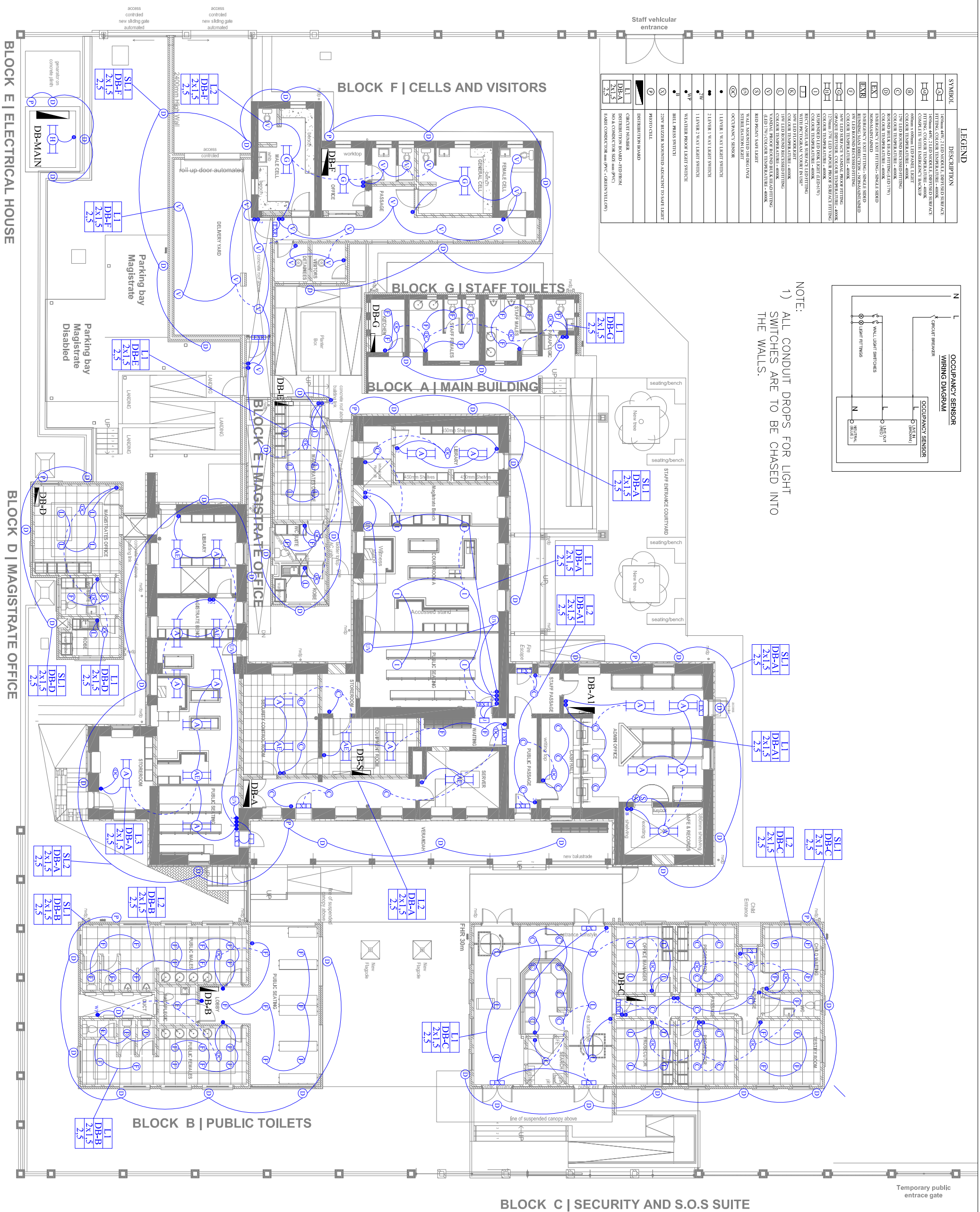
LEGEND	
SYMBOL	DESCRIPTION
	POST TOP 37W LED FITTING
	LV CABLE ROUTES
	LV CABLE TRAY
	IPVC SLEEVE, SIZE & QTY AS SHOWN
	LV DISTRIBUTION BOARD
	MANHOLE - SIZE AS SHOWN



LEGEND		DESCRIPTION	SYMBOL
		1.60m DIA. 21.60MOT. E. LIGHTS/SHED SURFACE	
		1.60m DIA. 21.60MOT. E. LIGHTS/SHED SURFACE FITTING, CO. AIR TEMPERATURE: -400K	
		COMPLETE WITH STANDARD BACKUP	
		CO. AIR TEMPERATURE: -400K	
		1.20m LED ROUND RECESSED FITTING	
		CO. AIR TEMPERATURE: -400K (1700)	
		BACKLIGHTING, 1xMT FITTING - SINGLE SHED	
		RUNNING, 1xMT FITTING - SINGLE SHED	
		BACKLIGHTING, 1xMT FITTING - SINGLE SHED	
		CO. AIR TEMPERATURE: -400K	
		CO. AIR TEMPERATURE: -400K	
		CO. AIR TEMPERATURE: -400K	
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NOTE:
1) ALL CONDUIT DROPS FOR LIGHT SWITCHES ARE TO BE CHASED INTO THE WALLS.



NO.	DATE	AMENDMENT

Client



Implementing Agent

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Discipline
ELECTRICAL

Project Description
ELLIDT MAGISTRATE'S OFFICE:
REPAIRS AND MAINTENANCE
WCS 042521

Drawing Status

TENDER DRAWING

Drawing Title

LIGHTING LAYOUT

Drawing Title

Drawing	Title
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LIGHTING LAYOUT

Ref.no	E181	Designed	M.P.
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Scale A1 - 1:100 Drawn J.C.

Date	JUNE 2024	Checked	H.S.
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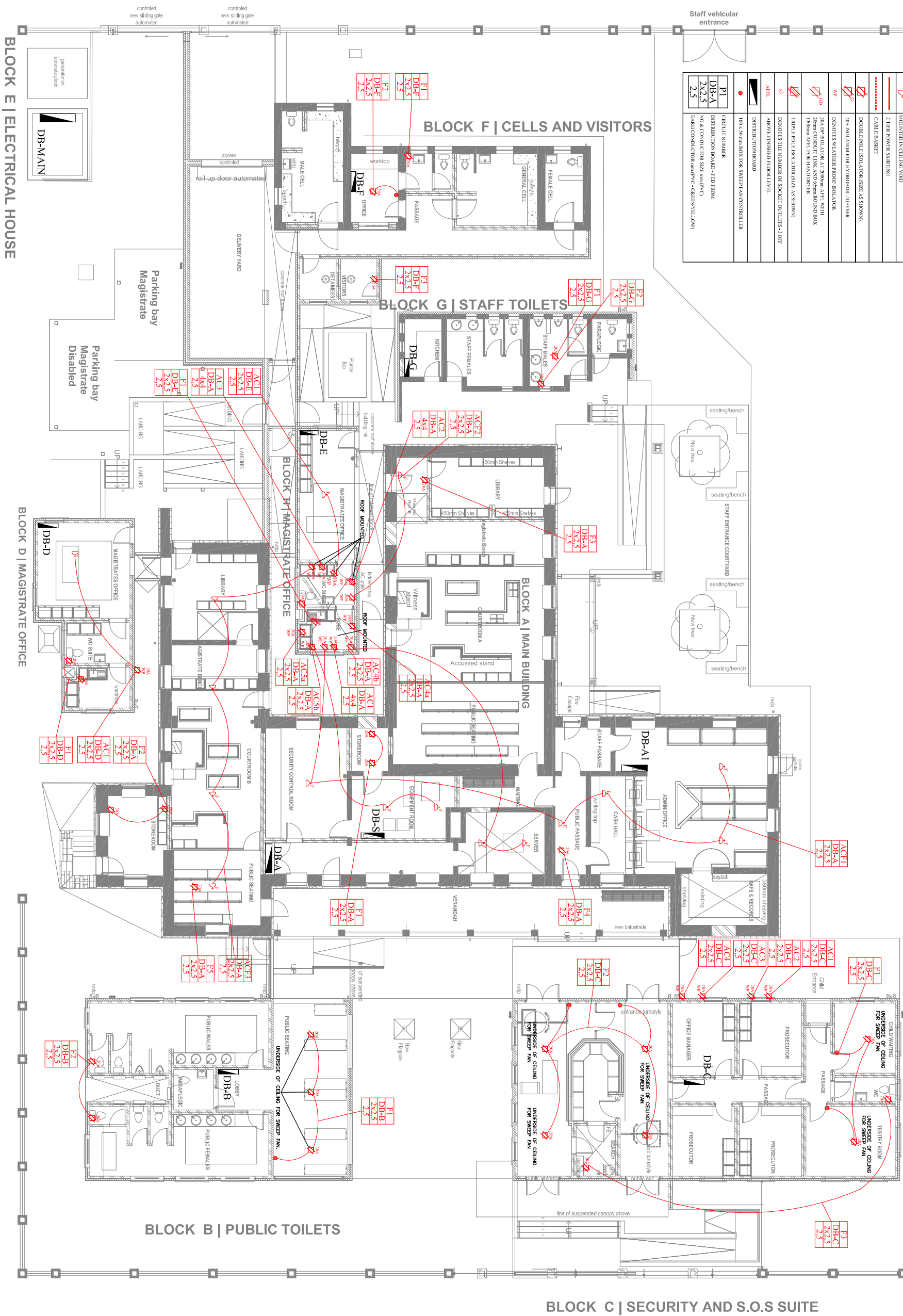
Drawing Number

E181	E2.1
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[illegible]

NOTE:

- 1) ALL ISOLATORS FOR EXTRACT FANS & AIR CONDITIONERS TO BE MOUNTED ADJACENT TO THE EQUIPMENT. THE FINAL POSITION IS TO BE OBTAINED FROM THE MECHANICAL SUB CONTRACTOR.



NO.	DATE	AMENDMENT

Client _____



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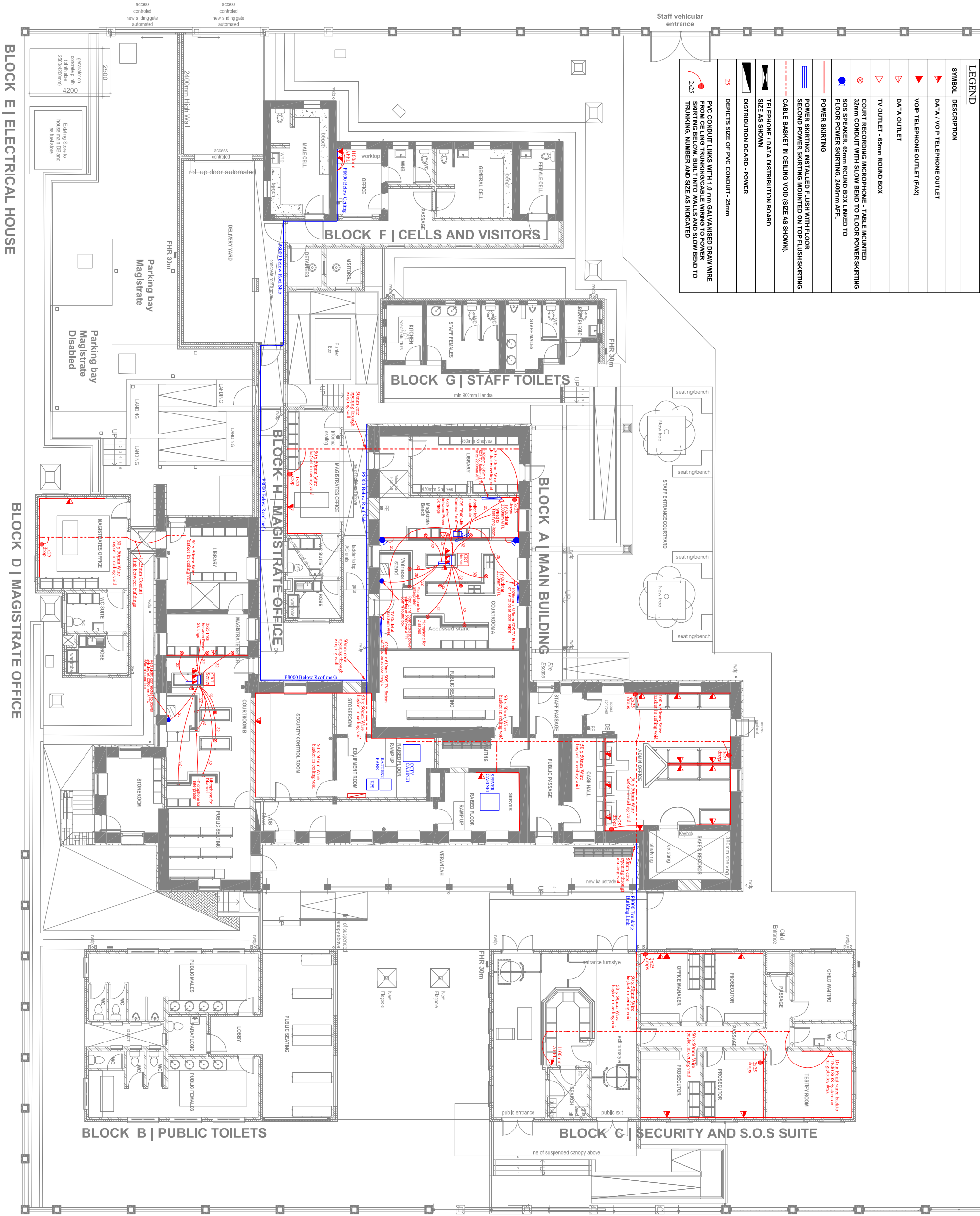
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Discipline	ELECTRICAL		
Project Description	ELLJDT MAGISTRATE'S OFFICE: REPAIRS AND MAINTENANCE WCS 042521		
Drawing Status	TENDER DRAWING		
Drawing Title	MECHANICAL POWER LAYOUT		
Ref.no	E181	Designed	MP.
Scale	A1 - 1:100	Drawn	J.C.
Date	JUNE 2024	Checked	H.S.
Drawing Number	E181 E2.3		

LEGEND	
SYMBOL	DESCRIPTION
▲	DATA / VOIP TELEPHONE OUTLET
▼	VOIP TELEPHONE OUTLET (FAX)
▷	DATA OUTLET
▽	TV OUTLET - 65mm ROUND BOX
⊗	COURT RECORDING MICROPHONE - TABLE MOUNTED 32mm CONDUIT WITH SLOW BEND TO FLOOR POWER SKIRTING
●	SOS SPEAKERS, 65mm ROUND BOX LINKED TO FLOOR POWER SKIRTING, 2400mm APFT
—	POWER SKIRTING
—	POWER SKIRTING INSTALLED FLUSH WITH FLOOR SECOND POWER SKIRTING MOUNTED ON TOP FLUSH SKIRTING
- - -	CABLE BASKET IN CEILING VOID (SIZE AS SHOWN)
—	TELEPHONE / DATA DISTRIBUTION BOARD SIZE AS SHOWN
—	DISTRIBUTION BOARD - POWER
25	DEPICTS SIZE OF PVC CONDUIT - 25mm
2x25	PVC CONDUIT LINKS WITH 1.0 mm GALVANISED DRAW WIRE FROM CEILING TRUNNINGS/CABLE WIRING TO POWER SKIRTING BELOW, BUILT INTO WALLS AND SLOW BEND TO TRUNNINGS, NUMBER AND SIZE AS INDICATED



NO.	DATE	AMENDMENT

Client

Implementing Agent

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Discipline
ELECTRICAL

Project Description
ELLIOT MAGISTRATE'S OFFICE: REPAIRS AND MAINTENANCE WCS 042521

Drawing Status
TENDER DRAWING

Drawing Title
TELEPHONE, DATA, CRT AND SOS SYSTEM LAYOUTS

Ref.no	E181	Designed	MP.
Scale	A1 - 1:100	Drawn	J.C.
Date	JUNE 2024	Checked	H.S.

Drawing Number
E181 E2.4

NO.	DATE	AMENDMENT

Client	

Implementing Agent



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Discipline

ELECTRICAL

Project Description

ELLIDT MAGISTRATE'S OFFICE;
REPAIRS AND MAINTENANCE
WCS 042521

Drawing Status

TENDER DRAWING

Drawing Title

CCTV LAYOUT

Ref: no E181

Scale A1 - 1:100









Date JUNE 2024

Drawing Number E181 E2.5

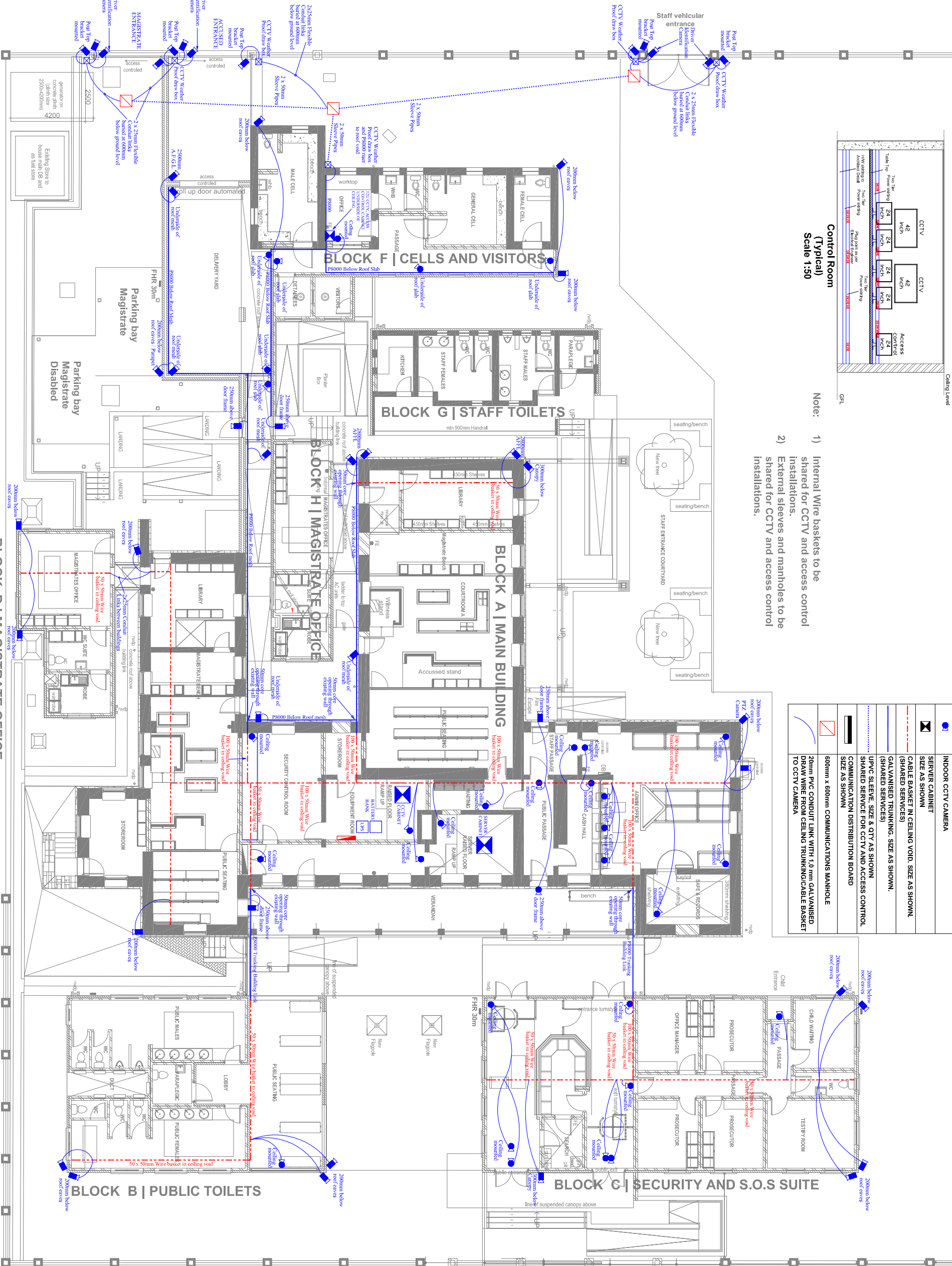
Designed M.P.

Drawn J.C.

Checked H.S.

LEGEND	
SYMBOL	DESCRIPTION
	OUTDOOR CCTV CAMERA
	INDOOR CCTV CAMERA
	SERVER CABINET SIZE AS SHOWN
	CABLE BASKET IN CEILING VOID. SIZE AS SHOWN. (SHARED SERVICES)
	UP/DC SLEEVE, SIZE & QTY AS SHOWN (SHARED SERVICES)
	SHARED SERVICE FOR CCTV AND ACCESS CONTROL COMMUNICATION DISTRIBUTION BOARD SIZE AS SHOWN
	600mm x 600mm COMMUNICATIONS MANHOLE
	20mm PVC CONDUIT LINK WITH 1.0 mm GALVANISED DRAW WIRE FROM CEILING TRUNKING/CABLE BASKET TO CCTV CAMERA

- Note:
- Internal Wire baskets to be shared for CCTV and access control installations.
 - External sleeves and manholes to be shared for CCTV and access control installations.



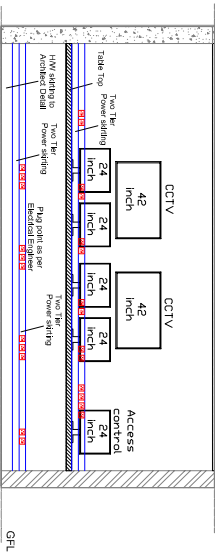
BLOCK E | ELECTRICAL HOUSE

BLOCK D | MAGISTRATE OFFICE

LEGEND	
SYMBOL	DESCRIPTION
(D)	ACCESS CONTROL DUAL BIOMETRIC AND CARD READER 1100mm ABOVE FINISHED FLOOR LEVEL, TO UNDERSIDE OF BOX
(L)	MAGNETIC DOOR LOCK WITH A DOOR RECLOSELOR
(R)	MAGNETIC TYPE MICRO DOOR READER SWITCH
(B)	GREEN BREAK GLASS - RESET TYPE 1100mm ABOVE FINISHED FLOOR LEVEL, TO UNDERSIDE OF BOX
(PB)	PAUSE BUTTON WIREED TO CONTROL ROOM NOTIFIES AN EMERGENCY FOR CONTROL ROOM TO INITIATE LOCK DOWN
(+)	BLUE LED VISUAL DISPLAY CONFIGURATION OF ALARM ACTIVATION (1200mm AFFL)
(IC)	IP INTERCOM CALL POINT WALL MOUNTED 1100mm ABOVE FINISHED FLOOR LEVEL, TO UNDERSIDE OF BOX
(IG)	IP INTERCOM CALL POINT GOOSENECK MOUNTED WITH STAINLESS STEEL WEATHER PROOF COVER
(M)	INTERCOM CALL POINT (WALL MOUNTED) WIRED TO LOCAL RECEIVER TWO WAY COMMUNICATION ONLY, 1200mm ABOVE FINISHED FLOOR LEVEL
(H)	INTERCOM HANDSET / RECEIVER WITH CHIME MOUNTED 1200mm AFFL
(I)	INTERCOM MASTER STATION WITH GATE RELEASE
(S)	INFRARED GATE SENSORS TO PREVENT GATE FROM CLOSING MOUNTED 400mm AFFL

LEGEND	
SYMBOL	DESCRIPTION
	STAINLESS STEEL, GOOSE NECK FOR ACCESS CONTROL AND INTERCOM
WP	WEATHER PROOF ENCLOSURE / STAINLESS STEEL COVER
	MOTORISED GATE UNIT COMPLETE WITH BATTERY BACKUP
---	CABLE RACKETS IN CEILING VOID, SIZE AS SHOWN (SHARED SERVICES)
---	GALVANISED TRUNKING, SIZE AS SHOWN (SHARED SERVICES)
---	UPVC SI FENCE, SIZE & QTY AS SHOWN
---	SHARED SERVICE FOR CCTV AND ACCESS CONTROL
	600mm x 600mm COMMUNICATIONS MANHOLE
	25mm PVC CONDUIT LINK WITH 1mm GALVANISED DRAW WIRE
	ACCESS CONTROL DOOR, GATE, TURNSTILES PART OF THE LOCK DOWN SYSTEM AND IS CONTROLLED BY THE SECURITY CONTROL ROOM.

**Control Room
(Typical)
Scale 1:50**



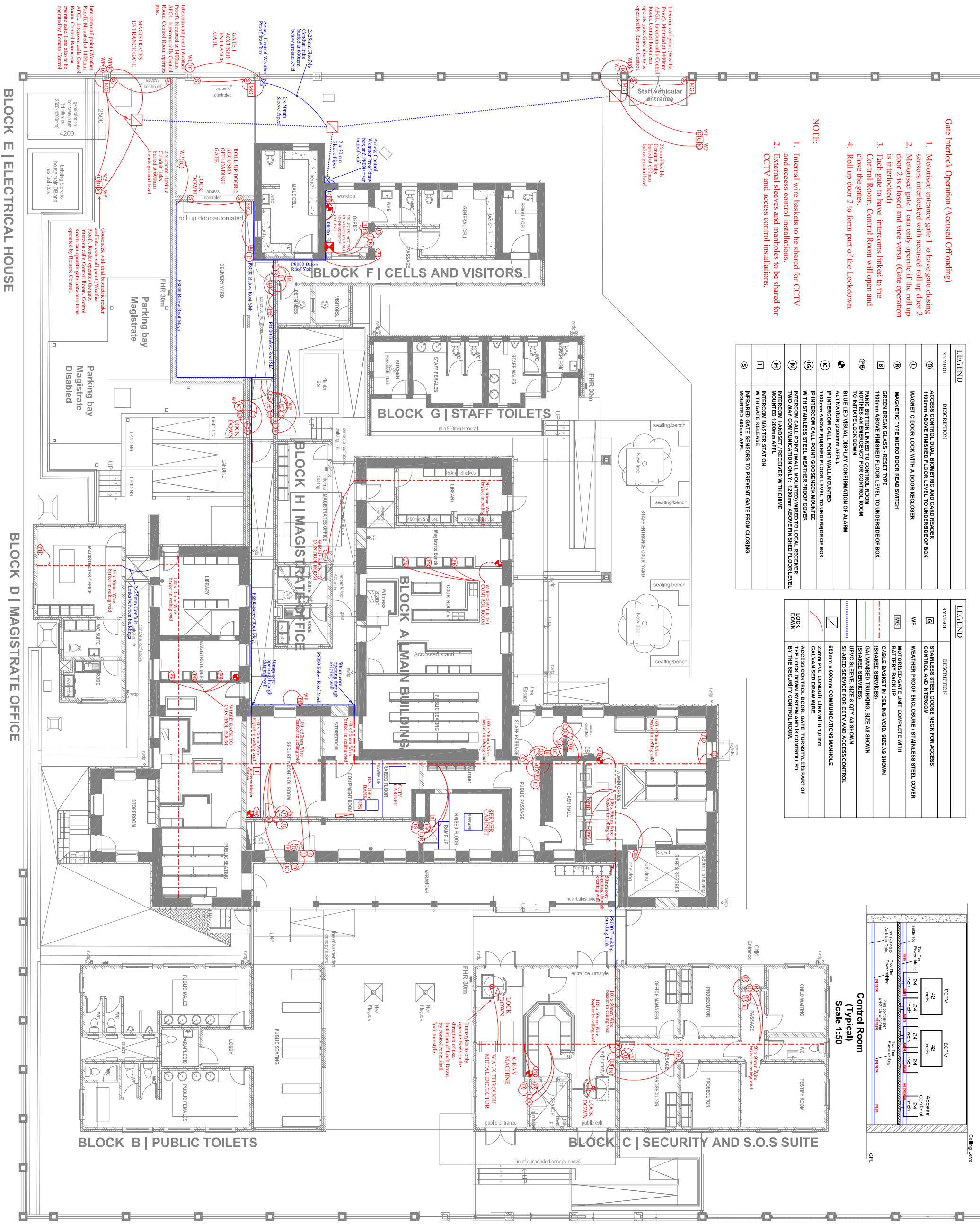
Ceiling Level

Gate Interlock Operation (Accused Offloading)

1. Motorised entrance gate 1 to have gate closing sensors interlocked with accused roll up door 2
2. Motorised gate 1 can only operate if the roll up door 2 is closed and vice versa. (Gate operation is interlocked)
3. Each gate to have intercoms linked to the Control Room. Control Room will open and close the gates
4. Roll up door 2 to form part of the Lockdown.

NOTE:

1. Internal wire baskets to be shared for CCTV and access control installations.
2. External sleeves and manholes to be shared for CCTV and access control installations.



