PROVINCIAL ADMINISTRATION OF KWAZULU-NATAL
DEPARTMENT OF PUBLIC WORKS

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

BILLS OF QUANTITIES

with GCC for Construction Works - Second Edition 2010

RETURNABLE DOCUMENT

SECTION 1 OF 2

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

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Clerk of Works
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Westville
3692

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N/A - Fax Number
info@ukuza.co.za

Employer:
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KZN Department of Public Works
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PIETERMARITZBURG
3200
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Regional Manager
KZN Department of Public Works
X9041
Pietermarizburg
3200
Tel Number: 033-897 1421/1422
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Tender Number:	ZNTM01255W	Project Code:	053651
CIDB Grading:	6GB or Higher	Document Date:	22-Sep-2025
ECDP Number:	N/A	Contract Period:	8 Calendar Months

Contracting Party: _____

CIDB Registration number: _____

Central Suppliers Database Registration Number: _____

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

THE TENDER

1. PART T1: TENDER PROCEDURES

		Page No.
T1.1	Tender Notice and Invitation to Tender	4
T1.2	Tender Data	4
T1.3	Annexure C - Standard Conditions of Tender	8

2. PART T2: RETURNABLE DOCUMENTS

T2.1	List of Returnable Documents	2
T2.2	Authority to Sign Tender (T2.2)	1
T2.3	Authority for Consortia or Joint Venture's to Sign Tender (T2.3)	2
T2.4	Special Resolution of Consortia or Joint Venture's (T2.4)	3
T2.5	Joint Venture Involvement Declaration (T2.5)	2
T2.6	Schedule of Proposed Sub-Contractors (T2.6)	1
T2.7	Capacity of Tenderer (T2.7)	6
T2.8	Financial Standing and other resources of Business Declaration (T2.8)	1
T2.9	Preference Points Claim Form (T2.9)	2
T2.10	Site Inspection Certificate as proof for attendance of compulsory briefing meeting (T2.10)	1
T2.11	Bidder's Disclosure - SBD 4 (T2.11)	3
T2.12	Record of Addenda to Tender Documents (T2.12)	1
T2.13	Particulars of Electrical Contractor (T2.13)	1
T2.14	Schedule of Imported Materials and Equipment (T2.14)	1
T2.15a	Annual Financial Statement for past financial year (2.15)	1
T2.16	Equipment Schedules (T2.16)	5
T2.17	Contractor's Safety, Health and Environmental Declaration (T2.17)	1
T2.18	Compulsory Enterprise Questionaire (T2.18)	1
T2.19	Tax Compliance Status (TCS) PIN to verify on line Compliance Supplier Status via e-Filing (T2.19)	1
T2.20	Proof of Good Standing With the Compensation Commissioner (T2.20)	1
T2.21	Form of Offer and Acceptance (Bound into Section 1 of 2) (T2.21)	3
T2.21a	Confirm Receipt of Offer and Acceptance (T2.21a)	1
T2.22	Final Bill of Quantity (T2.22)	215
T2.23	Certified Proof of Paid Municipal Rates and Taxes (Attach) (T2.23)	1
T2.24	Proof of Unemployment Insurance Fund (2.24)	1
T2.25	The National Industrial Participation Programme (T2.25)	2
T2.26	Proof of Registration on the Central Supplier Database (CSD) (T2.26)	1

T2.27	Certified Proof of CIDB Registration Number (T2.27)	1
T2.28	Proof of Deposit (T.28)	1
T2.29	Contract Form - Purchase of Goods/Works - Part 1 (T2.29)	1
T2.30	Contract Form - Purchase of Goods/Works - Part 2 (T2.30)	1
T2.31	OHSE Plan Structure (T2.31)	1
T2.32	Client's specific requirements for the Contractor's detailed OHSE Plan (T2.32)	1
T2.33	Baseline Risk Assessment (T2.33)	1
T2.34	Functionality Criteria (T2.34)	3
T2.35	Invitation to Tender - SBD 1 (T2.35)	2

THE CONTRACT

3. PART C1: AGREEMENT AND CONTRACT DATA

C1.1	Form of Offer and Acceptance	1
C1.2	Contract Data	7
C1.3	Form of Guarantee (C1.3)	3

4. PART C2: PRICING DATA

C2.1	Pricing Instructions	4
C2.2	Bills of Quantities	1-214

5. PART C3: SCOPE OF WORKS

C3.1	Scope of Works	8
C3.2	Specification for HIV/AIDS awareness	3
C3.3	HIV/STI Compliance report	2

6. PART C4: SITE INFORMATION

C4.1	Site Information	1

7. DRAWINGS

C5.1	List of Drawings	2

8. ANNEXURES

Annexure 1	Standard Preambles for all Trades (Rev 3) - DOH 2009	1 to 95
Annexure 2	General Electrical Specifications	E/1 to E/20; LP1 to LP6
Annexure 3	Mechanical Specifications	1,1-4,61; 1-32; 1-3
Annexure 4	Map of Bid submission location	1
Annexure 5	Joint Venture Agreement	7
Annexure 6	Health and Safety Specification	1-11; 0-11; 0-29
Annexure 7	Health and Safety Bill of Quantities	2
Annexure 8	Builders Lien Agreement	1
Annexure 9	Scope of Works in Respect of Work Relating to EPWP	4
Annexure 10	Proforma Project Specific Organogram	1
Annexure 11	Proforma Reference Letter	1
Annexure 12	Project Brief	23

IMPORTANT NOTICE TO TENDERERS

Any reference to words Tender or Tenderder herein and/or in any other documentation shall be construed to have the same meaning as the words Bid or Bidder/ Enterprise. These forms are for internal and external use for the KZN Department of Public Works, Provincial Administration of KwaZulu-Natal.

"Quality" shall mean totality of features and characteristics of a product or service that bears on the ability of the product or service to satisfy stated or implied needs.

No alternativeTenders will be accepted.

The Total (Including Value Added Tax) on the Final Summary of the Bill of Quantities must be carried to the "Offer" part only of the Form of Offer and Acceptance - T2.21

"Enterprise" shall mean the legal Tendering Entity or Tenderer who, on acceptance of the Offer, would become the contractor"

The Department reserves the right not to award to the lowest bidder.

In addition, the Department may conduct a detailed risk assessment prior to the award of the bid

No late arrivals will be admitted to the tender briefing meeting

Bidders who attend the tender briefing without a bid document (Hard Copy) will not be allowed to the briefing.

Site Inspection certificate will not be issued at the Tender briefing meeting.

The Site Inspection certificate must be signed and stamped by the Department representative as proof of attendance, should it not be signed your tender document will be disqualified.

Late submissions will not be accepted.

Only Bidders registered within the applicable CIDB grading of 6GB or Higher or relevant JV and bidders registered on the Central Suppliers Database will be eligible to submit bids.

The bid document can be downloaded from e-Tender Portal at no cost. However, should any bidder require a printed/hard copy of the bid document, a non-refundable payment must be made for collection thereof as per the banking details indicated in the tender document. Proof of payment must be produced upon collection of the bid document.

No EFT payments are accepted for the purchase of tender documents, only original deposit slips issued and stamped by the bank teller.

Bidders who are downloading the bid document and BOQ from the e-tender portal can either submit their priced BOQ as a hard copy or on a memory stick (at the cost of the bidder) together with their bid document at the time of close of bid.

Faxed or e-mailed bids are not accepted.

The Preference points system is applicable for this bid is 80/20, where 20 points of specific goals will be allocated as followers:
• Promotion of Enterprise located in a specific Municipal area (Umgungundlovu District Municipality) for work done or services to be rendered: 20 Points

KWAZULU-NATAL PROVINCE
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DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

THE TENDER

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

PART T1. - TENDER PROCEDURES

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

T1.1 - TENDER NOTICE AND INVITATION TO TENDER

T1.1 TENDER NOTICE AND INVITATION TO TENDER

THE KZN DEPARTMENT OF PUBLIC WORKS INVITES TENDERS FOR THE PROVISION OF:

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**
Advertisement date:	**20 August 2025**	**Closing date:**	**22 September 2025**
Closing time:	**11:00**	**Validity period:**	**84 Calender Days**

It is estimated that tenderers must have a CIDB contractor grading designation of 6ME or higher. No alternative Class of work, as refered to in Clause 25(3)(a)(i) of the CIDB Regulations, as amended, is anticipated for this project.

	It is estimated that Potentially Emerging enterprises should have a CIDB contractor grading of ***(N/A)*** and satisfy the criterion stated in the Tender Data. *(Only applicable if Client has an Official Mentorship programme in place to assist potentially emerging enterprises)* All Tenderer's should have a CIDB Class of Construction Contractor Grading Designation as indicated above. No Tenderer with a PE status can be considered If **"N/A"** is indicated above because the Department does not have an Official Mentorship Programme in place to assist a Potentially Emerging Enterprise.

Only Tenderder's who are responsive to the following responsiveness criteria are eligible to submit Tenders:

X	Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations for a : 6GB or higher, class of construction work, are eligible to have their Tenders evaluated.
X	Joint ventures are eligible to submit tenders provided that: 1 every member of the joint venture is registered with the CIDB; 2 the lead partner has a contractor grading designation in the 6GB or higher, class of construction work; or not lower than one level below the required the required grading designation in the class of works construction works under considerations and possess the required recognition status 3 the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a : **6GB or Higher** or a value determined in accordance with Regulation 25 (1B) or 25 (7A) of the Construction Industry Development Regulations.
X	Tender document must be properly received on or before the tender closing date and time specified on the invitation, fully completed and signed in ink (All as per Standard Conditions of Tender).
X	Submission of Compulsory Returnable Schedules documents as per List of returnable documents.
X	Tax Compliance Status (TCS) PIN number and Tenderder's or entity tax reference number.
X	Contractor's Safety, Health and Environmental Declaration.
X	Complete priced Bill of Quantities to be submitted on the day of the Tender closing date.
X	Proof of good standing with the Compensation Commissioner - In terms of Section 84(1)(b) of the Compensation for Occupation Injuries and Disease Act, 1993, a Tenderder may not be awarded a contract if he/she is not registered and in good standing with the Compensation Commissioner.
X	Certified Proof of Paid Municipal Rates and Taxes (Attach) (T2.23)
X	Certified Proof of UIF Registration (Attach) (T2.24)
X	Financial Standing and other resources of Business Declaration (T2.8)
X	Compulsory Enterprise Questionnaire (T2.18)
X	**Tenderers must meet the minimum qualifying score for functionality criteria first before they can be considered for price and preference by means of specific goals**
X	Invitation to Tender - SBD 1

Please note the following for POPIA:
By submitting this tender, I hereby acknowledge consent that the KZN Department of Public Works, may, from time to time, collect/store/use/destroy/delete/share or otherwise process my Company and Director's/Shareholders personal information as the context or circumstances may require and as contemplated in terms of POPIA. ☐ (TICK)

THE FOLLOWING PARTICULARS MUST BE FURNISHED (FAILURE TO DO SO MAY RESULT IN YOUR TENDER BEING DISQUALIFIED)

Name of Tenderer: _____

Postal Address: _____

Street Address: _____

Telephone Number CODE _____ NUMBER _____

Cellphone Number: _____

Facsimile Number: CODE _____ NUMBER _____

E-mail Address: _____

VAT Registration Number: _____

TAX COMPLIANCE STATUS (TCS) PIN TO VERIFY ON LINE COMPLIANCE SUPPLIER STATUS VIA SARS e-FILING (T2.19) YES ☐ or NO ☐

ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS / SERVICES / WORKS OFFERED? [If yes, enclose proof] YES ☐ or NO ☐

This tender will be evaluated according to the preferential procurement model in the Preferential Procurement Policy Framework Act, 2000: Preferential Procurement Regulations, 2022:

☒ 80/20 Preference point scoring system ☐ 90/10 Preference point scoring system

NOTE Refer to T2.34 - Functionality Criteria

Functionality requirement:	60	Points
Price:	80	points

1. The Specific Goal/s Allocated Points in terms of this tender:

Preference points system:
Preferences are offered to Tenderder's who have attained points for the specific goals in accordance with the table below; Documentary Proof required to satisfy the points claimed are also indicated in the table below:

No	Specific Goal	Number of Points Allocated
1	•Promotion of enterprise located in a specific municipal area (uMgungundlovu District Municipality) for work to be done or services to be rendered. Documentary proof required: 1. Proof of Municipal Account depicting Physical Address of the business (not older than 3 months) OR 2. Lease Agreement signed by landlord. OR 3. Original letter from the ward councilor	**20**

2.	Other specific goals (according to the PPPFA):		
(a)	Contract participation goal by awarding contracts to targeted enterprises	0	Points
(b)	[insert specific goal]	0	Points
(c)	[insert specific goal]	0	Points
(d)	[insert specific goal]	0	Points
Total must equal **10 or 20 points**		**20**	Points

Notes:

1 The successful Tenderder will be required to fill in and sign a written GCC 2010 2nd Edition Contract.

2 Tenderders should ensure that Tenders are delivered timeously to the correct address. If the Tender is late, it will not be accepted for consideration.

3 The requirements in respect of the application of either 80/20 and 90/10 preference points scoring system, will apply and the points reflected above for preferences will be adjusted accordingly on a pro-rata basis if required.

4 The Tender box is generally open during official working hours.

5 All Tenders must be submitted on the official forms – (Not to be re-typed)

6 This Tender is subject to the PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022, THE GENERAL CONDITIONS OF CONTRACT FOR CONSTRUCTION WORKS (GCC2010) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT

7 **The documentary proof required to satisfy the points claimed for specific goals in terms of this tender, are duly indicated on the table (1) above.**

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

Evaluate that non-financial proposals offered by tenderers, then advise tenderers who remain in contention for the award of the contract of the time and place when the financial proposals are to be opened.

Open only the financial proposals of tenderers who, in the Functionality evaluation score, have more than the minimum number of points for Functionality stated in the tender data, and announce the score obtained for the non-financial proposals and the total price and any preferences claimed. Return unopened financial proposals to tenderers whose non-financial proposals failed to achieve the minimum number of points for Functionality.

THE PHYSICAL ADDRESS FOR COLLECTION OF TENDER DOCUMENTS:

Tender documents may be collected during working hours at the following address :

Department of Public Works, 10 Prince Alfred Street, Pietermaritzburg, Southern Region

A non-refundable tender deposit of R450 is payable as per the tender advertisement , on collection of the Tender documents. The Tenderders must deposit the the above amount into the Department's bank account. The Account details are:

Account Name: KZN PROV GOV-WORKS
Bank Name: STANDARD BANK
Account Number: 052106446
Bank Code: 057525
Reference No: Ref No 14019647

The Tenderder must attach the account statement with above reference, to this Tender as proof of payment of the deposit.

COMPULSORY CLARIFICATION MEETING

A Compulsory clarification Meeting with representatives of the Employer will take place as follows:

Greys Hospital, The Recreation Hall at 11am

on: **Thursday, 28 August 2025**

QUERIES REGARDING THE TENDERING PROCEDURE OR TECHNICAL INFORMATION MAY BE DIRECTED TO:

DOPW Project Manager:	Ms S Khumalo	**Telephone no:**	033 897 1302
Cell no:	078 013 1207	**Fax no:**	033-897 1399
E-mail:	musa.khumalo@kznworks.gov.za		

DEPOSIT / RETURN OF TENDER DOCUMENTS:

Telegraphic, telephonic, telex, facsimile, electronic, posted and / or late tenders will **not** be accepted.

Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the **Tender Data document.**

All tenders must be submitted on the official forms – (not to be re-typed)

TENDER DOCUMENTS MAY BE:	**DEPOSITED IN THE TENDER BOX AT:**
	Southern Region Southern Region Office, 10 Prince Alfred Street Pietermarizburg 3200

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

T1.2 - TENDER DATA

T1.2 TENDER DATA

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Project Code:	**053651**		
Tender no:	**ZNTM01255W**	**Closing date:**	**22 September 2025**
Closing time:	**11:00**	**Validity period:**	**84 Calender Days**

Clause number:		
	The conditions of Tender are the Standard Conditions of Tender as contained in Annexure C of the CIDB Standard for Uniformity in Engineering and Construction Works Contracts as per Board Notice **423 of 2019** in Government Gazette **42622 of 8 August 2019** as amended from time to time. (see www.cidb.org.za) Refer to Conditions of Tender as bound into this document. The Standard Conditions of Tender make several references to the Tender Data for details that apply specifically to this tender. The Tender Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and the Standard Conditions of Tender. Each item of data given below is cross-referenced to the clause marked "C" in the above mentioned Standard Conditions of Tender.	
C.1.1	The Employer is the Head: Public Works (KZN Department of Public Works-Province of KwaZulu-Natal)	
	For this contract the single volume approach is adopted. This procurement document has been formatted and compiled under the headings for a single volume approach as contained in table 5 of the CIDB's "Standard for Uniformity in Engineering and Construction Works Contracts." The list of Returnable Documents identifies which of the documents a Tenderder must complete when submitting a Tender. The Tenderder must submit his Tender by completing the Returnable Documents including the priced Final Summary of the Bills of Quantities, signing the "Offer" section in the "Form of Offer and Acceptance" and delivering the whole of the procurement document back to the Department bound up as it was when it was received.	
C.1.2	The single volume procurement document issued by the Employer comprises the following:	
	TENDER	
	Part T1: Tendering procedures	
	T1.1 -	Tender Notice and Invitation to Tender
	T1.2 -	Tender Data
	T1.3 -	Annexure C - Standard Conditions of Tender
	Part T2: Returnable documents	
	T2.1 -	List of returnable documents
	T2.2 -	Returnable schedules (See different forms listed in ***T2.1 - Returnable Schedule***)
	CONTRACT	
	Part C1: Agreements and Contract Data	
	C1.1 -	Form of Offer and Acceptance
	C1.2 -	Contract Data
	C1.3 -	Form of Guarantee (C1.3)
	Part C2: Pricing data	
	C2.1 -	Pricing Instructions
	C2.2 -	Bills of Quantities
	Part C3: Scope of works	
	C3.1 -	Scope of Works
	C3.2 -	Specification for HIV/AIDS awareness
	C3.3 -	HIV/STI Compliance report
	C3.4 -	Project Specific Construction Safety, Health and Environmental Specification
	C3.5 -	Supplementary Preambles

	Part C4: Site information	
	C4.1 -	Site Information
	Part 5: List of Drawings/Annexure's	
	C5.1 -	List of Drawings
	C5.2 -	Standard Preambles for all Trades (Rev 3) - DOH 2009
	C5.3 -	General Electrical Specifications
	C5.4 -	Mechanical Specifications
	C5.5 -	Map of Bid submission location
	C5.6 -	Joint Venture Agreement
	C5.7 -	Health and Safety Specification
	C5.8 -	Health and Safety Bill of Quantities
	C5.9 -	Builders Lien Agreement
	C5.10	Scope of Works in Respect of Work Relating to EPWP
	C5.11	Proforma Project Specific Organogram
	C5.12	Proforma Reference Letter
	C5.13	Project Brief

C.1.4	The Employer's agent (Engineer/Principal Agent) is:	
	Name:	**Ukuza Consulting (Pty) Ltd**
	Capacity:	**Principal Agent/Engineer**
	Address:	**15 The Boulevard , Westville , Westville , 3200**
	Tel:	**031 265 0444**
	Fax:	**N/A**
	E-mail:	**info@ukuza.co.za**
	Responsible person:	**Mr George Kunje**
	The second sentence shall read "Communications can be in any of the official languages recognised in KwaZulu-Natal which is English, Afrikaans or Zulu but writing is preferred in English as this is generally accepted as a business language"	
C.1.6	**PP2-Competitive Selection Procedure**	**Design and Build**
	PP2B-Open Procedure	
	Tenderers must meet the minimum qualifying score for functionality criteria first before they can be considered for price and preference.	
C.2.1	For eligibility refer to **T1.1 Tender Notice and Invitation to Tender**	
	A contract will only be entered into with a Tenderder who has in his employ management and supervisory staff satisfying the requirements of the scope of work for labour intensive competencies for supervisory and management staff during the contract validity of the contract.	
	Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations for a : 6GB or higher class of construction work, are eligible to have their tenders evaluated. Joint ventures are eligible to submit tenders provided that: 1 every member of the joint venture is registered with the CIDB; 2 the lead partner has a contractor grading designation in the 6GB or higher, class of construction work; or not lower than one level below the required the required grading designation in the class of works construction works under considerations and possess the required recognition status 3 the combined contractor grading designation calculated in accordance with the Construction Industry Development Regulations is equal to or higher than a contractor grading designation determined in accordance with the sum tendered for a : 6GB or Higher or a value determined in accordance with Regulation 25 (1B) or 25 (7A) of the Construction Industry Development Regulations.	
	See end of T2.3 AUTHORITY FOR CONSORTIA OR JOINT VENTURES TO SIGN TENDER for combinations of JV's arrangements.	
C.2.7	For particulars regarding a pre-tender site inspection meeting (clarification meeting), see **T1.1 Tender Notice and Invitation to Tender.**	

C.2.12	Alternative tender offer permitted: **Yes** ☐ **No** ☒X
	If a tenderer wishes to submit an own alternative tender offer, the only criteria permitted for such alternative tender offer is that it demonstrably satisfies the Employer's standards and requirements. A tenderer may submit alternative tender offers only if a main tender offer, strictly in accordance with all the requirements of the tender documents, is also submitted. Provided that the tenderer's main tender offer is according to specification and would under normal circumstances be recommended for acceptance, his alternative tender offer may also be considered for the purpose of the award of the contract. Calculations, drawings and all other pertinent technical information and characteristics as well as modified or proposed Pricing Data must be submitted with the alternative tender offer to enable the Employer to evaluate the efficacy of the alternative and its principal elements, to take a view on the degree to which the alternative complies with the Employer's standards and requirements and to evaluate the acceptability of the pricing proposals. Calculations must be set out in a clear and logical sequence and must clearly reflect all design assumptions. Pricing Data must reflect all assumptions in the development of the pricing proposal. Acceptance of an alternative tender offer will mean acceptance in principle of the offer. It will be an obligation of the contract for the tenderer, in the event that the alternative is accepted, to accept full responsibility and liability that the alternative offer complies in all respects with the Employer's standards and requirements. The modified Pricing Data must include an amount equal to 5% of the amount tendered for the alternative offer to cover the Employer's costs of confirming the acceptability of the detailed design before it is constructed.
	Only the complete Service as per the Bills of Quantities
C.2.13.2	Tenderers are to ensure that their company details appear on the entire relevant Tender documentation and must be legible.
C.2.13.3	Part of each tender offer communicated on paper shall be submitted as an original, plus ONE copy of the tender document including supporting documents and priced Bill of Quantities where applicable, scanned onto a readable compact disk (CD) in pdf format, at the Tenderders own cost. The CD must be clearly marked with the tender information and company details.
C.2.13.4	The second sentence shall read as follows "The Employer will hold all authorised signatories jointly and severally liable on behalf of the tenderer". Tenderders proposing to contract as a Joint Venture shall submit a valid Joint Venture Agreement before the Joint Venture's offer could be accepted. Individuals, Partnerships and Companies proposing to contract as a party to a Joint Venture shall be jointly and severally liable on behalf of the Joint Venture.
C.2.13.5	The Employer's address for delivery of tender offers and identification details to be shown on each tender offer package are as per **T1.1 Tender Notice and Invitation to Tender.**
	A Open Procedure will be followed
C.2.15	The closing time for submission of tender offers is as per **T1.1 Tender Notice and Invitation to Tender.**
C.2.16	The tender offer validity period is as per **T1.1 Tender Notice and Invitation to Tender.**
C.2.17	Sub-clause C2.17 does not preclude the negotiation of the final terms of the contract with the preferred tenderer, following a competitive selection process, should the Employer elect to do so and provided that the competitive position of the preferred tenderer is not affected.
	The tenderer is to submit the Priced Bills of Quantities with the Returnable's at the closing of the tender.
	The tenderer must submit to the Employer, names of all management and supervisory staff that will be employed to supervise the labour-intensive portion of the works together with satisfactory evidence that
C.2.19	Access shall be provided for inspections, tests and analysis as may be required by the Employer.
C.2.22	Tenderers **do not** have to return all retained tender documents within 28 days after expiry of the Tender validity period.
	Tenderers are to refer to **List of Returnable Schedules** and **Scope of Works** to establish what is required to be submitted with this tender.
C.3.4	The location for opening of the tender offers, immediately after the closing time thereof shall be at: **KZN Department of Public Works, Southern Region Office, 10 Prince Alfred Street, Pietermaritzburg, 3200 at the time indicated on T1.1 Notice and Invitation to Bid**
C.3.8	The employer must determine, on opening and before detailed valuation, whether each Tender offer properly received: a) complies with the requirements of the Conditions of Tender. b) has been properly and fully completed and signed, and c) is responsive to the other requirements of the Tender documents. A responsive tender is one that conforms to all the terms, conditions and specifications of the tender documents without material deviation or qualification. A material deviation or qualification is one which, in the Employer's opinion, would: a) detrimentally affect the scope, quality, or performance of the Works, services or supply identified in the Scope of Work or b) significantly change the Employers or the Tenderers risks and responsibilities under the contract, or c) affect the competitive position of other Tenderers presenting responsive tenders, if it were to be rectified.

	Reject a non-responsive tender offer, and not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.
C.3.13	**Tender offers will only be accepted if:** (a) Tenderders must be registered on Government's Central Supplier Database (CSD) and include their master registration number (MAAA number) on the cover page of the tender document in order to enable the institution to verify the tenderers tax status on the CSD (b) the Tenderder is registered with the Construction Industry Development Board in an appropriate contractor grading designation is required for this tender and the Tenderder has submitted a CIDB certificate of registration which clearly indicates the status "Active" (c) the Tenderder is not in arrears for more than 3 months with municipal rates and taxes and municipal services charges. (d) the Tenderder has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the Tenderder's ability to perform to the contract in the best interests of the employer or potentially compromise the Tender process. (e) the tenderer or any of its directors is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act, 2004 (Act No. 12 of 2004) as a person prohibited from doing business with the public sector; and (f) the Tenderder has not: i) abused the Employer's Supply Chain Management System; or ii) failed to perform on any previous contract and has been given a written notice to this effect. (g) the Tenderder is registered with: i) the Unemployment Insurance Fund (UIF); and ii) the Workmen's Compensation Fund (h) the Tenderder submitted Authority to Sign the tender. (i) the Tenderder submitted Financial standing & other resources of Business Declaration. (j) the Tenderder submitted Equipment Schedules, if applicable. (k) the Tenderder signed the Form of Offer that is part of the Form of Offer and Acceptance. (l) the Tenderder submitted Preference Certificate, if applicable. (m) the Tenderder submit Final Summary of Bill of Quantities at tender closing. (n) the Tenderder submitted Bidder's Disclosure. (o) the Tenderder submitted Site Inspection Certificate from the Compulsory Briefing Meeting (p) All information required to assess 'Functionality" as per Tender Data scheduled requirements Providing the form of offer and acceptance does not contain any qualifying statements, it will constitute the formation of a contract between the employer and the successful Tenderder as described in the form of offer and acceptance.
C.3.15	Tenderders are informed that any formal dispute shall be resolved by being referred to Arbitration only.
C.3.17	Provide to the successful Tenderder one copy of the signed contract document and one copy of an unpriced bills of quantities

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

T1.3 - Annexure C - Standard Conditions of Tender

T1.3 - Annexure C - Standard Conditions of Tender

Note: Where this document refers to Bid or Bidder it shall be read as tender or tenderer

C.1 General

C.1.1 Actions

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

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

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

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

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

C.1.2 Tender Documents

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

C.1.3 Interpretation

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

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

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

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

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

c) **corrupt practice** means the offering, giving, receiving or soliciting of anything of value to influence the action of the employer or his staff or agents in the tender process;

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

C.1.4 Communication and employer's agent

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

C.1.5 Cancellation and Re-Invitation of Tenders

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

a) due to changed circumstances, there is no longer a need for the engineerin construction works specified in the inviteation;

b) funds are no longer available to cover the total envisaged expenditure; or

c) no acceptable tenders are received.

d) there is a material irregularity in the tender process.

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

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

C.1.6 Procurement procedures

C.1.6.1 General

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

C.1.6.2 Competitive negotiation procedure

C.1.6.2.1 Where the **tender data** requires that the competitive negotiation procedure is to be followed, tenderers shall submit tender offers in response to the proposed contract in the first round of submissions. Notwithstanding the requirements of C.3.4, the employer shall announce only the names of the tenderers who make a submission. The requirements of C.3.8 relating to the material deviations or qualifications which affect the competitive position of tenderers shall not apply.

C.1.6.2.2 All responsive tenderers, or at least a minimum of not less than three responsive tenderers that are highest ranked in terms of the evaluation criteria stated in the **tender data**, shall be invited to enter into competitive negotiations based on the principle of equal treatment, keeping confidential the proposed solutions and associated information. Notwithstanding the provisions of C.2.17, the employer may request that tenders be clarified, specified and fine-tuned in order to improve a tenderer's competitive position provided that such clarification, specification, fine-tuning or additional information does not alter any fundamental aspects of the offers or impose substantial new requirements which restrict or distort

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

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

C.1.6.3 Proposal procedure using the two stage-system

C.1.6.3.1 Option 1

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

F.1.6.3.2 Option 2

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

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

C.2 Tenderer's obligations

C.2.1 Eligibility

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

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

C.2.2 Cost of tendering

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

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

C.2.3 Check documents

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

C.2.4 Confidentiality and copyright of documents

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

C.2.5 Reference documents

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

C.2.6 Acknowledge addenda

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

C.2.7 Clarification meeting

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

C.2.8 Seek clarification

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

C.2.9 Insurance

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

C.2.10 Pricing the tender offer

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

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

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

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

C.2.11 Alterations to documents

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

C.2.12 Alternative tender offers

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

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

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

C.2.13 Submitting a tender offer

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

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

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

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

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

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

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

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

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

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

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

C.2.15 Closing time

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

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

C.2.16 Tender offer validity

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

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

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

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

C.2.17 Clarification of tender offer after submission

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

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

C.2.18 Provide other material

C.2.18.1 Provide, on request by the employer, any other material that has a bearing on the tender offer, the tenderer's commercial position (including notarized joint venture agreements), preferencing arrangements, or samples of materials, considered necessary by the employer for the purpose of a full and fair risk assessment. Should the tenderer not provide the material, or a satisfactory reason as to why it cannot be provided, by the time for submission stated in the employers request, the employer may regard the tender offer as non-responsive.

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

C.2.19 Inspections, tests and analysis

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

C.2.20 Submit securities, bonds and policies

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

C.2.21 Check final draft

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

C.2.22 Return of other tender documents

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

C.2.23 Certificates

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

C.3 The employer's undertakings

C.3.1 Respond to request from the tenderer

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

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

a) an individual firm, or a joint venture as a whole, or any individual member of the joint venture fails to meet any of the collective or individual qualifying .

b) the new partners to a joint venture were not prequalified in the first instance, either as individual firms or as another joint venture; or

c) in the opinion of the Employer, acceptance of the material change would compromise the outcome of the prequalification process.

C.3.2 Issue Addenda

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

C.3.3 Return late tender offers

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

C.3.4 Opening of tender submissions

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

C.3.4.2 Announce at the meeting held immediately after the opening of tender submissions, at a venue indicated in the **tender data**, the name of each tenderer whose tender offer is opened and, where applicable, the total of his prices, number of points claimed for its BBBEE status level and time for completion for the main tender offer only.

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

C.3.5 Two-envelope system

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

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

C.3.6 Non-disclosure

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

C.3.7 Grounds for rejection and disqualification

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

C.3.8 Test for responsiveness

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

a) complies with the requirements of these Conditions of Tender,

b) has been properly and fully completed and signed, and

c) is responsive to the other requirements of the tender documents.

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

a) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the Scope of Work,

b) significantly change the Employer's or the tenderer's risks and responsibilities under the contract, or

c) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified.

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

C.3.9 Arithmetical errors, omissions and discrepancies

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

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

a) the gross misplacement of the decimal point in any unit rate;

b) omissions made in completing the pricing schedule or bills of quantities; or

c) arithmetic errors in:

i) line items totals resulting from the product of a unit rate and a quantity in bills of quantities or schedules of prices; or

ii) the summation of the prices.

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

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

a) If bills of quantities or pricing schedules apply and there is an error in the line item total resulting from the product of the unit rate and the quantity, the line item total shall govern and the rate shall be corrected. Where there is an obviously gross misplacement of the decimal point in the unit rate, the line item total as quoted shall govern, and the unit rate shall be corrected.

b) Where there is an error in the total of the prices either as a result of other corrections required by this checking process or in the tenderer's addition of prices, the total of the prices shall govern and the tenderer will be asked to revise selected item prices (and their rates if bills of quantities apply) to achieve the tendered total of the prices.

C.3.10 Clarification of a tender offer

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

C.3.11 Evaluation of tender offers

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

Conditions of tender are by definition the document that establishes a tenderer’s obligations in submitting a tender and the employer’s undertakings in soliciting and evaluating tender offers. Such conditions establish the rules from the time a tender is advertised to the time that a contract is awarded and require employers to

The CIDB Standard Conditions of Tender are based on a procurement system that satisfies the following s requirements:	
Requirement	**Qualitative interpretation of goal**
Fair	The process of offer and acceptance is conducted impartially without bias, providing simultaneo access to participating parties to the same information.
Equitable	Terms and conditions for performing the work do not unfairly prejudice the interests of the parti
Transparent	The only grounds for not awarding a contract to a tenderer who satisfies all requirements are re from doing business with the employer, lack of capability or capacity, legal impediments and co interest.
Competitive	The system provides for appropriate levels of competition to ensure cost effective and best valu
Cost effective	The processes, procedures and methods are standardized with sufficient flexibility to attain bes outcomes in respect of quality, timing and price, and least resources to effectively manage and procurement processes.

The activities associated with evaluating tender offers are as follows:

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

C.3.11.1 General

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

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

PART T2 - RETURNABLE DOCUMENTS

T2.1 LIST OF RETURNABLE DOCUMENTS

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Project Manager:	**Ms S Khumalo**	**Tender no:**	**ZNTM01255W**

1. RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES

(Tenderer to Insert a tick (√) in the "Returnable document" column to check which documents he/she returned with the tender)

Tender document name	Returnable document	
Bidder's Disclosure - SBD 4 (T2.11)	**Yes**	
Authority to Sign Tender (T2.2)	**Yes**	
Authority for Consortia or Joint Venture's to Sign Tender (T2.3)	**Yes**	
Special Resolution of Consortia or Joint Venture's (T2.4)	**Yes**	
Schedule of Proposed Sub-Contractors (T2.6)	**Yes**	
Joint Venture Involvement Declaration (T2.5)	**Yes**	
Capacity of Tenderer (T2.7)	**Yes**	
Annual Financial Statement for past financial year (2.15)	**Yes**	
Site Inspection Certificate as proof for attendance of compulsory briefing meeting (T2.10)	**Yes**	
Preference Points Claim Form (T2.9)	**Yes**	
Compulsory Enterprise Questionnaire (T2.18)	**Yes**	
Financial Standing and other resources of Business Declaration (T2.8)	**Yes**	
Contractor's Safety, Health and Environmental Declaration (T2.17)	**Yes**	
Complete Priced Bill of Quantities (T2.22)	**Yes**	
Certified Proof of CIDB Registration Number (T2.27)	**Yes**	
Contract Form - Purchase of Goods/Works - Part 1 (T2.29)	**Yes**	
Contract Form - Purchase of Goods/Works - Part 2 (T2.30)	**Yes**	
Functionality Criteria (T2.34)	**Yes**	
Invitation to Tender - SBD 1 (T2.35)	**Yes**	

2. RETURNABLE SCHEDULES REQUIRED FOR TENDER EVALUATION PURPOSES BUT TO BE SUPPLIED BY THE TENDERER

(Tenderer to Insert a tick (√) in the "Returnable document" column to check which documents he/she returned with the tender)

Tender document name	Returnable document	
Tax Compliance Status (TCS) PIN to verify on line Compliance Supplier Status via e-Filing (T2.19)	**Yes**	
Certified Proof of Good Standing with the Compensation Commissioner (Attach) (T2.20)	**Yes**	
Proof of payment of Tender deposit (T2.28)	**Yes**	
Certified Proof of Paid Municipal Rates and Taxes (Attach) (T2.23)	**Yes**	
Certified Proof of UIF Registration (Attach) (T2.24)	**Yes**	
Certified Proof of Registration Number on the Central Suppliers Database (T2.26)	**Yes**	
Annual Financial Statement for past financial year (2.15)	**Yes**	
Entire tender document including returnable and supporting documents, scanned as PDF onto a CD, clearly marked with the Tender information.	**No**	N/A

3. RETURNABLE SCHEDULES THAT WILL BE INCORPORATED INTO THE CONTRACT

(Tenderder to Insert a tick (√) in the "Returnable document" column to check which documents he/she returned with the Tender)

Tender document name	Returnable document	
Form of Offer and Acceptance (Bound into Section 1 of 2) (T2.21)	**Yes**	
Record of Addenda to Tender Documents (T2.12)	**Yes**	
Particulars of Electrical Contractor (T2.13)	**Yes**	
Equipment Schedules-Mechanical / Electrical / Security Material (T2.16)	**Yes**	
Schedule of Imported Materials and Equipment (T2.14)	**Yes**	
Confirm Receipt of Offer and Acceptance (T2.21a)	**Yes**	

4. OTHER DOCUMENTS THAT WILL BE INCORPORATED INTO THE CONTRACT

(Tenderder to Insert a tick (√) in the "Returnable document" column to check which documents he/she returned with the Tender)

Tender document name	Returnable document	
Bill of Quantities (T2.22)	**Yes**	
Form of Guarantee (C1.3)	**Yes**	
List of Drawings/Annexure's (C5.1)	**Yes**	
The National Industrial Participation Programme (T2.25)	**Yes**	
Required Structure of Contractor's detailed OHSE Plan (T2.31)	**Yes**	
Client's specific requirements for the Contractor's detailed OHSE Plan (T2.32)	**Yes**	
Base line Risk Assessment (T2.33)	**Yes**	

5. DOCUMENTS REQUIRED FOR THE EVALUATION OF FUNCTIONALITY

(Tenderder to Insert a tick (√) in the "Returnable document" column to check which documents he/she returned with the Tender)

Tender document name	Returnable	
Schedule of projects similar in nature and value (Minimum of 3 Residential projects in urban area's) completed in the last 10 years in construction Public or Private projects. Project value to be R10,000,000 (incl VAT) and above	**Yes**	
3x Award letters which include the value of the project and duration for the 3 projects above	**Yes**	
3 x Completion certificates for each project listed above	**Yes**	
3x Reference Letters from Consultants / Client / Project Manager for projects of similar nature and value using Annexure 11 Proforma Reference Letter	**Yes**	
Detailed company organogram that reflects the names, qualifications, roles (e.g. Director, Manager, or supervisor) of members and number of years of experience. Using Annexure 10 Proforma Project Specific Organogram	**Yes**	
CV's indicating experience and relevant qualifications as per Project specific Organogram. To obtain the points the person must have a proven track record in the construction being considered (general building works) 2.1.2.1 Construction Manager 2.1.2.2 Site Agent 2.1.2.3 Foreman 2.1.2.4 Safety Officer (must have SACPCMP Registration) 2.1.2.5 Site Quantity Surveyor	**Yes**	
3 Months Bank Statement which must show availability of 2% working capital, the statements must not be older than 3 months. OR An original letter from an accredited financial institution confirming provision of 2% of working capital.	**Yes**	
Letter of Credit reference from relevant suppliers of major building materials (Electrical, Mechanical and Plumbing). Suppliers and credit limits to be stipulated on official letterhead. The credit limit must be above R 400 000.00 incl VAT combined. All letters must be dated and signed.	**Yes**	
4.1 Detailed statement of the proposed methodology of implementing the project without disrupting operation of the hospital including the compliance of health and safety. The following must be included: 4.1.1 Site organization including material storage, handling, and distribution 4.1.2 OHS management, compliance & reporting 4.1.3 Maintaining productivity through programming, progress tracking & corrective action plans. 4.1.4 Site documentation control, filing and archiving. 4.1.5 List of all proposed domestic & specialist sub-Contractors, how it will be coordinated and the management thereof during construction.	**Yes**	
Detailed Project Specific Program, ie. Gantt Chart strictly in color. The program must indicate the critical path, float, all major activities (from site handover to practical completion), and task durations.	**Yes**	

T2.2 AUTHORITY TO SIGN TENDER

RESOLUTION of a meeting of the Board of *Directors / Members / Partners of:

_____

_____

(Legally correct full name and registration number, if applicable, of the Enterprise)

held at *(town)*: _____ on *(date)*: _____

RESOLVED that:

1. The Enterprise submits a Tender to the KZN Department of Public Works in respect of the following project:

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

Tender Number: **ZNTM01255W**

2.
*Mr./Mrs./Ms: _____

in *his/her capacity as: _____ *(Position in the Enterprise)*

and who will sign as follows: _____ (Authorised Signatory)

be, and is hereby, authorised to sign the Tender, and any and all other documents and/or correspondence in connection with and relating to this Tender, as well as to sign any Contract, and any and all documentation, resulting from the award of the Tender to the Enterprise mentioned above.

	Name	Capacity	Signature
1			
2			
3			
4			
5			
6			
7			
8			

Note:

*1. * Delete which is not applicable.*

2. NB. This resolution / Power of Attorney must be signed by all the Directors / Members / Partners of the Legal Tendering Enterprise authorising the Representative to make this Offer.

3. Should the number of Directors / Members/Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

*4. In the case of the tendering Enterprise being a Close Corporation, a **certified copy of the Founding Statement** of such corpora - tion must be attached to this tender.*

ENTERPRISE STAMP (If Any)

T2.3 AUTHORITY FOR CONSORTIA OR JOINT VENTURES TO SIGN TENDER

RESOLUTION of a meeting of the Board of *Directors / Members / Partners of:

_____

_____

(*Legally correct full name and registration number, if applicable, of the Enterprise)*

held at *(town)*: _____ on *(date)*: _____

RESOLVED that:

1. The Enterprise submits a Tender, in consortium/Joint Venture with the following Enterprises:

   _____

   _____

   (List all the legally correct full names and registration numbers, if applicable, of the Enterprises forming the Consortium/Joint Venture)

   to the KZN Department of Public Works in respect of the following project:

   DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

   Tender Number: **ZNTM01255W**

2. * Mr. / Mrs. / Ms.: _____ in

   *his/her Capacity as: _____ *(Position in the Enterprise)*

   and who will sign as follows: _____
   be, and is hereby, authorised to sign a consortium/joint venture agreement with the parties listed under item 1 above, and any and all other documents and/or correspondence in connection with and relating to the consortium/joint venture, in respect of the project described under item 1 above.
3. The Enterprise accepts joint and several liability with the parties listed under item 1 above for the due fulfilment of the obligations of the joint venture deriving from, and in any way connected with, the Contract to be entered into with the Department in respect of the project described under item 1 above.
4. The Enterprise chooses as its *domicilium citandi et executandi* for all purposes arising from this joint venture agreement and the Contract with the Department in respect of the project under item 1 above:

   Physical address: _____

   _____

   _____

   _____ (Postal Code)

   Postal Address: _____

   _____

   _____

   _____ (Postal Code)

Telephone number: *(Dialling Code followed by number)* _____

Fax number: *(Dialling Code followed by number)* _____

Email Address : _____

***BOARD OF DIRECTORS / MEMBERS / PARTNERS in Consortium of Joint Venture**

	Name	Capacity	Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Note:

*1. * Delete which is not applicable.*

2. NB. This resolution / Power of Attorney must be signed by all the Directors / Members / Partners of the Tendering Enterprise.

3. Should the number of Directors / Members/Partners exceed the space available above, additional names and signatures must be supplied on a separate page.

ENTERPRISE STAMP (If Any)

Deemed to satisfy joint venture arrangements	Designation
Grading 2 + Grading 2 + Grading 2	= 3
Grading 3 + Grading 3 + Grading 3	= 4
Grading 4 + Grading 4	= 5
Grading 4 + Grading 3 + Grading 3	= 5
Grading 5 + Grading 5	= 6
Grading 5 + Grading 4 + Grading 4	= 6
Grading 6 + Grading 6	= 7
Grading 6 + Grading 5 + Grading 5	= 7
Grading 7 + Grading 7 + Grading 7	= 8
Grading 8 + Grading 8 + Grading 8	= 9

Tenderers who envisage entering into a Joint Venture shall complete a submit a Joint Venture Agreement (see copy of CIDB's agreement elsewhere in this document) with this Tender.

THE CIDB JOINT VENTURE GRADING DESIGNATION CALCULATOR sums the capacity of all joint venture partners and calculates a grading designation for the joint venture

T2.4 SPECIAL RESOLUTION OF CONSORTIA OR JOINT VENTURES

RESOLUTION of a meeting of the duly authorised representatives of the following legal entities who have entered into a consortium/joint venture to jointly tender for the project mentioned below: (*legally correct full names and registration numbers, of the Enterprises forming a Consortium/Joint Venture)*

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

held at: _____ *(place)* on _____ *(date)*

RESOLVED that:

A. The above-mentioned Enterprises submits a Tender in Consortium/Joint Venture to the KZN Department of Public Works in respect of the following project:

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

Tender Number: **ZNTM01255W**

Project Code: **053651**

B. Mr/Mrs/Ms: _____ in

*his/her Capacity as: _____ *(Position in the Enterprise)*

and who will sign as follows: _____
be, and is hereby, authorised to sign the Tender, and any and all other documents and/or correspondence in connection with and relating to the Tender, as well as to sign any Contract, and any and all documentation, resulting from the award of the Tender to the Enterprises in Consortium/Joint Venture mentioned above.

C. The Enterprises constituting the Consortium/Joint Venture, notwithstanding its composition, shall conduct all business under the name and style of:

_____

D. The Enterprises to the Consortium/Joint Venture accept joint and several liability for the due fulfilment of the obligations of the Consortium/Joint Venture deriving from, and in any way connected with, the Contract entered into with the Department in respect of the project described under item A above.

E. Any of the Enterprises to the Consortium/Joint Venture intending to terminate the consortium/joint venture agreement, for whatever reason, shall give the Department 30 days written notice of such intention. Notwithstanding such decision to terminate, the Enterprises shall remain jointly and severally liable to the Department for the due fulfilment of the obligations of the Consortium/Joint Venture as mentioned under item D above.

F. No Enterprise to the Consortium/Joint venture shall, without the prior written consent of the other Enterprises to the Consortium/Joint Venture and of the Department, cede any of its rights or assign any of its obligations under the consortium/joint Venture and of the Department, cede any of its rights or assign any of its obligations under the consortium/joint venture agreement in relation to the Contract with the Department referred to herein.

G. The Enterprises choose as the *domicilium citandi et executandi* of the consortium/joint venture for all purposes arising from the consortium/joint venture agreement and the Contract with the Department in respect of the project under item A above:

Physical address: _____

_____

_____

_____ (Postal Code)

Postal Address: _____

_____

_____

_____ (Postal Code)

Telephone number: *(Dialling Code followed by number)* _____

Fax number: *(Dialling Code followed by number)* _____

Email Address : _____

***BOARD OF DIRECTORS / MEMBERS / PARTNERS in Consortium of Joint Venture**

	Name	Capacity	Signature
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Note:

1. ** Delete which is not applicable.*

2. ***NB.*** *This resolution / Power of Attorney must be signed by all the Duly Authorised Representatives of the Legal Entities to the Consortium/Joint Venture submitting this Tender.*
3. *Should the number of Duly Authorised Representatives of the Legal Entities joining forces in this Tender exceed the space available above, additional names and signatures must be supplied on a separate page.*
4. *Resolutions, duly completed and signed, from the separate Enterprises who participate in this Consortium/Joint Venture must be attached to the Special Resolution.*

T2.5 JOINT VENTURES INVOLVEMENT DECLARATION

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

DECLARATION RELATING TO A TENDER SUBMITTED BY A JOINT VENTURE :

I/We the undersigned parties do hereby declare that our respective involvement in the Works, of which I/we tender by Joint Venture, would be as follows :-

Party No. 1	
CENTRAL SUPPLIERS DATABASE REGISTRATION NO:	
TenderDERS CIDB REGISTRATION NUMBER:	
Name	
Address	
Percentage involvement	%

Party No. 2	
CENTRAL SUPPLIERS DATABASE REGISTRATION NO:	
TENDERERS CIDB REGISTRATION NUMBER:	
Name	
Address	
Percentage involvement	%

Party No. 3	
CENTRAL SUPPLIERS DATABASE REGISTRATION NO:	
TenderDERS CIDB REGISTRATION NUMBER:	
Name	
Address	
Percentage involvement	%

Signed - Party No. 1

I/We *(Full Name)* _____

duly authorised in my capacity as _____

of *(Enterprise name)* : _____

do jointly and severally accept responsibility for the due performance of the Works contained in the above project should such Tender submitted by the Joint Venture be accepted.

_____ _____

Signed by Authorised Representative Date

Signed - Party No. 2

I/We *(Full Name)* _____

duly authorised in my capacity as _____

of *(Enterprise name)* : _____

do jointly and severally accept responsibility for the due performance of the Works contained in the above project should such tender submitted by the Joint Venture be accepted.

_____ _____

Signed by Authorised Representative Date

Signed - Party No. 3

I/We *(Full Name)* _____

duly authorised in my capacity as _____

of *(Enterprise name)* : _____

do jointly and severally accept responsibility for the due performance of the Works contained in the above project should such tender submitted by the Joint Venture be accepted.

_____ _____

Signed by Authorised Representative Date

T2.6 SCHEDULE OF PROPOSED SUBCONTRACTORS

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

We notify you that it is our intention to employ the following Subcontractors for work in this contract. The Subcontractors will all be CIDB registered and their CIDB Registration number shall be submitted below.

If we are awarded a contract we agree that this notification does not change the requirement for us to submit the names of proposed subcontractors in accordance with requirements in the contract for such appointments. If there are no such requirements in the contract, then your written acceptance of this list shall be binding between us.

We confirm that all subcontractors who are contracted to construct a house **are registered as home builders with the National Home Builders Registration Council**.

No	Name and address of proposed Subcontractor	Nature and extent of work	Year Completed	Value (R):	Contact Tel No:	Previous experience with Subcontractor
1	CIDB Registration Number:					
2	CIDB Registration Number:					
3	CIDB Registration Number:					
4	CIDB Registration Number:					
5	CIDB Registration Number:					

Name of authorised representative	**Signature**	**Capacity**	**Date**
Name of Enterprise:			

T2.7 CAPACITY OF TENDERER			
Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

1. **WORK CAPACITY:** (The Tenderer is requested to furnish the following capacity particulars and to attach additional pages if more space is required. Failure to furnish the particulars may result in the Tender being disregarded.)

1.1. Artisans and Employees: *(Artisans and Employees to be ,or are ,employed for this project)*

Categories of Employee - Key Personnel (part of Business Enterprise)	Professional Registration No.	Date of Employment	Number
Site Agent			
Construction Manager			
Foreman			
Safety Officer			
Artisans			
Unskilled employees			
Others			

1.2. Provide full particulars of the following Assets: *(Assets owned and to be hired - Indicate owned assets)*

Machinery	Plant	Equipment	Vehicles

1.3. Workshops:

Address of Main Workshop:	Address of Regional Workshop (If Applicable):

1.4. Other offers submitted at time of this tender for which results are pending:
(Any other client's tender must also be included)

Tender No.	Project Name	Client Name & Contact No.	Value Tendered in R's	Date Tender submitted	Contact Detail

2. PARTICULARS OF THE TENDERERS CURRENT AND PREVIOUSLY COMPLETED COMMITMENTS:

2.1. Current private sector projects: *(List the 5 projects closest to the contractor grading designation of this project)*

1	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
2	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
3	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
4	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
5	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	

2.2. Current Government sector projects: *(List the 5 projects closest to the contractor grading designation of this project)*

1	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
2	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
3	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
4	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	
5	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Scheduled date of completion	

2.3. Previously completed projects: *(List the 5 projects closest to the contractor grading designation of this project)*

1	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Date completed	
2	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Date completed	
3	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Date completed	
4	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Date completed	
5	Project Name		Date of commencement	
	Place (town)		Contract Amount (R)	
	Reference / Contact person		Contract period	
	Contact Tel. No.		Date completed	

Name of Tenderer	Signature of authorised representative	Date

T2.8 FINANCIAL STANDING AND OTHER RESOURCES OF BUSINESS DECLARATION

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

(a) Based on the track record determined on the Minimum Average Annual Turnover coupled to the assessed Works Capabilities of Contracting Enterprises, the Construction Industry Development Board (CIDB) awards Grading Designations and accordingly registers it on the system.

(b) However, it regularly occurs that a Contractor will at the same time submit tenders for a number of projects that are advertised during an overlapping period. Moreover, the Contractor may be busy with a Contract that is of the registered CIDB Grading Designation (value) or is even attending to a number of smaller valued Contracts.

(c) It therefore becomes the prerogative of a Tenderer in such instances to prove to the Department that the Enterprise has the capacity in every respect to attend to more than one (1) contract at a time.

(d) A Tenderer who wishes to be considered for this tender Contract award, over and above other tenders that they have submitted, shall submit when requested by the DoPW the necessary proof that:

(i) he/she has access to additional finance (inclusive of a PERFORMANCE GUARANTEE BY A REGISTERED FINANCIAL INSTITUTION),

(ii) he/she has additional Human Resources available to successfully complete this project.

(iii) he/she has adequate Equipment, Plant and Machinery that all of the above can, undoubtedly, be sourced for this tender. (Please submit to the DoPW the name and contact details of the supplier if the Tenderer is going to hire Equipment, Plant or Machinery, when requested.)

(e) Tenderer to submit their latest 12 months audited financial statements with the returnable documents.

I, the undersigned,

_____

(name of person authorized to sign on behalf of the Tenderer

understand that it is the responsibility of the Tenderer to prove and provide when requested by the DoPW, evidence of the good Financial Standing of the Business to complete the Contract successfully.

Furthermore, it is understood that failure to provide when requested by DoPW, at least the information as stated in paragraphs (d)(i)(ii) AND (iii) above will not enable the Evaluation Team to assess the CURRENT financial standing of the Business and the failure to provide said information when requested will, therefore, invalidate the Tender.

I accept and understand that the KZN Department of Public Works, as representative of the Provincial Administration of KwaZulu-Natal in this tender, may act against me and the Tenderer, jointly and severally, should this declaration and/or any information provided be found to be false.

Duly signed at…….. on this the….. day of…….. 20..

Full Name of Signatory	Name of Enterprise
Capacity of Signatory	Signature of authorised representative

T2.9 PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022	
Project Title:	DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT
Tender Number:	ZNTM01255W
Project Code:	053651

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**
SPECIFIC GOALS	**20**
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 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:

80/20 or 90/10

$Ps=80(1-(Pt-P\ min)/(P\ min)$ or $Ps=90(1-(Pt-P\ min)/(P\ min)$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmin = 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(1+(Pt-P max)/(P max) or Ps=90(1+(Pt-P max)/Pmax)

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 the Organ of State)	Number of Points allocated (80/20 system) (to be completed by the Organ of State)	Number of points claimed (90/10 system) (To be completed by the tenderer)	Number of points claimed (80/20 system) (To be completed by the tenderer)
• Promotion of enterprise located in a specific municipal area (uMgungundlovu District Municipality) for work to be done or services to be rendered. Documentary proof required: 1. Proof of Municipal Account depicting Physical Address of the business (not older than 3 months) OR 2. Lease Agreement signed by landlord. OR 3. Original or Certified copy of the letter from the ward councilor		20		

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;

(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: ……
……
……
……

T2.10 SITE INSPECTION MEETING CERTIFICATE			
Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**
Site Inspection Date:			**28 August 2025**

This is to certify that I, _____ *(Name of authorised Representative)*

representing _____ *(Name of Enterprise)*

visited the site on: _____ *(Date)*

I have made myself familiar with all local conditions likely to influence the work and the cost thereof. I further certify that I am satisfied with the description of the work and explanations given at the site inspection meeting and that I understand the work to be done, as specified and implied, in the execution of this contract.

I declare that the representative, named above, is my authorised representative and **not** a third party agent and that my representative's attending of this site meeting, shall be deemed conclusive proof that my Enterprise are fully aware of what was said and discussed at this meeting.

Name of Tenderer	Signature	Date

Name of DOPW Representative	Signature	Date

This form is only to be completed when applicable to the tender and if a Compulsory Briefing meeting has been called.

Departmental Stamp:

T2.11 BIDDER'S DISCLOSURE

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

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 interest1 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.

1 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.

Full Name	Identity Number	Name of State institution

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 consortium2 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,

2 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.

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.

3.5 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 PREVENTING AND COMBATING ABUSE IN THE SUPPLY CHAIN MANAGEMENT SYSTEM SHOULD THIS DECLARATION PROVE TO BE FALSE.

…… .……
Signature Date

…… ……
Position Name of bidder

T2.12 RECORD OF ADDENDA TO TENDER DOCUMENTS

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

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

	Date	Title or Details	No. of Pages
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			

Attach Additional Pages if more space is required

Tenderer to attach proof of receipt of above listed addenda

Signed		**Date**	
Name		**Position**	
Tenderer			

T2.13 PARTICULARS OF ELECTRICAL CONTRACTOR			
Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

Name of Electrical Contractor: _____

Address: _____

_____

_____

_____

Telephone Number: _____
(Area Code)(Number)

Fax Number: _____
(Area Code)(Number)

Registration number at the Department of Labour:	

Name of authorised representative	**Signature**	**Date**

T2.14 SCHEDULE FOR IMPORTED MATERIALS AND EQUIPMENT

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

This schedule should be completed by the tenderer. *(Attach additional page(s) if more space is required)*

Item	Material / Equipment	Quotation (Excluding VAT)
1		R
2		R
3		R
4		R
5		R
6		R

The Contractor shall list imported items, materials and/or equipment which shall be excluded from the Contract Price Adjustment Provisions (if applicable) and shall be adjusted in terms of currency fluctuations only. Copies of the supplier's quotations for the items, materials or equipment (provided that such costs shall not be higher than the relevant contract rate as listed above) should be lodged with the Principal Agent / Engineer of the Department of Public Works within 60 (sixty) days from the date of acceptance of the tender. No adjustment of the local VAT amount, nor the contractor's profit, discount, mark-up, handling costs, etc. shall be allowed. (See P&G E16)

These net amounts will be adjusted as follows:

FORMULA:

The net amount to be added to or deducted from the contract sum:

$$A = V\left(\frac{Z}{Y} - 1\right)$$

A = the amount (R) of adjustment

V = the net amount (supplier's quotation) (R) of the imported item

Y = exchange rate 14 days prior to closing date of tender submission

Z = exchange rate on the date of the Bill of Lading* of exporters invoice.

** A bill of lading (sometimes abbreviated as B/L or BoL) is a document issued by a carrier which details a shipment of merchandise and gives title of that shipment to a specified party. Bills of lading are one of three important documents used in international trade to help guarantee that exporters receive payment and importers receive merchandise. A straight bill of lading, which is referred to above, is used when payment has been made in advance of shipment and requires a carrier to deliver the merchandise to the appropriate party. It is therefore the date of the paid up invoice when the shipment leaves the exporter's location. [http://en.wikipedia.org/wiki/Bill_of_lading]*

Name of authorised representative	Signature	Date

T2.15a LATEST 12 MONTH ANNUAL FINANCIAL STATEMENT

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

ATTACH A CERTIFIED COPY OF THE ANNUAL FINANCIAL STATEMENT OF THE COMPANY FOR THE PAST FINANCIAL YEAR TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Tender by a Joint Venture, certified copies of the annual financial statements of the past financial year in respect of each party to the Joint Venture must be attached to this page

ATTACH COMPANY LATEST 12 MONTHS ANNUAL FINANCIAL STATEMENTS TO THIS PAGE

T2.16 EQUIPMENT SCHEDULES

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

The Tenderer shall complete the following schedules giving details of the various items of materials or equipment that he includes in his offer.