NO.	DATE	AMENDMENT

Client _____

Implementing Agent



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Discipline	
ELECTRICAL	
Project Description	
ELLIDT MAGISTRATE'S OFFICE: REPAIRS AND MAINTENANCE WCS 042521	
Drawing Status	
TENDER DRAWING	
Drawing Title	
ACCESS CONTROL & INTERCOM LAYOUTS	
Refno	E181
Scale	A1 - 1:100
Date	JUNE 2024
	Designed MP. Drawn JC. Checked H.S.
Drawing Number	
E181 E26	

NO.	DATE	AMENDMENT

Client	
Implementing Agent	



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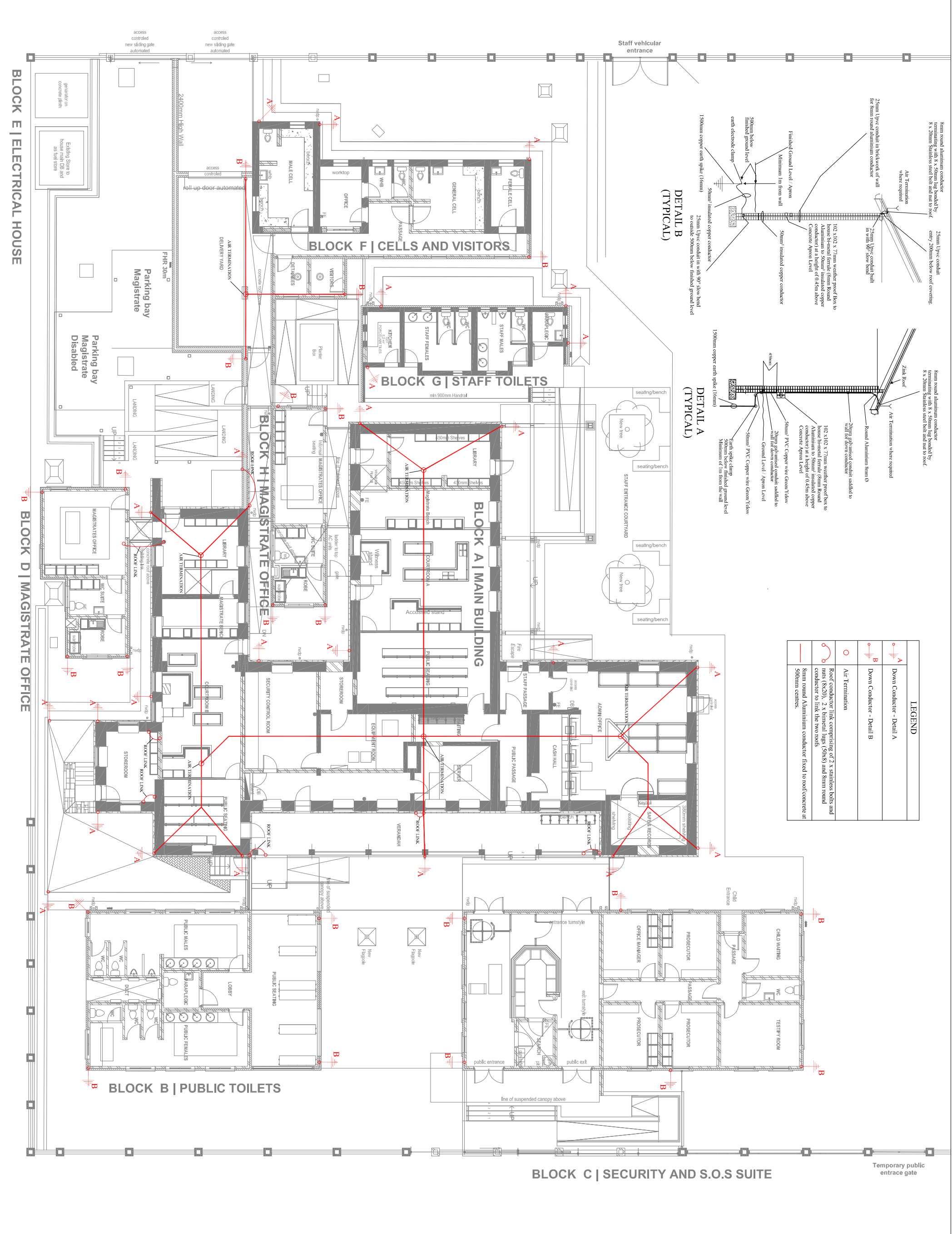
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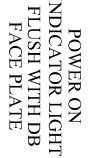
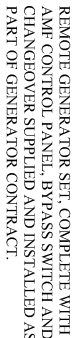
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Project Description	ELLIDT MAGISTRATE'S OFFICE; REPAIRS AND MAINTENANCE WCS 042521
Drawing Status	TENDER DRAWING
Drawing Title	LIGHTNING PROTECTION LAYOUT
Ref: no	E181
Scale	A1 - 1:100
Date	JUNE 2024
Designed	M.P.
Drawn	J.C.
Checked	H.S.
Drawing Number	E181 E2.7



POSITION 1: NORMAL = 1 CONNECTED TO 2


POSITION 3: OFF = NO POWER TO LOAD

250A

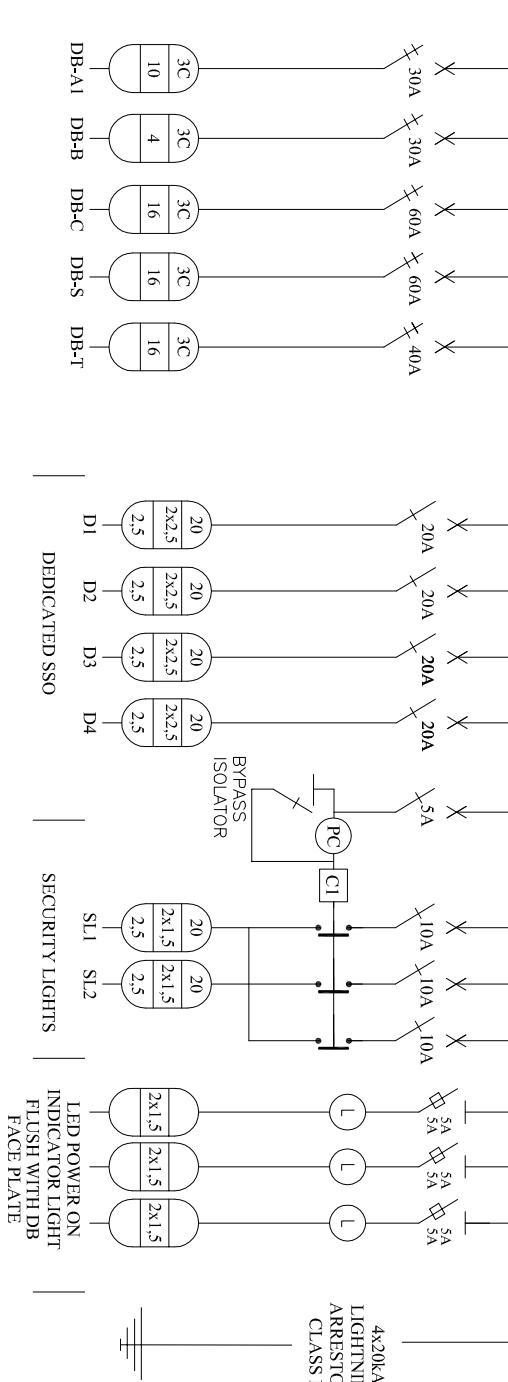
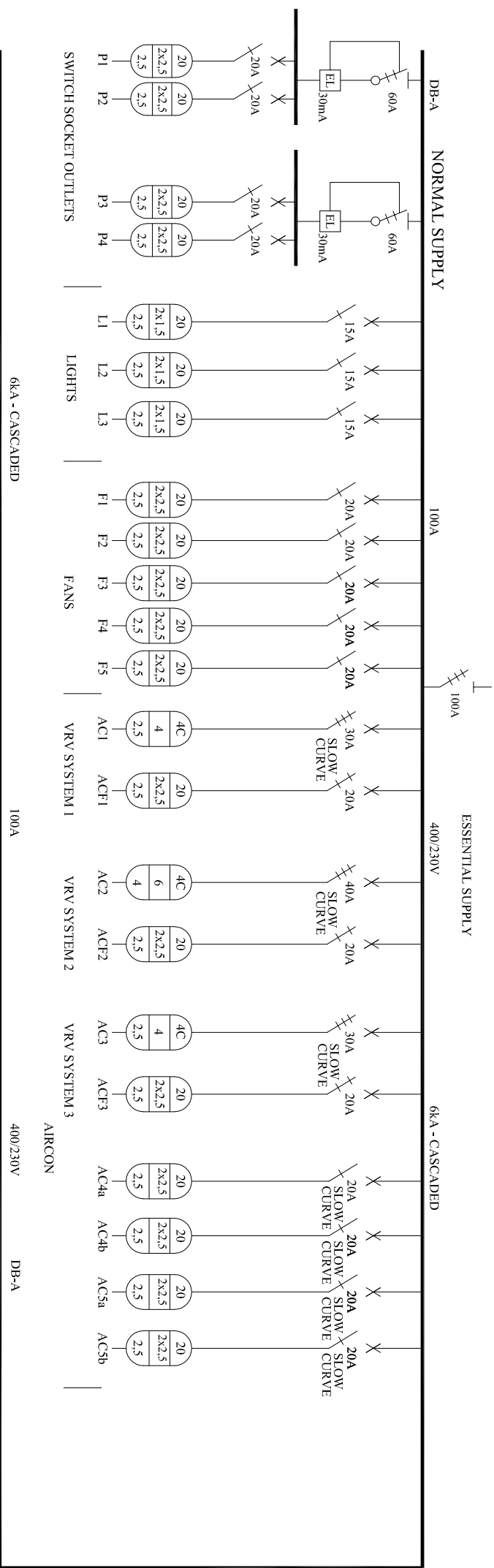


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RATING-BUSBAR: 250A	FAULT:15KA				
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FEEDERS: Bottom	<input checked="" type="checkbox"/>	Top	<input checked="" type="checkbox"/>	Side	<input type="checkbox"/>
MOUNTING: Free Standing	<input checked="" type="checkbox"/>	Floor	<input checked="" type="checkbox"/>		
Recessed	<input type="checkbox"/>	Surface	<input type="checkbox"/>		
DOORS: Yes	<input type="checkbox"/>	None	<input checked="" type="checkbox"/>	Lockable	<input type="checkbox"/>
COLOUR: White	<input type="checkbox"/>	Red	<input checked="" type="checkbox"/>	Cream	<input type="checkbox"/>
Orange	<input checked="" type="checkbox"/>	Grey	<input type="checkbox"/>	Other	<input type="checkbox"/>
SURGE ARRESTORS	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	
SPACE SPACE: 30%					

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SUPPLY:	Bottom <input checked="" type="checkbox"/>	Top <input type="checkbox"/>	Side <input type="checkbox"/>
FEEDERS:	Bottom <input checked="" type="checkbox"/>	Top <input type="checkbox"/>	Side <input type="checkbox"/>
MOUNTING: Free Standing		<input checked="" type="checkbox"/>	Floor <input checked="" type="checkbox"/>
Recessed		<input type="checkbox"/>	Surface <input type="checkbox"/>
DOORS:	Yes <input type="checkbox"/>	None <input type="checkbox"/>	Lockable <input type="checkbox"/>
COLOUR:	White <input type="checkbox"/>	Red <input checked="" type="checkbox"/>	Cream <input type="checkbox"/>
	Orange <input type="checkbox"/>	Grey <input type="checkbox"/>	Other <input type="checkbox"/>
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SPARE SPACE: 30%			

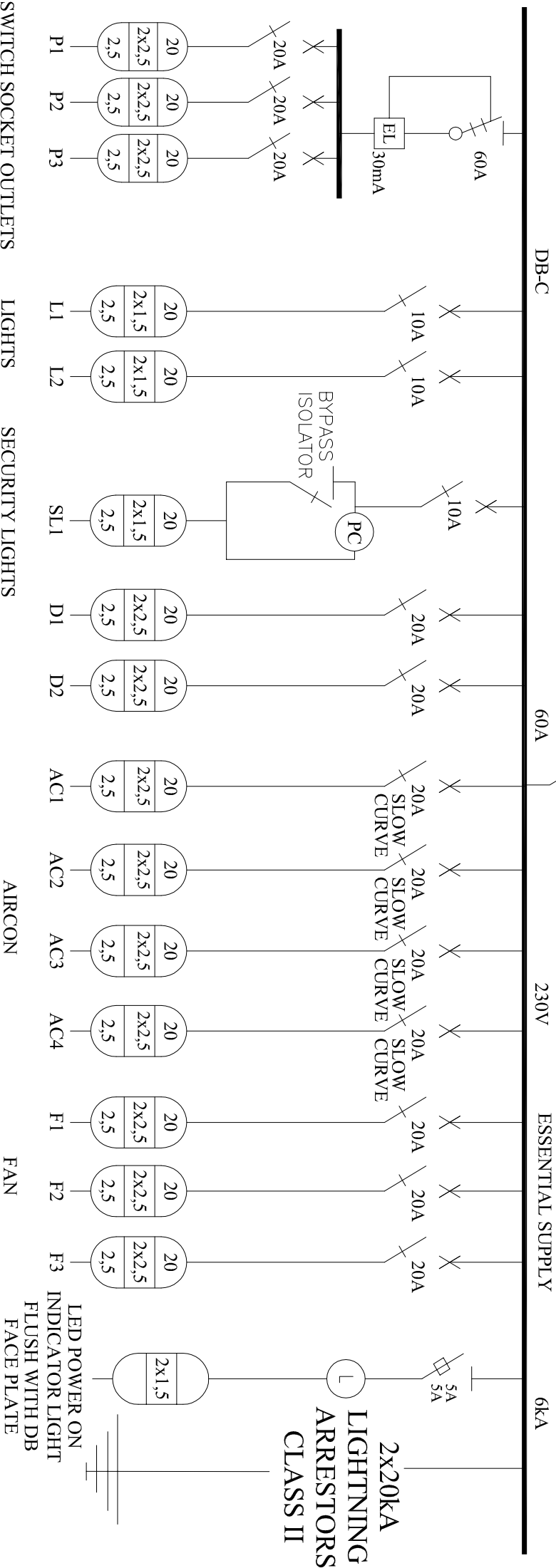
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<div><div>DRAWN</div><div>S.M.</div></div> <div><div>PROJECT MANAGER</div></div>					
<div><div>CHECKED</div><div>H.S.</div></div> <div><div>DATE</div><div>5-6-2024</div></div>					
<div><div>DIRECTOR</div></div>					
<div><div>COPYRIGHT AND USE OF THIS DRAWING IS RESERVED BY EYE SIZE</div></div>					
<div><div>DRAWING NUMBER</div><div>E181-E4.1</div></div> <div><div>A4</div><div>REVISION</div><div>0</div></div>					
<div><div>DESCRIPTION</div><div>DATE</div><div>APPROD</div></div>					
<div><div>REV</div><div>DESCRIPTION</div><div>DATE</div><div>APPROD</div></div>					

FROM DB-MAIN E



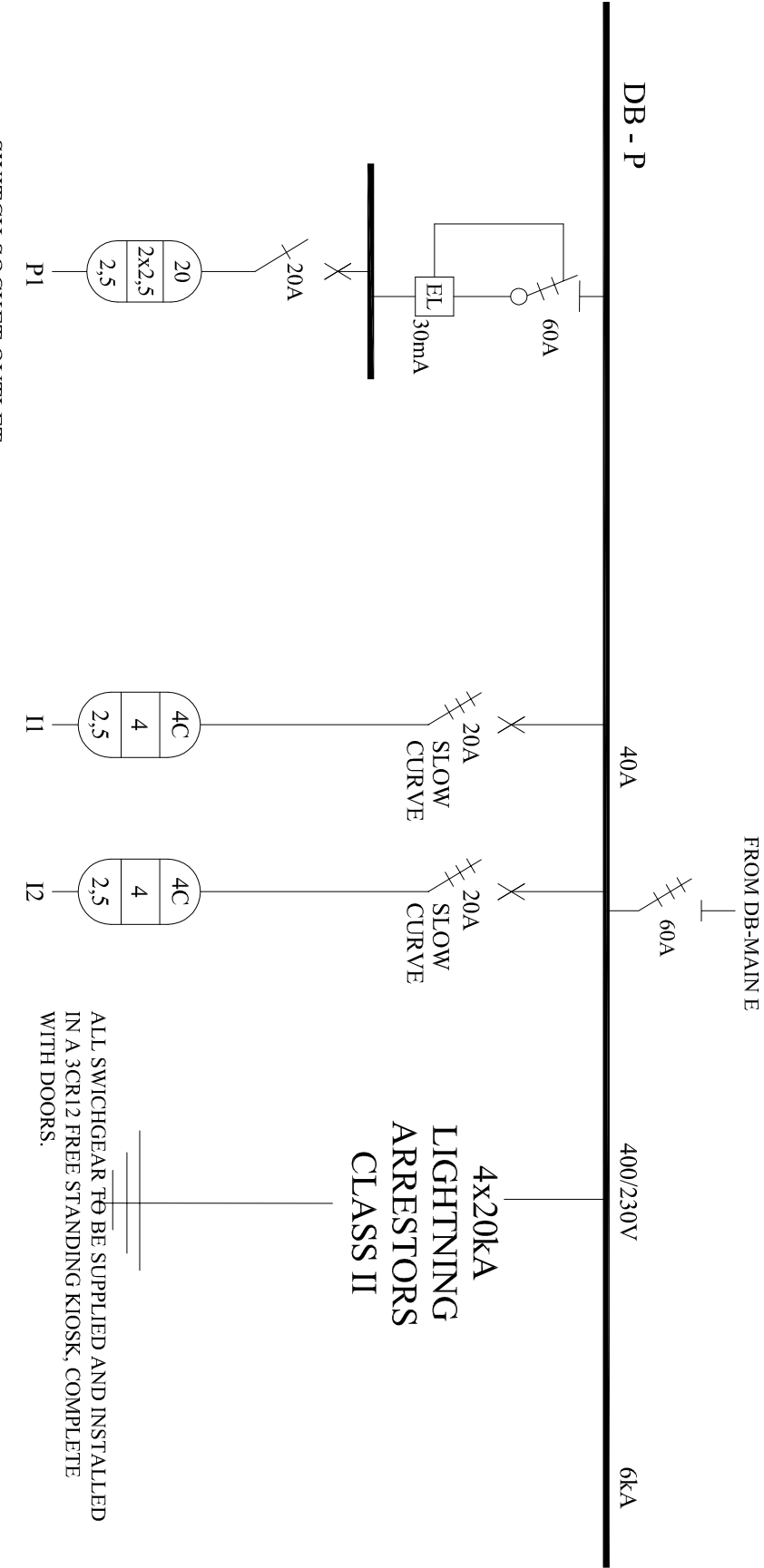
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FEDERS:	Bottom	<input checked="" type="checkbox"/> Top	<input type="checkbox"/> Side
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Recessed		<input type="checkbox"/> Surface	<input checked="" type="checkbox"/> Lockable
DOORS:	Yes	<input type="checkbox"/> None	<input checked="" type="checkbox"/> Cream
COLOUR:	White	<input type="checkbox"/> Red	<input type="checkbox"/> Other
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SPARE SPACE: 30%			

FROM DB-A



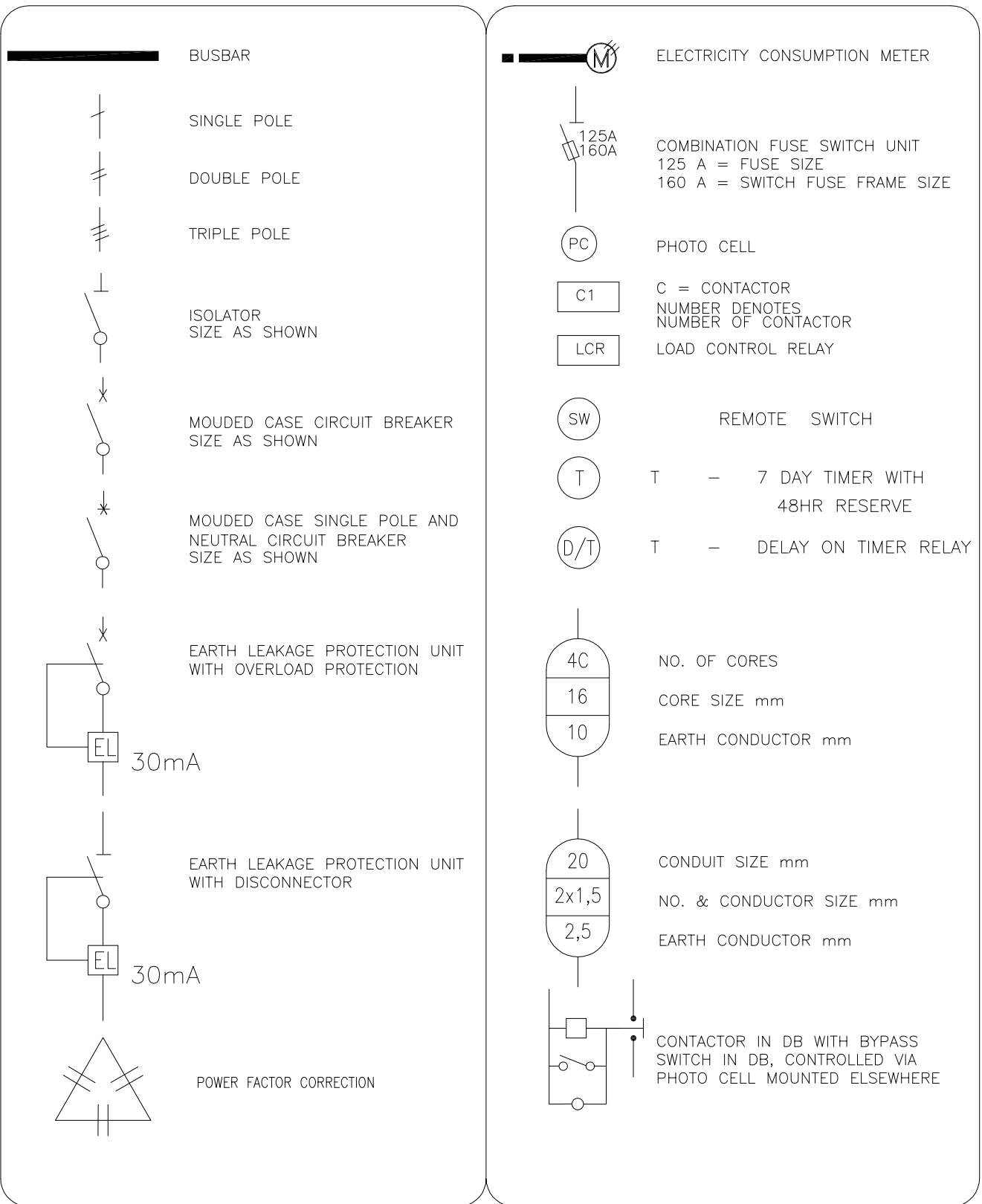
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Recessed			<input checked="" type="checkbox"/>	Surface	<input type="checkbox"/>	<input type="checkbox"/>
DOORS:	Yes	<input checked="" type="checkbox"/>	None	<input type="checkbox"/>	Lockable	<input checked="" type="checkbox"/>
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Orange		<input type="checkbox"/>	Grey	<input type="checkbox"/>	Other	<input type="checkbox"/>
SURGE ARRESTORS			Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
SPARE SPACE: 30%						


[illegible]



NAME:	DB-P
TYPE:	Normal
VOLTAGE:	400/230V
RATING-BUSBAR:	30A
FAULT:	6kA
SUPPLY:	Bottom
FEEDERS:	Bottom
MOUNTING:	Top
DOORS:	Yes
COLOUR:	Lockable
MATERIAL	Grey
SPARE SPACE:	30%

ALL SWITCHGEAR TO BE SUPPLIED AND INSTALLED IN A 3CR12 FREE STANDING KIOSK, COMPLETE WITH DOORS.



No.	DATE	DESCRIPTION	No.	DATE	DESCRIPTION
PROJECT			<div><div><i>Eye Sizwe Consulting Engineers</i></div><div>16 ALLENBY ROAD SELBORNE EAST LONDON 5213 TEL : + 27 (43) 7483830 EMAIL : petzerm@lantic.net</div></div>		
ELLIOT MAGISTRATE COURT					
SINGLE LINE DIAGRAM LEGEND					
DRAWING					
E181 E4.13 - SINGLE LINE DIAGRAM LEGEND					
DRAWN	DESIGNED	CHECKED	SCALE	DATE	
S.M.	M.P.	H.S.	N T S	5-6-2024	

1



4



3



2

ELECTRIC SHOCK TREATMENT

BEFORE ATTEMPTING ANY RESCUE OR ASSISTANCE, ALWAYS ENSURE YOUR OWN SAFETY

- DO NOT TOUCH CASUALTY WITH YOUR BARE HANDS WHILST HE IS IN CONTACT WITH THE LIVE WIRE
 - SWITCH OFF CURRENT IF POSSIBLE.
- INSULATE YOURSELF BY STANDING ON A PIECE OF DRY WOOD OR THICK FOLDED BLANKET OR COAT
- USING A DRY ROPE, BELT OR STICK MOVE THE WIRE FROM CASUALTY OR DRAG HIM AWAY FROM WIRE.

SEND FOR MEDICAL ASSISTANCE

- DO NOT GIVE STIMULANTS UNLESS ORDERED BY A DOCTOR
- APPLY STERILIZED DRESSING TO BURNS DO NOT REMOVE BURNT CLOTHING AND DO NOT BREAK BLISTERS.
- IF PATIENT IS BREATHING KEEP HIM WARM, COVER WITH BLANKETS OR COATS.
- IF PATIENT IS NOT BREATHING LOOK FOR ANY OBSTRUCTION WHICH MAY BE IN HIS MOUTH

TREATMENT

PERFORM MOUTH TO MOUTH ARTIFICIAL RESPIRATION

A THIN HANDKERCHIEF MAY BE PLACED OVER THE CASUALTY'S MOUTH OR NOSE IF DESIRED.

A. PLACE THE CASUALTY ON HIS BACK AND SIT OR KNEEL ON THE SIDE OF HIS HEAD. HOLD THE HEAD IN HANDS, ONE PRESSING IT BACKWARDS THE OTHER PUSHING THE LOWER JAW UPWARDS AND FORWARD. THIS IS IMPORTANT TO ENSURE AN UNRESTRICTED PASSAGE TO THE CASUALTY'S LUNGS.

B. PINCH THE CASUALTY'S NOSE CLOSED WITH ONE HAND.

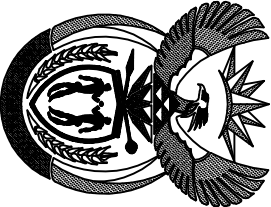
C. TAKE A DEEP BREATH, OPEN YOUR MOUTH WIDE AND SEAL YOUR LIPS AROUND THE CASUALTY'S MOUTH. BLOW AIR STEADILY ON TO THE CASUALTY'S LUNGS UNTIL HIS CHEST RISES.

D. REMOVE YOUR MOUTH AND TURN YOUR FACE TO ONE SIDE TO TAKE ANOTHER BREATH. THE CASUALTY WILL AUTOMATICALLY BREATHE OUT THROUGH HIS MOUTH.

E. SIX BREATHS SHOULD BE GIVEN AS QUICKLY AS POSSIBLE THEN REPEAT THE CYCLE AT 4 SECOND INTERVALS KEEP PATIENTS HEAD PASSED BACK AT ALL TIMES.

No.	DATE	AMENDMENT	D.P.W.
		<div><div>① Danger sign - Automated engine start without notice</div><div>② Electrical Shock Treatment Sign</div><div>③ Multilingual Danger sign</div><div>④ Electrical Hazzard Sign</div></div>	
Copyright vests in the Department of Public Works			

cad file name



public works

Department:
Public Works
REPUBLIC OF SOUTH AFRICA

DIRECTOR-GENERAL
MR. SIVWE DONKWANA

discipline
ELECTRICAL

service

TYPICAL GENERATOR LAYOUT DRAWING FOR GENERATORS UP TO 300kva.

WCS number
N/A

drawing title
TYPICAL GENERATOR SAFETY SIGNAGE

ref.no. N/A
scale 1:25
date 25 JUNE 2012

designed F. VAN ZYL
drawn M.I. SALAAM-MADATT
checked F. VAN ZYL

DPW drawing number
N/A

COEGA DEVELOPMENT CORPORATION (PTY) LTD

ELLIOT MAGISTRATE COURT : PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION

(BID NO: CDC/163/25)

C2.3d

Booster Pump Installation

Specification and Pricing Schedule



public works
Department:
Public Works
REPUBLIC OF SOUTH AFRICA

COEGA DEVELOPMENT CORPORATION (PTY) LTD

FOR

**REPAIRS AND ADDITIONS TO
ELLIOT MAGISTRATE COURT**

BOOSTER PUMP INSTALLATION

SPECIFICATION AND PRICING SCHEDULE

PREPARED FOR:

Coega Development Corporation (Pty) Ltd
Harraway House, No 12
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5241

PREPARED BY:

Eye Sizwe consulting Engineers
16 Allenby Road
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NAME OF TENDERER: _____

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INDEX

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PART 2	DETAILED TECHNICAL SPECIFICATIONS
PART 3	EQUIPMENT SCHEDULES
PART 4	BILLS OF QUANTITY
PART 5	SCHEMATIC DETAIL DRAWING (BOOSTER PUMP SYSTEM)

PART 1 - STANDARD SPECIFICATION

STANDARD SPECIFICATION

INDEX

1.1	GENERAL REQUIREMENTS FOR PLUMBING INSTALLATION
1.2	PIPING & PIPE FITTINGS FOR PLUMBING INSTALLATION
1.3	GALVANISED STEEL PIPE INSTALLATIONS
1.4	UPVC PIPES
1.5	HDPE UNDERGROUND PIPE INSTALLATIONS
1.6	CAST IRON PIPE INSTALLATIONS
1.7	VALVES FOR DOMESTIC WATER INSTALLATIONS
1.8	STRAINERS
1.9	NON RETURN VALVES
1.10	AIR RELEASE VALVES
1.11	PRESSURE REDUCING VALVES
1.12	WATER METERS
1.13	STERILISING OF WATER PIPES
1.14	PRESSURE TESTING OF PIPES
1.15	PUMPS

1.1 GENERAL REQUIREMENTS FOR PLUMBING INSTALLATIONS

1.1.1 GENERAL

The Subcontractor will be required to provide all labour, materials, equipment and services and perform all operations including access to all the high points required for the complete installation of all plumbing work as shown on the relevant drawings and in accordance with all applicable requirements of the Subcontract Documents.

This specification is of simplified form, and includes incomplete sentences. The omission or words or phrases shall be implied by inference.

1.1.2 DEFINITIONS AND ABBREVIATIONS

Definitions of terms used herein:

"Provide"	To supply, install, connect and hand over complete and ready for safe and regular operation of particular work referred to unless specifically indicated otherwise.
"Install"	To erect, mount and connect, complete with all related accessories.
"Supply"	To purchase, procure, acquire and deliver, complete with all related accessories.
"Work"	All labour, materials, equipment, apparatus, controls, accessories and other items required for correct and complete installation.
"Piping"	Pipe, tube, fittings, flanges, valves, controls, strainers, hangers, supports, accessories, drains, insulation and all related items.
"Wiring"	Conduit, fittings, wire, junction and outlet boxes, switches, cut-outs, socket outlets and all related items.
"Concealed"	Embedded in masonry or other construction installed in furred spaces, within double partitions or hung ceilings, in trenches, in crawl spaces or in enclosed spaces.
"Exposed"	Not installed underground or concealed as defined above.
"Indicated", "Shown" Or "Noted".	As indicated, shown or noted on drawings and/or specifications.
"Similar" or "Equal"	Of approved manufacture, equal in weight, size, design and efficiency of performance of the product specified or mentioned by name.

"Approved", "Satisfactory", "Accepted"	As approved, satisfactory or accepted by the Architect and/or Consulting Engineer.
"SANS"	South African National of Standards.
"BSI"	British Standards Institution
"ASHRAE"	American Society of Heating, Refrigeration and Air Conditioning Engineers.
"ASME"	American Society of Mechanical Engineer
"ASTM"	American Society for Testing Materials
"ASA"	American Standards Association
"NBS"	National Bureau of Standards (U.S.A.)
"NEMA"	National Electrical Manufacturers Association

1.1.3 QUALITY, GAUGES, WEIGHTS AND MEASURES OF MATERIALS

All materials shall be new, best quality and free from defects.

All similar materials and/or apparatus used for a similar purpose shall be of the same manufacturer.

Written approval shall be obtained for the use of any alternative to the specifications before the submission of tenders; otherwise it will be assumed that the specified materials, etc., have been allowed for in the tender.

All electrical materials and apparatus shall be listed by SABS, or BSS, and shall bear their label or mark.

The approval of the Authorities that have jurisdiction shall be secured for all materials, equipment and installation.

Gauges of wire and metal shall be metric unless otherwise specified.

All weights and measures shown or mentioned shall be taken to be according to the System International units.

All diameters of pipes given are the nominal bore except for copper and PVC pipes where outside diameters are shown (on drawings).

1.1.4 SPECIFICATION FOR WATER INSTALLATIONS

1.1.4.1 GENERAL

This standard specification defines the standard of equipment and materials as well as the quality of the services required for the various sections of the installation. Not all the clauses in this section of the standard specification shall be applicable on the contract. Refer to the detailed or material specification for which materials and equipment are to be used on this installation.

The contractor shall at all times adhere to this specification unless otherwise specified on the drawings and/or in the detailed specifications.

The contractor shall obtain guarantees from the manufacturer(s) and/or supplier(s) to the effect that each piece of equipment shall comply with the required performance and also that it will function as part of the complete system.

All materials and equipment supplied and installed shall carry the SABS mark of approval unless otherwise specified.

The contractor shall acquaint himself with the general arrangement of all other services and ensure that in fixing his work it will not obstruct the fixing or future maintenance of this installation or other services.

The contractor shall submit workshop drawings, samples, catalogues, performance characteristics etc. where required by the Engineer.

The Engineers drawings show broad principles of design, general layouts, and schematic arrangements and when read together with the specifications and the drawings of other disciplines and other contractors, they carry sufficient information to enable the contractor to determine how the installation is to be installed, operated, serviced and maintained.

It shall be the responsibility of the contractor to ensure that all equipment and methods used in the installation, comply with all relevant statutory regulations and amendments thereto, in particular the following must apply:

The Factories, Machinery and Building Work Act

Government and Local Authorities ordinances

Regulations, By-Laws, Rules and other statutory requirements

The National Building Regulations: SANS 0400-0

Water supply and drainage for building: SANS 10252-1:2004

Pipe sizes and positions are shown on the Engineers drawings. Fittings, valves, strainers, etc., must adapt to these pipe sizes.

The Contractor shall take measurements for installation of the equipment of the system and to produce complete workshop drawings for fabrication and installation, which shall be co-ordinated by the contractor with all other relevant equipment and services. Dimensions given on the drawings are only a guide and should be adapted to suit the relevant measurements of the specific fittings and/or equipment.

After complete installation of the system all equipment shall be tested, adjusted and readjusted until it operates to the satisfaction and approval of the engineer and the client.

The completed system shall be put into operation after all tests and adjustments have been carried out to the satisfaction of the engineer. The Contractor shall run and operate the system for a period of time as specified by the Engineer and train the staff of the client to operate and maintain the system for a period as required by the engineer, which will not exceed one month.

The contractor shall institute an approved Quality Assurance system (QA) which shall be submitted to the Engineer for his approval. The records of this QA system shall be

kept throughout the duration of the contract and be submitted to the engineer at regular intervals as required. The QA system shall comply with SABS 0157.

1.2 PIPING AND PIPE FITTINGS FOR PLUMBING INSTALLATIONS

1.2.1 COPPER PIPE INSTALLATIONS:

Note: Minimum Class. 2

ABOVE GROUND INSTALLATIONS

Copper pipes shall be of the hard drawn, thin-walled tube type Class "2" for the use without bending according to SABS 460-85 (as amended).

The outside diameters are to be (in mm): 15, 22, 28, 35, 42, 54, 76, 108 (OD)

Pipes shall be delivered to site in bundles of 5,5m straight lengths with orange/brown end caps.

Pipes shall be cut with tubing cutters or a hacksaw. Care shall be taken to produce a square end and to remove the burr by reaming the tube end inside and outside.

"Class 2" copper pipes shall not be bent under any circumstances.

Copper pipes shall be strictly to the manufacturer's specifications.

UNDERGROUND INSTALLATIONS

Copper pipes shall be heavy walled tube type "Class 3", according to SABS 460-85 (as amended).

The outside diameters, in mm, are 15, 22, 28, 35, 42, 54, 76, and 108.

Pipes shall be delivered to site in bundles of 5, 5 m straight lengths with grey end caps.

Pipes shall be cut with tubing cutters or a hacksaw. Care shall be taken to produce a square end and to remove the burr by reaming the tube end inside and outside.

"Class 3" copper pipes shall not be bent under any circumstances.

Underground copper pipes shall be wrapped for their entire length with "Green Denso". Denso shall overlap itself by not less than 25mm. At termination points Denso shall stop at 100mm beyond interior side of the wall or slab.

FITTINGS

Copper capillary soldered type fittings shall be used in accordance with ISO 2016, SABS 1067, DIN 2856 and/or BSS 864.

The normal diameter of the capillary soldered type fittings must be in accordance with the outside diameters of the copper tubes, i.e. 15, 22, 28, 35, 42, 54, 76, 108 mm.

No labour bends or tees will be accepted.

All fittings are to be stamped SABS.

No brass compression fittings are to be used. If, in certain situations, no other alternative can be used to joint the pipework the Contractor is to refer to the Engineer to obtain approval.

SOLDERING

The solder to be used shall be in accordance with SABS 24-1971 (as amended) or DIN 1707 and shall be grade 97/3 – 97% tin and 3% copper.

The flux shall contain no ammonia and be water based. The recommended flux to use is "EVERFLUX" or equal and approved.

The heat source to be used is a soft non-localized flame as produced by LPG Gas with a temperature not higher than 240 °C.

The pipe ends and fittings shall be cleaned and waxed with an approved solder flux, before soldering.

The soldering of capillary joints shall be split into two methods, one for the sizes up to 54 mm diameter and one for 76 mm and 108 mm diameter.

Sizes up to 54 mm diameter

Cut the pipe, ensure that all burrs are removed and tube end reamed inside and outside.

Clean tube and end fittings by means of a ring brush, wire, and wool or emery cloth.

Apply flux to the outside of the tube for a length at least equal to the depth of the fitting. Apply flux to the inside of the fitting. Apply flux with a small brush. After fluxing assembly joint so that it is ready to solder.

Apply the flame to the assembled joint concentrating the heat at the centre of the fitting rather than on the tube.

Ensure sufficient solder has been applied by the appearance of a visible fillet. After a short cooling period remove any excess residual flux with a damp rag.

Pipe shall be washed out as soon as possible after jointing.

Sizes 76 mm and 108mm diameter

The soldering of these sizes shall be done by using a hard silver solder such as Silbraloy or 30-40 % cadmium based silver solder. An oxygen acetylene torch should be used.

Note: No brazed joints are acceptable.

1.2.2 HANGERS AND SUPPORTS

Pipe hangers and brackets shall be of copper or copper alloy.

The use of steel or galvanized materials will only be accepted if the copper is completely insulated from steel or galvanized materials. This can be affected by the use of wood, plastic, rubber or tape. In this case the insulating material must be extended by 100mm on both sides of the steel.

PVC holder bats may also be used with written approval of the engineer.

Allowance for expansion must be provided to allow free movement of the pipe within the fixture.

Hangers and supports shall be installed at least 500mm away from a change of direction – tee or elbow.

Pipe hangers and brackets shall be installed on the following maximum spacing:

PIPE DIAMETER (mm)	HORIZONTAL (metre)	VERTICAL (metre)
15	1,3	1,9
22	1,9	2,5
28	1,9	2,5
35	2,5	2,8
42	2,5	2,8
54	2,5	3,9
76	2,8	3,9
108	2,8	3,9

Equipment fixed to copper pipes where the pipes are surface mounted shall be done by means of copper or brass wall plate fittings.

The base of vertical piping shall be supported by hangers placed on the horizontal branch close to the riser.

The contractor is to acquaint himself with the type of structure as no additional cost will be agreed for use of Unistrut elements between walls in the case of such a structure. Where wood truss roofs are installed, the contractors shall report to the consulting engineers, who on co-ordination with the structural engineer will inform him where the hangers may be fixed. No hanger shall be fixed in the middle of the truss between two nodes.

1.2.3 DI – ELECTRIC CONNECTIONS

Where copper pipes or fittings are to be connected to galvanized pipes or fittings an approved di-electric connection shall be installed to prevent reaction between dissimilar metals.

Copper pipes shall only be installed downstream of galvanized pipes.

Mixing of GMS-copper-GMS-copper is prohibited.

The connection between copper pipes and galvanized pipes shall be done by means of bronze or brass equipment of the de-zincified type.

Where large diameters are used with flanges, insulation joints shall be installed between ferrous and non-ferrous metallic pipe, fittings and valves. Insulating joints shall consist of a sandwich type insulating gasket of the dielectric type, insulating washers, and insulating sleeves for flange bolts. Insulating gaskets shall be full faced with outside diameter equal to the flange outside diameter. Bolt insulating shall be of a shape to prevent metal-to-metal contact of dissimilar metallic piping elements.

Flange gaskets to be suitable for the temperature and pressure of the system.

1.2.4 EXPANSION

The coefficient of linear expansion of copper pipes is 0,0166mm/metre/°C. This gives, for a Hot Water Distribution line, between installation at 20°C and use at 60°C an expansion of 0,67mm/metre.

1.2.4.1 Expansion offsets for copper piping < 54mm diameter

Expansion offsets shall be installed as indicated on drawings, standard specifications, special notes and recommendations of the manufacturers.

1.2.4.2 Expansion bellows for copper piping > 54mm diameter

Expansion bellows shall be installed as indicated on drawings. These bellows shall be suitable for an operating temperature of minus 10°C to ± 100°C at an operating pressure of 1500kPa.

The make and type of the expansion bellows is to be submitted to the Engineer for approval.

Expansion bellows must be installed strictly in accordance with the manufacturers' details.

The pipes leading to these expansion bellows and/or offsets must be allowed to move towards these expansion points by means of an anchoring point in between expansions.

Anchoring points are subject to the nature of roofs. Details have to be submitted to the Engineer for approval when copper pipes are installed in wooden roof trusses.

1.2.5 SLEEVES

Copper pipes shall have PVC sleeves or be covered with "THERMAFLEX" or equivalent when passing through walls, partitions, etc. Sleeves or thermaflex to be extended by 100mm on both sides of walls, partitions, etc. These sleeves have to be extended by 100mm on both sides of slabs or firewalls and be large enough to be packed with fireproof materials. Provide HDPE sleeves when passing through firewalls and slabs.

Where silicone is used to finish the packing, special silicone has to be used on hot water pipes. Refer to manufacturer's instructions.

1.2.6 PIPES IN WALLS AND DUCTS

Copper pipes which are chased into walls, concrete, screeds, floors and in general wherever they are in contact with cement have to be wrapped by means of "Green Denso", buff tape or equivalent.

Buff tape is recommended when copper pipes are chased in walls where the finish is only plastering. This will avoid greasy marks on the plastering when pipes are not deeply chased.

Green denso or buff tape shall overlap itself by no less than 25mm.

Green Denso or buff tape shall be extended outside walls, concrete, screeds, etc. by 100 mm and be cut after completion of finishes.

Under no circumstances shall brown paper or cement bags be used.

The Engineer reserves the right to ask the contractor to expose some pipes which have been built into walls, concrete, screeds, etc. If one of the pipes is not wrapped with the described material, the whole installation shall be exposed. This will be at the cost of the contractor, and shall not constitute an extension of time.

In enclosed ducts of copper pipes shall be wrapped with brown paper or masking paper to protect the pipes against splattering of cement.

1.2.7 CLEANING

All copper pipes shall be cleaned off of green marks, cement and paint.

All exposed pipes such as those in kitchens, laundries, cleaners, service passage ways, plantrooms, etc., shall be cleaned, polished and varnished.

1.3 GALVANISED STEEL PIPE INSTALLATIONS

1.3.1 PIPES (NOT FOR DOMESTIC & FIRE USE)

All galvanized steel pipes shall be medium gauge mild steel screwed and socketed pipes to SANS 62-2 (as amended) and shall be normalized and marked SANS by the manufacturer.

Pipes shall be hot dipped galvanized to SANS 32/EN 10240 (as amended) with a minimum of 45 microns.

The normal bores are: 15-20-25-32-40-50-65-80-1100-125-150 mm diameter.

1.3.2 UNDERGROUND INSTALLATIONS

Underground GMS pipes shall be wrapped for their entire length with "Green Denso ". Denso shall overlap itself by not less than 25mm. At termination points, Denso shall stop at 100 mm beyond the interior side of the wall or slab.

1.3.3 FITTINGS

All fittings shall be malleable cast iron fittings to SANS 14/ISO-49 (as amended) and galvanized to SABS 763 (as amended).

All fittings shall be normalized and marked SABS by the manufacturer.

If for any reason the use of fittings other than the above specified are proposed by the contractor, the contractor shall present:

- The reasons
- ISO, DIN, NBN, NF or other standards to the Engineers, who will agree or disagree with their conformity to SABS.

If no qualification is presented in the tender the fittings will have to be as per SABS 509, and marked SABS.

When galvanized pipes are used for waste and ventilation pipes they shall be fitted with brass or galvanized malleable cast iron drainage bends and/or junctions. The bends and junctions shall have inspection eyes when used on waste pipes.

When galvanized pipes are used for waste and vent purposes in walls, concealed places, ceiling or roof voids, leakage may occur during the first period of hand over. The contractor will take the entire responsibility and cost to expose the pipes, repair the leaks, patch floors and walls (including tiling), floor finishes, wall paper, fabrics, ceiling tiles or plastered ceilings and all related works. These works shall not constitute an extension of time.

1.3.4 THREADS

Galvanized pipes shall have screwed ends. Reamed after cutting and threading.

The threads have to be clean, cut to exact length.

An approved compound shall be applied on male threads only.

Joints up to 50 mm may have P.T.F.E. jointing tape equal to 3-M manufacture.

Two threads only may be visible outside the fittings - ± 1 thread tolerance.

Average lengths of threads, excluding extra tolerance, shall be:

- 15 mm diameter	:	13 mm
- 20 mm diameter	:	15 mm
- 25 mm diameter	:	17 mm
- 32 mm diameter	:	19 mm
- 40 mm diameter	:	19 mm
- 50 mm diameter	:	24 mm
- 65 mm diameter	:	27 mm
- 80 mm diameter	:	30 mm
- 100 mm diameter	:	36 mm
- 125 mm diameter	:	40 mm
- 150 mm diameter	:	40 mm

1.3.5 HANGERS AND SUPPORTS

Pipe hangers and supports shall be of galvanized materials.

PVC holder bats may be used for diameters up to 32.

Allowance for expansion must be provided to allow free movement of the pipe within the fixture.

Hangers and supports shall be installed at least 500 mm away from a change of direction, tee or elbow.

Pipe Hangers and brackets shall be installed on the following maximum spacing:

Pipe Diameter (mm)	Horizontal (metre)	Vertical (metre)
15	1.20	1.80
20	1.20	1.80
25	1.80	2.40

32	1.80	2.40
40	1.80	2.40
50	2.40	3.00
65	2.40	3.00
80	2.40	3.00
100	2.40	3.00
125	3.00	3.00
150	3.00	3.00

The base of vertical piping shall be supported by hangers placed on the horizontal branch close to the riser.

Where overhead construction, such as Shofco slabs or shaft openings, do not permit the fastening of hanger rods or pipe clamps in required locations, additional steel framing to be installed by the contractor.

The contractor is to acquaint himself with the type of structure as no additional cost will be agreed for the use of Unistrut elements between walls in the case of such a structure.

Where wood truss roofs are installed, the contractors shall report to the consulting engineers, who in co-ordination with the structural engineer will inform him where the hangers may be fixed in the middle of the truss between two nodes.

1.3.6 DI - ELECTRIC CONNECTIONS

Where galvanized pipes are to be connected to copper fittings an approved di-electric connection shall be installed to prevent reaction between dissimilar metals.

Galvanized pipes shall only be installed upstream of copper pipes. Mixing of GMS-Copper-GMS-Copper is prohibited.

The connection between galvanized pipes and copper pipes shall be done by means of bronze or brass equipment of the de-zincified type.

Where large diameters are used with flanges, insulation joints shall be installed between ferrous and non-ferrous metallic pipe, fittings and valves. Insulating joints shall consist of a sandwich type flange insulating gasket of the dielectric type, insulating washers, and insulating sleeves for flange bolts. Insulating gaskets shall be with outside diameter equal to the flange outside diameter. Bolt insulating sleeves shall be full length.

Units shall be of a shape to prevent metal-to-metal contact of dissimilar metallic piping elements.

Flange gaskets to be suitable for temperature and pressure of the system.

1.3.7 EXPANSION

Provision shall be made for thermal contraction and expansion.

Expansion offsets on expansion bellows shall be installed as indicated on the drawings.

The expansion bellows shall be suitable for an operating temperature of minus 10°C to +100°C at an operating pressure of 1500 kPa.

The make and type of the expansion bellows is to be submitted to the engineer for approval.

Expansion bellows must be installed strictly in accordance with the manufacturers' details.

The pipes leading to these expansion bellows and/or offsets must be allowed to move towards these expansion points by means of an anchoring point in between expansions.

Anchoring points are subject to the nature of the roof. Details have to be submitted to the engineer for approval, especially when galvanized pipes are installed in wooden roof trusses.

1.3.8 SLEEVES

Galvanized steel pipes shall have PVC sleeves or be covered with "THERMAFLEX" or equivalent when passing through walls, partitions, etc. Sleeves or thermaflex be extended by 100 mm on both sides of walls, partitions, etc. These sleeves have to be extended by 100 mm on both sides of slabs or firewalls and be large enough to be packed with fireproof materials. Provide HDPE sleeves when passing through firewalls and slabs.

Where silicone is used to finish the packing, special silicone has to be used on hot water pipes. Refer to manufacturer's instructions.

1.3.7 PIPES IN WALLS AND DUCTS

Galvanized steel pipes which are chased into walls, concrete, screeds, floors and in general wherever they are in contact with cement have to be wrapped by means of "Green Denso", buff tape or equivalent.

Buff tape is recommended when galvanized steel pipes are chased in walls where the finish is only plastering. This will avoid greasy marks on the plastering when pipes neither are nor deeply chased.

Green Denso or buff tape shall overlap itself by no less than 25 mm.

Green Denso or buff tape shall be extended outside walls, concrete, screeds, etc. by 100 mm and be cut after completion of finishes.

Under no circumstances shall brown paper or cement bags be used.

The Engineer reserves the right to ask the contractor to expose some pipes which have been built into walls, concrete, screeds, etc. If one of the pipes is not wrapped with the described material, the whole installation shall be exposed. This will be at the cost of the contractor, and shall not constitute an extension of time.

In enclosed ducts the galvanized steel pipes shall be wrapped with brown paper or masking paper to protect the pipes against splattering of cement.

1.3.8 CLEANING

All galvanized pipes shall be cleaned off of cement and paint.
All exposed pipes shall be painted

1.4 uPVC PIPES

1.4.1 uPVC PRESSURE PIPES FOR UNDERGROUND WATER MAINS

1.4.1.1 Pipes

All uPVC (unplasticised polyvinyl chloride) pressure pipes shall be to SANS 966-1 (as amended), and shall be normalized and marked SABS by the manufacturer. Colour – Blue.

The outside diameter is constant for all classes of a given size. There are five classes representing the working pressures of 400, 600, 900, 1200 and 1600 kPa.

The nominal OD is 20-25-32-40-50-63-75-90-110-125-140-160-200-250-315-355 and 400mm diameter.

Pipes shall be stored on level on timber supports of minimum 100 mm width, placed 1,500 mm apart.

The height of pipe stacks shall not exceed 1 metre. All pipe stacks and stored fittings shall be covered and protected to UV when stored outside.

Where the pipes are fitted with socket or coupling, they shall be stacked with sockets protruding at alternate ends.

1.4.1.2 Fittings

Fittings shall be of uPVC for bends, sockets, repair couplings and double sockets; and cast iron for tees, reducers, flange adaptors, end caps and gate valves.

Steel fittings are to be used for diameters 315-355 and 400. Saddles are to be manufactured from SG iron with galvanized bolts and units, two straps and a rubber gasket.

1.4.1.3 Joints

The joints between pipes or pipes and fittings shall be off the "Lyng" mechanical rubber ring joint type.

All spigots shall be free from burrs; spigots and sockets surfaces must be carefully cleaned.

The rubber ring and the polypropylene insert shall be clean and free of stones, sand and mud. The depth of entry is marked on spigot and must be so positioned as to be just visible outside the mouth of the socket. When pipes are cut on site a chamfer has to be created on the end of the cut pipe.

The chamfer must be uniform to approximately 15°C and must occur around the external circumference of the pipe for $\pm \frac{1}{2}$ of the wall thickness.

The chamfer must be free from burrs.

The contractor has to mark length of entry on the spigot as per the non-cut pipes.

Lubricant shall be applied around the spigot end to approximately half the distance between the pie and the mark which indicates the depth of entry. Lubricant also to be applied on the rubber ring.

All pies crossing under traffic areas shall be backfilled with soil crete and compacted.

Marker blocks shall be installed at all tees or changes of direction.

1.4.1.4 Trenching, bedding and backfilling

All trenching, bedding and backfilling shall be in accordance with SABS 1200-DB/LB/LD (as amended) and to the manufacture's recommendations.

Trenches must be backfilled immediately after laying the pipes, leaving the joints exposed for testing.

The pipes must be laid directly on the prepared bedding in the trench and any temporary supports, bricks or other foreign hard bodies must be removed.

All pipes shall be laid with at least 900 mm cover to the top of the pipe.

Suitably sized air release valves built into valve chambers shall be installed at high points on the pipe line.

1.4.1.5 Anchors

UPVC pressure pipes shall be anchored at all changes of direction, at all valves; all stops ends and all reducers.

Concrete anchor blocks are to be used. The sizes and weights of the anchor blocks are marked on the drawing by the Engineer. If any changes to the layout occur on site, the contractor shall refer to the Engineer who will calculate the new anchor blocks.

Anchor blocks shall be extended onto the socket area of the fitting which is anchored and should be keyed into the undisturbed sides and bottom of the trench.

Anchor points on the pipeline shall be protected by means of layer of plastic sheeting – or Densopol 80H Tape.

1.4.2 uPVC PRESSURE PIPES FOR ABOVE GROUND INSTALLATIONS

1.4.2.2 Pipes

All uPVC (unplasticised polyvinyl chloride) pressure pipes shall be to SABS 966 (as amended) and shall be normalized and marked SABS by the manufacturer. Colour blue-grey.

The outside diameter is constant for all classes of a given size.

There are five classes representing the working pressures of 400, 600, 900, 1200 and 1600 kPa.

The nominal OD is 16-20-25-32-40-50-63-75-90-110-125-149-160-180-200 mm diameter.

Pipes shall be stored on level on timber supports of minimum 100 mm width, placed 1,500 mm apart.

The height of pipe stacks shall not exceed 1 metre. All pipe stacks and stored fittings shall be covered and protected to UV when stored outside.

Where the pipes are fitted with socket or coupling, they shall be stacked with sockets protruding at alternate ends.

1.4.2.3 Fittings

Fittings shall be of uPVC for elbows, tees, junctions, union, couplings, bends, bushes, flanges and adapters.

Fittings of nominal size in the range 16-63mm shall be of Class 16.

Fittings of nominal size in the range 75-200mm shall be of Class 12.

All fittings shall be normalized and marked SABS by the manufacturer. Colour grey.

1.4.2.4 Joints

The joints between pipes or pipes and fittings shall be off two types: Solvent welding and flanged joints.

The solvent welding system shall be done according to the manufacturer's recommendations, using medium glass paper or emery cloth, appropriate cleaner and the correct solvent cement.

Flanged joints are of two types: Full face flanges from 16 to 160 mm diameter, and stub flanges from 50 to 200 mm diameter. Flange shall be of uPVC with the appropriate neoprene gasket.

1.4.2.5 Hangers and Supports

UPVC pipes, due to the high rate of thermal expansion and contraction, shall be supported as follows:

PIPE DIAMETER OD (mm)	HORIZONTAL AND VERTICAL (metre)
12	0.70
16	0.70
20	0.80
25	0.90
32	1.00
40	1.10
50	1.20
63	1.40
75	1.50
90	1.60
110	1.80
125	2.00
140	2.10

	PIPE DIAMETER OD (mm)	HORIZONTAL AND VERTICAL (metre)
	160	2.20
H O	200	2.50

Holder bats shall be of uPVC or aluminium. Holder bats shall permit free axial pipe movement and shall give good bearing support to the pipe.

Heavy valves or other equipment shall be supported independently to avoid distortion of the jointing system.

All steel brackets in contact with the uPVC system shall be free of sharp edges to avoid damage to the pipe.

1.4.2.6 Expansion

UPVC pipes due to the high rate of thermal expansion and contraction shall be fitted with expansion loops, proprietary expansion units or designed with the maximum practical number of changes in direction with anchor at intermediate points.

The engineer's drawings show the position of the expansion loops and the length of their legs.

When the expansion units are installed it shall be with the piston facing upstream. The expansion units shall be pre-set at the time of installation to accommodate the calculated total expansion and contraction. The pipe adjoining the piston end of the expansion unit shall be axially aligned with the unit by the use of two pipe guides firmly fixed to a convenient structure.

The first guide shall be installed at a distance of four times the OD of the pipe, the second at a distance of 10 times the OD of the pipe.

The other supports used on the system shall provide lateral restraint but allow axial movement of the pipe through holder bats.

Where space does not permit a flexible route or the use of expansion loops, rubber bellows may also be used. The rubber bellows shall be of a design sufficiently pliable to flex without damage to the pipe.

Anchoring points shall be submitted to the Engineer for approval, especially when uPVC pipes are installed in wooden roof trusses.

1.4.2.7 Sleeves

UPVC pipes shall have PVC sleeves or be covered with "Thermaflex" or equivalent when passing through walls, partitions etc.

When PVC sleeves are used, the size of the sleeves shall be one diameter larger than the pipe size.

No uPVC pipe shall be used when passing through fire walls and slabs. If no other option can be used, the contractor shall report to the Engineer who will refer to the fire design and either approve or disapprove the installation of such pipes through the fire walls and/or slabs.

1.4.2.8 Cleaning

All exposed uPVC pipes shall is not required; this shall be entirely at the Client's choice. Should the client wish to paint the uPVC pipes, holder bats will have to be opened and painting applied the whole length of the uPVC pipe.

1.5 **HDPE UNDERGROUND PIPE INSTALLATIONS**

Unless otherwise specified all underground pipework < 50mm Ø shall be Class 12 Type 4 HDPE pipe to SABS 533.

All fittings shall be of the "Plascon" compression type, conforming to ISO/DIS 3458.

All pipes shall be laid on a 100mm sand bedding cradle and covered with 300mm of sand or selected material.

All backfilling shall be to the Engineer's specification and approval.

Main fill shall be compacted to:

Minimum 93% of MOD ASHTO density under roads or the density of the appropriate road layer in that position.

90% of MOD ASHTO density in other areas.

No concrete shall come into direct contact with the HDPE pipe. At these points the fittings shall be wrapped with a "DENS POL 80 HT TAPE" or similar approved.

All pipes shall be laid with at least 90mm cover on to the top of the pipe.

Marker block shall be installed at all tees or changes of directions.

All pipe crossings under traffic areas shall be backfilled with soil crete and compacted as specified.

All pipework shall be pressure tested with all joints uncovered to the satisfaction of the Engineer.

Suitable sized air release valves built into valve chambers shall be installed at all high points of the pipe line.

1.6 **CAST IRON PIPES INSTALLATIONS**

1.6.1 PIPES

All cast iron pipes shall be centrifugally spun and manufactured from class 150 grey iron and be in accordance with SABS 1034 (as amended).

All pipes shall be coated inside and outside by submersion into reinforced red oxide primer with corrosion inhibitor.

All pipes shall be marked with trade mark or manufacturer's name and to carry the SABS mark.

The nominal bores are: 50-75-100-150mm diameters. Cast iron pipes shall be supplied in lengths of 2 meters.

1.6.2 FITTINGS

All fittings shall be manufactured from class 150 grey iron and shall be in accordance with SABS 1034 (as amended). All fittings shall be manufactured free of pinholes, blemishes, flash and foundry sand and have a smooth bore.

All fittings shall be shot blasted after manufacture. All fittings shall be coated inside and outside by submersion into reinforced red oxide primer with corrosion inhibitor.

All fittings shall be marked with trade mark or manufacturer's name and to carry the SABS mark.

The nominal bores are: 50-75-100-150 mm diameter.

1.6.3 JOINTS

All cast iron pipes and or pipes and fittings shall be jointed and fixed closely and neatly together with SABS approved stainless steel/Neoprene no-hub coupling.

1.6.4 HANGERS AND SUPPORTS

Cast iron pipes shall be installed with hanger as follows:

Horizontal straight lines	1 per length at 150 mm maximum downstream the joints.
Change of direction	1 on both sides of the change of directions at 150 mm from the joints.
Junctions	1 on the 3 sides of the junction at 150 mm maximum from the joints.
Vertical	1 at 150 mm maximum downstream from the 90° bend or the two 45° bends.
Stacks	1 per length at 150 mm maximum downstream the joints at straight pipes or at any fittings.

The supports shall be SABS manufactured stainless holder bats.

Any other type of supports shall be proposed by the contractor for the Engineer's approval.

Chains, straps, perforated bars or wire hangers are not permitted.

1.6.5 SLEEVES

Cast iron pie shall have PVC sleeves when passing through walls, partitions or slabs. PVC sleeves to be:

75 mm diameter for cast iron 50 mm diameter
110 mm diameter for cast iron 75 mm diameter
160 mm diameter for cast iron 75 mm diameter

200 mm diameter for cast iron 150 mm diameter

Sleeves to be extended by 200 mm on both sides of walls, partitions or slabs to allow a neat cut of the sleeves before completion.

1.6.6 CONNECTIONS TO PVC PIPES

Cast iron pipes and uPVC pipes have different OD and ID.

	CAST IRON		uPVC	
	OD	ID	OD	ID
50 Ø	58mm	50mm	50mm	43.6mm
75 Ø	82mm	72mm	75mm	68.6mm
100 Ø	110mm	100mm	110mm	103.6mm
150 Ø	160mm	150mm	160mm	153.4mm

In the case of horizontal runs the connection of uPVC pipes Ø 110 and Ø 160 onto cast iron pipes of Ø 100 and Ø 150 will not be accepted at the connection to the stacks when a 45°C cast iron junction is provided.

All connections between uPVC pipes and cast iron pipes to be done by means of SSN couplings. Holder bat shall be used on the uPVC pipes to create a fixed point at no more than 300mm from the connections onto cast iron pipe.

1.6.7 CLEANING

All cast iron pipes shall be cleaned off of cement.

All exposed cast iron pipes shall be cleaned off and painted according to the Client's requirements.

Holder bats shall be opened and painting applied the whole length of the cast iron pipes.

PVC sleeves shall be cut off before painting.

1.6.8 UNDERGROUND CAST IRON PIPES

Where any drain passes under a building or where indicated, the pipes shall be cast iron and shall be encased in concrete along its entire length, not less than 200 mm thick measured at the rub. Stainless steel couplings shall be wrapped with denso.

1.7 VALVES FOR DOMESTIC WATER INSTALLATIONS

1.7.1 GATE VALVE UNDERGROUND TO VALVE CHAMBERS TO CONNECT TO UPVC (> 50mmØ)

Gate valves to be equipped with non-rising spindle, spherical graphite iron body to SABS 936 Grade 42, cast iron nitrile butadine rubber covered gate, stainless steel spindle, nitrile butadine rubber o-rings and seals, cast iron bonnet and gunmetal thrust collar to BS 1 400 LG2.

The valve shall conform to SABS 664 and 665, and shall be capable of withstanding a working pressure of 1 600 kPa.

The valve shall be fitted with a square key close to the valve in a clockwise direction and socket ends to SABS 665 to fit into uPVC Class 12 pipe

1.7.2 GATE VALVES UNDERGROUND IN VALVE CHAMBER TO CONNECT TO HDPE PIPING

The gate valves shall be of the dezincified brass type with brass gate, brass body, non-rising spindly and BSP threaded socket ends. The valve shall conform to SABS 776/1965 Class 125. The valve shall be able to withstand a working pressure of 880kPa at 175°C.

1.7.3 GATE VALVES ABOVE GROUND FOR TEMPERATURES UP TO 40°C (>50mmØ)

Gate valves to be equipped with non-rising spindle, spherical graphite iron body to SABS 936 Grade 42, cast iron nitrile butadine rubber covered gate, stainless steel spindle, nitrile butadine rubber o-rings and seals, cast iron bonnet and gunmetal thrust collar to BS 1 400 LG2.

The valve shall conform to SABS 664 and 665, and shall be capable of withstanding a working pressure of 1 600 LG2.

The valve shall be fitted with a hand wheel to close in a clockwise direction. The hand wheel shall be lockable in the open position.

The valves shall be fitted with flanged ends to SABS 1123 / 1600 (1977).

1.7.4 GATE VALVES ABOVE GROUND FOR TEMPERATURES ABOVE 40°C (>50 mmØ)

Gate valves shall be equipped with non-rising spindle, spherical graphite iron body to SABS 963 Grade 52, cast iron gate, gunmetal seat and gate rings, high tensile bronze spindle, cast iron bonnet and gunmetal thrust collar to BS 1400 LG2.

The valve shall conform to SABS 665 and shall be capable of withstanding a working pressure of 1600 kPa.

The valve shall be fitted with flanged ends to SABS 1123/1600 (1977).

1.7.5 GATE VALVES ABOVE GROUND TO FIT COPPER PIPES (< 50 mmØ)

Gate valves shall be equipped with non-rising spindle, gunmetal bronze or dezincified brass body, gunmetal or dezincified brass gate, graphite asbestos packing in the gland.

The valve shall be equipped with flanges to SABS 1123/1600 (1977).

1.7.6 GATE VALVES ABOVE GROUND FOR TEMPERATURES UP TO 100°C (< 50 mmØ)

The gate valves shall be of the dezincified brass type with brass gate, brass body, non-rising spindle and BSP threaded socket ends. The valve shall conform to SABS 776-1965 class 125.

The valve shall be able to withstand a working pressure of 880 kPa at 175°C.

The valve shall be equipped with a hand wheel to close in a clockwise direction. For valves connecting to copper pipes compression gland type valves can be used.

1.8 STRAINERS

1.8.1 STRAINERS FOR CONNECTIONS TO STEEL PIPES (> 50 mm Ø)

These strainers shall be of the Y- type with cast iron body, stainless steel or bronze strainer element and must be equipped-with flanged ends to SABS 1123\1600 (1977). The hole sized of the strainer element shall be and be removable without dismantling of pipework. The strainer shall be suitable for a temperature of up to 90°C at a 1 000 kPa pressure rating.

1.8.2 STRAINERS FOR CONNECTION TO COPPER PIPES (> 50 mm Ø)

This strainer shall be of the Y- type with bronze or dezincified brass body, stainless steel element and must be equipped with flanged ends to SABS 1123-1600 (1977). The hole sizes of the strainer element shall be removable without dismantling of pipework. The strainer shall be suitable for temperature of up to 90°C at a 1 000 kPa pressure rating.

1.8.3 STRAINERS FOR CONNECTING TO STEEL AND COPPER PIPES (< 50 mmØ)

The strainers shall be of the Y- type with bronze or dezincified brass body, stainless steel strainer element and must be equipped with BSP threaded socket ends. The hole sizes of the strainer element shall be 0, 8 mm in diameter. The strainer shall be suitable for a temperature of up to 90°C at a pressure rating of 1 000 kPa.

1.9 NON-RETURN VALVES

1.9.1 NON-RETURN VALVES FOR COLD WATER (> 50 mm Ø)

The non-return valve shall be of the spring loaded dual plate type fitted between two flanges.

The non-return valve shall be equipped with a cast iron body, aluminium bronze plates, stainless steel springs and neoprene seals on the plates. The valves shall be suitable for a working pressure of 1 000 kPa.

1.9.2 NON RETURN VALVES FOR HOT WATER (< 100 mm Ø)

The non return valve shall be of the spring-loaded piston type, with bronze or dezincified brass body, stainless steel spring and bronze disc with neoprene seal fitted with BSP threaded socket ends. The valve shall be suitable for a working pressure of 1 000 kPa.

1.9.3 NON RETURN VALVES FOR COLD WATER (< 50 mm Ø)

The non return valve shall be of the spring-loaded piston type, with bronze or dezincified brass body, stainless steel spring and bronze disc with Neoprene Sea fitted with BSP threaded socket ends. The valve shall be suitable fir a working pressure of 1 000 kPa.

1.10 AIR RELEASE VALVES

1.10.1 DOUBLE ACTING AIR RELEASE VALVES WITH SIZES FROM 50 mm TO 200 mm

The air release valve shall be fitted with a small and large orifice chamber. The air release valve shall be fitted with a cast iron body, stainless steel or fibreglass balls, integral shut off valve and flanged end.

The valve shall be suitable for maximum pressure of 1 600 kPa.