TECHNICAL DATA: STANDBY GENERATOR

Manufacturer:	
Model number:	
Serial number:	

Voltage	
KVA	
Frequency	
RPM	
Cylinder/stroke	
Fuel capacity and consumption	
Sound pressure level	
Condenser air flow rate	
Attenuation type	
Battery Type	
AMF Change Over Panel Type	
Starter Motor Type and Voltage	
Standard Compliance	

Project Code: **053651**

EQUIPMENT SCHEDULES

TECHNICAL DATA: **UNINTERRUPTABLE POWER SUPPLY UPS**

Manufacturer	
Model	
Frequency	
Harmonic Distortion Reduction	
Operating Temperature	
Range of Protection – Lightning Strike	
KVA	
Maximum current, cooling mode	
Agent	
Telephone number of Agent	
Brochure enclosed	Yes/No

TECHNICAL DATA: **PARCEL X-RAY UNITS**

Manufacturer	
Model	
Dimension /Size	
Resolution	
Zoom ranges	
External Radiation Levels	
Standard Compliance	
Electrical nominal voltage	Volts
Monitor Type and size	
Agent	
Telephone no of Agent	
Brochure enclosed	Yes/No

Project Code: **053651**

EQUIPMENT SCHEDULES

TECHNICAL DATA: **WALK THROUGH DETECTOR**

Manufacturer	
Model	
Timer mode	
No of sequential settings per time switch	
No of N/O and N/C contacts per setting	
Adjustable time lapse between settings	
Operating voltage	
Operating current	
Agent	
Telephone number	
Brochure enclosed	Yes/No

TECHNICAL DATA: **TURNSTILE**

Manufacturer	
Size	
Range	
Voltage	
Battery Back Up Time	
Finish	
Agent	
Telephone number	
Brochure enclosed	Yes/No

Project Code: **053651**

EQUIPMENT SCHEDULES

TECHNICAL DATA: **PARAPLEGIC LIFT**

Manufacturer	
Panel thickness	
Load	
Stops	
Car Size	
Door Opening	
Door Type	
Speed	
Type of Drive	
Speed Control	
Type of Car and Landing Buttons	
Type of Landing Door Frames	
Type of Door	
Internal Finishes	
Pit	
Head Room	
Battery Type	
Method of joining panels	
Floor construction	
Standard Compliance	
Agent	
Telephone number of Agent	
Brochure enclosed	Yes/No

Project Code: **053651**

EQUIPMENT SCHEDULES

TECHNICAL DATA: **AIR-CONDITIONING AND VENTILATION INSTALLATION**

Area:		
Manufacturer:		
Model number:	WCPU	
	Cooling Tower	
Serial number:	WCPU	
	Cooling Tower	
Voltage		V
Starting amps		A
Running amps		A
System supply gauge pressure		kPA
System return gauge pressure		kPA
Condenser water inlet temperature		°C
Condenser water outlet temperature		°C
Condenser water flow rate		l/s
Blower unit air inlet temperature		°C
Blower unit air outlet temperature		°C
Blower unit air flow rate		m^3/s
Conditioned room air temperature after 1 hour, Design		°C
Conditioned room air temperature after 1 hour, Actual		°C

T2.17 CONTRACTOR'S SAFETY, HEALTH AND ENVIRONMENTAL DECLARATION

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

In terms of Regulation 5(1)(h) of the Construction Regulations of February 2014 a Contractor may only be appointed to perform construction work if the Client is satisfied that the Contractor has the necessary competencies and resources to carry out the work safely in accordance with the Occupational Health and Safety Act, Act 85 of 1993 and the Construction Regulations of February 2014. In line with this requirement the Contractor is required to read through this document carefully, sign it and submit it with his/her Tender.

DECLARATION

1. I, the undersigned hereby declare and confirm that I am fully conversant with the Occupational Health and Safety Act, Act 85 of 1993 and the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specifications attached to this document.
2. I hereby declare that my company and its employees has the necessary competency and resources to safely carry out the construction works under this contract in compliance with the Occupational Health and Safety Act, Act 85 of 1993, the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specifications.
3. I hereby confirm that adequate provisions has been made in my Tender to cover the cost of all Safety, Health and Environmental duties and responsibilities imposed on me by the Occupational Health and Safety Act, Act 85 of 1993, the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specifications.
4. I hereby undertake that if my Tender is accepted, to provide before commencement of the Works under the contract or as required by the Conditions of the Contract, a suitable and sufficiently documented Construction Safety, Health and Environmental Management Plan in accordance with Regulation 7(1)(a) of the Construction Regulations of February 2014, which shall be subject for approval by the Client.
5. I confirm that I may not commence with any part of construction work under the contract until my Construction Safety Health and Environmental Management Plan has been approved in writing by the Client.
6. I hereby confirm that copies of the following documentation will be kept on site for viewing and inspection purposes for the duration of the construction work:
   a) Client's Construction Safety, Health and Environmental Specification.
   b) Approved Construction Safety, Health and Environmental Plan.
   c) Occupational Health and Safety Act, Act 85 of 1993.
   d) Construction Regulations of February 2014.
7. I agree that my failure to complete and execute this declaration to the satisfaction of the Client will mean that I am unable to comply with the requirements of the Occupational Health and Safety Act, Act 85 of 1993 and the Construction Regulations of February 2014, and accept that my Tender will be rejected.

Duly signed at…….. on this the…... day of……. 20…..

Full Name of Signatory

Name of Enterprise

Capacity of Signatory

Signature of authorised representative of Tenderer

T2.18 Compulsory Enterprise Questionnaire

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

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

Section 1: Name of enterprise:	
Section 2: VAT registration number, if any:	
Section 3: CIDB registration number, if any:	
Section 4: CSD Number:	

Section 5: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

** Complete only if sole proprietor or partnership and attach separate page if more than 6 partners*

Section 6: Particulars of companies and close corporations

Company registration number	
Close corporation number	
Tax reference number	

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

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

i) authorizes the Employer to verify the tenderers tax clearance status from the South African Revenue Services that it is in order;

ii) confirms that neither the name of the enterprise or the name of any partner, manager, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears on the Register of Tender Defaulters established in terms of the Prevention and Combating of Corrupt Activities Act of 2004;

iii) confirms that no partner, member, director or other person, who wholly or partly exercises, or may exercise, control over the enterprise appears, has within the last five years been convicted of fraud or corruption;

iv) confirms that I / we are not associated, linked or involved with any other tendering entities submitting tender offers and have no other relationship with any of the tenderers or those responsible for compiling the scope of work that could cause or be interpreted as a conflict of interest; and

iv) confirms that the contents of this questionnaire are within my personal knowledge and are to the best of my belief both true and correct.

Signed		**Date**	
Name			
Position			
Enterprise name			

T2.19 TAX COMPLIANCE STATUS (TCS) PIN TO VERIFY ON LINE COMPLIANCE SUPPLIER STATUS VIA SARS e-FILING

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

TAX CLEARANCE REQUIREMENTS

It is a condition of Tender that the taxes of the successful tenderer must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the tenderer's tax obligations. It is a condition of this Offer of Commission that your practice remains in good standing with SARS (South African Revenue Services) in terms of its tax clearance.

1. In order to meet this requirement Tenderders are required to apply via e-filing at any SARS branch office nationally. The Tax Complance Status (TCS) requirements are also applicable to foreign Tenderders / individuals who wish to submit tenders.
2. SARS will then furnish the tenderer with a Tax Compliance Status (TCS) **PIN** that will be valid for a period of 1 (one) year from the date of approval.
3. In tenders where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Compliance Status (TCS) PIN.
4. Application for Tax Compliance Status (TCS) PIN can be done via e-filing at any SARS branch office nationally or on the website www.sars.gov.za.
5. Tax Clearance Certificates may be printed via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.

IMPORTANT NOTICE

1. The South African Revinue Services (SARS) has phased out the issuing of paper Tax Clearance Certificates.
2. From 18 April 2016 SARS introduced an enhanced Tax Compliance (TCS) system.
3. The new system allows taxpayers to obtain a Tax Compliance Status (PIN), which can be utilised by authorised third parties to varify taxpayers compliance status online via SARS e-filing.
4. Tenderers are required to fill in clearly, legibly, in bold print and black ink the SARS (TCS) PIN number and Tax Reference number in the space hereunder:

Tax Compliance Status(TCS) PIN Number	
Company / Tendering Entity Tax Reference Number	

Name of Tenderer: .....

Signature of tenderer: .....

Date: .....

T2.20 CERTIFIED PROOF OF GOOD STANDING WITH THE COMPENSATION COMMISSIONER

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

ATTACH A CERTIFIED COPY OF PROOF, THAT THE TENDERER IS IN GOOD STANDING WITH THE COMPENSATION COMMISSIONER, TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Tender by a Joint Venture, certified copies of proof of Good Standing with the Compensation Commissioner in respect of each party to the Joint Venture must be attached to this page

T2.21 - FORM OF OFFER AND ACCEPTANCE

Tender no: ZNTM01255W

OFFER

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

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

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

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

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS:

Amount (in words):	
Amount in figures:	**R**

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 to the Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in the Conditions of Contract identified in the Contract Data.

Signature (s)				
Name (s)				
Capacity				
For the tenderer				
	(Name and address of tenderer)			
Name and 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.

The terms of the contract, are contained in:

Part C1	Agreement and Contract Data, (which includes this agreement)
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 as listed in the returnable schedules as well as any changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance, are contained in the schedule of deviations attached to and forming part of this form of offer and acceptance. No amendments to or deviations from said documents are valid unless contained in this schedule.
The tenderer shall within two weeks after receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the employer's agent (whose details are given in the contract data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the contract data. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy of this document, including the schedule of deviations (if any). Unless the tenderer (now contractor) within five (5) working days of the date of such receipt notifies the employer in writing of any reason why he/she 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			
	(Name and address of employer)		
Name and signature of witness			

Schedule of Deviations

Notes:
1. The extent of deviations from the tender documents issued by the employer before the tender closing date is limited to those permitted in terms of the conditions of tender.
2. A tenderer's covering letter shall not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid, become the subject of agreements reached during the process of offer and
3. Any other matter arising from the process of offer and acceptance either as a confirmation, clarification or change to the tender documents and which it is agreed by the Parties becomes an obligation of the contract shall also be
4. Any change or addition to the tender documents arising from the above agreements and recorded here, shall also be incorporated into the final draft of the Contract.

1.1.1.	**Subject:**
Details:	

1.1.2.	**Subject:**
Details:	

1.1.3.	**Subject:**
Details:	

1.1.4.	**Subject:**
Details:	

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.

T2.21a CONFIRMATION OF RECEIPT

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

Tender no.:	**ZNTM01255W**	**Project Code:**	**053651**

The Tenderer (now Contractor), identified in the Offer part of this Agreement hereby confirms receipt from the Employer, identified in the Acceptance part of this Agreement, of one fully completed original copy of this Agreement, including the Schedule of Deviations (if any) today:

the _____ (day)

of _____ (month)

_____ (year)

at _____ (Place)

For the Contractor:

_____
Signature

_____
Name

_____
Capacity

Signature and name of witness:

_____
Signature

_____
Name

T2.22 - FINAL BILL OF QUANTITY SUMMARY

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

ATTACH SUMMARY PAGE OF THE BILL OF QUANTITIES

FINAL SUMMARY

Section No		Page No		Amount
1	Preliminary & General	21		
2	Nurses Quarters - Block A	81		
3	Nurses Quarters - Block B and Lobby	132		
4	Doctors Quarters	199		
5	Squash Court	214		
	Sub Total		R	
	VAT (15%)		R	
	Carried to Form of Tender - T2.21		R	

T2.23 - PROOF OF PAID MUNICIPAL RATES & TAXES

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

ATTACH PROOF OF PAID MUNICIPAL RATES & TAXES TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Quotation by a Joint Venture, proof of paid municipal rates and taxes for each member of the Joint Venture should be attached to this form.

T2.24 - CERTIFIED PROOF OF VALID UIF REGISTRATION

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

ATTACH A CERTIFIED COPY OF PROOF, THAT THE TENDERER IS IN GOOD STANDING WITH THE **UIF** TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Tender by a Joint Venture, certified copies of proof of Good Standing with the **UIF** in respect of each party to the Joint Venture must be attached to this page

The contractor must submit proof of UIF Contributions made to the fund to the Principal Agent on a monthly basis for the duration of the contract.

Should the contractor default on his monthly payments, the Employer will pay the outstanding payments due and the contractor will be liable for payments made by the Employer on behalf of the contractor, plus any additional cost associated with this process.

T2.25 THE NATIONAL INDUSTRIAL PARTICIPATION PROGRAMME

This document must be signed and submitted together with your tender

INTRODUCTION

The National Industrial Participation (NIP) Programme, which is applicable to all government procurement contracts that have an imported content, became effective on the 1 September 1996. The NIP policy and guidelines were fully endorsed by Cabinet on 30 April 1997. In terms of the Cabinet decision, all state and parastatal purchases / lease contracts (for goods, works and services) entered into after this date, are subject to the NIP requirements. NIP is obligatory and therefore must be complied with. The Industrial Participation Secretariat (IPS) of the Department of Trade and Industry (DTI) is charged with the responsibility of administering the programme.

1 PILLARS OF THE PROGRAMME

1,1 The NIP obligation is benchmarked on the imported content of the contract. Any contract having an imported content equal to or exceeding US$ 10 million or other currency equivalent to US$ 10 million will have a NIP obligation. This threshold of US$ 10 million can be reached as follows:

(a) Any single contract with imported content exceeding US$10 million.

or

(b) Multiple contracts for the same goods, works or services each with imported content exceeding US$3 million awarded to one seller over a 2 year period which in total exceeds US$10 million.

or

(c) A contract with a renewable option clause, where should the option be exercised the total value of the imported content will exceed US$10 million.

or

(d) Multiple suppliers of the same goods, works or services under the same contract, where the value of the imported content of each allocation is equal to or exceeds US$ 3 million worth of goods, works or services to the same government institution, which in total over a two (2) year period exceeds US$10 million.

1,2 The NIP obligation applicable to suppliers in respect of sub-paragraphs 1.1 (a) to 1.1 (c) above will amount to 30 % of the imported content whilst suppliers in respect of paragraph 1.1 (d) shall incur 30% of the total NIP obligation on a pro-rata basis.

1,3 To satisfy the NIP obligation, the DTI would negotiate and conclude agreements such as investments, joint ventures, sub-contracting, licensee production, export promotion, sourcing arrangements and research and development (R&D) with partners or suppliers.

1,4 A period of seven years has been identified as the time frame within which to discharge the obligation.

2 REQUIREMENTS OF THE DEPARTMENT OF TRADE AND INDUSTRY

2,1 In order to ensure effective implementation of the programme, successful tenderers (contractors) are required to, immediately after the award of a contract that is in excess of R10 million (ten million Rands), submit details of such a contract to the DTI for reporting purposes.

2,2 The purpose for reporting details of contracts in excess of the amount of R10 million (ten million Rands) is to cater for multiple contracts for the same goods, works or services; renewable contracts and multiple suppliers for the same goods, works or services under the same contract as provided for in paragraphs 1.1.(b) to 1.1. (d) above.

3 Tender SUBMISSION AND CONTRACT REPORTING REQUIREMENTS OF TenderDERS AND SUCCESSFUL TenderDERS (CONTRACTORS)

3,1 Tenderders are required to sign and submit this Standard Tenderding Document (SBD 5) together with the Tender on the closing date and time.

3,2 In order to accommodate multiple contracts for the same goods, works or services; renewable contracts and multiple suppliers for the same goods, works or services under the same contract as indicated in sub-paragraphs 1.1 (b) to 1.1 (d) above and to enable the DTI in determining the NIP obligation, successful Tenderders (contractors) are required, immediately after being officially notified about any successful Tender with a value in excess of R10 million (ten million Rands), to contact and furnish the DTI with the following information:

- Tender / contract number.
- Description of the goods, works or services.
- Date on which the contract was accepted.
- Name, address and contact details of the government institution.
- Value of the contract.
- Imported content of the contract, if possible.

3,3 The information required in paragraph 3.2 above must be sent to the Department of Trade and Industry, Private Bag X 84, Pretoria, 0001 for the attention of Mr. Elias Malapane within five (5) working days after award of the contract. Mr. Malapane may be contacted on telephone (012) 394 1401, facsimile (012) 394 2401 or e-mail at Elias@thedti.gov.za for further details about the programme.

4 PROCESS TO SATISFY THE NIP OBLIGATION

4,1 Once the successful Tenderder (contractor) has made contact with and furnished the DTI with the information required, the following steps will be followed:

a. the contractor and the DTI will determine the NIP obligation;
b. the contractor and the DTI will sign the NIP obligation agreement;
c. the contractor will submit a performance guarantee to the DTI;
d. the contractor will submit a business concept for consideration and approval by the DTI;
e. upon approval of the business concept by the DTI, the contractor will submit detailed business plans outlining the business concepts;
f. the contractor will implement the business plans; and
g. the contractor will submit bi-annual progress reports on approved plans to the DTI.

4,2 The NIP obligation agreement is between the DTI and the successful Tenderder (contractor) and, therefore, does not involve the purchasing institution.

Tender number: _____ Closing date: _____

Name of tenderer: _____

Postal address: _____

_____

Signature: _____ Name (in print): _____

Date: _____

T2.26 - CERTIFIED PROOF OF REGISTRATION ON CENTRAL SUPPLIERS DATABASE

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Bid no:	**ZNTM01255W**	**Project Code:**	**053651**

ATTACH A CERTIFIED COPY OF PROOF, THAT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIERS DATABASE TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Tender by a Joint Venture, certified copies of proof of registration on the Central Suppliers Data Base in respect of each party to the Joint Venture must be attached to this page

T2.27 - CERTIFIED PROOF OF CIDB REGISTRATION NUMBER

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

ATTACH A CERTIFIED COPY OF PROOF, THAT THE TENDERER IS REGISTERED WITH THE CONSTRUCTION INDUSTRY DEVELOPMENT BOARD (CIDB) TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Tender by a Joint Venture, certified copies of proof of registration with the CIDB in respect of each party to the Joint Venture must be attached to this page

Only those tenderers who are registered with the CIDB, or are capable of being so prior to the evaluation of submissions, in a contractor grading designation equal to or higher than a contractor grading designation determined in accordance with the sum tendered, or a value determined in accordance with Regulation 25(1B) or 25(7A) of the Construction Industry Development Regulations for a :

T2.28 - PROOF OF PAYMENT OF TENDER DEPOSIT

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

ATTACH A COPY OF PROOF OF PAYMENT WHERE AVAILABLE OF THE TENDER DEPOSIT BY THE TENDERER, TO THIS PAGE FOR ADJUDICATION PURPOSES

NOTE

In the case of a Tender by a Joint Venture a certified copy of proof of payment where available of the tender deposit is only necessary in respect of any one party to the Joint Venture and must be attached to this page

T2.29 CONTRACT FORM - PURCHASE OF GOODS/WORKS-Part 1

THIS FORM MUST BE FILLED IN DUPLICATE BY BOTH THE SUCCESSFUL TENDERER (PART 1) AND THE PURCHASER (PART 2). BOTH FORMS MUST BE SIGNED IN THE ORIGINAL SO THAT THE SUCCESSFUL TENDERER AND THE PURCHASER WOULD BE IN POSSESSION OF ORIGINALLY SIGNED CONTRACTS FOR THEIR RESPECTIVE RECORDS.

PART 1 (TO BE FILLED IN BY THE TENDERER)

1. I hereby undertake to supply all or any of the goods and/or works described in the attached tendering documents to Head: Public Works (Department of Public Works: Province of KwaZulu-Natal) in accordance with the requirements and specifications stipulated in tender number ZNTM01255W at the price/s quoted.
2. The following documents shall be deemed to form and be read and construed as part of this agreement:
   (i) Tendering documents, viz
   - Invitation to tender;
   - Tax Compliance Status (TCS) **PIN**;
   - Pricing schedule(s);
   - Technical Specification(s);
   - Preference claims for SPECIFIC GOAL/S, for this tender in terms of the Preferential Procurement Regulations 2022;
   - Bidder's Disclosure;
   - Special Conditions of Contract;

   (ii) General Conditions of Contract for construction works Edition 2 - GCC2010; and
3. (iii) Other (specify)
4. I confirm that I have satisfied myself as to the correctness and validity of my Tender; that the price(s) and rate(s) quoted cover all the goods and/or works specified in the Tenderding documents; that the price(s) and rate(s) cover all my obligations and I accept that any mistakes regarding price(s) and rate(s) and calculations will be at my own risk.
5. I accept full responsibility for the proper execution and fulfilment of all obligations and conditions devolving on me under this agreement as the principal liable for the due fulfilment of this contract.
6. I declare that I have no participation in any collusive practices with any Tenderder or any other person regarding this or any other Tender.

I confirm that I am duly authorised to sign this contract.

NAME (PRINT): _____

CAPACITY: _____

SIGNATURE: _____

NAME OF FIRM: _____

DATE: _____

Witnesses:

1. _____

2. _____

Date:

T2.30 CONTRACT FORM - PURCHASE OF GOODS/WORKS-Part 2

PART 2 (TO BE FILLED IN BY THE PURCHASER)

1. I _____ in my capacity as

_____

accepts your tender under reference ZNTM01255W dated _____for the supply of goods/works indicated hereunder and/or further specified in the annexure(s).

2. An official order indicating delivery instructions is forthcoming.
3. I undertake to make payment for the goods/works delivered in accordance with the terms and conditions of the contract, within 30 (thirty) days after receipt of an invoice accompanied by the delivery note.

ITEM NO.	PRICE (ALL APPLICABLE TAXES INCLUDED)	BRAND	DELIVERY PERIOD	B-BBEE STATUS LEVEL OF CONTRIBUTION	MINIMUM THRESHOLD FOR LOCAL PRODUCTION AND CONTENT (if applicable)

4. I confirm that I am duly authorised to sign this contract.

SIGNED AT _____ON_____
[Place] *[Date]*

NAME (PRINT): _____

SIGNATURE: _____

OFFICIAL STAMP:

Witnesses:

1. _____

2. _____

Date:

T2.31 - OHSE PLAN STRUCTURE

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

A detailed OHSE Plan is to be submitted by the successful tenderer as per Construction Regulation 7(1)(a). The following are the minimum standard legal documentation that must form part of the OHSE Plan based on the risks attached in executing this project titled;

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

SEE ANNEXURE 6

T2.32 - OHSE CLIENT SPECIFIC REQUIREMENTS

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**
Tender no:	**ZNTM01255W**
Project Code:	**053651**

SEE ANNEXURE 6

T2.33 - BASELINE RISK ASSESSMENT			
Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

SEE ANNEXURE 6

T2.34 - Functionality Criteria

TENDER EVALUATION CRITERIA AND SCORING

A minimum of 60 points must be attained to qualify for evaluation in terms of price and preference points.

Bidders must score a minimum of 20 points from item 1 and 2 in order to procced to item No 3 and 4

The weighting for Functionality 60 out of 100 sub-points is as follows:

	Evaluation Criteria	Item	Documentation to be provided	Sub-Points	Weighting Factor
1.	Schedule and proof of years of experience on similar projects	1.1 Schedule of projects similar in nature and value (Minimum of 3 Residential projects in urban area's) completed in the last 10 years in construction Public or Private projects. Project value to be R10,000,000 (incl VAT) and above	List of 3 Projects where Bidders must provide: 1.1.1 Award letters which include the value of the project and duration (3 points per letter) 1.1.2 Completion certificates for each project (2 points per Practical Completion certificate.) (05 points per project for full information)	3x3=9 2x3=6	15
		1.2 Reference Letter from Consultants / Client / Project Manager for projects of similar nature and value.	Bidders must provide reference letters for the submitted projects, commenting positively on the management of the project for each of the above 3 projects provided. See attached Annexure 11 Proforma Reference Letter (05 points for each reference letter)	5x3=15	15
2.	Experience and Resource capacity	2.1 Organogram, CVs and experience of resources proposed for the project.	2.1.1 Detailed company organogram that reflects the names, qualifications, roles (e.g. Director, Manager, or supervisor) of members and number of years of experience. The Organogram must indicate the intended individual's role for the Bidding Entity/ Construction company, who will be part of the execution of this project including the percentage of time and involvement devoted to this project.See attached Annexure 10 Proforma Project Specific Organogram (15 points for full information)	15	30
			2.1.2 Tenderer to submit the CV's indicating experience and relevant qualifications as per Project specific Organogram. To obtain the points the person must have a proven track record in the construction being considered (general building works) 2.1.2.1 Construction Manager 2.1.2.2 Site Agent 2.1.2.3 Foreman 2.1.2.4 Safety Officer (must have SACPCMP Registration) 2.1.2.5 Site Quantity Surveyor (03 points per item for full information).	3x5=15	

3.	Financial Standing	3.1 Proof of working capital of at least 5% of project value.	3.1.1 3 Months Bank Statement which must show availability of 2% working capital, the statements must not be older than 3 months. OR An original letter from an accredited financial institution confirming provision of 2% of working capital. (2% and above for 18 full points, less than 2% equates 0-points)	18	18
		3.2 Letter of Credit reference from suppliers and credit limits to be stipulated.	3.2.1 A minimum of 3x Letters of Credit reference from relevant suppliers of major building materials (Electrical, Mechanical and Plumbing). Suppliers and credit limits to be stipulated on official letterhead. The credit limit must be above R 400 000.00 incl VAT combined. All letters must be dated and signed. (4 points per credit letter dated and signed equating to 12 full points)	4x3=12	12
4.	Technical Approach and Methodology	4.1 Submission of a Project Specific Method Statement	Detailed statement of the proposed methodology of implementing the project without disrupting operation of the hospital. The following must be included: 4.1.1 Site organization including material storage, handling, and distribution 4.1.2 OHS management, compliance & reporting 4.1.3 Maintaining productivity through effective contract management and administration, progress tracking & corrective action plans. 4.1.4 Site documentation control, filing and archiving. 4.1.5 List of all proposed domestic & specialist sub-Contractors, how it will be coordinated and the management thereof during construction. (01 point per item for full information)	1x5=5	10
		4.2 Submission of detailed Project Specific Program including how time will be managed. The program must be realistic and be technically correct	Submit detailed Project Specific Program, ie. Gantt Chart strictly in color. The program must indicate the critical path, float, all major activities (from site handover to practical completion), and task durations. (5 points for full information)	5	
TOTAL POINTS				**100**	

TENDER EVALUATION CRITERIA AND SCORING PRICE AND SPECIFIC GOALS				
	Evaluation Criteria	**Deliverables / Goal**		**Points**
	Price	A maximum of 80 or 90 Points is allocated for Price.	80	Points
	Specific Goal 1	•Promotion of enterprise located in a specific municipal area (uMgungundlovu District Municipality) for work to be done or services to be rendered. Documentary proof required: 1. Proof of Municipal Account depicting Physical Address of the business (not older than 3 months) OR 2. Lease Agreement signed by landlord. OR 3. Original letter from the ward councilor	20	Points

PART A
INVITATION TO TENDER - SBD 1

YOU ARE HEREBY INVITED TO TENDER FOR REQUIREMENTS OF THE KWA-ZULU NATAL DEPARTMENT OF WORKS					
TENDER NUMBER:	ZNTM01255W	**CLOSING DATE:**	Monday, 22 September 2025	**CLOSING TIME:**	11:00
DESCRIPTION	DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT				
THE SUCCESSFUL TENDERER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT					
TENDER RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE TENDER BOX SITUATED AT *10 PRINCE ALFRED STREET*, PIETERMARITZBURG					

SUPPLIER INFORMATION				
NAME OF TENDERER				
POSTAL ADDRESS				
STREET ADDRESS				
TELEPHONE NUMBER	CODE		NUMBER	
CELLPHONE NUMBER				
FACSIMILE NUMBER	CODE		NUMBER	
E-MAIL ADDRESS				
VAT REGISTRATION NUMBER				
	TCS PIN:		**CSD No:**	
B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE (Tick YES or NO)	Yes		B-BBEE STATUS LEVEL SWORN AFFIDAVIT (Tick YES or NO)	Yes
	No			No
If YES, State the name of the verification agency accredited by SANAS				
ARE YOU THE ACCREDITED REPRESENTATIVE IN SOUTH AFRICA FOR THE GOODS /SERVICES /WORKS OFFERED?	Yes	NO	ARE YOU A FOREIGN BASED SUPPLIER FOR **THE GOODS**	YES / NO
	[IF YES ENCLOSE PROOF]		**(IF YES ANSWER PART B:3 BELOW)**	
SIGNATURE OF TENDERER			**DATE**	
CAPACITY UNDER WHICH THIS TENDER IS SIGNED (Attach proof of authority to sign this tender; e.g. resolution of directors, etc.)				
TOTAL NUMBER OF ITEMS OFFERED			**TOTAL TENDER PRICE (ALL INCLUSIVE)**	

TENDERING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:		**TECHNICAL INFORMATION MAY BE DIRECTED TO:**	
DEPARTMENT/ PUBLIC ENTITY	SCM ASSISTANT DIRECTOR: PRE BID	CONTACT PERSON	Ms S Khumalo
CONTACT PERSON	Ms N Zulu	TELEPHONE NUMBER	0338971302
TELEPHONE NUMBER	0338971442	FACSIMILE NUMBER	0338971399
FACSIMILE NUMBER	0338971399	E-MAIL ADDRESS	musa.khumalo@kznworks.gov.za
E-MAIL ADDRESS	nelisiwezulu@kznworks.gov.za		

PART B

TERMS AND CONDITIONS FOR TENDERING - SBD 1

1. TENDER SUBMISSION:

1.1. TENDERS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE TENDERS WILL NOT BE ACCEPTED FOR CONSIDERATION.

1.2. ALL TENDERS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED (NOT TO BE RE-TYPED) OR ONLINE

1.3. TENDERERS MUST REGISTER ON THE CENTRAL SUPPLIER DATABASE (CSD) TO UPLOAD MANDATORY INFORMATION NAMELY: (BUSINESS REGISTRATION/ DIRECTORSHIP/ MEMBERSHIP/IDENTITY NUMBERS; TAX COMPLIANCE STATUS; AND BANKING INFORMATION FOR VERIFICATION PURPOSES). B-BBEE CERTIFICATE OR SWORN AFFIDAVIT FOR B-BBEE MUST BE SUBMITTED TO TENDERING INSTITUTION.

1.4. WHERE A TENDERER IS NOT REGISTERED ON THE CSD, MANDATORY INFORMATION NAMELY: (BUSINESS REGISTRATION/ DIRECTORSHIP/ MEMBERSHIP/IDENTITY NUMBERS; TAX COMPLIANCE STATUS MAY NOT BE SUBMITTED WITH THE TENDER DOCUMENTATION. B-BBEE CERTIFICATE OR SWORN AFFIDAVIT FOR B-BBEE MUST BE SUBMITTED TO TENDERING INSTITUTION.

1.5. THIS TENDER IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022, THE GENERAL CONDITIONS OF CONTRACT ARE THE CLAUSES CONTAINED IN THE GENERAL CONDITIONS OF CONTRACT (2010) (SECOND EDITION) PUBLISHED BY THE SOUTH AFRICAN INSTITUTION OF CIVIL ENGINEERING. COPIES OF THESE CONDITIONS OF CONTRACT MAY BE OBTAINED THROUGH MOST REGIONAL OFFICES OF THE SOUTH AFRICAN INSTITUTION OF CIVIL ENGINEERING, OR BY VISITING THEIR WEBSITE AT WWW.SAICE.ORG.ZA; AND, IF APPLICABLE, ANY OTHER LEGISLATION OR SPECIAL CONDITIONS OF CONTRACT.

2. TAX COMPLIANCE REQUIREMENTS

2.1 TENDERERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.

2.2 TENDERERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VIEW THE TAXPAYER'S PROFILE AND TAX STATUS.

2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) OR PIN MAY ALSO BE MADE VIA E-FILING. IN ORDER TO USE THIS PROVISION, TAXPAYERS WILL NEED TO REGISTER WITH SARS AS E-FILERS THROUGH THE WEBSITE WWW.SARS.GOV.ZA.

2.4 TENDERERS MAY ALSO SUBMIT A PRINTED TCS TOGETHER WITH THE TENDER.

2.5 IN TENDERS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED, EACH PARTY MUST SUBMIT A SEPARATE PROOF OF TCS / PIN / CSD NUMBER.

2.6 WHERE NO TCS IS AVAILABLE BUT THE TENDERER 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.

3. QUESTIONNAIRE TO TENDERING FOREIGN SUPPLIERS

3.1. IS THE TENDERER A RESIDENT OF THE REPUBLIC OF SOUTH AFRICA (RSA)?	YES		NO	
3.2. DOES THE TENDERER HAVE A BRANCH IN THE RSA?	YES		NO	
3.3. DOES THE TENDERER HAVE A PERMANENT ESTABLISHMENT IN THE RSA?	YES		NO	
3.4. DOES THE TENDERER HAVE ANY SOURCE OF INCOME IN THE RSA?	YES		NO	

IF THE ANSWER IS "NO" TO ALL OF THE ABOVE, THEN, IT IS NOT A REQUIREMENT TO OBTAIN A TAX COMPLIANCE STATUS / TAX COMPLIANCE SYSTEM PIN CODE FROM THE SOUTH AFRICAN REVENUE SERVICE (SARS) AND IF NOT REGISTER AS PER 2.3 ABOVE.

NB: FAILURE TO PROVIDE ANY OF THE ABOVE PARTICULARS MAY RENDER THE TENDER INVALID.

PROVINCIAL ADMINISTRATION OF KWAZULU-NATAL
DEPARTMENT OF PUBLIC WORKS

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

BILLS OF QUANTITIES

with GCC for Construction Works - Second Edition 2010

CONTRACTUAL SECTION

SECTION 2 OF 2

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

Project Manager
KZN Department of Public Works
X9041
Pietermarizburg
Pietermarizburg
3200
031 897 1302 - Tel Number
033 897 1399 - Fax Number
musa.khumalo@kznworks.gov.za

Clerk of Works
Ukuza Consulting (Pty) Ltd
15 The Boulevard
Westville

3692
031 265 0444 - Tel Number
N/A - Fax Number
info@ukuza.co.za

Employer:
Head: Public Works
KZN Department of Public Works
Private Bag X 9041
PIETERMARITZBURG
3200
Tel Number: 033 - 8971300
Fax Number: 033 - 8971399

Region:
Regional Manager
KZN Department of Public Works
X9041
Pietermarizburg
3200
Tel Number: 033-897 1421/1422
Fax Number: 033-897 1399

Tender Number: **ZNTM01255W**
CIDB Grading: **6GB or Higher**
ECDP Number: **N/A**

Project Code: **053651**
Document Date: **22 September 2025**

Contracting Party: _____
CIDB Registration number: _____
Central Suppliers Database Registration Number: _____

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

THE TENDER

1. PART T1: TENDER PROCEDURES

		Page No.
T1.1	Tender Notice and Invitation to Tender	4
T1.2	Tender Data	4
T1.3	Annexure C - Standard Conditions of Tender	8

2. PART T2: RETURNABLE DOCUMENTS

T2.1	List of Returnable Documents	2
T2.2	Authority to Sign Tender (T2.2)	1
T2.3	Authority for Consortia or Joint Venture's to Sign Tender (T2.3)	2
T2.4	Special Resolution of Consortia or Joint Venture's (T2.4)	3
T2.5	Joint Venture Involvement Declaration (T2.5)	2
T2.6	Schedule of Proposed Sub-Contractors (T2.6)	1
T2.7	Capacity of Tenderer (T2.7)	6
T2.8	Financial Standing and other resources of Business Declaration (T2.8)	1
T2.9	Preference Points Claim Form (T2.9)	2
T2.10	Site Inspection Certificate as proof for attendance of compulsory briefing meeting (T2.10)	1
T2.11	Bidder's Disclosure - SBD 4 (T2.11)	3
T2.12	Record of Addenda to Tender Documents (T2.12)	1
T2.13	Particulars of Electrical Contractor (T2.13)	1
T2.14	Schedule of Imported Materials and Equipment (T2.14)	1
T2.15a	Annual Financial Statement for past financial year (2.15)	1
T2.16	Equipment Schedules (T2.16)	5
T2.17	Contractor's Safety, Health and Environmental Declaration (T2.17)	1
T2.18	Compulsory Enterprise Questionaire (T2.18)	1
T2.19	Tax Compliance Status (TCS) PIN to verify on line Compliance Supplier Status via e-Filing (T2.19)	1
T2.20	Proof of Good Standing With the Compensation Commissioner (T2.20)	1
T2.21	Form of Offer and Acceptance (Bound into Section 1 of 2) (T2.21)	3
T2.21a	Confirm Receipt of Offer and Acceptance (T2.21a)	1
T2.22	Final Bill of Quantity (T2.22)	215
T2.23	Certified Proof of Paid Municipal Rates and Taxes (Attach) (T2.23)	1
T2.24	Proof of Unemployment Insurance Fund (2.24)	1
T2.25	The National Industrial Participation Programme (T2.25)	2
T2.26	Proof of Registration on the Central Supplier Database (CSD) (T2.26)	1

T2.27	Certified Proof of CIDB Registration Number (T2.27)	1
T2.28	Proof of Deposit (T.28)	1
T2.29	Contract Form - Purchase of Goods/Works - Part 1 (T2.29)	1
T2.30	Contract Form - Purchase of Goods/Works - Part 2 (T2.30)	1
T2.31	OHSE Plan Structure (T2.31)	1
T2.32	Client's specific requirements for the Contractor's detailed OHSE Plan (T2.32)	1
T2.33	Baseline Risk Assessment (T2.33)	1
T2.34	Functionality Criteria (T2.34)	3
T2.35	Invitation to Tender - SBD 1 (T2.35)	2

THE CONTRACT

3. PART C1: AGREEMENT AND CONTRACT DATA

C1.1	Form of Offer and Acceptance	1
C1.2	Contract Data	7
C1.3	Form of Guarantee (C1.3)	3

4. PART C2: PRICING DATA

C2.1	Pricing Instructions	4
C2.2	Bills of Quantities	1-214

5. PART C3: SCOPE OF WORKS

C3.1	Scope of Works	8
C3.2	Specification for HIV/AIDS awareness	3
C3.3	HIV/STI Compliance report	2

6. PART C4: SITE INFORMATION

C4.1	Site Information	1

7. DRAWINGS

C5.1	List of Drawings	2

8. ANNEXURES

Annexure 1	Standard Preambles for all Trades (Rev 3) - DOH 2009	1 to 95
Annexure 2	General Electrical Specifications	E/1 to E/20; LP1 to LP6
Annexure 3	Mechanical Specifications	1,1-4,61; 1-32; 1-3
Annexure 4	Map of Bid submission location	1
Annexure 5	Joint Venture Agreement	7
Annexure 6	Health and Safety Specification	1-11; 0-11; 0-29
Annexure 7	Health and Safety Bill of Quantities	2
Annexure 8	Builders Lien Agreement	1
Annexure 9	Scope of Works in Respect of Work Relating to EPWP	4
Annexure 10	Proforma Project Specific Organogram	1
Annexure 11	Proforma Reference Letter	1
Annexure 12	Project Brief	23

IMPORTANT NOTICE TO TENDERERS

Any reference to words Tender or Tenderder herein and/or in any other documentation shall be construed to have the same meaning as the words Bid or Bidder/ Enterprise. These forms are for internal and external use for the KZN Department of Public Works, Provincial Administration of KwaZulu-Natal.

"Quality" shall mean totality of features and characteristics of a product or service that bears on the ability of the product or service to satisfy stated or implied needs.

No alternativeTenders will be accepted.

The Total (Including Value Added Tax) on the Final Summary of the Bill of Quantities must be carried to the "Offer" part only of the Form of Offer and Acceptance - T2.21

"Enterprise" shall mean the legal Tendering Entity or Tenderer who, on acceptance of the Offer, would become the contractor"

The Department reserves the right not to award to the lowest bidder.

In addition, the Department may conduct a detailed risk assessment prior to the award of the bid

No late arrivals will be admitted to the tender briefing meeting

Bidders who attend the tender briefing without a bid document (Hard Copy) will not be allowed to the briefing.

Site Inspection certificate will not be issued at the Tender briefing meeting.

The Site Inspection certificate must be signed and stamped by the Department representative as proof of attendance, should it not be signed your tender document will be disqualified.

Late submissions will not be accepted.

Only Bidders registered within the applicable CIDB grading of 6GB or Higher or relevant JV and bidders registered on the Central Suppliers Database will be eligible to submit bids.

The bid document can be downloaded from e-Tender Portal at no cost. However, should any bidder require a printed/hard copy of the bid document, a non-refundable payment must be made for collection thereof as per the banking details indicated in the tender document. Proof of payment must be produced upon collection of the bid document.

No EFT payments are accepted for the purchase of tender documents, only original deposit slips issued and stamped by the bank teller.

Bidders who are downloading the bid document and BOQ from the e-tender portal can either submit their priced BOQ as a hard copy or on a memory stick (at the cost of the bidder) together with their bid document at the time of close of bid.

Faxed or e-mailed bids are not accepted.

The Preference points system is applicable for this bid is 80/20, where 20 points of specific goals will be allocated as followers:
• Promotion of Enterprise located in a specific Municipal area (Umgungundlovu District Municipality) for work done or services to be rendered: 20 Points

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

THE CONTRACT

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

C1 - AGREEMENT AND CONTRACT DATA

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

FORM OF OFFER AND ACCEPTANCE

FORM OF OFFER AND ACCEPTANCE

Tender No - ZNTM01255W

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

C.1.1 - FORM OF OFFER AND ACCEPTANCE

THE OFFER AND ACCEPTANCE FORM IS BOUND INTO **SECTION 1** (See end of Returnable Documents) OF THIS DOCUMENT AS PART OF THE RETURNABLE DOCUMENTS. ONCE A CONTRACT IS CONCLUDED WITH A SUCCESSFUL TENDERER, THIS PAGE WILL BE REPLACED WITH THE FILLED AND SIGNED OFFER AND SIGN ACCEPTANCE BY THE EMPLOYER AND IT WILL BECOME PART OF THE CONTRACT.

PLEASE SUBMIT THE OFFER AND ACCEPTANCE FORM WITH THE OTHER RETURNABLE DOCUMENTS.

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

C1.2 - CONTRACT DATA

C 1.2 CONTRACT DATA:
with GCC for Construction Works - Second Edition 2010

CONTRACT DATA FOR:

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

Tender no: **ZNTM01255W**

The General Conditions of Contract are the clauses contained in the General Conditions of Contract (2010) (Second Edition) published by the South African Institution of Civil Engineering. Copies of these conditions of contract may be obtained through most regional offices of the South African Institution of Civil Engineering, telephone number 011 805 5947 or by visiting their website at www.saice.org.za.

CONTRACT SPECIFIC DATA
The following contract specific data are applicable to this contract:

CONTRACT VARIABLES

This schedule contains all variables specific to this document and is divided into pre-tender and post-tender categories. The pre-tender category must be completed in full and included in the tender documents. Both the pre-tender and post-tender categories form part of this **agreement.**

Spaces requiring information must be filled in, shown as 'not applicable' or deleted but not left blank. Where choices are offered, the non-applicable items are to be deleted. Where insufficient space is provided the information should be annexed hereto and cross referenced to the applicable clause of the schedule. Key cross reference clauses are italicised in *[ ]* brackets.
The Engineer/Principal Agent, in accordance with Clause 1.1.1.16, shall obtain the specific approval from the Employer before executing any of his functions according to the "Conditions under which Consultants are appointed", or in the event where an employee of the Employer represents the Employer, the relevant General Delegations applicable at the time of executing his/her duties as described in Clause 3.1.2.

Part 1: CONTRACT DATA PROVIDED BY THE EMPLOYER:

PRE-TENDER INFORMATION

CONTRACTING AND OTHER PARTIES

[1.1.1.15] **Employer:**

Head: Public Works (KZN Department of Public Works: Province of KwaZulu-Natal)

Postal address:
Private Bag X 9041
PIETERMARITZBURG
3200

Tel: ***033 - 8971399*** Fax: ***033 - 8971300***

[1.2.1.2] Physical address:
191 Prince Alfred Street
PIETERMARITZBURG
3200

[1.1.1.16] **Employers Agent 1**
Ukuza Consulting (Pty) Ltd

Agent's service:
Clerk of Works

Postal address:
15 The Boulevard
Westville
3692

Tel: ***031 265 0444*** Fax: ***N/A***

Employers Agent 2
Ukuza Consulting (Pty) Ltd

Agent's service:
Health and Safety Agent

Postal address:
15 The Boulevard
Westville
3692

Tel: ***031 265 0444*** Fax: ***N/A***

Employers Agent 3
Ukuza Consulting (Pty) Ltd

Agent's service:
Fire and Electrical Engineer

Postal address:
15 The Boulevard
Westville
3692

Tel: ***031 265 0444*** Fax: ***N/A***

Employers Agent 4
KZN Department of Public Works

Agent's service:
Architect

Postal address:
X9041
Pietermarizburg
3200

Tel: ***033 897 1312*** Fax: ***033 897 1399***

Tender no:	**ZNTM01255W**	
	Employers Agent 5 ***KZN Department of Public Works*** ***Agent's*** service: ***Quantity Surveyor*** Postal address: ***X9041*** ***Pietermarizburg*** ***3200*** Tel: insert ***033 897 1355*** Fax: ***033 897 1399***	
	Employers Agent 6 ***KZN Department of Public Works*** ***Agent's*** service: ***Mechanical Engineer*** Postal address: ***X9041*** ***Pietermarizburg*** ***3200*** Tel: insert ***033 355 5460*** Fax: ***033 897 1399***	
	Employers Agent 7 ***KZN Department of Public Works*** ***Agent's*** service: ***Health & Safety Officer*** Postal address: ***X9041*** ***Pietermarizburg*** ***3200*** Tel: insert ***033 355 7160*** Fax: ***033 897 1399***	
	Employers Agent 8 ***KZN Department of Public Works*** ***Agent's*** service: ***EPWP Officer*** Postal address: ***X9041*** ***Pietermarizburg*** ***3200*** Tel: insert ***033 355 7167*** Fax: ***033 897 1399***	
	PART 1: DATA PROVIDED BY THE EMPLOYER	
[1.1.1.13]	**Defects Liability Period**	
	The defects liability period is: **A time measured from the date of the Certificate of Completion.** Defects Liability Period is 12 Months for the whole of the Works	
	Latent Defect Period	
[5.16.3]	The latent defect period is:	5 years after the Final Approval Certificate
	Documentation required before Commencement of the Works:	
[5.3.1]	The documentation required before commencement with the Works execution are;	
[4.3]	Health and Safety Plan	The Contractor shall deliver his Health and Safety Plan of the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
[5.6]	Initial Programme	The Contractor shall deliver his programme of work within 10 calendar days after notice from the Employer, prior to the Commencement Date.
[6.2]	Guarantee	The Contractor shall deliver his chosen Guarantee (security) for this Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
[8.6]	Insurance	The Contractor shall deliver his insurance for the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Cash flow by contractor	The Contractor shall deliver his Cash flow for the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Priced Bill of Quantity	The Contractor shall deliver his Priced Bill of Quantity within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Programme	The Contractor is required to submit his Programme of Works in terms of Clause 5.6.1 and 5.3.1 and the Principal Agent is required to approve this within 7 days in terms of Clause 5.6.3
	Other requirements	
[5.3.2]	The time to submit the documentation required before commencement with Works execution is:	14 calendar days

	Non-Working days
[5.8.1]	Non-Working days **Sundays** Special non- working days **All Nationally Recognized Public Holidays and the year end break**
[5.8.1]	First Year end break - commences ***15-Dec-25*** ends ***05-Jan-26*** Second Year end break - commences ***14-Dec-26*** ends ***04-Jan-27*** Third Year end break - commences ***16-Dec-27*** ends ***09-Jan-28*** Fourth Year end break - commences ***18-Dec-28*** ends ***08-Jan-29***
	Engineer/Principal Agent to consult with Employer
[3.1.3]	The Engineer shall obtain the specific approval from the Employer before executing any of his functions according to the "Conditions under which Consultants are appointed", or in the event where an employee of the Employer represents the Employer, the relevant General Delegations applicable at the time of executing his/her duties.
	Security
[6.2.1]	The time to deliver the deed of guarantee is Prior to site hand over in terms of clause 5.3.1 and 5.3.2.
[6.2.1]	Please see CONTRACT DATA - below to select Guarantee Option
	Commencement Date
	Commencement date means the date of Site Hand over that should not occur prior to the tenderer receiving one fully signed copy of the Offer and Acceptance in terms of the Form of Offer and Acceptance.
	*The **Agreement comes into effect** on the date when;* *The tenderer receives one fully completed original copy of this document , including the Schedule of Deviations (if any)* *The agreement ("this document") consists of;* *1. Agreement and Conditions of Contract.* *2. Form of Offer and Acceptance.* *3. Contract Data.* *4. Scope of Works.* *5. Site Information.* *6. Drawings & documents referred to in the 1 to 4 above.* *(See Form of Offer and Acceptance)*
[5.3.1]	The contractor shall commence executing the Works within 7 calendar days from the Commencement Date.
[5.4.1]	***Possession of the* site** will be given within 10 calendar days after the **contractor** has fulfilled the conditions (4.3, 5.6, 6.2, 8.6) and received the notification from the Employer of Site Hand Over where the contractor will receive one fully signed copy of the Form of Offer and Acceptance from the **employer.**
[5.6.1]	The Contractor shall deliver his programme of work within 10 calendar days after notice from the Employer, prior to the Commencement Date.
	CONTRACT DETAILS
[1.1.1.33]	***Works*** description: Refer to document C3 – Scope of Work.
[1.1.1.30]	***Site*** description: Refer to document C4 – Site Information.
	Specific options that are applicable to a **State** organ only Where so :
[6.10.6.2]	***1)*** Interest rate legislation: ***(a)*** in respect of interest owed by the **employer**, the interest 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), will apply; and ***(b)*** in respect of interest owed to the **employer**, the interest 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), will apply
	2) Lateral support insurance to be effected by the contractor: ***Yes X*** / ***No***
	3) Payment will be made for materials and goods ***Yes X*** / ***No***
	4) Dispute resolution by litigation ***Yes*** / ***No X***
	5) Extended **defects** liability period applicable to the following elements: ***Electrical, Mechanical and Civil work***
[8.6.1.1.2]	The Value of material, supplied by the Employer, and not included in the Contract Price, is: ***R0,00***
[8.6.1.1.3]	The amount to cover Professional Fees, not included in the Contract Price, for repairing damage and loss to be included in the insurance: ***N/A***
[8.6.1.3]	The limit for indemnity for liable insurance is: ***Unlimited Claims***
[6.5.1.2.3]	The percentage allowance to cover overhead charges for contractor and subcontractors, is: ***33,30%***
[6.5.2]	The percentage allowance to cover overhead charges for contractor , is: ***10,00%***
[1.1.1.14]	**Practical Completion Date** The Practical Completion date is: **To Be Confirmed**
	For the **works** as a whole: The whole of the works shall be completed within: ***8*** *Months (which shall be deemed to include all Non – Working Days, Special Non – Working Days and the year-end Builders Annual Industry Holiday Periods).*
[5.5.1]	The date for **practical completion** shall be ***To be determined***
[5.13.1]	The penalty per calendar day shall be : ***0.04% of the Contract Price, rounded to the nearest R10***

	***For the* works** in **sections:**
	***The date for* practical completion** from the **commencement date** and the **penalty** per **calendar day:**
	Portion 1:
[5.5.1]	***N/A***
[5.13.1]	***0.04% of the Contract Price, rounded to the nearest R10***
	Portion 2:
[5.5.1]	***N/A***
[5.13.1]	***0.04% of the Contract Price, rounded to the nearest R10***
	Portion 3:
[5.5.1]	***N/A***
[5.13.1]	***0.04% of the Contract Price, rounded to the nearest R10***
	Portion 4:
[5.5.1]	***N/A***
[5.13.1]	***0.04% of the Contract Price, rounded to the nearest R10***
	Portion 5:
[5.5.1]	***N/A***
[5.13.1]	***0.04% of the Contract Price, rounded to the nearest R10***
	Portion 6:
[5.5.1]	***N/A***
[5.13.1]	***0.04% of the Contract Price, rounded to the nearest R10***
[1.3.2]	***The* law** applicable to this **agreement** shall be that of the: **Republic of South Africa**
[6.10.1.5]	The percentage advance on materials not yet built into the Permanent Works is: ***80,00%***
[6.10.3]	Percentage retention on amounts due to contractor is: ***The Percentage retention is nil. The only security required by the Employer will be such as selected by the Contractor on the Form of Offer and Acceptance and Part 2: CONTRACT DATA PROVIDED BY THE CONTRACTOR, point 2 - Documents, of the Contract Data.*** Maximum retention is: ***0,00%*** *of the Contract Price*
[6.8.1]	Notwithstanding anything to the contrary contained in the General conditions of Contract and Preliminaries, this contract could only, when the construction period exceeds 6 months **and** the contract exceeds R1,000,000.00, be subject to a Contract Price Adjustment Factor.
[6.8.2] *[6.8.3]*	Clause 6.8.2 the last part of the sentence saying *"calculated according to the formula and the conditions set out in the Contract Price Adjustment Schedule."* must be replaced by *"calculated according to the Contract Price Adjustment Provisions (CPAP) Indices Application Manual for use with P0151 indices (Revised 1 January 2013)" as published by Statistics South Africa. The Contract Price Adjustment Provision (CPAP) will be subject to the most recently released indices by Statistic South Africa. Tenderers are advised that with reference to Clause 3.4.6 of the Contract Price Adjustment Provisions (CPAP) Indices Applications Manual, the Head: Public Works will not accept the submission by Tenderers of lists of additional items."*
[6.8.2] *[6.8.3]*	Where this contract is a Lump Sum contract, the contract will only be subject to Contract Price Adjustment Provisions (CPAP)(Revised 1 January 2013) where the contract period equals or exceeds 6 calendar months. The applicable work group shall be WG 180 for domestic buildings or WG 181 for commercial and industrial buildings only.
[5.14.5]	***The following clause must be added to clause 5.14.5:*** *[5.14.5.6]* The employers agent shall submit the **final account** within 3 calendar months to the principal agent.
[10.5]	The determinations of disputes shall be by ARBITRATION ONLY.
[10.5.3]	The number of Adjudication Board Members to be appointed is: **One**
[10.9.1]	Replace the last part of the clause with the following: *"..on the application of either party, by the Chairman, or his nominee of the Association of Arbitrators."*
	***Where* CPAP** is applicable, the **contract sum** will be adjusted in accordance with the Contract Price Adjustment Provisions (**CPAP**) as set out in the **CPAP** Indices Application Manual as published by Statistics South Africa, dated 1 January 2013 and any amendments thereto: 1) Glass etc. measured in specialist section Metalwork, will be adjusted in terms of the index for that work group unless specifically stated otherwise in the bills of quantities. 2) In case of uninterruptible power supplies, elevators, escalators and hoists, generating sets, motor-alternator sets and intercommunication systems shall be adjusted in accordance with Work Group 170. 3) Further to clause 3.4.6 of the CPAP Indices Application Manual, the listing of additional items for exclusion by Tenderer's, will not be permitted. ***Alternative Indices:* Not Applicable**
	Details of changes made to the General Conditions of Contract for construction works (2010) Second Edition
	Clause
[1.1]	*[1.1.1.5]* **COMMENCEMENT DATE** – means the actual date of Site Hand over that should not occur prior to the Tenderer receiving one fully signed copy of the Offer and Acceptance in terms of the Form of Offer and Acceptance.
	[5.12.2.2] **ABNORMAL CLIMATIC CONDITIONS** - means conditions over and above what could reasonably be expected for the specific locality where the Works are being executed and include inter alia exessive rain, heat, cold, wind and any other climatic condition that would not normally be experienced during the season that the Works are executed in that area. The South African Weather Service's (http://www.weathersa.co.za) 10 year average climatic conditions statistics would be what could be reasonably expected for the specific locality where the Works are executed.
	[6.2.1] **CONSTRUCTION GUARANTEE** – means an on demand guarantee at call obtained by the **contractor** from an institution approved by the **employer** in terms of the **employer's** construction guarantee form as selected in the Offer and Acceptance Form and the **contract data.** **CONSTRUCTION PERIOD** – means the period commencing on the **commencement date** and ending on the date of **due completion date.** This period will be deemed to commence on actual site hand over date to the contractor and end on the date of practical completion and shall include all annual industrial holiday periods, Sundays and public holidays. **CORRUPT PRACTICE** – means the offer, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution. **FINAL ACCOUNT** - The document prepared by the principal agent, which reflects the contract value of the works at final approval or termination. **FRAUDULENT PRACTICE** – means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of any tenderer and includes collusive practise among tenderers (prior to or after the tender submission) designed to establish tender prices at artificial non-competitive levels and to deprive the tenderer of the benefits of free and open competition.

INTEREST – the interest rates applicable on this contract, whether specifically indicated in the relevant clauses or not, will be in terms of the legislation of the Republic of South Africa, and in particular:

(a) in respect of interest owed by the **employer,** the interest 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), will apply; and

(b) in respect of interest owed to the employer, the interest 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), will apply

[1.1.1.16] **ENGINEER/PRINCIPAL AGENT –** means the person or entity appointed by the **Employer** and named in the **Contract Data** as the **Engineer /Principal Agent** to act as agent of the **Employer**. In the event of an Engineer/**Principal Agent** not being appointed, then all the duties and obligations of an Engineer/**Principal Agent** as detailed in the **Contract** shall be fulfilled by a representative of the **Employer** as named in the **Contract Data. (Hereafter referred to as Engineer)**

[1.1.1.21] **GENERAL ITEMS -** or preliminaries means items stipulated in the Pricing Data relating to general obligations, site services, facilities and/or items that cover elements of the cost of the work which are not considered as proportional to the quantities of the Permanent Works.

[4.4.1] Add the following to the clause 4.4.1: *"The Contract shall only use subcontractors who are duly registered with the CIDB and who has an ACTIVE status at the time of submitting the tender"*

[6.2.1] Refer to Offer and Acceptance form for the various options that the contractor may choose from in providing a form of **Guarantee** under "GUARATEE OPTIONS".