1.10.2 SINGLE ORIFICE AIR RELEASE VALVES

The air release valve shall be fitted with a small orifice, cast iron body, fibreglass ball float and BSP threaded inlet.

When the valve is installed a shut off valve shall be supplied on the inlet side.

The valve shall be suitable for maximum pressure of 1 600 kPa.

1.11 PRESSURE REDUCING VALVES

1.11.1 COMBINATION PRESSURE REDUCING STATIONS

Where a high peak flow can occur as well as a small flow where the small flow is out of the range of the large pressure reducing valve, a small PRV shall be installed in parallel with the large PRV. The two PRV'S in parallel shall be set according to the manufacturers' specification.

1.11.2 LARGE PRESSURE REDUCING VALVES (> 50 mm Ø)

The pressure reducing valve shall be equipped with a cast iron body neoprene-nylon reinforced diaphragm, bronze seal disc washer, stainless steel shaft and flanged ends. The valve shall be pilot operated and shall be designed to handle high flow at a minimum head loss.

The valve must be adjustable to handle a wide range of incoming pressure at a constant downstream pressure.

1.11.3 SMALL PRESSURE REDUCING VALVES (15 mm Ø – 50 mm Ø)

The pressure reducing valve shall be equipped with brass body, balanced single seal, and integral strainer. The valve shall be able to handle a wide range of incoming pressure while the downstream pressure stays constant. Maximum inlet pressure of 1 000 kPa with a maximum water temperature of 40°C.

The valve shall be equipped with BSP male threaded couplings.

1.12 WATER METERS

1.12.1 COMBINATION WATER METERS

Where high peak flow as well as small flow can occur, and the small flow is out of the registration range of large water meter, a small water meter shall be installed in parallel with the large water meter to cater for the small flows.

1.12.2 WATER METERS (50 mm Ø – 150 mm Ø)

These water meters shall be of the dry type with all gears and transmission and roller counters in a dry head, and shall be equipped with flanged ends, cast iron body with high quality corrosion proof coating. The meter must be protected from magnetic fields and must be sealed to prevent tampering with adjustments. The meter must be able to work up to a pressure of 1600 kPa under a maximum water temperature of 40°C. The scale meter must be in m³ and equipped with needle indicators readings in litres. Accuracy of meter to be not less than 98%.

1.12.3 WATER METERS (15 mm Ø – 50 mm Ø)

The meter shall be of the volumetric rotary piston type with brass body equipped with union couplers. The meter reading must be in kilo litres. The meter shall have an accuracy of not less than 98%. The meter must be able to operate up to a water pressure of 1 000 kPa at a water temperature of 40°C.

1.13 STERILISING OF WATER PIPES

Before any pipeline is taken into use, it shall be sterilized over its complete length. The pipe shall be filled with potable water chlorinated to a concentration of 15 mg of chlorine per litre of water which shall remain in contact with the inner surface of the pipeline for a period of not less than 24 hours. The pipeline shall be filled for sterilizing in such a manner that no chlorine shock is created or air trapped in the pipeline.

At least 14 days prior to the commencement of sterilizing the contractor shall submit full details of the provided method of sterilizing the pipeline to the Engineer for his approval.

The cost of water for filling the pipeline for sterilizing shall be done by the contractor.

The contractor shall provide all necessary materials, tools, equipment, and labour necessary to sterilize the pipeline. After sterilizing the pipeline the contractor shall, at no extra cost, empty the pipeline and dispose of the water in a manner approved by the Engineer.

The contractor may use the following products as a source of chlorine:

Chloride of lime to SABS 295 yielding 33% frees chlorine by mass.
Calcium hypochlorite to SABS 295 yielding 70% frees chlorine by mass.
Chlorine gas applied by chlorinator.

The sterilizing of the pipes shall be witnessed by the Engineer.

1.14 PRESSURE TESTING OF PIPES

All pipes shall be pressure tested before taken into use. This pressure test shall be witnessed by the Engineer.

Completed sections of the pipe installation shall be filled with water after all branches have been plugged, sealed or closed.

The section of pipe shall be pressure tested by means of a suitable manually operated or mechanically driven pressure pump.

A pressure of at least 1,5 times the working pressure of the class ratings of pipes, or fittings shall be applied for a period of time specified in the specifications or as recommended by the manufacturers. (Refer to SABS 1200 for minimum and maximum pressure test pressures.)

Test should not be performed against closed valves.

Leakage which occurs shall be measured and calculated and checked against the allowable losses, as specified in SABS 1200.

If the completed section of pipe complies with all specifications and passes the tests and inspection, it could be approved and the Contractor may be instructed to backfill the open sections of trench at the joints and connections.

The Contractor shall then proceed to build all the valve chambers and inspection chambers, etc.

The Supervisor shall also check that all valves operate satisfactorily and open and close in the correct rotation as specified.

The Quantity Surveyor shall be notified to measure the quantities of all the materials.

1.15 PUMPS

PUMP TYPES

Pumps shall be of the non-overloading, centrifugal, volute type. Pumps generally shall be of the horizontally split, double suction type, operating at not over 1500 r.p.m.

Pumps having discharge connections not exceeding 200mm (Nominal pipe size) and operating at not over 38 metres of water dynamic head may be of the vertically split, single suction type having the casing secured directly to the bedplate and operating at not over 1500 r.p.m. Pumps having discharge connections not exceeding 100mm NB and operating at over 38 metres but not over 72 metres, total dynamic head, may also be of this type and may operate at not over 3000 r.p.m.

Pumps having discharge connections not exceeding 75mm NB may be of the vertically split, single suction type, and may be of the close coupled type in which the impeller is bracket-mounted type in which the casing is overhung from the bearing bracket. Pumps of either type shall operate at not over 1500 r.p.m. except that where the total dynamic head exceeds 18m; speeds not exceeding 3000 r.p.m. will be permitted.

1.15.1 PUMP CASINGS

Casings of horizontally split pumps shall be designed for a working pressure of 8, 5 bar or 1, 5 times the actual discharge pressure, whichever is greater. Casings of vertically split pumps shall be designed for working pressures of 5 bar or 1, 5 times the actual discharge pressure whichever is greater. Pressure classification of flange connections shall correspond to casing working pressures.

All pumps having discharge connections larger than 75mm NB and operating at more than 18m total dynamic head shall be provided with casing wearing rings. Rings shall be of bronze chrome iron, nickel iron or other composition suitable for the individual application.

High points of pump casings shall be provided with air vent cocks. Cocks shall be extended outside of any insulation specified. Low points of casings shall be provided with valved drains and inlet and outlet connections shall be provided with properly located gauge tappings. Each

removable casing weighing over 23 kg shall be provided with a lifting eye or lugs of ample strength. Casing brackets of vertically split pumps equipped with stuffing boxes shall be arranged to have drip pockets. A drip pipe shall be run from each drip pocket and terminate with an approved air gap over the nearest drip funnel or floor drain.

1.15.2 PUMP IMPELLERS

Impellers shall be bronze and shall be dynamically balanced. Hot water circulating pumps shall be of an "all bronze" construction.

Impellers of pumps having 38mm and larger discharge connections shall be fully enclosed and hydraulically balanced. Actual impeller size selected shall not exceed 85% of maximum impeller size possible in casing.

1.15.3 PUMP SHAFTS

Shafts for pumps with stuffing boxes shall be stainless steel, monel metal or shall be carbon steel with sleeves of bronze, chrome iron or nickel extending through the stuffing boxes.

1.15.4 PUMP BEARINGS

Bearings for close coupled pumps shall be of the ball or roller type. Bearings for all other pumps shall be either ball or roller bearings or ring oiled or wool packed sleeve bearings with ample oil reservoirs. Thrust bearings shall be either the ball or Kingsbury type. Bearings shall be effectively sealed to prevent loss of oil and entrance of dirt or water.

1.15.5 STUFFING BOXES AND PACKING

Stuffing boxes shall be deep enough for not less than 4 rings of packing and shall have bronze glands. Glands for horizontally split case pumps shall be split. Pumps of 38mm size and larger operating with a suction lift shall be equipped with bronze lantern rings and external or internal water seal connection with needle valves.

Packing shall be suitable in all cases for the service required with proper consideration of water pressure, temperature, temperature changes and sediment carried in water. Mechanical seals may be provided in lieu of stuffing boxes where recommended and guaranteed by the pump manufacturer for the particular service involved.

1.15.6 FLEXIBLE COUPLINGS

All pumps, other than close coupled pumps, shall be provided with suitable flexible couplings which shall impose no restriction on normal end play and expansion.

Each flexible coupled pump shall be provided with a cast iron fabricated steel bed plate of ample size to hold both pump and motor in correct alignment. Pump and motor shall be accurately aligned when running at normal temperature. Bed plates of horizontally split pumps shall have raised lips and drain connections. A drain pipe shall be run from each drain connection and terminated with an approved air gap over the nearest drip funnel or floor drain.

1.15.7 PUMP EFFICIENCY

The efficiency of each pump shall not be less than 70% and not more than 3% below the peak of the efficiency curve for the impeller furnished.

Catalogue data submitted for approval shall include characteristic curves.

1.15.8 PUMP MOTORS

Each pump shall be equipped with an electric motor. The name plate rating of the electric motor shall be not less than the maximum brake horse power required by the pump at any operating head characteristic from zero to shut-off, or as otherwise specified. Electric motors shall be suitable for Star-Delta starting, if larger than 7, 5 Kw, and shall be totally enclosed fan-cooled.

1.15.9 WEATHERPROOF COVERS

Each pump and motor mounted externally to the plant room or building shall be protected by a removable galvanised sheet metal cover. The cover shall be designed to have sufficient space for ventilation of the electric motor.

PART 2 – DETAILED TECHNICAL SPECIFICATION

DETAILED TECHNICAL SPECIFICATION

2. DETAILED SPECIFICATION

2.1 TYPE OF CONTRACT

This contract will be a Domestic sub-contract to the Main Contract.

2.2 GENERAL

The booster pump system to consist of a package unit with two pumps complete with its own control system and manifolds for suction and discharge (Stainless Steel).

The set will be located in a plantroom near storage tank.

2.3 SCOPE OF WORK

- i) Supply install pump set to specification complete with all pipework within plantroom as per layout drawing.
- ii) Commission pumps and train staff on operation of pumps.
- iii) Supply of water to pumps and connection from discharge point by civil contractor.

CONCEPT OF OPERATION

A common booster ring main installed from outside pump room around site, by civil contractor or will supply all domestic supply points and fire hose reels.

PUMP POWER CONTROL PANEL DESIGN

- (i) Main incoming isolator and amp meter.
- (ii) Circuit breaker for each pump (2-Off)
- (iii) Flow switch control to cut off pumps in the event the pumps run dry (This will form oart of pump control)
- (iv) Fire storage level float switch control in tank to send signal to relay to raise alarm via strobe light warning when domestic use water storage is depleted.
- (vii) Provide over load voltage protection on mains supply to pump panel.

LEVEL-1 : Float control warning via strobe light.

2.4 PROGRAMME AND COMPLETION

- a) All work included in this contract shall be completed before or concurrently with the completion programme.

Tenderers are to take cognizance of the fact that they will be working with the Principal Contractor as well as other sub contractors and they have to adhere to the Principal Contractors programme as well as co-ordinate the electrical requirements.

b) **ORDER OF THE WORKS**

Existing Building Upgrade

- c) **BUILDINGS OCCUPIED:** Works will be carried out as per Architects Instruction.

2.5 LOCAL CONDITIONS

Tenderers must acquaint themselves fully with the project, the local conditions and the requirements of the specification. Late claims by the successful Tenderer for extra payment arising out of underestimating any of the requirements will not be considered by the Client. Tenderers are advised to attend Compulsory Site Inspection at time of Tender.

2.6 CODE OF PRACTICE

The latest editions and/or amendments of the following Standards and Codes shall be considered a minimum requirement. In the event of differing requirements the most stringent Code or Standard shall apply:-

2.6.1 THE MACHINERY AND OCCUPATIONAL SAFETY ACT OF SA OF 1983, AS
amended.

2.6.2 SA BUREAU OF STANDARDS STANDARD 0287.

2.6.3 SANS 10252-2: 2004 AS AMENDED

2.6.4 BSS VDE AND ICE STANDARDS AND CODES OF PRACTICE.

2.6.5 THE LATEST EDITION OF THE STANDARD WIRING REGULATIONS (SABS 0142-1981) as amended

2.6.6 ANY REGULATIONS, BYLAWS OR SAFETY REGULATIONS APPLIED BY THE LOCAL authority.

Samples of equipment and material intended for use in the sub-contract works may be requested by the Engineer before work is commenced and such samples may be retained until completion of the sub-contract.

2.7 DAMAGE TO BUILDING AND INJURY TO PERSONS

The Sub-contractor shall, during the execution of the sub-contract, indemnify the Project Manager in respect of all claims arising out of injury or deaths of any person lawfully on the premises, whose injury or death is caused by the execution of this sub-contract.

2.8 DELIVERY AND STORAGE

The Sub-contractor must make his own arrangements for the transportation of material and workmen to the site. He will be responsible for the safe storage of all materials, tools and equipment against theft or damage, whether such materials or equipment is installed under this contract or not.

2.9 RESPONSIBILITY

Until the sub-contract works have been taken over, or are deemed to have been taken over under the Conditions of Contract, the Sub-contractor shall be responsible for the sub-contract works, whether under construction, during test or in use for the employers.

2.10 EQUIPMENT AND MATERIAL

It is the intent of these specifications that wherever a manufacturer of a product is specified, the terms "other approved" or "approved equal" are used, the substituted item must conform in all respects to the specified item. Consideration will not be given to claims that the substituted items meet the performance requirements with lesser construction (such as lesser heat exchange surface etc.) Performance as delineated in schedules and in the specifications shall be interpreted as minimum performance. In many cases equipment is oversized to allow for pick up loads which cannot be delineated under the minimum performance.

Substituted equipment, where permitted and approved, must conform to space requirements. Any substituted equipment that cannot meet space requirements, whether approved or not, shall be replaced at the Sub-contractors expense.

Alternative equipment from that as noted or required on the drawings and / or the specification may only be supplied the written approval of the Engineer.

All other things being equal, preference will be given to South African manufactured materials and equipment.

All equipment and materials required for installation under these specifications shall be new and without blemish or defect.

Substitution of mechanical equipment for that shown on the schedules or designated by model number in the specifications will not be considered if the item is not a regular catalogued item shown in the current catalogue of the manufacturer.

All equipment of any one type (such as fans, pumps, coils etc) shall be the products of one manufacturer.

2.11 ITEMS

The installation shall include everything necessary and installed to the approval of the Engineer. The supply and installation of equipment required for adherence to the Standards and Codes may not have been indicated in detail on the drawings or in the other parts of the specification, but will nevertheless be considered included in the contract value.

The same make and type of apparatus shall be used for similar items throughout the installation.

2.12 COMPLETION OF WORKS

Completion of the sub-contract works shall include the instruction of a person or persons, appointed by the Employer, in the correct and efficient operation and in the function of the installation.

2.13 TESTS AND INSPECTION

Notwithstanding the carrying out of tests and submission of test certificates, the Sub-contractor will in no way be relieved of the responsibility for the successful and efficient operation of the equipment on site of his liability for its conforming to the various laws. The Engineer reserves the right to carry out any tests prior to final acceptance to ensure that the equipment conforms to this specification. After completion, either in part or as a whole, the complete installation shall be tested in accordance with the Acts, Ordinance, Regulations, By-laws and rulings applying to the particular installation

2.14 GUARANTEE

The 12-month guarantee called for in the Supplementary Specification, shall apply to all items of plant such as Pumps, etc. Delivered to site and/or erected. It is the responsibility of the Contractor to negotiate with the suppliers in order to secure equipment guarantee on this basis.

The date of acceptance shall be that appearing in the acceptance Certificate issued by the Department and shall define the start of 12-months guarantee and 12-months free maintenance period.

No Claims for extended guarantee or otherwise from the Suppliers, Principals, etc. will be considered even if equipment is required on site long before acceptance date.

PART 3 – EQUIPMENT SCHEDULE

3.1) Booster Pumps - (2-Off) (Assembled As One Package Unit)

<u>DESCRIPTION</u>	<u>VALUE</u>
Type	Multi Stage Centrifugal Pump
Size	KELI DL 12-40
Impeller Material	Stainless Steel
Pump Housing Material	Stainless Steel
Shaft Seal Type	Mechanical
Shaft Material	Stainless Steel
Flow	12m ³ @ 4 Bar
<u>INSTALLATION</u>	
Operating Water Temp	Ambient 20°c
Max Operating Pressure	400 kpa
Pump Suction Size (Inlet)	75Ø
Pump Suction Size (Outlet)	75Ø
<u>ELECTRICAL</u>	
Pump Motor Type	Efficiency IE-5
Pump Motor (KW)	3 Kw
Rated Voltage	3 Phase, 400V / 50Hz
Motor Protection	Yes , IP-54
<u>TECHNICAL</u>	
Efficiency	56,2%
Actual Calculated Flow	200 L/min
Resulting Pump Head	350 Kpa
Gross Weight	102 Kg
Pump Base	Stainless Steel
Pressure Vessel Cap	25 L

Note:

- 1.) Pump set to be supplied as a complete factory tested unit.
- 2.) Each pump to be of the vertical multistage pump complete with stainless steel base and control panel. Power supply to each pump panel to be from primary control panel specified.
- 3.) Pump set is to be supplied with its own hydrosphere to maintain pressure, pressure transducer and pressure gauge.
- 4.) Pump control panel supplied with pumps to spec.
- 5.) Pump operation run / stand-by on flip/flop, stop and start or alternatively both pumps to run to meet emergency demand.
- 6.) Pump to be supplied as a package unit mounted on common base with common stainless steel manifold c/w isolation and NRV.
- 7.) All associated low level indication with alarm and override switch to be part of pump panel.

PART 4 - BILLS OF QUANTITY

SCHEDULE OF QUANTITIES – NOTES TO TENDERERS

4.1 THESE BILLS OF QUANTITIES CONTAIN PAGES NUMBERED CONSECUTIVELY IN EACH BILL. BEFORE THE TENDERER SUBMITS HIS TENDER HE SHOULD CHECK THE NUMBER OF PAGES AND IF ANY ARE FOUND TO BE MISSING, DUPLICATED OR INDISTINCT, OR THE BILLS OF QUANTITIES CONTAIN ANY OBVIOUS ERRORS, HE SHOULD APPLY TO THE ENGINEER IMMEDIATELY TO HAVE SAME RECTIFIED OR CLARIFIED AS NO LIABILITY WHATSOEVER WILL BE ADMITTED BY THE ENGINEER IN RESPECT OF ERROR IN THE BID DUE TO THE FOREGOING.

4.2 THE BILLS OF QUANTITIES FORM PART OF AND MUST BE READ IN CONJUNCTION WITH THE SPECIFICATIONS AND DRAWINGS WHICH CONTAIN THE FULL DESCRIPTION OF THE WORKS TO BE CARRIED OUT AND MATERIALS AND EQUIPMENT TO BE USED.

4.3 TENDERS SHALL BE SUBMITTED FOR INITIAL CONSIDERATION ON THE DECLARATION OF THE TOTAL VALUE OF THE BILL SUMMARY, NON-SCHEDULED BILL ITEM RATES AND EXTRA OVER RATES. TO ENABLE THE ENGINEER TO THOROUGHLY ASSESS THE MERITS OF TENDERS SUBMITTED THE BILLS PRICED IN DETAIL SHALL BE MADE AVAILABLE UPON REQUEST WITHIN 2 DAYS AFTER CLOSING DATE OF TENDERS.

4.4 THE TOTAL TENDER SUM IN THE FORM OF TENDER OR OTHER SUBSEQUENTLY NEGOTIATED BETWEEN THE ENGINEER AND TENDERER SHALL CONSTITUTE THE CONTRACT SUM OF THE SUCCESSFUL TENDERER. TENDERERS ARE ADVISED TO CHECK THEIR ITEMS EXTENSIONS AND TOTAL ADDITIONS, AS NO CLAIM FOR ARITHMETICAL ERRORS WILL BE CONSIDERED.

4.5 NO ALTERATION, ERASURE OR ADDITION IS TO BE MADE IN THE TEXT OF THE BILLS OF QUANTITIES. SHOULD ANY ALTERATION, ERASURE OR ADDITION BE MADE, IT WILL NOT BE RECOGNISED AND THE ORIGINAL WORDING OF THE BILLS OF QUANTITIES WILL BE ADHERED TO.

4.6 THE PRICED BILLS OF QUANTITIES OF THE SUCCESSFUL TENDERER WILL BE CHECKED AND THE ENGINEER RESERVES THE RIGHT TO CALL FOR REASONABLE ADJUSTMENTS TO ANY INDIVIDUAL PRICE AND TO RECTIFY ANY DISCREPANCY WHILST THE TOTAL TENDER PRICE, AS SUBMITTED, REMAINS UNALTERED.

4.7 THE RESPONSIBILITY FOR THE ACCURACY OF THE QUANTITIES WRITTEN INTO THE BILLS REMAINS WITH THE PARTY WHO PREPARED THE BILLS. THE BIDDER SHALL BE RELIEVED OF THE RESPONSIBILITY OF MEASURING QUANTITIES AT THE TENDER STAGE, EXCEPT FOR PIPING AND ELECTRICS AND SUCH OTHER ITEMS AS MAY BE NOTED WHICH ARE LUMP SUM ITEMS AND ARE TO BE SUBMITTED IN DETAIL WITH THE DETAILED BILL. THE TENDER SUM SUBMITTED SHALL BE IN RESPECT OF THE QUANTITIES SET OUT IN THE BILLS, ALTHOUGH THE TENDERER WILL BE REQUIRED TO MAKE HIS ASSESSMENT OF ITEMS SUCH AS FIXINGS, PIPE SUPPORTS, DUCT SUPPORTS, ETC, AVM PADS, ETC AND SHALL INCLUDE IN THE ITEM PRICES FOR SUCH SMALL INSTALLATION MATERIALS AS ARE REQUIRED FOR THE COMPLETE INSTALLATION IN ACCORDANCE WITH THE SPECIFICATION.

4.8 THE SUB-CONTRACTOR AND THE EMPLOYER OR HIS AGENT MAY AGREE THAT THE TOTAL BILL OR BILLS INCLUDING ANY VARIATIONS BY WAY OF ADDITIONS THERETO OR DEDUCTIONS THEREFROM, REPRESENTS A FAIR AND ACCURATE QUANTIFICATION OF THE ITEMS SET OUT IN THE BILLS AND THE PARTIES MAY AGREE FINAL PAYMENT ON THAT BASIS. IN THE EVENT OF ANY DISPUTE AS TO THE QUANTITIES, THE DISPUTED ITEMS SHALL BE ADJUSTED WHERE NECESSARY.

4.9 THE QUANTITIES IN THESE BILLS OF QUANTITIES ARE NOT TO BE USED FOR ORDERING PURPOSES.

4.10 VARIATIONS IN THE SCOPE AND EXTENT OF THE WORK INCLUDED IN THE BILLS SHALL BE ALLOWED TO MEET THE EMPLOYER'S REQUIREMENTS.

4.11 UNLESS SEPARATE RATES FOR THE SUPPLY AND INSTALLATION OF ANY ITEM IS SPECIFICALLY CALLED FOR, THE SUPPLY AND INSTALLATION COSTS OF ANY ITEM SHALL BE FULLY INCLUDED IN THE UNIT PRICE.

4.12 THE RATES INCLUDED FOR NON-SCHEDULED BILL ITEMS SHALL FORM PART OF THE TENDER, AND WILL ONLY BE PAYABLE TO THE SUB-CONTRACTOR IF AND WHEN COVERED BY A VARIATION ORDER.

4.13 TENDERERS SHALL PRICE THE PRELIMINARIES UNDER ANY OR ALL OF THREE GROUPS, VIZ:

4.13.1 Fixed amount

4.13.2 An amount varied in proportion to the final contract value as compared to the BID price.

4.13.3 An amount varied in proportion to the final contract period as compared to the originally specified contract period.

4.13.4 THE ALLOCATION OF PRICES TO THE THREE LISTED ABOVE MUST BE REALISTIC AND THE SUB-CONTRACTOR MAY BE REQUIRED TO JUSTIFY THE ALLOCATION OF THE PRICES. ATTENTION IS PARTICULARLY DRAWN TO THE RIGHT RESERVED IN TERMS OF CLAUSE 6.6 ABOVE.

4.13.5 ALL PROVISIONAL SUMS SHALL BE EXPENDED AS DIRECTED BY THE ENGINEER AND ANY BALANCE REMAINING SHALL BE DEDUCTED FROM THE TOTAL CONTRACT SUM.

4.13.6 THE QUANTITIES IN THESE BILLS OF QUANTITIES ARE MEASURED PROVISIONALLY. ALL WORK EXECUTED IN ACCORDANCE WITH THE WORKSHOP DRAWINGS APPROVED BY THE ENGINEER SHALL BE RE-MEASURED AND PRICED AT RATES CONTAINED IN OR BASED ON THE PRICED BILL OF QUANTITIES.

4.13.7 MONTHLY PROGRESS CLAIMS SHALL BE SUBMITTED ON A DRAWING RE-MEASURE BASIS IN THE BILL OF QUANTITIES FORMAT. PRELIMINARIES, SO CLAIMED SHALL BE PRO-RATA TO THE CONTRACT SUM LESS PRELIMINARIES, CONTINGENCIES, PROVISIONAL SUMS AND CONTRACT PRICE ADJUSTMENT PROVISIONS.

ELLIOT MAGISTRATE COURT: REPAIRS AND RENOVATIONS

[illegible]

ELLIOT MAGISTRATE COURT: REPAIRS AND RENOVATIONS
BOOSTER PUMP SPECIFICATION

Item	Description	Unit	Qty	Rate	Amount
	<u>Domestic Booster Pump Set. VSD (Package Unit)</u>				
1	Pump Set To Spec (Includes Run / Stand-By) c/w S/S manifold (2 - Pump in set) Flow rate is 3,3 L/s each and maximum pressure is : (430 Kpa) ; operating pressure is : (350 Kpa) (Supply , Delivery , Installation)	item	Set		
	<u>Copper Pipework - (Class - 3)</u>				
2	54mm Ø	m	10		
	<u>Elbows</u>				
3	54mm Ø	item	8		
	<u>Flanges</u>				
4	54mm Ø	item	12		
	<u>Isolating Valves - (Brass Type)</u>				
5	54mm Ø	item	4		
6	22mm dia - (Drain Valve)	item	2		
	<u>Non Return Valves</u>				
7	54mm Ø	item	2		
	<u>Y' Strainer Flanged</u>				
8	54mm Ø	item	2		
	<u>Sockets</u>				
9	22mm dia.	item	4		
10	Male Iron to Copper Fitting - 54mmØ	item	12		
	<u>Gauges - (Fluid Type)</u>				
11	Pressure Gauges	item	2		
12	Automatic Air Vent - 28mmØ	item	1		
	<u>Pipe Supports</u>				
13	set	set	1		
	<u>Painting of Pipework</u>				
14	set	set	1		
	<u>Electrics</u>				
15	Electrical Cabling + connection between isolator and equipment (6m)	set	1		
16	<u>Control Panel</u> : To Spec including circuit breaker for pumpset and low level control signal from tank float switch (See schematic drawing)	set	1		
	Total for Bill No.1 carried to Summary Page				

ELLIOT MAGISTRATE COURT: REPAIRS AND RENOVATIONS
BOOSTER PUMP SPECIFICATION

Item	Description	Unit	Qty	Rate	Amount
	<u>MISCELLANEOUS ITEMS</u>				
1	Shop and As Built Drawings to Spec. - (3 Copies Supplied)	sum	sum		
2	12 Months Maintenance & Guarantee	sum	sum		
3	O & M Manuals to spec.- (3 Copies Supplied)	sum	sum		
4	Transport	sum	sum		
5	P & G's Carried Forward from first page	sum	sum		
6	Commissioining	sum	sum		
7	Staff Training	sum	sum		
Total for Bill No.2 carried to Summary Page					

Item	Description	Amount
	<u>PRICE</u> <u>SUMMARY PAGE</u>	
1	Total Carried Forward For - Bill 1	
2	Total Carried Forward For Bill 2 - MISCELLANEOUS ITEMS	
	TOTAL NETT	
	ADD: 15% Value Added Tax	
	TOTAL ESTIMATED PRICE (INCL VAT)	
Completed By:		
Signature: _____		
Name: _____		
On behalf of: _____		
Date: _____		

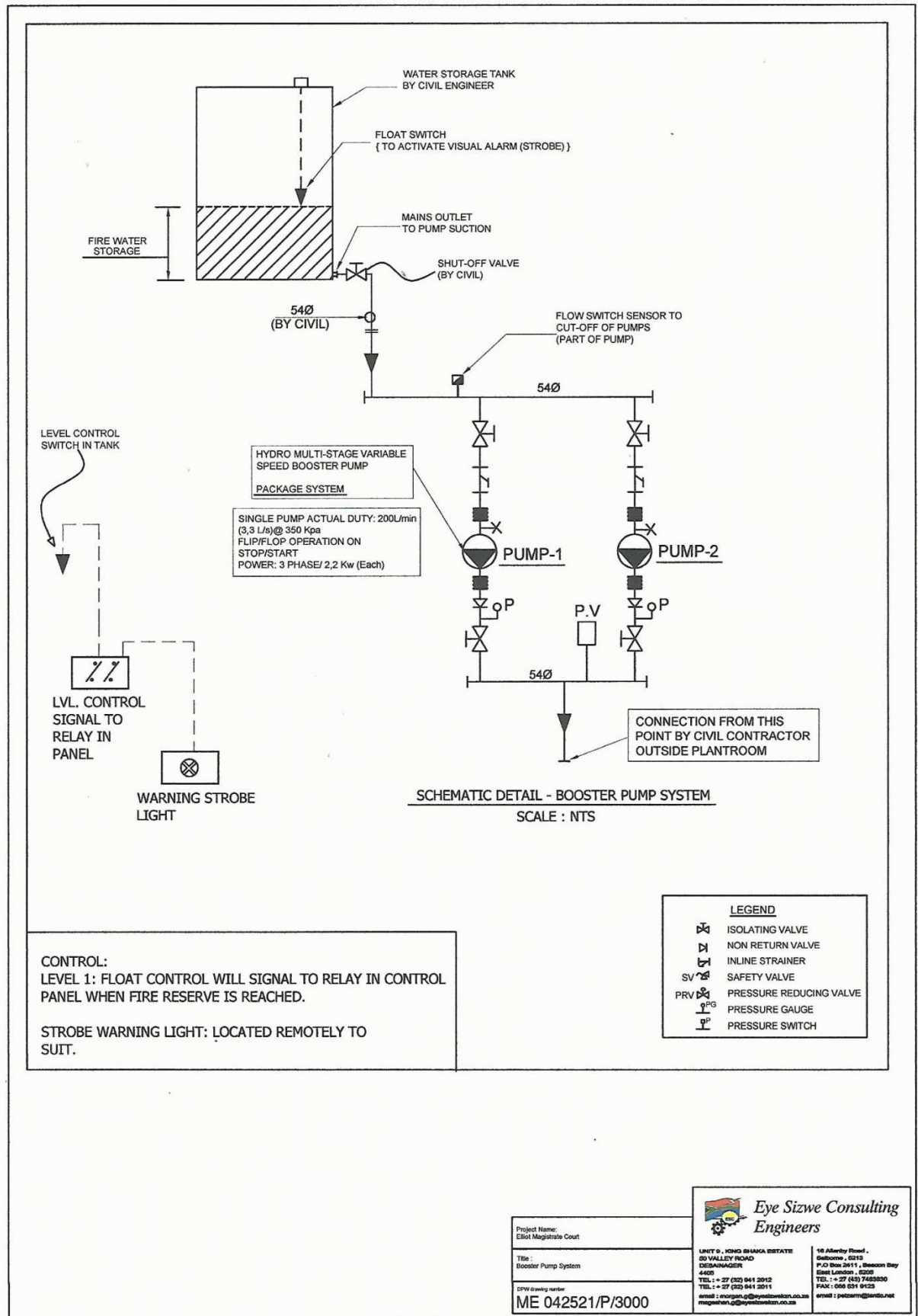
PART 5 –
SCHEMATIC DETAIL DRAWING
(BOOSTER PUMP SYSTEM)

SCHEDULE OF DRAWINGS

The following drawings are **ON THE NEXT PAGE OF THIS DOCUMENT.**

DRAWING NO.	TITLE
ME 042521/P/3000	Schematic Detail of Booster Pump System

ELLIOT MAGISTRATE COURT: REPAIRS AND RENOVATIONS
BOOSTER PUMP SPECIFICATION



COEGA DEVELOPMENT CORPORATION (PTY) LTD

ELLIOT MAGISTRATE COURT : PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION

(BID NO: CDC/163/25)

C2.3e

Fire Detection Installation

Specification and Pricing Schedule



public works
Department:
Public Works
REPUBLIC OF SOUTH AFRICA

COEGA DEVELOPMENT CORPORATION (PTY) LTD

FOR

**REPAIRS AND ADDITIONS TO
ELLIOT MAGISTRATE COURT**

FIRE DETECTION INSTALLATION

SPECIFICATION AND PRICING SCHEDULE

PREPARED FOR:

Coega Development Corporation (Pty) Ltd
Harraway House, No 12
Pearce Street
Berea
East London
5241

PREPARED BY:

Eye Sizwe consulting Engineers
16 Allenby Road
Selborne
East London
5213

NAME OF TENDERER: _____

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ELECTRICAL / MECHANICAL
Eye Sizwe Consulting Engineers
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INDEX

- PART 1 STANDARD SPECIFICATION
- PART 2 DETAILED TECHNICAL SPECIFICATIONS
- PART 3 BILLS OF QUANTITY
- PART 4 DETAIL DRAWING
(FIRE DETECTION SYSTEM)

PART 1 - STANDARD SPECIFICATION

1.1.1 STANDARD SPECIFICATIONS FOR FIRE DETECTION, SECURITY AND ACCESS CONTROL SERVICES

The Department of Public standard technical specifications, issued as a separate document, is intended to be read in conjunction with the Bid documents issued by Eye Sizwe Consulting Engineers. The applicable standards are listed below.

The documents may be obtained from the Department of Public Works website www.publicworks.gov.za

NOTE : Any Supplementary specifications relating to a particular project will be incorporated in the relevant Bid Document and must be read in conjunction with these Standard Specifications.

STANDARD TECHNICAL SPECIFICATIONS

Installation to conform to SANS 10139 – 2012 Edition 3.2 – Fire Detection and alarm systems for buildings – System design, installation and servicing.

PART 2 – DETAILED TECHNICAL SPECIFICATION

DETAILED TECHNICAL SPECIFICATION

2. DETAILED SPECIFICATION

- NOTE 1** Bidders are advised that this Bid is based on the Department of Public Works standard 'commissioning and maintenance of all aspects of this Bid.
- NOTE 2** Bidders must acquaint themselves fully with all requirements of the Standard Specifications. Where prices are to be obtained from suppliers of equipment, Bidders must ensure that their suppliers are also fully conversant with the Standard Specifications.
- NOTE 3** The Engineer will therefore rigidly enforce each and every requirement of the Standard Specifications. All works shall be executed in accordance with "good engineering practice".
- NOTE 4** Unless otherwise agreed or specified by the Engineer, all equipment shall be of South African manufacture.

2.1 TYPE OF CONTRACT

This contract will be a Domestic sub-contract to the Main Contract.

2.2 GENERAL

The area to be protected is an existing safe and records room.

2.3 SCOPE OF WORK

There are two systems to this installation.

SYSTEM-1 : Supply and install to specification, a fire detection system. The primary function of this installation is to detect fire within this area and activate an alarm system.

Its secondary function is to provide fire detection signals (2-Off minimum) to the gas suppression system. This installation consists of an alarm panel, one call point, a strobe/sounder unit and three smoke detectors.

SYSTEM-2 : Supply and install to specification, a fire suppression system to this area.

This system to operate on a "Double Knock" signal, ie: Only when two activation signals is received from the fire detection panel, the gas manifold will be activated to release the inergen thro' the ceiling mounted nozzles, to suppress the fire.

All equipment and fittings as per BOQ.

2.4.1 WORK CARRIED OUT BY OTHERS

The following work to be done by others:-

- (i) All builders work including the forming of holes in walls and making good after installation.
- (ii) The cutting of holes in suspended ceiling and ceiling tiles for the fixing of detector heads, sirens and other devices.
- (iii) 15amp 220V essential power supply to main control panel and essential power supply to slave panels as indicated on drawings.

2.4.2 SITE VISIT: COMPULSORY AS PER BID ADVERT

2.4.2.1 SITE ACCESS

Elliot Magistrate Court is located in Elliot.

2.4.2.2 SECURITY OF MATERIALS AND EQUIPMENT

Unless expressly allowed for in the contract sum, the Bidder shall in connection with the works, provide and maintain, at his own cost, all lights, guards, barriers, fencing and watching when and where necessary or as required by the Engineer or by any competent statutory or other authority for the protection of the works or for the safety and convenience of the public.

2.4.2.3 STORAGE

The Sub Contractor must provide adequate storage, to the satisfaction of the Engineer, for all materials supplied to him. All material must, in addition be stored or stacked in positions that will not interfere with other work in progress in the area.

2.4.2.4 SUITABLE AND SUFFICIENT PLANT AND MATERIAL

The Sub Contractor shall supply and use such suitable and sufficient plant, equipment and materials as may be required for the efficient carrying out of the contract work and shall, when called upon in writing by the Engineer to do so, furnish returns showing details of all plant, equipment and material employed on the contract.

2.4.2.5 REGULATIONS, FACTORIES ACT AND BY-LAWS

The work shall be carried out strictly in accordance with :

- (a) the latest issue of "SANS 10142 : Code of Practice for the Wiring of Premises", hereafter called the "Wiring Code" – If Required.
- (b) the "Occupational Health and Safety Act" of 1993 as amended to date and hereafter called the "Act",
- (c) the Municipal By-Laws and any special requirements of the local Supply Authority;
- (d) the local Fire Office Regulations.
- (e) The National Building Regulations and Building Standards Act 1977 (Act 103 of 1977) as amended
- (f) Installation to conform to SANS 10139 – 2012 Edition 3.2 – Fire Detection and alarm systems for buildings – System design, installation and servicing

In addition, the work is to be of high standard and to the satisfaction of the Engineer.

2.4.2.6 QUALITY OF MATERIALS

Only "new" materials of first class quality shall be used and all materials shall be subject to the approval of the Engineer.

Wherever applicable, the material is to comply with the SANS 10139 – 2012.

All materials are to be priced as specified and no alternatives will be entertained during the Bid process.

Materials, wherever possible, must where possible be of South African manufacture.

2.4.2.7 PRELIMINARY AND GENERAL

The contractors charges for completing an item scheduled in the preliminary and general section of the schedule shall be interpreted to be his rate or price to cover his direct costs plus overheads and to include his profit and all costs and expenses that he requires for the item specified and for all general risks, obligations set forth in, or implied in the documents on which the Bid is based.

2.4.2.8 CONDUIT AND ACCESSORIES

Unless otherwise stated in this specification and except where other methods of installation are permitted for certain circuits, the installation shall be in Galvanised Bosal conduit. **Open wiring will not be allowed in roof spaces.**

All conduits and trunking will be installed in this contract.

2.4.2.9 POWER SUPPLY

A suitable 230V power supply will be made available at the required locations by others. The Sub Contractor will be responsible with the connection to the supply as well as all the battery backup power where required

2.4.2.10 OTHER CONTRACTORS ON SITE

Bidders are advised that this is a domestic sub contract to the building contract which will run concurrently.

Bidders must be aware of the need for co-ordination with the Building Contractor and must allow in their prices for all costs and difficulties associated with co-ordinating their works with the Building Contractor. In addition, the Contractor will be required to carry out his works in a manner which does not cause unnecessary interference with the Building Contractors Works and progress on site.

2.4.2.11 EQUIPMENT DETAILS AND DESCRIPTION

(i) Detectors:

Ionisation Chamber Detectors:- Make "Ziton" or approved equal.

It shall be designed for ceiling mounting on a standard round electrical outlet box having 50 mm hole centres.

The detector shall operate satisfactorily on a nominal 24 volt DC non-polarised 2 wire system over a voltage range of 15 to 40 volts. The unit shall be factory adjusted but on-site adjustments shall be possible.

The unit shall operate satisfactorily under the following conditions:

- Temperature -20°C to +50°C
- Humidity 20% to 90% RH
- Air Velocity up to 10 m/s

An alarm indicator lamp visible for 180° shall be built into the unit. Provision shall also be made to connect a remote indicator lamp, if required. The supplier shall indicate the radiation level of the radio-active source.

(ii) Break Glass: -

Where indicated on the drawings manual emergency call points shall be of the break glass type which is capable of being broken by thumb or finger pressure on the glass element. It shall be capable of operating after long periods of disuse. Testing the call point shall be by means of a special key which enables the glass to move backwards to operate the slider mechanism and close the contacts. It shall be enclosed in a red plastic surface mounted box and labelled "FIRE - press hard to break glass".

(iii) Siren / Strobe Combination:-

Siren to have the following features;

- (a) Single and multi-sound. DB output
- (b) High output with low consumption and low frequency version conforming to BS 5839.
- (c) All D.C. units to be polarised for line monitoring.

(iv) Fire Alarm Cables:- PH 120

(v) Main Control: - Size" ZP3 or approved equal

The panel is to feature a comprehensive visual/acoustical approach through a clearly defined array of LED's choice of language.

The control panel to be designed for a minimum of 50 zone. The panel must be capable of monitoring each zone for fire, fault, short circuit and open circuit conditions and main supply, battery connections and voltage and all system wiring is monitored for earth leakage. Each loop must be capable of supporting up to 127 devices. Provision in main panel to be made for communication to existing Hospital building as indicated on site plan.

(vi) Block Diagram:

A suitable separate enclosure with the layout of the building and zones is to be provided adjacent to all alarm and repeater panels.

2.5 TECHNICAL INFORMATION

The Bidder shall provide all technical and other information in respect of equipment which he has rendered for this shall include:

- a) Electrical input/output details.
- b) Circuit diagrams and component layouts.
- c) System and equipment description.

Facilities

- 1 The transmission paths between the control panel and other external devices shall be a 2 wire circuit.
- 2 It shall be possible to couple the following devices/detectors to the control panel.
 - a) Automatic fire detectors.
 - b) Alarm devices (zoned).
- 3 The Control Panel shall accept the following type of fire sensing devices:
 - a) Ionisation smoke detectors.
 - b) Optical detectors.
 - c) Thermal detectors (rate of rise).
 - d) Manual call points.
- 4 These circuits shall be continually and automatically monitored for open circuit, short circuit, earth leakage and detector removal.
- 5 A fault in any of the transmission paths shall cause a "Fault Alarm" to be indicated automatically in the Control Panel.
- 6 Monitoring of elements in an alarm line:
 - a) The alarm threshold of every detector shall also vary in accordance with its idle state. This change shall be stored and continually updated, in the Control Panel.
 - b) The alarm threshold of any detector shall be automatically set.

2.6 MONITORING OF ZONES

- (a) Each zone shall be clearly defined and indicated.
- (b) Each zone must have the facility to be monitored for a fire alarm condition from the automatic detectors.

2.7 ALARM/DETECTION LINES

- (a) Alarm/Detection lines may have a capacity of detectors or elements as decided upon by the manufacturer. These detectors/elements shall be freely distributed over any one of the individual zones.
- (b) An alarm zone may only extend over a single fire zone.
- (c) An alarm line shall not extend beyond one floor except in the case of stairwell or lift shafts.
- (d) Each line shall be capable of all self monitoring functions.
- (e) A triggered detector/element shall not cause any other detectors on the line to cease monitoring.
- (f) In the specific Zone where a fire has been detected it shall be possible to control equipment plant, fire dampers, etc. - pertinent to that particular zone only.
- (g) Any individual zone in an alarm line shall be capable of being isolated without affecting the operation of the remaining zones in the line and without raising a fire alarm. However, during this condition an isolation indication per zone, shall be displayed in the control panel.

2.8 SIGNALLING AND ANNUNCIATION

General

- a) Fire and fault signals shall be indicated visually and audibly in the control panel. The indications shall be that fire alarms and fault warnings can be clearly distinguished visually and audibly.
- b) The internal audible signal device may be the same for both fire alarms and fault warnings.
- c) All zone visual indicators shall be dual LED's - i.e. one LED per zone for fire and one LED per zone for fault. Common LED's for "fire" and "fault" conditions shall not be provided. No incandescent lamps shall be used.
- d) An LED test button for testing the function of all LED's on the front panel.
- e) An "Alarm-Accept" button for silencing the local panel buzzer.
- f) A "Reset" button for restoring the system to normal.

2.9 REMOTE ANNUNCIATION

- a) Facilities must be provided for remote indication and control all functions.

2.10 NORMAL CONDITIONS

When the control panel is in the normal operating condition without any alarms or faults being displayed, a green LED shall indicate visually that the power is turned on.

2.11 FIRE ALARM CONDITION

- a) A fire alarm shall be indicated in the control panel as follows:
 - An intermittent audible indication.
 - An "Alarm" indication on the control panel.

- b) After the alarm has been accepted, by operation of a switch, the control panel "Alarm" visual indicator shall remain steady, until the panel is reset.
- c) The control panel must have facilities for 2 independent Remote Signalling circuits. These circuits shall be suitable for potentially free or 24 Volt signalling and shall be monitored for short circuit, open circuit and earth leakage. They must be suitable for operating external alarm devices such as bells and visual flashing lamps.

2.12 FAULT CONDITION

- a) Any fault warning shall be indicated in the control panel as follows:
 - A steady audible indication.
 - One steady AMBER LED indicating the effected zones.
 - An earth leakage indication shall be provided for the entire system.

2.13 POWER FAILURE

- a) In the event of mains failure for a period in excess of 50 seconds, a power supply fault shall be indicated, audibly and visually, in the control panel. The visual display shall be a separate AMBER LED. Any mains outages of less than 50 seconds shall automatically switch the load to the stand-by battery, but without an indication.
- b) In the event of a fault occurring on the standby battery, even though it is on load, a power supply fault shall be indicated, audibly and visually, in the control panel. The visual indication shall consist of an AMBER LED.

2.14 SYSTEM MAINTENANCE

1 General

- a) The system shall be, as far as possible, self testing and maintenance free.

2 Control Unit Test

- a) The control unit shall have a test facility for the following:
 - Simulation of fire alarm for each zone individually.
 - LED test for all panel and zone LED's.

3 Field Tests

- a) Detector tests
 - The control unit shall allow for detector test and inspection by a single person.
 - The test alarms triggered on each detector by the inspecting person shall be indicated on the detector by a RED L.E.D, and shall be automatically reset by the control unit.

4 Alarm Tests

- The control unit shall allow for the testing of all audible and visual alarm devices and control relays.

5 Maintenance Service Requirements

(i) Legal Requirements

The legal requirement is that if a building has a fire detection system installed it must be serviced at least once a year by a competent person, after which a document must be issued stating that the system is operational with a listing of any problems that exist. The faults recorded must be attended to immediately

(ii) Requirements of the service

The service must be performed and tested at least once a year on all of the devices in the system. This includes all of the detectors, the break glass units, the sounders and any shutdown systems (e.g. air-conditioner shutdown). The system used for the service must show which detectors have been serviced and which have been skipped. A small sticker on the serviced detectors (use a different colour per service) gives the user reassurance that the detectors have been tested and that none of the units has been missed. Using this method also gives the user a form of "guarantee" that the marked devices have in fact been serviced.

(iii) Annual service

During the annual service all of the devices must be checked. It is important to mark the detectors as it is easy to miss detectors on the larger sites.

(iv) Service requirements

(a) The panel

The following must be checked and recorded:

1. Incoming voltage (mains)
2. Battery charging voltage
3. All the cables and the connections should be checked to see that the cables are still secure and will not give problems in the short term.
4. The full functionality of the panel must then be checked, after which the panel is to be cleaned and locked.

(b) Detectors

Each detector must be removed and cleaned. The cable connections should be checked and while the detector is out the panel it must be checked to see that the zone being worked on shows a fault when the detector is replaced the panel is to reset. The detector is to be triggered to check that the panel does in fact register a fire. The panel is to be reset before the next device is serviced.

(c) Break glass unit

The break glass unit must be triggered by either removing the glass or using the special triggering key. The panel must indicate a fire. After the test the panel can be reset.

(d) Sounders

Each device must be triggered at least once during the service. The sounders can be disconnected or isolated after the test when all of the devices are being tested. In this way the personnel in the area will be able to continue their work with minimal disturbance.

2.15 SYSTEM POWER SUPPLY

The system shall be provided by a 24V dc supply from the standby battery.

1 Power Supply

- a) The output of the power supply shall be capable of sustaining an alarm from all the connected alarm lines simultaneously.
- b) The power supply shall be an integral part of the control unit.
- c) In the event of a failure of the equipment 24V dc supply there shall be an automatic switch over to the standby battery supply without an interruption of the load and without activating a fire alarm.
- d) The power supply unit shall be dimensioned in such a way, that it maintains the battery at fully charged state or is capable of re-charging the battery, discharged to cut-off voltage at the rated discharged current, to 80% of the achievable rated battery capacity within a period of 24hr, besides supplying the power requirements of the alarm system in the idle condition.
- e) The central control unit shall be protected against polarity on the voltage supply side.

2 Stand-by Battery

The stand-by battery must be capable of supplying the system in idle condition for a stated period of 12 hrs plus half an hour in alarm condition after the stated period.

3 Alarm inputs from other sources

Alarm inputs from fire detectors and alarm initiating devices, which are provided by others, shall be incorporated by the Contractor to the central fire alarm monitoring system, provided by him.

2.16 TRAINING

The Bidder shall allow for all literature, visual aids and suitable amount of time for the complete training of four representatives on site. Training is for all systems installed.

2.17 OPERATING AND MAINTENANCE MANUALS

Full and complete Operating and Maintenance Manuals must be supplied with all systems.

It must contain:

- General description of system.
- Full operating instructions.
- All features available on the system.
- All installation requirements.
- Technical Specification of the system.
- Details of all adjustments on the system.
- All wiring diagrams, connection diagrams.
- Recommended spares list.

2.18 SCHEDULE OF INFORMATION (GENERAL)

2.18.1 SCHEDULE OF SUPPLIERS

(TO BE COMPLETED BY ALL BIDDERS)

Bidders shall complete the following schedule of suppliers for every item specified and **which is applicable** to this particular Bid and on which the Bid price was determined.

FIRE DETECTION INSTALLATION

1.1	IONISATION DETECTORS		
(a)	Make		
(b)	Country of origin		
(c)	Approved by	(i)	
(d)		(ii) SABS	
(e)	Test facility		
(f)	Expected life		
(g)	Maximum recommend number of detectors per control circuit		
1.2	HEAT DETECTORS		
(a)	Make		
(b)	Country of origin		
(c)	Approved by	(i)	
(d)		(ii) SABS	
(e)	Test facility		
(f)	Expected life		
(g)	Maximum recommend number of detectors per control circuit		
1.3	BATTERIES		
(a)	Make of Batteries		
(b)	Country of origin		
(c)	Type		
(d)	Type and make of charger		
(e)	Recharge time		
(f)	Guaranteed life of battery when used with the type of charger offered		
1.4	AUDIBLE ALARM UNIT		
(a)	Make		
(b)	Country of origin		
(c)	Approved by SABS		
(d)	Does it conform to this specification?		
1.5	SMOKE DETECTION SLAVE PANEL		
(a)	Make of Batteries		
(b)	Country of origin		
(c)	Approved by SABS		
(d)	Does it conform to this specification?		

PART 3 - BILLS OF QUANTITY

BILLS OF QUANTITY - GENERAL NOTES

3.1.1 NOTES TO BIDDERS

3.1.2 THESE BILLS OF QUANTITIES CONTAIN PAGES NUMBERED CONSECUTIVELY IN EACH BILL. BEFORE THE BIDDER SUBMITS HIS BID HE SHOULD CHECK THE NUMBER OF PAGES AND IF ANY ARE FOUND TO BE MISSING, DUPLICATED OR INDISTINCT, OR THE BILLS OF QUANTITIES CONTAIN ANY OBVIOUS ERRORS, HE SHOULD APPLY TO THE ENGINEER IMMEDIATELY TO HAVE SAME RECTIFIED OR CLARIFIED AS NO LIABILITY WHATSOEVER WILL BE ADMITTED BY THE ENGINEER IN RESPECT OF ERROR IN THE BID DUE TO THE FOREGOING.

3.1.3 THE BILLS OF QUANTITIES FORM PART OF AND MUST BE READ IN CONJUNCTION WITH THE SPECIFICATIONS AND DRAWINGS WHICH CONTAIN THE FULL DESCRIPTION OF THE WORKS TO BE CARRIED OUT AND MATERIALS AND EQUIPMENT TO BE USED.

3.1.4 NO ALTERATION, ERASURE OR ADDITION IS TO BE MADE IN THE TEXT OF THE BILLS OF QUANTITIES. SHOULD ANY ALTERATION, ERASURE OR ADDITION BE MADE, IT WILL NOT BE RECOGNISED AND THE ORIGINAL WORDING OF THE BILLS OF QUANTITIES WILL BE ADHERED TO.

3.1.5 THE PRICED BILLS OF QUANTITIES OF THE SUCCESSFUL BIDDER WILL BE CHECKED AND THE ENGINEER RESERVES THE RIGHT TO CALL FOR REASONABLE ADJUSTMENTS TO ANY INDIVIDUAL PRICE AND TO RECTIFY ANY DISCREPANCY WHILST THE TOTAL BID PRICE, AS SUBMITTED, REMAINS UNALTERED.

3.1.6 THE RESPONSIBILITY FOR THE ACCURACY OF THE QUANTITIES WRITTEN INTO THE BILLS REMAINS WITH THE PARTY WHO PREPARED THE BILLS. THE BIDDER SHALL BE RELIEVED OF THE RESPONSIBILITY OF MEASURING QUANTITIES AT THE BID STAGE, EXCEPT FOR PIPING AND ELECTRICS AND SUCH OTHER ITEMS AS MAY BE NOTED WHICH ARE LUMP SUM ITEMS AND ARE TO BE SUBMITTED IN DETAIL WITH THE DETAILED BILL. THE BID SUM SUBMITTED SHALL BE IN RESPECT OF THE QUANTITIES SET OUT IN THE BILLS, ALTHOUGH THE BIDDER WILL BE REQUIRED TO MAKE HIS ASSESSMENT OF ITEMS SUCH AS FIXINGS, PIPE SUPPORTS, DUCT SUPPORTS, ETC, AVM PADS, ETC AND SHALL INCLUDE IN THE ITEM PRICES FOR SUCH SMALL INSTALLATION MATERIALS AS ARE REQUIRED FOR THE COMPLETE INSTALLATION IN ACCORDANCE WITH THE SPECIFICATION.

3.1.7 THE SUB-CONTRACTOR AND THE EMPLOYER OR HIS AGENT MAY AGREE THAT THE TOTAL BILL OR BILLS INCLUDING ANY VARIATIONS BY WAY OF ADDITIONS THERETO OR DEDUCTIONS THEREFROM, REPRESENTS A FAIR AND ACCURATE QUANTIFICATION OF THE ITEMS SET OUT IN THE BILLS AND THE PARTIES MAY AGREE FINAL PAYMENT ON THAT BASIS. IN THE EVENT OF ANY DISPUTE AS TO THE QUANTITIES, THE DISPUTED ITEMS SHALL BE ADJUSTED WHERE NECESSARY.

3.1.8 THE QUANTITIES IN THESE BILLS OF QUANTITIES ARE NOT TO BE USED FOR ORDERING PURPOSES.

3.1.9 VARIATIONS IN THE SCOPE AND EXTENT OF THE WORK INCLUDED IN THE BILLS SHALL BE ALLOWED TO MEET THE EMPLOYER'S REQUIREMENTS.

3.1.10 UNLESS SEPARATE RATES FOR THE SUPPLY AND INSTALLATION OF ANY ITEM IS SPECIFICALLY CALLED FOR, THE SUPPLY AND INSTALLATION COSTS OF ANY ITEM SHALL BE FULLY INCLUDED IN THE UNIT PRICE.

3.1.11 THE RATES INCLUDED FOR NON-SCHEDULED BILL ITEMS SHALL FORM PART OF THE BID, AND WILL ONLY BE PAYABLE TO THE SUB-CONTRACTOR IF AND WHEN COVERED BY A VARIATION ORDER.

3.1.12 ALL PROVISIONAL SUMS SHALL BE EXPENDED AS DIRECTED BY THE ENGINEER AND ANY BALANCE REMAINING SHALL BE DEDUCTED FROM THE TOTAL CONTRACT SUM.

- 3.1.13 **THE QUANTITIES IN THESE BILLS OF QUANTITIES ARE MEASURED PROVISIONALLY. ALL WORK EXECUTED IN ACCORDANCE WITH THE WORKSHOP DRAWINGS APPROVED BY THE ENGINEER SHALL BE RE-MEASURED AND PRICED AT RATES CONTAINED IN OR BASED ON THE PRICED BILL OF QUANTITIES.**
- 3.1.14 **MONTHLY PROGRESS CLAIMS SHALL BE SUBMITTED ON A DRAWING RE-MEASURE BASIS IN THE BILL OF QUANTITIES FORMAT. PRELIMINARIES, SO CLAIMED SHALL BE PRO-RATA TO THE CONTRACT SUM LESS PRELIMINARIES, CONTINGENCIES, PROVISIONAL SUMS AND CONTRACT PRICE ADJUSTMENT PROVISIONS.**
- 3.1.15 **CLUSTERS AS REFERRED TO IN THE BILL REPORT MEANS ALL FITTINGS, VALVES, GAUGES, PRV'S, STRAINERS, BALANCING VALVES, UNIONS, ETC, UPSTREAM AND DOWNSTREAM OF THE SPECIFIED EQUIPMENT INCLUDING INSULATION WHERE REQUIRED IN THE PLANTROOM AREA.**

ELLIOT MAGISTRATE COURT: REPAIRS AND RENOVATIONS

FIRE DETECTION SPECIFICATION

[illegible]

ELLIOT MAGISTRATE COURT: REPAIRS AND RENOVATIONS

FIRE DETECTION SPECIFICATION

[illegible]

ELLIOT MAGISTRATE COURT: REPAIRS AND RENOVATIONS FIRE DETECTION SPECIFICATION

[illegible]

ELLIOT MAGISTRATE COURT: REPAIRS AND RENOVATIONS

FIRE DETECTION SPECIFICATION

[illegible]

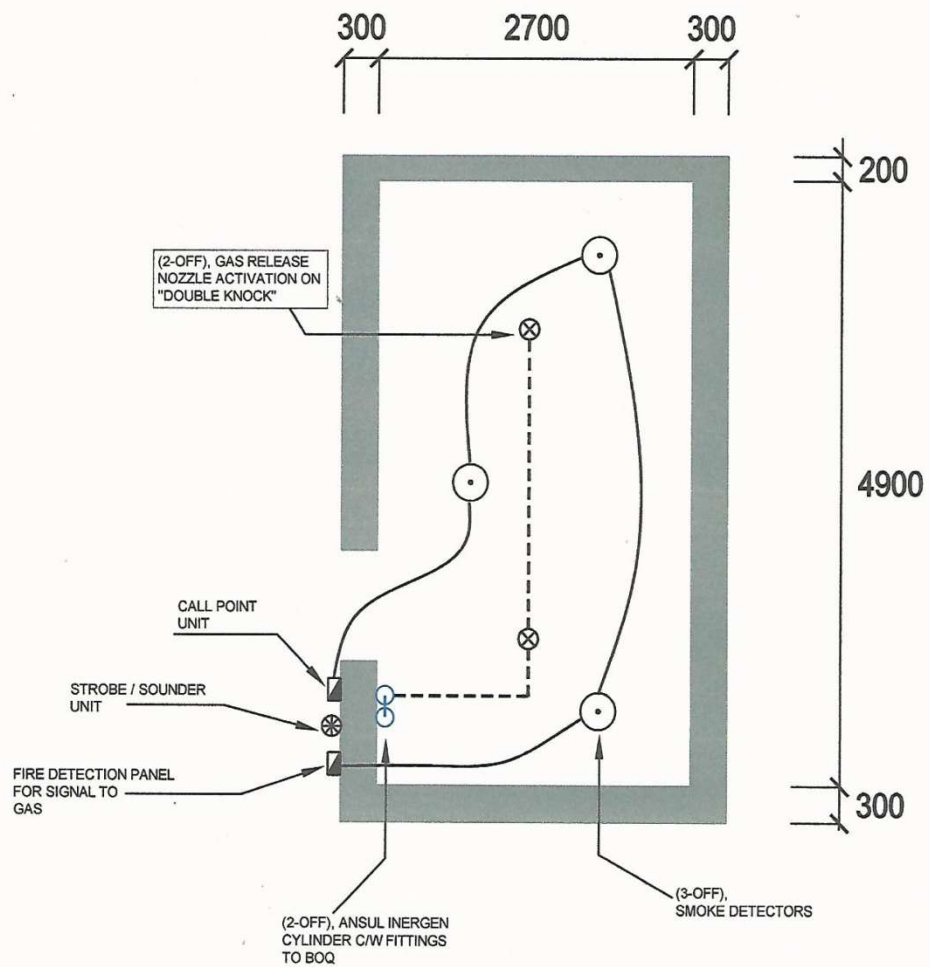
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	TOTAL PRICE (INCL VAT)	
	Completed By:	
	Name of Contractor:	
	Contract Person:	
	Contact Detail:	
	Date:	
	Signature:	

PART 4 –
DETAIL DRAWING
(FIRE DETECTION SYSTEM)

SCHEDULE OF DRAWINGS

The following drawings are **ON THE NEXT PAGE OF THIS DOCUMENT.**

DRAWING NO.	TITLE
ME 042521/FD/4000	Fire Detection and Gas Suppression Layout to Safe & Records Room



PLAN - SAFE & RECORDS ROOM

-SCALE 1:50-

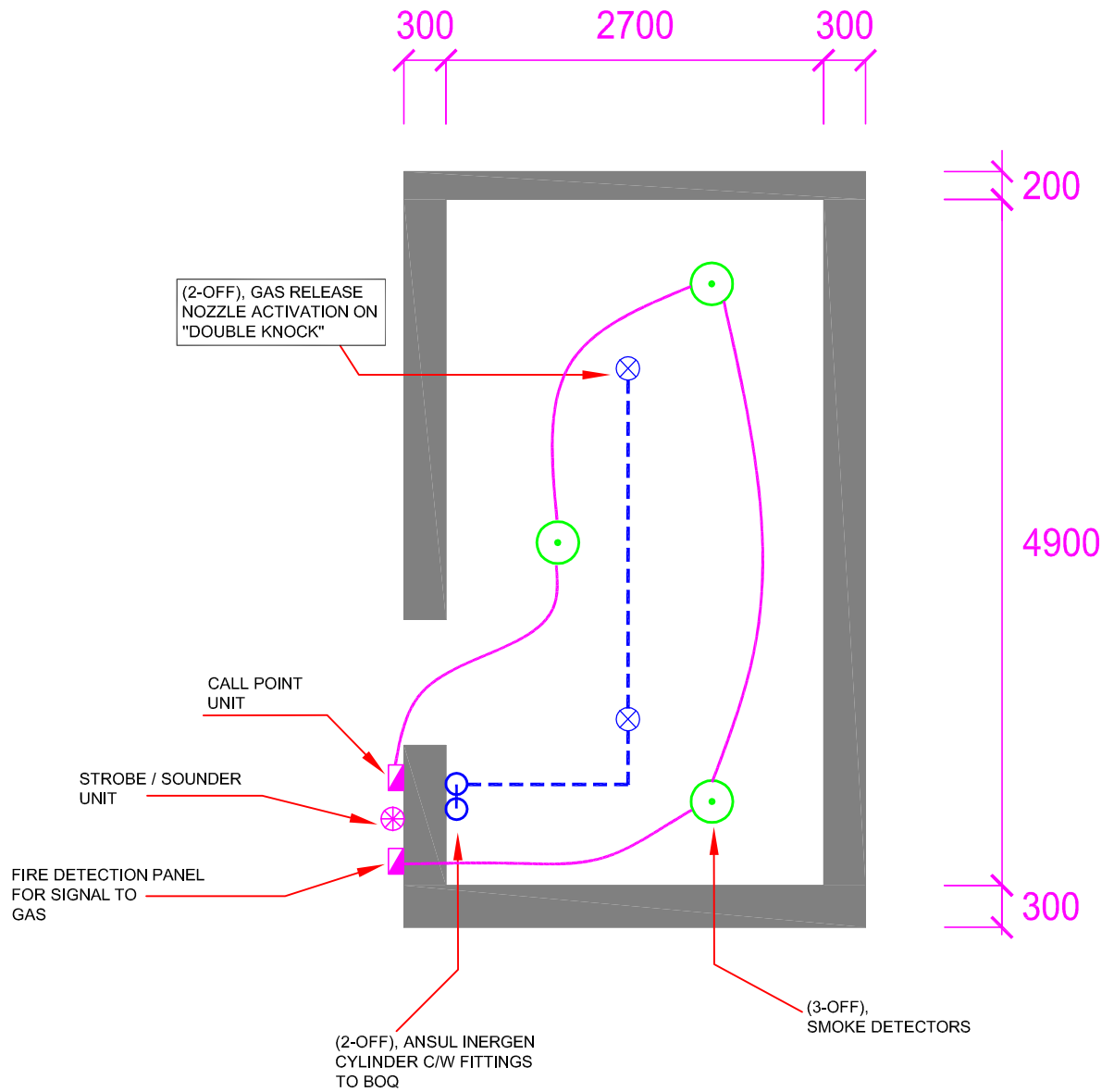
Project Name:
Elliot Magistrate Court

Title:
Fire Detection and Gas Suppression Layout to Safe & Records Room

Drawing number:
ME 042521/FD/4000

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PLAN - SAFE & RECORDS ROOM

-SCALE 1:50-

FOR TENDER

Project Name:
Elliot Magistrate Court

Title :
Fire Detection and Gas Suppression Layout to Safe &
Records Room

DPW drawing number
ME 042521/FD/4000



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COEGA DEVELOPMENT CORPORATION (PTY) LTD

ELLIOT MAGISTRATE COURT : PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION

(BID NO: CDC/163/25)

C2.3f

HVAC Installation

Specification and Pricing Schedule



public works
Department:
Public Works
REPUBLIC OF SOUTH AFRICA

COEGA DEVELOPMENT CORPORATION (PTY) LTD

FOR

**REPAIRS AND ADDITIONS TO
ELLIOT MAGISTRATE COURT**

HVAC INSTALLATION

SPECIFICATION AND PRICING SCHEDULE

PREPARED FOR:

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PREPARED BY:

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NAME OF TENDERER: _____

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PART 1 - STANDARD SPECIFICATION

- (a) Air-conditioning and Ventilation in accordance to Department of Public Works, Standard (PW 327), Issue x11, Dated 1998.
- (b) South African National Standards for occupancy ventilation – SANS 10400 – Part ‘‘O’’
- (c) SANS 10147:2011 – Refrigeration Systems including parts associated with air-conditioning systems.
- (d) South African National Standards wiring code: SANS 10142-1:2006.
- (e) Occupational Health and Safety Act on Regulations: Act 85 of 1993.
- (f) All Sheetmetal ductwork manufacture to DW/144 and SANS 1238-2004 standards.
- (g) STS.5 – The electrical and installation for mechanical services, issue VIII, Dec 1984 and SA National Standards wiring code SANS 10142-1:2006.
- (h) Standard specification for refrigeration services issue VIII, 1988 and SANS 10147:2011 refrigeration systems including plants associated with air-conditioning systems.