[6.10.6.2] Replace *"at the prime overdraft rate, as charged by the Contractor's Bank,"* with *"..at the interest 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)."*
Omit *",on all overdue payments from the date on which the same should have been paid..." and replace with " only after 30 calendar days from receiving written notice from the Contractor that the amount is overdue,.."*

SPECIAL CONDITIONS OF CONTRACT

[5.12.3] Omit clause 5.12.3 and add the following:
"5.12.3. If an extension of time is granted, the Contractor shall be paid such additional time-related General Items, including for special non-working days, if applicable as are appropriate regarding to any other compensation which may already have been granted in respect of the circumstances concerned.The reasons for extension of time that would invoke payment of time related General Items are inter alia;

5.12.3.1 Failure to give possession of the site to the contractor.
5.12.3.2 Making good physical loss and repairing damage to the works where the contractor is not at risk.
5.12.3.3 Contract instructions not occasioned by default by the contractor.
5.12.3.4 Failure to issue construction information timeously or the late issue of a contract instruction following a request from the contractor.
5.12.3.5 Late acceptance by the principal agent of a design undertaken by a selected subcontractor where the contractor's obligations have been met.
5.12.3.6 Suspension or cancellation termination invoked by a nominated or selected n/s subcontractor due to default by the employer or the principal agent.
5.12.3.7 Insolvency of a nominated subcontractor.
5.12.3.8 A direct contractor.
5.12.3.9 Opening up and testing of work and materials and goods where such work is according to in accordance with the contract documents.
5.12.3.10 The execution of additional work for which the quantity included in the bills of quantities is not sufficiently accurate.
5.12.3.11 Late or failure to supply materials and goods for which the employer is responsible.
5.12.3.12 Suspension of the works."

[5.14.5.1] Omit entire clause 5.14.5.1

[5.16.4] Add the following new clause *"5.16.4. Upon the issue of a Final Approval Certificate, unless otherwise provided in the Contract:*
5.16.4.1. The performance Guarantee (if any) shall be returned within 14 days to the guarantor in terms of Clause 7."

[6.2.2] Replace the following *"..it shall be deemed that the Contractor has selected a security of ten percent retention of the value of the Works."* with *"..it shall be deemed that the Contractor has selected a security of a bank or insurance guarantee of 5% of the value of the Works and a payment reduction of 5% of the value certified in the payment certificate excluding value added tax."*

[6.2.3] Add to clause 6.2.3 the following "*The Contractor shall provide proof of paid-up premium payments to accompany his payment certificate as proof that his performance guarantee has not expired yet. The Contractor will not receive payment without proof of the validity of their performance*

[9.3.2.2] Omit *"without prejudice to the exercise of any lien the Contractor may have acquired over the Employer's property."*

Duties and functions of the **Engineer** requiring the specific approval of the **Employer** BEFORE execution of any part of these duties are as follows:

(a) Determinations of contractors claims for extension of time (revision of the contract completion date). All claims for extension of time shall be submitted by the **Engineer,** together with the **Engineer's** recommendations, to the **Employer** for determination. Omit "Engineer" in clause 42.2 and

(b) Drawings, instructions or communications of any kind requiring variations of the works and involving EXTRA's shall NOT be given effect by the **Contractor** UNTIL BOTH the "Official Variation Order" and the "Financial Request for Variation Order and Additional Funds" form, as issued by the Department of Public Works, have been approved and signed by the **Employer**.

(c) Insurance policies to be approved by the **Employer** within 21 days of the date of the **Commencement** of the Works.

(d) Any notice of disagreement raised by the **Contractor** or written Dispute Notice given by the **Contractor** to the **Engineer** shall be submitted by the **Engineer**, together with the **Engineer's** recommendations, to the **Employer** for determination.

(e) The issue of the certificate of practical completion, certificate of completion and the final approval certificate shall be signed and submitted by the **Engineer**, to the **Employer** for final approval and signature. The certificates shall not be considered as officially issued until signed by the

MANAGING PROJECT DURATION

(a) The Contractor shall co-ordinate his programme with all other contractors whose work may precede or be executed simultaneously to his own. The Contractor will be called upon to plan and control the project using the Project Evaluation and Review Technique (PERT) or other approved Critical Path Method (CPM) network analysis of his events and activities and those of the dub-contractors in his employ and must co-ordinate his planning with any other contractor employed on the project. A fortnightly project control report will be expected from the Contractor in writing, evaluating any gains or delays against the critical path and he should allow for all costs involved in planning reviewing and updating the programme to the satisfaction of the Principal Agent against this item.

(b) Activity-and total float shall belong to the Employer.

(c) The Contractor shall deliver his programme of work within 10 calendar days after notice from the Employer, prior to the Commencement Date.
It is a condition of this contact that, the contracter submit to the Engineer/principal agent a detailed CPM Programme which shall be to the approval of the Engineer/principal agent. In this regard tenderers are advised to consult with the Engineer/Principal Agent as to the format and requirements of the programme as no claim whatsoever will entertained should the programme fail to meet the requirements of the Engineer/Principal Agent. Failure to submit the programme within the stipulated time may result in the contractor being held in breach of contract.

The approved programme will form the basis of time management of the project and extension of time will not be guaranteed unless the Contractor has strictly complied with this provision.
The programme shall make allowance for rain and the number of rain days allowed within the critical path shall be on the provisions of the clause dealing with inclement weather and claiming for delays in performance in this bill.
Allowance for the above must be made under this item as no claims for failing to comply with this precondition will later be entertained.

INCLEMENT WEATHER AND CLAIMS FOR DELAYS IN PERFORMANCE

(a) The Contract Sum includes a monthly allowance of 3 working days inclement weather during which rainfall exceeds 10mm per day for months as indicated in the Scope of Works. These days shall be reflected on the critical path of the Contractor's programme as specified in MANAGING PROJECT DURATION above.

(b) Claims for delays in performance due to inclement weather shall be calculated separately for each calendar month and for the project as a whole. Delays or gains to the critical path shall be reflected in all revisions of the programme. An extension of time will only be granted where the following conditions are met:

(i) The criteria to be used for WORK stoppages shall be for safety hazards or poor quality of work.
(ii) The Employer's site representative or the Employer's Principal Agent, if the site representative is not available shall be notified when the Contractor stops the work and intends to claim performance delays. The Employer representative shall inspect the situation together with the Contractor and give an immediate decision.

1. The stoppage claimed must cause a delay in the Completion Date of work. If the critical activities can proceed and a non-critical activity is delayed due to inclement weather no claims for delay shall be granted.
2. No claims for stoppages less than 2(two) hours per day shall be considered.
3. Claims granted for more than 2 (two) hours, but less than 10 (ten) hour (lunch included) day, shall be added together and expressed as full days.
4. All claims shall be submitted in writing to the Principal Agent within one working day of the actual stoppage.
5. The total delay in performance granted to the Contractor expressed in days shall be added to the contractual Completion Date of each section of the Works. The contractual penalty clause shall only come into effect after this newly arrived date.
6. Total delays (in hours) will be rounded up or down to the nearest integer for the calculation of Working Days. The total hours (including lunch) per Working Day shall be 10 unless otherwise indicated on the Contractor's programme.
7. Where the programmed delays for inclement weather exceed the actual delays incurred the Completion Date(s) will not be adjusted.
8. Where the project includes builder's holidays the programmed durations for inclement weather shall be adjusted pro-rate to the actual Working Days.
9. The total of all monthly delays due to inclement weather shall be calculated in accordance with the example given below:

Description		Months					Total
		Sept	Oct	Nov	Dec	Jan	
		Hours	Hours	Hours	Hours	Hours	Hours
Programmed	Rain days	0	30	30	15	15	90
Actual	Rain days	16	22	35	15	18	106
Difference		-16	8	-5	0	-3	-16
8 hrs/day*						Estimated Extension of time - in working days	2

See point 5.2 in the Scope of Works for the specific days the tenderer must allow for in this contract.

Tender no: **ZNTM01255W** **Part 2: CONTRACT DATA PROVIDED BY THE CONTRACTOR:**

POST-TENDER INFORMATION

Note: All information for this section requires consultation with the **Contractor**. The **Engineer/Principal Agent** shall not pre-select any of the alternatives available to the **Contractor.**

1 CONTRACT DETAILS

[1.1.1.9] **Contractor Name:** .....

[1.2.1.2] Postal address:

.....

.....

.....

Tel no ..... Fax no .....

Tax / VAT Registration No: ..... e-mail .....

Physical address:

.....

.....

.....

[1.1.1.10] The accepted **contract price** inclusive of **tax** is R :

.....

[Amount in words]

Payment Of Preliminaries (Clause 6.7, 6.8, 6.10 and 6.11)

The preliminaries amounts shall be paid in terms of:

***Alternative A**	**Yes**
****Alternative B**	**N/A**

** Assessed by the Engineer/Principal Agent as an amount prorated to the value of the Work duly executed in the same ratio as the Preliminaries bears to the Contract Price excluding VAT, Preliminary amount, Contingencies and any CPAP.*

*** Calculated from the priced Bill of Quantity/Lump Sum document. The Contractor and the Engineer/Principal Agent shall agree on a division of the priced Preliminaries items into: initial establishment charge, monthly charge and final disestablishment charge.*

If the Contractor and the Engineer/Principal Agent can not agree, within 10 Working Days from the Commencement Date, on such a division then the Engineer/Principal Agent shall make a division of the Preliminaries to be incorporated in the valuations for each monthly payment certificate as follows;

10% of the General Items/Preliminaries amount shall not be varied

15% of the General Items/Preliminaries shall only be varied in proportion of the Contract Price to the Contract Sum

75% of the General Items/Preliminaries shall be varied in proportion to the revised Construction Period compared with the initial Construction Period.

Alternative A

Adjustment of Preliminaries (Clause 6.7, 6.8, 6.10 and 6.11)

For the adjustment of Preliminaries both the Contract Sum and the Contract Value (including tax) shall exclude the amount of Preliminaries, all Contingency Sum(s) and any provision for Cost Price Adjustment Provisions:-

- An amount which shall not be varied.

- An amount varied in proportion to the contract value as compared to the Contract Sum.

- An amount varied in proportion to the Construction Period as compared to the initial Construction Period (excluding revisions to the Construction Period to which the Contractor is not entitled) to adjustment of the Contract Value in terms of the agreement.

The Contractor shall provide a breakdown of charges (including tax) within 15 working days of the date of acceptance of tender and, where applicable, an apportionment of Preliminaries per section

If the Contractor and the Principal Agent cannot agree, within ten (10) Working Days from the Commencement Date, on such a division then the Principal Agent shall make a division of the Preliminaries to be incorporated in the valuations for each monthly payment certificate as follows;

10% of the amount shall not be varied

15% varied in proportion of the Contract Value to the Contract Sum

75% varied in proportion to the revised Construction period compared with the initial Construction Period

Sectional Completion : Subdivision of Preliminaries Costs

For the adjustment of preliminaries for sections of the work the value of fixed, value, and time related amounts of the preliminaries for each section is required. The contractor is to provide such information within fifteen (15) working days of taking possession of the site, failing which the categorised preliminaries amounts shall be prorated to the value of each section.

The above shall apply equally for projects where sectional completion was not contemplated at tender stage but subsequently occurred on an adhoc basis during construction of the works as agreed between the client and the employer. The original priced categorised amounts for fixed, value, and time related amounts shall be prorated to the value of each section.

When an extension of time has been granted in terms of the GCC and the preliminaries require to be adjusted accordingly, the pertinent sectional (subdivided) categorised preliminaries amounts shall be utilised, where applicable and not the overall preliminary amounts.

Where sectional completion is required in terms of the agreement, the Contractor shall provide the Principal Agent with the division of the above categorized amounts into sections. Should the Contractor fail to provide such information within the period stipulated the categorized amounts shall be prorated to the value of each section.

YES *yes / no*

or

Alternative B The Contractor shall within 15 working days of the date of possession of the site provide the Principal Agent with a detailed breakdown of Preliminaries amounts for the works as a whole, or per section where applicable, including administrative and supervisory staff charges and for the use of construction equipment in terms of the programme. NO *yes / no*

The contractor is informed that only option 'A' shall apply

2 DOCUMENTS

Contract documents marked and annexed hereto:

Priced **Bills of Quantities:**	**Yes**	X	**No**	
Lump Sum document: :	**Yes**		**No**	X

Guarantee Options:

YES

2.2 DESIGN BRIEF **YES** **YES or NO**

2.3 DRAWINGS **YES** **YES or NO**

See list of drawings/Annexure's attached to this document. **YES** **YES or NO**

2.4 DESIGN PROCEDURES **YES or NO**

Not applicable

Contract drawings:	**Yes**	X	**No**	
Other documents:				

Waiver of the Contractors lien or right of continuing possession is required. **YES**

GUARANTEE OPTIONS

The Tenderer agrees to provide a bank or insurance guarantee in accordance with clause 6.2.3 of the Conditions of the GCC2010 Contract within the period stated in the Contract Data. This guarantee shall be for a sum equal to an amount stated in the Contract Data.

Guarantees submitted must be issued by either an insurance company duly registered in terms of the Insurance Act (Long Term Insurance Act No 52 of 1998 or Short Term Insurance Act No 53 of 1998) or by a bank duly registered in terms of the Banks Act No 94 of 1990, on the pro-forma referred to above. No alterations or amendments of the wording of the pro-forma will be accepted.

(a) the tenderer accepts that in respect of contracts up to R1 million, a payment reduction of 5% of the contact value will be applicable and will be reduced by the Employer in terms of the applicable conditions of contract.

(b) in respect of contracts above R1 million, the Tenderer offers to provide security as indicated below: select one option

(i) bank or insurance Performance Guarantee of 10 % of the Contract Price	X

3 SIGNATURES OF THE CONTRACTING PARTIES

Thus done and signed at……on ……..of……20…..

Name of signatory — for and behalf of the **Employer** who by signature hereof

Capacity of signatory — as Witness.

Thus done and signed at……on ……..of……20…..

Name of signatory — for and behalf of the **Contractor** who by signature hereof

Capacity of signatory — as Witness.

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

C1.3 - FORM OF GUARANTEE

C1.3 PERFORMANCE GUARANTEE - GCC FOR CONSTRUCTION WORKS (2nd Edition - 2010)

Head: Public Works
KZN Department of Public Works:
Private Bag X 9041
PIETERMARITZBURG
3200

Sir,

ON DEMAND PERFORMANCE GUARANTEE

Tender Number ZNTM01255W	**Project Code 053651**

For use with the General Conditions of Contract for Construction Works, Second Edition, 2010.

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means: _____

Physical Address: _____

"Employer" means: The Provincial Administration of KwaZulu-Natal in its Department of Public Works

"Contractor" means: _____

"Engineer" means: _____

"Works" means: **DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**

"Site" means: _____

"Contract" means: The Agreement made in terms of the Form of Offer and Acceptance and such amendments or additions to the Contract as may be agreed in writing between the parties.

"Contract Sum" means: The accepted amount inclusive of tax of: _____

Amount in Words:

"Guaranteed Sum" means: The maximum aggregate amount of: 10% _____
Of Contract Sum

Amount in Words: _____

"Expiry Date" means: _____

CONTRACT DETAILS

Engineer Issues: Interim Payment Certificates, Final Payment Certificates and the Certificate Completion of the Works as defined in the Contract.

PERFORMANCE GUARANTEE

1 The Guarantor's liability shall be limited to the amount of the Guaranteed Sum.

2 The Guarantor's period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the Expiry Date or the date of issue by the Engineer of the Certificate of Completion of the Works or the date of payment in full of the Guaranteed Sum, whichever occurs first. The Engineer and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.

3 The Guarantor hereby acknowledges that:

3,1 any reference in this Performance Guarantee to the Contract 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;

3,2 its obligation under the Performance Guarantee is restricted to the payment of money.

4 Subject to the Guarantor's maximum liability referred to in 1, 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 Engineer in an Interim or Final Payment Certificate has not been made in terms of the Contract 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) days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;

4,3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum Certified in 4.

5 Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to 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 Performance Guarantee, such demand stating that:

5,1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or

5,2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 5; and

5,3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.

6 It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.

7 Where the Guarantor has made payments in terms of 5, 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 this Payment Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance 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 Payment by the Guarantor in terms of 4 or 5 shall be made with seven (7) calendar days upon receipt of the first written demand to the Guarantor.

9 Payment by the Guarantor in terms of 5 will only be made against the return of the original Performance Guarantee by the Employer.

10 The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.

11 The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.

12 This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.

13 This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.

14 Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Court Act No 32 of 1944, as amended, to this jurisdiction of the Magistrate's Court 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 Court.

Signed at _____

Date _____

Guarantor's signatory (1) _____

Capacity _____

Guarantor's signatory (2) _____

Capacity _____

Witness signatory (1) _____

Witness signatory (2) _____

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

PART C2 - PRICING DATA

C2.1 PRICING INSTRUCTIONS GCC FOR CONSTRUCTION WORKS (Second Edition 2010)			
Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

C2.1 Pricing Instructions

Where any item is not relevant to this specific contract, such item is marked N/A (signifying “not applicable”)

The adjustment of the preliminaries each item priced is to be allocated to one or more of the three categories by insertion of “F”, “V”, “T” as the case may be against the price in the “rate” column immediately preceding the “amount” column, where “F” denotes a fixed amount (amount not varied), “V” denotes an amount variable in proportion to value and “T” denotes an amount variable in proportion to time.

1 MASSES AND MEASURING UNITS

These shall be in accordance with the Measuring Units and National Measuring Standards Act No. 76 of 1973 and amendments thereto.

The pages of each of these documents are numbered consecutively and before the Tenderer submits his tender he should check the number of pages, and if any are found missing or duplicated, or the figures or writing indistinct, or the documents contain any obvious error, he should apply to the Head : Public Works AT ONCE and have same rectified as no liability whatsoever will be admitted by the Administration in respect of errors in Tender due to the foregoing.

2 PRICES FOR VARIATIONS

Where prices or quotations for variations are submitted by the Contractor during the currency of the Contract, it is to be clearly understood that these are for the purpose of consideration by the Head : Public Works and that there is no assumption of acceptance. The Contractor will be notified of acceptance of prices or quotations either by insertion of the amount on the variation order or by written intimation.

3 SCALE

The scale to which the Drawings are made is only to be made use of when no figured dimensions are given either on the Drawings or in the tender documents and the figured dimensions are always to be followed though they may not coincide with the scale of the Drawings, but dimensions where possible are to be taken from the buildings.

4 PROVISIONAL ITEMS

All items described as "Provisional" shall be used as directed by the Employer and measured and valued or paid for.

No work for which "Provisional" items are allowed shall be commenced without written instructions from the Head : Public Works.

5 TIMELY ORDERING OF MATERIALS

The Contractor is warned to place all orders for materials or special articles as early as possible, as he will be held solely responsible for any delay in the delivery of such goods.
Nevertheless this tender is conditional upon no liability being attached to the Contractor if delivery of materials is rendered impossible by reason of any act of the Government.

6 ELECTRICAL LIGHTING, POWER AND WATER

The Contractor shall provide any artificial lighting which may be necessary or required for the proper execution of the works, and provide electric power and water required by all Sub-Contractors, Nominated Sub-Contractors and Sub-Contractors appointed directly by the Employer.

The Contractor shall give all notices and pay all fees in connection with temporary electrical and water connections and shall connect temporary Electrical and Water meters for and pay for all current and water consumed.

Tenderers are advised that the permanent light fittings and water points of any kind installed in the Works are not to be used to provide temporary lighting and supplement water requirements for construction purposes.

7 IMPORT PERMITS, DUTIES AND SURCHARGES.

All tenders by means of which imported products are being called for, must use the rate of exchange 14 days prior to the closing date indicated in the tender documents. If this day falls on a weekend or public holiday, the next working day must be used.

Furthermore, Tenderers must submit documentary proof (in the form of a certified copy) from their bank or legally recognised financial institution, clearly indicating what the rate of exchange was 14 days prior to the closing date, as mentioned above.

Together with this, the Tenderer must confirm that the tender price relating to an imported product, was based on the rate of exchange 14 days prior to the closing date as mentioned above.

8 STANDARD SYSTEM OF MEASUREMENT WHERE BILLS OF QUANTITIES FORM PART OF THE TENDER DOCUMENTS

The work executed under this Contract has been measured in accordance with the;

Standard System of Measuring Builders Work (7th Edition)

including all amendments unless descriptions of items indicate a deviation and it shall be understood that the system of measurement which is herein adopted is the only system of measurement which will be recognised in connection with this contract. Any contradictions to this system of measurement contained in the “Model Preambles for Trades 2008” shall be disregarded (unless same have been accommodated in the system of measurement) but applicable rates shall be included for all requirements stated and not measured separately in compliance with this system.

9 PRICING OF ROCK EXCAVATIONS

It is a condition of this tender that should the tenderer elect to price the Rock Excavation included in this tender, the rates must be market related and should be identically priced for the same classification of excavations and not vary for similar billed items in the different sections.

10 BROAD BASED BLACK ECONOMIC EMPOWERMENT

1. It is the deliberate policy of the Provincial Administration of KwaZulu-Natal to foster and to encourage the economic empowerment of Black South Africans. This policy will be implemented without prescription and without prejudicing the principles and the integrity of the Provincial Administration of KwaZulu-Natal. Subject to these constraints and also subject to good business practise and commercial consideration, it is therefore considered appropriate that the Provincial Administration of KwaZulu-Natal should encourage business relationships with companies which actively pursue Affirmative Action and Black Economic Empowerment Programmes.
2. In responding to this tender you are therefore encouraged to devote attention to these two subjects of Affirmative Action and Economic Empowerment. In addition, in considering the appointment of sub-contractors, you are requested to extend the spirit of these policies.
3. The foregoing enunciations of this policy are not intended to be prescriptive nor to preclude any individual or operation from responding to this tender.

11 REGISTRATION ON THE CENTRAL SUPPLIERS DATABASE

1. In terms of the Public Finance Management Act (PFMA), 1999 (Act No 1 of 1999) Section 38 (1) (a) (iii) and 51 (1) (iii) and Section 76 (4) of PFMA National Treasury developed a single platform, The Central Supplier Database (CSD) for the registration of prospective suppliers including the varification functionality of key supplier information.
2. Prospective suppliers will be able to self - register on the CSD website: www.csd.gov.za
3. Once the supplier information has been varified with external data sources by National Treasury a unique supplier number and security code will be allocated and communicated to the supplier. Suppliers will be required to keep their data updated regularly and should confirm at least once a year that their data is still current and updated.
4. Suppliers can provide their CSD supplier number and unique security code to organs of state to view their varified CSD information.
5. Tenderers are required to fill in clearly, legibly, in bold print and black ink their CSD supplier number in the space hereunder:

Name of Supplier	
Central Supplier Database (CSD) Supplier Number:	

12 TAX CLEARANCE REQUIREMENTS

It is a condition of tender that the taxes of the successful tenderer must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the Tenderder's tax obligations. It is a condition of this Offer of Commission that your practice remains in good standing with SARS (South African Revenue Services) in terms of its tax clearance, during the project, which is required to process your payment certificates.

1. In order to meet this requirement tenderers are required to apply via e-filing at any SARS branch office nationally. The Tax Complance Status (TCS) requirements are also applicable to foreign Tenderders / individuals who wish to submit Tenders.
2. SARS will then furnish the Tenderder with a Tax Compliance Status (TCS) PIN that will be valid for a period of 1 (one) year from the date of approval.
3. In tenders where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Compliance Status (TCS) PIN.
4. Application for Tax Compliance Status (TCS) PIN can be done via e-filing at any SARS branch office nationally or on the website www.sars.gov.za.
5. Tax Clearance Certificates may be printed via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.
6. Tax Clearance Certificates may be printed via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.

Security PIN Number	

	Company / Entity Tax Reference Number	

13 BILLS OF QUANTITIES/LUMP SUM DOCUMENT

The Bills of Quantities document forms part of and must be read and priced in conjunction with all the other documents forming part of the contract documents, the Standard Conditions of Tender, Conditions of Contract, Standard Preambles to all Trades, Specifications, Drawings and all other relevant documentation.

14 VALUE ADDED TAX

The tender price must include for Value Added Tax (VAT). All rates, provisional sums, etc. in the Bills of Quantities must however be net (exclusive of VAT) with VAT calculated and added to the Total Value thereof in the Final Summary.

15 FIXED PRICE CONTRACT

CPAP Applicable

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

C2.2 - Preliminaries for GCC for Construction works - 2nd Edition 2010

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION PROJECT

BILL NO. 1
C2 .2 PRELIMINARY AND GENERAL

	NOTES	UNIT	QUANTITY	RATE	AMOUNT
i)	The agreement is to be the General Conditions of Contract for Works of Civil Engineering Construction (2010) (Second Edition) , published by the S. A. Institution Of Civil Engineering.				
ii)	The Preliminaries are to be the Construction and management requirements for works contracts - Part 1: General engineering and construction works (SANS 1921-1: 2004 Edition 1) prepared by Standards South Africa and shall be deemed to be incorporated herein.				
iii)	Tenderers are referred to the abovementioned documents for the full intent and meaning of each clause thereof (hereinafter referred to by heading and clause number only) for which such allowance must be made as may be considered necessary.				
iv)	Where standard clauses or alternatives are not entirely applicable to this contract such modifications, corrections or supplements as will apply are given under each relevant clause heading.				
v)	Where any item is not relevant to this specific contract such item is marked N/A (signifying "not applicable").				
vi)	Adjustment of the preliminaries: each item priced, is to be allocated to one or more of the three categories, where "F" denotes a fixed amount (amount not to be varied), "V" denotes an amount variable in proportion to value and "T" denotes an amount in proportion to time.				
vii)	Time (T) related Preliminaries will only be adjusted for omissions or additions, issued by the Employer, or delays caused by the Employer, for which variation and extension of time has been granted. ***See Contract Data*** .				
	SECTION A: GENERAL CONDITIONS OF CONTRACT				
A1	General (clause 1) F:..... V:..... T:.....	Item			
A2	Basis of Contract (clause 2) F:..... V:..... T:.....	Item			
A3	Engineer (clause 3) F:..... V:..... T:.....	Item			
A4	Contractor's General Obligation (clause 4) F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
A5	Time and Related Matters (clause 5) - As referred to in the Contract Data under Special Condition of Contract. The Contract Period shall be deemed to include all Non – Working Days, Special Non – Working Days and the year-end Builders Annual Industry Holiday Periods. F:..... V:..... T:.....	Item			
A6	Payment and Related Matters (clause 6) F:..... V:..... T:.....	Item			
A7	Quality and Related Matters (clause 7) F:..... V:..... T:.....	Item			
A8	Risk and Related Matters (clause 8) F:..... V:..... T:.....	Item			
A9	Termination of Contract (clause 9) F:..... V:..... T:.....	Item			
A10	Claims and Disputes (clause 10) F:..... V:..... T:.....	Item			
	SECTION B: SANS 1921-1:2004 (Edition 1): CONSTRUCTION AND MANAGEMENT REQUIREMENTS FOR WORKS CONTRACTS: PART 1 **Refer to the SCOPE OF WORK for detail requirements:**				
B1	Scope F:..... V:..... T:.....	Item			
B2	Normative references F:..... V:..... T:.....	Item			
B3	Definitions F:..... V:..... T:.....	Item			
B4	Requirements for construction and management F:..... V:..... T:.....	Item			
B4.1	General F:..... V:..... T:.....	Item			
B4.2	Responsibilities for design and construction F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
B4.3	Planning, programme and method statements F:..... V:..... T:.....	Item			
B4.4	Quality assurance F:..... V:..... T:.....	Item			
B4.5	Setting out F:..... V:..... T:.....	Item			
B4.6	Management and disposal of water F:..... V:..... T:.....	Item			
B4.7	Blasting F:..... V:..... T:.....	Item			
B4.8	Works adjacent to services and structures F:..... V:..... T:.....	Item			
B4.9	Management of the Works and site F:..... V:..... T:.....	Item			
B4.10	Earthworks F:..... V:..... T:.....	Item			
B4.11	Testing F:..... V:..... T:.....	Item			
B4.12	Materials, samples and fabrication drawings F:..... V:..... T:.....	Item			
B4.13	Equipment F:..... V:..... T:.....	Item			
B4.14	Site establishment F:..... V:..... T:.....	Item			
B4.15	Survey control F:..... V:..... T:.....	Item			
B4.16	Temporary works F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
B4.17	Existing services F:..... V:..... T:.....	Item			
B4.18	Health and safety F:..... V:..... T:.....	Item			
B4.19	Environmental requirements F:..... V:..... T:.....	Item			
B4.20	Alterations, additions, extensions and modifications to existing works F:..... V:..... T:.....	Item			
B4.21	Inspection of adjoining structures, services, buildings and property F:..... V:..... T:.....	Item			
B4.22	Attendance on nominated and selected subcontractors F:..... V:..... T:.....	Item			
	SECTION C: SCOPE OF WORK in accordance with SANS 10403 *(The reference to Clauses refer to Table B.1 of SANS 1921-1:2004)*				
C1	Certification by recognised bodies - CLAUSE 4.4 F:..... V:..... T:.....	Item			
C2	Agrément certificates - CLAUSE 4.5 F:..... V:..... T:.....	N/A			
C3	Other services and facilities - CLAUSE 4.8 F:..... V:..... T:.....	Item			
C4	Recording of weather - CLAUSE 5.2 F:..... V:..... T:.....	Item			
C5	Management meetings - CLAUSE 5.3 F:..... V:..... T:.....	Item			
C6	Daily records CLAUSE 5.6 F:..... V:..... T:.....	Item			
C7	Bond and guarantees - CLAUSE 5.7 F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
C8	Permits - CLAUSE 5.9 F:..... V:..... T:.....	Item			
C9	Proof of compliance with the law - CLAUSE 5.10 F:..... V:..... T:.....	Item			
	SECTION D: SPECIFICATION DATA ASSOCIATED WITH SANS 1921-1:2004 (Table A.1)				
D1	Requirements for drawings, information and calculations for which the contractor is responsible CLAUSE 4.1.7 F:..... V:..... T:.....	Item			
D2	The responsibility strategy assigned to the contractor for the works CLAUSE 4.2.1 F:..... V:..... T:.....	Item			
D3	The planning, programme and method statements - CLAUSE 4.3 F:..... V:..... T:.....	Item			
D4	Samples of materials, workmanship and finishes - CLAUSE 4.12.1 F:..... V:..... T:.....	Item			
D5	Fabrication drawings that the contractor is to provide and deliver to the employer - CLAUSE 4.12.2 F:..... V:..... T:.....	Item			
D6	Office for the foreman CLAUSE 4.14.3 F:..... V:..... T:.....	Item			
D7	Telephone - CLAUSE 4.14.3 F:..... V:..... T:.....	Item			
D8	Office for inspector of works - CLAUSE 4.14.3 F:..... V:..... T:.....	Item			
D9	Telephone in office for inspector of works - CLAUSE 4.14.3 F:..... V:..... T:.....	Item			
D10	Sheds - CLAUSE 4.14.3 F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
D11	Provision and erection of signboards - CLAUSE 4.14.6 F:..... V:..... T:.....	Item			
D12	Termination, diversion or maintenance of existing services - CLAUSE4.17.1 F:..... V:..... T:.....	Item			
D13	Services which are known to exist - CLAUSE 4.17.3 F:..... V:..... T:.....	Item			
D14	Detection apparatus - CLAUSE 4.17.4 F:..... V:..... T:.....	Item			
D15	Additional health and safety requirements - CLAUSE 4.18 F:..... V:..... T:.....	Item			
	SECTION E: SPECIFIC PRELIMINARIES Section E contains Specific Preliminary items which apply to this contract except where "N/A" (Not Applicable) appears against the item.				
E1	**PROPRIETARY BRANDED PRODUCTS** The contractor shall take delivery of, handle, store, use apply and/or fix all proprietary branded products in strict accordance with the manufacturers' instruction after consultation with the manufacturer's authorised representative. F:..... V:..... T:.....	Item			
E2	**OVERTIME** Should overtime be required to be worked for any reason whatsoever, the costs of such overtime are to be borne by the Contractor unless the Engineer/Principal Agent has specifically authorised in writing, prior to the execution thereof, that costs for such overtime are to be borne by the Employer. F:..... V:..... T:.....	Item			
E3	**AS BUILT DRAWINGS** The position of construction breaks and the extent of individual concrete pours are to be recorded by the Contractor on the Structural Engineer's drawings and are to be submitted to the Engineer/Principal Agent and the Structural Engineer for their records. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

	SECTION E: SPECIFIC PRELIMINARIES	UNIT	QUANTITY	RATE	AMOUNT
E4	**SITE INSTRUCTIONS** Site Instructions issued on site are to be recorded in triplicate in a Site Instruction book which is to be maintained on site by the Contractor. F:..... V:..... T:.....	Item			
E5	**LABOUR RECORD** At the end of each week the Contractor shall provide the Engineer/Principal Agent with a written record, in schedule form, reflecting the number and description of tradesmen and labourers employed by him and all sub-contractors on the works each day. F:..... V:..... T:..... *Note : In the event that the contractor fails to satisfy the requirements of this specification, the Employer (Head: Public Works) may apply any of the sanctions provided in the contract. Sanctions may include the application of a financial penalty of .04% of the Contract Sum per calendar day of which the required report has not been submitted.*	Item			
E6	**PLANT RECORD** At the end of each week the Contractor shall provide the Engineer/Principal Agent with a written record, in schedule form, reflecting the number, type and capacity of all plant, excluding hand tools, currently used on the works. F:..... V:..... T:.....	Item			
E7	**NON CESSION OF MONIES** The Contractor shall not cede nor assign his rights or claims to any monies due or to become due under this contract. F:..... V:..... T:.....	Item			
E8	**SECTIONAL COMPLETION** When it is required that the contract be executed in sections or portions, the tenderer shall allow for all costs in this regard as no claim for additional costs will be entertained. F:..... V:..... T:.....	Item			
E9	**LOCAL LABOUR** It is a general requirement of this contract that persons normally resident in the locality of the works (Local Labour) be given preference for employment on the contract. Provided, however, that should adequate and appropriate Labour not be available within the locality, others may be employed subject to satisfactory proof being provided that every reasonable endeavour has been made to employ Local Labour. The Contractor shall identify the local community leaders with the purpose of negotiating with them regarding the utilization of Local Labour in the construction process. In this regard, the Contractor shall furthermore give preference, wherever possible to the employment of single heads of households, women and youth. The Contractor shall, in general, maximize the involvement of the local community. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
E10	**IMPORT PERMITS AND DUTIES** The responsibility for obtaining the necessary import permits shall rest with the successful Tenderer. No foreign exchange will be arranged or provided by the Administration. Tenderers are to allow in their tenders and pay the ordinary levy imposed on imported items in terms of item 196.10 of Part 8 of Schedule No. 1 of the Customs and Excise Act, 1964 with effect from 1 October 1989. F:..... V:..... T:.....	Item			
E11	**CONTRACT PRICE ADJUSTMENT PROVISIONS (CPAP)** Notwithstanding anything to the contrary contained in the GCC for Construction Works 2010 2nd Edition, this Contract shall only when the Construction Period exceeds 6 months and the Contract sum exceeds R1,000,000,00 be subject to the Contract Price Adjustment Provisions Indices Application Manual for use with P0151 indices (CPAP) (Revised 1 January 2013) as published by Statistics South Africa. Tenderers are advised that with reference to Clause 3.4.6 of the Contract Price Adjustment Provisions (CPAP) Indices Applications Manual, the Head: Public Works ***will not accept the submission by Tenderers of lists of additional items.*** Where this contract is a Lump Sum contract, the contract will be subject to Contract Price Adjustment Provisions (CPAP) only where the contract period equals or exceeds 6 calendar months. The applicable work group shall be WG 180 for domestic buildings or WG 181 for commercial and industrial buildings. F:..... V:..... T:.....	Item			
E12	**EPWP CONDITIONS AND SPECIFICATIONS** **12.1 EMPLOYMENT TARGETS** E12.1 a Employment Targets The contractor needs to provide a realistic estimate on the number of jobs that the project has a potential to create throughout the project duration as the project will be implemented using Labour Intensive Construction methods on elements where it is economical and feasible. Number of jobs estimated to be created is a minimum of 12 unskilled labour. No of jobs to be created = ……. *[Contractor to fill in an estimated number]* F:..... V:..... T:..... E12.1 b Employment requirements Tenderers are advised that this contract will be subject to the Expanded Public Works Program (EPWP) aimed at alleviating and reducing unemployment. Tenderers must allow for any costs for the employement of unskilled labour as per the requirements of the EPWP program; 1. 60% of unskilled labour to be women 2. 55% of unskilled labour to be youth aged between 18 and 35 years 3. 2% of unskilled labour to be people living with disability 4. 100% Unskilled labour utilised must reside within the boundries of the Municipality Ward where this contract is executed, with preference to the local community closest or at the walking distance to the contract site. Wherever possible local skilled tradesmen are to be employed on this contract with the view to maximize utilization of local resources. F:..... V:..... T:.....	Item Item Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	E12.1 c Labour rate and payment intervals The contractor should ensure that labour rate paid to unskilled local labour is commensurate to the daily task. When determining the rate, consideration should be given to that EPWP beneficiaries are mostly bread winners in their families, as the program intends alleviating poverty. There should also be consideration that the labour rate promotes creation of expanded number of jobs created and person days of work. Contractors should make endeavours to ensure that labourers, particularly unskilled are remunerated on fortnight basis and prior notification be made should there be a shortfall on their wages. The labour rate for local unskilled shall also be determined in consideration of the location of the project, i.e. for projects implemented in urbanized municipalities will not be the same as that for rural municipalities. F:..... V:..... T:.....	Item			
	12.2 LABOUR INTENSIVE CONSTRUCTION METHOD E12.2 a Labour Intensive Construction (LIC) method On site there must a person(s) having competency in managing and implementing LIC methods. *Foreman @ NQF Level 4 the Unit Standard on Implementing LIC methods on site. *Site Agent/ Managers @ NQF level 5 the Unit Standard on Manage Labour-Intensive Skills Programme both must be CETA accredited F:..... V:..... T:.....	Item			
	E12.2 b Labour Intensive Construction Method Those parts of the contract to be constructed using Labour Intensive methods will be marked in the BoQ with letter LI (indicating Labour Intensive) against every item so designated. Such works will only be constructed using method so indicated. Reference to be made to Guidelines for the implementation of Labour Intensive Infrastructure projects under EPWP. "Scope of Work in Respect of Work Relating to the Expanded Public Works Programme (EPWP)" **Labour-intensive component** Due to the nature of the work involved, this type of project lends itself to be feasible as a labour-Intensive project i.e. the construction activities will indeed require skilled/unskilled labour. The aim of the projects is to provide some form of economic benefit whilst generating and increasing the acquired skills shortage to improve sustainability in the local area. The following are potential focus areas where employment creation can be optimized per project: (i) Trenching works not exceeding depth of 1.5m, including trenching for Foundation, Electrical, Water, Mechanical & Civil Services Works including backfilling where ground conditions permit (ii) Building Works; All masonry works (which include concrete mixing on site; brickwork; block work ; plastering; screed works; jointing; etc.); Painting, Plumbing, Ironmongery; roof cladding; glazing; tilling; carpentry; flooring; waterproofing; etc. (iii)Sewers works including Construction of manholes, laying of Sewer pipes, bedding, backfilling and compaction.				
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	(iv) Water Reticulation works including excavation, bedding, laying of pipes and compaction (v) Site Clearance Works (vi) Electrical Reticulation works. (vii) Stormwater water drainage using in-situ concrete (viii) Landscaping and Grassing of Sports Field (ix) Cleaning and Fencing Works The above identified activities are deemed suitable to be constructed using the LIC methods; to build, upgrade and maintain the social and economic of the underdeveloped area, promoting community participation, development of skills and creating more work opportunities. The above identified activities should be marked in the Bill of Quantities with the letter (LI). Contractor to price the above items in the Bill of Quantities bearing in mind that they are regarded as the main sources of job creation, whether sub contracted or undertaken by the main contractor. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letter LI are not necessarily an exhaustive list of all the activities which must be done by hand. Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment. F:..... V:..... T:.....	Item			
	E12.3 RECORD KEEPING 12.3.1 Every employer must keep in the project site office the following minutes of site progress minutes; contractors' monthly site progress reports; accurately recorded attendance register; proof of payment as means to verify authenticity of data in the EPWP Beneficiary form submitted with payment certificates. Copies of submitted EPWP beneficiary data forms should also be kept in the site office. F:..... V:..... T:.....	Item			
	12.3.2 The employer must keep this record for a period of at least three (3) years after the completion of the project in his/her office as the project site office would have been relocated. This should be safely kept for job creation data verifications and periodical audits on projects conducted by National and Provincial Department of Public Works after one (1) or two (2) quarters of submitting captured EPWP Data to the National EPWP coordinating Department. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	E12.4 EPWP REPORTING as per EPWP DATA FORM At the end of each month as part of site progress report and to be attached to every contractors' progress payment certificate; the contractor shall provide the principal agent & Public Works with a written records, as per EPWP data form; which will be reflecting, beneficiaries full name & surname; ID No and job description of labour employed by main contractor and sub-contractors on site. At the end of each month the contractor must submit the following documents to be attached to the Progress payment certificate: 1. EPWP monthly data collection form 2. Worker monthly payment upload 3. Worker monthly proof of payment i.e 3.1 Acknowledgement of receipt of payment or 3.2 Payslips 3.3 Bank statement highlighted the workers paid 4. Worker monthly training form 5. Monthly attendance register 6. Certified copies of ID's (once off) 7. ID size photos (once off) 8. Proof of UIF 9. Proof of COIDA F:..... V:..... T:.....	Item			
	E12.5 EPWP PROMOTION <u>12.5.1 EPWP signage board</u> EPWP Program at the project level shall always be promoted through have the projects signage board that embrace EPWP logo at the bottom, correct measurement for this signage board will be provided by the project leader during the site handing over meeting. the standard "HELVETIVA MEDUIM " letters are to be used . Professional title to be 10 mm above line . Line thickness to be 8 mm thick . Space between bottom of the line and bottom of the lettering below the line has to be 100 mm. Letter sizes are as follows : Helvetica meduim 100 mm black upper case to be for project name and owner . Helvetica meduim 75mm black upper case only to be used for professional titles.Project name and owner shall be black lettering on white background.board sizes are as follows : Board to be minomum 2000mm from ground level and to be constructed from reinforced formed chromadek panels minimum 0,6mm thick chromadek. The contractor is responsible for ensuring that the project board remains neatly and safely erected for the full duration including maintenance period,after which the project board and post are to be dismantled and handed to the client in good order. F:..... V:..... T:.....	Item			
	<u>12.5.2 Branding of labour apparel</u> Contractor & Sub-contractors' labourers shall be provided with EPWP branded Personal Protective Equipment (PPE), reflector vest with EPWP acronym at the back as an ideal and cost effective means of promoting program on site. The contractor is advised to price for both items 12.5.1 and 12.5.2 F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	E12.6 COMMUNITY LIAISON OFFICER (CLO) UTILISATION OF A COMMUNITY LIAISON OFFICER In addition to the requirements of Clause E9, contained in this document; The Contractor shall allow for and pay any and all costs necessary for the engagement of the services of a Community Liaison Officer (CLO) for the full duration of this contract In the interest of providing a sound service to both the community and the Contractor, a CLO may only manage one project at a given time. A CLO will be identified by the local structures of the ward areas and appointed following fair and transparent interviewing process, to be conducted in the presence of local structures and the contractor representative, in order to assist the Contractor in the procurement of any local labour, etc. required for this project. The Contractor is to liaise with the CLO and afford him any assistance needed in ensuring sound working relations with the local community. **Key Responsibilities of the CLO are envisaged to include and not necessary be limited to:** 1. Assisting local leadership in conducting skills and resources audit which facilitates sourcing labour from within the ward or targeted areas for employment, as required by contractor. 2. Assisting in sourcing labour-only domestic sub-contractors and the procurement of materials from local resources, as required by the contractor. 3. Assisting the contractor by identifying areas of potential conflict and or threats to the project or to stakeholders in the project and recommend appropriate action to the contractor. 4. Assisting contractor and stakeholders in the project in the resolution of any conflict which may arise. 5. Establishing and ensuring that sufficient and open communication channels between the contractor and the work force are maintained. 6. Establish and ensuring that efficient and open communication channels between the contractor and the community are maintained 7. Identifying and reporting to the Contractor regarding issues where communication between stakeholder is necessary, recommend courses of action and facilitate such communications 8. Assisting the Contractor and the work force in the establishment of grievance procedures and necessary recommenda-tion to the Contractor regarding the grievances and solution thereto. 9. Attending to site meetings and project implementation meetings as required by the Contractor and prepare periodic reports as may be required by the Contractor from time to time. 10. Attending to such other duties which are consistent with the functions of a CLO, as may be required by the Contractor from time to time. Tenderers are to price twice the rate of unskilled local labour rate against this item for any and all costs arising out of compliance with the foregoing and in the event of a Tenderer failing to price against this item or making inadequate financial provision against this item for compliance as aforesaid, then no claim for costs or additional cost incurred will be entertained by the Head: Works F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	E12.7 SKILLS DEVELOPMENT ON SITE Contractor in conforming to the object of EPWP that its beneficiaries need to be capacitated with skills that will render them employable in the future. It is then the responsibility of the Contractor that mandatory life skills are provided to 100% of workforce on site and on the job training to labourers from whom the potential for further development has been identified. The latter is not mandatory to all as it covers technical skills. Contractor should also make provision for the possibility that there might be local youth that will need to be placed on the project with an intention to be provided support towards improving their level of competency and productivity. Contractor shall also provide all necessary on-the-job training to targeted labour to enable such labour to master and advance on techniques required to undertake the work in accordance with requirements of the contract in a manner that does not compromise workers health and safety. F:..... V:..... T:.....	Item			
	E12.8 LABOUR ONLY Sub Contracting for local emerging enterprises The project can support the notion of one main contractor to be appointed whilst several subcontractors, possibly from the local Small, Medium and Micro Enterprises (SMME) group, are employed to undertake various smaller activities. Two alternatives can be applied for setting out work for sub-contractors, i.e. full responsibility (provide their own plant, materials and labour) or secondly the main contractor remains responsible for the supply of plant and materials, while the sub-contractor is responsible for implementation, thus providing the skills and labour content only for the various construction activities. The contractor will be required to appoint a reasonable number of emerging sub-contractors to undertake work to the minimum of **5%** of the contract value on the various service areas but not limited to the following services; Item / Description/Task/Activity General Building works: Masonry; Carpentry and joinery; Floor finishes/Tilling; Paint work; Joinery fittings; Plumbing (internal & external); Plastering Civil works: Paving; Landscaping This percentage excludes the costs of employing local unskilled labour. A minimum of **3%** of the total number of the appointed emerging subcontractors must be owned by **females** who have more than **50.1%** ownership of their company/organization. SMME represent an important vehicle to address the challenges of job creation, economic growth and equity in our country. SMMEs are playing a critical role in absorbing labour, penetrating new markets and generally expanding economies in creative and innovative ways. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	C12.8.2 Subcontractor Mentoring Once the Subcontractors have been identified and engaged, the Contractor shall closely monitor their performance in the execution of their contracts. The Contractor will be responsible for drawing implementation plan that will assist in managing the development of sub-contractors undertaking Labour Intensive work. The Contractor will be responsible for management of the sub-contractors and to ensure that they comply with all EPWP requirements as set-out in this specification. The Contractor and sub-contractors will be required to compile monthly progress reports to be submitted with payment certificates. The reports shall include planned targets with regards to the works and employment, employment of EPWP beneficiaries and project expenditure. Failure to produce monthly reports will render payment certificates incomplete. The contractor will be required to assist, train, mentor and monitor its Sub-contractors and report through monitoring tool on progress of each Sub-contractor. F:..... V:..... T:.....	Item			
	C12.8.3 Portfolio of Evidence The Contractor is to develop and /or maintain a portfolio of evidence for each sub-contractor. The Portfolio of Evidence is a collection of proof of the training, coaching, guidance and monitoring inputs provided to the Sub-contractor. It is the document which records the development progress of the Sub-Contractor and will need to be updated continually throughout the duration of the contract. The Portfolio of Evidence should include but not limited to the following documentation: •The development path designed for each Sub-Contractor, •The Training course completed by the Sub-Contractor, •The hours of guiding, coaching and mentoring received for each activity listed in the developmental plan, •A list of outcomes achieved at each level for each activity. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	Performance and penalties The Contractor performance will be monitored throughout the contract. Should the Contractor fail to fulfil his obligation he will be liable for penalties. Payment of the penalty shall not absolve the Contractor of any claim, or relieve the Contractor of any of his duties, obligations or responsibilities under the contract. •Utilisation of the Sub-Contractors The Contractor's achievement of the targets will be measured quarterly to determine the progress made to date. C12.8.4 Local Suppliers Local material suppliers within the vicinity of the site to be utilise as long as their materials meets the required specification. However, quality and suitability would have to be checked by the employer, if the local suppliers are unable to meet the demand the nearest suitable suppliers are to be used. Production of materials should be done on site, where economies of scale allow e.g. concrete paving blocks should be encouraged which will enable employment creation and also allow for enterprise development. F:..... V:..... T:.....	Item			
	C12.8.5 TENDERER'S TO NOTE CONDITIONS a) The contract to be entered into between the Contractor and the Priority Population Group's (PPG's) will be a labour and material sub-contract or labour only depending on the contractor and subcontractor agreement. b) The Contractor will be responsible for ensuring that all materials for use by the PPG's in the works are to be on site timeously. The Contractor shall liaise with The Mentor and PPG to determine the nature and extent of materials required and the lead time necessary. F:..... V:..... T:..... c) The Contractor shall be responsible for the overall programming of the Works and he is to allow for monitoring the PPG's programme and progress. d)In conjunction with the Mentor, he is to allow for the supervision and mentoring (where necessary) of the PPG to ensure quality and adherence to standard building practice F:..... V:..... T:..... e) The Contractor is to allow for extra storage facilities on site for the PPG's tools and equipment. F:..... V:..... T:.....	Item Item Item Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	f) Basic tools shall be provided by the Priority Population Group's (PPG's) and where these are not available; the Contractor will supply him with the necessary tools and equipment and deduct the costs thereof from the interim claims made by the PPG. g) Work requiring specialized tools will be provided free of charge by the Contractor with the provision that these be returned upon completion of the Work. F:..... V:..... T:..... <u>CO-ORDINATION AND SUPERVISION</u> The Contractor is to co-ordinate and supervise the work of all the PPG's, Sub-Contractors and Nominated Sub- Contractors appointed directly by the Employer in such a manner and at all times as will suit the building programme and he is to allow adequate access, for the PPG's, where required, to carry out their work in an efficient manner and acceptable quality standards in accordance with the specifications as no claims for extras in this connection will be entertained. F:..... V:..... T:..... <u>ATTENDANCE</u> The Contractor may allow for attendance upon the PPG's concerned to execute the work. The Contractor is to allow the PPG's the use of any scaffolding belonging to him while it remains so erected on the site. Where scaffolding is necessary for the use by any PPG and the Contractor has not erected any for his own use or has removed same after his own use, the Contractor shall supply sufficient scaffolding to the PPG to be erected and dismantled by the PPG and returned to the Contractor. This attendance upon PPG's to execute the work is to include for the scaffolding provisions as aforesaid and, in addition, is to include for co-operating to the fullest extent with all the parties, attending on off-loading materials, providing suitable storage for tools and materials used by the PPG's, use of general facilities such as latrines, etc., supply and cost of power, lighting, water and the like. F:..... V:..... T:..... **E12.9 EPWP CONTRACT FOR LABOUR** C12.9 EPWP contract for labour It is compulsory that shortly after the contractor and or sub contractor has appointed local labour, the employment contract should be signed by both parties, prior to commencement with works on site. The employment contract forms part of the Ministerial Determination or from the regional EPWP officials. F:..... V:..... T:.....	Item Item Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	E12.10 EPWP SCOPE of WORK **Note:** **Contractors are to price any item on the Bill of Quantities having below, bearing in mind that they are regarded as main sources of job creation, whether sub contracted or undertaken by the main contractor.** **Elements on the scope of work where application of Labour Intensive Construction methods as will indicated with letters (LI) are regarded feasible are as follows;** i) Excavating trenches for foundations and any other civil works with the depth not more than 1.5 m ii) All masonry works which include concrete mixing on site; brickwork; plastering; screed works; jointing; etc. iii) Painting, Plumbing, Ironmongery; roof cladding; glazing; tilling; carpentry; flooring; waterproofing; etc. F:..... V:..... T:..... **Note:** It is a general requirement of this contract that persons normally resident in the ward of the works (local labour) be given preference for employment on the contract. Provided, however, that **should adequate and appropriate labour not be available within the ward**, others may be employed subject to satisfactory proof being provided that every reasonable endeavour has been made to employ local labour **(Local Sub-contractor(s); Skilled; Semi-Skilled and Unskilled)**. The contractor shall in consultation with the local community leaders **(Project Steering Committee)** with the purpose of negotiating with them regarding the utilization of local resources in the construction process. In this regard, the contractor shall furthermore give preference, wherever possible to the employment of single heads of households, women and youth as well as families declared as most indigent by War on Poverty/ Sukuma Sakhe program profiling process. The contractor should aim, in general, to maximise the involvement of the local community, however workers from other communities should not exceed 20% of all persons working on the project, where local employees possess skills at level of competency that meet contractors requirements <u>Payment for the labour-intensive component of the works</u> Payment for works identified in the Scope of Work as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the Scope of Work. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict. <u>Linkage of payment for labour-intensive component of works to submission of project data</u> The Contractor's payment invoices shall be accompanied by labour information for the corresponding period in a format specified by the employer. If the contractor chooses to delay submitting payment invoices, labour returns shall still be submitted as per frequency and timeframe stipulated by the Employer. The contractor's invoices shall not be paid until all pending labour information has been submitted. <u>Applicable labour laws</u> The current Ministerial Determination (also downloadable at <u>www.epwp.gov.za</u>) Expanded Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice , shall apply to works described in the scope of work as being labour-intensive and which are undertaken by unskilled or semi-skilled workers. F:..... V:..... T:.....	Item Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
E13	**HIV/AIDS AWARENESS** Tenderers are to price against the following items for compliance with the SPECIFICATION FOR HIV/AIDS AWARENESS bound into this document (The clauses referred to are those of the Specification for HIV/AIDS)				
E13.1	Provide and maintain a condom dispenser in terms of Clause 5.1a) F:..... V:..... T:.....	Item			
E13.2	Provide and maintain HIV/AIDS awareness posters terms of Clause 5.1b) F:..... V:..... T:.....	Item			
E13.3	HIV /Aids Awareness Programme on Site for not less than 90% of workers inclusive of all direct and indirect costs; Engage a qualified service provider as described in the scope of works to conduct an HIV Awareness Programme in terms of Clause 5.2.1a) F:..... V:..... T:.....	Item			
E13.4	Arrange for workers to attend the HIV Awareness Programme in terms of Clause 5.2.1b) F:..... V:..... T:.....	Item			
E13.5	**Reporting** Prepare and attach to claims for payment a brief report in terms of Clause 5.3 (see also HIV/STI Compliance Report included with this document). F:..... V:..... T:..... ***Note: In the event that the contractor fails to satisfy the requirements of this specification, the employer (Head: Public Works) may apply any of the sanctions provided for in the contract. Sanctions may include the application of a financial penalty of .04% of the Contract Sum per calendar day of which the required reports has not been submitted.***	Item			
E14	**OCCUPATIONAL HEALTH AND SAFETY ACT NO. 85 OF 1993** Tenderers are to allow for costs in providing a project specific ' Construction Phase Safety, Health and Environmental Plan' in accordance with "Section 2 - Specification Data associated with SANS 1921-1:2004" clause C4.18 in "Part C3 - Scope of Work" F:..... V:..... T:.....	Item			
E15	**NOTICE BOARD, SITE OFFICE, ETC.** Tenderers are to allow for the provision and removal of a project notice board and a site office in accordance with the Principal Agent's requirements. F:..... V:..... T:.....	Item			
E16	**IMPORTED MATERIALS AND EQUIPMENT** Where imported items are listed in the tender documents, the tenderer shall provide all information called for, failing which the price of any such item, material or equipment shall be excluded from currency fluctuations. (***Refer to T2.14 - Schedule of Imported Materials and Equipment*** . F:..... V:..... T:.....	Item			
E17	**CONTRACT DOCUMENTS** The drawings issues with these Tender documents do not comprise the complete set but serves as a guide only for tendering purposes and for indicating the scope of works to enable the Tenderer to acquaint him with the nature and extent of the works and the manner in which they are to be executed. Should any part of the drawings not be clearly legible to the Tenderer he shall, before submitting his Tender, obtain clarification in writing from the principal agent. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
E18	**GENERAL PREAMBLES** The Document Preambles will be the "ASAQS Model Preambles for Trades – 2008" and is obtainable from the various Regional Office's of the Department of Public Works and shall be read in conjunction with the Bills of Quantities and be referred to for the full descriptions of work to be done and materials to be used.				
	F:..... V:..... T:.....	Item			
E19	**TRADE NAMES** Wherever a Trade Name for any product has been described in the Bills of Quantities the Tenderer's 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.				
	F:..... V:..... T:.....	Item			
E20	**EXISTING PREMISES OCCUPIED** Refer to Scope of Works Part C3 of this Tender Document for information on the occupation of existing buildings.				
	F:..... V:..... T:.....	Item			
E21	**INACCURATE AND DEFECTIVE WORK EXECUTED UNDER PREVIOUS CONTRACT** The contractor shall, after taking possession of the site and before commencing the work, check all levels, liners, profiles and the like and satisfy himself as to the dimensional accuracy of all work executed under the previous contract which may affect his work. Should any inaccurate or defective work be found, the contractor shall immediately notify the principal agent in writing requesting his instructions with regard thereto and afford every facility to those rectifying such inaccurate or defective work.				
	F:..... V:..... T:.....	Item			
E22	**VIEWING THE SITE IN SECURITY AREAS** If the site is situated in a security area and the Tenderder must arrange with the Authorities to obtain permission to enter the site for Tenderding purposes.				
	F:..... V:..... T:.....	Item			
E23	**COMMENCEMENT OF WORKS IN SECURITY AREAS** If the works falls within a security area, the contractor must arrange with the Authorities and give the necessary notices before commencement of the works. Should the contractor fail to make such arrangements, admission to the site may be refused and any additional costs will be for the contractor's account.				
	F:..... V:..... T:.....	Item			
E24	**ENTRANCE PERMITS TO SECURITY AREAS** If the works fall within a security area, the contractor shall obtain entrance permits for his personnel and workmen entering the area and shall comply with all regulations and instructions which may be issued from time to time regarding the protection of persons and property under control of the Authority.				
	F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
E25	**SECURITY CHECK OF PERSONNEL** The principal agent may require the contractor to have his personnel and workmen, or a certain number of them, security classified. In the event of the principal agent requesting the removal of a person or persons from the works for security reasons, the contractor shall do so forthwith and shall thereafter ensure that such person or persons are denied access to the works and the site and/or to any document or information relating to the works. F:..... V:..... T:.....	Item			
E26	**PROHIBITION ON TAKING PHOTOGRAPHS** In terms of article 119 of the Defence Act, 44 of 1957, it is prohibited to sketch or to take photographs of any military site or installation or any building or civil works thereon or to be in possession of a camera or other apparatus used for taking photographs, except when authorised thereto by or on behalf of the Minister. The same prohibition is also applicable to all Correctional Institutions in terms of article 44.1(e) of the Correctional Services Act 8 of 1959. F:..... V:..... T:.....	Item			
E27	Management of Water Water for Construction purposes must be obtained from alternative water sources (i.e. supply other than water that is produced and distributed by a regulated water service authority from a licenced water treatment works for human consumption), eg dams, rivers, boreholes, springs, rainwater harvesting, recycled sewerage water,etc. The alternative water source shall not be of an inferior quality / standard than that required for construction purposes. The client reserves the rigfht through his agents to test such supplies or request certificates confirming the grade and nature of the water supply. Relevant knowledge of the respective area will be an advantage.				
	Carried forward to collection			R	

SECTION 1

SUMMARY – PRELIMINARY & GENERAL

Collection	Page No.	Amount	
	1	R	
	2	R	
	3	R	
	4	R	
	5	R	
	6	R	
	7	R	
	8	R	
	9	R	
	10	R	
	11	R	
	12	R	
	13	R	
	14	R	
	15	R	
	16	R	
	17	R	
	18	R	
	19	R	
	20	R	
Carried forward to Final Summary		R	

Section No. 1
Preliminary & General
Summary

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

PART C2.3 BILL OF QUANTITIES

Item No		Quantity	Rate	Amount

SECTION NO. 2: NURSES QUARTERS - BLOCK A

BILL NO. 1

ALTERATIONS

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

General Notes:

The contractor shall carry out the whole of the works with as little mess and noise as possible and with minimum disturbance to adjoining premises and their tenants. He shall provide proper protection and provide, erect and
remove when directed, any temporary tarpaulins that may be necessary during the progress of the works, all to the satisfaction of the principal agent.

Water supply pipes and other piping that may be encountered and found necessary to disconnect or cut, shall be effectually stopped off or grubbed up and removed, and any new connections that may be necessary shall be made with proper fittings, to the satisfaction of the principal agent.

Doors, fanlights, fittings, frames, linings, etc which are to be re-used shall be thoroughly overhauled before refixing including taking off, easing and rehanging, cramping up, re-wedging as required and making good cramps, dowels, etc, and easing, oiling, adjusting and repairing ironmongery as necessary, replacing any glass damaged in removal or subsequently and stopping up all nail and screw holes with tinted plastic wood to match timber, unless otherwise described. Re-painting or re-varnishing is given separately.

Carried Forward R

	Brought Forward			R	
	Prices for taking out of doors, windows, etc shall include for removal of all beads, architraves, ironmongery, etc.				
	Prices for taking out and removing doors and frames shall include for removing door stops, cabin hooks, etc and making good floor and wall finishes to match existing				
	With regard to building up of openings in existing walls, cement screeds and pavings, granolithic, tops of walls, etc, shall be levelled and prepared for raising of brickwork.				
	Making good of finishes shall include making good of the brick and concrete surfaces onto which the new finishes are applied, where necessary.				
	The contractor will be required to take all dimensions affecting the existing buildings on the site and he will be held solely responsible for the accuracy of all such dimensions where used in the manufacture of new items (doors, windows, fittings, etc).				
	View Site				
	Before submitting the tender, the contractor shall visit the site and satisfy himself/herself as to the nature and extent of the work to be done and the value of the materials contained in the buildings or portions of the buildings to be demolished. No claim for any variations of the contract sum in respect of the nature and extent of the work or of inferior or damaged materials will be entertained.				
	Take out and remove, and prepare all surfaces to receive new, including making good existing surfaces where items have been removed				
	Plumbing and Sanitary Fittings:				
1	Remove 50 or 110mm UPVC pipe including cutting off piping as necessary, disconnecting piping from fittings etc; cartaway to approved dumping site to be located by Contractor and prepare to receive new	m	5		
	Carried Forward			R	

				R	
	Brought Forward				
2	Remove 15mm, 22mm or 35mm UPVC pipe including cutting off piping as necessary, disconnecting piping from fittings etc; cartaway to approved dumping site to be located by Contractor and prepare to receive new	m	2		
3	Remove existing damaged fascias and gutters and rainwater pipes etc; cartaway to approved dumping site to be located by Contractor and prepare to receive new	m	123		
4	Remove existing damaged downpipes etc; cartaway to approved dumping site to be located by Contractor and prepare to receive new	m	48		
5	Clean out existing tough stains on wash hand basins with and approved cleaning agent and service existing wash hand basins including two taps per basin and bottle trap	No	1		
	<u>Floors/Walls and Coverings:</u>				
6	Remove floor tiles including average 40mm thick screed from concrete floors, cartaway to approved dumping site to be located by Contractor and prepare surface to receive new tiles	m2	104		
7	Remove cracked floor tiles in patches including average 40mm thick screed from concrete floors, cartaway to approved dumping site to be located by Contractor and prepare surface to receive new tiles	m	1		
8	Clean and polish existing floors to staircases, etc.	m2	126		
9	Clean and make good existing plastered and or painted walls and columns	m2	10		
10	Hack up and remove 40mm screed from floors, cartaway to approved dumping site to be located by Contractor and prepare to receive new	m2	104		
11	Strip off cracked plaster on walls, cartaway to approved dumping site to be located by Contractor and prepare to receive new	m2	10		
	Carried Forward			R	

				R	
	Brought Forward				
12	Clean stained external brick walls including removing all organic material including all necessary scaffolding, detergents etc	m2	400		
13	Cleaning of existing aluminium louvres and external façade balustrade including all related scaffolding, detergents etc; to all levels of Nurses Quarter Block A façade.	m2	1 850		
14	Build up window opening 970 x 1500mm high in NFP one brick wall in Class II mortar and make good internal plaster on one side and external plaster on one side	No	5		
15	Build up door fanlight opening 1600 x 400mm high in NFP one brick wall in Class II mortar and make good internal plaster on both side including all lintels etc.	No	10		
16	Remove existing aluminium corner protector.	m	5		
	<u>Joinery:</u>				
17	Repair damaged wall-hung dresser units in dormitories	No	5		
18	Repair other wall-hung shelving units in bedrooms and bathrooms	No	24		
	<u>Slabs, Ceilings, etc:</u>				
19	Remove damaged ceiling systems including soffits, gridlock suspension system, etc. cart away to approved dumping site to be located by Contractor and prepare to receive new	m2	73		
20	Remove existing 600 x 1200mm boards only existing ceiling grid, etc. cart away to approved dumping site to be located by Contractor and prepare to receive new	m2	50		
21	Remove existing gridlock suspension system, etc. cart away to approved dumping site to be located by Contractor and prepare to receive new	m2	50		
	Carried Forward			R	

	Brought Forward			R	
22	Break out and remove loose spalling concrete from concrete ceiling soffits, beams, etc., to expose steel reinforcement, clean down apply 'Sika FerroGard' to reinforcing and repair concrete with 'Prostruct 529 MCI Structural' concrete repair with a minimum of 10mm to the repair in strict accordance with manufacturers instructions.	m3	4		
23	Break concrete around steel or UPVC pipe going through concrete slabs not exceeding 300mm thick for working space to remove leaking sections of pipe and make good 25Mpa concrete after new pipe installation.	m3	4		
24	Break up or out and remove reinforced concrete inclusive of plaster, screed, tile, finishes, etc., including cutting off and removing reinforcement to kitchen apron/slab and make good to receive new finish	m3	1		
	<u>Doors and Windows:</u>				
25	Remove existing damaged door size 800 x 2030mm high, including ironmongery, fittings, etc., cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	5		
26	Remove existing damaged duct door size 600 x 2200mm, including ironmongery, fittings, etc., cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	10		
27	Remove existing damaged steel or aluminium door size 1120 x 2100mm high, including ironmongery, fittings, etc., cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	1		
28	Remove existing fire escape door size 1600 x 2030mm high, including ironmongery, fittings, etc., cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	3		
29	Remove existing doors size 900 x 2030 and set aside for re-use doors including making good hinges and door frames and later refit and undercut doors to suite new floor levels	No	5		
30	Remove damaged steel door frames for door size 800 x 2030mm high, cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	1		
	Carried Forward			R	

	Brought Forward			R	
31	Remove damaged steel door frames for door size 800 x 2030mm high with fanlight size 800 x 500mm high, cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	1		
32	Remove damaged timber double door frames for door size 1600 x 2100mm high with fanlight size 1600 x 400mm high, cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	3		
33	Remove damaged steel window size 1900 x 1300mm high including damaged handles, stays etc. where applicable, cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	1		
34	Remove steel window size 970 x 1500mm high including damaged handles, stays etc. where applicable, cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	1		
35	Remove damaged 4mm glazing, etc. from existing windows and sashes in panes not exceeding 0,5m2 (sashes and frames to remain and reglazing elsewhere measured) cartaway to approved dumping site to be located by Contractor and prepare to receive new	m2	5		
36	Remove damaged 4mm glazing, etc. from existing windows and sashes in panes exceeding 0,5m2 and not exceeding 2m2 (sashes and frames to remain and reglazing elsewhere measured) cartaway to approved dumping site to be located by Contractor and prepare to receive new	m2	15		
37	Remove door and window handle, locks, etc cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	24		
38	Cut out and form opening 190 x 190mm high in existing toughened safety glazed window.	No	5		
	Carried Forward			R	

	Brought Forward			R	
39	Cut out and form opening 360 x 360mm high in existing toughened safety glazed window.	No	5		
40	Clean and restore existing ironmongery including door handles, push plates, etc.	No	15		
	Sundry items:				
41	Remove soap dish holders, toilet paper holders, etc., cartaway to approved dumping site to be loc	No	1		
42	Remove damaged ironing boards , cart away to approved dumping site to be located by Contractor and prepare to receive new	No	30		
43	Remove signage on walls, doors etc; cart away to approved dumping site to be located by Contractor and prepare to receive new	No	6		
44	Clean existing 1000mm high steel balustrade (area measured on flat)	m2	63		
45	Remove curtain tracks , cart away to approved dumping site to be located by Contractor and prepare to receive new	m	10		
	Carried Forward to Summary of Section No. 2			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 1
Alterations

Item No			Quantity	Rate	Amount
	BILL NO. 2				
	FOUNDATIONS				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	TV ROOM GROUND FLOOR SURFACE BED				
	Removal of damaged concrete, cartaway to dump site located by the contractor				
1	Surace bed	m3	8		
	Excavations in earth not exceeding 2m deep				
2	To reduce levels	m3	15		
	Carting away				
3	Extra over excavations for carting away surplus material from the excavations to a dumping site to be located by the contractor	m3	15		
	Earth Fill Material				
4	Imported selected G4 fill layer consisting 100mm thick and compacted to 98% Mod AASHTO density	m3	15		
5	Imported selected G7 fill layer consisting 100mm thick and compacted to 98% Mod AASHTO density	m3	15		
	Soil Poisoning				
6	Treat ground below paving with an approved weed killer	m2	73		
	Carried Forward			R	

				R	
	Brought Forward				
	Compaction of surfaces				
7	Compaction of ground surfaces under pavings etc, including ripping up surface and scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% Mod AASHTO density	m2	73		
	25MPa/19mm concrete				
8	Surface beds	m3	15		
	Rough formwork (degree of accuracy II) to sides				
9	Surface beds	No	34		
	Finish top surfaces of concrete smooth with a steel float to				
10	Surface beds	m2	73		
	Fabric reinforcement				
11	Type 245 fabric reinforcement in concrete surface beds, slabs, etc	m2	73		
	One layer of 250 micron 'derbigum' or similar approved USB Green waterproof sheeting with minimum 150mm lap joints sealed with 'derbigum' Pressure Sensitive Tap				
12	Under Surface beds	m2	73		
	Testing				
13	Making and testing set of three 150 x 150 x 150mm concrete strength test cubes	No	1		
	10mm 'Sondor Jointex' or similar approved closed cell expanded polyethylene preformed joint filler with hinged blocking piece between horizontal and/or vertical brick and concrete surfaces:				
14	Joints not exceeding 300mm high or wide.	m	34		
	Carried Forward			R	

	Brought Forward			R	
	Polysulphide joint sealant including backing cord, bond breaker, primer, etc. or similar approved in:				
15	10 x 10mm Vertical expansion joints in plastered or face brick wall including raking out expansion joint filler as necessary.	m	34		
	Horizontal joggle construction joints through concrete including bitumen paint bond breaker to one face:				
16	Surface beds not exceeding 300mm thick.	m	34		
	Carried Forward to Summary of Section No. 2			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 2
Foundations

Item No			Quantity	Rate	Amount
	BILL NO. 3				
	MASONRY				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	BRICKWORK IN SUPERSTRUCTURE				
	Brickwork in NFP bricks in Class II mortar:				
1	Half brick walls	m2	5		
2	Half brick skin of existing one brick wall including 6mm diameter galvanised threaded pins (5/m2) drilled and epoxied into existing brickwork (removal of outer skin elsewhere measured).	m2	5		
	BRICKWORK SUNDRIES				
	Brickwork reinforcement:				
3	75mm Wide reinforcement built in horizontally	m	30		
	Chip off projections, fill up crevices, cement wash with 1:6 cement and sand slurry and apply two coats "Brixeal" bitumen emulsion waterproofing coating on:				
4	Outer face of inner skin of brick walls including any additional labour required in raising wall in two separate skins and working around wire ties.	m2	5		
	FACE BRICKWORK				
	'Corobrik' or similar approved red face bricks to match existing pointed with recessed horizontal and vertical joints:				
5	Extra over brickwork for face brickwork externally	m2	5		
	Carried Forward to Summary of Section No. 2			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 3
Masonry

Item No			Quantity	Rate	Amount
	BILL NO. 4				
	WATERPROOFING				
	PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	SUPPLEMENTARY PREAMBLES				
	Waterproofing				
	All 'wet' areas, such as showers, must first be waterproofed with a 10 year guarantee, waterproofing which is designed, supplied and fixed by and approved supplier.				
	'Sika Cemflex' waterproof membrane comprising prime coat of waterproofing slurry, 'Cemflex Fabric' and two additional coats of waterproofing slurry or similar approved applied strictly in accordance with the manufacturer's instructions on:				
1	On plastered walls under tiles, etc.	m2	400		
	One layer of 'Bithuthene 5000' waterproof membrane and one layer of 'Sika Cemflex' waterproofing or similar approved applied strictly in accordance with the manufacturer's instructions on:				
2	Screeded shower floors, turn-ups, etc.	m2	208		
3	Dressing around shower outlet.	No	32		
	REPAIRS OF WATERPROOFING TO FLAT ROOFS				
	Carried Forward			R	

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	<u>One layer of mineral grain waterproofing (Sika BlackSeal T-140 MG or similar approved) on:</u>			
4	Parapet walls in narrow widths not exceeding 300mm wide	m	110	
	<u>Sundries:</u>			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
5	Allow a budgetary allowance of R 5 000.00 (Five Thousand Rands) for Removal and Reinstatement of Services on Roof expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used	Item		
	<u>PROTECTIVE ROOFING PAINT</u>			
	<u>Two coats 'Silvacote' bituminous aluminium paint or similar approved on:</u>			
6	Parapet walls in narrow widths not exceeding 300mm wide	m	110	
	<u>JOINT SEALANTS ETC</u>			
	<u>Approved clear silicone sealant:</u>			
7	Apply silicone in joints between hand wash basins/kitchen sinks and walls	m	100	
	Carried Forward to Summary of Section No. 2			R

Section No. 2
Nurses Quarters - Block A
Bill No. 4
Waterproofing

Item No		Quantity	Rate	Amount

BILL NO. 5

ROOF COVERING

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Roof coverings

Fixing of all roof sheeting is to be in accordance with the Manufacturer's approved Instruction Book

All roof coverings are to be installed to comply with SABS Code of Practice 0237 as applicable

All roof sheeting shall be laid under a five year guarantee for site workmanship and water tightness

Ridge coverings and flashing

Ridge coverings and flashings shall have at least 225mm laps and closers shall have at least 150mm laps at end joints with sufficient laps at angles and intersections.

Rates

Prices for sheeting are to include for all straight cutting and waste, laps, protecting from damage and cleaning down at completion - all in strict accordance with manufacturer's instructions and to the approval of the Principal Agent

Roof coverings, ridge coverings, closers, flashings, etc. are measured net and prices are to include for all laps, screws, bolts, etc. Prices for roof coverings are also to include for straight cutting. All work shall be left completely watertight.

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	FLASHINGS, LININGS, COPINGS, ETC				
	80mm Thick aluminium 'Safintra SAFLOK ZicAL' flashings with 'Colorplus' finish on one side all in accordance with the manufacturer's recommendations or similar approved :				
1	Headwall or sidewall flashing 460mm girth.	m	2		
2	Counter flashing 200mm girth.	m	2		
3	Narrow or broad flute closer 150mm girth.	m	50		
	Sundries				
4	Moulded broad or narrow flute polyethylene filler blocks to suit 'Klip-lok 700' roof profile sheeting.	m	50		
5	Counter flash top of metal flashing to plastered wall with 140mm wide 'Superlaycryl' bandage and seal joint.	m	4		
	Sundry Roof Items:				
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
6	Allow a budgetary allowance of R 20 000.00 (Twenty Thousand Rands) for Sundry Roof Items including Roof Guarantees expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used			SUM	
	Carried Forward to Summary of Section No. 2			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 5
Roof Coverings

Item No			Quantity	Rate	Amount
	BILL NO. 6				
	CARPENTRY AND JOINERY				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	EAVES, VERGES, ETC				
	'Everite Nutec' or similar approved fibre-cement fascias and bargeboards:				
1	12 x 225mm Fascias and barge boards, including plastic H-profile jointing strips.	m	125		
	EXTERIOR QUALITY DOORS				
	Wrot meranti				
2	44mm Framed batten door 810 x 2030mm high of 106mm top rail and stiles, 22 x 106mm middle ledge and 22 x 220mm bottom ledge filled in flush on one side with 22mm V-jointed both sides boarding.	No	5		
3	20mm Door size 600 x 2200mm high duct door	No	10		
	TIMBER DOORS				
	Semi-solid flush doors with 3,2mm hardboard covering on both sides to match existing and hung to existing steel frames with three hinges per leaf				
4	40mm Door 750 x 1880mm high hung 180mm high above finished floor level	No	7		
5	40mm Door 810 x 2030mm high	No	7		
	Carried Forward			R	

				R	
	Brought Forward				
	FIRE DOORS AND FRAMES				
	The following SANS 1253 fire rated doors are to be 'Bitcon Rubidor' or similar approved finished on both sides with veneer to match existing and hung on and including one and a half pairs of heavy brass hinges to and including 1,6mm galvanised mild steel door frame				
6	Class 'B' single door size 810 x 2030mm high with frame suitable for 230mm thick wall.	No	1		
7	Class 'B' double door size 1610 x 2030mm high with square meeting stiles, in two equal leaves with frame suitable for 230mm thick wall.	No	3		
	Sundries				
8	Undercut door 750mm wide by 20mm	No	2		
9	Undercut door 810mm wide by 20mm	No	13		
10	Undercut door 1600mm wide by 20mm	No	3		
	FRAMED FRAMES, ETC				
	Wrot meranti:				
11	20 x 100mm Rebated linings plugged	m	5		
12	42 x 68mm Rebated frame for 813 x 2100mm high door	No	1		
13	42 x 68mm Rebated frame for 600 x 2200mm high door	No	1		
	DUCT COVERS				
	Wrot meranti duct covers				
14	20mm Duct cover size 600 x 600mm high	No	5		
	Carried Forward			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 6
Carpentry & Joinery

Brought Forward		R	
JOINERY FITTINGS			
CUPBOARDS TO KITCHENS, BEDROOMS, ETC			
Finishes:			
KITCHEN 16mm Iceberg white natural touch Melamine doors with 2mm ABS door edging			
Doors: 16mm Iceberg white natural touch Melamine doors with 2mm ABS door edging Soft close hinges on all doors			
Shelves: 16 mm white Melamine shelves with 1mm ABS edging			
Handles: 128mm Hollow stainless Steel Barrel Handle code 8236			
Counter: 20mm thick Shimmer Proquartz counter top or similar approved			
Units to include Masonite backs 128mm recessed plinths V313 Wrap			
BEDROOM			
BIC Doors: 16mm natural touch Melamine doors with 2mm ABS door edging. Colour to be confirmed on site			
White melamine carcasses with 1mm ABS edging			
Soft close hinges on all doors			
Melamine facias to soffit			
192mm Hollow stainless Steel Barrel Handle code 8238			
Dresser: New 16mm Royal Mahogany melanine dresser with matching drawers			
Heavy duty ball bearing runners			
ABS edging on all boards			
128mm Hollow stainless Steel Barrel Handle code 8236			
Carried Forward		R	

Section No. 2
Nurses Quarters - Block A
Bill No. 6
Carpentry & Joinery

	Brought Forward			R	
	Shelving: 16mm natural touch Melamine outer shelf boxing with 2mm ABS door edging. Colour to be confirmed on site				
	16 mm white Melamine shelves with 1mm ABS edging				
	General:				
	References given in descriptions refer to the respective types of fittings detailed on the architect's drawing(s) numbered DOH-NS-A-5008-0 and 5009-0 annexed to these bills of quantities				
	Kitchen cupboards (Refer Drawing DOH-NS-A-5008-O)				
15	U-shaped counter top size 2800 x 600 x 850mm high with one leg size 1890 x 600 x 850mm high and other leg 1180 x 600 x 850mm high with cut out for a double bowl sink and drainer (elsewhere measured)	m	10		
	Bedroom cupboards (Refer Drawing DOH-NS-A-5009-0				
16	Bedroom cupboard size 1420 x 620 x 2880mm high overall with adjustable shelves, clothing rail and one double door (Closet Unit 1)	No	1		
17	Bedroom cupboard size 200 x 130 x 900mm high overall with adjustable shelves and single door (Closet Unit 2)	No	1		
18	Bedroom cupboard doors size 680 x 770mm high	No	6		
19	Bedroom cupboard doors size 680 x 1930mm high	No	6		
20	Bedroom wall dresser unit size 870 x 400 x 240mm high with two drawers under	No	24		
21	Open shelving unit size 900 x 170 x 500mm high with adjustable shelf (Shelving Unit 1)	No	20		
	Carried Forward			R	

				R
	Brought Forward			
22	Open shelving unit size 1200 x 250 x 600mm high with adjustable shelf (Shelving Unit 2)	No	20	
23	Adjustable shelf size 700 x 600mm wide (For Closet Unit 1)	No	5	
24	Adjustable shelf size 870 x 170mm wide (For Shelving Unit 1)	No	5	
25	Adjustable shelf size 1170 x 250mm wide (For Shelving Unit 2)	No	5	
26	Adjustable shelf size 170 x 130 wide (For Closet Unit 2)	No	1	
27	Shelf size 1420 x 600mm wide (For Closet Unit 1)	No	5	
28	Adjustable shelf size 1420 x 600mm wide (For Closet Unit 1)	No	5	
	Joinery Ironmongery:			
29	128mm Hollow stainless Steel Barrel Handle code 8236	No	36	
30	192mm Hollow stainless Steel Barrel Handle code 8238	No	6	
	Sundry Joinery Fittings:			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
31	Allow a budgetary allowance of R 30 000.00 (Thirty Thousand Rands) for Sundry Joinery Fittings expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used		Item	
	Carried Forward to Summary of Section No. 2			R

Section No. 2
Nurses Quarters - Block A
Bill No. 6
Carpentry & Joinery

Item No		Quantity	Rate	Amount

BILL NO. 7

CEILINGS, PARTITIONS AND ACCESS FLOORING

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Fixing

Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins, or to be shot-pinned, to brickwork or concrete

Items described as "plugged" shall be deemed to includescrewing to fibre, plastic or metal plugs at not exceeding 500mm centres, and where described as "bolted", the bolts have been given elsewhere

Ceilings

Unless otherwise described ceilings shall be deemed to be horizontal

Proprietary suspended ceilings

Hangers, suspension grids, "lay-in" panels, etc are to be in accordance with the manufacturers' recommendations

Electrical light fittings, diffusers, panels etc are generally "lay-in" units of the same dimensions as the suspension grid described and allowance must be made in the rates accordingly for their support inclusive of any flexibility in setting out that may be required (ceiling panels have not been deducted and pricing is to take cognisance thereof)

SUSPENDED CEILINGS

Carried Forward R

	Brought Forward			R	
	1200 x 600 x 9mm thick 'Pelican Systems' Econotile Vinyl Clad foil back Shell White ceiling tiles, laid on Econogrid pre-painted 38mm exposed steel tee suspension system, including all necessary hangers, grids and hold down clips. Suspension shall be in accordance with the manufacturer`s recommendations and SABISA or similar approved.				
1	Ceilings suspended not exceeding 1m below existing concrete soffits	m2	73		
2	Extra over on openings for light fittings, mechanical diffusers, etc	No	2		
3	Extra over ceiling for 1200 x 600mm recessed light fitting.	No	4		
	Cornices to suspended ceilings:				
4	'Pelican Systems' Aluminium PS1 shadow wall trim, fixed to plastered brickwork with 5 x 25mm wall anchors at 450mm centres or similar approved	m	38		
	Carried Forward to Summary of Section No. 2			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 7
Ceilings

Item No		Quantity	Rate	Amount

BILL NO. 8

IRONMONGERY

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Proprietary items

Where applicable the manufacturers' names or product catalogue titles are given in sub-headings preceding the items

On request returnable samples are to be provided to the principal agent for consideration

Finishes to ironmongery

Where applicable finishes to ironmongery are indicated by suffixes in accordance with the following list:
BS Satin bronze lacquered
CH Chromium plated
SC Satin chromium plated
SE Silver enamelled
GE Grey enamelled
AN Anodised natural
AS Anodised silver
AB Anodised bronze
AG Anodised gold
ABL Anodised black
PB Polished brass
PL Polished and lacquered
PT Epoxy coated
SD Sanded

Carried Forward R

				R	
	Brought Forward				
	Rates				
	Prices are to be based on the specific products/articles specified. If tenderers wish to offer alternative products/articles for certain items, these items are to be clearly marked and the alternative specification given with supporting brochures etc clarifying the features of the products/articles offered				
	HINGES, BOLTS, ETC				
	Manufactured by "Assa Abloy" or "Similar approved"				
1	'UNION' or 'similar approved' two ball bearing butt hinge (code: JH-BB-STD-2-SS) with Stainless Steel finish.	Pairs	23		
2	'UNION' or 'equal approved '150mm Flush bolt (code: SS8208-150SS).	No	1		
3	'UNION' or 'equal approved '150mm Flush bolt (code: SS8208-150SS) with spring loaded dust proof strike and keep with keep let into concrete screeded floor (code:8852SC).	No	1		
4	'UNION' or 'equal approved '225mm Flush bolt (code: AL8208-225AS).	No	5		
5	'UNION' or 'equal approved '225mm Flush bolt (code: AL8208-225AS with spring loaded dust proof strike and keep with keep let into concrete screeded floor (code:8852SC).	No	5		
	HANDLES AND LOCKS				
	Manufactured by "Assa Abloy" or "Similar approved"				
6	'Union' or 'equal approved' Gower 3 lever lockset with Chrome handle finish (Code: CZ6822452CH) including powder coated 3 lever lock with Stainless Steel backplate.	No	8		
	Carried Forward			R	

	Brought Forward			R	
7	'Union' or 'equal approved' Gower lockset with cylinder and Chrome handle finish (Code: CZ68205222CH)	No	1		
8	'Union' or 'equal approved' 3 lever mortice lock (Code: 2252-76SS)	No	5		
9	'Union' or 'equal approved' Euro cylinder deadlock (Code: L-2115-78SS)	No	1		
10	'Union' or 'equal approved' knob cylinder profile KD SC (Code: 2X19SC)	No	1		
11	'Union' or 'equal approved' Steel lever handle on backplates with Chrome handle finish (Code: CZ682-24CH)	No	10		
12	'Union' or 'equal approved' Stainless steel dove pull handle on 150 x 230mm backplates (Code: SS5D96-22-06SS)	No	8		
13	'Union' or 'equal approved' Stainless steel dove pull handle on 150 x 230mm backplates (Code: SS5D96R22-05SS)	No	3		
14	'UNION' or equal approved stainless steel bathroom deadlock (code:SS2016SS) and escutcheon on rose (code: SS5004-73SS).	No	21		
15	'UNION' or equal approved double panic bolt touch bar 900mm (code: J-883TD-SIL) with dogging device and 2.5mm switch bracket (code:EDS-MS-P-BAR)	No	15		
16	'UNION' or equal approved double panic bolt touch bar 900mm (code: J-883-SIL) with dogging device	No	2		
17	'Union' or equal approved rectangular Stainless Steel flush pull handle (Code: FFP65X50SS), size 65mm x 50mm complete with cupboard lock (Code: LC6315R) fitted to duct doors	No	80		
	Carried Forward			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 8
Ironmongery

				R	
	Brought Forward				
18	'Union' or equal approved rebate set (code: 2700SS).	No	1		
19	Supply and install mortice lock striker plate, in stainless steel (Grade 304) or (if used) mild steel with a powder - coat finish compatible with Union Lockset 3 Lev - CZ6822452 - Satin Chrome or similar approved, to timber door frames, including all fixings.	m	2		
20	Refix existing door handle onto existing door	No	5		
	DOOR CLOSERS				
21	'ASSA ABLOY' or equal approved rack and pinion door closer with link arm (Code: DC200) fixed to steel frame	No	22		
22	'ASSA ABLOY' or equal approved cam action door closer (Code: DC500) fixed to steel or timber frame	No	2		
23	'ASSA ABLOY' or equal approved overhead double door closer with Cam-Motion® technology and guide rail with integrated mechanical coordinator (Code: FD461-DC500) complete with mounting plates (Code: DCA120-40) fixed to steel frames	No	2		
24	'ASSA ABLOY' or equal approved overhead double door closer with Cam-Motion® technology and guide rail with integrated mechanical coordinator (Code: FD462-DC500) complete with mounting plates (Code: DCA120-40) fixed to steel frames	No	19		
	SUNDRIES				
	Manufactured by "Assa Abloy" or "Similar approved" unless otherwise stated				
25	'UNION' or 'similar approved' stainless steel door stop (code: AL8730AS) with Stainless Steel finish	No	150		
26	'UNION' or equal approved aluminium hat, coat and robe hook (code: AL8721AS) with Anodised Silver finish.	No	52		
	Carried Forward			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 8
Ironmongery

				R	
	Brought Forward				
27	'UNION' or equal approved aluminium hat, coat and robe hook with rubber tip (code: AL8722AS) with Anodised Silver finish.	No	28		
28	'Gelmar' chrome plated hat and coat hook code 3004 or similar approved	No	39		
29	'UNION' or equal approved street surface loop (code: EDS-ABK-401).	No	8		
30	'ASSA ABLOY' or equal approved cam action floor spring (Code: DCA420DAHO) including preparation to receive same.	No	2		
31	1400mm Stainless steel clothing rail to built in cupboard.	No	10		
32	'ASSA ABLOY' or equal approved emergency exit unlocking box (Code: BGLASS-R) including preparation to receive same	No	1		
33	'ASSA ABLOY' or equal approved emergency exit unlocking box (Code: BGLASS-G) including preparation to receive same	No	1		
	PUSH PLATES AND KICKING PLATES				
	The following door protection is to be A.I.S.I. Grade 304 satin polished stainless steel fixed to timber doors with an approved epoxy adhesive (no screw holes).				
34	800 x 250 x 0,9mm Thick kick plate.	No	29		
35	150 x 230 x 0,9mm Thick push plates.	No	16		
36	150 x 230mm Stainless steel push plate (Code:SS5023-06-228W) including fixing screws	No	5		
37	150 x 230mm Stainless steel push plate with euro cylinder (Code:SS5023L-05-228W) including fixing screws	No	1		
	Carried Forward			R	

				R	
	Brought Forward				
	BATHROOM FITTINGS				
38	Supply and install 450mm Wall Mounted 'Italcare Acrylic' Fold-up Shower Seat or similar approved	No	1		
39	Supply and install 32mm stainless steel grab rail as 'Franke CNTXPAR' with 'Franke fine grip 2510012' size 300 x 300 x 96mm dep fixed to tiled or plastered wall or similar approved	No	1		
40	Supply and install 32mm stainless steel grab rail as 'Franke CNTX600' with 'Franke fine grip 2510012' size 600 x 95mm dep fixed to tiled or plastered wall or similar approved	No	1		
41	Supply and install stainless steel 600mm long 'Plumbline Mahale 035685' double towel rail or similar approved	No	8		
42	Supply and install 600mm long 'Style' single chrome towel rail or similar approved	No	96		
43	Supply and install 'ITD' Wireline stainless steel rectangular chrome finish soap basket (Code:TVWR3205/SS) or similar approved	No	1		
44	Supply and install stainless steel 'ITD Wireline TVWR3207/SS' 2 level shower caddy or similar approved	No	32		
45	Supply and install white 2 roll lockable toilet roll holder (Code:TR2A) or similar approved	No	24		
46	Supply and install 100 x 134 x 304mm satin stainless steel 'Franke 359705 Stratos STRX618 ' surfaced mounted manual soap dispenser	No	8		
47	Supply sanitary 12L pedal operated sanitary bin	No	30		
	STEEL WINDOW FURNITURE				
	Carried Forward			R	

	Brought Forward			R	
	Supply and install the following ironmongery to existing windows:				
48	Brass side window handles to match existing	No	120		
49	Brass peg stay to match existing	No	50		
50	Brass sliding stay and screw to match existing	No	120		
	SIGNAGE				
	Manufactured by "Assa Abloy" or "Similar approved"				
51	ASSA ABLOY Aluminium engraved plate E02 (Tea cup), size 152 x 152mm (Code: AL5066-06ASE02).	No	4		
52	ASSA ABLOY Stainless steel engraved plate E10 (male indicator), size 152 x 152mm (Code: SS5066-06SSE10).	No	4		
53	ASSA ABLOY Stainless steel engraved plate E11 (female indicator), size 152 x 152mm (Code: SS5066-06SSE11).	No	4		
54	ASSA ABLOY Stainless steel engraved plate E18 (shower indicator), size 152 x 152mm (Code: SS5066-06SSE18).	m	4		
	Sundries:				
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
55	Allow a budgetary allowance of R 40 000.00 (Forty Thousand Rands) for Sundry Signage and Ironmongery expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used		Item		
	Carried Forward to Summary of Section No. 2			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 8
Ironmongery

Item No			Quantity	Rate	Amount
	BILL NO. 9				
	METALWORK				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	GALVANIZED PRESSED STEEL DOOR FRAMES				
	1,6mm Mild steel double rebated frames suitable for one brick walls:				
1	Frame for door 813 x 2030mm high	No	1		
2	Frame for door size 810 x 2030mm high with fanlight door size 810 x 500mm high to match existing	No	1		
3	Frame for double door 1600 x 2100mm high	No	1		
	SHOWER DOORS				
4	Supply and install white aluminium adjustable shower door size 900 to 1200 x 1850mm high or similar approved (PC. of R5000.00 each supply only excluding VAT). Prices are to include for sandblasting to glass and sealing all round with approved silicone waterproofing sealant at junction/gaps with tiled walls, etc.	No	33		
5	Supply and install sandblasting to existing shower door glass.	m2	12		
	WALL CORNER PROTECTION				
	Carried Forward			R	

				R	
	Brought Forward				
	Stainless steel Grade 316:				
6	70 x 70 x 0,9mm Thick angle corner protector 1000mm long glued to concrete or plastered or tiled walls or columns including necessary preparation.	m	8		
7	25 x 15 x 0,9mm Thick angle corner protector 2440mm long glued to plastered or tiled wall including necessary preparation.	m	49		
	ALUMINIUM WINDOWS				
	Purpose made heavy duty 'ANSO CLIP 44' or other approved white powder coated anodised aluminium shopfront system glazed with 4mm clear toughened safety glass (in accordance with SANS10400-N and AAMSA Regulations) unless otherwise stated complete with frame to be fitted on existing brick or concrete wall including all necessary ironmongery				
8	Window size 1000 x 1500mm high overall comprising one top hung opening out casements, and one fixed light	No	1		
9	Boxing in around Extractor Fan size 480 x 480mm with metal sheets on existing steel sashes in panes exceeding 0,1m2 and not exceeding 0,5m2	m2	3		
	EXTERNAL ALUMINIUM LOUVRES				
	POWDER COATED HORIZONTAL ALUMINIUM LOUVRE UNITS				
	Aluminium fixed louvre units fixed to brickwork or concrete or steel				
10	Supply and install Z profile aluminium louvre panel to match existing approximately 230mm girth fixed to existing aluminium brackets including scaffolding where necessary	m	30		
	Carried Forward			R	

	Brought Forward			R
	ALUMINIUM DOORS			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
11	Allow a budgetary allowance of R 15 000.00 (Fifteen Thousand Rands) for servicing and/or replacing aluminium doors and windows expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used	Item		
	BALUSTRADING			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
12	Allow a budgetary allowance of R 10 000.00 (Ten Thousand Rands) for minor repairs to existing damaged balustrades expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used	Item		
	Carried Forward to Summary of Section No. 2			R

Section No. 2
Nurses Quarters - Block A
Bill No. 9
Metalwork

Item No			Quantity	Rate	Amount
	BILL NO. 10				
	PLASTERING				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	SCREEDS				
	Screeds on concrete or Repairs:				
1	Triangular fillet size 25 x 25mm extreme in angle of wall and screed to receive waterproofing membrane.	m	144		
2	40mm Thick on floors and landings to receive ceramic tiles	m2	104		
3	Average 100mm thick to falls and cross falls to floors.	m2	160		
	INTERNAL PLASTER				
	One coat cement plaster (1:5) as described on brickwork, blockwork or concrete on:				
4	Walls	m2	10		
5	Existing walls including preparation	m2	5		
6	Existing walls in patches including preparation	m2	5		
7	Existing walls in narrow widths including preparation	m2	2		
	EXTERNAL PLASTER				
	One coat cement plaster (1:4) as described on brickwork or concrete on:				
8	Walls	m2	20		
	Carried Forward			R	

	Brought Forward			R	
9	Existing narrow widths including preparation.	m2	30		
10	Existing concrete soffits and beams in patches including preparation	m2	10		
	Cement textured plaster on brickwork:				
11	On walls	m2	80		
12	Walls in narrow widths	m2	20		
	Carried Forward to Summary of Section No. 2			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 10
Plastering

Item No			Quantity	Rate	Amount
	BILL NO. 11				
	TILING				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	NOTE TO TENDERERS: Tenderers are advised that prices for the following tiling must include for the cost of supplying the tiles as designated in all of the items listed below, cost of laying, use and waste in fittings, bedding and grouting in the appropriate and approved material as required, transport, handling, storage, profit and overheads and cleaning down on completion				
	CERAMIC WALL TILES				
	200 x 200 x 6mm 'Samca Shiny' or similar approved wall tiles fixed with adhesive to plaster (elsewhere measured) and flush pointed with tinted jointing compound on:				
1	Existing walls including preparation	m2	536		
2	Existing walls with waterproof grout in isolated panels, splashbacks, etc. including preparation	m2	32		
3	Extra over tiling for plastic edge strip	m	200		
4	Fair exposed cutting and fitting around pipe not exceeding 50mm diameter	No	20		
	MOSAIC WALL TILES				
	Carried Forward			R	

	Brought Forward			R	
	300 x 300mm 'Iced Coffee Brown Slip Resistant Mosaic' or similar approved mosaic tiles fixed with adhesive to plaster, etc. (screed elsewhere measured) and flush pointed with tinted jointing compound on:				
5	Existing walls in narrow widths including preparation	m2	23		
6	Fair exposed cutting and fitting around pipe not exceeding 50mm diameter	No	40		
	CERAMIC FLOOR TILING				
	400 x 400 x 6mm 'Brushed Cement Grey' or similar approved floor tiles fixed with adhesive to plaster (elsewhere measured) and flush pointed with tinted jointing compound:				
7	On floors and landings	m2	331		
8	Skirting 100mm high of cut tiles	m	887		
9	Supply and install tinted jointing compound flush pointed to skirting	m	30		
10	Extra over tiling for plastic edge strip	m	887		
	MOSAIC FLOOR TILES				
	300 x 300mm 'Iced Coffee Brown Slip Resistant Mosaic' or similar approved mosaic tiles fixed with adhesive to screeded floors, etc. (screed elsewhere measured) and flush pointed with tinted jointing compound				
11	Inside shower cubicles	m2	29		
12	Cut and fit tiling around shower outlet.	No	24		
	Carried Forward to Summary of Section No. 2			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 11
Tiling

Item No		Quantity	Rate	Amount

BILL NO. 12

PLUMBING AND DRAINAGE

PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Sealing of edges

Outer edges of sinks, basins, baths, urinals, etc are to be sealed against adjacent surfaces with approved silicone

uPVC pipes and fittings

Sewer and drainage pipes and fittings shall be jointed and sealed with butyl rubber rings

Soil, waste and vent pipes and fittings shall be solvent weld jointed or sealed with butyl rubber rings

Reducing fittings

Where fittings have reducing ends or branches they are described as "reducing" and only the largest end or branch size is given. Should the contractor wish to use other fittings and bushes or reducers he may do so on the understanding that no claim in this regard will be entertained

Fixing of pipes

Unless specifically otherwise stated, descriptions of pipes shall be deemed to include fixing to walls, etc, casting in, building in or suspending not exceeding 1m below suspension level

Carried Forward R

	Brought Forward			R	
	General				
	Descriptions of overflow pipes where measured in number, shall be deemed to include joints to cisterns and splay cut ends				
	Descriptions of service pipes and flexible connecting pipes shall be deemed to include connections to taps, cisterns, etc and to steel pipes (adaptors for connections to copper pipes, etc are given separately)				
	Descriptions of WC pans, slop hoppers, etc shall be deemed to include for joints to soil pipes (pan connectors are separately measured)				
	As-built drawings				
	Where required, the contractor shall prepare an updated set of as-built drawings. At completion of the contract the contractor shall hand these drawings to the principal agent for reproducing onto the originals for handing over to the employer (provision for allowance of as-built drawings elsewhere)				
	RAINWATER DISPOSAL				
	Pre-painted aluminium domestic rainwater goods:				
1	Aluminium gutter to match existing fixed to falls with and including aluminium hangers at 600mm centres to timber fascia	m	123		
2	Extra over gutter for stopped end	No	4		
3	Extra over gutter for 90 degree bend.	No	4		
4	Extra over gutter for outlet for 110mm diameter pipe	No	5		
	Downpipes, etc:				
5	75mm diameter PVC pipe fixed to plastered or faced brick wall with purpose made galvanised mild steel brackets.	m	48		
6	Re-connect existing 75mm diameter downpipe to gutter	No	3		
7	Extra over for bend	No	2		
	Carried Forward			R	

	Brought Forward			R	
8	Extra over pipe for 75mm swan neck 300mm projection.	No	2		
9	Extra over for shoe	No	2		
	SANITARY FITTINGS				
	All rails, brackets, etc. where not bolted are to be fixed with long heavy gauge brass screws into approved expanding plugs.				
	Supply, fix, clean, wash and leave in a satisfactory condition the following items of sanitaryware including silicone pointing between fitting and plastered or tiled wall, partition or vanity top:				
10	White vitreous china wash hand basin size 550 x 430mm as 'Duravit 231055' fitted with 32mm chromium plated slotted waste fitting as 'GIO BW202S' fixed to plastered or tiled wall or similar approved including suitable bottle trap (elsewhere measured), flanges, adapters etc.	No	91		
11	White vitreous china floor standing back inlet pan and cistern as 'Lecico Neon' code ' NEOBOXFFL0MDFBE' complete with MDF toilet seat including sealing foot of bowl with abe Dow Corning acetoxy silicone sealant or similar approved fixed to tiled floor.	No	17		
12	White vitreous china floor standing semi closed couple suite as 'Vaal Pearl Paraplegic' code '730103WH' or similar approved fixed to tiled floor complete with purpose made chromium plated side-flush lever (right) and purpose made urea seat and cover plate, F14C cranked rail and F16C cistern rail	No	1		
	Stainless Steel				
	The following stainless steel fittings are to be Franke Kitchen Systems (Pty) Ltd., or other approved				
	The underside of all sink bowls, sinks and drainers are to be sound deadened by the application of an approved guaranteed vermin proof sound deadening emulsion or fibreglass sheeting				
	All exposed surfaces of stainless steel fittings are to be buffed to an even satin finish all over				
	Carried Forward			R	

	Brought Forward			R	
	Sinks, bowls and basins are to be pressed out of single sheets with complete drainage to outlets and each bowl is to be fitted with integral built-in overflow and chromium plated brass grating and unless otherwise described, 40mm recessed waste outlet and union with chromium plated brass grating, rubber plug and chromium plated brass chain and stay				
	Prices for all stainless steel fittings are to include for the supply and fixing of the fittings as described and for cleaning, washing and leaving in a satisfactory condition at completion				
	1,2mm Thick A.I.S.I. Grade 304 (18/10) stainless steel:				
13	'Franke Projectline Deb' code 'PLN621' drop-in type double end bowl sink and drainer unit size overall 1160 x 460mm wide or similar approved including including 38mm bracket strainer waste fitting with overflow, trap (e/m), sink to include mixer 15mm flexible connection cutting one tap hole and set in preformed opening in timber worktop (elsewhere measured) including necessary timber packing pieces, etc.	No	5		
	0,8 mm Thick A.I.S.I. Grade 430 (17/10) stainless steel:				
14	Supply and install Franke Wash Trough Double ET102 Economy Stainless Steel (1025 x 455mm) or similar approved, including stopper	No	6		
	SANITARY PLUMBING				
	Alterations to existing pipe work, etc.:				
15	Cut into existing 50mm diameter UPVC pipe and supply and insert new junction and connect up new 50mm UPVC branch pipe including all necessary fittings.	No	1		
16	Cut into existing 110mm diameter UPVC pipe and supply and insert new reducing junction and connect up new 50mm UPVC branch pipe including all necessary fittings.	No	2		
	uPVC soil and vent pipes				
17	50mm pipe fixed in walls, ceilings, roofs, floors, etc	m	60		
	Carried Forward			R	

	Brought Forward			R	
18	110mm pipe and fixing to walls, etc	m	60		
19	160mm pipe and fixing to walls, etc	m	12		
	Extra over uPVC soil and vent pipes for fittings				
20	50mm Bend	No	18		
21	50mm Access bend	No	15		
22	50mm Junction	No	5		
23	50mm End cap	No	5		
24	50mm Access pipe	No	18		
25	50mm Double junction	No	5		
26	50mm Inspection junction	No	18		
27	50mm Stubstack	No	6		
28	50mm Air vent cowl	No	18		
29	50mm Two-way vent valve	No	3		
30	110 x 50mm Reducer	No	6		
31	110mm Pan connector	No	24		
32	110mm Bend	No	24		
33	110mm Access bend	No	16		
34	110mm Junction	No	18		
35	110mm Access Junction	No	6		
36	110mm Reducing junction	No	6		
37	110mm Inverted reducing junction	No	1		
38	110mm End cap	No	6		
39	110mm Access pipe	No	5		
	Carried Forward			R	

				R	
	Brought Forward				
40	110mm Double junction	No	5		
41	110mm Stubstack	No	5		
42	110mm Air vent cowl	No	24		
43	110mm Inspection eye bend with oval lid bolted on	No	6		
44	110mm Inspection junction with oval lid bolted on	No	6		
45	110mm Inspection double junction	No	6		
46	110mm 'GI Two-way' vent valve	No	1		
47	160mm Bend	No	6		
48	160mm Access bend	No	6		
	WATER SUPPLIES				
	Alterations to existing pipe work, etc.				
49	Cut into existing 22mm diameter copper pipe and supply and insert new tee or reducing tee including all necessary fittings, etc. to take new branch pipe.	No	6		
	Class 460/2 copper pipes with capillary couplings				
50	15mm Pipes	m	193		
51	22mm Pipes	m	30		
	Extra over Class 460/2 copper pipes for capillary fittings				
52	15mm Fittings	No	144		
53	22mm Fittings	No	18		
	Extra over Class 460/2 copper pipes for compression fittings				
54	15mm Fittings	No	126		
55	22mm Fittings	No	72		
	TRAPS				
	Carried Forward			R	

				R	
	Brought Forward				
	Floor outlets:				
56	Supply and install 'Wirquin James WRSW003' Square Revolutionary Multi-Directional Shower Waste Outlet or similar approved including jointing to uPVC pipe and including the necessary adaptors	No	24		
57	100mm square 'Gio A302' Floor drain including jointing to uPVC pipe and including the necessary adaptors	No	9		
	Flexitraps:				
58	40 x 50mm Butyl rubber 'P' or 'S' trap jointed to waste outlet fitting and UPVC pipe including clamps.	No	10		
59	110mm 'P' trap.	No	18		
	Franke Traps:				
60	40 x 50mm 'Franke - SPAZI F/2' code 'FRA-1120009' double bowl kitchen plumbing kit and joint to waste outlet of fitting and 50mm UPVC pipe including necessary adaptor.	No	4		
	Brass traps, waste unions, etc.:				
61	32 x 32mm Chromium plated bottle trap as 'GIO A186'	No	90		
62	15mm Chromium plated 'Master Ballostop' as 'Cobra 1090' in-line flow control and shut-off valve and joints to copper pipe.	No	139		
63	22mm Chromium plated 'Master Ballostop' as 'Cobra 1090' in-line flow control and shut-off valve and joints to copper pipe.	No	37		
	TAPS, VALVES, ETC.				
	Where taps, valves, etc. are described as jointed to copper pipes, prices are to include, where necessary, for the required capillary or compression joint fittings				
	All taps, stopcocks, etc. are to have the indicators silicone glued into position				
	Carried Forward			R	

				R	
	Brought Forward				
64	Supply and install 'Hansgrohe Crometta 85 28423000' 1Jet Green 6l/min overhead shower with 128mm 'Hansgrohe 27411000' wall mounted shower arm and flange or similar approved and joints to copper	No	32		
65	Supply and install 'Amalfi Jade Plus' chrome exposed shower mixer and column or similar approved and joints to copper	No	1		
66	Supply and install 15mm 'Amalfi Garnet TVGR3000/CH' shower mixer with chrome finish or similar approved fixed to plastered or tiled wall and joints to copper pipe	No	32		
67	Supply and install 15mm chromium plated 'Amalfi Garnet TVGR3031/CH' pillar type sink mixer or similar approved including holing sink for same fixed to tiled or plastered wall and joints to copper pipe	No	4		
68	Supply and install 15mm 'Cobra 3309SB-15' washing machine tap or similar approved fixed to plastered or tiled wall and joints to copper pipe	No	30		
69	Supply and install 15mm 'Amalfi Onyx TVON4815/CH' bib tap with chrome finish or similar approved fixed to basin and joints to copper pipe	No	6		
70	Supply and install 15mm 'Amalfi Onyx TVON4850/CH' pillar tap with chrome finish or similar approved fixed to basin and joints to copper pipe	No	180		
71	Supply and install 15mm 'Cobra 503-21B' elbow action pillar tap with chrome finish or similar approved fixed to basin and joints to copper pipe	No	1		
	FIRE APPLIANCES ETC				
72	'Everyway' or similar approved hose reel with 30m plastic hose, chromium plated stopcock, shut-off nozzle and wall bracket	No	6		
73	4,5kg Dry chemical powder fire extinguisher including backing board fixed to wall.	No	6		
	Carried Forward			R	

				R
	Brought Forward			
74	4,5kg Ozone friendly carbon dioxide fire extinguisher including backing board fixed to wall.	No	1	
	WATER SUPPLIES TO FIRE APPLIANCES			
	Class 460/2 copper pipes			
75	28mm Pipe	m	5	
	Extra over class 460/2 copper fittings for the following capillary fittings			
76	28mm Fittings	No	10	
	Sundries:			
77	Chase brick or block wall for pipes not exceeding 50mm diameter.	m	50	
78	110mm UPVC sleeve into existing coring in slab not exceeding 300mm thick	No	9	
79	Core drilling of holes 100mm diameter through slab not exceeding 300mm thick.	No	9	
80	Minor builders work related to Plumbing and Drainage		Item	
	Testing			
81	Allow for testing the whole of the Sanitary Plumbing, Water Supplies to the satisfaction of the Architect and Local Authorities. All defective work is to be taken out and replaced at the Contractor's expense and the whole re-tested until found satisfactory.		Item	
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
82	Allow a budgetary allowance of R 25 000.00 (Twenty Five Thousand Rands) for Allow for jetting and cleaning existing pipes expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used		Item	
	Carried Forward to Summary of Section No. 2			R

Section No. 2
Nurses Quarters - Block A
Bill No. 12
Plumbing & Drainage

Item No		Quantity	Rate	Amount

BILL NO. 13

ELECTRICAL WORK

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Specifications, drawings, etc

Tenderers are referred to the specifications and drawings, annexed to these bills of quantities for the electrical work, for the full descriptions of the following items which are to be read and priced in conjunction with the said specification and drawings. All items have been measured provisionally and are subject to remeasurement on site.