**Copies of standard specification are obtainable from director-general, department of public works, private bag x 65, Pretoria, 0001

STANDARD SPECIFICATION

FOR

AIR CONDITIONING AND VENTILATION INSTALLATIONS

SECTION 1

1.0 GENERAL REQUIREMENTS

1.1.0 NOTICE

- 1.1.1 This standard specification forms part of, and is to be read in conjunction with the Department's supplementary technical specifications for air conditioning and ventilation installations.
- 1.1.2 In so far as the conditions herein contained are at variance with anything contained in the supplementary specifications, the contract shall be in terms of the supplementary specification for each particular service.
- 1.1.3 Where reference is made to "Contractor" or "Sub-Contractor", it shall be read to mean the successful Tenderer appointed to execute the contract specified in the supplementary specification.

1.2.0 STANDARD MEASURES

- 1.2.1 The dimensions, weights, etc., shown on the drawings and mentioned in the specifications shall be taken as the Republic of South Africa's legal standard weights and measures.

1.3.0 MATERIALS AND WORKMANSHIP

- 1.3.1 All work is to be executed with materials of the best quality and in the most substantial manner under the inspection and to the entire satisfaction of the Department.
- 1.3.3 All apparatus, components parts, fittings and materials supplied and/or installed whether especially specified herein or not shall conform in respect of quality, manufacture, tests and performance with the requirements of the appropriate current South African (SABS) or British Standard Specifications (BS) and Addenda thereto, except where otherwise required by this specification or permitted by approval of the Department in writing. All materials and workmanship which may, in the opinion of the Department, be inferior to that specified for the work will be condemned. All condemned material and workmanship must be replaced or rectified as the case may be, to the satisfaction of the Department.

- 1.3.4 No second hand equipment of any description may be offered for supply or installation.
- 1.3.5 If so required the Department may call for samples of material and equipment for approval. Such samples shall be submitted within 14 days of the request and if judged necessary by the Department may only be returned after completion of the installation in order to ensure that the quality of the installed product is the same as that of the approved sample.
- 1.3.6 Any fitting or item of equipment not specifically mentioned but obviously necessary for the successful completion of the installation is to be included so as to form a complete working installation.

1.4.0 DRAWINGS

- 1.4.1 The tender drawings issued with the supplementary technical specification are schematic and do not necessarily purport to show the exact position, size or details of construction of equipment.
- 1.4.2 Tenderers must satisfy themselves that the equipment offered by them can be accommodated in the available space and positioned in such a way that access for maintenance, repairs or removal is not obstructed.

1.4.3 Contractor's drawings

Where indicated in the Supplementary Specification these drawings are to be prepared by the Contractor at his expense in accordance with this document and shall be on a scale of not less than 1:50.

These drawings shall at least consist of:

a) Builder's work drawings

These shall indicate all work to be done by others (bases, foundations, holes in concrete and masonry, etc.) as well as the sizes, capacities and positions of service connections (electrical, water, drainage, etc) to be provided by others, all in accordance with the supplementary specification.

b) General arrangement drawings

These shall indicate all equipment, distribution systems, testing and inspection requirements as well as instrumentation positions and access requirements.

During their preparation, the Contractor shall take cognisance of all relevant architectural, structural, electrical and other services drawings in order to properly co-ordinate his layout. These drawings can be obtained via the Department. The drawings shall be amended as required during the contract period, and up to date copies kept on site for reference purposes.

- 1.4.4 Positions and sizes of air grilles, louvred openings through reinforced concrete beams and slabs, etc., as indicated on the tender drawings shall be adhered to as far as possible. Amendments will only be considered if absolutely unavoidable.

c) Shop drawings

These shall be based on the General Arrangement drawings, and shall show in detail the construction of all the parts of the works, method of assembly where applicable, erection and construction, materials and connections, welds, gaskets, sealants, fastenings, reinforcing and all other necessary detail.

d) Electrical drawings

Electrical drawings shall comprise complete control and power wiring diagrams, as well as front and side elevations giving major dimensions of control panels as well as instrumentation and switch position layouts.

e) As-Built drawings and wiring diagrams

These are up-to-date approved drawings at the completion of the contract. Tenderers shall allow in their price for submitting to the Department a set of each of the up-to-date general arrangement drawings, shop drawings, as well as electrical drawings together with the O&M manuals specified herein.

1.4.4 Submission of contractor's drawings

Drawings shall be submitted to the Department in orderly fashion commencing within the following time limits or as determined by the main contract programme (where applicable):

Builder's work drawings	: within 2 weeks of tender acceptance.
General layout drawings	: within 4 weeks of tender acceptance.
Shop drawings	: within 6 weeks of tender acceptance.
Electrical drawings	: within 6 weeks of tender acceptance.
As-built drawings	: at completion before first hand-over.

By submitting drawings, the Contractor represents that he has determined and verified all site measurements, site instruction criteria, materials, catalogue numbers and similar data, or will do so, and that he has checked and co-ordinated each of his drawings with the requirements of the works and the contract documents, taking into account drawings of all other relevant disciplines.

At the time of submission the Contractor shall inform the Department in writing of any deviation in the Contractor's drawings from the requirements of the supplementary documents.

After scrutiny the Department may at its discretion and depending on the number of discrepancies, require amendment and resubmission prior to approval. Drawings shall be resubmitted until approved prior to any portion of the works related to the drawings being commenced.

Should the Contractor, during drawing amendment, alter any portion of his drawings not specifically required by the Department, he shall point this out in writing when resubmitting the drawing.

Approval of the Contractor's drawings in no way indemnifies him from being responsible for the correctness of the drawings and satisfactory operation of the installation.

- 1.4.6 If the Tenderer wishes to submit alternative proposals, differing from the Department's design, drawings indicating such proposals comprehensively shall be submitted with his tender.

1.5.0 SITE CONDITIONS

- 1.5.1 It is the responsibility of the Tenderer to visit the site during the tender phase and to familiarise himself with conditions related to it. If the location of the site is not indicated in the Supplementary Specification, it can be obtained from the Department. No claim for additional payment related to ignorance of site conditions will be accepted. By submitting a tender it is accepted that the Tenderer is fully aware of all site conditions as well as the access to it, and has allowed for this in his tender price.

1.6.0 DEVIATIONS FROM TENDER DOCUMENTS

- 1.6.1 No deviations or alterations from that of the specification, schedules or drawings shall be made without first obtaining the written approval of the Department.

AC.PWD.XII

1.7.0 PROGRAMMING OF WORK

1.7.1 The contract works shall proceed concurrently with the building construction or in accordance with an approved programme in all respects.

1.7.2 It is essential that the Contractor programmes his construction and all other work in conjunction with the Main Contractor and the main contract programme in order to avoid possible delays or clashes of trades.

1.7.3 For direct contracts the Contractor shall submit a detailed programme in the form of a bar chart based on the contract period and the various activities and components of the installation. This programme shall be submitted to the Department within two weeks of site hand-over.

1.8.0 MANUFACTURER'S RATINGS

1.8.1 All equipment such as fans, compressors, cooling towers, pumps, etc., shall be selected to be operated well within the manufacturer's ratings. Equipment offered for use beyond these limits will not be considered.

1.8.2 Tenderers must submit manufacturer's ratings of all equipment offered. Ratings shall be given in the SI system.

1.9.0 NOTICES

1.9.1 The Contractor shall supply and install all notices and warning signs that are required by the appropriate laws or regulations and by these documents.

1.10.0 GUARANTEE

1.10.1 The 12-month guarantee called for in the Supplementary Specification, shall apply to all items of plant such as chillers, etc., delivered to site and/or erected. It is the responsibility of the Contractor to negotiate with his suppliers in order to secure their equipment guarantee on this basis.

1.10.2 The date of acceptance shall be that appearing in the acceptance certificate issued by the Department and shall define the start of the guarantee period and free maintenance period (where applicable).

1.10.3 No Claims for extended guarantee or otherwise from Suppliers, Principals etc., will be considered even if equipment is required on site long before acceptance date.

1.11.0 LUBRICATION

1.11.1 All bearings must be packed with approved grease or filled with the correct oil, and all gearboxes and sumps must be filled with the lubricant specified by the manufacturer. The Contractor will be responsible for the supply of all lubricants required for the initial fill. All lubricants must be new and supplied in sealed drums or containers.

1.12.0 COMMISSIONING AND TESTING

1.12.1 Commissioning Engineers

The Tenderer shall allow in his tender price for the services of approved and expert Commissioning Engineers, as may be appropriate for the individual specialised sections of his contract, as well as a

competent Engineer in overall control of the installation. Testing and commissioning shall be carried out by these Engineers.

Should undue problems be encountered at any time, the Contractor may be requested by the Department to obtain the services of a representative of the manufacturer of specified items of equipment, at no cost to the Department.

1.12.2 Notice of Testing and Commissioning

The Department shall receive not less than two weeks advance notice of any tests to be witnessed by the Department.

1.12.3 Failure of Works, Site or Commissioning Tests

Should the Department be notified to attend official tests as laid down, and should the equipment fail the test for any reason whatsoever, such that the Department is required to re-witness the test, the time, transport and disbursement by the Department in so doing will be for the Contractor's account, which amount may be deducted, at the option of the Department, from monies due to the Contractor.

1.12.4 Quality Testing of Equipment

The Department reserves the right to arrange for testing of any piece of equipment at will, to check on compliance with the relevant specifications. Should the particular piece of equipment pass the test, the cost of such testing will be borne by the Department. However, should it fail the test, the cost of the test, rectification of the shortcomings, re-testing and repetition of the same test on the remaining like items will be for the Contractor's account.

1.12.5 Inspection during Manufacture

The Contractor will advise the Department when the items to be supplied are in the course of manufacture. The Department reserves the right to inspect any items during the course of manufacture, and witness any performance tests that may be required thereon. The Contractor shall give the Department at least two weeks advance notice of works tests.

1.12.6 Testing

The Contractor shall be responsible for carrying out all tests laid down in the specific sections elsewhere in this document, in addition to those listed hereafter and in the Supplementary Specification.

Testing and balancing shall not begin until the system has been completed and is in full working order.

The plant shall be tested and operated to meet the performance figures and duties specified.

All safety features and interlocks will be tested.

The Contractor will be responsible for all costs incurred in the testing, including the supply, calibration and use of all instruments and tools, but not the supply of water or power on site.

All instruments and test equipment used shall be provided by the Contractor, and shall be accurately calibrated and maintained in good working order. All test instruments used for tests to be witnessed by the Department's Representative shall be provided with calibration certificates, which must be available to the Department's Representative.

Specific attention is drawn to the fact that calibration certificates will be required for the following:

Watt meters, ammeters, voltmeters, frequency meters, pressure gauges, flow meters, orifices plates, temperature gauges and dynamometers.

All instruments shall be of above standard grade, and test pressure gauges shall not be less than 150mm in diameter. The maximum scale of the instrument shall not exceed 1,5 times the full test requirement.

It is essential that the Contractor inspects and tests all equipment before requesting the Department to inspect or witness acceptance tests thereon.

All acceptance tests, whether in the manufacturer's works or on site, must be carried out in the presence of the Department's Representative.

Should the Department wish to verify the calibration of any instruments, the Contractor shall make the necessary arrangements for the instrument to be re-calibrated by a recognised authority. Should the instrument prove to be correctly calibrated, the cost of the re-calibration test will be borne by the Department. Should the instrument prove to be in error, the cost of the tests will be borne by the Contractor.

Two copies of the complete test reports shall be submitted to the Department, prior to the first delivery of the project. Reports shall cover all tests carried out on individual sections, including such works tests as may have been conducted. All reports shall be neatly typed.

1.12.7 Commissioning

The Contractor shall carry out all tests and commissioning of the systems installed by him, in a co-ordinated and properly organised manner.

Air-Conditioning and Ventilation installations shall be commissioned in accordance with the following Codes or such other recognised commissioning procedure or code approved by the Department:

- a) Air Distribution Systems:
SABS 0173 : Code of Practice for the Installation, Testing and Balancing of Air Conditioning Ductwork.
- b) Refrigeration Systems:
CIBS : Commissioning Code : Series R : Refrigeration Systems.
- c) Control Systems:
CIBS : Commissioning Code : Series C : Automatic Controls.
- d) Hot Water and Steam Boilers:
CIBS : Commissioning Code : Series B : Boiler Plant.
- e) Water Distribution Systems:
CIBS : Commissioning Code : Series W : Water Distribution Systems.

Should the tests be carried out over an area outside the range of normal speech, it is required that the Contractor make available at least four battery powered, two-way radio sets, to facilitate communications.

The testing procedures shall be sufficiently comprehensive to prove the correct functioning of each and every piece of equipment, and its suitability for the application.

After all systems and equipment have been tested and commissioned to the satisfaction of the Department, a detailed demonstration of all functions of the system shall be carried out in the presence of the Department's Representative, so as to allow him to become fully acquainted with the operation of the system.

The commissioning tests shall include the tests laid down under the specific sections hereafter, and a full operational test of all pumps, compressors, fans and control gear in all modes of operation.

The Contractor shall allow for the replacement and cost of any materials and fuel used for testing purposes, as part of the contract.

The demonstration to the users shall include a repeat of the operational tests above.

The planning of this demonstration shall take place in collaboration with the Department.

A certificate of completion will not be issued until all tests have been satisfactorily completed, and the plant has operated successfully, to the complete satisfaction of the Department.

1.13.0 PERFORMANCE TOLERANCE

- 1.13.1 All performance figures obtained during testing and commissioning must be within -5% and +5% of the specified performance figures given in the supplementary specification. Should the plant fail to comply with these figures after it has been tested and operated for a period of seven days, then the Contractor shall have a further four weeks to meet the requirements of the specification, after which the Department shall have the right to reject the plant and recover all monies paid to the Contractor for the rejected plant.

1.14.0 TEST CERTIFICATES

- 1.14.1 The Contractor shall ensure that copies of all relevant test certificates, inspection reports, materials analysis certificates and similar data as may be required under various sections of this specification, or by Government Licensing and Inspection Authorities or Local Authorities, shall be provided before handing over the plant. Acceptance of the plant will be delayed if such certificates are not available. In particular, attention is drawn to pressure vessel and boiler construction and materials test certificates.

1.15.0 APPLICATION FOR INSTALLATION

- 1.15.1 The Contractor shall allow for the submission of the necessary forms, fees and drawings to the Inspector of Machinery or other relevant Authorities to obtain permission to install equipment where this is required. He shall also, in co-operation with the Department make any arrangements that may be required for Government Inspectors or other relevant Inspectors to carry out prescribed tests.

1.16.0 POWER, WATER AND DRAIN CONNECTIONS

- 1.16.1 Power, water and drain points in the plant room will be provided by and at the expense of the Department.
- 1.16.2 All plumbing between equipment and water and drain points shall form part of the contract.
- 1.16.3 The exact details of terminal points will be set out in the Supplementary Specification.

1.17.0 QUALITY OF MATERIALS

- 1.17.1 Only new materials of high quality shall be used throughout and shall be subject to the approval of the Department.
- 1.17.2 All materials, where applicable, shall conform in respect of quality, manufacture, tests and performance, with the requirements of the SABS standards or, where no such standards exist, they shall conform with the appropriate current specification of the British Standard Institution. Materials manufactured in South Africa shall be used wherever possible.

1.17.3 Imported materials shall comply with the requirements of the relevant SABS or British Standard Specifications, although these materials need not necessarily bear the SABS mark.

1.17.4 All materials shall be suitable for the particular site conditions. These conditions shall include weather conditions as well as prevailing conditions during installation and subsequent permanent use.

1.17.5 Should the materials or components not be suitable for use under temporary site conditions, where applicable, the Contractor shall provide at his own cost, suitable protection until these unfavourable site conditions cease to exist.

1.18.0 SERVICE ACCESS

1.18.1 Where equipment such as fans, dampers, etc. are installed above ceiling the Contractor shall ensure that access will be possible for maintenance purposes after installation.

1.19.0 STANDARD SPECIFICATIONS

1.19.1 Unless otherwise specified in the supplementary specification, the following standard specifications (including amendments) of the organisations indicated shall form part of this specification.

- a) SABS 1125-1977; Room air conditioners
- b) SABS 0140-1978; Identification colour marking
- c) SABS 0139-1981; The prevention, automatic detection and extinguishing of fire in buildings.
- d) SABS 0147-1992; Refrigerating systems including plants associated with air conditioning systems.
- e) SABS 0173-1980; The installation, testing and balancing of air-conditioning duct work.
- f) SABS 193-1972; Fire dampers.
- g) SABS 1238-1979; Air-conditioning ductwork.
- h) SABS 1424-1987; Filters for air-conditioning and general ventilation.

1.19.2 Tenderers shall indicate in their tender submission whether their tender and/or equipment as applicable complies with any of the above specifications or carries the SABS mark.

1.20.0 MONTREAL PROTOCOL

Tenders for equipment utilising chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) or hydrofluorocarbons (HFCs), to be supplied and installed shall be within the constraints and schedules of the Montreal Protocol and the Copenhagen Agreement and such amendments thereto as may be made by the international community.

Where tenders are submitted for equipment not complying with this Protocol it shall be clearly indicated, in writing, in the tender submission.

PART 2 – DETAILED TECHNICAL SPECIFICATION

2. DETAILED TECHNICAL SPECIFICATION

Ambient Conditions:

Summer: Outside: 34°C / DB 23°C / WB

Winter: Outside: 2°C

Altitude: 700m

2.1 PROGRAMME

The sub-contractor will be required to complete the required installation works in accordance with the Main Contractors programme. The sub-contractor is advised to make his suppliers nominated, specified or otherwise aware of the liquidated damages payable upon delayed completion.

2.2 SCOPE OF CONTRACT

GENERAL

The overall scope of works is renovation to existing court building and additional ablution and public areas.

Air conditioning with reverse cycle heating and exhaust ventilation to ablution and store areas forms the scope of works.

Fresh air input is conditioned and supplied to air-conditioned areas. Three off low static 100% fresh air A/C units have been utilised for this purpose.

- 2.2.1 Supply, install and commission A/C system as per specification and drawings.
- 2.2.2 Ablution and stores areas to be exhaust ventilated as indicated on drawings.
- 2.2.3 All refrigeration pipework to be insulated to spec and run in trunking or galvanised cable trays as indicated.
- 2.2.4 All condensate drain pipework in ceiling voids and in trunking to be insulated.
- 2.2.5 All A/C control units to be hard wired.
- 2.2.6 A/C units in court room A and B to have one control unit for all A/C units in each court.
Each court unit to have high, low and medium speed settings for indoor units.
- 2.2.7 Any existing redundant A/C units is the property of the state and must be given to public works.
- 2.2.8 Scope of work will include removal/repair of any existing A/C units as per site instruction.
- 2.2.9 P and G costs to cover all health and safety requirements , insurances , travel and out of town working.
- 2.2.10 All works under this contract must cover a 12 month service guarantee on maintenance and quality.
- 2.2.11 All A/C equipment coils must be treated for corrosion before installation. This should form part of equipment Cost.
- 2.2.12 A/C technician should be in possession of a valid qualification for experience in this type of A/C system.

2.3 DRAWINGS

The works shall be carried out in accordance with this specification and the Schedule of Drawings Part 5.

2.4 DRAWINGS TO BE SUPPLIED BY CONTRACTOR

The Contractor shall produce and co-ordinate working drawings of all services included in this contract. Prior to the preparation of the co-ordinated working drawings, the Contractor shall liaise with other Contractors as directed by the Builder to ensure that due consideration of other services are taken into account.

The drawings shall include full details of builders work requirements and hole details necessary to carry out the works, and as required by the Engineer.

The drawings shall be based upon the Engineer's co-ordinated design drawings and shall be submitted in duplicate progressively prior to the programmed commencement of work, for approval.

The Contractor is responsible for co-ordinating all site works under the contract to suit the programme.

All alterations to working drawings, whether due to co-ordination or otherwise, shall be carried out by the Contractor and, after final approval has been obtained, the Contractor shall make final issue to all parties concerned with 3 copies to the Engineer.

The Contractor is advised that the position of all holes, chases etc. are to be approved by the Engineer, and that all holes required are to be shown on the Contractors' builders work drawings which are to be approved by the Engineer prior to cutting or forming of such holes on site.

The Contractor shall allow for preparing such drawings sufficiently in advance to give the respective parties adequate time for approval of drawings, and to suit the Builder's programme. The Contractor is to obtain written approval of his builders work drawings.

All building work such as the cutting away or forming of holes, in walls, floors and roofs etc. providing concrete plinths and all plugging of holes for fixing bolts, will be done by the Builder but the Contractor will mark out and be held responsible for the correct positioning of all plinths to be formed and holes to be cut or formed and bolts to be grouted in etc., by the Builder, and the contractor shall provide in reasonable time to suit the Builder's programme of works, full details of his requirements.

The Contractor shall supply plant foundation drawings showing the position and dimensions of plinths required together with details of anti-vibration material, foundation bolt holes, to allow the Builder to have this work prepared in time to receive the plant.

The Contractor is to provide full detailed wiring diagrams for all electrical components supplied and installed with required connection to main supply. Any work caused by inaccuracy of marking out or other default of the Contractor shall be paid for by the Contractor. Such unnecessary work may include repairing, replacing, making good, taking down and rebuilding of any part of the building plant and other as may be effected by such work.

The Contractor shall submit to the Engineer, before ordering, drawings showing the construction of any special plant or machinery required for the contract and shall receive the Engineer's written approval of all such drawings before ordering.

The Engineer's approval of drawings submitted by the Contractor shall not in any way relieve the Contractor from his responsibility in respect of the accuracy of all such drawings nor from his responsibility to provide equipment suitable in dimension, construction and finish for the location in which it is to be installed. Any modification or amendments to these drawings requested by the Engineer in order to ensure that they fulfil the contract conditions shall not involve the employer in extra expenditure.

When submitting any drawings, the Contractor shall advise the Engineer if, in order to avoid delay in completion of the works, early approval is necessary.

Any unnecessary work carried out by the Builder adjudged by the Engineer or Architect to be caused by inaccuracy of marking out or other default of the contractor shall be paid for by the contractor.

All detailed drawings submitted for approval shall be to a reasonable scale, and the Engineers decision as to what constitutes a reasonable scale shall be final. All important dimensions shall be given and the material of which each part is to be constructed shall be indicated. All dimensions marked on the drawings shall be considered correct, although measurement by scale may differ there from. Detailed drawings shall be regarded as correct where they differ from the general arrangement drawings. A graphical scale shall be incorporated on all drawings.

2.5 EQUIPMENT AND MATERIAL

It is the intent of these specifications that wherever a manufacturer of a product is specified, the

terms "other approved" or "approved equal" are used, the substituted item must conform in all respects to the specified item.

Consideration will not be given to claims that the substituted items meet the performance requirements with lesser construction (such as lesser heat exchange surface etc.) Performance as delineated in schedules and in the specifications shall be interpreted as minimum performance. In many cases equipment is oversized to allow for pickup loads which cannot be delineated under the minimum performance.

Substituted equipment, where permitted and approved, must conform to space requirements. Any substituted equipment that cannot meet space requirements, whether approved or not, shall be replaced at the Contractors expense. Alternative equipment from that as noted or required on the drawings and/or the specification, may only be supplied on the written approval of the Engineer.

All other things being equal, preference will be given to South African manufactured materials and equipment.

All equipment and materials required for installation under these specifications shall be new and without blemish or defect.

2.6 UNTIMELY SUBMISSION OF DRAWINGS

Any extra expense incurred due to any addition and/or amendment made by the Contractor after the drawings mentioned above have been submitted or due to the untimely submission of drawings, shall be for the Contractor's account.

It shall be binding upon the Contractor to establish with or obtain from the builder the scheduled time of commencement and programming of all building work affecting the Contractor in respect of this clause.

2.7 FINAL DRAWINGS

The Contractor shall furnish the Engineer (for onward transmission to the Employer) with three sets of Hard copy drawings of the plant as finally completed, incorporating all variations made during the course of construction. Such drawings shall be submitted no later than two weeks after the completion of the contract works as part of the O & M Manuals. All 'As Built' drawings must also be issued in an electronic format.

2.8 ITEMS

The installation shall include everything necessary and installed to the approval of the Engineer. The supply and installation of equipment required for adherence to the Standards and Codes may not have been indicated in detail on the drawings or in the other parts of the specification, but will nevertheless be considered included in the contract value.

The same make and type of apparatus shall be used for similar items throughout the installation.

2.9 TOOLS AND SPARE PARTS

The Contractor shall include for the supply of all special purpose tools necessary for performing normal maintenance operations on all plant and equipment supplied and installed under the sub-contract.

2.10 MANUALS

Before completion of the contract works the Contractor shall hand, free of charge to the Engineer, four copies of a service manual for all the plant covered by the works.

2.11 COMPLETION OF WORKS

Completion of the contract works shall include the instruction of a person or persons, appointed by the Employer, in the correct and efficient operation and in the function of the installation.

2.12 EXTERNAL LOUVRES

External weather proof louvres shall be constructed from extruded aluminium. A galvanized steel vermin proof wire mesh screen is to be fitted to the rear face of each louver.

2.13 VENTILATION FANS

Ventilation fans shall be in accordance with the Schedule of Fans and as shown on the drawings. The technical requirements shall comply with section 4.2.0 of Public Works Standard Specification.

Fans shall deliver the specified air quantities against the system resistance.

Fan motors shall be suitable for single-phase or 3 phase, 50 cycle electrical supply.

Roof mounted fans shall be provided with fibreglass cowl and soaker sheet to suit the roof profile.

2.14 PRECAUTION

The successful contractor must take note of the following before commencing any works on site:-

2.14.1 The existing building is classified as an heritage site, therefore no external drilling or cutting of holes thro " Sand Stone" walls will be permitted.

2.14.2 All new works must be co-ordinated with consultant or architect on site.

2.14.3 Any existing A/C equipment to be removed must be done without any damage to existing walls.

PART 3 – EQUIPMENT SPEC

3.1) AC EQUIPMENT:

All A/C units to be of the inverter type for energy savings.

All units to have reverse cycle heating.

All units to be treated for corrosion on casings and coils.

A/c units sizes, type and capacities are indicated on layout drawings.

Ventilation fan type, size and air flow duties as indicated on layout drawings.

3.2) AC CONTROLS:

Court "A" & "B": Single control hard wired, two pipe refrigeration system.

Administration Areas: Individual control to each office or area, three pipe refrigeration system with distribution boxes. Controls to be hard wired.

Individual Offices: Single split type A/C units with remote control.

3.3) VENTILATION FANS:

Exhaust type. All ducted fans are of the incline "Silent Series Type".

Each ducted fan to have an isolator near fan and a remote on/off control.

All other extract fans to have 2-Pole isolators near fan.

3.4) LOUVRES AND GRILLES:

Material construction to be aluminium. All weather louvers to be fitted with vermon screen on inside.