Distribution boards etc

Rates for distribution boards etc are to include for busbars, jumpers, neutral bars, internal wiring and connections, circuit identification markers, control gear labels, circuit legend cards and working drawings

Switches, socket outlets, etc

Rates for switches, socket outlets, etc are to include for screwing to outlet boxes, connecting up and cover plates

Light fittings

Rates for light fittings are to include for hanging, fixing and connecting and for lamp holders and fluorescent tubes and lamps of the type and wattage described

Carried Forward R

				R	
	Brought Forward				
	SWITCHED SOCKET OUTLETS				
1	Replacement of three-pin socket outlet with double 16A, 3-pin single switched outlet (1 x SANS 164-1 and SANS 164-2) with USB outlet	No	30		
	LIGHT SWITCHES				
2	Replacement of single-way switches	No	20		
	CONDUCTORS (POWERPOINTS)				
3	Remove Cape Town cooker plugs and make good the junction box with lid.	No	13		
4	Supply and install 20A double pole isolator in 4x4 glavanised box. The isolator must have a led indication light to indicate when switched on	No	4		
	LUMINARIES AND ACCESSORIES				
	The LED light fittings are to be the PioLED manufactured or equally approved. Performance requirements shall be according to SANS 475. Luminaries shall also bear the SANS mark of approved and SANS 1464 safety mark.				
5	Replacement of two foot fluorescent fittings in each Nurses Room. The fittings should be decorative and suitable for reading and knock-resistant Linear 2ft 20W, LED white in colour and finish.	No	60		
6	Replacement of bulkheads in bathrooms with IP65 LED, 2ft linear fittings	No	81		
7	Supply and install permanent live circuits using 2.5mm Cu PVC sheathed Cu cable	m	1 600		
8	Supply and install 10A, 10kA circuit breaker into the distribution board	No	4		
9	Replacement of foot lights in the passages of the Nurses Home with LED foot lights to fit into existing recess. To be of tough kick resistant material	No	60		
10	Allow to rewire existing battery backup fittings	No	80		
	Carried Forward			R	

				R	
	Brought Forward				
	ELECTRICAL METERS				
11	Supply and install a DIN rail mounted 3-phase meters to Nurses Home,for six floors in Block A	No	6		
	WIREWAYS AND ACCESSORIES				
12	Supply and install SPD's (Surge Protection Devices), Class II, 3-phase with indication to each DB at Nurses Home	No	12		
13	Supply and install 5A, two pole isolators within 1,5m of extractors	No	15		
14	Supply and install PVC trunking 16mm x 25mm on soffit and walls from DB to isolators for 4 floors. Mount securely at 1 meter intervals with Hilti screws (or similar approved) .	m	100		
15	Supply and install 2,5mm sq. cable, 2 core surfix from DB to the 5A isolators.	m	120		
16	Supply and install 5A 10kA circuit breaker into the distribution board	No	1		
	FIRE DOORS AND ILLUMINATED EXITS AT NURSES ACCOMMODATION				
17	Supply and install 20 mm galvanised conduit type or similar approved from the designated DB to the Maglock panel at the Emergency Exit Doors	m	700		
18	Supply and install 4mm sq surfix cable	No	700		
19	Supply, deliver and install 10A,10kA MCB in panel for 9 floors, 3 per floor	No	27		
20	Supply, deliver and install surface mounted automatic fire door closer , with interface input/output units , similar to that made by Dorma	No	18		
	SUNDRY ITEMS				
	Testing and Commissioning				
21	Testing and commissioning of entire electrical installation & Issue Certificates of Compliance		Item		
	Carried Forward			R	

	Brought Forward		R	
	Construction Record Drawings			
22	Allow for the marking up of prints of the entire installation for the production of construction drawing records. The Engineer shall produce the final drawings.	Item		
	Signs and Labels			
23	Supply and install all power, lighting, and earthing signs and labels as specified and in accordance with all OHS Act requirements	Item		
	Operation Manuals			
24	Supply as per project specifications	Item		
	Maintenance & Guarantees			
25	A 12 month maintenance, after sales support and guarantee	Item		
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
	Lightning Protection			
26	Allow a budgetary allowance of R70 000.00 (Seventy Thousand Rands) for Lightning and Earthing Protection expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used		SUM	
	Sundry Electrical Items:			
27	Allow a budgetary allowance of R90 000.00 (Ninety Thousand Rands) for Sundry Electrical Items including DB Repairs to achieve Compliance expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used		SUM	
	SMOKE DETECTION			
	Carried Forward		R	

				R	
	Brought Forward				
	Supply and install the following:				
28	Power supply with 12V battery and fire escape doors	No	22		
29	Green break glass + perspex cover positoned on the inside of the door	No	22		
30	1mm PH30 cable	m	1 100		
31	Maglock (holding force 500kg)	No	22		
32	Z bracket for maglock fixing	No	22		
33	Labour to install and commission magnetic locks	No	22		
34	Fibre optic splicing	No	12		
35	Configuration and commissioning of full system		Item		
36	Loop cards	No	2		
	Carried Forward to Summary of Section No. 2			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 13
Electrical Work

Item No			Quantity	Rate	Amount
	BILL NO. 14				
	MECHANICAL WORK				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	MECHANICAL VENTILATION INSTALLATION				
	All items have been measured provisionally and are subject to remeasurement on site.				
	Works include the following:				
	Extract Fans				
1	Supply & Install extract fan - vortice vario Ari LLs 150/6 or similar and approved; suitable for wall or window installation c/w external fixed shutter and electrical connection to local isolator and on/off via light switch. EF-01/EA-01: DUTY -97,2 l/s EXTRACT	No	5		
2	Supply & Install extract fan - vortice vario Ari LLs 230/09 or similar and approved; suitable for wall or window installation c/w external fixed shutter and electrical connection to local isolator and on/off via light switch. EF-02/EA-02- DUTY:188 l/s EXTRACT	No			
3	Supply & Install extract fan - vortice vario ARI LLS 300/12 including appropriate timer or similar and approved; suitable for wall or window installation c/w external fixed shutter and electrical connection to isolator and to be controlled via timer. EF-03/EA-03- DUTY: 320 l/s EXTRACT	No	5		
	Carried Forward			R	

	Brought Forward			R	
4	Supply & Install plate-mounted extract fan - HYDOR HPA350/4 CFP-350/4 or similar and approved; suitable for wall or window installation; c/w electrical connection to local isolator and 24hr, 7-day timer control. EF-04/EA-04: DUTY: 720l/s EXTRACT suitable aluminium louvre to be included and installed: SHL12- Alumimium Gravity Louvre 480 x 480mm	No	2		
5	Relocation of On/Off Switch to existing installed Hydor HPA 350/4 / CFP-350/4 Fans to within 1,2 m of exisiting position, including all labour and material costs	No	8		
6	Welding shut on-site of windows adjacent to existing Hydor HPA 350/4 / CFP-350/4 Fans (4 welds per window)	No	10		
	Electrical				
7	Supply and install suitable isolator for extract fan, and associated cabling to power supply point	No	12		
	Door Grilles				
8	DG-1: 400 x 500, supply & fit, natural aluminium anodised	No	15		
	Sundries:				
9	Testing and commissioning of extract fan		Item		
10	12-month maintenance & guarantee		Item		
11	3 sets of Operations & Maintenance Manuals		Item		
	Carried Forward to Summary of Section No. 2			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 14
Mechanical Work

Item No			Quantity	Rate	Amount
	BILL NO. 15				
	GLAZING				
	PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	TOPS, SHELVES, DOORS, MIRRORS, ETC.				
	Supply and install 6 mm Silvered float glass copper backed mirrors with polished edges plugged to plastered or tiled walls or mirror cabinet or built in cupboard:				
1	Mirror 400 x 600mm high	No	120		
2	Mirror 600 x 1300mm high	No	5		
3	Mirror 900 x 500mm high	No	96		
	GLAZING TO STEEL WITH PUTTY				
	Supply and install 4mm thick toughened safety window and/or door glazing				
4	Existing steel sashes in panes exceeding 0,1m2 and not exceeding 0,5m2, including taking out and removing existing glass, removing all putty and preparing rebates.	m2	5		
5	Existing steel sashes in panes exceeding 0,5m2 and not exceeding 2m2, including taking out and removing existing glass, removing all putty and preparing rebates.	m2	25		
	Carried Forward			R	

	Brought Forward			R	
	Supply and install 4mm thick obscure window and/or door glazing				
6	Existing steel sashes in panes exceeding 0,1m2 and not exceeding 0,5m2, including taking out and removing existing glass, removing all putty and preparing rebates.	m2	5		
	GLAZING TO TIMBER FANLIGHTS				
	Supply and install 2 hour rated glazing				
7	Existing fire timber door fanlights in panes exceeding 0,1m2 and not exceeding 0,5m2, including taking out and removing existing glass, removing all putty and preparing rebates.	m2	6		
	GLASS LOUVRES				
8	6mm Obscure glass louvre 150mm wide and fix ends in existing metal louvre clips including preparation	m	10		
	Carried Forward to Summary of Section No. 2			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 15
Glazing

Item No			Quantity	Rate	Amount
	BILL NO. 16				
	PAINTWORK				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	PAINT ON PLASTER, ETC.				
	Prepare surfaces and remove all loose material, apply One coat 'Plascon Professional (PP700)' gypsum and plaster primer (PU800) and two finishing coats 'Plascon Professional Superior Low Sheen (PEM 1000)' pure acrylic emulsion paint or similar approved on:				
1	Walls internally	m2	433		
2	Textured plastered walls	m2	10		
3	Ceilings internally	m2	223		
4	Ceilings externally	m2	62		
5	Columns externally	m2	12		
	Prepare surfaces and remove all loose material, apply One coat 'Plascon Professional (PP700)' gypsum and plaster primer (PU800) and two finishing coats 'Plascon Professional Super Matt (PEM 900)' pure acrylic emulsion paint or similar approved on:				
6	Walls internally	m2	115		
7	Ceilings internally	m2	5		
	Carried Forward			R	

				R	
	Brought Forward				
	Prepare surfaces and remove all loose material, apply One coat 'Plascon Professional (PP700)' gypsum and plaster primer (PU800) and two finishing coats 'Plascon Professional Superior Low Sheen (PHL)' pure acrylic emulsion paint or similar approved on:				
8	Walls internally	m2	726		
9	Ceilings internally	m2	52		
	Clean down, etc and paint with and approved suitable paint for fibre cement ceiling tiles on:				
10	Suspended ceilings internally	m2	50		
	PAINT ON METAL				
	One coat calcium plumbate primer on:				
11	Backs of galvanised steel door frames	m2	1		
	Prepare surfaces and remove all loose material, dust, grease, salts and contamination with 'Plascon Aquasolve Degreaser GR1', apply one coat primer (UC170) one coat 'Plascon Professional undercoat (PU800)' and one finishing coat 'Plascon Water Based Velvaglo (VLW)' or similar approved on galvanised:				
12	Door frames and linings	m2	23		
13	Door screens (measured on flat)	m2	8		
14	Sashes and frames (measured on flat)	m2	400		
15	Balustrading (measured on flat)	m2	126		
16	Copper pipes not exceeding 300mm girth.	m	40		
	Carried Forward			R	

	Brought Forward			R	
	Clean down with galvanise wash primer and apply two finishing coats external quality pure acrylic paint on:				
17	uPVC rainwater down pipe exceeding 50mm and not exceeding 100mm diameter including bends and shoes.	m	200		
	Prepare surfaces and remove all loose material, dust, grease, salts and contamination with Polycell Sugar Soap Powder, rinse with water and apply one coat Plascon Polysafe 18 Primer' and two coats 'Plascon True Color TCR Range' or similar approved paint on:				
18	Existing corrugated roof sheeting	m2	50		
	PAINT ON WOOD				
	One coat general purpose wood primer on:				
19	Backs of frames not exceeding 300mm girth before fixing.	m	7		
	Stop, fill, sand down and prepare wood surfaces and apply one coat 'Plascon Professional Wood Primer (UC2)', one coat 'Plascon Professional undercoat (PU800)' and one finishing coat 'Plascon Water Based Velvaglo (VLW)' or similar approved on:				
20	General surfaces	m2	186		
21	Frames and linings	m2	55		
22	Skirtings, rails, cills, fascias, etc., not exceeding 300mm girth.	m2	6		
	Stop, fill, sand down and prepare wood surfaces and apply three coats of 'Plascon Woodcare Ultra Vanish (X-Range)' or similar approved on:				
23	General surfaces	m2	233		
24	General surfaces of fittings	m2	50		
25	Skirtings, rails, cills, fascias, etc., not exceeding 300mm girth.	m2	211		
	Carried Forward to Summary of Section No. 2			R	

Section No. 2
Nurses Quarters - Block A
Bill No. 16
Paintwork

Item No			Quantity	Rate	Amount
	BILL NO. 17				
	MISCELLANEOUS				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	CURTAINING				
1	Supply and install single heavy duty curtain tracks including wheel runners and end caps	m	270		
	WASHING LINES				
2	Supply and install mini retractable 5m clothesline with 3 lines as 'Retractaline 6003394000025' or similar approved	No	10		
	IRONING BOARDS				
3	Supply and install 'SpaceSaver' wall mounted ironing board cabinet	No	30		
	BIRD PROOFING				
4	Supply and install single braced silver and gold 'Eagle Eye Wind-Driven Kit' or similar approved	No	1		
5	Supply and install land bird 'Eagle Eye Pro-Peller Unit' or similar approved	No	2		
6	Supply and install 'Eagle Eye' double braced kit for high winds or similar approved	No	2		
	Carried Forward			R	

	Brought Forward		R	
	All Project Abortive Works:			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
7	Allow a budgetary allowance of R 50 000.00 (Fifty Thousand Rands) for All Project Abortive Works expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used		SUM	
	Carried Forward to Summary of Section No. 2		R	

Section No. 2
Nurses Quarters - Block A
Bill No. 17
Miscellaneous

SECTION SUMMARY - Nurses Quarters - Block A

Bill No		Page No	Amount
1	Alterations	28	
2	Foundations	31	
3	Masonry	32	
4	Waterproofing	34	
5	Roof Coverings	36	
6	Carpentry & Joinery	41	
7	Ceilings	43	
8	Ironmongery	50	
9	Metalwork	53	
10	Plastering	55	
11	Tiling	57	
12	Plumbing & Drainage	66	
13	Electrical Work	71	
14	Mechanical Work	73	
15	Glazing	75	
16	Paintwork	78	
17	Miscellaneous	80	
	Carried to Final Summary		R

Section No. 2
Nurses Quarters - Block A

Item No		Quantity	Rate	Amount

SECTION NO. 3: NURSES QUARTERS - BLOCK B AND LOBBY

BILL NO. 1

ALTERATIONS

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

General Notes:

The contractor shall carry out the whole of the works with as little mess and noise as possible and with minimum disturbance to adjoining premises and their tenants. He
shall provide proper protection and provide, erect and remove when directed, any temporary tarpaulins that may be necessary during the progress of the works, all to the satisfaction of the principal agent.

Water supply pipes and other piping that may be encountered and found necessary to disconnect or cut, shall be effectually stopped off or grubbed up and removed, and any new connections that may be necessary shall be made with proper fittings, to the satisfaction of the principal agent.

Doors, fanlights, fittings, frames, linings, etc which are to be re-used shall be thoroughly overhauled before refixing including taking off, easing and rehanging, cramping up, re-wedging as required and making good cramps, dowels, etc, and easing, oiling, adjusting and repairing ironmongery as necessary, replacing any glass damaged in removal or subsequently and stopping up all nail and screw holes with tinted plastic wood to match timber, unless otherwise described. Re-painting or re-varnishing is given separately.

Prices for taking out of doors, windows, etc shall include

Carried Forward R

	Brought Forward			R	
	for removal of all beads, architraves, ironmongery, etc. Prices for taking out and removing doors and frames shall include for removing door stops, cabin hooks, etc and making good floor and wall finishes to match existing With regard to building up of openings in existing walls, cement screeds and pavings, granolithic, tops of walls, etc, shall be levelled and prepared for raising of brickwork. Making good of finishes shall include making good of the brick and concrete surfaces onto which the new finishes are applied, where necessary. The contractor will be required to take all dimensions affecting the existing buildings on the site and he will be held solely responsible for the accuracy of all such dimensions where used in the manufacture of new items (doors, windows, fittings, etc). **View Site** Before submitting the tender, the contractor shall visit the site and satisfy himself/herself as to the nature and extent of the work to be done and the value of the materials contained in the buildings or portions of the buildings to be demolished. No claim for any variations of the contract sum in respect of the nature and extent of the work or of inferior or damaged materials will be entertained. **Take out and remove, and prepare all surfaces to receive new, including making good existing surfaces where items have been removed** Plumbing and Sanitary Fittings:				
1	Remove existing damaged downpipes etc; cartaway to approved dumping site to be located by Contractor and prepare to receive new	m	48		
	Floors/Walls and Coverings:				
2	Clean and polish existing floors to staircases, etc.	m2	50		
3	Clean and make good existing tiles to walls and columns	m2	20		
	Carried Forward			R	

	Brought Forward			R	
4	Clean stained external brick walls including removing all organic material including all necessary scaffolding and detergents etc.	m2	1 560		
5	Cleaning of existing aluminium louvres and external façade balustrade including all related scaffolding, detergents etc; to all levels of Nurses Quarter Block B and Lobby façade	m2	660		
6	Remove damaged sections of brick walls and prepare vicinity to receive new.	m2	20		
	<u>Slabs, Ceilings, etc:</u>				
7	Remove damaged ceiling systems including soffits, gridlock suspension system, etc. cart away to approved dumping site to be located by Contractor and prepare to receive new	m2	91		
8	Remove existing 600 x 1200mm boards only existing ceiling grid, etc. cart away to approved dumping site to be located by Contractor and prepare to receive new	m2	50		
9	Remove existing gridlock suspension system, etc. cart away to approved dumping site to be located by Contractor and prepare to receive new	m2	50		
	<u>Doors and Windows:</u>				
10	Remove door and window handle, locks, etc cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	5		
11	Remove existing damaged shower door size 1100 x 1850mm high,etc., cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	2		
	<u>Sundry items:</u>				
12	Remove damaged ironing boards, cart away to approved dumping site to be located by Contractor and prepare to receive new	No	4		
	Carried Forward			R	

	Brought Forward			R	
13	Remove existing ironing board inlet from metal framework and replace with new timber inlet board and cover including sanding and repainting metal supports	No	2		
14	Allow for testing ironing boards for asbestos.		Item		
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 1
Alterations

Item No		Quantity	Rate	Amount

BILL NO. 2

ROOF COVERING

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Roof coverings

Fixing of all roof sheeting is to be in accordance with the Manufacturer's approved Instruction Book

All roof coverings are to be installed to comply with SABS Code of Practice 0237 as applicable

All roof sheeting shall be laid under a five year guarantee for site workmanship and water tightness

Ridge coverings and flashing

Ridge coverings and flashings shall have at least 225mm laps and closers shall have at least 150mm laps at end joints with sufficient laps at angles and intersections.

Rates

Prices for sheeting are to include for all straight cutting and waste, laps, protecting from damage and cleaning down at completion - all in strict accordance with manufacturer's instructions and to the approval of the Principal Agent

Roof coverings, ridge coverings, closers, flashings, etc. are measured net and prices are to include for all laps, screws, bolts, etc. Prices for roof coverings are also to include for straight cutting. All work shall be left completely watertight.

Carried Forward R

	Brought Forward			R	
	FLASHINGS, LININGS, COPINGS, ETC				
	80mm Thick aluminium 'Safintra SAFLOK ZicAL' flashings with 'Colorplus' finish on one side all in accordance with the manufacturer's recommendations or similar approved :				
1	Headwall or sidewall flashing 460mm girth.	m	5		
2	Counter flashing 200mm girth.	m	5		
3	Narrow or broad flute closer 150mm girth.	m	5		
	Sundries				
4	Moulded broad or narrow flute polyethylene filler blocks to suit 'Klip-lok 700' roof profile sheeting.	m	5		
5	Counter flash top of metal flashing to plastered wall with 140mm wide 'Superlaycryl' bandage and seal joint.	m	5		
6	Supply and install aluminium soft-closing trap door to match existing and installed strictly according to fire regulations		Item		
	ROOF INSULATION				
	Sundry Roof Items:				
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
7	Allow a budgetary allowance of R 10 000.00 (Ten Thousand Rands) for Sundry Roof Items including Roof Guarantees expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used			SUM	
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 2
Roof Coverings

Item No			Quantity	Rate	Amount
	BILL NO. 3				
	CARPENTRY AND JOINERY				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	EAVES, VERGES, ETC				
	'Everite Nutec' or similar approved fibre-cement fascias and bargeboards:				
1	12 x 225mm Fascias and barge boards, including plastic H-profile jointing strips.	m	120		
	DUCT COVERS				
	Wrot meranti				
2	20mm Duct cover size 600 x 600mm high	No	2		
	JOINERY FITTINGS				
	Sundry Joinery Fittings:				
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
3	Allow a budgetary allowance of R 30 000.00 (Fifty Thousand Rands) for Sundry Joinery Fittings expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used		Item		
	Carried Forward			R	

	Brought Forward			R
	Reception Area:			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
4	Allow a budgetary allowance of R 30 000.00 (Thirty Thousand Rands) for Reception Area Joinery expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used	Item		
	Carried Forward to Summary of Section No. 3			R

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 3
Carpentry & Joinery

Item No		Quantity	Rate	Amount

BILL NO. 4

CEILINGS, PARTITIONS AND ACCESS FLOORING

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Fixing

Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins, or to be shot-pinned, to brickwork or concrete

Items described as "plugged" shall be deemed to includescrewing to fibre, plastic or metal plugs at not exceeding 500mm centres, and where described as "bolted", the bolts have been given elsewhere

Ceilings

Unless otherwise described ceilings shall be deemed to be
horizontal

Proprietary suspended ceilings

Hangers, suspension grids, "lay-in" panels, etc are to be in accordance with the manufacturers' recommendations

Electrical light fittings, diffusers, panels etc are generally "lay-in" units of the same dimensions as the suspension grid described and allowance must be made in the rates accordingly for their support inclusive of any flexibility in setting out that may be required (ceiling panels have not been deducted and pricing is to take cognisance thereof)

Carried Forward R

	Brought Forward			R	
	SUSPENDED CEILINGS				
	1200 x 600 x 9mm thick 'Pelican Systems' Econotile Vinyl Clad foil back Shell White ceiling tiles, laid on Econogrid pre-painted 38mm exposed steel tee suspension system, including all necessary hangers, grids and hold down clips. Suspension shall be in accordance with the manufacturer`s recommendations and SABISA or similar approved.				
1	Ceilings suspended not exceeding 1m below existing concrete soffits	m2	91		
2	Extra over on openings for light fittings, mechanical diffusers, etc	No	1		
3	Extra over ceiling for 1200 x 600mm recessed light fitting.	No	10		
	1200 x 600 x 9mm thick 'Pelican Systems' Econotile Vinyl Clad foil back Shell White ceiling tiles, laid on existing Econogrid pre-painted 38mm exposed steel tee suspension system, including all necessary hangers, grids and hold down clips. Suspension shall be in accordance with the manufacturer`s recommendations and SABISA or similar approved.				
4	Ceilings suspended not exceeding 1m below existing concrete soffits	m2	223		
	Cornices to suspended ceilings:				
5	'Pelican Systems' Aluminium PS1 shadow wall trim, fixed to plastered brickwork with 5 x 25mm wall anchors at 450mm centres or similar approved	m	116		
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 4
Ceilings

Item No		Quantity	Rate	Amount

BILL NO. 5

IRONMONGERY

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Proprietary items

Where applicable the manufacturers' names or product catalogue titles are given in sub-headings preceding the items

On request returnable samples are to be provided to the principal agent for consideration

Finishes to ironmongery

Where applicable finishes to ironmongery are indicated by suffixes in accordance with the following list:
BS Satin bronze lacquered
CH Chromium plated
SC Satin chromium plated
SE Silver enamelled
GE Grey enamelled
AN Anodised natural
AS Anodised silver
AB Anodised bronze
AG Anodised gold
ABL Anodised black
PB Polished brass
PL Polished and lacquered
PT Epoxy coated
SD Sanded

Carried Forward R

				R	
	Brought Forward				
	Rates				
	Prices are to be based on the specific products/articles specified. If tenderers wish to offer alternative products/articles for certain items, these items are to be clearly marked and the alternative specification given with supporting brochures etc clarifying the features of the products/articles offered				
	HINGES, BOLTS, ETC				
	Manufactured by "Assa Abloy" or "Similar approved"				
1	'UNION' or 'similar approved' 200mm aluminium reflex hinge (code: 8352-200SN).	Pairs	3		
	HANDLES AND LOCKS				
	Manufactured by "Assa Abloy" or "Similar approved"				
2	'Union' or 'equal approved' Gower 3 lever lockset with Chrome handle finish (Code: CZ682-24-52-CH) including powder coated 3 lever lock with Stainless Steel backplate.	No	1		
3	'Union' or 'equal approved' 3 lever mortice lock (Code: 2252-76SS)	No	1		
4	'Union' or 'equal approved' Euro cylinder deadlock (Code: L-2115-78SS)	No	1		
5	'Union' or 'equal approved' stainless steel deadbolt lock (Code: QD35X85MM-SS)	No	1		
6	'Union' or 'equal approved' knob cylinder profile KD SC (Code: 2X19SC)	No	2		
7	'Union' or 'equal approved' single profile MKD SC (Code: 2X20SCMKD)	No	2		
	Carried Forward			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 5
Ironmongery

				R	
	Brought Forward				
8	'Union' or 'equal approved' escutcheon on rose profile (Code: PZ-05SS)	No	2		
9	'Union' or 'equal approved' Stainless steel 230mm BTB pull handle (Code:PHD-BB-225-22SS)	No	2		
10	'Union' or 'equal approved' Steel lever handle on backplates with Chrome handle finish (Code: CZ682-24CH)	No	30		
11	'Union' or 'equal approved' Stainless steel dove pull handle on 150 x 230mm backplates (Code: SS5D96R22-05SS)	No	1		
12	'Union' or 'equal approved' Stainless steel 400mm BTB pull handle (Code: 5206BBSS)	No	4		
13	'UNION' or equal approved double panic bolt touch bar 900mm (code: J-883TD-SIL) with dogging device	No	32		
14	'Union' or equal approved rectangular Stainless Steel flush pull handle (Code: FFP65X50SS), size 65mm x 50mm complete with cupboard lock (Code: LC6315R) fitted to duct doors	No	10		
15	'Union' or equal approved rebate set (code: 2700SS).	No	1		
16	Supply and install mortice lock striker plate, in stainless steel (Grade 304) or (if used) mild steel with a powder - coat finish compatible with Union Lockset 3 Lev - CZ6822452 - Satin Chrome or similar approved, to timber door frames, including all fixings.	m	1		
	DOOR CLOSERS				
17	'ASSA ABLOY' or equal approved rack and pinion door closer with link arm (Code: DC200) fixed to steel frame	No	30		
18	'ASSA ABLOY' or equal approved cam action door closer (Code: DC500) fixed to steel or timber frame	No	4		
	Carried Forward			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 5
Ironmongery

	Brought Forward			R	
19	'ASSA ABLOY' or equal approved overhead double door closer with Cam-Motion® technology and guide rail with integrated mechanical coordinator (Code: FD461-DC500) complete with mounting plates (Code: DCA120-40) fixed to steel frames	No	2		
20	'ASSA ABLOY' or equal approved overhead double door closer with Cam-Motion® technology and guide rail with integrated mechanical coordinator (Code: FD462-DC500) complete with mounting plates (Code: DCA120-40) fixed to steel frames	No	9		
	Carried Forward			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 5
Ironmongery

	Brought Forward			R	
	SUNDRIES				
	Manufactured by "Assa Abloy" or "Similar approved"				
21	'UNION' or 'similar approved' stainless steel door stop (code: AL8730AS) with Stainless Steel finish	No	36		
22	'UNION' or equal approved street surface loop (code: EDS-ABK-401).	No	1		
23	'ASSA ABLOY' or equal approved cam action floor spring (Code: DCA420DAHO) including preparation to receive same	No	1		
24	'ASSA ABLOY' or equal approved emergency exit unlocking box (Code: BGLASS-R) including preparation to receive same	No	1		
25	'ASSA ABLOY' or equal approved emergency exit unlocking box (Code: BGLASS-G) including preparation to receive same	No	1		
	PUSH PLATES AND KICKING PLATES				
	The following door protection is to be A.I.S.I. Grade 304 satin polished stainless steel fixed to timber doors with an approved epoxy adhesive (no screw holes).				
26	800 x 250 x 0,9mm Thick kick plate.	No	1		
27	150 x 230 x 0,9mm Thick push plates.	No	2		
28	150 x 230mm Stainless steel push plate (Code:SS5023-06-228W) including fixing screws	No	1		
29	150 x 230mm Stainless steel push plate with euro cylinder (Code:SS5023L-05-228W) including fixing screws	No	1		
	Carried Forward			R	

	Brought Forward			R	
	BATHROOM FITTINGS				
30	Supply sanitary 12L pedal operated sanitary bin	No	34		
	SIGNAGE				
	Sundries:				
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
31	Allow a budgetary allowance of R 10 000.00 (Twenty Thousand Rands) for Sundry Ironmongery expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used			SUM	
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 5
Ironmongery

Item No			Quantity	Rate	Amount
	BILL NO. 6				
	METALWORK				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	SHOWER DOORS				
	Shower doors:				
1	Supply and install white aluminium adjustable shower door size 900 to 1200 x 1850mm high or similar approved (PC. of R5000.00 each supply only excluding VAT). Prices are to include for sandblasting to glass and sealing all round with approved silicone waterproofing sealant at junction/gaps with tiled walls, etc.	No	2		
	WALL CORNER PROTECTION				
	Stainless steel Grade 316:				
2	50 x 50 x 0,9mm Thick angle corner protector 1200mm long glued to concrete or plastered or tiled walls or columns including necessary preparation.	m	3		
3	25 x 15 x 0,9mm Thick angle corner protector 2440mm long glued to plastered or tiled wall including necessary preparation.	m	3		
	Carried Forward			R	

	Brought Forward			R	
	ALUMINIUM WINDOWS				
	Purpose made heavy duty 'ANSO CLIP 44' or other approved white powder coated anodised aluminium shopfront system glazed with 4mm clear toughened safety glass (in accordance with SANS10400-N and AAMSA Regulations) unless otherwise stated complete with frame to be fitted on existing brick or concrete wall including all necessary ironmongery				
4	Window size 1000 x 1500mm high overall comprising one top hung opening out casements, and one fixed light	No	1		
5	Boxing in around Extractor Fan size 480 x 480mm with metal sheets on existing steel sashes in panes exceeding 0,1m2 and not exceeding 0,5m2	m2			
	Purpose made heavy duty 'ANSO CLIP 44' or other approved natural anodised aluminium shopfront system glazed with 6mm clear toughened safety glass (in accordance with SANS10400-N and AAMSA Regulations) unless otherwise stated complete with frame to be fitted on existing brick or concrete wall ironmongery elsewhere measured				
6	Double door frame size 1500 x 2400mm high overall with comprising two equal leaves with mid rail and four fixed glass panes to match existing	No	1		
	EXTERNAL ALUMINIUM LOUVRES				
	POWDER COATED HORIZONTAL ALUMINIUM LOUVRE UNITS				
	Aluminium fixed louvre units fixed to brickwork or concrete or steel				
7	Supply and install Z profile aluminium louvre panel to match existing approximately 230mm girth fixed to existing aluminium brackets including scaffolding where necessary	m	30		
	Carried Forward			R	

	Brought Forward		R	
	ALUMINIUM DOORS			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
8	Allow a budgetary allowance of R 5 000.00 (Five Thousand Rands) for servicing and/or replacing aluminium doors and windows expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used		SUM	
	BALUSTRADING			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
9	Allow a budgetary allowance of R 10 000.00 (Ten Thousand Rands) for minor repairs to existing damaged balustrades expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used	Item		
	Carried Forward to Summary of Section No. 3		R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 6
Metalwork

Item No			Quantity	Rate	Amount
	BILL NO. 7				
	PLASTERING				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	EXTERNAL PLASTER				
	One coat cement plaster (1:4) as described on brickwork or concrete on:				
1	Existing walls	m2	10		
2	Existing narrow widths including preparation.	m2	10		
3	On narrow widths	m2	10		
	Cement textured plaster on brickwork:				
4	Existing walls including preparation	m2	60		
5	Existing walls in narrow widths including preparation	m2	10		
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 7
Plastering

Item No			Quantity	Rate	Amount
	BILL NO. 8				
	TILING				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	NOTE TO TENDERERS: Tenderers are advised that prices for the following tiling must include for the cost of supplying the tiles as designated in all of the items listed below, cost of laying, use and waste in fittings, bedding and grouting in the appropriate and approved material as required, transport, handling, storage, profit and overheads and cleaning down on completion.				
	CERAMIC FLOOR TILING				
	600 x 600 x 6mm 'Tile Afrika - Mozart Dove' or similar approved fixed with adhesive to screed (elsewhere measured) and flush pointed with tinted jointing compound				
1	On existing screeded floors and landings including preparation	m2	90		
2	Skirting 100mm high of cut tiles	m	63		
3	Extra over tiling for plastic edge strip	m	63		
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 8
Tiling

Item No		Quantity	Rate	Amount

BILL NO. 9

PLUMBING AND DRAINAGE

PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Sealing of edges

Outer edges of sinks, basins, baths, urinals, etc are to be sealed against adjacent surfaces with approved silicone

uPVC pipes and fittings

Sewer and drainage pipes and fittings shall be jointed and sealed with butyl rubber rings

Soil, waste and vent pipes and fittings shall be solvent weld jointed or sealed with butyl rubber rings

Reducing fittings

Where fittings have reducing ends or branches they are described as "reducing" and only the largest end or branch size is given. Should the contractor wish to use other fittings and bushes or reducers he may do so on the understanding that no claim in this regard will be entertained

Fixing of pipes

Unless specifically otherwise stated, descriptions of pipes shall be deemed to include fixing to walls, etc, casting in, building in or suspending not exceeding 1m below suspension level

Carried Forward R

	Brought Forward			R	
	General				
	Descriptions of overflow pipes where measured in number, shall be deemed to include joints to cisterns and splay cut ends				
	Descriptions of service pipes and flexible connecting pipes shall be deemed to include connections to taps, cisterns, etc and to steel pipes (adaptors for connections to copper pipes, etc are given separately)				
	Descriptions of WC pans, slop hoppers, etc shall be deemed to include for joints to soil pipes (pan connectors are separately measured)				
	As-built drawings				
	Where required, the contractor shall prepare an updated setof as-built drawings. At completion of the contract thecontractor shall hand these drawings to the principal agentfor reproducing onto the originals for handing over to theemployer (provision for allowance of as-built drawingselsewhere)				
	RAINWATER DISPOSAL				
	Pre-painted aluminium domestic rainwater goods:				
1	Aluminium gutter to match existing fixed to falls with and including aluminium hangers at 600mm centres to timber fascia	m	95		
2	Extra over gutter for stopped end	No	2		
3	Extra over gutter for 90 degree bend.	No	4		
4	Extra over gutter for outlet for 110mm diameter pipe	No	5		
	Downpipes, etc:				
5	75mm diameter PVC pipe fixed to plastered or faced brick wall with purpose made galvanised mild steel brackets.	m	48		
6	Re-connect existing 75mm diameter downpipe to gutter	No	3		
7	Extra over for bend	No	2		
	Carried Forward			R	

	Brought Forward			R	
8	Extra over pipe for 75mm swan neck 300mm projection.	No	2		
9	Extra over for shoe	No	2		
	SANITARY FITTINGS				
	All rails, brackets, etc. where not bolted are to be fixed with long heavy gauge brass screws into approved expanding plugs.				
	Supply, fix, clean, wash and leave in a satisfactory condition the following items of sanitaryware including silicone pointing between fitting and plastered or tiled wall, partition or vanity top:				
	Stainless Steel				
	The following stainless steel fittings are to be Franke Kitchen Systems (Pty) Ltd., or other approved				
	The underside of all sink bowls, sinks and drainers are to be sound deadened by the application of an approved guaranteed vermin proof sound deadening emulsion or fibreglass sheeting				
	All exposed surfaces of stainless steel fittings are to be buffed to an even satin finish all over				
	Sinks, bowls and basins are to be pressed out of single sheets with complete drainage to outlets and each bowl is to be fitted with integral built-in overflow and chromium plated brass grating and unless otherwise described, 40mm recessed waste outlet and union with chromium plated brass grating, rubber plug and chromium plated brass chain and stay				
	Prices for all stainless steel fittings are to include for the supply and fixing of the fittings as described and for cleaning, washing and leaving in a satisfactory condition at completion				
	Carried Forward			R	

	Brought Forward			R	
	1,2mm Thick A.I.S.I. Grade 304 (18/10) stainless steel:				
10	'Franke Projectline Deb' code 'PLN621' drop-in type double end bowl sink and drainer unit size overall 1160 x 460mm wide or similar approved including including 38mm bracket strainer waste fitting with overflow, trap (e/m), sink to include mixer 15mm flexible connection cutting one tap hole and set in preformed opening in timber worktop (elsewhere measured) including necessary timber packing pieces, etc.	No	1		
	0,8 mm Thick A.I.S.I. Grade 430 (17/10) stainless steel:				
11	Supply and install Franke Wash Trough Double ET102 Economy Stainless Steel (1025 x 455mm) or similar approved, including stopper	No	1		
	SANITARY PLUMBING				
	Alterations to existing pipe work, etc.:				
	uPVC soil and vent pipes				
12	50mm pipe fixed in walls, ceilings, roofs, floors, etc	m	10		
	Extra over uPVC soil and vent pipes for fittings				
13	50mm Bend	No	2		
	WATER SUPPLIES				
	Class 460/2 copper pipes with capillary couplings				
14	15mm Pipes	m	3		
	Extra over Class 460/2 copper pipes for capillary fittings				
15	15mm Fittings	No	3		
	Extra over Class 460/2 copper pipes for compression fittings				
16	15mm Fittings	No	2		
	Carried Forward			R	

	Brought Forward			R	
	Franke Traps:				
17	40 x 50mm 'Franke - SPAZI F/2' code 'FRA-1120009' double bowl kitchen plumbing kit and joint to waste outlet of fitting and 50mm UPVC pipe including necessary adaptor.	No	1		
	Brass traps, waste unions, etc.:				
18	15mm Chromium plated 'Master Ballostop' as 'Cobra 1090' in-line flow control and shut-off valve and joints to copper pipe.	No	1		
	TAPS, VALVES, ETC.				
	Where taps, valves, etc. are described as jointed to copper pipes, prices are to include, where necessary, for the required capillary or compression joint fittings				
	All taps, stopcocks, etc. are to have the indicators silicone glued into position				
19	Supply and install 'Cobra Stella 3351ST-15-HQ' bath mixer with diverter & hand shower or similar approved	No	1		
20	Supply and install 15mm chromium plated 'Amalfi Garnet TVGR3031/CH' pillar type sink mixer or similar approved including holing sink for same fixed to tiled or plastered wall and joints to copper pipe	No	1		
21	Supply and install 15mm 'Cobra 3309SB-15' washing machine tap or similar approved fixed to plastered or tiled wall and joints to copper pipe	No	4		
22	Supply and install 15mm 'Amalfi Onyx TVON4815/CH' bib tap with chrome finish or similar approved fixed to basin and joints to copper pipe	No	6		
23	Supply and install 15mm 'Amalfi Onyx TVON4850/CH' pillar tap with chrome finish or similar approved fixed to basin and joints to copper pipe	No	2		
	Carried Forward			R	

				R	
	Brought Forward				
	FIRE APPLIANCES ETC				
24	'Everyway' or similar approved hose reel with 30m plastic hose, chromium plated stopcock, shut-off nozzle and wall bracket	No	8		
25	4,5kg Dry chemical powder fire extinguisher including backing board fixed to wall.	No	6		
26	4,5kg Ozone friendly carbon dioxide fire extinguisher including backing board fixed to wall.	No	2		
	WATER SUPPLIES TO FIRE APPLIANCES				
	Class 460/2 copper pipes				
27	28mm Pipe	m	8		
	Extra over class 460/2 copper fittings for the following capillary fittings				
28	28mm Fittings	No	1		
	Sundries:				
29	Minor builders work related to Plumbing and Drainage		Item		
	Testing				
30	Allow for testing the whole of the Sanitary Plumbing, Water Supplies to the satisfaction of the Architect and Local Authorities. All defective work is to be taken out and replaced at the Contractor's expense and the whole re-tested until found satisfactory.		Item		
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
31	Allow a budgetary allowance of R 20 000.00 (Twenty Thousand Rands) for Allow for jetting and cleaning existing pipes expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used			SUM	
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 9
Plumbing & Drainage

Item No		Quantity	Rate	Amount

BILL NO. 10

ELECTRICAL WORK

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Specifications, drawings, etc

Tenderers are referred to the specifications and drawings, annexed to these bills of quantities for the electrical work, for the full descriptions of the following items which are to be read and priced in conjunction with the said specification and drawings. All items have been measured provisionally and are subject to remeasurement on site.

Distribution boards etc

Rates for distribution boards etc are to include for busbars, jumpers, neutral bars, internal wiring and connections, circuit identification markers, control gear labels, circuit legend cards and working drawings

Switches, socket outlets, etc

Rates for switches, socket outlets, etc are to include for screwing to outlet boxes, connecting up and cover plates

Light fittings

Rates for light fittings are to include for hanging, fixing and connecting and for lamp holders and fluorescent tubes and lamps of the type and wattage described

Carried Forward R

				R	
	Brought Forward				
	SWITCHED SOCKET OUTLETS				
1	Replacement of three-pin socket outlet with double 16A, 3-pin single switched outlet (1 x SANS 164-1 and SANS 164-2) with USB outlet	No	9		
2	Supply and installation of surface mount, three-pin socket outlet with double 16A(1 x SANS 164-1 and SANS 164-2) (3 off per kitchenette)	No	1		
3	Supply and install PVC trunking 16mm x 25mm on soffit and walls . Mount securely at 1 meter intervals with Hilti screws (or similar approved) .	m	300		
4	supply and install 2.5mm surfix cable white	m	300		
5	Supply and install 16A, 10KA circuit breaker in the distribution board	No	2		
	CONDUCTORS (POWERPOINTS)				
6	Supply and install 25mm surface mount conduit	m	200		
7	Supply and install 4mm surfix wire white	m	200		
8	Supply and installation of double-pole stove isolators (in suface mounted enclosure) in kitchenette.	No	5		
9	Supply and install 25mm pvc spraugue	m	15		
10	Supply and install 4mm Cu PVC house wire between isolator and stove	m	50		
11	Supply and installation of 40A, 10kA single-pole circuit breaker in designated DB.	No	5		
	LIGHT SWITCHES				
12	Replacement of single-way switches	No	30		
	LUMINARIES AND ACCESSORIES				
	Carried Forward			R	

	Brought Forward			R	
	The LED light fittings are to be the PioLED manufactured or equally approved. Performance requirements shall be according to SANS 475. Luminaries shall also bear the SANS mark of approved and SANS 1464 safety mark.				
13	Replacement of five foot fluorescent fittings in the kitchen and laundry with 5ft 60W, LED linear fittings white in colour and finish.	No	55		
14	Replacement of bulkheads in bathrooms and plantrooms with IP65 LED, 2ft linear fittings	No	54		
15	Replacement of foot lights in the passages of the Nurses Quarters with LED foot lights to fit into existing recess. To be of tough kick resistant material	No	30		
16	Replacement of galleries and frosted glass shades, with white trim LED bulkheads 18 watts. Make electrically and aesthetically good the junction box and connections .	No	60		
17	Supply and install permanent live circuits using 2.5mm Cu PVC sheathed Cu cable	m	1 600		
18	Supply and install 10A, 10kA circuit breaker into the distribution board	No	5		
19	Allow to rewire existing battery backup fittings	No	80		
	ELECTRICAL METERS				
20	Supply and install a DIN rail mounted 3-phase meters to Nurses Home. There are six floors each of Block B	No	6		
	WIREWAYS AND ACCESSORIES				
21	Supply and install SPD's (Surge Protection Devices), Class II, 3-phase with indication to each DB at Nurses Home	No	12		
22	Supply and install 5A, two pole isolators within 1.5m of extractors.	No	13		
23	Supply and install 10A 10kA circuit breaker into Db	No	4		
	Carried Forward			R	

	Brought Forward			R	
24	Supply and install trunking 16mm x 25mm on soffit and walls from DB to isolators for 4 floors. Mount securely at 1 meter intervals with Hilti screws (or similar approved) .	m	100		
25	Supply and install 2,5mm sq. cable, surfix from DB to the 5A isolators.	m	200		
	FIRE DOORS AND ILLUMINATED EXITS AT NURSES ACCOMMODATION				
26	Supply and install 20 mm galvanised conduit type or similar approved from the designated DB to the Maglock panel at the Emergency Exit Doors	m	700		
27	Supply and install 4mm sq surfix cable	m	700		
28	Supply, deliver and install 10A, 10kA MCB in panel for 8 floors, 2 per floor	No	20		
29	Supply, deliver and install surface mounted automatic fire door closer, with interface input/output units , similar to that made by Dorma	No	10		
	NURSES ACCOMMODATION HEAT PUMPS				
	Supply, Deliver and Install the following:				
30	Supply and install 160A, 50KA circuit breaker into main LV building distribution board	No	1		
31	Supply & Install 100mm Premier Heavy Duty cable tray from substation 8 to plant room - to be hot dip galvanised	m	50		
32	3-phase, 4 core PVC, SWA ECC 35mm sq. cable from Nurse's substation (non-essential supply) and terminate into DB (supplied by others) in the plant room. Supply glanding.	m	55		
	SUNDRY ITEMS				
	Testing and Commissioning				
33	Testing and commissioning of entire electrical installation & Issue Certificates of Compliance		Item		
	Carried Forward			R	

				R	
	Brought Forward				
	Construction Record Drawings				
34	Allow for the marking up of prints of the entire installation for the production of construction drawing records. The Engineer shall produce the final drawings.		Item		
	Signs and Labels				
35	Supply and install all power, lighting, and earthing signs and labels as specified and in accordance with all OHS Act requirements		Item		
	Operation Manuals				
36	Supply as per project specifications		Item		
	Maintenance & Guarantees				
37	A 12 month maintenance, after sales support and guarantee		Item		
	Sundry Electrical Items:				
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
38	Allow a budgetary allowance of R90 000.00 (Ninety Thousand Rands) for Sundry Electrical Items including DB Repairs to achieve Compliance expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used			SUM	
	SMOKE DETECTION				
	Supply and install the following:				
39	Power supply with 12V battery and fire escape doors	No	21		
40	Green break glass + perspex cover positoned on the inside of the door	No	21		
41	1mm PH30 cable	m	1 050		
42	Maglock (holding force 500kg)	No	21		
	Carried Forward			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 10
Electrical Work

	Brought Forward			R	
43	Z bracket for maglock fixing	No	21		
44	Labour to install and commission magnetic locks	No	21		
45	Configuration and commissioning of full system		Item		
46	Loop cards	No	2		
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 10
Electrical Work

Item No			Quantity	Rate	Amount
	BILL NO. 11				
	MECHANICAL WORK				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	HOT WATER INSTALLATION				
	Works include the following:				
	1. Complete supply, delivery, installation, testing & commissioning of the new hot water system together with associated pumps, piping reticulation, piping supports, valves, fittings and labelling.				
	2. Isolation, decommissioning and removal of certain existing hot water equipment, together with associated pipework and fittings. All equipment to be handed over to Greys Hospital Maintenance Department.				
	3. Isolation and termination of existing Steam lines.				
	4. Testing of existing supplies to the building and reticulation in the building				
	5. All items have been measured provisionally and are subject to remeasurement on site.				
	Existing Services				
1	Isolating, decommissioning, disconnection & removal of existing 5,500 litres hot water tank, including all associated pipework, valves & fittings.	No	1		
2	Isolating, terminating and blanking off existing 110 dia steam supply and return line		Item		
	Carried Forward			R	

	Brought Forward			R	
3	Isolating, terminating and removing all existing pipework, valves & fittings remaining in plantroom	Item			
4	Allow for flow testing of existing domestic cold water reticulation in building	Item			
5	Allow for flow testing of existing domestic hot water reticulation system in building	Item			
6	Allow for flow testing of existing Fire water reticulation system	Item			
7	Allow for pressure testing of existing domestic cold water reticulation system in building	Item			
8	Allow for pressure testing of existing domestic hot water reticulation system in building	Item			
9	Allow for pressure testing of existing Fire water reticulation system in building	Item			
10	Testing of Municipal water quality	Item			
	Equipment				
11	Installation of a 6 000 litre horizontal hot water vessel, other approved.Excluding internal electrical heating elementsManufactured according toASMEVIII div 1 and SANS 347:2012 Standards6mm shell thickness, Dish Ends and Shell to be constructed with S355JR (300WA) Steel, 400NB Manhole for easy maintenance.Tesing pressure 900 kPa, Operating pressure 600 kPa,Internally treated with epoxy coating Externally treated with weatherproof epoxy and galvanised steel cladding.Insulation and Galvanized Steel cladding included.All pipework connections between tanks and heatpumps to be fitted with lagging and galvanised-steel cladded.Drain and drain piping included, all safety features, supports and all necessary accessories as specified. All pipework interconnection between tanks and heat pumps to be fitted with lagging and cladding.All ports to be flanged. This item has been supplied and delivered as new to the site under the previous contractor.	Item			
	Carried Forward			R	

	Brought Forward			R	
12	Supply, delivery and installation of a 80kW Air to Water Heat Pump, Thermowise TKRS-800E/SN2-M, or other approved, with Smart Colour Touchscreen controller. 19,3kW, 380V Input Heating to 60°C, minimum ambient temperature 5 °C Including controller, automatic defrost cycle, all safety features, thermostats, controls, connection to main control panel, with maximum noise level of 70dB(A), fittings, insulation, cladding, bends,tees, and necessary accessories as specified. All pipework interconnection between tank and heat pumps to be fitted with lagging as specified, including PVC drains to nearest drainage point. Blu Chem Coil treatment or similar coil treatment to improve lifespan of coil to be included.	No	2		
13	Blu Chem treatment or similar, and Installation of a 80kW Air to Water Heat Pump, Thermowise TKRS-800E/SN2-M, or other approved, with Smart Colour Touchscreen controller. 19,3kW, 380V Input Heating to 60°C, minimum ambient temperature 5 °C Including controller, automatic defrost cycle, all safety features, thermostats, controls, connection to main control panel, with maximum noise level of 70dB(A), fittings, insulation, cladding, bends,tees, and necessary accessories as specified. All pipework interconnection between tank and heat pumps to be fitted with lagging as specified, including PVC drains to nearest drainage point. (Heat pump is new, has been delivered to site has not been unboxed).		Item		
14	Allowance for the Supply, delivery & installation of electrical control panel (IP54) complete with all switchgear, contactors, circuit breakers, fuses, warning lights & alarms, over/under current protection, Phase rotation protection, toggle switches and isolator(s); and including all electrical & control wiring, cable trays, conduit (Bossal type or other approved), saddles, brackets, fittings and all necessary accessories in accordance to the specification and manufacturer's recommendations for the hot water plant installation. **Panel to Control 2 x Circulation Pumps, 3 x Hot Water Return Pumps and 3 x 80kW Heat Pumps**		Item		
15	installation of circulation pumps for Heat Pumps: Grundfos CM 15-2 (pumps are new, have been delivered to site and are stored on site, unopened)	No	1		
16	Supply, delivery & installation of Hot Water Return circulation pumps: Grundfos UPS 25-60-180	No	2		
	Carried Forward			R	

	Brought Forward			R	
17	Electrical connections and wiring of Heat Pumps	No	3		
18	Electrical connections and wiring of Circulation Pumps	No	5		
	Piping, fittings, valves & insulation				
	Supply & install Copper piping (SANS 460 Copper class 2), including pipework between heatpumps and hot water vessels; including tie-ins to domestic cold water, hot water and hot water return.				
19	108mm diameter	m	15		
20	76mm diameter	m	15		
21	67mm diameter	m	15		
22	54mm diameter	m	55		
23	42mm diameter	m	10		
24	35mm diameter	m	10		
25	28mm diameter	m	10		
26	22mm diameter	m	10		
	Supply & Install Copper class 2 Fittings for piping				
	Elbows, Tees, Reducers, Reducing Tees, Straight Connectors:				
27	108mm Elbow	No	6		
28	108mm Tee	No	4		
29	108mm Reducing tees	No	1		
30	108mm Reducer	No	2		
31	108mm Straight coupler	No	8		
32	76mm Elbow	No	4		
33	76mm Tee	No	2		
	Carried Forward			R	

				R	
	Brought Forward				
34	76mm Reducing tee	No	1		
35	76mm Reducer	No	2		
36	76mm Straight coupler	No	5		
37	67mm Elbow	No	10		
38	67mm Tee	No	2		
39	67mm Reducing tee	No	6		
40	67mm Reducer	No	2		
41	67mm Straight coupler	No	15		
42	54mm fittings	No	45		
43	42mm fittings	No	15		
44	35mm fittings	No	15		
45	28mm fittings	No	15		
46	22mm fittings	No	15		
	Insulation				
	Supply & Install k-flex installation, or other approved, with R-value of 0.8 m2/kw, complete with 0.5mm galvaised sheet metal cladding				
	For piping:				
47	76mm diameter	m	15		
48	67mm diameter	m	15		
49	54mm diameter	m	55		
	Carried Forward			R	

	Brought Forward			R	
50	42mm diameter	m	10		
51	35mm diameter	m	10		
52	28mm diameter	m	10		
53	22mm diameter	m	10		
	For fittings:				
54	76mm fittings	No	14		
55	67mm fittings	No	15		
56	54mm fittings	No	45		
57	42mm fittings	No	15		
58	35mm fittings	No	15		
59	28mm fittings	No	15		
60	22mm fittings	No	15		
61	Hangers & brackets			SUM	
	Supply & Install MEPLA piping for tank drain point, including sleeves, fittings and consumables				
62	50mm diameter	m	10		
	Inline Y-Strainers:				
63	108mm diameter	No	1		
64	54mm diameter	No	5		
	Ball valves				
65	108mm diameter	No	7		
66	76mm diameter	No	2		
67	67mm diameter	No	2		
	Carried Forward			R	

				R	
	Brought Forward				
68	54mm diameter	No	25		
69	42mm diameter	No	2		
70	35mm diameter	No	2		
71	28mm diameter	No	2		
72	22mm diameter	No	2		
	Non-return valves				
73	108mm diameter	No	1		
74	54mm diameter	No	5		
	Pressure reducing valves				
75	108mm diameter	No	1		
76	Safety valves, including all fittings and accessories	No	5		
77	Temperature gauges	No	12		
78	Pressure gauges	No	5		
79	Binder test port connections	No	10		
80	Water Meter on main incoming domestic water line		Item		
	GENERAL				
81	Transport & rigging of equipment		Item		
82	Hydraulic calculations		Item		
83	Minor Builders work associated with hot water installation (including drilling, sleeves, making good etc. Excluding plinths measured elsewhere)		Item		
84	Preparation of Workshop drawings & printing (3 sets)		Item		
	Carried Forward			R	

	Brought Forward			R	
85	Commissioning & Testing the complete hot water system		Item		
86	12 months Maintenance & Guarantee of hot water system		Item		
87	3 sets of Operations & Maintenance Manuals		Item		
88	Signs & labels, as specified and in accordance with OHS Act		Item		
89	Preparation of As-buit drawings & printing (3 sets)		Item		
90	Training of Hospital Maintenance staff		Item		
91	Plumbing CoC		Item		
92	Electrical CoC		Item		
	MECHANICAL VENTILATION INSTALLATION				
	Works include the following:				
	Extract Fans				
93	Supply & Install extract fan - Vortice Vario ARI LLs 150/6 or similar and approved; suitable for wall or window installation c/w external fixed shutter and electrical connection to local isolator and on/off via light switch. EF-01/EA-01- DUTY : 97,2 l/s EXTRACT	No	5		
94	Supply & Install extract fan - Vortice Vario ARI LLs 230/09 or similar and approved; suitable for wall or window installation c/w external fixed shutter and electrical connection to local isolator and on/off via light switch. EF-02/EA-O2:DUTY- 188 l/s EXTRACT	No	5		
95	Supply & Install extract fan - vortice vario ARI LLs 300/12 or similar and approved; suitable for wall or window installation c/w external fixed shutter and electrical connection to local isolator and on/off via light switch. EF-03/EA-03:DUTY - 320 l/s EXTRACT	No			
	Carried Forward			R	

	Brought Forward			R	
96	Supply & Install plate-mounted extract fan - Hydor HPA 350/4 / CFP-350/4 or similar and approved; suitable for wall or window installation; c/w electrical connection to local isolator and 24hr, 7-day timer control. EF-04/EA-04:DUTY - 720l/s EXTRACT suitable aluminium louvre to be included SHL12-Alumimium Gravity Louvre 480 x 480mm in hot water plantroom	No			
97	Relocation of On/Off switch to existing Hydor HPA 350/4 /CPF-350/4 Fans to within 1,2m of existing position, including all labour and material costs	No	8		
98	Welding shut on-site of windows adjacent to existing Hydor HPA 350/4 /CFP-350/4 Fans. (4 welds per window)	No	12		
	Electrical				
99	Supply and install suitable isolator for extract fan, and associated cabling to power supply point	No	10		
	Door Grilles				
100	DG-1: 400 x 500, supply & fit, natural aluminium anodised	No	13		
	Weather Louvres				
101	Remove existing and replace with 1800 x 900mm louvre at plantrooms, aluminium anodised with wire mesh (vermin proof)	No	2		
	Sundries:				
102	Testing and commissioning of extract fan		Item		
103	12-month maintenance & guarantee		Item		
104	3 sets of Operations & Maintenance Manuals		Item		
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 11
Mechanical Work

Item No			Quantity	Rate	Amount
	BILL NO. 12				
	GLAZING				
	PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	GLAZING TO STEEL WITH PUTTY				
	Supply and install 4mm thick toughened safety window and/or door glazing				
1	Existing steel sashes in panes exceeding 0,1m2 and not exceeding 0,5m2, including taking out and removing existing glass, removing all putty and preparing rebates.	m2	2		
2	Existing steel sashes in panes exceeding 0,5m2 and not exceeding 2m2, including taking out and removing existing glass, removing all putty and preparing rebates.	m2	2		
	GLAZING TO TIMBER FANLIGHTS				
	Supply and install 2 hour rated glazing				
3	Existing fire timber door fanlights in panes exceeding 0,1m2 and not exceeding 0,5m2, including taking out and removing existing glass, removing all putty and preparing rebates.	m2	13		
	GLASS LOUVRES				
4	6mm Obscure glass louvre 150mm wide and fix ends in existing metal louvre clips including preparation	m	1		
	SUNDRIES				
5	Supply and install film glazing to shopfronts to match existing	m2	48		
	Carried Forward to Summary of Section No. 3			R	
	Section No. 3 Nurses Quarters - Block B and Lobby Bill No. 12 Glazing				

Item No			Quantity	Rate	Amount
	BILL NO. 13				
	PAINTWORK				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	PAINT ON PLASTER, ETC.				
	Prepare surfaces and remove all loose material, apply One coat 'Plascon Professional (PP700)' gypsum and plaster primer (PU800) and two finishing coats 'Plascon Professional Superior Low Sheen (PEM 1000)' pure acrylic emulsion paint or similar approved on:				
1	Walls internally	m2	180		
2	Ceilings internally	m2	120		
	PAINT ON METAL				
	Prepare surfaces and remove all loose material, dust, grease, salts and contamination with 'Plascon Aquasolve Degreaser GR1', apply one coat primer (UC170) one coat 'Plascon Professional undercoat (PU800)' and one finishing coat 'Plascon Water Based Velvaglo (VLW)' or similar approved on galvanised:				
3	Door frames and linings	m2	5		
4	Door screens (measured on flat)	m2	2		
5	Sashes and frames (measured on flat)	m2	20		
	Carried Forward			R	

	Brought Forward			R	
6	Balustrading (measured on flat)	m2	112		
	Prepare surfaces and remove all loose material, dust, grease, salts and contamination with Polycell Sugar Soap Powder, rinse with water and apply one coat Plascon Polysafe 18 Primer' and two coats 'Plascon True Color TCR Range' or similar approved paint on:				
7	Existing corrugated roof sheeting	m2	50		
	PAINT ON WOOD				
	Stop, fill, sand down and prepare wood surfaces and apply one coat 'Plascon Professional Wood Primer (UC2)', one coat 'Plascon Professional undercoat (PU800)' and one finishing coat 'Plascon Water Based Velvaglo (VLW)' or similar approved on:				
8	General surfaces	m2	5		
	Stop, fill, sand down and prepare wood surfaces and apply three coats of 'Plascon Woodcare Ultra Vanish (X-Range)' or similar approved on:				
9	General surfaces	m2	5		
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 13
Paintwork

Item No			Quantity	Rate	Amount
	BILL NO. 14				
	EXTERNAL WORKS				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	ALTERATIONS				
	Removal of interlocking pavers:				
1	On driveways etc, including 150mm layer below	m2	5		
	Removal of damaged concrete, cartaway to dump site located by the contractor and shaping of trenches to receive new				
2	Storm drains	m3	5		
	EARTHWORKS				
	Earth Fill Material				
3	Imported selected fill (G5) in layer 150mm thick and compacted to 93% Mod AASHTO density	m3	1		
	Soil Poisoning				
4	Treat ground below paving with an approved weed killer	m2	5		
	Compaction of surfaces				
5	Compaction of ground surfaces under pavings etc, including ripping up surface and scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% Mod AASHTO density	m2	5		
	Carried Forward			R	

	Brought Forward			R	
	PAVING				
6	Supply and install 600 x 600mm concrete pavers to match existing including 50mm sand bed below	m2	10		
7	Supply and install 60mm grey interlocking pavers size 200 x 100mm to match existing including 50mm sand bed below	m2	5		
8	Remove vegetation on existing concrete pavers, channels, etc.	m2	500		
	CONCRETE, FORMWORK AND REINFORCEMENT				
	REINFORCED CONCRETE CAST ON/IN FORMWORK				
	25MPa/19mm concrete				
9	Concrete drain	m3	10		
	ROUGH FORMWORK (DEGREE OF ACCURACY II)				
	Rough formwork to sides				
10	Concrete drains	m2	14		
	REINFORCEMENT				
	Mild steel reinforcement to structural concrete work:				
11	Bars of various diameters.	t	0.25		
	High tensile steel reinforcement to structural concrete work:				
12	Bars of various diameters.	t	0.25		
	TESTING				
13	Making and testing set of three 150 x 150 x 150mm concrete strength test cubes	No	1		
	Carried Forward			R	

				R	
	Brought Forward				
	GRATINGS TO EXTERNAL DRAINS				
14	Supply and install mentis grating size 340mm wide x 1000mm long on existing drainage channels to match existing	m	40		
15	Remove soil from existing concrete drainage channel etc., cartaway to approved dumping site to be located by Contractor	m3	20		
	REMEDIAL BUILDING WORK TO PLANT ROOM				
	Breaking out for and forming openings through brick walls , including brick lintels, making good cement plaster on one side and into reveals and face brickwork on other side and into reveals with 20 MPa concrete thresholds with steel trowelled finish (new extract fans measured elsewhere)				
16	190 x 190mm openings	No	10		
17	260 x 260mm openings	No	2		
18	360 x 360mm openings	No	2		
19	400 x 400mm openings	No	20		
	Cutting out and forming openings through timber doors for door grilles, including making good all edges of opening				
20	400 x 550mm opening through timber doors for door grilles	No	28		
	Light fittings				
21	Remove and replace light fitting to match existing	No	4		
	Waterproofing				
22	Hack up and remove damaged waterproofing including making good concrete floor and install new 4mm 'Derbigum' or other approved waterproofing to floors	m2	5		
23	Prepare surfaces and remove all loose material and apply 2 coats of 'Dulux Hi-Chem' epoxy paint strictly in accordance with manufactures instructions to floors or similar approved	m2	30		
	Carried Forward			R	

				R	
	Brought Forward				
	Aluminium louvres				
24	Remove and replace vermin proof weather louvres with new to match existing	No	3		
	Plumbing and Drainage				
25	Remove damaged and Install new 110mm diameter floor drain to match existing	No	4		
26	110mm diameter HDPE drainage pipe	m	10		
27	Tie in new drainage pipe into existing system		Item		
	Paint to existing surfaces				
	Prepare surfaces and remove all loose material, apply one coat 'Plascon Merit Plaster Primer' and two coats 'Plascon Polvin Super Acrylic' paint:				
28	On walls internally	m2	70		
29	On Soffits	m2	30		
	Prepare surfaces and remove all loose material, dust, grease, salts and contamination with 'Plascon Aquasolve Degreaser GR1', rinse and apply one coat 'Plascon Galvogrip Metal Primer', apply one coat 'Plascon Merit Universal Undercoat' and two coats 'Plascon Magic Flow Eggshell Enamel' paint on galvanised steel on:				
30	Roller shutter doors	m2	12		
	Sundries				
31	Servicing existing roller shutter doors		Item		
32	Supply and lay gravel average 50mm thick around concrete plinths	m2	51		
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 14
External Works

Item No			Quantity	Rate	Amount
	BILL NO. 15				
	MISCELLANEOUS				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	WASHING LINES				
1	Supply and install mini retractable 5m clothesline with 3 lines as 'Retractaline 6003394000025' or similar approved	No	2		
	IRONING BOARDS				
2	Supply and install 'SpaceSaver' wall mounted ironing board cabinet	No	4		
	BIRD PROOFING				
3	Supply and install single braced silver and gold 'Eagle Eye Solar Kit' or similar approved	No	1		
4	Supply and install single braced silver and gold 'Eagle Eye Wind-Driven Kit' or similar approved	No	1		
5	Supply and install land bird 'Eagle Eye Pro-Peller Unit' or similar approved	No	1		
6	Supply and install 'Eagle Eye' double braced kit for high winds or similar approved	No	1		
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
Nurses Quarters - Block B and Lobby
Bill No. 15
Miscellaneous

SECTION SUMMARY - Nurses Quarters - Block B and Lobby

Bill No		Page No	Amount
1	Alterations	85	
2	Roof Coverings	87	
3	Carpentry & Joinery	89	
4	Ceilings	91	
5	Ironmongery	97	
6	Metalwork	100	
7	Plastering	101	
8	Tiling	102	
9	Plumbing & Drainage	108	
10	Electrical Work	114	
11	Mechanical Work	123	
12	Glazing	124	
13	Paintwork	126	
14	External Works	130	
15	Miscellaneous	131	
	Carried to Final Summary		R

Section No. 3
Nurses Quarters - Block B and Lobby

Item No		Quantity	Rate	Amount

SECTION NO. 4: DOCTORS QUARTERS

BILL NO. 1

ALTERATIONS

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

General Notes:

The contractor shall carry out the whole of the works with as little mess and noise as possible and with minimum disturbance to adjoining premises and their tenants. He shall provide proper protection and provide, erect and
remove when directed, any temporary tarpaulins that may be necessary during the progress of the works, all to the satisfaction of the principal agent.

Water supply pipes and other piping that may be encountered and found necessary to disconnect or cut, shall be effectually stopped off or grubbed up and removed, and any new connections that may be necessary shall be made with proper fittings, to the satisfaction of the principal agent.

Doors, fanlights, fittings, frames, linings, etc which are to be re-used shall be thoroughly overhauled before refixing including taking off, easing and rehanging, cramping up, re-wedging as required and making good cramps, dowels, etc, and easing, oiling, adjusting and repairing ironmongery as necessary, replacing any glass damaged in removal or subsequently and stopping up all nail and screw holes with tinted plastic wood to match timber, unless otherwise described. Re-painting or re-varnishing is given separately.

Prices for taking out of doors, windows, etc shall include

Carried Forward R

	Brought Forward			R	
	for removal of all beads, architraves, ironmongery, etc. Prices for taking out and removing doors and frames shall include for removing door stops, cabin hooks, etc and making good floor and wall finishes to match existing With regard to building up of openings in existing walls, cement screeds and pavings, granolithic, tops of walls, etc, shall be levelled and prepared for raising of brickwork. Making good of finishes shall include making good of the brick and concrete surfaces onto which the new finishes are applied, where necessary. The contractor will be required to take all dimensions affecting the existing buildings on the site and he will be held solely responsible for the accuracy of all such dimensions where used in the manufacture of new items (doors, windows, fittings, etc). **<u>View Site</u>** Before submitting the tender, the contractor shall visit the site and satisfy himself/herself as to the nature and extent of the work to be done and the value of the materials contained in the buildings or portions of the buildings to be demolished. No claim for any variations of the contract sum in respect of the nature and extent of the work or of inferior or damaged materials will be entertained. **<u>Take out and remove, and prepare all surfaces to receive new, including making good existing surfaces where items have been removed</u>** <u>Plumbing and Sanitary Fittings:</u>				
1	Re-use wash hand basins (taken from doctors accomodation and nurses accomodation removals)	No	7		
	<u>Floors/Walls and Coverings:</u>				
2	Remove floor tiles including average 40mm thick screed from concrete floors, cartaway to approved dumping site to be located by Contractor and prepare surface to receive new tiles	m2	10		
	Carried Forward			R	

				R	
	Brought Forward				
3	Clean and polish existing vinyl floor coverings.	m2	50		
4	Clean and polish existing screeded floors to passages, staircases, etc.	m2	200		
5	Clean and make good existing tiles to walls and columns	m2	5		
6	Clean and make good existing plastered and or painted walls and columns	m2	10		
7	Make good concrete screeded floors	m2	10		
8	Strip off cracked plaster on walls, cartaway to approved dumping site to be located by Contractor and prepare to receive new	m2	10		
9	Remove damaged sections of brick walls and prepare vicinity to receive new.	m2	20		
10	Clean stained external brick walls including removing all organic material including all necessary scaffolding, detergents etc	m2	252		
11	Remove granolithic cladding on external walls, columns, beams etc., cart away to approved dumping site to be located by Contractor including all necessary scaffolding	m2	250		
12	Build up window opening 970 x 1500mm high in NFP one brick wall in Class II mortar and make good internal plaster on one side and external plaster on one side	No	4		
13	Build up door fanlight opening 1600 x 400mm high in NFP one brick wall in Class II mortar and make good internal plaster on both side including all lintels etc.	No	1		
14	Build up door fanlight opening 810 x 400mm high in NFP one brick wall in Class II mortar and make good internal plaster on both side including all lintels etc.	No	11		
	<u>Joinery:</u>				
15	Repair damaged built in cupboards	No	7		
	Carried Forward			R	

Section No. 4
Doctors Quarters
Bill No. 1
Alterations

				R	
	Brought Forward				
16	Repair damaged built in shelving in living rooms	No	7		
	Slabs, Ceilings, etc:				
17	Remove damaged ceiling systems including soffits, gridlock suspension system, etc. cart away to approved dumping site to be located by Contractor and prepare to receive new	m2	50		
18	Remove existing 600 x 1200mm boards only existing ceiling grid, etc. cart away to approved dumping site to be located by Contractor and prepare to receive new	m2	50		
19	Remove existing gridlock suspension system, etc. cart away to approved dumping site to be located by Contractor and prepare to receive new	m2	50		
20	Repair sections of damaged concrete slabs, beams etc, with plaster, including making good all exposed reinforcing, concrete ceiling soffits and beams etc. to receive paint	m2	5		
21	Hack up existing Derbigum waterproofing and cart away to dump site to be located by Contractor and including preparing surfaces to receive new waterproofing membrane by sealing and repairing cracks and filling holes, etc. with 'Prostruct 526' or similar approved	m2	25		
22	Break out and remove loose spalling concrete from concrete ceiling soffits, beams, etc., to expose steel reinforcement, clean down apply 'Sika FerroGard' to reinforcing and repair concrete with 'Prostruct 529 MCI Structural' concrete repair with a minimum of 10mm to the repair in strict accordance with manufacturers instructions.	m3	5		
23	Break concrete around steel or UPVC pipe going through concrete slabs not exceeding 300mm thick for working space to remove leaking sections of pipe and make good 25Mpa concrete after new pipe installation.	m3	5		
	Carried Forward			R	

				R	
	Brought Forward				
	Doors and Windows:				
24	Remove existing damaged bedroom and lounge door size 800 x 2030mm high, including ironmongery, fittings, etc., cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	1		
25	Remove existing damaged door size 800 x 420mm high, including ironmongery, fittings, etc., cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	1		
26	Remove existing damaged duct door size 600 x 1920mm, including ironmongery, fittings, etc., cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	1		
27	Remove existing fire escape door size 810 x 2030mm high, including ironmongery, fittings, etc., cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	11		
28	Remove existing fire escape door size 1600 x 2030mm high, including ironmongery, fittings, etc., cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	1		
29	Remove existing damaged steel or aluminium door size 1120 x 2100mm high, including ironmongery, fittings, etc., cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	1		
30	Remove existing doors size 800 x 2030 and set aside for re-use doors including making good hinges and door frames and including later refit and undercut doors to suite new floor levels	No	1		
31	Rehang existing doors size 800 x 2030 including making good hinges and door frames.	No	1		
32	Remove damaged timber door frames for door size 800 x 2030mm high, cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	5		
	Carried Forward			R	

				R	
	Brought Forward				
33	Remove damaged steel door frames for door size 800 x 2030mm high with fanlight door size 800 x 500mm high, cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	11		
34	Remove damaged timber double door frames for door size 1600 x 2100mm high with fanlight size 1600 x 400mm high, cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	1		
35	Remove steel window size 970 x 1500mm high including damaged handles, stays etc. where applicable, cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	5		
36	Remove damaged 4mm glazing, etc. from existing windows and sashes in panes not exceeding 0,5m2 (sashes and frames to remain and reglazing elsewhere measured) cartaway to approved dumping site to be located by Contractor and prepare to receive new	m2	3		
37	Remove damaged 4mm glazing, etc. from existing windows and sashes in panes exceeding 0,5m2 and not exceeding 2m2 (sashes and frames to remain and reglazing elsewhere measured) cartaway to approved dumping site to be located by Contractor and prepare to receive new	m2	3		
38	Remove door and window handle, locks, etc cartaway to approved dumping site to be located by Contractor and prepare to receive new	No	9		
39	Remove existing aluminium corner protector.	m	29		
40	Cut out and form opening 400 x 400mm high in existing toughened safety glazed window.	No	2		
41	Clean and make good glazed external steel windows, doors, etc (area measured on flat) including all necessary scaffolding.	m2	331		
	Carried Forward			R	

Section No. 4
Doctors Quarters
Bill No. 1
Alterations

	Brought Forward			R	
42	Clean and restore existing ironmongery including door handles, push plates, etc.	No	2		
	Sundry items:				
43	Remove damaged washing line set with tray, etc., cart away to approved dumping site to be located by Contractor and prepare to receive new	No	4		
44	Remove ironing boards , cart away to approved dumping site to be located by Contractor and prepare to receive new	No	4		
45	Remove existing ironing board inlet from metal framework and replace with new timber inlet board and cover including sanding and repainting metal supports	No	2		
46	Remove signage on walls, doors etc; cart away to approved dumping site to be located by Contractor and prepare to receive new	No	5		
47	Clean existing 1000mm high steel balustrade (area measured on flat)	m2	230		
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Doctors Quarters
Bill No. 1
Alterations

Item No			Quantity	Rate	Amount
	BILL NO. 2				
	WATERPROOFING				
	PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	SUPPLEMENTARY PREAMBLES				
	Waterproofing				
	All 'wet' areas, such as showers, must first be waterproofed with a 10 year guarantee, waterproofing which is designed, supplied and fixed by and approved supplier.				
	REPAIRS OF WATERPROOFING TO FLAT ROOFS				
	One layer of mineral grain waterproofing (Sika BlackSeal T-140 MG or similar approved) on:				
1	Flat roofs including turn-ups, etc.	m2	25		
2	Parapet walls in narrow widths not exceeding 300mm wide	m	35		
3	Dressing into fullbore outlet.	No	5		
	PROTECTIVE ROOFING PAINT				
	Two coats 'Silvacote' bituminous aluminium paint or similar approved on:				
4	Waterproofing to roofs	m2	25		
	Carried Forward			R	

				R	
	Brought Forward				
5	Parapet walls in narrow widths not exceeding 300mm wide	m	35		
6	Around fullbores	No	5		
	JOINT SEALANTS ETC				
	Approved clear silicone sealant:				
7	In joints between frames and walls	m	5		
8	In joints between hand wash basins/kitchen sinks and walls	m	35		
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Doctors Quarters
Bill No. 2
Waterproofing

Item No		Quantity	Rate	Amount

BILL NO. 3

ROOF COVERING

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Roof coverings

Fixing of all roof sheeting is to be in accordance with the Manufacturer's approved Instruction Book

All roof coverings are to be installed to comply with SABS Code of Practice 0237 as applicable

All roof sheeting shall be laid under a five year guarantee for site workmanship and water tightness

Ridge coverings and flashing

Ridge coverings and flashings shall have at least 225mm laps and closers shall have at least 150mm laps at end joints with sufficient laps at angles and intersections.

Rates

Prices for sheeting are to include for all straight cutting and waste, laps, protecting from damage and cleaning down at completion - all in strict accordance with manufacturer's instructions and to the approval of the Principal Agent

Roof coverings, ridge coverings, closers, flashings, etc. are measured net and prices are to include for all laps, screws, bolts, etc. Prices for roof coverings are also to include for straight cutting. All work shall be left completely watertight.

Carried Forward R

				R	
	Brought Forward				
	Sundries				
1	Supply and install aluminium soft-closing trap door to match existing and installed strictly according to fire regulations		Item		
	ROOF VENTILATORS				
2	Supply and install galvanised sheet steel multi-purpose ventilator to match existing fixed through roof sheeting to steel purlins, including flashings, closers, sealing strips, etc.	No	4		
	Sundry Roof Items:				
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
3	Allow a budgetary allowance of R 30 000.00 (Thirty Thousand Rands) for Sundry Roof Items including Roof Guarantees expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used			SUM	
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Doctors Quarters
Bill No. 3
Roof Coverings

Item No			Quantity	Rate	Amount
	BILL NO. 4				
	CARPENTRY AND JOINERY				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	EAVES, VERGES, ETC				
	'Everite Nutec' or similar approved fibre-cement fascias and bargeboards:				
1	12 x 225mm Fascias and barge boards, including plastic H-profile jointing strips.	m	10		
	EXTERIOR QUALITY DOORS				
	Wrot meranti				
2	44mm Framed batten door 810 x 2030mm high of 106mm top rail and stiles, 22 x 106mm middle ledge and 22 x 220mm bottom ledge filled in flush on one side with 22mm V-jointed both sides boarding.	No	1		
3	20mm Door size 600 x 1920mm high duct door	No	3		
	Solid meranti door with vertical slats to match existing and hung to existing steel frames with three hinges per leaf				
4	40mm Door 790 x 1990mm high	No	1		
	TIMBER DOORS				
	Carried Forward			R	

				R	
	Brought Forward				
	Semi-solid flush doors with 3,2mm hardboard covering on both sides to match existing and hung to existing steel frames with three hinges per leaf				
5	40mm Door 750 x 2010mm high	No	9		
6	40mm Door 810 x 2030mm high	No	17		
7	40mm Door 810 x 420mm high	No	1		
	Hollowcore light duty flush doors with veneer on both sides to match existing and hung to existing steel frames with three hinges per leaf				
8	40mm Door size 600 x 1920mm high duct door	No	24		
9	40mm Door size 525 x 1920mm high duct door	No	2		
	Rehang previously removed medium duty doors to steel frames or timber frames with three hinges per leaf:				
10	40mm Door size 600 x 1920mm high duct door	No	1		
11	40mm Door 810 x 2030mm high	No	1		
	FIRE DOORS AND FRAMES				
	The following SANS 1253 fire rated doors are to be 'Bitcon Rubidor' or similar approved finished on both sides with veneer to match existing and hung on and including one and a half pairs of heavy brass hinges to and including 1,6mm galvanised mild steel door frame				
12	Class 'B' single door size 810 x 2030mm high with frame suitable for 230mm thick wall.	No	11		
13	Class 'B' double door size 1610 x 2030mm high with square meeting stiles, in two equal leaves with frame suitable for 230mm thick wall.	No	1		
	Sundries				
14	Undercut door 525mm wide by 20mm	No	2		
	Carried Forward			R	

Section No. 4
Doctors Quarters
Bill No. 4
Carpentry & Joinery

				R	
	Brought Forward				
15	Undercut door 600mm wide by 20mm	No	25		
16	Undercut door 750mm wide by 20mm	No	9		
17	Undercut door 810mm wide by 20mm	No	28		
18	Undercut door 1600mm wide by 20mm	No	1		
	FRAMED FRAMES, ETC				
	Wrot meranti:				
19	20 x 100mm Rebated linings plugged	m	6		
20	42 x 68mm Rebated frame for 600 x 1920mm high door	No	24		
	DUCT COVERS				
	Wrot meranti				
21	20mm Duct cover size 600 x 600mm high	No	5		
	JOINERY FITTINGS				
	CUPBOARDS TO KITCHENS, BEDROOMS, ETC				
	Finishes:				
	KITCHEN 16mm Iceberg white natural touch Melamine doors with 2mm ABS door edging				
	16mm Dunblane grey natural touch Melamine doors with 2mm ABS door edging (Broom cupboard)				
	Doors: 16mm Iceberg white natural touch Melamine doors with 2mm ABS door edging				
	16mm Dunblane grey natural touch Melamine doors with 2mm ABS door edging (Broom cupboard)				
	Soft close hinges on all doors				
	Carried Forward			R	

Brought Forward R

Shelves:
16 mm white Melamine shelves with 1mm ABS edging

Handles:
128mm Hollow stainless Steel Barrel Handle code 8236

Counter:
32mm thick water resistant Comet Granite gloss Postform worktop with a tight radius profile

Drawers:
Iceberg white natural touch Melamine drawers
Heavy duty ball bearing runners

Units to include Masonite backs
128mm recessed plinths V313 Wrap

BEDROOM

BIC Doors:
16mm natural touch Melamine doors with 2mm ABS door edging. Colour to be confirmed on site

White melamine carcasses with 1mm ABS edging

Soft close hinges on all doors

Melamine facias to soffit

192mm Hollow stainless Steel Barrel Handle code 8238

Carried Forward R

Section No. 4
Doctors Quarters
Bill No. 4
Carpentry & Joinery

	Brought Forward			R	
	General:				
	The following cupboard fittings are given as complete units i.e. the components of the units have not been given separately. Descriptions of such units shall, therefore, be deemed to include all components, assembling, housing, notching, glueing, blocking, planting-on and screwing with countersunk screws, edge strips, thermosetting plastic laminate, glass, ironmongery, metalwork, paint or varnish finishes, etc				
	Prices are to include for all necessary filler pieces against walls etc				
	Prices are to include for additional pointing with an approved silicone sealant and/or trimming with beads as may be directed by the Principal Agent to make good any imperfect abutments of fittings with walls, etc				
	References:				
	References given in descriptions refer to the respective types of fittings detailed on the architect's drawing(s) numbered DOH-DR-A-5000-0 annexed to these bills of quantities				
	Kitchen cupboards (Refer Drawing DOH-DR-A-5000-0 and ((Shop drawing) Joinery Workshop Drawing Option 3)				
22	High level cupboard unit size 1800 x 350 x 720mm high overall with adjustable shelf, one single door and one double door	No	5		
23	Broom cupboard size 450 x 600 x 2150mm high overall with adjustable shelf and one single door	No	5		
24	Counter top size 2600 x 600 x 850mm high overall with cut out for a double bowl sink and drainer (elsewhere measured) and comprising cupboards with adjustable shelf, one single door and two double doors under	No	5		
25	L shaped counter top one side size 1800 x 600 x 850mm high overall and other leg 200 x600 x 850mm high overall comprising cupboards with adjustable shelf, double doors and one drawer unit under	No	5		
	Carried Forward			R	

Section No. 4
Doctors Quarters
Bill No. 4
Carpentry & Joinery

				R
	Brought Forward			
	Joinery Ironmongery:			
26	128mm Hollow stainless Steel Barrel Handle code 8236	No	5	
27	192mm Hollow stainless Steel Barrel Handle code 8238	No	5	
	Bedroom cupboards (Refer Drawing DOH-DR-A-5000-0)			
28	Bedroom cupboard doors size 680 x 770mm high	No	30	
29	Bedroom cupboard doors size 680 x 1930mm high	No	30	
	Bathroom mirror cabinets			
30	Supply and Install 255 x 115 x 350mm Decorwood single bathroom white cabinet with mirror or similar approved	No	1	
	Sundry Joinery Fittings:			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
31	Allow a budgetary allowance of R 10 000.00 (Ten Thousand Rands) for Sundry Joinery Fittings expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used		Item	
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Doctors Quarters
Bill No. 4
Carpentry & Joinery

Item No		Quantity	Rate	Amount

BILL NO. 5

CEILINGS, PARTITIONS AND ACCESS FLOORING

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Fixing

Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins, or to be shot-pinned, to brickwork or concrete

Items described as "plugged" shall be deemed to includescrewing to fibre, plastic or metal plugs at not exceeding 500mm centres, and where described as "bolted", the bolts have been given elsewhere

Ceilings

Unless otherwise described ceilings shall be deemed to be horizontal

Proprietary suspended ceilings

Hangers, suspension grids, "lay-in" panels, etc are to be in accordance with the manufacturers' recommendations

Electrical light fittings, diffusers, panels etc are generally "lay-in" units of the same dimensions as the suspension grid described and allowance must be made in the rates accordingly for their support inclusive of any flexibility in setting out that may be required (ceiling panels have not been deducted and pricing is to take cognisance thereof)

NAILED UP CEILINGS

Carried Forward R

				R	
	Brought Forward				
	Sundries				
1	Supply and install 6mm 'Pelican Systems' Jumbo fibre-cement or similar approved board to existing aluminium frame size 500 x 1200mm high overall between balustrade and staircase soffit. size to be confirmed on site	No	1		
	FLUSH PLASTERED SUSPENDED CEILINGS				
	'Pelican Systems' JUMBO skimmed ceiling system with 9mm thick JUMBO plasterboard fixed at right angles using 25mm Jumbo drywall screws at 150mm centres to JUMBO steel brandering comprising JUMBO steel brandering at 400mm centres in one direction only. All joints to be covered with JUMBO fiba tape and the entire surface plastered with 3mm to 6mm thick JUMBO skimming plaster. Or similar approved				
2	Ceilings suspended not exceeding 1m below existing steel or timber roof trusses	m2	12		
3	Plaster skim to existing ceiling with 3mm to 6mm thick JUMBO skimming plaster. Or similar approved	m2	5		
	SUSPENDED CEILINGS				
	1200 x 600 x 9mm thick 'Pelican Systems' Econotile Vinyl Clad foil back Shell White ceiling tiles, laid on Econogrid pre-painted 38mm exposed steel tee suspension system, including all necessary hangers, grids and hold down clips. Suspension shall be in accordance with the manufacturer`s recommendations and SABISA or similar approved.				
4	Ceilings suspended not exceeding 1m below existing concrete soffits	m2	25		
5	Extra over on openings for light fittings, mechanical diffusers, etc	No	7		
6	Extra over ceiling for 1200 x 600mm recessed light fitting.	No	4		
	Carried Forward			R	

	Brought Forward			R	
	1200 x 600 x 9mm thick 'Pelican Systems' Econotile Vinyl Clad foil back Shell White ceiling tiles, laid on existing Econogrid pre-painted 38mm exposed steel tee suspension system, including all necessary hangers, grids and hold down clips. Suspension shall be in accordance with the manufacturer`s recommendations and SABISA or similar approved.				
7	Ceilings suspended not exceeding 1m below existing concrete soffits	m2	227		
	Cornices to suspended ceilings:				
8	'Pelican Systems' Aluminium PS1 shadow wall trim, fixed to plastered brickwork with 5 x 25mm wall anchors at 450mm centres or similar approved	m	100		
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Doctors Quarters
Bill No. 5
Ceilings

Item No		Quantity	Rate	Amount

BILL NO. 6

IRONMONGERY

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Proprietary items

Where applicable the manufacturers' names or product catalogue titles are given in sub-headings preceding the items

On request returnable samples are to be provided to the principal agent for consideration

Finishes to ironmongery

Where applicable finishes to ironmongery are indicated by suffixes in accordance with the following list:
BS Satin bronze lacquered
CH Chromium plated
SC Satin chromium plated
SE Silver enamelled
GE Grey enamelled
AN Anodised natural
AS Anodised silver
AB Anodised bronze
AG Anodised gold
ABL Anodised black
PB Polished brass
PL Polished and lacquered
PT Epoxy coated
SD Sanded

Carried Forward R

				R	
	Brought Forward				
	Rates				
	Prices are to be based on the specific products/articles specified. If tenderers wish to offer alternative products/articles for certain items, these items are to be clearly marked and the alternative specification given with supporting brochures etc clarifying the features of the products/articles offered				
	HINGES, BOLTS, ETC				
	Manufactured by "Assa Abloy" or "Similar approved"				
1	'UNION' or 'similar approved' two ball bearing butt hinge (code: JH-BB-STD-2-SS) with Stainless Steel finish.	Pairs	36		
2	'UNION' or 'similar approved' 200mm aluminium reflex hinge (code: 8352-200SN).	Pairs	3		
	HANDLES AND LOCKS				
	Manufactured by "Assa Abloy" or "Similar approved"				
3	'Union' or 'equal approved' Gower 3 lever lockset with Chrome handle finish (Code: CZ682-24-52)	No	28		
4	'Union' or 'equal approved' Gower lockset with cylinder and Chrome handle finish (Code: CZ68205222CH)	No	1		
5	'Union' or 'equal approved' 3 lever mortice lock (Code: 2252-76SS)	No	1		
6	'Union' or 'equal approved' Gower lockset with chrome handle finish (Code: CZ682TL-73H)	No	1		
7	'Union' or 'equal approved' WC lock (Code: 22314-76/5SS)	No	1		
	Carried Forward			R	

Section No. 4
Doctors Quarters
Bill No. 6
Ironmongery

	Brought Forward			R	
8	'Union' or 'equal approved' Deadbolt lock (Code: QD35X85MMSS)	No	1		
9	'Union' or 'equal approved' knob cylinder profile KD SC (Code: 2X19SC)	No	1		
10	'Union' or 'equal approved' single profile MKD SC (Code: 2X20SCMKD)	No	2		
11	'Union' or 'equal approved' escutcheon on rose profile (Code: PZ-05SS)	No	1		
12	'Union' or 'equal approved' escutcheon (Code: AL584-054AS)	No	1		
13	'Union' or 'equal approved' Stainless steel 230mm BTB pull handle (Code:PHD-BB-225-22SS)	No	2		
14	'Union' or 'equal approved' Steel lever handle on backplates with Chrome handle finish (Code: CZ682-24H)	No	5		
15	'Union' or 'equal approved' Stainless steel dove pull handle on 150 x 230mm backplates (Code: SS5D96-22-06SS)	No	24		
16	'Union' or 'equal approved' Stainless steel 400mm BTB pull handle (Code: 5206BBSS)	No	2		
17	'UNION' or equal approved double panic bolt touch bar 900mm (code: J-883TD-SIL) with dogging device and 2.5mm switch bracket (code:EDS-MS-P-BAR)	No	12		
18	'UNION' or equal approved double panic bolt touch bar 900mm (code: J-883-SIL) with dogging device	No	2		
	Carried Forward			R	

	Brought Forward			R	
19	'Union' or equal approved rectangular Stainless Steel flush pull handle (Code: FFP65X50SS), size 65mm x 50mm complete with roller catch (Code: ARC1182SS) fitted to duct doors	No	29		
20	'Union' or equal approved rectangular Stainless Steel flush pull handle (Code: FFP65X50SS), size 65mm x 50mm complete with cupboard lock (Code: LC6315R) fitted to duct doors	No	27		
21	'Union' or equal approved Parallel arm bracket (code: DCA154-EV1).	No	1		
	DOOR CLOSERS				
22	'ASSA ABLOY' or equal approved rack and pinion door closer with link arm (Code: DC200) fixed to steel frame	No	16		
23	'ASSA ABLOY' or equal approved cam action door closer (Code: DC500) fixed to steel or timber frame	No	2		
24	'ASSA ABLOY' or equal approved overhead double door closer with Cam-Motion® technology and guide rail with integrated mechanical coordinator (Code: FD461-DC500) complete with mounting plates (Code: DCA120-40) fixed to steel frames	No	2		
25	'ASSA ABLOY' or equal approved overhead double door closer with Cam-Motion® technology and guide rail with integrated mechanical coordinator (Code: FD462-DC500) complete with mounting plates (Code: DCA120-40) fixed to steel frames	No	13		
	SUNDRIES				
	Manufactured by "Assa Abloy" or "Similar approved"				
26	'UNION' or 'similar approved' aluminium door stop (code: 87001SS) with Stainless Steel finish	No	38		
	Carried Forward			R	

Section No. 4
Doctors Quarters
Bill No. 6
Ironmongery

				R	
	Brought Forward				
27	'UNION' or 'similar approved' stainless steel door stop (code: AL8730AS) with Stainless Steel finish	No	1		
28	'UNION' or equal approved aluminium hat, coat and robe hook (code: AL8722AS) with Anodised Silver finish.	No	9		
29	'UNION' or equal approved street surface loop (code: EDS-ABK-401).	No	12		
30	'ASSA ABLOY' or equal approved cam action floor spring (Code: DCA420DAHO) including preparation to receive same	No	2		
31	1400mm Stainless steel clothing rail to built in cupboard.	No	6		
32	'ASSA ABLOY' or equal approved emergency exit unlocking box (Code: BGLASS-R) including preparation to receive same	No	1		
33	'ASSA ABLOY' or equal approved emergency exit unlocking box (Code: BGLASS-G) including preparation to receive same	No	1		
	PUSH PLATES AND KICKING PLATES				
	The following door protection is to be A.I.S.I. Grade 304 satin polished stainless steel fixed to timber doors with an approved epoxy adhesive (no screw holes).				
34	800 x 200 x 0,9mm Thick kick plate.	No	1		
35	800 x 300 x 0,9mm Thick kick plate.	No	62		
36	150 x 400 x 0,9mm Thick push plates.	No	31		
37	150 x 230 x 0,9mm Thick push plates.	No	2		
38	150 x 230mm Stainless steel push plate (Code:SS5023-06-228W) including fixing screws	No	24		
	Carried Forward			R	

				R	
	Brought Forward				
39	150 x 230mm Stainless steel push plate with euro cylinder (Code:SS5023L-05-228W) including fixing screws	No	1		
	BATHROOM FITTINGS				
40	Supply and install 600mm long 'Style' single chrome towel rail or similar approved	No	7		
41	Supply and install stainless steel 'ITD Wireline TVWR3207/SS' 2 level shower caddy or similar approved	No	7		
42	Supply and install stainless steel polished round 'Plumbline Mandara' toilet roll holder or similar approved	No	7		
	STEEL WINDOW FURNITURE				
	Supply and install the following ironmongery to existing windows:				
43	Brass side window handles to match existing	No	12		
44	Brass peg stay to match existing	No	9		
45	Brass sliding stay and screw to match existing	No	20		
	SIGNAGE				
	Manufactured by "Assa Abloy" or "Similar approved"				
46	ASSA ABLOY Aluminium engraved plate E02 (Tea cup), size 152 x 152mm (Code: AL5066-06ASE02).	No	1		
47	ASSA ABLOY Stainless steel engraved plate E10 (male indicator), size 152 x 152mm (Code: SS5066-06SSE10).	No	1		
48	ASSA ABLOY Stainless steel engraved plate E11 (female indicator), size 152 x 152mm (Code: SS5066-06SSE11).	No	1		
	Carried Forward			R	

	Brought Forward		R	
	Sundries:			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
49	Allow a budgetary allowance of R 10 000.00 (Ten Thousand Rands) for Sundry Ironmongery expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used		SUM	
	Carried Forward to Summary of Section No. 4		R	

Section No. 4
Doctors Quarters
Bill No. 6
Ironmongery

Item No			Quantity	Rate	Amount
	BILL NO. 7				
	METALWORK				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	GALVANIZED PRESSED STEEL DOOR FRAMES				
	1,6mm Mild steel double rebated frames suitable for one brick walls:				
1	Frame for door size 600 x 1920mm high	No	2		
	SHOWER DOORS				
2	Supply and install 'Crystal Tech Chrome Walk In Bi Slider CT8008BF' shower door size 1600 to 1700 x 2000mm high or similar approved. Prices are to include for sandblasting to glass and sealing all round with approved silicone waterproofing sealant at junction/gaps with tiled walls, etc.	No	7		
	WALL CORNER PROTECTION				
	Stainless steel Grade 316:				
3	70 x 70 x 0,9mm Thick angle corner protector 1000mm long glued to concrete or plastered or tiled walls or columns including necessary preparation.	m	6		
4	25 x 15 x 0,9mm Thick angle corner protector 2440mm long glued to plastered or tiled wall including necessary preparation.	m	29		
	ALUMINIUM WINDOWS				
	Carried Forward			R	

				R	
	Brought Forward				
	Purpose made heavy duty 'ANSO CLIP 44' or other approved white powder coated anodised aluminium shopfront system glazed with 4mm clear toughened safety glass (in accordance with SANS10400-N and AAMSA Regulations) unless otherwise stated complete with frame to be fitted on existing brick or concrete wall including all necessary ironmongery				
5	Window size 1900 x 1300mm high overall comprising one top hung opening out casements, two side hung opening out casements and one fixed lights	No	1		
	Purpose made heavy duty 'ANSO CLIP 44' or other approved natural anodised aluminium shopfront system glazed with 6mm clear toughened safety glass (in accordance with SANS10400-N and AAMSA Regulations) unless otherwise stated complete with frame to be fitted on existing brick or concrete wall ironmongery elsewhere measured				
6	Double door frame size 1500 x 2400mm high overall with comprising two equal leaves with mid rail and four fixed glass panes to match existing	No	1		
	EXTERNAL ALUMINIUM LOUVRES				
	POWDER COATED HORIZONTAL ALUMINIUM LOUVRE UNITS				
	Aluminium fixed louvre units fixed to brickwork or concrete or steel				
7	Supply and install Z profile aluminium louvre panel to match existing approximately 230mm girth fixed to existing aluminium brackets including scaffolding where necessary	m	30		
	ALUMINIUM DOORS				
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
	Carried Forward			R	

				R
	Brought Forward			
8	Allow a budgetary allowance of R 5 000.00 (Five Thousand Rands) for servicing and/or replacing aluminium doors and windows expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used	Item		
	BALUSTRADING			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
9	Allow a budgetary allowance of R 5 000.00 (Five Thousand Rands) for minor repairs to existing damaged balustrades expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used	Item		
	EXPANSION JOINTS			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
10	Allow a budgetary allowance of R 15 000.00 (Fifteen Thousand Rands) for Expansion Joints expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used	Item		
	STEEL POSTS			
11	Supply and install 200 x 80 x 6mm thick base plate welded to steel pole and bolted to existing concrete roof and slab	No	2	
12	Supply and install M16 bolt and washers	No	4	
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Doctors Quarters
Bill No. 7
Metalwork

Item No			Quantity	Rate	Amount
	BILL NO. 8				
	PLASTERING				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	SCREEDS				
	Screeds (1:3) as described on concrete:				
1	Triangular fillet size 25 x 25mm extreme in angle of wall and screed to receive waterproofing membrane.	m	35		
2	40mm Thick on floors and landings to receive ceramic tiles	m2	50		
3	Average 100mm thick to falls and cross falls to floors.	m2	25		
	EXTERNAL PLASTER				
	One coat cement plaster (1:4) as described on brickwork or concrete on:				
4	Existing walls	m2	18		
5	Existing walls in narrow widths including preparation.	m2	132		
6	Existing concrete soffits and beams in patches including preparation	m2	20		
	Cement textured plaster on brickwork or concrete:				
7	Walls	m2	205		
8	Walls in narrow widths	m2	45		
	Carried Forward to Summary of Section No. 4			R	
	Section No. 4 Doctors Quarters Bill No. 8 Plastering				

Item No			Quantity	Rate	Amount
	BILL NO. 9				
	TILING				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	NOTE TO TENDERERS: Tenderers are advised that prices for the following tiling must include for the cost of supplying the tiles as designated in all of the items listed below, cost of laying, use and waste in fittings, bedding and grouting in the appropriate and approved material as required, transport, handling, storage, profit and overheads and cleaning down on completion				
	CERAMIC WALL TILES				
	200 x 200 x 6mm 'Samca Shiny' or similar approved wall tiles fixed with adhesive to plaster (elsewhere measured) and flush pointed with tinted jointing compound on:				
1	Existing walls including preparation	m2	1		
2	Existing walls with waterproof grout in isolated panels, splashbacks, etc. including preparation	m2	17		
3	Extra over tiling for plastic edge strip	m	43		
4	Fair exposed cutting and fitting around pipe not exceeding 50mm diameter	No	5		
	MOSAIC WALL TILES				
	Carried Forward			R	

	Brought Forward			R	
	300 x 300mm 'Iced Coffee Brown Slip Resistant Mosaic' or similar approved mosaic tiles fixed with adhesive to plaster, etc. (screed elsewhere measured) and flush pointed with tinted jointing compound on:				
5	Existing walls in narrow widths including preparation	m2	1		
	CERAMIC FLOOR TILING				
	600 x 600 x 6mm 'Styletec Code UID200522A S71' or similar approved floor tiles fixed with adhesive to plaster (elsewhere measured) and flush pointed with tinted jointing compound:				
6	On floors and landings	m2	55		
7	Skirting 100mm high of cut tiles	m	61		
	600 x 600 x 6mm 'Tile Afrika - Mozart Dove' or similar approved fixed with adhesive to screed (elsewhere measured) and flush pointed with tinted jointing compound				
8	On existing screeded floors and landings including preparation	m2	65		
9	Skirting 100mm high of cut tiles	m	42		
10	Extra over tiling for plastic edge strip	m	103		
	MOSAIC FLOOR TILING				
	300 x 300mm 'Iced Coffee Brown Slip Resistant Mosaic' or similar approved mosaic tiles fixed with adhesive to screeded floors, etc. (screed elsewhere measured) and flush pointed with tinted jointing compound				
11	Inside shower cubicles	m2	3		
12	Cut and fit tiling around shower outlet.	No	1		
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Doctors Quarters
Bill No. 9
Tiling

Item No		Quantity	Rate	Amount

BILL NO. 10

PLUMBING AND DRAINAGE

PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Sealing of edges

Outer edges of sinks, basins, baths, urinals, etc are to be sealed against adjacent surfaces with approved silicone

uPVC pipes and fittings

Sewer and drainage pipes and fittings shall be jointed and sealed with butyl rubber rings

Soil, waste and vent pipes and fittings shall be solvent weld jointed or sealed with butyl rubber rings

Reducing fittings

Where fittings have reducing ends or branches they are described as "reducing" and only the largest end or branch size is given. Should the contractor wish to use other fittings and bushes or reducers he may do so on the understanding that no claim in this regard will be entertained

Fixing of pipes

Unless specifically otherwise stated, descriptions of pipes shall be deemed to include fixing to walls, etc, casting in, building in or suspending not exceeding 1m below suspension level

Carried Forward R

	Brought Forward			R	
	General				
	Descriptions of overflow pipes where measured in number, shall be deemed to include joints to cisterns and splay cut ends				
	Descriptions of service pipes and flexible connecting pipes shall be deemed to include connections to taps, cisterns, etc and to steel pipes (adaptors for connections to copper pipes, etc are given separately)				
	Descriptions of WC pans, slop hoppers, etc shall be deemed to include for joints to soil pipes (pan connectors are separately measured)				
	As-built drawings				
	Where required, the contractor shall prepare an updated set of as-built drawings. At completion of the contract the contractor shall hand these drawings to the principal agent for reproducing onto the originals for handing over to the employer (provision for allowance of as-built drawings elsewhere)				
	RAINWATER DISPOSAL				
	Downpipes, etc:				
1	Aluminium downpipe to match existing	m	18		
2	Extra over for bend	No	1		
3	Extra over pipe for swan neck 300mm projection.	No	1		
4	Extra over for shoe	No	1		
	SANITARY FITTINGS				
	All rails, brackets, etc. where not bolted are to be fixed with long heavy gauge brass screws into approved expanding plugs.				
	Carried Forward			R	

	Brought Forward			R	
	Supply, fix, clean, wash and leave in a satisfactory condition the following items of sanitaryware including silicone pointing between fitting and plastered or tiled wall, partition or vanity top:				
5	White vitreous china wash hand basin size 550 x 430mm as 'Duravit 231055' fitted with 32mm chromium plated slotted waste fitting as 'GIO BW202S' fixed to plastered or tiled wall or similar approved including suitable bottle trap (elsewhere measured), flanges, adapters etc.	No	7		
6	White vitreous china floor standing back inlet pan and cistern as 'Lecico Neon' code ' NEOBOXFFL0MDFBE' complete with MDF toilet seat including sealing foot of bowl with abe Dow Corning acetoxy silicone sealant or similar approved fixed to tiled floor.	No	6		
	Stainless Steel				
	The following stainless steel fittings are to be Franke Kitchen Systems (Pty) Ltd., or other approved				
	The underside of all sink bowls, sinks and drainers are to be sound deadened by the application of an approved guaranteed vermin proof sound deadening emulsion or fibreglass sheeting				
	All exposed surfaces of stainless steel fittings are to be buffed to an even satin finish all over				
	Sinks, bowls and basins are to be pressed out of single sheets with complete drainage to outlets and each bowl is to be fitted with integral built-in overflow and chromium plated brass grating and unless otherwise described, 40mm recessed waste outlet and union with chromium plated brass grating, rubber plug and chromium plated brass chain and stay				
	Prices for all stainless steel fittings are to include for the supply and fixing of the fittings as described and for cleaning, washing and leaving in a satisfactory condition at completion				
	Carried Forward			R	

	Brought Forward			R	
	1,2mm Thick A.I.S.I. Grade 304 (18/10) stainless steel:				
7	'Franke Projectline Deb' code 'PLN621' drop-in type double end bowl sink and drainer unit size overall 1160 x 460mm wide or similar approved including including 38mm bracket strainer waste fitting with overflow, trap (e/m), sink to include mixer 15mm flexible connection cutting one tap hole and set in preformed opening in timber worktop (elsewhere measured) including necessary timber packing pieces, etc.	No	7		
	0,8 mm Thick A.I.S.I. Grade 430 (17/10) stainless steel:				
8	Supply and install Franke Wash Trough Double ET102 Economy Stainless Steel (1025 x 455mm) or similar approved, including stopper	No	3		
	SANITARY PLUMBING				
	uPVC soil and vent pipes				
9	50mm pipe fixed in walls, ceilings, roofs, floors, etc	m	35		
10	110mm pipe and fixing to walls, etc	m	5		
	Extra over uPVC soil and vent pipes for fittings				
11	50mm Bend	No	14		
12	50mm Access bend	No	7		
13	50mm Junction	No	7		
14	50mm End cap	No	1		
15	50mm Access pipe	No	1		
16	50mm Double junction	No	1		
17	110 x 50mm Reducer	No	1		
18	110mm Pan connector	No	6		
19	110mm Bend	No	2		
	Carried Forward			R	

				R	
	Brought Forward				
20	110mm Access bend	No	1		
21	110mm Junction	No	1		
	WATER SUPPLIES				
	Alterations to existing pipe work, etc.				
22	Cut into existing 22mm diameter copper pipe and supply and insert new tee or reducing tee including all necessary fittings, etc. to take new branch pipe.	No	1		
	Class 460/2 copper pipes with capillary couplings				
23	15mm Pipes	m	35		
24	22mm Pipes	m	7		
	Extra over Class 460/2 copper pipes for capillary fittings				
25	15mm Fittings	No	28		
26	22mm Fittings	No	7		
	Extra over Class 460/2 copper pipes for compression fittings				
27	15mm Fittings	No	7		
28	22mm Fittings	No	7		
	TRAPS				
	Floor outlets:				
29	Supply and install 'Wirquin James WRSW003' Square Revolutionary Multi-Directional Shower Waste Outlet or similar approved including jointing to uPVC pipe and including the necessary adaptors	No	7		
	Flexitraps:				
30	40 x 50mm Butyl rubber 'P' or 'S' trap jointed to waste outlet fitting and UPVC pipe including clamps.	No	3		
	Carried Forward			R	

				R	
	Brought Forward				
	Franke Traps:				
31	40 x 50mm 'Franke - SPAZI F/2' code 'FRA-1120009' double bowl kitchen plumbing kit and joint to waste outlet of fitting and 50mm UPVC pipe including necessary adaptor.	No	7		
	Brass traps, waste unions, etc.:				
32	32 x 32mm Chromium plated bottle trap as 'GIO A186'	No	7		
33	15mm Chromium plated 'Master Ballostop' as 'Cobra 1090' in-line flow control and shut-off valve and joints to copper pipe.	No	7		
34	22mm Chromium plated 'Master Ballostop' as 'Cobra 1090' in-line flow control and shut-off valve and joints to copper pipe.	No	7		
	TAPS, VALVES, ETC.				
	Where taps, valves, etc. are described as jointed to copper pipes, prices are to include, where necessary, for the required capillary or compression joint fittings				
	All taps, stopcocks, etc. are to have the indicators silicone glued into position				
35	Supply and install 'Hansgrohe Crometta 85 28423000' 1Jet Green 6l/min overhead shower with 128mm 'Hansgrohe 27411000' wall mounted shower arm and flange or similar approved and joints to copper	No	7		
36	Supply and install 15mm 'Amalfi Onyx TVON4850/CH' pillar tap with chrome finish or similar approved fixed to basin and joints to copper pipe	No	14		
37	Supply and install 15mm 'Amalfi Garnet TVGR3000/CH' shower mixer with chrome finish or similar approved fixed to plastered or tiled wall and joints to copper pipe	No	7		
38	Supply and install 15mm chromium plated 'Amalfi Garnet TVGR3031/CH' pillar type sink mixer or similar approved including holing sink for same fixed to tiled or plastered wall and joints to copper pipe	No	7		
	Carried Forward			R	

				R	
	Brought Forward				
39	Supply and install 15mm 'Cobra 3309SB-15' washing machine tap or similar approved fixed to plastered or tiled wall and joints to copper pipe	No	8		
40	Supply and install 15mm 'Amalfi Onyx TVON4815/CH' bib tap with chrome finish or similar approved fixed to basin and joints to copper pipe	No	6		
	FIRE APPLIANCES ETC				
41	'Everyway' or similar approved hose reel with 30m plastic hose, chromium plated stopcock, shut-off nozzle and wall bracket	No	7		
42	4,5kg Dry chemical powder fire extinguisher including backing board fixed to wall.	No	8		
43	4,5kg Ozone friendly carbon dioxide fire extinguisher including backing board fixed to wall.	No	6		
	WATER SUPPLIES TO FIRE APPLIANCES				
	Class 460/2 copper pipes				
44	28mm Pipe	m	5		
	Extra over class 460/2 copper fittings for the following capillary fittings				
45	28mm Fittings	No	5		
	Sundries:				
46	Chase brick or block wall for pipes not exceeding 50mm diameter.	m	20		
47	Core drilling of holes 100mm diameter through slab not exceeding 300mm thick.	No	1		
48	Minor builders work related to Plumbing and Drainage		Item		
	Carried Forward			R	

	Brought Forward			R
	Testing			
49	Allow for testing the whole of the Sanitary Plumbing, Water Supplies etc; to the satisfaction of the Architect and Local Authorities. All defective work is to be taken out and replaced at the Contractor's expense and the whole re-tested until found satisfactory.	Item		
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances			
50	Allow a budgetary allowance of R 50 000.00 (Twenty Five Thousand Rands) for Allow for jetting and cleaning existing pipes expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used	Item		
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Doctors Quarters
Bill No. 10
Plumbing & Drainage

Item No		Quantity	Rate	Amount

BILL NO. 11

ELECTRICAL WORK

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Specifications, drawings, etc

Tenderers are referred to the specifications and drawings, annexed to these bills of quantities for the electrical work, for the full descriptions of the following items which are to be read and priced in conjunction with the said specification and drawings. All items have been measured provisionally and are subject to remeasurement on site.

Distribution boards etc

Rates for distribution boards etc are to include for busbars, jumpers, neutral bars, internal wiring and connections, circuit identification markers, control gear labels, circuit legend cards and working drawings

Switches, socket outlets, etc

Rates for switches, socket outlets, etc are to include for screwing to outlet boxes, connecting up and cover plates

Light fittings

Rates for light fittings are to include for hanging, fixing and connecting and for lamp holders and fluorescent tubes and lamps of the type and wattage described

Carried Forward R

				R	
	Brought Forward				
	SWITCHED SOCKET OUTLETS				
1	Replacement of three-pin socket outlet with double 16A, 3-pin single switched outlet (1 x SANS 164-1 and SANS 164-2) with USB outlet	No	9		
	LIGHT SWITCHES				
2	Replacement of single-way switches	No	26		
	CONDUCTORS (POWERPOINTS)				
3	Remove Cape Town cooker plugs and make good the junction box with lid.	No	4		
4	Supply and install 20A double pole isolator in 4x4 glavanised box. The isolator must have a led indication light to indicate when switched on	No	4		
	LUMINARIES AND ACCESSORIES				
	The LED light fittings are to be the PioLED manufactured or equally approved. Performance requirements shall be according to SANS 475. Luminaries shall also bear the SANS mark of approved and SANS 1464 safety mark.				
5	Replacement of pendant lights in the bedrooms of the Doctors Quarters. The light fittings to be decorative and in keeping with a Doctors Quarters,viz pendant LG Dome ,399 mm diameter preferably metallic.	No	10		
6	Replacement of five foot fluorescent fittings in the kitchen and laundry with 5ft 60W, LED linear fittings white in colour and finish. 4000K	No	4		
7	Supply and install 20W LED white round bulkhead IP65 4000K , complete with LED lamps polycarbonate body and diffuser. Light fitting to carry a five year warantee	No	26		
8	Supply and install 20W LED white round bulkhead IP65 4000K with battery backup for 3 hours at 70% light output , complete with LED lamps polycarbonate body and diffuser. Light fitting to carry a five year warantee	No	10		
9	Permanent live circuits using 2.5mm Cu PVC sheathed Cu cable	m	1 600		
	Carried Forward			R	

				R	
	Brought Forward				
10	Supply and install 10A, 10kA circuit breaker into the distribution board	No	6		
11	Allow to rewire existing battery backup fittings	No	80		
	FIRE DOORS AND ILLUMINATED EXITS AT DOCTORS ACCOMMODATION				
12	Supply, deliver and install 20 mm galvanised conduit type or similar approved from the designated DB to the Maglock panel at the Emergency Exit Doors, together with 4mm sq., 3 core for 7 floors.	m	380		
13	Supply and install 4mm2 2C surfix black in the above conduit inclusive of terminations	m	380		
14	Supply, deliver and install 10A, 10kA MCB in panel for 7 floors	No	13		
15	Supply, Install Illuminated EXIT signs	No	36		
16	Supply, deliver and install surface mounted automatic fire door closer, with interface input/output units , similar to that made by Dorma	No	11		
	DOCTORS QUARTERS HEAT PUMPS				
	Supply, Deliver and Install the following:				
17	Supply and install 100mm Premier Heavy Duty cable tray from Doctors Quarters substation to the plant room, hot dip galvanised	m	20		
18	3-phase, 4 core PVC, SWA ECC 16mm sq. cable from DQ substation (non-essential supply) and terminate into DB (supplied by others) in the plant room. Suppy glanding.	m	25		
	SQUASH COURT				
19	Replacement of linear fittings in the Squash Courts with suitable covers for squash ball impact, as supplied by Pre- Sports , Nordland or equivalent to JBLS 1200 4 ft GEN 3359mA ,Supply, Deliver, Install	No	4		
	SUNDRY ITEMS				
	Carried Forward			R	

	Brought Forward			R	
	Testing and Commissioning				
20	Testing and commissioning of entire electrical installation & Issue Certificates of Compliance	Item			
	Construction Record Drawings				
21	Allow for the marking up of prints of the entire installation for the production of construction drawing records. The Engineer shall produce the final drawings.	Item			
	Signs and Labels				
22	Supply and install all power, lighting, and earthing signs and labels as specified and in accordance with all OHS Act requirements	Item			
	Operation Manuals				
23	Supply as per project specifications	Item			
	Maintenance & Guarantees				
24	A 12 month maintenance, after sales support and guarantee	Item			
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
	Lightning Protection				
25	Allow a budgetary allowance of R50 000.00 (Fifty Thousand Rands) for Lightning and Earthing Protection expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used			SUM	
	Sundry Electrical Items:				
26	Allow a budgetary allowance of R 180 000.00 (One Hundred and Eighty Thousand Rands) for Sundry Electrical Items including DB Repairs to achieve Compliance expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used	Item			
	Carried Forward			R	

Section No. 4
Doctors Quarters
Bill No. 11
Electrical Work

	Brought Forward			R	
	SMOKE DETECTION				
	Supply and install the following:				
27	Power supply with 12V battery and fire escape doors	No	21		
28	Green break glass + perspex cover positoned on the inside of the door	No	21		
29	1mm PH30 cable	m	1 050		
30	Maglock (holding force 500kg)	No	21		
31	Z bracket for maglock fixing	No	21		
32	Labour to install and commission magnetic locks	No	21		
33	Fibre optic splicing	No	12		
34	Configuration and commissioning of full system		Item		
35	Loop cards	No			
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Doctors Quarters
Bill No. 11
Electrical Work

Item No		Quantity	Rate	Amount
	BILL NO. 12			
	MECHANICAL WORK			
	STANDARD PREAMBLES			
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates			
	HOT WATER INSTALLATION			
	Works include the following:			
	1. Complete supply, delivery, installation, testing & commissioning of the new hot water system together with associated pumps, piping reticulation, piping supports, valves, fittings and labelling.			
	2. Isolation, decommissioning and removal of certain existing hot water equipment, together with associated pipework and fittings. All equipment to be handed over to Greys Hospital Maintenance Department.			
	3. Isolation and termination of existing Steam lines (not included here. Refer to BOQ for Nurses Accommodation)			
	4. Testing of existing supplies to the building and reticulation in the building			
	5. All items have been measured provisionally and are subject to remeasurement on site.			
	Existing Services			
1	Isolating, decommissioning, disconnection & removal of existing 1800 litres hot water tank, including dosing equipment, all associated pipework, valves & fittings. completed under previous contract	No		
	Carried Forward			R

	Brought Forward			R	
2	Isolating, terminating and removing all remaining existing pipework, valves & fittings remaining in plantroom in Drs Accommodation	Item			
3	Allow for flow testing of existing domestic cold water reticulation in building	Item			
4	Allow for flow testing of existing domestic hot water reticulation system in building	Item			
5	Allow for flow testing of existing Fire water reticulation system	Item			
6	Allow for pressure testing of existing domestic cold water reticulation system in building	Item			
7	Allow for pressure testing of existing domestic hot water reticulation system in building	Item			
8	Allow for pressure testing of existing Fire water reticulation system in building	Item			
	<u>Equipment</u>				
9	Completion of the installation of a 3 000 litre vertical thermowise hot water vessel, Excluding internal electrical heating elements Manufactured according toASMEVIII div 1 and SANS 347:2012 Standards Tesing pressure 900 kPa, Operating pressure 600 kPa, Insulation and Galvanized Steel cladding included. All pipework connections between tanks and heatpumps to be fitted with lagging and galvanised-steel cladded. Drain and drain piping included, all safety features, supports and all necessary accessories as specified. All pipework interconnection between tanks and heat pumps to be fitted with lagging and cladding. All ports to be flanged	Item			
	Carried Forward			R	

	Brought Forward			R	
10	Complete the Installation of 38kW Air to Water Heat Pump, Thermowise TKRS-380E/SN2-M, or other approved, with Smart Colour Touchscreen controller9.2kW, 380V Input Heating to 60°C, minimum ambient temperature 5 °CIncluding controller, automatic defrost cycle, all safety features, thermostats, controls, connection to main control panel, with maximum noise level of 70dB(A), fittings, insulation, cladding, bends,tees, and necessary accessories as specified. All pipework interconnection between tank and heat pumps to be fitted with lagging as specified, including PVC drains to nearest drainage point.	No	3		
11	Tie in of the existing 2500 Litre Hot water tank on-site into the system as per Schematic		Item		
12	Allow for the Supply, delivery & installation of electrical control panel (IP54) complete with all switchgear, contactors, circuit breakers, fuses, warning lights & alarms, over/under current protection, Phase rotation protection, toggle switches and isolator(s); and including all electrical & control wiring, cable trays, conduit (Bossal type or other approved), saddles, brackets, fittings and all necessary accessories in accordance to the specification and manufacturer's recommendations for the hot water plant installation. Panel to Control 2 x Hot Water Circulation Pumps, 3 x Heatpump Circulation Pumps and 3 x 38kW Heat Pumps		Item		
13	Completion of installation of circulation pumps for Heat Pumps: Grundfos CM10-2	No	3		
14	Installation of Hot Water Return circulation pumps: Grundfos UPS 25-60-180	No	2		
15	Electrical connections and wiring of Heat Pumps	No	3		
16	Electrical connections and wiring of Circulation Pumps	No	5		
	<u>Piping, fittings, valves & insulation</u>				
	Carried Forward			R	

	Brought Forward			R	
	Supply & install Copper piping (SANS 460 Copper class 2), including pipework between heatpumps and hot water vessels; including tie-ins to domestic cold water, hot water and hot water return.				
17	108mm diameter	m	5		
18	76mm diameter	m	8		
19	67mm diameter	m	15		
20	54mm diameter	m	30		
21	42mm diameter	m	30		
22	35mm diameter	m	10		
23	28mm diameter	m	10		
24	22mm diameter	m	10		
	Supply & Install Copper class 2 Fittings for piping				
	Elbows, Tees, Reducers, Reducing Tees, Straight Connectors:				
25	108mm Reducing tees	No	2		
26	108mm Reducer	No	2		
27	108mm Straight coupler	No	2		
28	76mm Elbow	No	4		
29	76mm Tee	No	2		
30	76mm Reducing tee	No	1		
31	76mm Reducer	No	2		
32	76mm Straight coupler	No	5		
33	67mm Elbow	No	10		
	Carried Forward			R	

Section No. 4
Doctors Quarters
Bill No. 12
Mechanical Work

	Brought Forward			R	
34	67mm Tee	No	2		
35	67mm Reducing tee	No	6		
36	67mm Reducer	No	2		
37	67mm Straight coupler	No	10		
38	54mm fittings	No	20		
39	42mm fittings	No	35		
40	35mm fittings	No	15		
41	28mm fittings	No	15		
42	22mm fittings	No	15		
	Insulation				
	Supply & Install k-flex installation, or other approved, with R-value of 0.8 m2/kw, complete with 0.5mm galvaised sheet metal cladding				
	For piping:				
43	76mm diameter	m	8		
44	67mm diameter	m	15		
45	54mm diameter	m	30		
46	42mm diameter	m	30		
47	35mm diameter	m	10		
48	28mm diameter	m	10		
49	22mm diameter	m	10		
	Carried Forward			R	

	Brought Forward			R	
	For fittings:				
50	76mm fittings	No	14		
51	67mm fittings	No	30		
52	54mm fittings	No	20		
53	42mm fittings	No	35		
54	35mm fittings	No	15		
55	28mm fittings	No	15		
56	22mm fittings	No	15		
57	Hangers & brackets			SUM	
	Supply & Install MEPLA piping for tank drain point, including sleeves, fittings and consumables				
58	50mm diameter	m	10		
	Inline Y-Strainers:				
59	76mm diameter	No	1		
60	42mm diameter	No	5		
	Ball valves				
61	108mm diameter	No	2		
62	76mm diameter	No	5		
63	67mm diameter	No	2		
64	54mm diameter	No	8		
65	42mm diameter	No	12		
	Carried Forward			R	

				R	
	Brought Forward				
66	35mm diameter	No	2		
67	28mm diameter	No	2		
68	22mm diameter	No	2		
	Non-return valves				
69	76mm diameter	No	1		
70	42mm diameter	No	5		
	Pressure reducing valves				
71	76mm diameter	No	1		
72	Safety valves, including all fittings and accessories	No	5		
73	Temperature gauges	No	12		
74	Pressure gauges	No	5		
75	Binder test port connections	No	10		
76	Water Meter on main incoming domestic water line		Item		
	GENERAL				
77	Transport & rigging of equipment		Item		
78	Hydraulic calculations		Item		
79	Minor Builders work associated with hot water installation (including drilling, sleeves, making good etc. Excluding plinths measured elsewhere)		Item		
80	Preparation of Workshop drawings & printing (3 sets)		Item		
81	Commissioning & Testing the complete hot water system		Item		
82	12 months Maintenance & Guarantee of hot water system		Item		
	Carried Forward			R	

	Brought Forward			R	
83	3 sets of Operations & Maintenance Manuals		Item		
84	Signs & labels, as specified and in accordance with OHS Act		Item		
85	Preparation of As-buit drawings & printing (3 sets)		Item		
86	Training of Hospital Maintenance staff		Item		
87	Plumbing CoC		Item		
88	Electrical CoC		Item		
	MECHANICAL VENTILATION INSTALLATION				
	Works include the following:				
	Extract Fans				
89	Supply & Install plate-mounted extract fan - Hydor HPA 350/4 / CFP-350/4 or similar and approved; in Hot water Plantroom - fan suitable for wall installation; c/w electrical connection to local isolator and 24hr, 7-day timer control. EF-04: 720l/s extract suitable aluminium louvre to be included SHL12-Alumimium Gravity Louvre 480 x 480mm	No	1		
	Electrical				
90	Supply and install suitable isolator for extract fan, and associated cabling to power supply point	No	1		
	Weather Louvres				
91	Remove existing and replace with 1800 x 900mm louvre at plantrooms, aluminium anodised with wire mesh (vermin proof)	No	6		
	Sundries:				
92	Testing and commissioning of extract fan		Item		
93	12-month maintenance & guarantee		Item		
94	3 sets of Operations & Maintenance Manuals		Item		
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Doctors Quarters
Bill No. 12
Mechanical Work