EyeSizwe Consulting Engineers

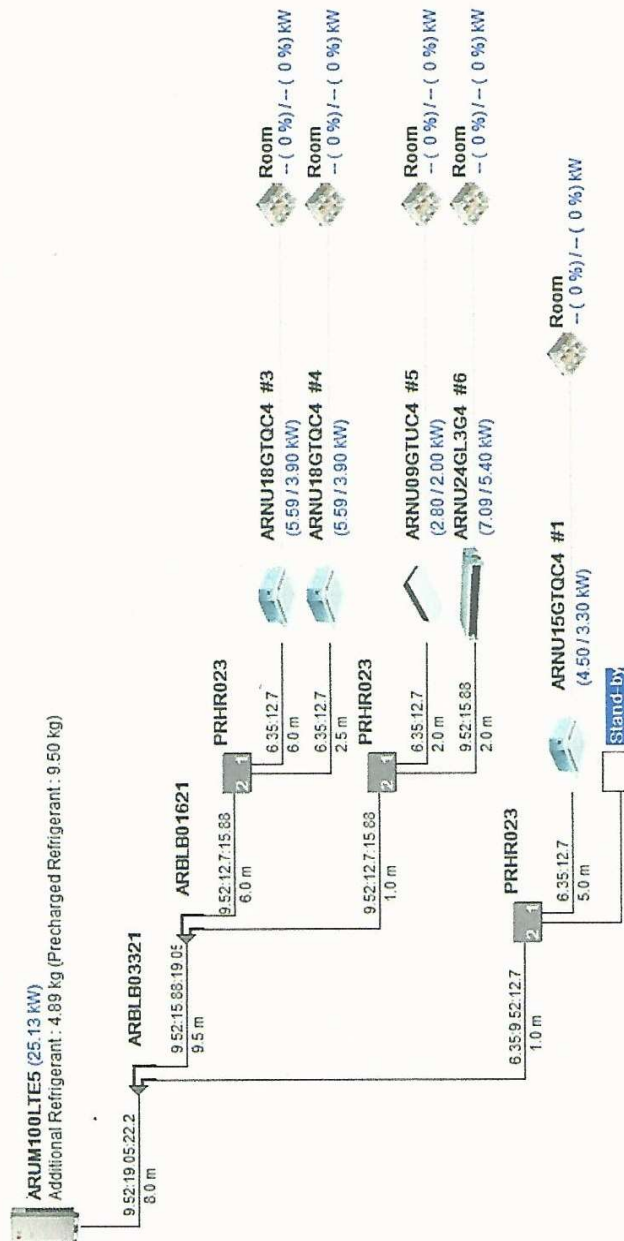
MULTI V

System Tree Diagram

System Name: system 1

2020/05/12

System No : 1/3



EyeSizwe Consulting Engineers

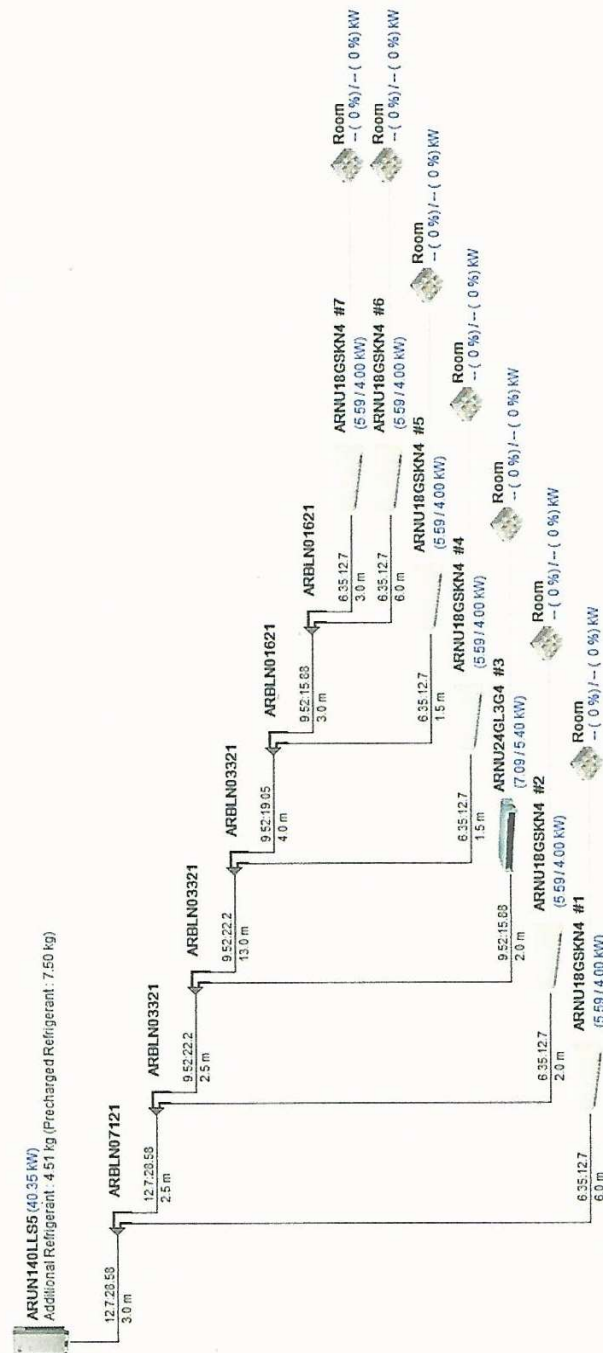
MULTI V

System Tree Diagram

System Name: system 2

2020/05/12

System No : 2/3



**	Conditional Application
Two pipe	Liquid, Vapor
Remote Controller	Group Control, Dry Contact
Indoor Units	7 of 35
Condensation Ratio	40.7 at 39.2 (10.4%)
Total Pipe	50.0 of 1000.0 m

EyeSizwe Consulting Engineers

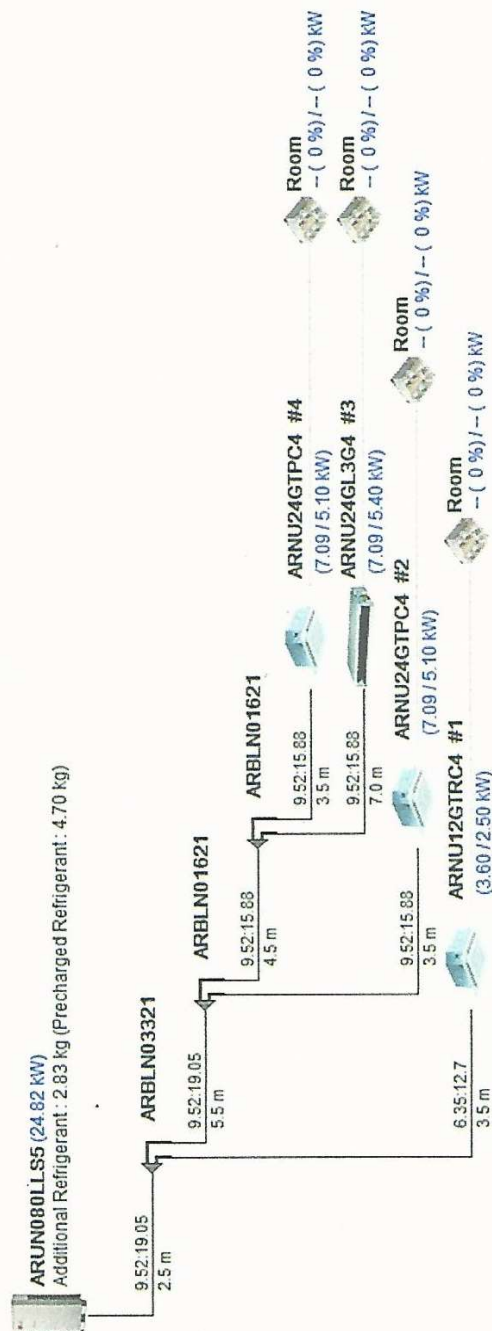
MULTI V

System Tree Diagram

System Name: system 3

2020/05/12

System No : 3/3



**	Conditional Application
Two pipe	Liquid: Vapor
Remote Controller	Group Control, Dry Contact
Indoor Units	4 of 20
Combination Ratio	24.9 of 22.4 (111%)
Total Pipe	30.0 of 1000.0 m

PART 4 – BILLS OF QUANTITY

SCHEDULE OF QUANTITIES - GENERAL NOTES

4. NOTES TO TENDERERS

4.1.1 THESE BILLS OF QUANTITIES CONTAIN PAGES NUMBERED CONSECUTIVELY IN EACH BILL. BEFORE THE TENDERER SUBMITS HIS TENDER HE SHOULD CHECK THE NUMBER OF PAGES AND IF ANY ARE FOUND TO BE MISSING, DUPLICATED OR INDISTINCT, OR THE BILLS OF QUANTITIES CONTAIN ANY OBVIOUS ERRORS, HE SHOULD APPLY TO THE ENGINEER IMMEDIATELY TO HAVE SAME RECTIFIED OR CLARIFIED AS NO LIABILITY WHATSOEVER WILL BE ADMITTED BY THE ENGINEER IN RESPECT OF ERROR IN THE BID DUE TO THE FOREGOING.

4.1.2 THE BILLS OF QUANTITIES FORM PART OF AND MUST BE READ IN CONJUNCTION WITH THE SPECIFICATIONS AND DRAWINGS WHICH CONTAIN THE FULL DESCRIPTION OF THE WORKS TO BE CARRIED OUT AND MATERIALS AND EQUIPMENT TO BE USED.

4.1.3 TENDERS SHALL BE SUBMITTED FOR INITIAL CONSIDERATION ON THE DECLARATION OF THE TOTAL VALUE OF THE BILL SUMMARY, NON-SCHEDULED BILL ITEM RATES AND EXTRA OVER RATES. TO ENABLE THE ENGINEER TO THOROUGHLY ASSESS THE MERITS OF TENDERS SUBMITTED THE BILLS PRICED IN DETAIL SHALL BE MADE AVAILABLE UPON REQUEST WITHIN 2 DAYS AFTER CLOSING DATE OF TENDERS.

4.1.4 THE TOTAL TENDER SUM IN THE FORM OF TENDER OR OTHER SUBSEQUENTLY NEGOTIATED BETWEEN THE ENGINEER AND TENDERER SHALL CONSTITUTE THE CONTRACT SUM OF THE SUCCESSFUL TENDERER. TENDERERS ARE ADVISED TO CHECK THEIR ITEMS EXTENSIONS AND TOTAL ADDITIONS, AS NO CLAIM FOR ARITHMETICAL ERRORS WILL BE CONSIDERED.

4.1.5 NO ALTERATION, ERASURE OR ADDITION IS TO BE MADE IN THE TEXT OF THE BILLS OF QUANTITIES. SHOULD ANY ALTERATION, ERASURE OR ADDITION BE MADE, IT WILL NOT BE RECOGNISED AND THE ORIGINAL WORDING OF THE BILLS OF QUANTITIES WILL BE ADHERED TO.

4.1.6 THE PRICED BILLS OF QUANTITIES OF THE SUCCESSFUL TENDERER WILL BE CHECKED AND THE ENGINEER RESERVES THE RIGHT TO CALL FOR REASONABLE ADJUSTMENTS TO ANY INDIVIDUAL PRICE AND TO RECTIFY ANY DISCREPANCY WHILST THE TOTAL TENDER PRICE, AS SUBMITTED, REMAINS UNALTERED.

4.1.7 THE RESPONSIBILITY FOR THE ACCURACY OF THE QUANTITIES WRITTEN INTO THE BILLS REMAINS WITH THE PARTY WHO PREPARED THE BILLS. THE BIDDER SHALL BE RELIEVED OF THE RESPONSIBILITY OF MEASURING QUANTITIES AT THE TENDER STAGE, EXCEPT FOR PIPING AND ELECTRICS AND SUCH OTHER ITEMS AS MAY BE NOTED WHICH ARE LUMP SUM ITEMS AND ARE TO BE SUBMITTED IN DETAIL WITH THE DETAILED BILL. THE TENDER SUM SUBMITTED SHALL BE IN RESPECT OF THE QUANTITIES SET OUT IN THE BILLS, ALTHOUGH THE TENDERER WILL BE REQUIRED TO MAKE HIS ASSESSMENT OF ITEMS SUCH AS FIXINGS, PIPE SUPPORTS, DUCT SUPPORTS, ETC, AVM PADS, ETC AND SHALL INCLUDE IN THE ITEM PRICES FOR SUCH SMALL INSTALLATION MATERIALS AS ARE REQUIRED FOR THE COMPLETE INSTALLATION IN ACCORDANCE WITH THE SPECIFICATION.

4.1.8 THE SUB-CONTRACTOR AND THE EMPLOYER OR HIS AGENT MAY AGREE THAT THE TOTAL BILL OR BILLS INCLUDING ANY VARIATIONS BY WAY OF ADDITIONS THERETO OR DEDUCTIONS THEREFROM, REPRESENTS A FAIR AND ACCURATE QUANTIFICATION OF THE ITEMS SET OUT IN THE BILLS AND THE PARTIES MAY AGREE FINAL PAYMENT ON THAT BASIS. IN THE EVENT OF ANY DISPUTE AS TO THE QUANTITIES, THE DISPUTED ITEMS SHALL BE ADJUSTED WHERE NECESSARY.

4.1.9 THE QUANTITIES IN THESE BILLS OF QUANTITIES ARE NOT TO BE USED FOR ORDERING PURPOSES.

4.1.10 VARIATIONS IN THE SCOPE AND EXTENT OF THE WORK INCLUDED IN THE BILLS SHALL BE ALLOWED TO MEET THE EMPLOYER'S REQUIREMENTS.

4.1.11 UNLESS SEPARATE RATES FOR THE SUPPLY AND INSTALLATION OF ANY ITEM IS SPECIFICALLY CALLED FOR, THE SUPPLY AND INSTALLATION COSTS OF ANY ITEM SHALL BE FULLY INCLUDED IN THE UNIT PRICE.

4.1.12 THE RATES INCLUDED FOR NON-SCHEDULED BILL ITEMS SHALL FORM PART OF THE TENDER, AND WILL ONLY BE PAYABLE TO THE SUB-CONTRACTOR IF AND WHEN COVERED BY A VARIATION ORDER.

4.1.13 TENDERERS SHALL PRICE THE PRELIMINARIES UNDER ANY OR ALL OF THREE GROUPS, VIZ:

4.1.14 Fixed amount

4.1.15 An amount varied in proportion to the final contract value as compared to the BID price.

4.1.16 An amount varied in proportion to the final contract period as compared to the originally specified contract period.

4.1.17 THE ALLOCATION OF PRICES TO THE THREE LISTED ABOVE MUST BE REALISTIC AND THE SUB-CONTRACTOR MAY BE REQUIRED TO JUSTIFY THE ALLOCATION OF THE PRICES. ATTENTION IS PARTICULARLY DRAWN TO THE RIGHT RESERVED IN TERMS OF CLAUSE 6.6 ABOVE.

4.1.18 ALL PROVISIONAL SUMS SHALL BE EXPENDED AS DIRECTED BY THE ENGINEER AND ANY BALANCE REMAINING SHALL BE DEDUCTED FROM THE TOTAL CONTRACT SUM.

4.1.19 THE QUANTITIES IN THESE BILLS OF QUANTITIES ARE MEASURED PROVISIONALLY. ALL WORK EXECUTED IN ACCORDANCE WITH THE WORKSHOP DRAWINGS APPROVED BY THE ENGINEER SHALL BE RE-MEASURED AND PRICED AT RATES CONTAINED IN OR BASED ON THE PRICED BILL OF QUANTITIES.

4.1.20 MONTHLY PROGRESS CLAIMS SHALL BE SUBMITTED ON A DRAWING RE-MEASURE BASIS IN THE BILL OF QUANTITIES FORMAT. PRELIMINARIES, SO CLAIMED SHALL BE PRO-RATA TO THE CONTRACT SUM LESS PRELIMINARIES, CONTINGENCIES, PROVISIONAL SUMS AND CONTRACT PRICE ADJUSTMENT PROVISIONS.

ELLIOT MAGISTRATE COURT: AIRCONDITONING AND VENTILATION
PART A: AIRCONDITIONING AND VENTILATION

[illegible]

ELLIOT MAGISTRATE COURT: AIRCONDITONING AND VENTILATION
PART A: AIRCONDITIONING AND VENTILATION

Item	Description	Unit	Qty	Rate	Amount
	<u>AC SYSTEM - 1 (ADMIN AREAS) (PHASE: 4)</u>				
1	Outdoor condenser to spec, Size: ARUM100LTE5 (Inverter HP : 28 Kw Cooling / 24 Kw Heating)	item	1		
	<u>COUPLED INDOOR A/C UNITS (Refer to Drawing)</u>				
2	(AC-1) , Ceiling Cassettes - 18,000 Btu (5,6 Kw)	item	2		
3	(AC-2) , Ceiling Cassettes - 9,000 Btu (2,8 Kw)	item	1		
4	(AC-5) , Ceiling Cassettes - 15,000 Btu (4,5 Kw)	item	1		
5	(AC-6) , Low Static In-Ceiling Ducted AC unit (24,000 Btu) (7,1 Kw)	item	1		
6	Split A.C unit (Inverter) , (AC-3) ceiling casette - (12,000 Btu) (3,6 Kw)	item	2		
7	Remote A/C control units with speed control	item	8		
8	Electrical work to A/C system	Set			
	<u>INSULATED DUCTWORK</u>				
9	Size : 1000mm x 150mm	m	4		
10	1000mm x 150mm x 600mm Long C/W Access Panel	item	1		
11	1000mm x 150mm - SQ Bend	item	1		
12	1000mm x 150mm Duct with O/A filter + Weater Louvre	item	1		
13	Roof soaker sheet (Detail "X")	item	1		
14	250mmØ - Insulated Duct	m	7		
15	200mmØ - Insulated Duct	m	9		
16	150mmØ - Insulated Duct	m	6		
17	150mmØ Spigot x 100mm	item	4		
18	200mmØ Spigot x 100mm	item	3		
19	10mmØ - Support Rod Hangers - (AC-6)	item	8		
20	Remote Control Switch - (AC-6) hard wired with speed control	item	1		
	<u>INSULATED FLEXIBLE DUCT</u>				
21	150mmØ	m	6		
22	200mmØ	m	2		
	Total for Bill No.1 Carried to Summary Page				

ELLIOT MAGISTRATE COURT: AIRCONDITIONING AND VENTILATION
PART A: AIRCONDITIONING AND VENTILATION

Item	Description	Unit	Qty	Rate	Amount
	<u>REFRIGERATION PIPING & FITTINGS</u>				
	<u>Insulated Refrigeration Pipework</u>				
23	6mmØ	m	20		
24	10mmØ	m	30		
25	13mmØ	m	25		
26	15mmØ	m	22		
27	20mmØ	m	22		
28	22mmØ	m	10		
	<u>Insulated uPVC Drain Pipework</u>				
29	40mmØ	m	20		
30	20mmØ	m	10		
31	Elbows - 40mmØ	item	4		
32	Elbows - 20mmØ	item	8		
33	Reducer Tees - 40mmØ / 20mmØ	item	6		
34	EGA tube trunking , Size : 150mm	m	6		
35	Galvanised Support Cable Tray , Size : 150mm	m	35		
36	Refrigeration Charge	Set	Sum		
	<u>'Y' - Branch Fittings</u>				
37	Size : ARBLB-03321	item	1		
38	Size : ARBLB-01621	item	1		
	<u>Distribution Box</u>				
39	Size : PRHR-023	item	3		
40	Anti-Vibration Mounts : 100mmx100mmx25mm	item	10		
41	Commissioning and Testing	Set	Sum		
	Total for Bill No.2 Carried to Summary Page				

ELLIOT MAGISTRATE COURT: AIRCONDITIONING AND VENTILATION
PART A: AIRCONDITIONING AND VENTILATION

Item	Description	Unit	Qty	Rate	Amount
	AC SYSTEM - 2 (COURT "A") (PHASE - 4)				
1	Outdoor condenser to spec, Size: ARUN140LLS-5 (Inverter HP , 39 Kw Cooling / 39 Kw Heating)	item	1		
	COUPLED INDOOR A/C UNITS (REFER TO DRAWING)				
2	(AC-7) , Midwall Units - 18,000 Btu (5,6 Kw)	item	5		
3	(AC-8) , Midwall Units - 18,000 Btu (5,6 Kw)	item	1		
4	(AC-9) , Low Static In-Ceiling Ducted A/c Unit - 24,000 Btu (7,1 Kw)	item	1		
5	Remote A/C control unit and wiring electrical work to AC system (Daisy chain hard wired in trunking)	Set			
	Insulated Ductwork				
6	Size: 1000mm x 150mm	m	4		
7	1000mm x 150mm x 600mm Long c/w access panel	item	1		
8	1000mm x 150mm - SQ Bend	item	1		
9	1000mm x 150mm - Duct with O/A filter + Weather Louvre	item	1		
10	Roof soaker sheet - Detail - "X"	item	1		
11	150mmØ - Duct	m	4		
12	150mmØ - Spigot	item	2		
	Insulated Flexible Duct				
13	150mmØ	item	2		
14	10mmØ - Support Rod Hangers - (AC-9)	item	8		
15	Remote Control Switch (AC-9), hard wired with speed control	item	1		
16	(1-Way Blow) , Diffuser : 400 x 400	item	1		
	REFRIGERATION PIPING & FITTINGS Insulated Refrigeration Pipework				
17	6mmØ	m	20		
18	10mmØ	m	30		
19	13mmØ	m	27		
	Total for Bill No.3 Carried to Summary Page				

ELLIOT MAGISTRATE COURT: AIRCONDITONING AND VENTILATION
PART A: AIRCONDITIONING AND VENTILATION

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ELLIOT MAGISTRATE COURT: AIRCONDITONING AND VENTILATION
PART A: AIRCONDITIONING AND VENTILATION

[illegible]

ELLIOT MAGISTRATE COURT: AIRCONDITONING AND VENTILATION
PART A: AIRCONDITIONING AND VENTILATION

[illegible]

ELLIOT MAGISTRATE COURT: AIRCONDITONING AND VENTILATION
PART A: AIRCONDITIONING AND VENTILATION

Item	Description	Unit	Qty	Rate	Amount
1	Ceiling Sweep Fans (CF-1) c/w control - 900Ø	item	12		
2	Ceiling Sweep Fans (CF-2) c/w control - 600Ø	item	2		
	<u>Extract Fan Silent Series</u>				
3	(EF-1) , 300 L/s - Size : TD 1000/200	item	2		
4	(EF- 2) , 100 L/s - Size : TD 380/125	item	1		
5	(EF- 3) , 250 L/s - Size : TD 800/200	item	2		
6	Remote fan control switch and wiring	item	5		
7	Xpelair Fan , (WX-6) - (EF-4) - Extract Fan	item	4		
8	Size: GX-6 - (EF-5) - Extract Fan	item	9		
	<u>Aluminium Door Grilles</u>				
9	Size : 300mm x 200mm - (DG-1)	item	4		
10	Size : 350mm x 350mm - (DG-2)	item	4		
11	Size : 250mm x 250mm - (DG-3)	item	4		
11.1	Size : 400mm x 250mm - (DG-4)	item	4		
	<u>Aluminium Weather Louvre</u>				
12	Size : 350mm x 350mm - (WL-1)	item	2		
13	Size : 250mm x 250mm - (WL-2)	item	1		
14	Size : 700mm x 250mm - (WL-3)	item	1		
15	Size : 1000mm x 150mm - (WL-4)	item	3		
	<u>Circular Discharge Grille</u>				
16	150mmØ - (G-1)	item	2		
17	200mmØ - (G-2)	item	2		
18	200mm x 200mm - "CHUBB" Steel Grille	item	1		
	<u>Circular Disc Valves</u>				
19	Size : (DV-1) -150mmØ	item	4		
20	Size : (DV-2) -150mmØ	item	25		
21	Size : (DV-3) - 200mmØ	item	2		
22	Return Air Gille - 500mm x 250mm	item	4		
23	Fire Damper - 150mmØ	item	1		
24	150mmØ - Back Draught Damper	item	1		
	Total for Bill No.7 Carried to Summary Page				

ELLIOT MAGISTRATE COURT: AIRCONDITONING AND VENTILATION
PART A: AIRCONDITIONING AND VENTILATION

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ELLIOT MAGISTRATE COURT: AIRCONDITONING AND VENTILATION
PART A: AIRCONDITIONING AND VENTILATION

[illegible]

ELLIOT MAGISTRATE COURT: AIRCONDITONING AND VENTILATION
PART A: AIRCONDITIONING AND VENTILATION

Ref	Description	Amount
1	Total Carried Forward From - Bill Page 1	
2	Total Carried Forward From - Bill Page 2	
3	Total Carried Forward From - Bill Page 3	
4	Total Carried Forward From - Bill Page 4	
5	Total Carried Forward From - Bill Page 5	
6	Total Carried Forward From - Bill Page 6	
7	Total Carried Forward From - Bill Page 7	
8	Total Carried Forward From - Bill Page 8	
9	Total Carried Forward From - Bill Page 9	
	TOTAL NETT	
	ADD: 15% Value Added Tax	
	TOTAL PRICE	
	Completed By:	
	Name of Contractor:	
	Contract Person:	
	Contact Detail:	
	Date:	
	Signature:	

PART 5 – SCHEDULE OF DRAWINGS

SCHEDULE OF DRAWINGS

The following drawings are **BOUND OR PLACED INTO THE BACK OF THE DOCUMENT.**

DRAWING NO	TITLE
ME042521/ACV1	AIR-CONDITIONING AND VENTILATION LAYOUT

C2.3 Final Summary

COEGA DEVELOPMENT CORPORATION (PTY) LTD

ELLIOT MAGISTRATE COURT: PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION
(Tender No: CDC/163/25)

CDC/163/25 ~ ELLIOT MAGISTRATES COURT
PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF ENTIRE
FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
ADDITIONAL ACCOMMODATION

FINAL SUMMARY		Page	Amount
<u>Section No</u>			
<u>BUILDERS WORK</u>			
1	Section No. 1 - Preliminaries	32	
2	Section No. 2 - Demolitions and Alterations	42	
3	Section No. 3 - New Works	143	
4	Section No. 4 - External Works	203	
5	Section No. 5 - Socio-Economic Deliverables (CSDG Included)	220	
	Sub Total		R
<u>ELECTRICAL AND MECHANICAL INSTALLATION</u>			
<u>Electrical</u>			
	Add: CCTV, Intercom & Access Control Installation from <u>Book 2 : Part C2 : ITEM C2.3a</u>	Item	
	Add: Standby Generator Installation from <u>Book 2 : Part C2 : ITEM C2.3b</u>	Item	
	Add: Electrical Installation from <u>Book 2 : Part C2 : ITEM C2.3c</u>	Item	
<u>Mechanical</u>			
	Add: Booster Pump Installation from <u>Book 2 : Part C2 : ITEM C2.3d</u>	Item	
	Add: Fire Detection Installation from <u>Book 2 : Part C2 : ITEM C2.3e</u>	Item	
	Add: HVAC Installation from <u>Book 2 : Part C2 : ITEM C2.3f</u>	Item	
	Continued		R

COEGA DEVELOPMENT CORPORATION (PTY) LTD

**ELLIOT MAGISTRATE COURT: PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE
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FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF
ADDITIONAL ACCOMMODATION**

<u>Section No</u>	<u>FINAL SUMMARY</u>	<u>Page</u>	<u>Amount</u>
	Continued		R
	<u>BUDGETARY ALLOWANCES</u>		
	<u>The following budgetary allowances are for work to be executed by the Municipality</u>		
	<u>ELECTRICAL CONNECTION UPGRADE</u>		
	Allow the sum of R300,000.00 (Three Hundred Thousand Rand) for the Electrical Connection Upgrade and Fee Payment including deposits to the municipality	Item	300,000.00
	<u>The following budgetary allowances are for work to be executed by the Department Service Providers</u>		
	<u>IT NETWORK AND VOIP TELEPHONE</u>		
	Allow the sum of R680,000.00 (Six Hundred and Eighty Thousand Rand) for the Supply and Installation of the IT Network and Voip Telephone to be executed complete by a specialist sub-contractor	Item	680,000.00
	<u>SEXUAL OFFENCES SYSTEM</u>		
	Allow the sum of R400,000.00 (Four Hundred Thousand Rand) for the Supply and Installation of the Sexual Offences System to be executed complete by a specialist sub-contractor	Item	400,000.00
	<u>COURT RECORDING EQUIPMENT</u>		
	Allow the sum of R150,000.00 (One Hundred and Fifty Thousand Rand) for the Relocation and Installation of existing Court Recording Equipment System to be executed complete by a specialist sub-contractor	Item	150,000.00
	<u>TELEPHONE AND ICT SYSTEM</u>		
	Allow the sum of R100,000.00 (One Hundred Thousand Rand) for the relocation of Telephone and ICT Systems to be executed complete by a specialist sub-contractor	Item	100,000.00
	Sub Total		R
	Continued		R

**ELLIOT MAGISTRATE COURT: PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION
(Tender No: CDC/163/25)**

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COEGA DEVELOPMENT CORPORATION (PTY) LTD

**ELLIOT MAGISTRATE COURT: PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION
(Tender No: CDC/163/25)**

BILL OF QUANTITIES FOR HEALTH AND SAFETY ELLIOT MAGISTRATES COURT

	Description	Unit	Qty	Rate	Total
1.	Allow for the necessary Workman's Compensation Fund or FEM contributions for the duration of the project with and including renewals	item	1		
2.	Allow for the preparation and approval of project-specific H&S Plan & File [CR 7(1)(a)]	item	1		
3.	Allow for the implementation and maintenance of project-specific H&S Plan & File. [CR 7]	Put Months	24		
4.	Allow for the appointment of a Full-Time Competent Construction Health & Safety Officer/Manager (CHSO/M) registered with SACPCMP (who has 5 or more years working experience) to assist in the control of all health and safety related aspects on site as per [CR 8(5)]	Put Months	24		
5.	Provide for appointment of responsible and competent person/s to manage and supervise the works and administer and enforce health and safety on site as per [CR 8(1), (2), & (7)]	Put Months	24		
6.	Allow for provision of telecommunication facilities for the appointed Construction Health & Safety Officer	Put Months	24		
7.	Allow for provision of Basic Emergency Preparedness and Response equipment & at least Level 2 First Aider/s	Put Months	24		
	Provide, supply and maintenance for each worker the following SANS approved personal protective equipment & clothing as per the site-specific risk assessments:				
8.	Hard Hats (High Density polyethylene, & 6-point lining)	No			
9.	Overall/work suit (100% Cotton)	No			
10.	Safety boots/shoes (Steel-Toe)	No			

COEGA DEVELOPMENT CORPORATION (PTY) LTD

**ELLIOT MAGISTRATE COURT: PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION
(Tender No: CDC/163/25)**

11.	Gumboots (Steel-Toe)	No			
12.	Safety gloves	No			
13.	Ear Plugs/Muffs	No			
14.	Dust Mask (at least FF2 type)	No			
15.	Respirators	No			
16.	Safety goggles	No			
17.	Personal Fall arrest and rescue equipment with and including lifelines and associated equipment	No			
18.	High visibility reflective vests and/or bibs	No			
19.	Temporary handrails, toe boards other than for access scaffolding	Meters			
20.	SANS approved safety netting (orange color with minimum of 1,2 meters high)	Meters			
21.	Pre-employment medical examinations	item	1		
22.	Exit medical examinations	item	1		
23.	Periodic medical examinations				
24.	Mobile toilets and waste removal	No			
25.	First Aid box	No			
26.	Fire Extinguisher Equipment	No			
27.	1200mm surveyor poles for barricading net	Meters	70		
28.	Drip trays	No			
29.	Waste bins	No			
30.	Site Signage	No			
31.	Provision for drinking water	item			
	HEALTH AND SAFETY EDUCATION				
32.	Allow for HIV/AIDS awareness and Implementation programmes, including STI and TB	Put Months	24		

COEGA DEVELOPMENT CORPORATION (PTY) LTD

**ELLIOT MAGISTRATE COURT: PLANNED MAINTENANCE, REPAIR AND REFURBISHMENT OF THE ENTIRE FACILITY AND CAPITAL WORKS TO INCLUDE CONSTRUCTION OF ADDITIONAL ACCOMMODATION
(Tender No: CDC/163/25)**

33.	Safety Representative Training Working at Heights training Fire fighting training	Put Months	24		
	ENVIRONMENTAL				
34.	Provide for adequate handling and storage of materials so as to minimize contamination of ground, air or water.	Item	1		
35.	Provide for the adequate and safe collection and disposal of waste material from site by an approved method.	Item	1		
36.	Provide Facilities and Eating Area for workers.	Item	1		
37.	Provide for rehabilitation on completion of site areas and temporary access routes not covered by construction or landscaping specifications.	Item	1		
	COMPULSORY BREAKDOWN FOR THE ADJUSTMENT OF PRELIMINARIES				
38.	Value Related	Item			
39.	Fixed Value Related	Item			
40.	Time Related	Item			
41.	TOTAL				

SPECIALIST WORK SPECIFICATIONS AND PRICING SCHEDULES

PART T2: RETURNABLE DOCUMENTS

SBD 4

SBD4**BIDDER'S DISCLOSURE****1. PURPOSE OF THE FORM**

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. Bidder's declaration

- 2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest² in the enterprise,
employed by the state? **YES/NO**

- 2.1.1 If so, furnish particulars of the names, individual identity numbers, and, if applicable, state employee numbers of sole proprietor/ directors / trustees / shareholders / members/ partners or any person having a controlling interest in the enterprise, in table below.

Full Name	Identity Number	Name of State institution

² the power, by one person or a group of persons holding the majority of the equity of an enterprise, alternatively, the person/s having the deciding vote or power to influence or to direct the course and decisions of the enterprise.

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2.2 Do you, or any person connected with the bidder, have a relationship with any person who is employed by the procuring institution? **YES/NO**

2.2.1 If so, furnish particulars:

.....
.....

2.3 Does the bidder or any of its directors / trustees / shareholders / members / partners or any person having a controlling interest in the enterprise have any interest in any other related enterprise whether or not they are bidding for this contract? **YES/NO**

2.3.1 If so, furnish particulars:

.....
.....

3 DECLARATION

I, the undersigned, (name)..... in submitting the accompanying bid, do hereby make the following statements that I certify to be true and complete in every respect:

- 3.1 I have read and I understand the contents of this disclosure;
- 3.2 I understand that the accompanying bid will be disqualified if this disclosure is found not to be true and complete in every respect;
- 3.3 The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement or arrangement with any competitor. However, communication between partners in a joint venture or consortium³ will not be construed as collusive bidding.
- 3.4 In addition, there have been no consultations, communications, agreements or arrangements with any competitor regarding the quality, quantity, specifications, prices, including methods, factors or formulas used to calculate prices, market allocation, the intention or decision to submit or not to submit the bid, bidding with the intention not to win the bid and conditions or delivery particulars of the products or services to which this bid invitation relates.
- 3.4 The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

³ Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

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- 3.5 There have been no consultations, communications, agreements or arrangements made by the bidder with any official of the procuring institution in relation to this procurement process prior to and during the bidding process except to provide clarification on the bid submitted where so required by the institution; and the bidder was not involved in the drafting of the specifications or terms of reference for this bid.
- 3.6 I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

I CERTIFY THAT THE INFORMATION FURNISHED IN PARAGRAPHS 1, 2 and 3 ABOVE IS CORRECT.

I ACCEPT THAT THE STATE MAY REJECT THE BID OR ACT AGAINST ME IN TERMS OF PARAGRAPH 6 OF PFMA SCM INSTRUCTION 03 OF 2021/22 ON ENHANCING COMPLIANCE, TRANSPARENCY AND ACCOUNTABILITY IN SUPPLY CHAIN MANAGEMENT SHOULD THIS DECLARATION PROVE TO BE FALSE.

.....

Signature

.....

Date

.....

Position

.....

Name of bidder

SBD 6.1

SBD 6.1

**PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL
PROCUREMENT REGULATIONS 2022**

This preference form must form part of all tenders invited. It contains general information and serves as a claim form for preference points for specific goals.

NB: BEFORE COMPLETING THIS FORM, TENDERERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF THE TENDER AND PREFERENTIAL PROCUREMENT REGULATIONS, 2022

1. GENERAL CONDITIONS

1.1 The following preference point systems are applicable to invitations to tender:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included); and
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 **To be completed by the organ of state**

(delete whichever is not applicable for this tender).