Item No			Quantity	Rate	Amount
	BILL NO. 13				
	GLAZING				
	PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	TOPS, SHELVES, DOORS, MIRRORS, ETC.				
	Supply and install 6 mm Silvered float glass copper backed mirrors with polished edges plugged to plastered or tiled walls or mirror cabinet or built in cupboard:				
1	Mirror 280 x 390 mm high	No	7		
2	Mirror 400 x 600 mm high	No	7		
3	Mirror 510 x 1600 mm high	No	10		
	GLAZING TO STEEL WITH PUTTY				
	Supply and install 4mm thick toughened safety transluscent window and/or door glazing on:				
4	Existing steel sashes in panes exceeding 0,1m2 and not exceeding 0,5m2, including taking out and removing existing glass, removing all putty and preparing rebates.	m2	3		
5	Existing steel sashes in panes exceeding 0,5m2 and not exceeding 2m2, including taking out and removing existing glass, removing all putty and preparing rebates.	m2	3		
	Carried Forward			R	

	Brought Forward			R	
	Supply and install 4mm thick obscure window and/or door glazing on:				
6	Existing steel sashes in panes exceeding 0,1m2 and not exceeding 0,5m2, including taking out and removing existing glass, removing all putty and preparing rebates.	m2	1		
	GLASS LOUVRES				
7	6mm Clear glass louvre 150mm wide and fix ends in existing metal louvre clips including preparation	m	5		
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Doctors Quarters
Bill No. 13
Glazing

Item No			Quantity	Rate	Amount
	BILL NO. 14				
	PAINTWORK				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	PAINT ON PLASTER, ETC.				
	Prepare surfaces and remove all loose material, apply One coat 'Plascon Professional (PP700)' gypsum and plaster primer (PU800) and two finishing coats 'Plascon Professional Superior Low Sheen (PEM 1000)' pure acrylic emulsion paint or similar approved on:				
1	Walls internally	m2	147		
2	Textured plastered walls externally	m2	250		
3	Gypsum plastered ceilings internally	m2	17		
4	Ceilings externally	m2	12		
5	Columns externally	m2	48		
	Prepare surfaces and remove all loose material, apply One coat 'Plascon Professional (PP700)' gypsum and plaster primer (PU800) and two finishing coats 'Plascon Professional Superior Low Sheen (PHL)' pure acrylic emulsion paint or similar approved on:				
6	On walls internally	m2	102		
7	Ceilings internally	m2	26		
	Carried Forward			R	

				R	
	Brought Forward				
	PAINT ON METAL				
	One coat calcium plumbate primer on:				
8	Backs of galvanised steel door frames	m2	1		
	Prepare surfaces and remove all loose material, dust, grease, salts and contamination with 'Plascon Aquasolve Degreaser GR1', apply one coat primer (UC170) one coat 'Plascon Professional undercoat (PU800)' and one finishing coat 'Plascon Water Based Velvaglo (VLW)' or similar approved on galvanised:				
9	Door frames and linings	m2	6		
10	Door screens (measured on flat)	m2	38		
11	Sashes and frames (measured on flat)	m2	129		
12	Balustrading (measured on flat)	m2	360		
13	Copper pipes not exceeding 300mm girth.	m	10		
	Clean down with galvanise wash primer and apply two finishing coats external quality pure acrylic paint on:				
14	uPVC rainwater down pipe exceeding 50mm and not exceeding 100mm diameter including bends and shoes.	m	5		
	Prepare surfaces and remove all loose material, dust, grease, salts and contamination with Polycell Sugar Soap Powder, rinse with water and apply one coat Plascon Polysafe 18 Primer' and two coats 'Plascon True Color TCR Range' or similar approved paint on:				
15	Existing corrugated roof sheeting	m2	20		
	PAINT ON WOOD				
	Carried Forward			R	

	Brought Forward			R	
	One coat general purpose wood primer on:				
16	Backs of frames not exceeding 300mm girth before fixing.	m	153		
	Stop, fill, sand down and prepare wood surfaces and apply one coat 'Plascon Professional Wood Primer (UC2)', one coat 'Plascon Professional undercoat (PU800)' and one finishing coat 'Plascon Water Based Velvaglo (VLW)' or similar approved on:				
17	General surfaces	m2	114		
18	Skirtings, rails, cills, fascias, etc., not exceeding 300mm girth.	m2	77		
19	Frames and linings	m2	3		
	Stop, fill, sand down and prepare wood surfaces and apply three coats of 'Plascon Woodcare Ultra Vanish (X-Range)' or similar approved on:				
20	General surfaces	m2	60		
21	General surfaces of fittings	m2	35		
22	Skirtings, rails, cills, fascias, etc., not exceeding 300mm girth.	m2	69		
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Doctors Quarters
Bill No. 14
Paintwork

Item No			Quantity	Rate	Amount
	BILL NO. 15				
	EXTERNAL WORKS				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	ALTERATIONS				
	Removal of interlocking pavers:				
1	On driveways etc, including 150mm layer below	m2	10		
	Removal of damaged concrete, cartaway to dump site located by the contractor and shaping of trenches to receive new				
2	Storm drains	m3	5		
	EARTHWORKS				
	Excavations in earth not exceeding 2m deep				
3	To reduce levels	m3	5		
	Carting away				
4	Extra over excavations for carting away surplus material from the excavations to a dumping site to be located by the contractor	m3	5		
	Earth Fill Material				
5	Imported selected fill (G5) in layer 150mm thick and compacted to 93% Mod AASHTO density	m3	5		
	Soil Poisoning				
6	Treat ground below paving with an approved weed killer	m2	20		
	Carried Forward			R	

	Brought Forward			R	
	Compaction of surfaces				
7	Compaction of ground surfaces under pavings etc, including ripping up surface and scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% Mod AASHTO density	m2	20		
	PAVING				
8	Supply and install 600 x 600mm concrete pavers to match existing including 50mm sand bed below	m2	10		
9	Supply and install 60mm grey interlocking pavers size 200 x 100mm to match existing including 50mm sand bed below	m2	10		
10	Remove vegetation on existing concrete pavers, channels, etc.	m2	10		
11	Supply and lay bituminous primer and 50mm thick AC continously graded fine mix asphalt compacted to 95% marshall in patches	m2	2		
	CONCRETE, FORMWORK AND REINFORCEMENT				
	REINFORCED CONCRETE CAST ON/IN FORMWORK				
	25MPa/19mm concrete				
12	Concrete drain	m3	5		
	ROUGH FORMWORK (DEGREE OF ACCURACY II)				
	Rough formwork to sides				
13	Concrete drains	m2	4		
	REINFORCEMENT				
	Mild steel reinforcement to structural concrete work:				
14	Bars of various diameters.	t	0.25		
	Carried Forward			R	

	Brought Forward			R	
	High tensile steel reinforcement to structural concrete work:				
15	Bars of various diameters.	t	0.25		
	TESTING				
16	Making and testing set of three 150 x 150 x 150mm concrete strength test cubes	No	1		
17	Modified AASHTO Density test	No	1		
18	Field Density test including Optimum Moisture Content (four readings per test)	No	1		
	Carried Forward			R	

				R	
	Brought Forward				
	GRATINGS TO EXTERNAL DRAINS				
19	Supply and install mentis grating size 340mm wide x 1000mm long on existing drainage channels to match existing	m	30		
20	Remove soil from existing concrete drainage channel etc., cartaway to approved dumping site to be located by Contractor	m3	22		
	REMEDIAL BUILDING WORK TO PLANT ROOM				
	Breaking out for and forming openings through brick walls , including brick lintels, making good cement plaster on one side and into reveals and face brickwork on other side and into reveals with 20 MPa concrete thresholds with steel trowelled finish (new extract fans measured elsewhere)				
21	150 x 150mm openings	No	10		
22	400 x 400mm openings	No	20		
	Building Up Openings:				
23	Build up openings not exceeding 0.5m2 in NFP one brick wall in Class II mortar and make good internal plaster on one side and facebrick to match existing on other side including all necessary lintels etc.	No	1		
	Cutting out and forming openings through timber doors for door grilles, including making good all edges of opening				
24	400 x 500mm opening through timber doors for door grilles	No	30		
	Light fittings				
25	Remove and replace light fitting to match existing	No	4		
	Carried Forward			R	

	Brought Forward			R	
	Waterproofing				
26	Hack up and remove damaged waterproofing including making good concrete floor and install new 4mm 'Derbigum' or other approved waterproofing to floors	m2	60		
27	Prepare surfaces and remove all loose material and apply 2 coats of 'Dulux Hi-Chem' epoxy paint strictly in accordance with manufactures instructions to floors or similar approved	m2	40		
	Plumbing and Drainage				
28	Remove damaged and Install new 110mm diameter floor drain to match existing	No	4		
29	110mm diameter HDPE drainage pipe	m	10		
30	Tie in new drainage pipe into existing system		Item		
	Paint to existing surfaces				
	Prepare surfaces and remove all loose material, apply One coat 'Plascon Professional (PP700)' gypsum and plaster primer (PU800) and two finishing coats 'Plascon Professional Superior Low Sheen (PEM 1000)' pure acrylic emulsion paint or similar approved on:				
31	On walls internally	m2	110		
32	On Soffits	m2	80		
	Prepare surfaces and remove all loose material, dust, grease, salts and contamination with 'Plascon Aquasolve Degreaser GR1', apply one coat primer (UC170) one coat 'Plascon Professional undercoat (PU800)' and one finishing coat 'Plascon Water Based Velvaglo (VLW)' or similar approved on galvanised:				
33	Roller shutter doors	m2	12		
	Sundries				
34	Servicing existing roller shutter doors		Item		
	Carried Forward			R	

	Brought Forward			R	
35	Supply and lay gravel average 50mm thick around concrete plinths	m2	51		
	<u>Repairs to Walkway Cladding</u>				
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
36	Allow a budgetary allowance of R 50 000.00 (Fifty Thousand Rands) for Repairs to Walkway Cladding expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used			SUM	
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Doctors Quarters
Bill No. 15
External Works

Item No			Quantity	Rate	Amount
	BILL NO. 16				
	MISCELLANEOUS				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	CURTAINING				
1	Supply and install single heavy duty curtain tracks including wheel runners and end caps	m	75		
	WASHING LINES				
2	Supply and install mini retractable 5m clothesline with 3 lines as 'Retractaline 6003394000025' or similar approved	No	2		
	IRONING BOARDS				
3	Supply and install 'SpaceSaver' wall mounted ironing board cabinet	No	6		
	BIRD PROOFING				
4	Supply and install single braced silver and gold 'Eagle Eye Solar Kit' or similar approved	No	2		
5	Supply and install single braced silver and gold 'Eagle Eye Wind-Driven Kit' or similar approved	No	2		
6	Supply and install land bird 'Eagle Eye Pro-Peller Unit' or similar approved	No	3		
7	Supply and install 'Eagle Eye' double braced kit for high winds or similar approved	No	3		
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Doctors Quarters
Bill No. 16
Miscellaneous

SECTION SUMMARY - Doctors Quarters

Bill No		Page No	Amount
1	Alterations	139	
2	Waterproofing	141	
3	Roof Coverings	143	
4	Carpentry & Joinery	149	
5	Ceilings	152	
6	Ironmongery	159	
7	Metalwork	162	
8	Plastering	163	
9	Tiling	165	
10	Plumbing & Drainage	173	
11	Electrical Work	178	
12	Mechanical Work	186	
13	Glazing	188	
14	Paintwork	191	
15	External Works	197	
16	Miscellaneous	198	
	Carried to Final Summary		R

Section No. 4
Doctors Quarters

Item No		Quantity	Rate	Amount

SECTION NO. 5: SQUASH COURT

BILL NO. 1

ALTERATIONS (PROVISIONAL)

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

General Notes:

The contractor shall carry out the whole of the works with as little mess and noise as possible and with minimum disturbance to adjoining premises and their tenants. He
shall provide proper protection and provide, erect and remove when directed, any temporary tarpaulins that may be necessary during the progress of the works, all to the satisfaction of the principal agent.

Water supply pipes and other piping that may be encountered and found necessary to disconnect or cut, shall be effectually stopped off or grubbed up and removed, and any new connections that may be necessary shall be made with proper fittings, to the satisfaction of the principal agent.

Doors, fanlights, fittings, frames, linings, etc which are to be re-used shall be thoroughly overhauled before refixing including taking off, easing and rehanging, cramping up, re-wedging as required and making good cramps, dowels, etc, and easing, oiling, adjusting and repairing ironmongery as necessary, replacing any glass damaged in removal or subsequently and stopping up all nail and screw holes with tinted plastic wood to match timber, unless otherwise described. Re-painting or re-varnishing is given separately.

Prices for taking out of doors, windows, etc shall include for removal of all beads, architraves, ironmongery, etc.

Carried Forward R

				R	
	Brought Forward				
	Prices for taking out and removing doors and frames shall include for removing door stops, cabin hooks, etc and making good floor and wall finishes to match existing				
	With regard to building up of openings in existing walls, cement screeds and pavings, granolithic, tops of walls, etc, shall be levelled and prepared for raising of brickwork.				
	Making good of finishes shall include making good of the brick and concrete surfaces onto which the new finishes are applied, where necessary.				
	The contractor will be required to take all dimensions affecting the existing buildings on the site and he will be held solely responsible for the accuracy of all such dimensions where used in the manufacture of new items (doors, windows, fittings, etc).				
	View Site				
	Before submitting the tender, the contractor shall visit the site and satisfy himself/herself as to the nature and extent of the work to be done and the value of the materials contained in the buildings or portions of the buildings to be demolished. No claim for any variations of the contract sum in respect of the nature and extent of the work or of inferior or damaged materials will be entertained.				
	Take out and remove, and prepare all surfaces to receive new, including making good existing surfaces where items have been removed				
	Floors/Walls and Coverings:				
1	Clean and polish existing screeded floors	m2	5		
	Slabs, Ceilings, etc:				
2	Remove damaged ceiling systems including soffits, gridlock suspension system, etc. cart away to approved dumping site to be located by Contractor and prepare to receive new	m2	16		
	Carried Forward			R	

Section No. 5
Squash Court
Bill No. 1
Alterations

	Brought Forward			R	
	Doors & Windows:				
3	Remove damaged 4mm glazing, etc. from existing windows and sashes in panes not exceeding 0,5m2 (sashes and frames to remain and reglazing elsewhere measured) cartaway to approved dumping site to be located by Contractor and prepare to receive new	m2	2		
4	Clean and make good glazed external steel windows, doors, etc (area measured on flat).	m2	14		
	Sundry items:				
5	Clean existing 1000mm high steel balustrade (area measured on flat)	m2	7		
	Carried Forward to Summary of Section No. 5			R	

Section No. 5
Squash Court
Bill No. 1
Alterations

Item No			Quantity	Rate	Amount
	BILL NO. 2				
	WATERPROOFING				
	PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	SUPPLEMENTARY PREAMBLES				
	Waterproofing				
	All 'wet' areas, such as showers, must first be waterproofed with a 10 year guarantee, waterproofing which is designed, supplied and fixed by and approved supplier.				
	JOINT SEALANTS ETC				
	Approved clear silicone sealant:				
1	In joints between frames and walls	m	20		
	Carried Forward to Summary of Section No. 5			R	

Section No. 5
Squash Court
Bill No. 2
Waterproofing

Item No		Quantity	Rate	Amount

BILL NO. 3

CEILINGS, PARTITIONS AND ACCESS FLOORING

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Fixing

Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins, or to be shot-pinned, to brickwork or concrete

Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 500mm centres, and where described as "bolted", the bolts have been given elsewhere

Ceilings

Unless otherwise described ceilings shall be deemed to be
horizontal

Proprietary suspended ceilings

Hangers, suspension grids, "lay-in" panels, etc are to be in accordance with the manufacturers' recommendations

Electrical light fittings, diffusers, panels etc are generally "lay-in" units of the same dimensions as the suspension grid described and allowance must be made in the rates accordingly for their support inclusive of any flexibility in setting out that may be required (ceiling panels have not been deducted and pricing is to take cognisance thereof)

Carried Forward R

	Brought Forward			R	
	SUSPENDED CEILINGS				
1	Ceilings suspended not exceeding 1m below concrete soffits	m2	16		
	1200 x 600 x 9mm thick 'Pelican Systems' Econotile Vinyl Clad foil back Shell White ceiling tiles, laid on Econogrid pre-painted 38mm exposed steel tee suspension system, including all necessary hangers, grids and hold down clips. Suspension shall be in accordance with the manufacturer`s recommendations and SABISA or similar approved.				
2	Extra over ceiling for 1200 x 600mm recessed light fitting.	No	2		
	Cornices to suspended ceilings:				
3	'Pelican Systems' Aluminium PS1 shadow wall trim, fixed to plastered brickwork with 5 x 25mm wall anchors at 450mm centres or similar approved	m	18		
	Carried Forward to Summary of Section No. 5			R	

Section No. 5
Squash Court
Bill No. 3
Ceilings

Item No		Quantity	Rate	Amount

BILL NO. 4

IRONMONGERY

STANDARD PREAMBLES

The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Proprietary items

Where applicable the manufacturers' names or product catalogue titles are given in sub-headings preceding the items

On request returnable samples are to be provided to the principal agent for consideration

Finishes to ironmongery

Where applicable finishes to ironmongery are indicated by suffixes in accordance with the following list:
BS Satin bronze lacquered
CH Chromium plated
SC Satin chromium plated
SE Silver enamelled
GE Grey enamelled
AN Anodised natural
AS Anodised silver
AB Anodised bronze
AG Anodised gold
ABL Anodised black
PB Polished brass
PL Polished and lacquered
PT Epoxy coated
SD Sanded

Carried Forward R

				R	
	Brought Forward				
	Rates				
	Prices are to be based on the specific products/articles specified. If tenderers wish to offer alternative products/articles for certain items, these items are to be clearly marked and the alternative specification given with supporting brochures etc clarifying the features of the products/articles offered				
	HINGES, BOLTS, ETC				
	Manufactured by "Assa Abloy" or "Similar approved"				
1	'UNION' or 'similar approved' 200mm aluminium anodised reflex hinge.	No	2		
	HANDLES AND LOCKS				
	Manufactured by "Assa Abloy" or "Similar approved"				
2	'Union' or 'equal approved' Deadbolt lock (Code: QD35X85MMSS)	No	1		
3	'Union' or 'equal approved' knob cylinder profile KD SC (Code: 2X19SC)	No	1		
4	'Union' or 'equal approved' escutcheon on rose profile (Code: PZ-05SS)	No	1		
5	'Union' or 'equal approved' Stainless steel 400mm BTB pull handle (Code: 5206BBSS)	No	1		
	DOOR CLOSERS				
6	'ASSA ABLOY' or equal approved rack and pinion door closer with link arm (Code: DC200) fixed to steel frame	No	1		
	Carried Forward			R	

				R	
	Brought Forward				
7	'ASSA ABLOY' or equal approved cam action door closer (Code: DC500) fixed to steel or timber frame	No	1		
	SUNDRIES				
	Manufactured by "Assa Abloy" or "Similar approved"				
8	'UNION' or 'similar approved' stainless steel door stop (code: AL8730AS) with Stainless Steel finish.	No	1		
	Sundries:				
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
9	Allow a budgetary allowance of R 5 000.00 (Five Thousand Rands) for Sundry Signage expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used		Item		
	Carried Forward to Summary of Section No. 5			R	

Section No. 5
Squash Court
Bill No. 4
Ironmongery

Item No			Quantity	Rate	Amount
	BILL NO. 5				
	METALWORK				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	GALVANIZED PRESSED STEEL DOOR FRAMES				
	1,6mm Mild steel double rebated frames suitable for half brick walls:				
1	Frame for door 813 x 2100mm high	No	1		
	ALUMINIUM WORK				
	Purpose made heavy duty 'ANSO CLIP 44' or other approved epoxy powder coated aluminium shopfront system glazed with 4mm clear toughened safety glass (in accordance with SANS10400-N and AAMSA Regulations) unless otherwise stated complete with frame to be fitted on existing brick or concrete wall including all necessary ironmongery				
2	Door size 900 x 2100mm high overall comprising two fixed glass panels to suit	No	1		
	ALUMINIUM DOORS AND/OR WINDOWS				
	Work for budgetary allowances are provided, will be measured, valued and deducted in whole or in part if not required without any compensation for loss or profit on the said allowances				
3	Allow a budgetary allowance of R 20 000.00 (Twenty Thousand Rands) for servicing and/or removing and replacing aluminium door and/or window ironmongery expanded as directed by the Principal Agent and measured and valued at scheduled rates and omitted if not so used		Item		
	Carried Forward to Summary of Section No. 5			R	

Section No. 5
Squash Court
Bill No. 5
Metalwork

Item No			Quantity	Rate	Amount
	BILL NO. 6				
	FLOOR COVERING				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	SUSPENDED FLOORING				
	Beach Wood sprung squash court timber flooring installed in accordance with the World Squash Federation Specifications for single squash courts				
1	On existing floors	m2	63		
	Sundries:				
2	Sand down and seal timber flooring	m2	63		
	Carried Forward to Summary of Section No. 5			R	

Section No. 5
Squash Court
Bill No. 6
Floor Covering

Item No			Quantity	Rate	Amount
	BILL NO. 7				
	GLAZING				
	PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	GLAZING TO STEEL WITH PUTTY				
	Supply and install 4mm thick toughened safety window and/or door glazing				
1	Existing steel sashes in panes exceeding 0,1m2 and not exceeding 0,5m2, including taking out and removing existing glass, removing all putty and preparing rebates.	m2	7		
	Carried Forward to Summary of Section No. 5			R	

Section No. 5
Squash Court
Bill No. 7
Glazing

Item No			Quantity	Rate	Amount
	BILL NO. 8				
	PAINTWORK				
	STANDARD PREAMBLES				
	The Tenderer is referred to the "KwaZulu Natal: Department of Health Standard Preambles to all Trades - January 2009 (Rev 3)" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	PAINT ON PLASTER				
	Prepare surfaces and remove all loose material, apply One coat 'Plascon Professional (PP700)' gypsum and plaster primer (PU800) and two finishing coats 'Plascon Professional Superior Low Sheen (PEM 1000)' pure acrylic emulsion paint or similar approved on:				
1	On textured plastered walls externally	m2			
2	On columns externally	m2			
	Prepare surfaces and remove all loose material, apply One coat 'Plascon Professional (PP700)' gypsum and plaster primer (PU800) and two finishing coats 'Plascon Velvaglo (VLO)' pure acrylic emulsion paint or similar approved on:				
3	On walls internally	m2	5		
	Prepare surfaces and remove all loose material, apply One coat 'Plascon Professional (PP700)' gypsum and plaster primer (PU800) and two finishing coats 'Plascon Professional Super Matt (PEM 900)' pure acrylic emulsion paint or similar approved on:				
4	On ceilings and beams internally	m2			
	PAINT ON METAL				
	Carried Forward			R	

	Brought Forward			R	
	Prepare surfaces and remove all loose material, dust, grease, salts and contamination with 'Plascon Aquasolve Degreaser GR1', apply one coat primer (UC170) one coat 'Plascon Professional undercoat (PU800)' and one finishing coat 'Plascon Water Based Velvaglo (VLW)' or similar approved on galvanised:				
5	Door frames and linings	m2			
6	Sashes and frames (measured on flat)	m2			
	PAINT ON WOOD				
	Stop, fill, sand down and prepare wood surfaces and apply three coats of 'Plascon Woodcare Ultra Vanish (X-Range)' or similar approved on:				
7	General surfaces	m2	7		
8	Skirtings, rails, cills, fascias, etc., not exceeding 300mm girth.	m	36		
	Stop, fill, sand down and prepare wood surfaces and apply one coat 'Plascon Professional Wood Primer (UC2)', one coat 'Plascon Professional undercoat (PU800)' and one finishing coat 'Plascon Water Based Velvaglo (VLW)' or similar approved on:				
9	Skirtings, rails, cills, fascias, etc., not exceeding 300mm girth.	m	10		
	Stop, fill, sand down and prepare wood surfaces and apply two coats 'Plascon Brick and Concrete Marking Paint (BTP)' or similar approved on:				
10	Floor lines in narrow widths not exceeding 300mm wide	m2	15		
	Carried Forward to Summary of Section No. 5			R	

Section No. 5
Squash Court
Bill No. 8
Paintwork

SECTION SUMMARY - Squash Court

Bill No		Page No	Amount
1	Alterations	202	
2	Waterproofing	203	
3	Ceilings	205	
4	Ironmongery	208	
5	Metalwork	209	
6	Floor Covering	210	
7	Glazing	211	
8	Paintwork	213	

Carried to Final Summary R

Section No. 5
Squash Court

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

PART C3. SCOPE OF WORKS

C3.1 SCOPE OF WORKS
GCC FOR CONSTRUCTION WORKS (Edition 2 of 2010)

Scope of Works complied in accordance with SANS 10403 where reference is made to this part of SANS 1921-1:2004

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender no:	**ZNTM01255W**	**Project Code:**	**053651**

SECTION 1

1 EXTENT OF THE WORKS

1.1 EMPLOYERS OBJECTIVES

The objective of the project is the completion contrat of the upgrade and renovate the Nurses' and Doctors' accommodation and Squash Court at Grey's Hospital to bring it to habitable conditions such that it complies with the applicable National Building Regulations. The minimum specifications for the recommended finishes are to match those done by the UKZN on the facilities they have refurbished.

1.2 OVERVIEW OF THE WORKS

Renovations and upgrades to Nurses', Doctors' accommodation and Squash Court at Grey's Hospital

1.3 EXTENT OF THE WORKS

• Nurses accommodation – Completion of the Ground floor. 1st, 2nd, 3rd and 4th floors for both wings, hereafter referred to as 'Block A' and 'Block B' . In Block B 1st to 4th Floor Nuses units are already occupied by Nurses but some electrical, fire roof and mechanical items are outstanding and minor works. Block A is not occupied
• Doctors' accommodation - Ground floor. 1st, 2nd, 3rd , 4th , 5th and 6th floors and Squash Court. For Doctors accommodation 1st to 5th Floor are already occupied but some electrical, fire, roof and mechanical items are outstanding and minor works are required to complete the Doctors Quarter.

The refurbishments are exclusively for building finishes such as ceilings, floor coverings, tiling, sanitary fittings, electrical fittings, wall finishes, etc. Replacing damaged roof sheeting, cleaning and refurbishment of the external facades of Nurses and Doctors' accomodation complete with minor external works

Fire upgrades to entire Nurses and Doctors accomodation including UKZN accomodation parts the of buildings need to be completed

Refer to Section 3 of the project brief for more details.

1.4 LOCATION OF THE WORKS

The site is situated within the premises of the Grey's Hospital in Pietermaritzburg under the Msunduzi Municipality. The details of the site are summarised below:
Street Address: 201Townbush Road, Pietermaritzburg, Kwa-Zulu Natal, 3201
Postal Address: Private Bag X9001, Pietermaritzburg, 3200

1.5 TEMPORARY WORKS

The temporary works relevant to the project include site clearance at proposed camp sites, establishment of site offices and construction facilities; access scaffolding for working on external walls of high rise buildings to clean/ repair/ replace wall finishes, etc; demolition of some walls in the Nurses' accommodation bathrooms, removal of old and damaged building finishes such as tiling in bathrooms, joinery in kitchens, floor carpeting in individual residential units, sanitary fittings in bathrooms, etc.

Temporary equipment like scaffolding, site offices and facilities will be returned to the Contractor's depot at the end of the project; while the debris or waste materials collected due to the planned demolitions will be carted away to a legal landfill site to be located by the contractor. Any salvagable materials such as doors, sanitary fittings, etc. will be reused where possible.

2 ENGINEERING

2.1 EMPLOYER'S DESIGN

Refer to attached project brief - Annexure 12

2.2 DESIGN BRIEF

The project brief called for the condition assessment of the existing building componets as per 1.3 above which would inform the works required to undertake the complete refurbishment of the staff accommodation facilities:

Refer to the attached project brief for more details.

2.3 DRAWINGS

See list of drawings/Annexure's attached to this document.

2.4 DESIGN PROCEDURES

Not applicable

3 PROCUREMENT

3.1 PREFERENTIAL PROCUREMENT PROCEDURES

This tender will be subject to the implementation of the Preferential Procurement Regulations, 2022, pertaining to the Preferential Procurement Policy Framework Act, Act Number 5 of 2000 and the relevant Supply Chain Management Legislation and the KwaZulu-Natal Supply Chain Management Policy Framework published by the KwaZulu-Natal Provincial Treasury. Tenderders are referred to www.kzntreasury.gov.za for access to the relevant documents.
Tenderders are advised to familiarize themselves with the contents of the KwaZulu-Natal Supply Chain Management Policy Framework regarding Preference Point Systems, evaluation of tenders appeals and other matters.

3.2 RESOURCE STANDARD PERTAINING TO TARGETED PROCUREMENT

NOTE : This project will be adjudicated as not exceeding R 50,000 000,00

3.3 SCOPE OF MANDATORY SUBCONTRACT WORK

Not applicable

3.4 PREFERRED SUBCONTRACTORS/SUPPLIERS

The Tenderer shall submit in writing, together with his tender, a list of proposed domestic subcontractors.

3.5 SUBCONTRACTING PROCEDURES

Not applicable

4 CONSTRUCTION

4.1 APPLICABLE SANS 2001 STANDARDS FOR CONSTRUCTION WORKS

The Contractor is referred to the "Model Preambles to Trades - 2008", any "Supplementary Preambles", the Electrical Specifications and Mechanical Specification for full descriptions of materials and methods referred to in these Bills of Quantities/Lump Sum documents, insofar as they apply. The Contractor is advised to study the "Standard Preambles to all Trades", any "Supplementary Preambles", the Electrical Specifications and Mechanical Specification, before pricing Bills of Quantities/Lump Sum documents.
Where the description in the Bills of Quantities/Lump Sum documents differ from those in the Standard Electrical Specifications, the descriptions in the Bills of Quantities/Lump Sum documents are to apply. No claim whatsoever will be allowed in respect of errors in pricing due to brevity of description of items in the Bills of Quantities/Lump Sum documents which are fully described when read in conjunction with the relevant Preambles and/or Specifications. Suppliers of materials and the like, whose quality systems apply with one or more of the SABS/SANS ISO 9000 Series should be used whenever possible in the absence of a particular SABS/SANS Specification Standard Mark.
Wherever the words "shall be deemed to be included in the description", "shall be stated" or other words having the same effect, appear in the Standard System, it shall be deemed that all descriptions in these Bills of Quantities/Lump Sum documents incorporated such inclusions and statements whether specifically stated or not.

The Contractor is hereby informed that where SABS/SANS Specifications are referred to in these Bills of Quantities/Lump Sums documents and Specifications thereto, then ONLY the Specification of Work Clauses will apply. The method of measurement and payment clauses will NOT apply to this Contract.

The Contractor is hereby informed that risk of collapse and keeping excavations free from water (excluding subterranean water) generally are deemed to be included in the descriptions unless accommodated in the system of measurement. Please refer to the Geotechnical Investigation report when included at the end of these tender documents.
Whenever reference is made to "Sub-Contractor", "Nominated Sub-Contractor" or the like in the specifications included or referred to in these Bills of Quantities/Lump Sums documents, it shall be deemed to mean "Contractor" as defined.

4.2 APPLICABLE NATIONAL AND INTERNATIONAL STANDARDS

See above 4.1

4.3 PARTICULAR / GENERIC SPECIFICATIONS

The Contractor is referred to the following documents whether attached to this document or not:

SPECIFICATION	PAGES
Specification for HIV/AIDS Awareness (CIDB)	HIV1 TO HIV3
Specific Construction, Safety, Health and Environmental Plan	1-32
Standard Preambles for all Trades (Rev 3) - DOH 2009	1 to 95
General Electrical Specification	E/1 to E/20
Lightning Protection Installation	LP/1 to LP/6

4.4 CERTIFICATION BY RECOGNIZED BODIES

Only contractors registered with the Electrical Contracting Board of South Africa in accordance with the Regulations of the Occupational Health and Safety Act will be accepted and permitted to do work under this contract.

4.5 AGRÉMENT CERTIFICATES

Not applicable

4.6 PLANT AND MATERIAL PROVIDED BY THE EMPLOYER

Not applicable

4.7 SERVICES AND FACILITIES PROVIDED BY THE EMPLOYER

Not applicable

4.8 OTHER SERVICES AND FACILITIES

The Contractor shall provide any artificial lighting which may be necessary or required for the proper execution of the works, and provide electric power and water required by all Sub-Contractors, Nominated Sub-Contractors and Sub-Contractors appointed directly by the Administration.
The Contractor shall give all notices and pay all fees in connection with temporary electrical and water connections and shall connect temporary Electrical and Water meters for and pay for all current and water consumed.
The Contractor is advised that the permanent light fittings and water points of any kind installed in the Works are not to be used to provide temporary lighting and supplement water requirements for construction purposes.

5 MANAGEMENT

5.1 APPLICABLE SANS 1921 STANDARDS

Tenderders are referred to
SECTION 2 : SPECIFICATION DATA ASSOCIATED WITH SANS 1921-1:2004 IN THIS DOCUMENT

5.2 RECORDING OF WEATHER

The Contractor shall keep record of abnormal climatic conditions to facilitate the adjudication of claims for extension of the contract period.

The Contractor shall allow in his programme for the following number of days for rain days (rain > 10mm per day) as per the table below:

CURRENT YEAR			YEAR + 1	YEAR + 2
January	*w/days*		3	3
February	*w/days*		3	3
March	*w/days*		3	3
April	*w/days*		3	3
May	*w/days*		3	3
June	*w/days*		3	3
July	*w/days*		3	
August	*w/days*		3	
September	*w/days*		3	
October	*w/days*		3	
November	*w/days*		3	
December	*w/days*	3	3	

5.3 MANAGEMENT MEETINGS

In order to facilitate the smooth functioning of the Works and to ensure the closest co-operation between all the parties concerned, the Employer will call for regular meetings to be held on the site, at which a senior member of the Contracting firm and the General Foreman of the Works will always be required to be present.
In addition to the above, other persons will be required to attend these meetings as and when their presence is necessary, e.g., Consultants in all disciplines, representatives of the various Sub-Contractors, etc.
Proper minutes of these meetings will be kept by the Employer\Principal Agent and copies will be circulated to all persons attending the meetings and to others who need to be kept informed.

5.4 FORMS FOR CONTRACT ADMINISTRATION

The Employer shall provide all necessary forms.

5.5 ELECTRONIC PAYMENTS

The Contractor shall provide all required information to the Employer to facilitate electronic payments upon request.

5.6 DAILY RECORDS

The Contractor shall keep daily records of people and equipment employed as well as a site diary in respect of work performed on the site.
At the end of each week the Contractor shall provide the Principal Agent with a written record, in schedule form, reflecting the number and description of tradesmen and labourers employed by him and all Sub-Contractors on the works each day.
At the end of each week the Contractor shall provide the Principal Agent with a written record, in schedule form, reflecting the number, type and capacity of all plant, excluding hand tools, currently used on the works.

5.7 BONDS AND GUARANTEES

The Contractor shall within 10 calendar days after receiving notice from the Engineer and prior to receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the Employer's agent (whose details are given in the contract data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the Contract Data.

5.8 PAYMENT CERTIFICATES

Requirements will be in accordance with the Employers prescriptions.

5.9 PERMITS

The Contractor is advised that, in the case of an existing building or institution, all security measures in force will remain in operation and he must acquaint himself and his Employees with them as he and his Employees will at all times be subject to these measures.
The Contractor will on no account extend his operations beyond the confines of the building site as indicated by the Employer and must ensure that all his Employees are made aware of these limits. Any Employee disregarding this instruction and found outside the limit of the building site without authority, shall be redeployed immediately and shall not again be employed on this Contract.
The Contractor will be responsible for ensuring that this instruction is strictly enforced and must provide and remove upon completion or when directed, such other necessary temporary barriers, fences, etc., as may be required and is to allow opposite this item for any charges he may wish to make in this connection.
The Employer will accept no responsibility whatsoever for damage to or the loss of plant, materials, etc., from the site.

5.10 PROOF OF COMPLIANCE WITH THE LAW

The following certificates must be provided before first delivery is taken:
- HIV/STI Report (Bound into this document)
- Electrical Compliance Certificate
- Plumbing Compliance Certificate
- Lightning Certificate
- Soil Protection Certificate
- Concrete test and cube certificates
- Waterproofing Guarantee certificates
- TR1 and TR2 prefabricated roof truss certificates
- Soil compaction certificates
- Electrical and Mechanical test certificates
- Plumbing and drainage pressure test certificates
- Fire Compliance Certificate
- Entomology Certificate
- SANS 10400-A:2010 compliance certificates
- Latest National Building Regulation

5.11 INSURANCE PROVIDED BY THE EMPLOYER

Not Applicable

SECTION 2

SPECIFICATION DATA ASSOCIATED WITH SANS 1921-2004

Clause Numbers	
4.1.7	**The requirements for drawings, information and calculations for which the Contractor is responsible are:**
	Method Statement, Project implementation Program and Electrical Installation
4.2.1	**The responsibility strategy assigned to the Contractor for the works is:**
	Strategy A
4.2.2	**The structural engineer is:**
	Department of Public Works
4.2.3	**Drawings & other info are to be submitted in accordance with the contractors programme**
	See Drawings as Annexed in these Bills of Quantities
4.3	**The planning, programme and method statement are to comply with the following:**
	N/A

4.12.1	**Samples of materials**
	The work is to be executed with materials of the best specified and in the most substantial and workmanlike manner under the inspection of the Employer and to his satisfaction. The Contractor shall furnish, without delay, such samples as called for or may be called for by the Employer, who may reject all materials or workmanship not corresponding with the approved sample. The samples of materials, workmanship and finishes that the Contractor is to provide and deliver to the employer are: To be provided as requested by the Principal Agent and other Employer's agents
4.12.2	**Fabrication drawings that the contractor is to provide to the employer are:**
	The Contractor shall furnish, without delay, fabrication drawings as called for or may be called for by the
4.12.3	**Office accommodation, equipment, accommodation for site meetings and other facilities for use by the employer and his agents are:**
	OFFICE FOR FOREMAN
	Provide, erect, maintain and remove at completion a suitable temporary office for the Contractor or his Foreman, perfectly secured, lighted and ventilated and having a desk with drawers.
	TELEPHONE
	The Contractor shall provide a telephone on the site for the use of the Contractor and all Sub-Contractors for the duration of the Contract, and must make the necessary application for connection, give all notices and pay all fees, rentals and charges for the service and also for all calls.
	OFFICE FOR INSPECTOR OF WORKS
	Provide, erect, maintain and remove at completion a well constructed temporary office for the Inspector of Works not less than 4 x 3 m on plan and 3 m high to eaves to the approval of the Employer. The office shall be constructed of wood framing covered externally with corrugated iron or corrugated asbestos and with a lean-to roof covered with the same material as the external wall covering. The office shall be lined internally with soft board or other approved material and a ceiling shall be provided of the same material as the internal lining. A suspended wood floor shall be provided and is to finish not less than 300 mm above the ground level. A lockable door and a window, which provides adequate light and ventilation, shall be fitted. An office constructed of 115 mm thick brick-work and provided with a screeded concrete floor and roofed and ceiled as above described may be accepted as an alterative but prior permission of the Employer will be necessary before construction of such an office is commenced and his requirements shall be stated and fulfilled by the Contractor. The office shall be fitted in an approved manner with a sloping topped desk of height and length suitable for the laying out and studying of drawings, a desk or table with not less than two lock-up drawers, shelves, seating and wash-stand, and the Contractor shall provide all necessary attendance.
	TELEPHONE IN OFFICE FOR INSPECTOR OF WORKS
	N/A

	SHED
	Provide, erect, maintain and remove at completion, ample temporary sheds for the proper storage of materials and for the use of the workmen, and remove when no longer required.
4.14.6	**The requirement for provision and erection of signboards are:**
	Supply, erect, maintain and remove at completion a painted notice board, size overall 2800 x 2345 mm high sign written to detail as Drawing No. T9506 which drawing is available from offices of the Department of Public Works. Only the official notice board is to be displayed on the site and no Sub-Contractor's boards will be permitted. The Contractor, at his own cost, may provide a board on which all sub-contract firms' names may be sign written. The notice board is to be to the approval of the Employer and is to be maintained in first class condition and placed where directed at the entrance to the site and remain there for the duration of the Contract.
4.17.1	**Requirement for the termination, diversion or maintenance of existing services:**
	Should the Contractor come in contact with any underground cables or pipes during excavations, immediate notification must be made to the Employer and all work in the vicinity of such cables, pipes, etc., shall cease until authority to proceed has been obtained from the Employer. Should the Contractor damage underground cables or pipes resulting in a disruption of services to an existing institution such damage shall be repaired immediately. The Contractor shall inspect all floors, walls, ceilings, etc for existing services before commencing with works on site. Any damage to existing services shall be repaired immediadely at the Contractors' cost. The Contractor shall be responsible for the diversion of any existing services necessary to conduct his work as directed and approved by the Employer.
4.17.3	**Services which are known to exist on the site:**
	Investigate and provide detail drawings.
4.17.4	**Requirement for detection apparatus**
	None
4.18	**ADDITIONAL HEALTH AND SAFETY REQUIREMENTS ARE:**
	By the submission of a tender, any Tenderder will, if awarded the contract to which this tender document relates, be deemed to be the mandatory as envisaged by Section 37 (2) of the Act. As a mandatory the successful Tenderder will be deemed to be the “principal contractor” and an employer in his/her/their own right with duties as prescribed in the Act and accordingly will be deemed to have agreed to be solely responsible for ensuring that in connection with the service to which this tender document relates, all work will be performed and machinery and plant used in accordance with the Act. Should the Contractor, for whatever reason be unable to perform as required by the Act, the Contractor undertakes to inform the Employer accordingly. Tenderders are advised that it is a Condition of this Tender that a 'Construction Phase Safety, Health and Environmental Plan' specifically relates to the project for which tenders are being submitted and must be prepared by the Tenderder and submitted with the other tender documents at the time of tender. Failure to do so will invalidate the tender. Tenderders are therefore advised to study the 'Construction Safety, Health and Environmental Specification' which is issued as part of this tender document, the Model Preambles to Trades - 2008, any project Specification included in this tender document and any and all drawings which are referred to and issued as part of this tender document before preparing their own project specific 'Construction Phase Safety, Health and Environmental Plan' . Tenderders are also advised that such a plan which is submitted with a tender but is incomplete or considered inadequate by the Employer or his Representative will invalidate the tender. The Contractor will be deemed to have satisfied himself with his obligations in terms of the Act and to have allowed for all costs arising from compliance with the Act as no claim for extra costs arising from compliance with, and obligations in terms of the Act will be entertained.
4.22	**WORK BY NOMINATED AND SELECTED SUBCONTRACTORS COMPRISE:**
	[Provide list of applicable contractors]

C3.2 - SPECIFICATION FOR HIV/AIDS AWARENESS

1 Scope

This generic specification contains requirements applicable to the reduction of the risk of transfer of the HIV virus between and among construction workers and the local community through the following four strategies:

a) raising awareness about HIV/AIDS;
b) providing construction workers with access to condoms;
c) HIV counselling, testing and referral services; and
d) Sexually Transmitted Infection diagnosis and treatment.

2 Normative references:

The following standard contains provisions that, through reference in this text, constitute provisions of this standard:

SANS 4074 ISO 4074, *Condom Rubbers*

3 Definitions and Abbreviations

3,1 Definitions

Construction Worker: all persons in the employ of the contractor or in the employ of any of the subcontractors contracted by the contractor.

Local Community: the communities local to the site which are most likely to have contact with the construction worker and, in particular, sex workers in those communities.

Service provider: the natural or juristic person recognised by the South African Department of Health as specialist in conducting Aids Awareness Programmes.

3,2 Abbreviations

STI: Sexually transmitted infection

HIV: Human Immunodeficiency Virus

AIDS: Acquired Immune Deficiency Syndrome

4 Objectives

The objectives are to:

a) reduce the risk of transfer of the HIV virus between and among construction workers and the local community;
b) raise awareness amongst construction workers and the local community of the risk of infection with the HIV virus;
c) promote early diagnosis; and
d) assist affected individuals to access care and counselling.

5 Requirements

5,1 General requirement

The contractor shall, in order to satisfy the objectives stated in 4:

a) make condoms complying with the requirements of SABS ISO 4074 available to all construction workers at readily accessible points on the site, suitably protected from the elements, for the duration of the contract;

b) either place and maintain HIV/AIDS awareness posters of size of not less than A1 in areas which are highly trafficked by construction workers, or provide construction workers with a pamphlet, in languages largely understood by construction workers, which

c) encourage voluntary HIV/STI testing;

d) provide information concerning counselling, support and care of those that are infected services; and

e) comply with the requirements of 5.2.

***The* provisions *of* 5.1 c) *and d) do not apply to* this contract.**

5,2 HIV awareness programme

5.2.1 The contractor shall:

a) engage a qualified service provider as described in the scope of works to conduct an HIV Awareness Programme which is structured to achieve the outcomes stated in 5.2.3 for contract workers as soon as a construction workers camp is established and populated or, where no such camp is established, within two weeks of the commencement of a significant portion of the works and at subsequent intervals, if any, provided for in the scope of works; and

b) arrange for, provide a suitable venue, and instruct all construction workers to attend the HIV Awareness Programme and notify the Employer's Representative of the date, time and venue whenever a session with construction workers is conducted.

Note: The National Department of Public Works maintains a list of qualified service providers.

5.2.2 The contractor shall do nothing to dissuade construction workers from attending such an HIV Awareness Programme and shall take all reasonable steps to ensure that a minimum of 90% of construction workers engaged in the works attend such a programme, when it is conducted.

5.2.3 The outcomes of the HIV Awareness Programme shall as a minimum, result in contract workers exposed to such a programme being able to:

a) communicate the existence of problems of HIV and be able to outline the consequences of transmission of HIV to or from the local community;

b) recall and communicate the mode of HIV transmission and preventative measures including the proper use of the condom.

The HIV/ Aids awareness programme described in 5.2 is to be repeated at four month intervals throughout the duration of the contract. (Four times in total, including the initial one at the start of the contract)

5,3 Reporting

5.3.1 The contractor shall prepare and attach to his claims for payment a brief report which outlines how the actions taken by the contractor in the period for which payment is claimed satisfy the requirements and a schedule which lists the names, identity numbers, trade / occupation and name of employer of all construction workers exposed to the programme (see **HIV/STI Compliance Report**).

5.3.2 The employer's representative shall certify the report and schedule described in 5.3.1 whenever a claim for payment is issued to the employer.

Note: In the event that the contractor fails to satisfy the requirements of this specification, the employer (Head: Public Works) may apply any of the sanctions provided for in the contract. Sanctions may include the application of a financial penalty of .04% of the Contract Sum.

The *HIV /Aids* awareness programme *described* in 5.2 shall in addition *be conducted* for the benefit *of* the local community on two occasions in the community centre nearest to the building site. The contractor shall be *responsible* for inviting identifiable community-based *institutions and organisations, churches, and schools to participate in the* programme.

C3.3 - HIV/STI COMPLIANCE REPORT

Pro-forma reporting format in terms of the SPECIFICATION FOR HIV/AIDS AWARENESS

Project Code:	053651		
Payment Claim number:		Period covered by payment claim:	

1. Distribution of condoms (briefly describe where and how condoms are distributed).

2. Posters / pamphlets (briefly describe where posters were placed / how pamphlets were distributed).

3. Voluntary testing (briefly describe the actions taken / information provided to promote testing).

4. Counselling, support and care (summarise information provided).

5. HIV awareness programme (briefly describe action).

6. Schedule of construction workers exposed to the HIV awareness programme.

Name	Identity number	Trade / occupation	Name of employer

I hereby declare the above to be a true reflection of actions taken to ensure compliance with the specification.

For Contractor:

Name: _____

Signature: _____

Date: _____

Employer's representative:

Name: _____

Signature: _____

Date: _____

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

PART C4. SITE INFORMATION

C4.1 SITE INFORMATION
GCC FOR CONSTRUCTION WORKS (2 Edition of 2010)

Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Tender No.	**ZNTM01255W**	**Project Code:**	**053651**

C4.1 Site Information

C4.1 GENERAL

(a) The site is situated within an existing building separated into nurses residence and doctors quarters. These buildings are situated within the complex of Greys Hospital, which is an active/live environment.

(b) The project site is an existing nurses and doctors' accommodation that is currently occupied (live site). The contractor must make allowance for limited working hours and public safety

(c) The project site is adjacent to offices and a school

C4.2 GEOTECHNICAL INVESTIGATION REPORT

(a) Not applicable

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

PART C5 - DRAWINGS / ANNEXURES

C5.1 - LIST OF DRAWINGS/ANNEXURES

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

Tender No.:	**ZNTM01255W**	**Project Code:**	**053651**

The Following Drawings are not for Construction Purposes even if annotated as such. The relevant Construction drawings/annexure's will be issued to the Contractor at commencement of the construction phase.

The following drawings/annexure's shall be issued during the Tender period to form part of the tender documentation.

DRAWING NO	DESCRIPTION
	ROOM SCHEDULE
071262 - DOH-NS - A - 1000 - 0	LOCALITY PLAN
071262 - DOH-NS - A - 1001 - 0	SITE PLAN
071262 - DOH-NS - A - 2000 - 0	BASEMENT PLAN
071262 - DOH-NS - A - 2001 - 0	GROUND FLOOR PLAN
071262 - DOH-NS - A - 2002 - 0	FIRST STOREY PLAN
071262 - DOH-NS - A - 2003 - 0	SECOND STOREY PLAN
071262 - DOH-NS - A - 2004 - 0	THIRD STOREY PLAN
071262 - DOH-NS - A - 2005 - 0	FOURTH STOREY PLAN
071262 - DOH-NS - A - 4000 - 0	SOUTH EAST & NORTH WEST ELEVATIONS
071262 - DOH-NS - A - 4001 - 0	NORTH EAST & SOUTH WEST ELEVATIONS
071262 - DOH-NS - A - 5000 - 0	GROUND TO FIRST ENTRANCE LOBBY DETAILS
071262 - DOH-NS - A - 5001 - 0	SECOND TO FOURTH ENTRANCE LOBBY DETAILS
071262 - DOH-NS - A - 5002 - 0	GF BLOCK A TYPICAL KITCHEN DETAIL
071262 - DOH-NS - A - 5003 - 0	BLOCK A FIRST TO FOURTH ABLUTIONS DETAILS
071262 - REL - A - 5001 - 01	TYPICAL NURSES BLOCK A ABLUTIONS DETAILS
071262 - DOH-NS - A - 5005 - 0	TYPICAL ROOM PLANS & ELEVATIONS DETAIL
071262 - REL - A - 5003 - 00	TYPICAL NURSES BLOCK A ABLUTIONS DETAILS
071262 - DOH-NS - A - 5007 - 0	BLOCK B TYPICAL KITCHEN DETAILS
071262 - DOH-NS - A - 5008 - 0	TYPICAL KITCHEN JOINERY
071262 - DOH-NS - A - 5009 - 0	TYPICAL ROOM JOINERY
071262 - DOH-NS - A - 5010 - 0	WINDOW SCHEDULE
071262 - DOH-NS - A - 5011 - 0	DOOR SCHEDULE
071262 - DOH-DR - A - 2000 - 0	GROUND STOREY PLAN
071262 - DOH-DR - A - 2001 - 0	FIRST STOREY PLAN
071262 - DOH-DR - A - 2002 - 0	SECOND STOREY PLAN
071262 - DOH-DR - A - 2003 - 0	THIRD STOREY PLAN
071262 - DOH-DR - A - 2004 - 0	FOURTH STOREY PLAN
071262 - DOH-DR - A - 2005 - 0	FIFTH STOREY PLAN
071262 - DOH-DR - A - 2006 - 0	SIXTH STOREY PLAN
071262 - DOH-DR - A - 2007 - 0	SIXTH STOREY PLAN - CEILING LAYOUT
071262 - DOH-DR - A - 2008 - 0	SQUASH COURT - LAYOUT PLAN AND ELEVATIONS
071262 - DOH-DR - A - 2008 - 0	TYPICAL BEDROOM LAYOUT
071262 - DOH-DR - A - 5000 - 0	JOINERY DETAILS
DOCTORS QUARTERS KITCHEN	JOINERY WORKSHOP DRAWING OPTION 3
071262 - DOH-DR - A - 5000 - 1	BATHROOM DETAILS TYPE A
071262 - DOH-DR - A - 5002 - 0	BATHROOM DETAILS (Sheet 2 of 3)
071262 - DOH-DR - A - 5001 - 1	BATHROOM DETAILS TYPE C
DOH.1-T1.6	NURSES QUARTERS ROOF SHEETING
DOH.1-T1.6	DOCTORS QUARTERS ROOF SHEETING
DOH.1-T1.6	DOCTORS QUARTERS COLUMN AND GUTTER DOWN
	DINING HALL FLOOR SLAB REPAIR/ REPLACEMENT

ANNEXURES	
Annexure 1	Standard Preambles for all Trades (Rev 3) - DOH 2009
Annexure 2	General Electrical Specifications
Annexure 3	Mechanical Specifications
Annexure 4	Map of Bid submission location
Annexure 5	Joint Venture Agreement
Annexure 6	Health and Safety Specification
Annexure 7	Health and Safety Bill of Quantities
Annexure 8	Builders Lien Agreement
Annexure 9	Scope of Works in Respect of Work Relating to EPWP
Annexure 10	Proforma Project Specific Organogram
Annexure 11	Proforma Reference Letter
Annexure 12	Project Brief

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

SOUTHERN REGION
PROFESSIONAL SERVICES
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FROM: **PROFESSIONAL SERVICES, SOUTHERN REGION**

SUBJECT: **GREYS HOSPITAL – RENOVATION AND UPGRADE TO NURSES AND DOCTORS' ACCOMMODATION ROOM SCHEDULE**

PURPOSE

The purpose of this report is to schedule the observations made at the Greys Hospital Renovations and Upgrades to the Nurses and Doctors' Accommodation Project, for the works remaining for the Completion Project. The analysis made herein, along with any recommendation(s) made by relevant professional(s), pose as preliminary or initial observations and actions that are to be considered in any remediations undertaken in addressing the items indicated.

Below is the Key table to which status of the listed works is determined within the schedules.