- a) The applicable preference point system for this tender is the 90/10 preference point system.
- b) The applicable preference point system for this tender is the 80/20 preference point system.
- c) Either the 90/10 or 80/20 preference point system will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the accurate system once tenders are received.

1.3 Points for this tender (even in the case of a tender for income-generating contracts) shall be awarded for:

- (a) Price; and
- (b) Specific Goals.

1.4 **To be completed by the organ of state:**

The maximum points for this tender are allocated as follows:

	POINTS
PRICE	80 or 90
SPECIFIC GOALS	20 or 10
Total points for Price and SPECIFIC GOALS	100

1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this

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tender to claim points for specific goals with the tender, will be interpreted to mean that preference points for specific goals are not claimed.

- 1.6 The organ of state reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the organ of state.

2. DEFINITIONS

- (a) **“tender”** means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation;
- (b) **“price”** means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts;
- (c) **“rand value”** means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes;
- (d) **“tender for income-generating contracts”** means a written offer in the form determined by an organ of state in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the organ of state and a third party that produces revenue for the organ of state, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions; and
- (e) **“the Act”** means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3. FORMULAE FOR PROCUREMENT OF GOODS AND SERVICES

3.1. POINTS AWARDED FOR PRICE

3.1.1 THE 80/20 OR 90/10 PREFERENCE POINT SYSTEMS

A maximum of 80 or 90 points is allocated for price on the following basis:

$$P_s = 80 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right) \quad \text{or} \quad P_s = 90 \left(1 - \frac{P_t - P_{min}}{P_{min}} \right)$$

Where

P_s = Points scored for price of tender under consideration

P_t = Price of tender under consideration

P_{min} = Price of lowest acceptable tender

3.2. FORMULAE FOR DISPOSAL OR LEASING OF STATE ASSETS AND INCOME GENERATING PROCUREMENT

3.2.1. POINTS AWARDED FOR PRICE

A maximum of 80 or 90 points is allocated for price on the following basis:

80/20 or 90/10

$$Ps = 80 \left(1 + \frac{Pt - P_{max}}{P_{max}} \right) \text{ or } Ps = 90 \left(1 + \frac{Pt - P_{max}}{P_{max}} \right)$$

Where

Ps = Points scored for price of tender under consideration
Pt = Price of tender under consideration
Pmax = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

- 4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:
- 4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 80/20 or 90/10 preference point system applies, an organ of state must, in the tender documents, stipulate in the case of—
- (a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system; or
 - (b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,
- then the organ of state must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

Table 1: Specific goals for the tender and points claimed are indicated per the table below.

(Note to organs of state: Where either the 90/10 or 80/20 preference point system is applicable, corresponding points must also be indicated as such.)

Note to tenderers: The tenderer must indicate how they claim points for each preference point system.)

The specific goals allocated points in terms of this tender	Number of points allocated (90/10 system) (To be completed by	Number of points allocated (80/20 system) (To be completed	Number of points claimed (90/10 system) (To be completed	Number of points claimed (80/20 system) (To be completed
---	--	---	---	---

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	the organ of state)	by the organ of state)	by the tenderer)	by the tenderer)

DECLARATION WITH REGARD TO COMPANY/FIRM

4.3. Name of company/firm.....

4.4. Company registration number:

4.5. TYPE OF COMPANY/ FIRM

- ☐ Partnership/Joint Venture / Consortium
 - ☐ One-person business/sole propriety
 - ☐ Close corporation
 - ☐ Public Company
 - ☐ Personal Liability Company
 - ☐ (Pty) Limited
 - ☐ Non-Profit Company
 - ☐ State Owned Company
- [TICK APPLICABLE BOX]

4.6. I, the undersigned, who is duly authorised to do so on behalf of the company/firm, certify that the points claimed, based on the specific goals as advised in the tender, qualifies the company/ firm for the preference(s) shown and I acknowledge that:

- i) The information furnished is true and correct;
- ii) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form;
- iii) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct;
- iv) If the specific goals have been claimed or obtained on a fraudulent basis or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have –
 - (a) disqualify the person from the tendering process;
 - (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct;

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- (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation;
- (d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
- (e) forward the matter for criminal prosecution, if deemed necessary.

.....	
SIGNATURE(S) OF TENDERER(S)	
SURNAME AND NAME:
DATE:
ADDRESS:

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T2.1.1 FORM A: Authority for Signatory

Indicate the status of the tenderer by ticking the appropriate box hereunder. The tenderer must complete the certificate set out below for the relevant category.

A Company	B Partnership	C Joint Venture	D Sole Proprietor	E Close Corporation

A. Certificate for Company

I,, chairperson

of the board of,

hereby confirm that by resolution of the board (copy attached) taken on

..... 20...., Mr/Ms

acting in the capacity of, was authorised to sign all documents in connection with this tender for Contract No. CDC/163/25 and any contract resulting from it on behalf of the company.

As witnesses:

1.

Chairman:

2.

Date:

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B. Certificate for Partnership

We, the undersigned, being the key partners in the business trading as

....., hereby authorise

Mr/Ms
acting in the capacity of

....., to sign all documents in connection with this tender for

Contract No CDC/163/25 and any contract resulting from it on our behalf.

Name	Address	Signature	Date

Note: This certificate is to be completed and signed by all key partners upon whom rests the direction of the affairs of the Partnership as a whole.

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C. Certificate for Joint Venture (Continue)

We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorise

Mr/Ms, authorised signatory of the company

....., acting in the capacity of lead

partner, to sign all documents in connection with this tender for Contract No **CDC/163/25** any contract resulting from it on our behalf.

This authorisation is evidenced by the attached power of attorney signed by legally authorised signatories of all the partners to the Joint Venture.

Name of Firm	Address	Authorizing Name and Capacity	Authorizing Signature

D. Certificate for Sole Proprietor

I,, hereby confirm that I am

the sole owner of the business trading as

As witnesses:

1.

Sole Owner:

2.

Date:

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E. Certificate for Close Corporation

We, the undersigned, being the key members in the business trading as

.....

hereby authorize Mr/Ms

acting in the capacity of, to sign all
to sign all documents in connection with this tender for Contract No CDC/163/25 and any contract resulting
from it on our behalf.

Name	Address	Signature	Date

Note: This certificate is to be completed and signed by all key partners upon whom rests the direction of the affairs of the Partnership as a whole.

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T2.1.2 FORM B: Schedule of Work Carried out by the Tenderer

The Tenderer shall list below the projects of a similar nature and highest value awarded to him over the last 5 years.

Details of contactable references for each project listed must be included. At least three (3) traceable CLIENT references must be provided.

Contractors MUST attach appointment letter, completion certificates from previous employers or consultants that they have worked with. This information is essential to the award of the Contract.

EMPLOYER (Name, Tel No and Fax No)	LEAD CONSULTANT (Name, Tel No and Fax No)	NATURE OF WORK	VALUE OF WORK	YEAR OF COMPLETION

SIGNATURE: **DATE:**
(of person authorised to sign on behalf of the Tenderer)

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T2.1.2 FORM B (continue): Schedule of Current Contracts

The Tenderer shall list below the current projects awarded to his company.

Traceable and contactable references for each project listed must be included.

Contractors MUST attach appointment letters. This information is essential to the award of the Contract.

EMPLOYER (Name, Tel No and Fax No)	LEAD CONSULTANT (Name, Tel No and Fax No)	NATURE OF WORK	VALUE OF WORK	EXPECTED COMPLETION DATE

SIGNATURE: **DATE:**
(of person authorised to sign on behalf of the Tenderer)

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T2.1.3 FORM C: Proposed Key Personnel

The Tenderer shall list below the key personnel (including first nominee and the second-choice alternate), whom he proposes to employ on the contract should his offer be accepted, both at his headquarters and on the Site, to direct and for the execution of the work, together with their qualifications, experience, positions held and their nationalities.

CV's of the critical staff members such as Contract Manager, Site Agent, Foreman and Health & Safety Officer

LOCATION	TYPE	NAME	SIGNATURE	SUMMARY OF QUALIFICATIONS, EXPERIENCE AND PRESENT OCCUPATION
Head Office	Contract Manager			
SITE OFFICE	Site Agent			
	Foreman			
	Health & Safety Officer			

SIGNATURE:

DATE:.....

(of person authorised to sign on behalf of the Tenderer)

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T2.1.4 FORM D: Schedule of Proposed Sub-Contractors

I/We hereby notify you that it is my/our intention to employ the following Sub-Contractors for work in this contract.

NAMES AND ADDRESSES OF PROPOSED SUB- CONTRACTORS	NATURE AND EXTENT OF WORK TO BE SUB- CONTRACTED	PREVIOUS EXPERIENCE WITH SUB- CONTRACTOR OR RECENT WORK EXECUTED BY THE SUB- CONTRACTOR	LOCAL BASED (Yes or No)	BEE Level (Indicate)

SIGNATURE:

DATE:.....

(of person authorised to sign on behalf of the Tenderer)

T2.1.5 FORM E: Particulars of Electrical Contractor

I/We hereby notify you that it is my/our intention to employ the following Electrical Contractor for work in this contract.

NAME AND ADDRESS OF PROPOSED ELECTRICAL CONTRACTOR	NATURE AND EXTENT OF WORK	PREVIOUS EXPERIENCE WITH ELECTRICAL CONTRACTOR OR RECENT WORK EXECUTED BY THE ELECTRICAL CONTRACTOR	LOCAL BASED (Yes or No)	BEE Level (Indicate)

SIGNATURE:

DATE:.....

(of person authorised to sign on behalf of the Tenderer)

T2.1.6 FORM F: Financial References

Financial Statements

I/We agree, if required, to furnish an audited copy of the latest set of financial statements together with my/our Directors' and Auditors' report for consideration by the Employer.

Details of Company's Bank

I/We hereby authorise the Employer/Engineer to approach all or any of the following banks for the purposes of obtaining a financial reference:

DESCRIPTION OF BANK DETAIL	BANK DETAILS APPLICABLE TO TENDERER'S HEAD OFFICE
Name of Bank	
Branch Name	
Branch Code	
Street Address	
Postal Address	
Name of Manager	
Telephone Number	()
Fax Number	()
Account Number	

SIGNATURE:

DATE:.....

(of person authorised to sign on behalf of the Tenderer)

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T2.1.7 FORM G: Estimated Monthly Expenditure

The Tenderer shall state below the estimated value of work to be completed every month based on his preliminary programme and his tendered unit rates.

*** The amounts for contingencies and Contract Price Adjustment must not be included.**

MONTH	VALUE *
1	R
2
3	R
4
5	R

	R

	R
TOTAL	R

SIGNATURE: **DATE:**
(of person authorised to sign on behalf of the Tenderer)

T2.1.9 FORM H: PROTECTION OF PERSONAL INFORMATION: CONSENT

The introduction of The Protection of Personal Information Act (POPIA) ensures the regulation of personal information through its entire life cycle of collection, transfer, storing and deletion.

As part of its business activities, the Coega Development Corporation (CDC) obtains and requires access to personal data from a wide range of internal and external parties, including without limitation bidders who respond to requests for proposals that are published by the CDC from time to time. The CDC confirms that it shall process the information disclosed by Bidders for the purpose of evaluating and subsequently awarding/appointing a successful Bidder.

The CDC hereby states that it does not and will never modify, amend, or alter any personal information submitted to it by a Bidder. Unless directed to do so by an order of court, the CDC does not disclose or permit the disclosure of any personal information to any Third Party without the prior written consent of the owner of the information.

Similarly, Bidders will from time-to-time access and will be seized with information of a personal nature pertaining to the CDC. Some of the information may, because of legislative compliances be available in the public domain, whilst some is uniquely provided to bidders in pursuit of procurement or other business-related activities. In this regard, the CDC requires that Bidders which receive or have access to its personal information, process any such information in a manner compliant with the requirements of the POPIA.

AGREEMENT

1. The CDC and the Bidder (the Parties) agree and undertake that upon obtaining and having access to personal information relating to either of them, they shall always ensure that:
 - a) They process the information only for the express purpose for which it was obtained.
 - b) Information is provided only to designated and authorized personnel who require the personal information to carry out the Parties' respective obligations in terms of the Procurement processes.
 - c) They will introduce, and implement all reasonable measures ensure the protection of all personal information from unauthorized access and/or use.
 - d) They have taken appropriate measures to safeguard the security, integrity, and authenticity of all personal information in its possession or under its control.
 - e) The Parties agree that if personal information will be processed for any other purpose other than the one for which the accessing of the information was intended, explicit written consent will be obtained prior to the execution of such reason.
 - f) The Parties shall carry out regular assessments to identify all reasonably foreseeable internal and external risks to the interception of personal information in its possession or under its control and shall implement and maintain appropriate controls in mitigation of such risks.

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2. The Parties agree that they will promptly return or destroy any personal data in their possession or control which belongs to the other Party once it no longer serves the purpose for which it was collected, subject to any legal retention requirements. The information will be destroyed in such a manner that it cannot be reconstructed to its original form, linking it to any individual or organisation.
3. Bidder's Obligations:
- a) The Bidder is required to notify the Information Officer of CDC, in writing as soon as possible after it becomes aware of or suspects any loss, unauthorised access or unlawful use of any of the CDC's personal information.
 - b) The Bidder shall, at its own cost, promptly and without delay take all necessary steps to mitigate the extent of the loss or compromise of personal data.
 - c) The Bidder shall be required to provide the CDC with details of the persons affected by the compromise and the nature and extent of the compromise, including details of the identity (if known) of the unauthorized person who may have accessed or acquired the personal data.
 - d) The Bidder undertakes to co-operate with any investigation relating to security breach which is carried out by or on behalf of CDC.

On behalf of the Bidder:

.....

Signature

.....

Date

.....

Position

.....

Name of the Bidder

On behalf of the Client:

.....

Signature

.....

Date

.....

Position

.....

Name of Client Representative

T2.1.8 FORM I: Details of Amendments and Qualifications

AMENDMENTS AND QUALIFICATIONS

I / We herewith propose the amendments and discounts as set out in the tables below:

(a) AMENDMENTS

PAGE, CLAUSE OR ITEM NO	PROPOSED AMENDMENT

[Notes: (1) Amendments to the Contract Data are not acceptable;

(2) The Tenderer must give full details of all the financial implications of the amendments and qualifications in a covering letter attached to his tender.]

(b) ALTERNATIVES

PROPOSED ALTERNATIVE	DESCRIPTION OF ALTERNATIVE

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[Notes: (1) Individual alternative items that do not justify an alternative tender, and an alternative offer for time for completion should be listed here.

(2) In the case of a major alternative to any part of the work, a separate Bill of Quantities, programme, etc, and a detailed statement setting out the salient features of the proposed alternatives must accompany the tender.]

(c) DISCOUNTS

ITEM ON WHICH DISCOUNT IS OFFERED	DESCRIPTION OF DISCOUNT OFFERED

[Note: The Tenderer must give full details of the discounts offered in a covering letter attached to his tender, failing which, the alternative offer will be prejudiced]

SIGNATURE: **DATE:.....**
(of person authorised to sign on behalf of the Tenderer)

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T2.1.10 FORM J: Schedule of Construction Plant and Equipment

The following are lists of major items of relevant equipment that I/we presently own or lease and will have available for this contract or will acquire or hire for this contract if my/our tender is accepted.

(a) Details of major equipment that is owned by and immediately available for this contract.

Quantity	Description, size, capacity, etc.

Attach additional pages if more space is required.

(b) Details of major equipment that will be hired, or acquired for this contract if my/our tender is acceptable.

Quantity	Description, size, capacity, etc.

Attach additional pages if more space is required.

SIGNATURE: **DATE:**
(of person authorised to sign on behalf of the Tenderer)

T2.1.11 FORM K: Contract Participation Goal: EME / QSE Target Form

The CIDB Standard for Indirect Targeting is incorporated into this Contract. A Contract Participation Goal (CPG) of 35% (by value, excluding contingencies, escalation, VAT, Socio-economic deliverables, and EPWP allowances (if applicable)) is stipulated/desirable in this contract.

The Tenderer is to commit to targeted works that can be performed by EMEs/QSEs as subcontractors. The EME/ QSE targeted CPG must be calculated in relation to every entity involved in the project as defined in the CDC SMME Specification document.

The identification of SMME packages post-award will be done in conjunction with the CDC SMME Unit and the project team. The sourcing, procurement, appointment, mentoring, and graduating of SMMEs will be done in accordance with the CDC SMME Specification.

The overall percentage in the table below will be utilised for the allocation of points in the Functionality Assessment stage of Evaluation and will be monitored during construction for compliance. Penalties may be applied for achieving less than the stated/committed CPG %.

Please refer to Tables A1 and A2 in the Functionality section of Volume 1 of the Tender documents for the Evaluation Indicators for scoring purposes

CONTRACT NUMBER : _____

CONTRACT DESCRIPTION : _____

PROJECT MANAGER : _____

TENDERER/S NAME : _____

I/We tender the following targets of:

Exempted Micro Enterprises (EMEs) / SMMEs Participation		
Participation	% Goal Tendered	Estimated RAND Value (R)
SMME Packages committed	%	R
Overall % Contract Participation Goal (Desirable 35%)	%	R

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I/We commit to achieving the above-mentioned Contract Participation Goal and to respond promptly to points of clarification regarding my/our CPGs, failing which I/we understand that my/our Tender will be deemed non-responsive on the grounds of being incomplete and not meeting the mandatory requirements as stipulated in the Tender.

Should the tenderer be a Grade 7 or higher, they will need to complete form K in order to score points under functionality. Where the tenderer is a Grade 6, they will be awarded full points under functionality.

Penalty on non-compliance/not achieving the committed minimum target of 35% participation

"The tenderers must allow for all costs application that they may feel be associated with the successful integration, development of and completion of SMME Contractors' work to the approval of the Principal Agent on this project. This includes all the costs associated with the provision of an SMME Participation as stipulated on the Form K at a desirable minimum of 35% of construction costs excluding VAT, Contingencies and Escalation". The employer shall be entitled without prejudice to its other remedies under the contract, to deduct from the contract price, as penalty calculated on the following formula:

Committed % of PV (*in monetary value*) - %age AV (*in monetary value*) = PAV (*in monetary value*):

where PV = Project Value,

where AV= Achieved SMME Participation Value,

where PAV = Penalty Accumulated Value

Penalty = *Target @ Committed % - % Achieved SMME Participation* = Balance of the % not achieved
(which would be the penalty for non-compliance)

Duly authorised to sign on behalf of: (name of tenderer)	:	

Name of Person signing	:	
------------------------	---	--

Signature	:	
-----------	---	--

Date	:	
------	---	--

T2.1.12 FORM L: Record of Addenda to Tender Documents

We confirm that the following communications received from the Principal Agent before the submission of this tender offer, amending the tender documents, have been taken into account in this tender offer:

	Date	Title or Details
1		
2		
3		
4		
5		

Attach additional pages if more space is required.

Signed:

Date:

Name:

Position:

SIGNATURE:

DATE:

(of person authorised to sign on behalf of the Tenderer)

T2.1.13 FORM M: Proposed Construction Work Programme and Methodology

Bidders must provide an approach paper (Methodology and Technical approach) detailing the execution of the project which is consistent with the construction programme.

The Methodology is to make reference to the scope of works and SHEQ issues, and must also include contingency planning and management. The key risk factors affecting the project should be described with possible mitigation action.

Refer to Functionality Criteria and Weighting(Book 1, Annex E).

Proposed Construction Work programme and Methodology attached hereto.

(Please Tick)

YES		NO	
-----	--	----	--

SIGNATURE:

DATE:

(of person authorised to sign on behalf of the Tenderer)

T2.1.14 FORM N: Joint Venture Disclosure Form

EMPLOYER : COEGA DEVELOPMENT CORPORATION
.....
CONTRACT DESCRIPTION : ELLIOT MAGISTRATE COURT
.....
CONTRACT NUMBER : CDC/163/25
.....

- Note: 1) This form needs not be completed for Joint Ventures which have enterprise partners.
- 2) All the information requested must be filled in the spaces provided. If additional space is required, additional sheets may be attached.
- 3) A copy of the joint venture agreement must be attached to this form. In order to demonstrate the targeted enterprise partner's share in the ownership, control, management responsibilities, risks and profits of the joint venture, the proposed joint venture agreement must include specific details relating to:
- i) The contributions of capital and equipment
 - ii) Work items to be performed by the enterprise partner's own forces.
 - iii) The commitment of management, supervisory and operative personnel employed by the targeted enterprise partner to be dedicated to the performance of the Contract.
- 4) Copies of all written agreements between partners concerning the contract must be attached to this form including those which relate to ownership options and to restrictions/limits regarding ownership and control.
- 5) Each enterprise partners must complete an Enterprise Declaration Affidavits.

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JOINT VENTURE PARTICULARS

Name : _____

Postal address : _____

Physical address : _____

Telephone : _____ Fax : _____

IDENTITY OF EACH ENTERPRISE PARTNER

Name : _____

Postal address : _____

Physical address : _____

Telephone : _____ Fax : _____

Contact Person : _____

Name : _____

Postal address : _____

Physical address : _____

Telephone : _____ Fax : _____

Contact Person : _____

Name : _____

Postal address : _____

Physical address : _____

Telephone : _____ Fax : _____

Contact Person : _____

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DESCRIPTION OF THE ROLE OF THE PARTNERS IN THE JOINT VENTURE.

OWNERSHIP OF THE JOINT VENTURE

a)	Percentage Ownership in respect of	:	Enterprises	%	Enterprises	%
b)	Profit and Loss Sharing	:	Enterprises	%	Enterprises	%
c)	Initial Capital Contribution	:	Enterprises	R	Enterprises	R
d)	Ongoing Capital Contribution	:	Enterprises	R	Enterprises	R
e)	Major Plant and Equipment Contribution	:	Enterprises		Enterprises	

**RECENT CONTRACTS EXECUTED BY PARTNERS IN THEIR OWN RIGHT OR AS
PARTNERS IN OTHER JOINT VENTURES**

Targeted Enterprise Partners

1. : _____
2. : _____
3. : _____
4. : _____
5. : _____

CONTROL AND PARTICIPATION IN THE JOINT VENTURE

(Identify by name and firm those individuals who are, or will be, responsible for, and have authority to engage in the relevant management functions and policy and decision making, indicating any limitations in their authority e.g. co-signature requirements and Rand limits).

(Continue on next page)

CONTROL AND STRUCTURE OF THE JOINT VENTURE

Briefly describe the manner in which the Joint Venture is structured and controlled.

The undersigned warrants that he/she is duly authorised to sign this Joint Venture Disclosure Form and affirms that the foregoing statements are correct and include all material information necessary to identify and explain the terms and operations of the Joint Venture and the intended participation of each partner in the undertaking.

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The undersigned further covenants and agrees to provide the Employer with complete and accurate information regarding actual Joint Venture work and the payment therefore, and any proposed changes in any provisions of the Joint Venture agreement, and to permit the audit and examination of the books, records and files of the Joint Venture, or those of each partner relevant to the Joint Venture, by duly authorized representatives of the Employer.

Signature : _____

Name : _____

Duly authorised to sign on behalf of : _____

Address : _____

Telephone : _____

Fax : _____

Date : _____

T2.1.15 FORM O: BBEE Validation, CIDB Certificates and CSD Registration document

1. The Tenderer shall attach to this page a valid and Tax Compliance Status (PIN)

Original and Valid Certificate attached :

(Please Tick)

YES		NO	
-----	--	----	--

2. The Tenderer shall attach to this page a certified copy of the BBEE Validation Certificate issued by an accredited Verification Agency and/or financial statement in case of an EME/SMME.

In a case of Joint Ventures (JV) each JV partner must submit their BBEE Validation Certificate.

Certified copy attached :

(Please Tick)

YES		NO	
-----	--	----	--

3. The Tenderer shall attach to this page a copy of their CIDB Registration Certificate

In a case of Joint Ventures (JV) each JV partner must submit their CIDB Registration Certificate.

Certified Copy attached :

(Please Tick)

YES		NO	
-----	--	----	--

4. The Tenderer shall attach to this page a copy of their CSD Registration Certificate

In a case of Joint Ventures (JV) each JV partner must submit their CSD Registration Certificate.

Printout attached :

(Please Tick)

YES		NO	
-----	--	----	--

SIGNATURE:

DATE:.....

(of person authorised to sign on behalf of the Tenderer)

T 2.1.16 FORM P: Preliminary Programme

The tenderer shall attach hereto the anticipated construction sequence of the main work activities.

The program shall clearly indicate the lead times for materials ordering and delivery and any other key dates also showing the critical path activities.

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T2.1.17 FORM Q: EME AFFIDAVIT

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**B-BBEE EXEMPTED AFFIDAVIT FOR EXEMPTED MICRO ENTERPRISES
(ISSUED IN TERMS OF THE AMENDED CONSTRUCTION SECTOR CODE)**

(Gazette Vol. 630 No. 41287)

Issued in terms of paragraph 3.6.2.4.1 (B)

I, the undersigned,

Full names and surname	
Identity number	

Hereby declare under oath as follows:

- The contents of this statement are to the best of my knowledge a true reflection of the facts.
- I am a Member / Director / Owner of the following enterprise and am duly authorized to act on its behalf:

Enterprise Name:			
Trading Name (If Applicable):			
Registration Number:			
Physical Address:			
Type of Entity (CC, (Pty) Ltd, Sole Prop etc.):			
Nature of Construction Business: <i>Indicate the applicable category with a tick.</i>	BEP (Built Environment Professional)	Contractor	Supplier
Definition of "Black People"	As per the Broad-Based Black Economic Empowerment Act 53 of 2003 as Amended by Act No 46 of 2013 "Black People" is a generic term which means Africans, Coloureds and Indians – who are citizens of the Republic of South Africa by birth or descent; or who became citizens of the Republic of South Africa by naturalization before 27 April 1994; or after 27 April 1994 and who would have been entitled to acquire citizenship by naturalization prior to that date;"		
Definition of "Black Designated Groups"	"Black Designated Groups" means: (a) unemployed black people not attending and not required by law to attend an educational institution and not awaiting admission to an educational institution; (b) Black people who are youth as defined in the National Youth Commission Act of 1996; (c) Black people who are persons with disabilities as defined in the Code of Good Practice on employment of people with disabilities issued under the Employment Equity Act; (d) Black people living in rural and under developed areas; (e) Black military veterans who qualifies to be called a military veteran in terms of the Military Veterans Act 18 of 2011;"		

- I hereby declare under Oath that as per Amended Code Series 100 of the Amended Codes of Good Practice issued under section 9 (1) of B-BBEE Act No 53 of 2003 as Amended by Act No 46 of 2013,

- The Enterprise is _____% Black Owned
- The Enterprise is _____% Black Female Owned
- The Enterprise is _____% Owned by Black Designated Group (provide Black Designated Group Breakdown below as per the definition in the table above)
 - Black Youth % _____%
 - Black Disabled % _____%
 - Black Unemployed % _____%
 - Black People living in Rural areas % _____%
 - Black Military Veterans % _____%

Construction Sector Affidavit

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- Based on the Financial Statements/Management Accounts and other information available on the latest financial year-end of _____, the annual Total Revenue was less than the applicable amount confirmed **by ticking the applicable box below.**

BEP	R1.8 million	
Contractor	R3.0 million	
Supplier	R3.0 million	

If the turnover exceeds the applicable amount in the table above then this affidavit is no longer applicable and an EME certificate must be obtained from a rating agency accredited by SANAS or when applicable a B-BBEE Verification Professional Regulator appointed by the Minister of Trade and Industry.

- Please Confirm on the below table the B-BBEE Level Contributor, **by ticking the applicable box below.**

100% Black Owned	Level One (135% B-BBEE procurement recognition level)	
At least 51% Black Owned	Level Two (125% B-BBEE procurement recognition level)	
At least 30% Black Owned	Level Four (100% B-BBEE procurement recognition level)	
Less than 30% Black Owned	Level Five (80% B-BBEE procurement recognition level)	

- I know and understand the contents of this affidavit and I have no objection to take the prescribed oath and consider the oath binding on my conscience and on the Owners of the Enterprise which I represent in this matter.
- The sworn affidavit will be valid for a period of 12 months from the date signed by commissioner.

Deponent Signature: _____

Date: _____

Commissioner of Oaths
Signature & stamp

Construction Sector Affidavit

T2.1.18 FORM R: PERFORMANCE EVALUATION

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FORM R: CONTRACTOR PERFORMANCE MANAGEMENT

PROJECT NUMBER		
CONTRACT NUMBER		
PROJECT NAME		
SERVICE PROVIDER		
PROJECT MANAGER		
PROJECT VALUE		
PROJECT DURATION AND START DATE		
PROJECT STATUS (Planning/Design/Construction/Completed)		
REVIEW PERIOD	FROM:	TO:
EVALUATION DATE		

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Measures of Performance

Evaluation Indicators			Final Score	EXCELLENT 5	VERY GOOD 4	GOOD 3	POOR 2	UNSATISFACTORY 1
Quality Compliance				SP delivered an excellent final product which exceeded the client's expectations, met with all contractual requirements without exceeding the project schedule or the project cost. SP provided value engineering capability during the project reducing or maintaining original cost estimates whilst still maintaining high standards of product quality	SP not only complied with all the client's requirements and specification as defined in the contract documentation and drawings, he/ she also added value by either reducing cost and not delaying schedule commitment whilst achieving quality requirements	SP complied with the client's requirements and met all specifications as indicated in the contract documents	SP failed to comply with at least 50% of quality requirements as set out in the contract documents and or drawings	SP did not deliver to the client's requirements. No attempt was made to meet the quality requirements.
Cost	<u>TARGET</u>	<u>ACTUAL</u>		SP managed to expedite expenditure and is 20% ahead of projected cashflow and not compromising quality criteria.	SP managed to expedite expenditure and is 10% ahead if projected cashflow whilst still maintaining client and project requirements.	SP expenditure is as per the agreed cashflow.	SP delayed execution of the contract and has spent 15% below the target cash flow	SP delayed execution of the contract and has spent 25% below the target cash flow

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Schedule Adherence	<u>TARGET</u>	<u>ACTUAL</u>		SP delivered the project or work packages ahead of the scheduled delivery date by more than 15% of the planned project duration, delivering to the full scope of the project.	SP managed to complete the project or work packages ahead of the planned completion date by reducing project duration with 10% of planned time.	SP achieved original schedule date.	SP underestimated project activities and ultimately project duration resulting in a project delay by more than 15% of the project duration.	SP poor management of the project resulted in the project being delayed by a period longer than 20% of the project duration initially agreed at the conclusion of the contract.
SME Participation	<u>TARGET</u>	<u>ACTUAL</u>		SP made extensive use of SME in the course of the project exceeding project requirements achieving 40% SME participation.	SP made a significant contribution to the development of SMME's during the duration of the project with 38% SME participation.	SP achieved the 35% SME participation requirements as defined in the contract documentation.	SP who does not meet initial SMME contribution requirements as set out in the contract documentation achieved 30% SME participation.	Achieved 25% SME participation.
No of Jobs created	<u>TARGET</u>	<u>ACTUAL</u>		SP created more jobs than contracted by 15% or more	SP created more jobs than initially contracted by 10%.	SP created the number of jobs as defined in the contract document.	SP who does not meet the requirement for job in the contract, achieved 10% less.	Achieved 15% less.
No of Interns	<u>TARGET</u>	<u>ACTUAL</u>		SP employed an increased number of interns above what was agreed initially by 15% or greater	SP employed an increased number of interns above what was agreed initially by 10%	SP employed the agreed number of interns.	Achieved 10% less.	Achieved 15% less.
S.H.E				SP at all times during the project displayed a pro-active approach	SP not only met all the S.H.E requirements in the	SP was in full compliance with all the	SP sometimes complies with S.H.E requirements as defined in the	SP scarcely achieve set S.H.E requirements.

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		taking a leading role with regard to S.H.E requirements and maintains a one step ahead approach to ensure the project is managed in a manner that does not expose the project and client and cause delays.	contract documents but ensured that any gaps encountered in S.H.E requirements were closed to reduce any negative exposure to the client.	S.H.E requirements of the project.	contract documents and statutory and regulatory requirements. Exposing the project to undue risk and negatively affecting the project quality, cost and schedule.	
FINAL SCORE**			SCORE > 35 EXCELLENT	SCORE > 28 VERY GOOD	SCORE > 20 GOOD	SCORE < 20 POOR

****These areas could be weighted and a final score achieved based on CDC priorities**

SP that obtains a score of less than 18 is regarded as a poor performer therefore not recommended for further appointment.

Project Manager's Comments: <i>(PM to define challenges experienced or positive comments)</i>	A good performing contractor and completed the project before original PC date. The reason for schedule was for PC including the relocation of the decanting structures.
---	---

Signatures:

Project Manager:

Date:

Bidders to note that this serves as a guide, bidders may provide the evaluation sheet which is as per their previous clients.

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END