KEY: STATUS SUMMARY OF CONDITION OF ROOM ELEMENTS/ITEMS WHERE WORK IS OBSERVED.			
SYMBOL	O	X	/
DEFINITION	WORK IS COMPELETED IN A SATISFACTORY CONDITION AS PER CLIENT NEEDS, DESIGN AND BUIDLING REGULATION. (INCLUDES QUANTITY, INSTALLATION AND FINISH)	WORK IS NOT COMPLETED IN A SATISFACTORY CONDITION AS PER CLIENT NEEDS, DESIGN AND BUIDLING REGULATION. (INCLUDES QUANTITY MISSINGS INDICATED AS (NO. x), INSTALLATION AND FINISH)	WORK IS PARTIALLY COMPLETED AND NEEDS TO MEET SATISFACTORY CONDITION AS PER CLIENT NEEDS, DESIGN AND BUIDLING REGULATION. (INCLUDES QUANTITY MISSINGS INDICATED AS (NO. x), INSTALLATION AND FINISH)

CLIENT NAME: DEPARTMENT OF HEALTH – KWAZULU NATAL

PROJECT NAME: GREYS HOSPITAL – RENOVATION AND UPGRADE TO NURSES AND DOCTORS' ACCOMMODATION

ROOM DATA SCHEDULE FOR NURSES ACCOMMODATION: BLOCK B

GROUND FLOOR

ELEMENTS	FLOOR		WALLS (PAINT)		DOOR (PAINT & INSTALLATION)		IRONMONGERY (DOOR)		IRONMONGERY (WINDOW)		LIGHTS		SINK		JOINERY (PAINT, HANG RAIL & SHELVING)		DRESSER (INSTALL & FINISH)		MIRROR (INSTALL)		CURTAIN RAIL (INSTALL)	
	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT
ROOMS																						
G/01	O		/	Touch-ups	O		O		O		O		/	No taps & rail	/	No paint & rail	X		X		X	
G/02	O		/	Touch-ups	O		O		O		O		/	No taps & rail	/	No paint & rail	X		X		X	
G/03	O		/	Touch-ups	O		O		O		O		/	No taps & rail	X		X		X		X	
G/04	O		/	Touch-ups	/	Paint touch-ups	O		O		O		/	No taps & rail	X		X		X		X	
G/05	/	Skirting Grout	/	Touch-ups	O		O		O		O		/	No taps & rail	X		X		X		X	
G/06	O		/	Touch-ups	O		O		/	(1x) Peg stays	O		/	No taps & rail	X		X		X		X	
G/07	/	Tile chipping	/	Touch-ups	O		O		O		O		/	No taps & rail	X	Hole damage	X		X		X	
G/08	O		/	Touch-ups	O		O		/	(2x) Peg stays	O		/	No taps & rail	/	No paint & rail	X		X		X	
G/09	O		/	Touch-ups	O		O		/	(2x) Peg stays	O		/	No taps & rail	X		X		X		X	
G/10	/	Tile chipping	/	Touch-ups	O		O		O		O		/	No taps & rail	X		X		X		X	
G/11	/	Tile chipping	/	Touch-ups	O		O		O		O		/	No taps & rail	X		X		X		X	
G/12	/	Tile chipping	/	Touch-ups	/	Paint touch-ups. Strike plate missing	O		O		O		/	No taps & rail	X		X		X		X	
G/13	/	Tile Chip	/	Touch-ups	/	Paint touch-ups	O		O		O		/	No taps & rail	X		X		X		X	
G/14	/	1 Missing tile skirting crack.	/	Touch-ups on ceilings	/	Paint touch-ups and frame	O		O		O		/	No taps & rail	/	No paint & rail	X		X		X	
G/15	O		/	Touch-ups	O		O		O		O		/	No taps & rail	/	No paint & rail	X		X		X	
G/16	/	2 Missing skirting tiles.	/	Touch-ups	O		O		O		O		/	No taps & rail	/	No paint & rail	X		X		X	
G/17	/	Skirting Strip	/	Touch-ups	O		O		O		O		/	No taps & rail	X		X		X		X	
G/18	/	Skirting	/	Touch-ups	O		O		/	(1x) Peg stays	O		/	No taps & rail	X		X		X		X	
G/19																						
G/20	/	2 Skirting tiles.	/	Touch-ups	O		/	Fix handle.	O		O		/	No taps & rail	X		X		X		X	
G/21	/	Skirting	O		/	Paint touch-ups	O		O		O		/	No taps & rail	X		X		X		X	
G/22	/	2 Missing skirting tiles.	/	Touch-ups	O		O		/	(1x) Peg stays (1x) Handle	O		/	No taps & rail	X		X		X		X	

ELEMENTS	FLOOR		WALLS (PAINT)		DOOR (PAINT & INSTALLATION)		IRONMONGERY (DOOR)		IRONMONGERY (WINDOW)		LIGHTS		SINK		JOINERY (PAINT, HANG RAIL & SHELVING)		DRESSER (INSTALL & FINISH)		MIRROR (INSTALL)		CURTAIN RAIL (INSTALL)	
	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT
G/23	/	2 Missing skirting tiles.	/	Touch-ups	O		O		/	(2x) Peg stays	O		/	No taps & rail	X		X		X		X	
G/24	/	2 Missing skirting tiles.	/	Touch-ups	O		O		O		O		/	No taps & rail	X		X		X		X	
ANCILLARY AND COMMON SPACES																						
KITCHEN	/	Floor tiles and skirting missing. Raised floor ledge to be demolished	/	Paint coat on walls and ceiling	/		/		/		/		/		/	Counter fittings not installed					/	
TV LOUNGE	X		/	(4x) Window glass panes missing	/		/		/	(8x) Peg stays	/										/	
LAUNDRY	/	Skirting tiles missing	X		X		X		/	(6x) Peg stays (3x) Handles	/		O								X	

CLIENT NAME: DEPARTMENT OF HEALTH – KWAZULU NATAL

PROJECT NAME: GREYS HOSPITAL – RENOVATION AND UPGRADE TO NURSES AND DOCTORS' ACCOMMODATION

ROOM DATA SCHEDULE FOR NURSES ACCOMMODATION: BLOCK B

FIRST FLOOR

ELEMENTS	FLOOR		WALLS (PAINT)		DOOR (PAINT & INSTALLATION)		IRONMONGERY (DOOR)		IRONMONGERY (WINDOW)		LIGHTS		SINK		JOINERY (PAINT, HANG RAIL & SHELVING)		DRESSER (INSTALL & FINISH)		MIRROR (INSTALL)		CURTAIN RAIL (INSTALL)	
	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT
ROOMS																						
1/01	O		O		O		/	Mechanism not installed	/	(2x) Peg stays (2x) Handles	X	(4) light fittings not installed	O		/	No rail/ shelve & (2) handles	/	Drawer Sanding and varnishing	O		O	
1/02	O		O		O		X		/	(2x) Peg stays (2x) Handles	X	(4) light fittings not installed	O		/	No rail & shelves	/	Drawer Sanding and varnishing	O		O	
1/03	O		O		O		/	Mechanism not installed	X	(2x) Peg stays (3x) Handles	X	(4) light fittings not installed	O		/	No rail & shelves	/	Drawer Sanding and varnishing	O		O	
1/04	O		O	(2X) Broken window panes	O		X	Handles & mechanism not installed	/	(2x) Peg stays (2x) Handles	X	(4) light fittings not installed	O		/	No rail/ shelve & handle	/	Drawer Sanding and varnishing	O		O	
1/05	O		O		O		O		/	(2x) Peg stays	O		O		/	No rail/ shelve & (2) handles	/	Drawer Sanding and varnishing	O		O	
1/06	O		O		O		O		/	(2x) Peg stays	/	(1) light fitting not installed	O		/	No rail & (2x) handle	/	Drawer Sanding and varnishing	O		O	
1/07	O		O		O		/	Mechanism not installed	/	(2x) Peg stays (2x) Handles	X	(4) light fittings not installed	O		/	No rail & shelves	/	Drawer Sanding and varnishing	O		O	
1/08	O		O		O		X	Handles & mechanism not installed	X	(2x) Peg stays (3x) Handles	X	(4) light fittings not installed	O		/	No rail & shelves	/	Drawer Sanding and varnishing	O		O	
1/09	O		O		O		/	Mechanism not installed	X	(2x) Peg stays (3x) Handles	X	(4) light fittings not installed	O		/	No rail & shelve	/	Drawer Sanding and varnishing	O		O	
1/10	O		O		O		O		/	(2x) Peg stays	O		O		/	No rail	/	Drawer Sanding and varnishing	O		O	
1/11	O		O		O		X	Handles & mechanism not installed	/	(2x) Peg stays (1x) Handles	X	(4) light fittings not installed	O		/	No rail	/	Drawer Sanding and varnishing	O		O	
1/12	O		O		O		O		/	(2x) Peg stays	O		O		/	No rail & handle	/	Drawer Sanding and varnishing	O		O	

ELEMENTS	FLOOR		WALLS (PAINT)		DOOR (PAINT & INSTALLATION)		IRONMONGERY (DOOR)		IRONMONGERY (WINDOW)		LIGHTS		SINK		JOINERY (PAINT, HANG RAIL & SHELVING)		DRESSER (INSTALL & FINISH)		MIRROR (INSTALL)		CURTAIN RAIL (INSTALL)	
	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT
1/13	O		O		O		O		/	(2x) Peg stays	O		O		/	No rail	/	Sanding and varnishing	O		O	
1/14	O		O		O		O		/	(2x) Peg stays	O		O		/	No rail	/	Sanding and varnishing	O		O	
1/15	O		O		O		O		/	(2x) Peg stays	O		O		/	No rail	/	Sanding and varnishing	O		O	
1/16	O		O		O		X	Handles & mechanism not installed	X	(2x) Peg stays (3x) Handles	/	(2) light fitting not installed	O		/	No rail	/	Sanding and varnishing	O		O	
1/17	O		O		O		O		/	(2x) Peg stays	/	(1) light fitting not installed	O		/	No rail	/	Sanding and varnishing	O		O	
1/18	O		O		O		O		/	(2x) Peg stays	O		O		/	No rail	/	Sanding and varnishing	O		O	
1/19	O		O		O		O		/	(2x) Peg stays	/	(1) light fitting not installed	O		/	No rail & shelves	/	Sanding and varnishing	O		O	
1/20	O		/	Touch-ups	/	Paint touch-ups	O		X	(2x) Peg stays	O		O		/	No rail	/	Drawer Sanding and varnishing	O		O	
1/21	O		O		O				O				O		/	No paint & rail	/	Drawer Sanding and varnishing			O	
1/22	O		/	Touch-ups above door	O		O		/	(2x) Peg stays	O		O		/	No rail	/	Drawer Sanding and varnishing	O		O	
1/23	O		O		O				/	(1x) Peg stays			O		/	No paint & rail	/	Drawer Sanding and varnishing			O	
1/24	O		O		O		O		/	(2x) Peg stays	O		O		/	No paint & rail	/	Drawer Sanding and varnishing	O		O	
ANCILLARY AND COMMON SPACES																						
KITCHEN	/	Grout on skirting. Demolish floor ledge	O		O		/	Missing on one door.	X	(2x) Peg stays (2x) Handles	O		O		O						/	
TV LOUNGE	O		/	Paint ceiling	O		O		/	(8x) Peg stays (5x) Handles	O										O	
LAUNDRY	O		O		O		/	Missing on one door.	X	(6x) Peg stays (6x) Handles	O		O								X	

CLIENT NAME: DEPARTMENT OF HEALTH – KWAZULU NATAL

PROJECT NAME: GREYS HOSPITAL – RENOVATION AND UPGRADE TO NURSES AND DOCTORS' ACCOMMODATION

ROOM DATA SCHEDULE FOR NURSES ACCOMMODATION: BLOCK B

SECOND FLOOR

ELEMENTS	FLOOR		WALLS (PAINT)		DOOR (PAINT & INSTALLATION)		IRONMONGERY (DOOR)		IRONMONGERY (WINDOW)		LIGHTS		SINK		JOINERY (PAINT, HANG RAIL & SHELVING)		DRESSER (INSTALL & FINISH)		MIRROR (INSTALL)		CURTAIN RAIL (INSTALL)	
	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT
ROOMS																						
2/01	/	Grouting	O		O		O		X	(2x) Peg stays (2x) Handles	O		X		/	No paint & rail	X		X		X	
2/02	/	Grouting	O		O		O		X	(2x) Peg stays (2x) Handles	/	(1) light fitting not installed	X		/	No paint & rail	X		X		X	
2/03	/	Grouting	O		O		O		X	(2x) Peg stays (2x) Handles	O		X		/	No paint & rail	X		X		X	
2/04	/	Grouting	O		O		O		X	(2x) Peg stays (2x) Handles	/	(2) light not installed, (2) not fitted correctly	X		/	No paint & rail	X		X		X	
2/05	/	Grouting	O		/	Touch-ups	O		X	(2x) Peg stays (2x) Handles	/	(1) not fitted correctly	X		/	No paint & rail	X		X		X	
2/06	/	Grouting	O		O		O		X	(2x) Peg stays (2x) Handles	/	(1) light not installed, (1) not fitted correctly	X		/	No paint & rail	X		X		X	
2/07	/	Grouting	O		O		O		X	(2x) Peg stays (2x) Handles	/	(1) light not installed, (2) not fitted correctly	X		/	No paint & rail	X		X		X	
2/08	/	Grouting	O		O		O		/	(2x) Peg stays (1x) Handles	/	(1) light fitting not installed	X		/	No paint & rail	X		X		X	
2/09	/	Grouting	O		O		O		/	(2x) Peg stays (1x) Handles	O		X		/	No paint & rail	X		X		X	
2/10	/	Grouting	O		O		O		/	(2x) Peg stays (1x) Handles	/	(2) light fitting not installed	X		/	No paint & rail	X		X		X	
2/11	/	Grouting	O		O		O		/	(2x) Peg stays (1x) Handles	/	(1) light fitting not installed	X		/	No paint & rail	X		X		X	

ELEMENTS	FLOOR		WALLS (PAINT)		DOOR (PAINT & INSTALLATION)		IRONMONGERY (DOOR)		IRONMONGERY (WINDOW)		LIGHTS		SINK		JOINERY (PAINT, HANG RAIL & SHELVING)		DRESSER (INSTALL & FINISH)		MIRROR (INSTALL)		CURTAIN RAIL (INSTALL)	
	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT
2/12	/	Grouting	O		O		O		/	(2x) Peg stays (1x) Handles	/	(1) not fitted correctly + no switch cover	X		/	No paint & rail	X		X		X	
2/13	/	Grouting	O		O		O		/	(2x) Peg stays (1x) Handles	/	(1) not fitted correctly	X		/	No paint & rail	X		X		X	
2/14	/	Grouting	O		O		O		/	(2x) Peg stays (1x) Handles	/	(1) not fitted correctly	X		/	No paint & rail	X		X		X	
2/15																						
2/16																						
2/17	/	Grouting	O		/	Touch-ups	O		/	(2x) Peg stays (1x) Handles	/	(1) not fitted correctly	X		/	No paint & rail	X		X		X	
2/18	/	Grouting	O		O		O		/	(2x) Peg stays (1x) Handles	/	(1) not fitted correctly, (1) light fitting not installed	X		/	No paint & rail	X		X		X	
2/19	/	No grout on skirting	O		O		/	Not adequately installed	/	(2x) Peg stays	/	(1) not fitted correctly	X		/	No paint & rail	X		X		X	
2/20	/	No grout on skirting	O	(1x) Window pane broken	O		O		/	(2x) Peg stays (1x) Handles	/	(1) not fitted correctly	X		/	No paint & rail	X		X		X	
2/21																						
2/22	/	No grout on skirting	O		O		O		/	(2x) Peg stays (1x) Handles	/	(2) light fitting not installed + switch, (1) not fitted correctly	X		/	No paint & rail	X		X		X	
2/23	/	No skirting	O		O		O		/	(2x) Peg stays	/	(2) light fitting not installed, (1) not fitted correctly	X		/	No paint & rail	X		X		X	
2/24																						

Note.

- Pin Boards have not been installed in rooms; 2, 4, 5, 10, 11, 12 and 13

CLIENT NAME: DEPARTMENT OF HEALTH – KWAZULU NATAL

PROJECT NAME: GREYS HOSPITAL – RENOVATION AND UPGRADE TO NURSES AND DOCTORS' ACCOMMODATION

ROOM DATA SCHEDULE FOR NURSES ACCOMMODATION: BLOCK B

THIRD FLOOR

ELEMENTS	FLOOR		WALLS (PAINT)		DOOR (PAINT & INSTALLATION)		IRONMONGERY (DOOR)		IRONMONGERY (WINDOW)		LIGHTS		SINK		JOINERY (PAINT, HANG RAIL & SHELVING)		DRESSER (INSTALL & FINISH)		MIRROR (INSTALL)		CURTAIN RAIL (INSTALL)	
	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT
ROOMS																						
3/01	O		O		/	Paint coat + paint frame	/	Strike plate not installed	/	(1x) Peg stays (1x) Handles	X		X		/	No paint & rail	X		X		X	
3/02	O		O		/	Paint coat + paint frame	O		/	(2x) Peg stays	X		X		/	No paint & rail	X		X		X	
3/03	O		O		/	Paint coat + paint frame + door jamming	O		/	(1x) Peg stays (1x) Handles	X		X		/	No paint & rail	X		X		X	
3/04	O		O		/	Paint coat + paint frame	O		/	(2x) Peg stays (1x) Handles	X		X		/	No paint & rail	X		X		X	
3/05	O		/	Paint coat on walls and ceiling	X		O		X	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/06	O		/	Paint coat ceiling, (1x) glass pane missing	/	Paint coat + paint frame + door jamming	O		X	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/07	O		/	Paint coat ceiling	/	Paint coat + paint frame	O		X	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/08	O		O		X	Door jamming	O		X	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/09	O		O		/	Paint coat + paint frame + door jamming	O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/10	O		O	(1x) Glass pane missing	/	Paint coat + paint frame + door jamming	O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/11	/	Skirting and grouting	O		/	Paint coat + paint frame + door jamming	O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/12	/	Skirting and grouting	O		/	Paint coat + paint frame	O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	

ELEMENTS	FLOOR		WALLS (PAINT)		DOOR (PAINT & INSTALLATION)		IRONMONGERY (DOOR)		IRONMONGERY (WINDOW)		LIGHTS		SINK		JOINERY (PAINT, HANG RAIL & SHELVING)		DRESSER (INSTALL & FINISH)		MIRROR (INSTALL)		CURTAIN RAIL (INSTALL)	
	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT
3/13	O		/	Paint coat on walls and ceiling	/	Paint coat + paint frame	O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/14	O		/	Paint coat on walls and ceiling	/	Paint coat + door jamming + paint frame	O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/15	O		/	Paint coat on walls and ceiling	/	Paint coat	O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/16	/	Skirting and grouting	/	Paint coat on walls and ceiling	/	Paint coat + door jamming	O		/	(2x) Peg stays	X		X		X		X		X		X	
3/17	/	Skirting and grouting	/	Paint coat on walls and ceiling	X		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/18	/	Skirting and grouting	/	Paint coat on walls and ceiling	X		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/19	/	Skirting and grouting	/	Paint coat on walls and ceiling	X		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/20	/	Skirting and grouting	/	Paint coat on walls and ceiling	X		/	Not adequate	/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/21	/	Skirting and grouting	/	Paint coat on walls and ceiling + (1) glass pane missing	X		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
3/22	/	Skirting and grouting	/	Paint coat on walls and ceiling	X		O		/	(2x) Peg stays (1x) Handles	X		X		/	No paint & rail	X		X		X	
3/23	/	Skirting and grouting	/	Paint coat on walls and ceiling	X		O		/	(1x) Peg stays	X		X		/	No paint & rail	X		X		X	
3/24	/	Skirting and grouting	/	Paint coat on walls and ceiling	/	Paint coat	/	Incorrectly labelled key	/	(2x) Peg stays (1x) Handles	X		X		/	No paint & rail	X		X		X	
ANCILLARY AND COMMON SPACES																						
KITCHEN	/	Tiles missing. Demolish floor ledge	X	Paint coat on walls and ceiling + (1) glass pane missing	X		/		X	(2x) Peg stays (2x) Handles	/		O		/	Drawer jamming					X	
TV LOUNGE	/	No grout on skirting	X		/	Door jamming	/		X	(8x) Peg stays (9x) Handles	/										/	

LAUNDRY	/	Not adequately done	X		/	Paint coat + door jamming	/		X	(6x) Peg stays (6x) Handles	/		O								X	
PASSAGE			/		/		/				/	(7x) lights missing										

CLIENT NAME: DEPARTMENT OF HEALTH – KWAZULU NATAL

PROJECT NAME: GREYS HOSPITAL – RENOVATION AND UPGRADE TO NURSES AND DOCTORS' ACCOMMODATION

ROOM DATA SCHEDULE FOR NURSES ACCOMMODATION: BLOCK B

FOURTH FLOOR

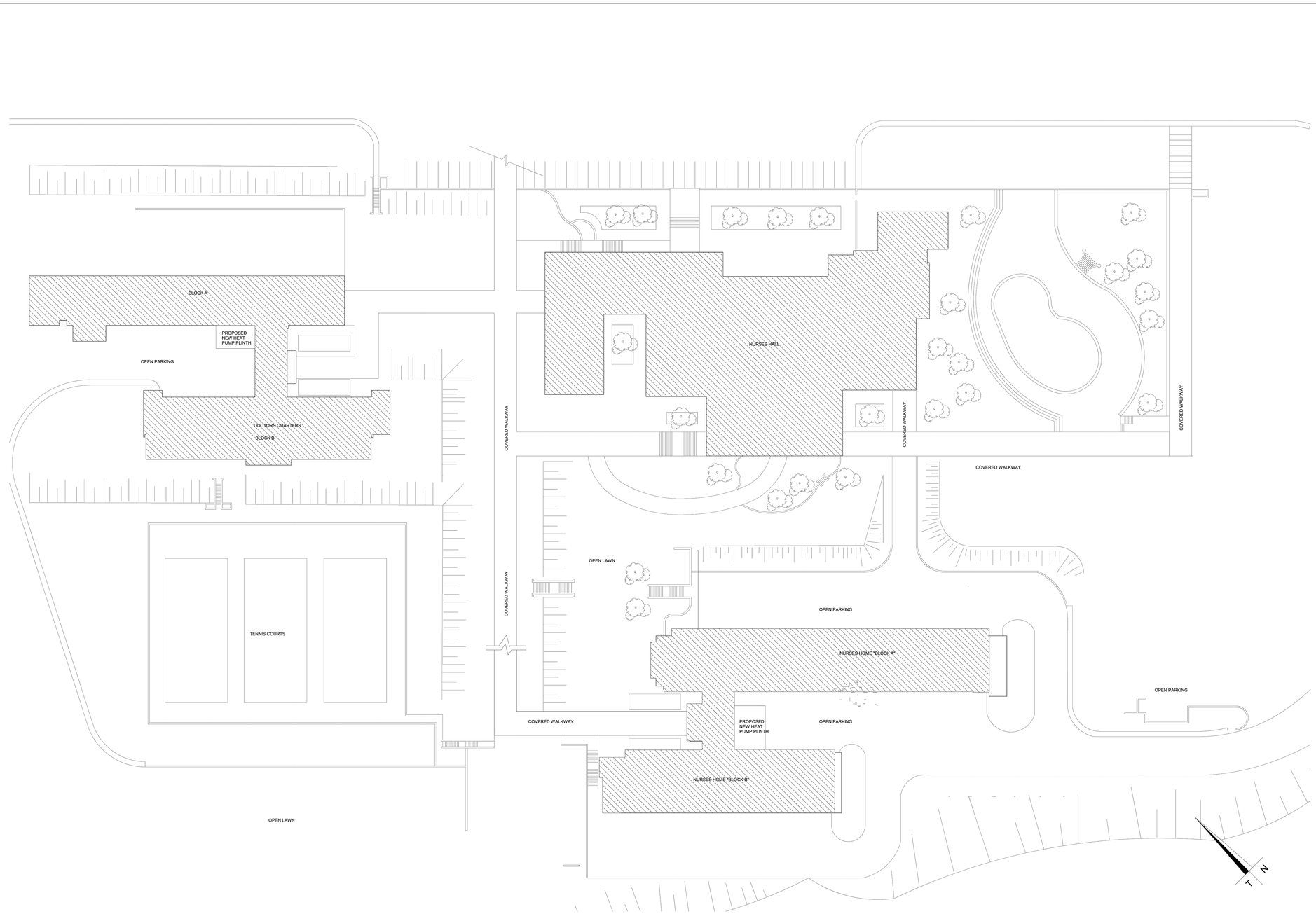
ELEMENTS	FLOOR		WALLS (PAINT)		DOOR (PAINT & INSTALLATION)		IRONMONGERY (DOOR)		IRONMONGERY (WINDOW)		LIGHTS		SINK		JOINERY (PAINT, HANG RAIL & SHELVING)		DRESSER (INSTALL & FINISH)		MIRROR (INSTALL)		CURTAIN RAIL (INSTALL)	
	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT
ROOMS																						
4/01	/	Skirting and grouting	/	(1x) Window glass pane broken	/	Paint coat & touch-ups on frame	O		/	(1x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/02	/	Skirting and grouting	O		/	Paint coat & touch-ups on frame	O		/	(1x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/03	/	Skirting and grouting	/	Paint coat & touch-ups	O		O		X		X		X		/	No paint & rail	X		X		X	
4/04	/	Skirting and grouting	/	Paint coat & touch-ups	O		O		/	(1x) Peg stays (1x) Handles	X		X		/	No paint & rail	X		X		X	
4/05	/	Skirting and grouting	/	(1x) Window glass pane broken	O		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/06	/	Skirting and grouting	O		O		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/07	/	Skirting and grouting	/	Chip	O		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/08	/	Skirting and grouting	O		/	Paint coat & touch-ups	O		/	(2x) Peg stays (2x) Handles	/	(3) lights not installed	X		/	No paint & rail	X		X		X	
4/09	/	Skirting and grouting	O		/	Paint coat & touch-ups	O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/10	/	Skirting and grouting	O		O		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/11	/	Skirting and grouting	O		O		O		X		X		X		/	No paint & rail	X		X		X	
4/12	/	Skirting and grouting	O		O		O		/	(1x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/13	/	Skirting and grouting	O		/	Paint coat & touch-ups	O		/	(1x) Peg stays (1x) Handles	X		X		/	No paint & rail	X		X		X	

ELEMENTS	FLOOR		WALLS (PAINT)		DOOR (PAINT & INSTALLATION)		IRONMONGERY (DOOR)		IRONMONGERY (WINDOW)		LIGHTS		SINK		JOINERY (PAINT, HANG RAIL & SHELVING)		DRESSER (INSTALL & FINISH)		MIRROR (INSTALL)		CURTAIN RAIL (INSTALL)	
	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT
4/14	/	Skirting and grouting	O		O		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/15	/	Skirting and grouting	O		O		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/16	/	Skirting and grouting	O		O		O		/	(1x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/17	/	Skirting and grouting	O		O		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/18	/	Skirting and grouting	O		O		O				X		X		/	No paint & rail	X		X		X	
4/19	/	Skirting and grouting	O		X		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/20	/	Skirting and grouting	O		O		O		/	(2x) Peg stays (1x) Handles	X		X		/	No paint & rail	X		X		X	
4/21	/	Skirting and grouting	O		O		O		X		X		X		/	No paint & rail	X		X		X	
4/22	/	Skirting and grouting	O		O		O		/	(2x) Peg stays (1x) Handles	X		X		/	No paint & rail	X		X		X	
4/23	/	Skirting and grouting	O		O		O		/	(2x) Peg stays (2x) Handles	X		X		/	No paint & rail	X		X		X	
4/24	/	Skirting and grouting	O		O		O		/	(2x) Peg stays (2x) Handles	X		X		X		X		X		X	
ANCILLARY AND COMMON SPACES																						
KITCHEN	/	Tile & skirting missing. Demolish floor ledge	X		X		X		/	(2x) Peg stays (1x) Handles	X		X		X						/	
TV LOUNGE	/	Skirting missing	/	Wall damage (hole)					/	(6x) Peg stays (6x) Handles	X										/	
LAUNDRY	/	Skirting missing	/	(1x) Window glass pane broken, no ironing boards	O		O		X	(6x) Peg stays (6x) Handles	/		O								X	

PASSAGE	O		O		/	(7x) Duct doors missing	O				/											

CLIENT NAME: DEPARTMENT OF HEALTH – KWAZULU NATAL																						
PROJECT NAME: GREYS HOSPITAL – RENOVATION AND UPGRADE TO NURSES AND DOCTORS' ACCOMMODATION																						
ROOM DATA SCHEDULE FOR DOCTORS' ACCOMMODATION																						
SIXTH FLOOR																						
ELEMENTS	FLOOR		WALLS (PAINT)		DOOR (PAINT & INSTALLATION)		IRONMONGERY (DOOR)		IRONMONGERY (WINDOW)		LIGHTS		SINK		JOINERY (PAINT, HANG RAIL & SHELVING)		DRESSER (INSTALL & FINISH)		MIRROR (INSTALL)		CURTAIN RAIL (INSTALL)	
	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT	STATUS	COMMENT
ROOMS																						
6F 1/01	O		O		/	Internal doors	/	Internal doors	/		/		X		X		X		X		X	
6F 2/01	O		/	Paint coat & touch-ups	/	Internal doors	/	Internal doors	/		/		X		X		X		X		X	
6F 3/01	O		/	Paint coat & touch-ups	/	Internal doors	/	Internal doors	/	(4x) Peg stays (2x) Handles	/		X		X		X		X		X	
6F 4/01	O		/	Paint coat & touch-ups	/	Internal doors	/	Internal doors	/	(4x) Peg stays (3x) Handles	/		X		X		X		X		X	
6F 5/01	O		/	Paint coat & touch-ups. (1x) Window glass pane broken	/	Internal doors	/	Internal doors	/	(3x) Peg stays (2x) Handles	/		X		X		X		X		X	
6F 6/01	O		/		/	Internal doors	/	Internal doors	/	(4x) Peg stays (4x) Handles	/		X		X		X		X		X	
6F 7/01	O		/		X		/	Internal doors	/		/		X		X		X		X		X	

ANNEXURE D - DRAWINGS



1 Site
1 : 250

NOTES

GENERAL:

-All drawings to read ton be read in conjunction with room schedule.

-All measurements and heights have to be controlled & adapted to ex buildings, prior to commencement of any work.

-Any discrepancies or contradiction has to be discussed with the architect immediately.

-No drawings are to be scaled.

-All brickwork is to be set out using a profile marked at 85 mm c/c & 128 mm c/c for maxi bricks.

-The contractor must have a full set of drawings on site during construction.

-All dimensions as indicated on plan are to be set out on a level horizontal plane.

-The contractor is to build in S.A.B.S. approved D.P.C's whether or not these are shown on drawings, to all external walls at each floor, beam or parapet level and to all windows, doors, grilles or other openings in external walls. Cavity walls to have stepped D.P.C's.

-Quality of all materials and workmanship to comply with the relevant S.A.B.S. & NBR specifications.

-All window frames & ironmongery to be inspected, rusted frames to be replacedwith new aluminum window. Painted surfaces to be sanded and prepared for painting to match existing damaged ironmongery to be replaced to match existing

SANS 10400 NOTES:

- All work to comply with sans 10400 standards and specifications
- Structural design to arch's and eng's specification and compiles with parts h, j, k, l, m or n of sans 10400
- All dimensions of rooms and spaces to comply with sans 10400-C
- All sanitary facilities comply with sans 10400-F
- All roof gutters and down pipes to comply with sans 10400- R
- All glazing to comply with part N of SANS 10400
- Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
- All drainage subject to an agreement certificate and to comply with sans 10400-P
- All disposal of storm water to comply with SANS 10400-R
- Facilities for disabled persons are provided and are in accordance to SANS 10400-S

REVISION HISTORY

Num#	Chk#	Change Name	Date

DRAWN BY
NAME RYAN SUTHERLAND
SIGNATURE _____ DATE _____

CHECKED BY
NAME NIKIWE MVUYANA
SIGNATURE _____ DATE _____

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

SOUTHERN REGION

PROJECT
KZN DEPT OF HEALTH:
GREYS HOSPITAL: RENOVATIONS & UPGRADES TO NURSES AND DOCTORS ACCOMODATION

DRAWING DESCRIPTION
NURSES ACCOMODATION
SITE PLAN

SCALE	AS SHOWN	PAGE SIZE	A0
DWG NR	DOH,1 – DN0.2	ISSUE DATE	06/25/21
PROJECT NR	WIMS NR: 071262	REVISION NR	00

No.	Date	Amendment	Issued to

GENERAL NOTES

1. All drawings to read to be read in conjunction with Room Schedule.
2. All measurements and heights have to be controlled & adapted to ex buildings, prior to commencement of any work.
3. Any discrepancies or contradiction has to be discussed with the architect immediately.
4. No drawings are to be scaledAll brickwork is to be set out using a profile marked at 85 mm c/c & 128 mm c/c for maxi bricks
5. The contractor must have a full set of dwg's on site during construction.All dimensions as indicated on plan are to be set out on a level horizontal plane.
6. The contractor is to build in s.a.b.s. approved d.p.c's whether or not these are shown on drawings, to all external walls at each floor, beam or parapet level and to all windows, doors, grilles or other openings in external

SANS 10400 NOTES:

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2. All dimensions of rooms and spaces to comply with sans 10400-c
3. All sanitary facilities comply with sans 10400-F
4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number 071262 page type A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

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Department:
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PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - LOCALITY PLAN

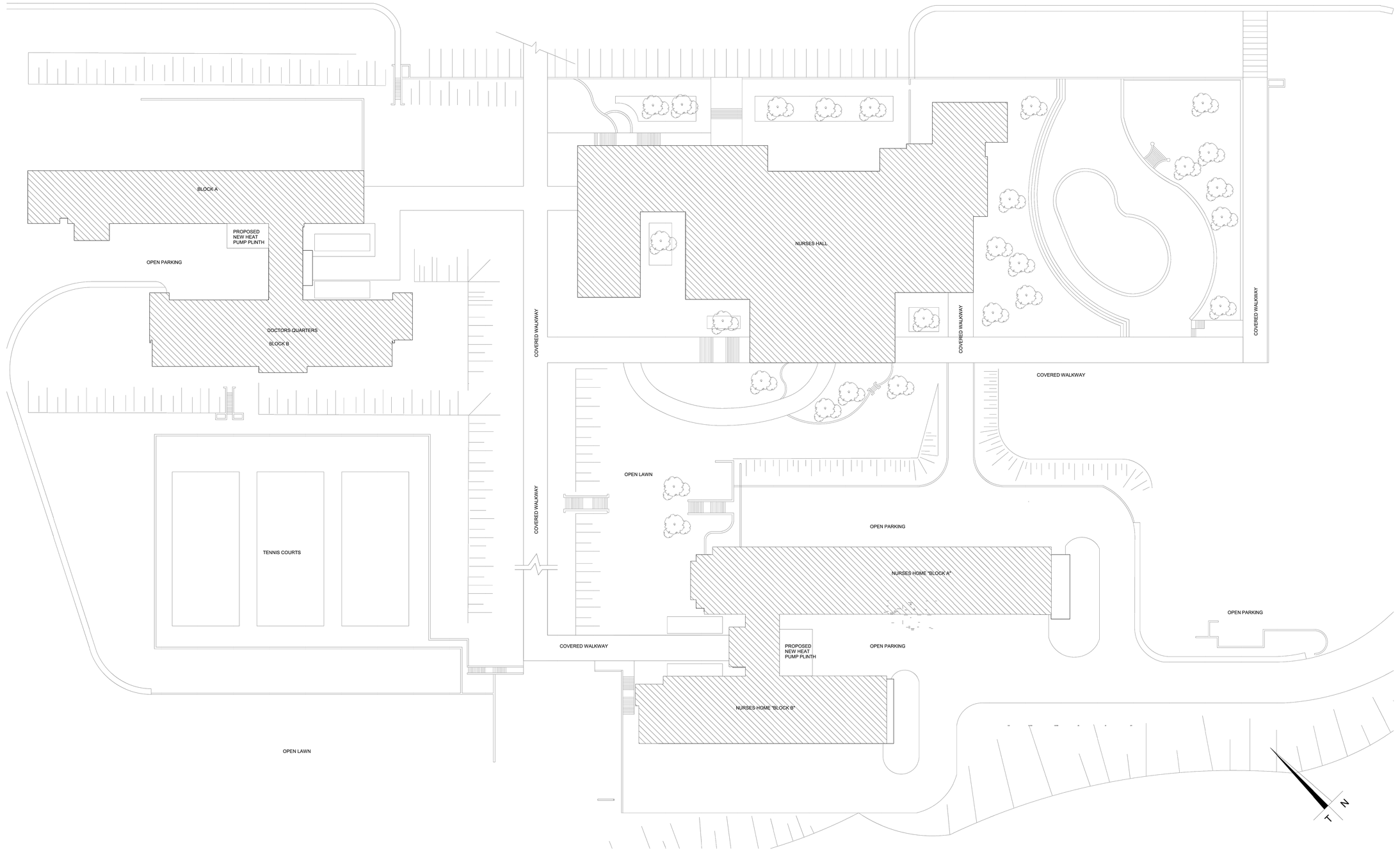
Project Stage
071262 - STAGE 5: CONSTRUCTION

Drawn	R. Morahang		Date
scale	1 : 2000		2022/05/25 09:00:39

drawing number
071262 DOH - NS - A- 1000 - 0

Drawing Number ID
071262 = WIMS no
DOH = Department
A = Consultant Discipline
0000 = Drawing No
0 = Revision No

ANNEXURE D - DRAWINGS



1 Site
1 : 250

No.	Date	Amendment	Issued to

GENERAL NOTES

1. All drawings to read to be read in conjunction with Room Schedule.
2. All measurements and heights have to be controlled & adapted to ex. buildings, prior to commencement of any work.
3. Any discrepancies or contradiction has to be discussed with the architect immediately.
4. No drawings are to be scaledAll brickwork is to be set out using a profile marked at 85 mm c/c & 128 mm c/c for maxi bricks
5. The contractor must have a full set of dwg's on site during construction.All dimensions as indicated on plan are to be set out on a level horizontal plane.
6. The contractor is to build in s.a.b.s. approved d.p.c's whether or not these are shown on drawings, to all external walls at each floor, beam or parapet level and to all windows, doors, grilles or other openings in external

SANS 10400 NOTES:

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2. All dimensions of rooms and spaces to comply with sans 10400-c
3. All sanitary facilities comply with sans 10400-F
4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number 071262 page type A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
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Department:
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Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - SITE PLAN

Project Stage
071262 - STAGE 5: CONSTRUCTION

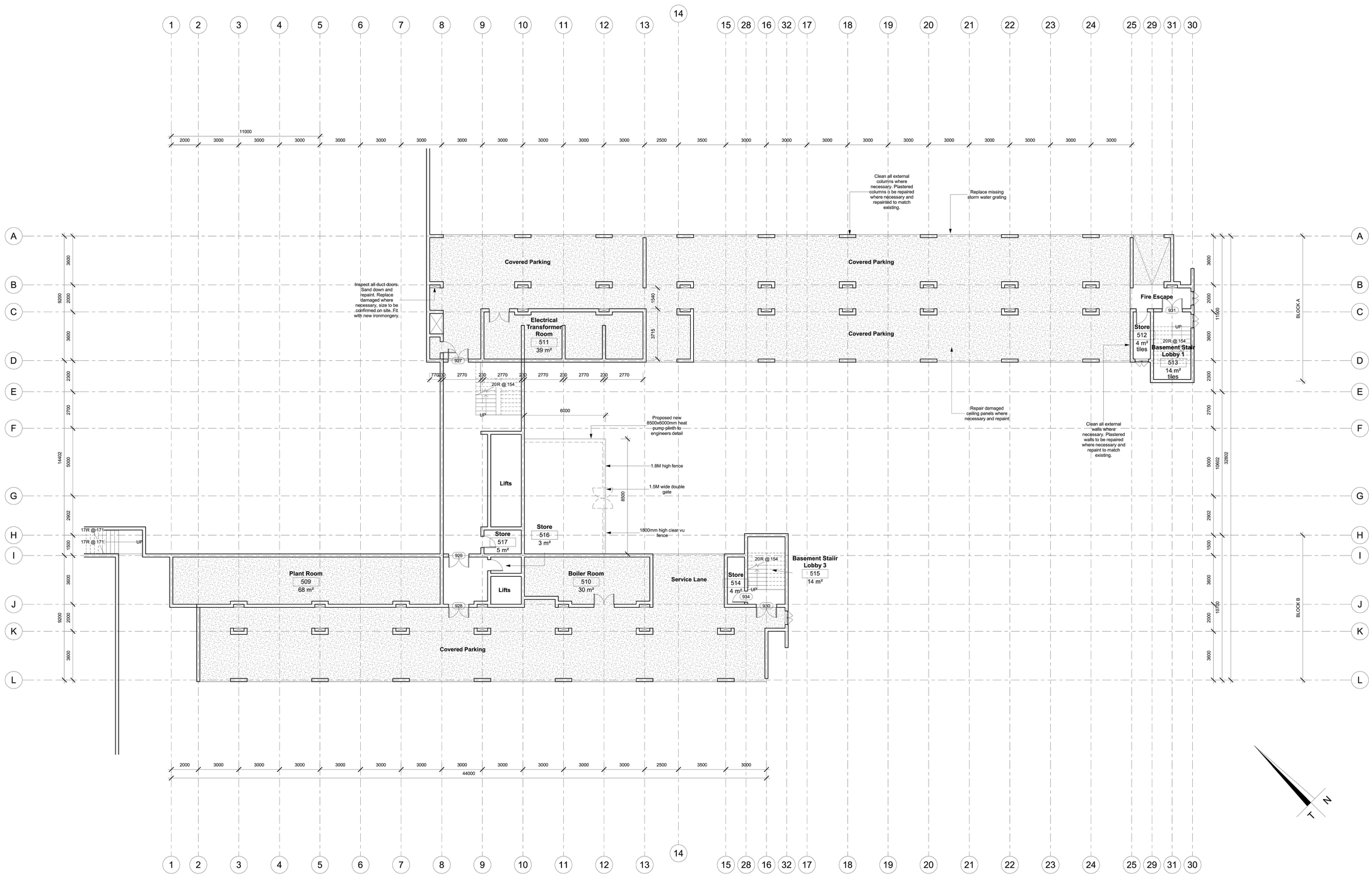
Drawn	R. Morahena		Date
scale	1 : 250		2022/05/25 09:00:39

drawing number
071262 DOH - NS - A- 1001 - 0

Drawing Number ID

071262	= WIMS no
DOH	= Department
A	= Consultant Discipline
0000	= Drawing No
0	= Revision No

ANNEXURE D - DRAWINGS



1 Basement Floor Level
1 : 100

No.	Date	Amendment	Issued to

GENERAL NOTES

1. All drawings to read to be read in conjunction with Room Schedule.
2. All measurements and heights have to be controlled & adapted to ex buildings, prior to commencement of any work.
3. Any discrepancies or contradiction has to be discussed with the architect immediately.
4. No drawings are to be scaledAll brickwork is to be set out using a profile marked at 85 mm c/c & 128 mm c/c for maxi bricks
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6. The contractor is to build in s.a.b.s. approved d.p.c's whether or not these are shown on drawings, to all external walls at each floor, beam or parapet level and to all windows, doors, grilles or other openings in external

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2. All dimensions of rooms and spaces to comply with sans 10400-c
3. All sanitary facilities comply with sans 10400-F
4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number 071262 | page type A0

DEPARTMENT SIGNATURES

FACILITY

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

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health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - BASEMENT PLAN

Project Stage

071262 - STAGE 5: CONSTRUCTION

Drawn R. Monaheng | Date

scale 1 : 100 | 2022/05/25 09:00:39

drawing number

071262 DOH - NS - A- 2000 - 0

Drawing Number ID

071262 = WIMS no

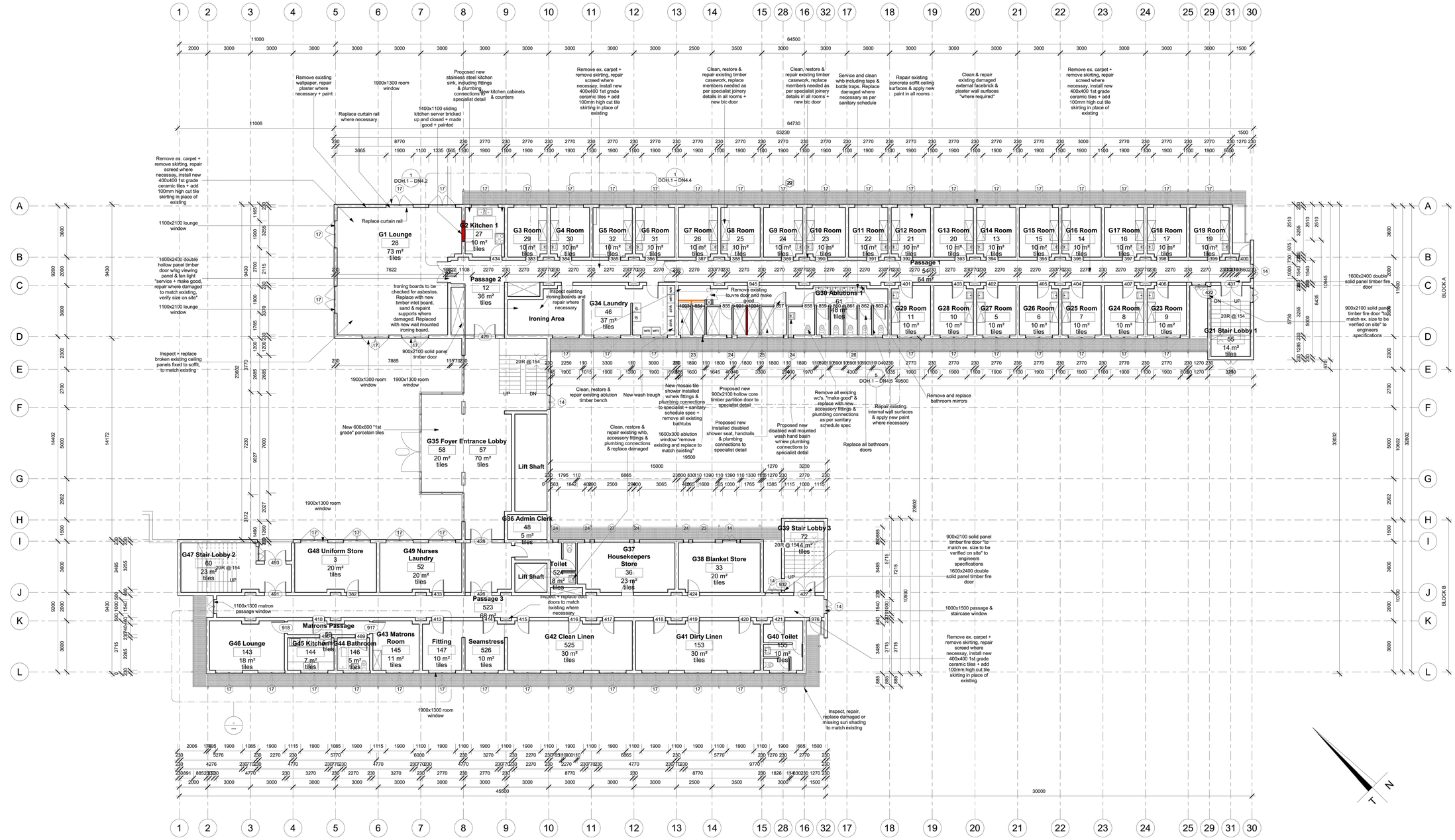
DOH = Department

A = Consultant Discipline

0000 = Drawing No

0 = Revision No

ANNEXURE D - DRAWINGS



1 Ground Floor Level
1 : 100

No.	Date	Amendment	Issued to

GENERAL NOTES

1. All drawings to read to be read in conjunction with Room Schedule.
2. All measurements and heights have to be controlled & adapted to ex buildings, prior to commencement of any work.
3. Any discrepancies or contradiction has to be discussed with the architect immediately.
4. No drawings are to be scaledAll brickwork is to be set out using a profile marked at 85 mm c/c & 128 mm c/c for maxi bricks
5. The contractor must have a full set of dwg's on site during construction.All dimensions as indicated on plan are to be set out on a level horizontal plane.
6. The contractor is to build in s.a.b.s. approved d.p.c's whether or not these are shown on drawings, to all external walls at each floor, beam or parapet level and to all windows, doors, grilles or other openings in external

SANS 10400 NOTES:

1. All work to comply with sans 10400 standards and specificationsStructural design to arch's and eng's specification and complies with parts h, j, k, l, m or n of sans 10400
2. All dimensions of rooms and spaces to comply with sans 10400-c
3. All sanitary facilities comply with sans 10400-F
4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number 071262

page type A0

DEPARTMENT SIGNATURES

FACILITY

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

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Signature | Date

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health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - GROUND STOREY PLAN

Project Stage

0771262 - STAGE 5: CONSTRUCTION

Drawn R. Monaheng | Date

scale 1 : 100 | 2022/05/25 09:00:39

drawing number

071262 DOH - NS - A- 2001 - 0

Drawing Number ID

071262 = WIMS no

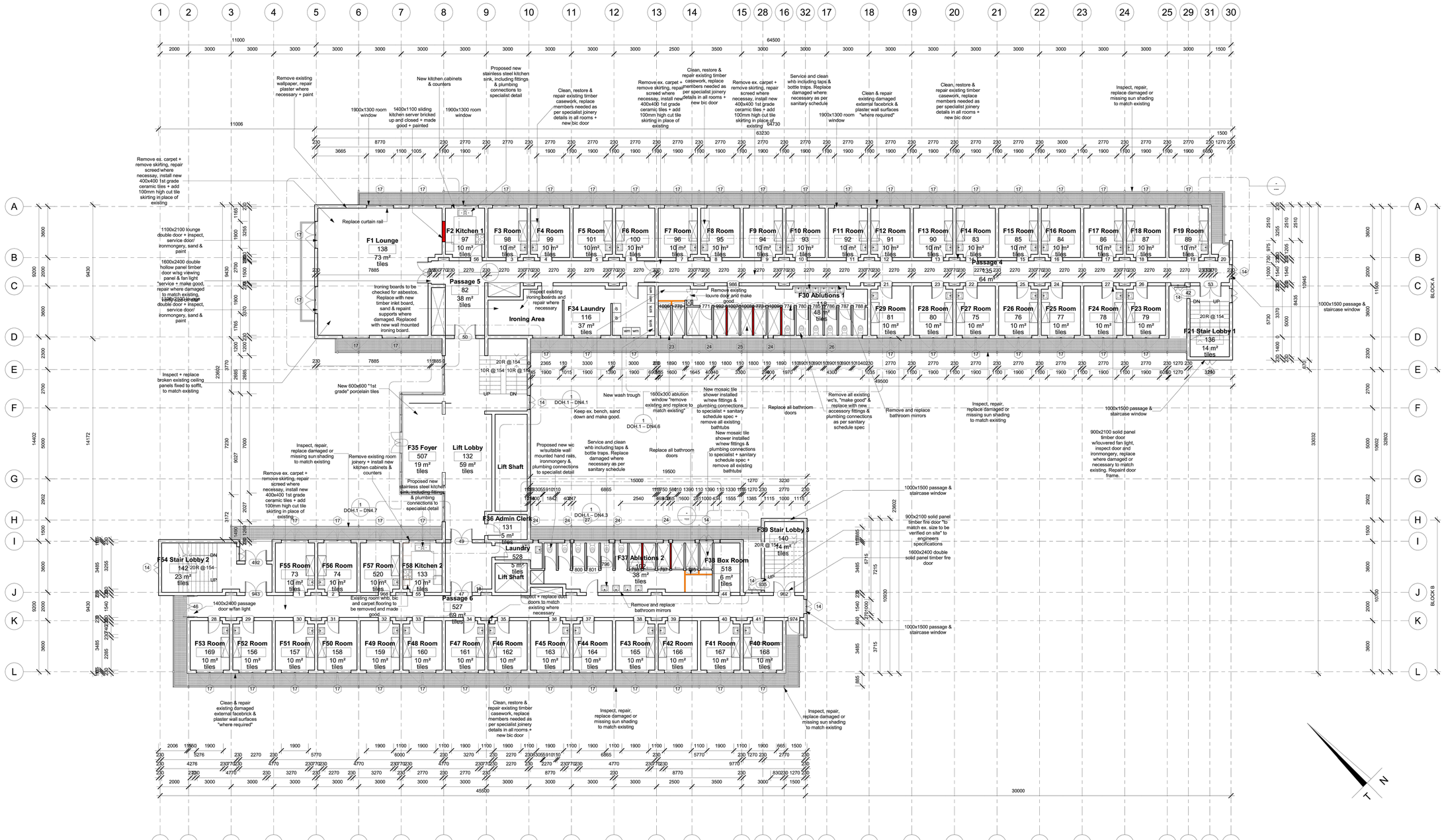
DOH = Department

A = Consultant Discipline

0000 = Drawing No

0 = Revision No

ANNEXURE D - DRAWINGS



1 1st Floor Level
1 : 100

No.	Date	Amendment	Issued to

GENERAL NOTES

1. All drawings to read to be read in conjunction with Room Schedule.
2. All measurements and heights have to be controlled & adapted to ex buildings, prior to commencement of any work.
3. Any discrepancies or contradiction has to be discussed with the architect immediately.
4. No drawings are to be scaledAll brickwork is to be set out using a profile marked at 85 mm c/c & 128 mm c/c for maxi bricks
5. The contractor must have a full set of dwg's on site during construction.All dimensions as indicated on plan are to be set out on a level horizontal plane.
6. The contractor is to build in s.a.b.s. approved d.p.c's whether or not these are shown on drawings, to all external walls at each floor, beam or parapet level and to all windows, doors, grilles or other openings in external

SANS 10400 NOTES:

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2. All dimensions of rooms and spaces to comply with sans 10400-c
3. All sanitary facilities comply with sans 10400-F
4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number 071262 | page type A0

DEPARTMENT SIGNATURES
FACILITY
DISTRICT MANAGER
DOH PROJECT LEADER
Checked by (Professional Consultant)
Name
Signature | Date

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health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project
GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

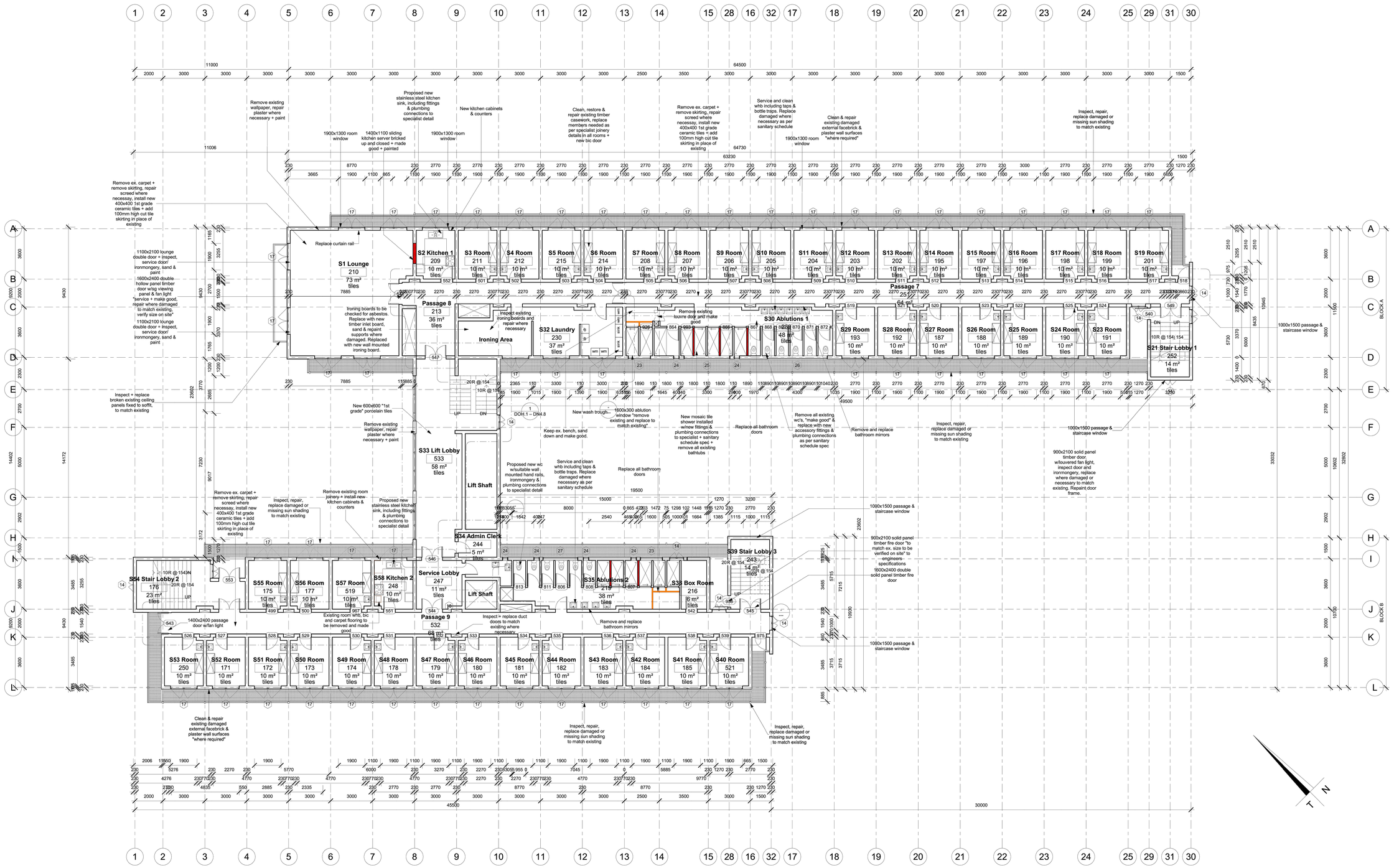
Drawing title
NURSES & DOCTORS ACCOMMODATION - 1ST STOREY PLAN

Project Stage
0771262 - STAGE 5: CONSTRUCTION

Drawn R. Monateng | Date
scale 1 : 100 | 2022/05/25 09:00:39
drawing number
071262 DOH - NS - A- 2002 - 0

Drawing Number ID
071262 = WIMS no
DOH = Department
A = Consultant Discipline
0000 = Drawing No
0 = Revision No

ANNEXURE D - DRAWINGS



1 2nd Floor Level
1 : 96

No.	Date	Amendment	Issued to

GENERAL NOTES

1. All drawings to read to be read in conjunction with Room Schedule.
2. All measurements and heights have to be controlled & adapted to ex buildings, prior to commencement of any work.
3. Any discrepancies or contradiction has to be discussed with the architect immediately.
4. No drawings are to be scaledAll brickwork is to be set out using a profile marked at 85 mm c/c & 128 mm c/c for maxi bricks
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6. The contractor is to build in s.a.b.s. approved d.p.c's whether or not these are shown on drawings, to all external walls at each floor, beam or parapet level and to all windows, doors, grilles or other openings in external

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4. All roof gutters and down pipes to comply with SANS10400- R
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7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number 071262 | page type A0

DEPARTMENT SIGNATURES

FACILITY

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature | Date

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Public Works
PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - 2nd STOREY PLAN

Project Stage
0771262 - STAGE 5: CONSTRUCTION

Drawn	R. Monaheng		Date
scale	1 : 96		2022/05/25 09:00:39

drawing number
071262 DOH - NS - A- 2003 - 0

Drawing Number ID

071262 = WIMS no

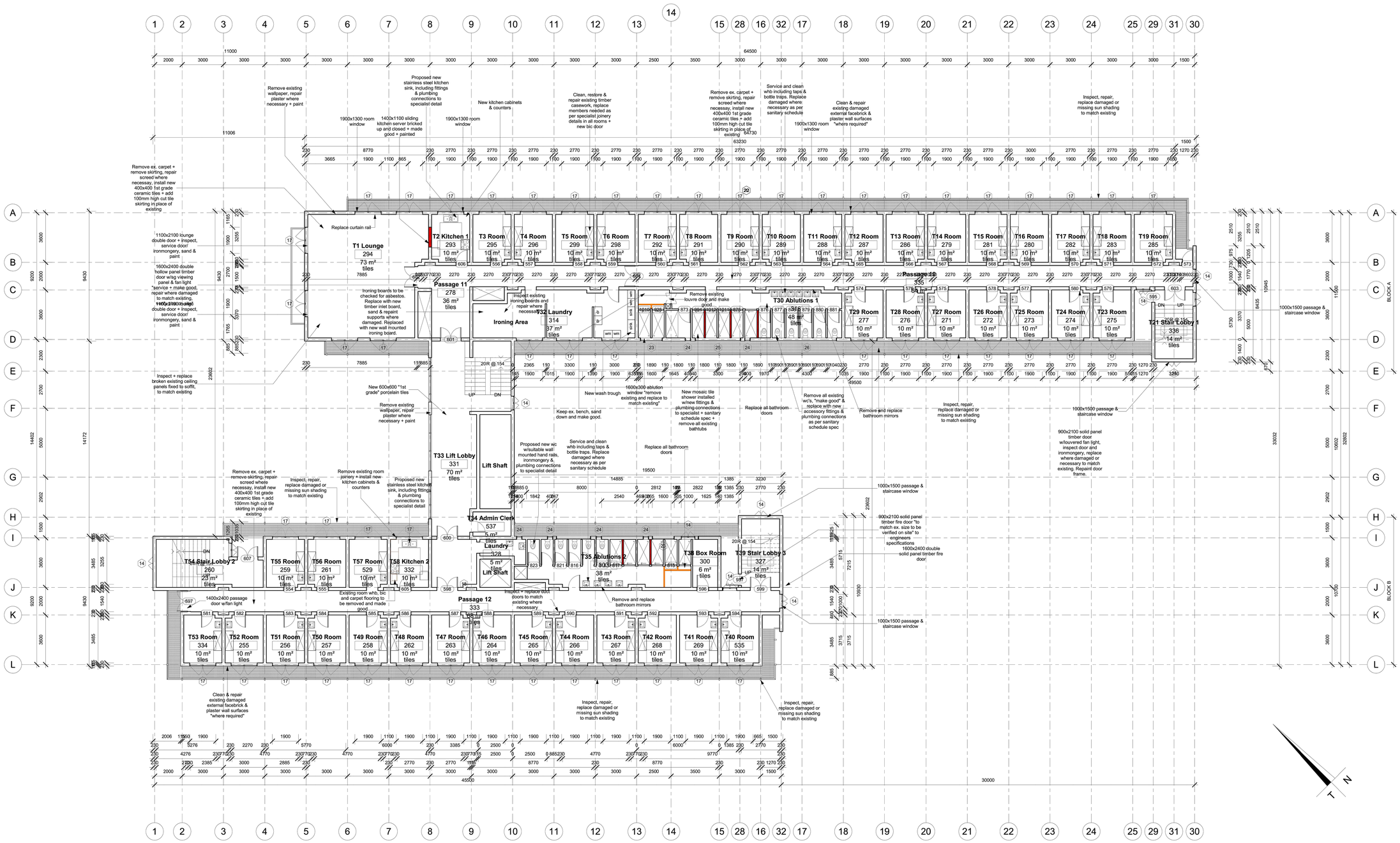
DOH = Department

A = Consultant Discipline

0000 = Drawing No

0 = Revision No

ANNEXURE D - DRAWINGS



1 3rd Floor Level
1 : 100

No.	Date	Amendment	Issued to

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3. Any discrepancies or contradiction has to be discussed with the architect immediately.
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8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number 071262 | page type A0

DEPARTMENT SIGNATURES
FACILITY
DISTRICT MANAGER
DOH PROJECT LEADER
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Name
Signature | Date

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health
Department: Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - 3rd STOREY PLAN

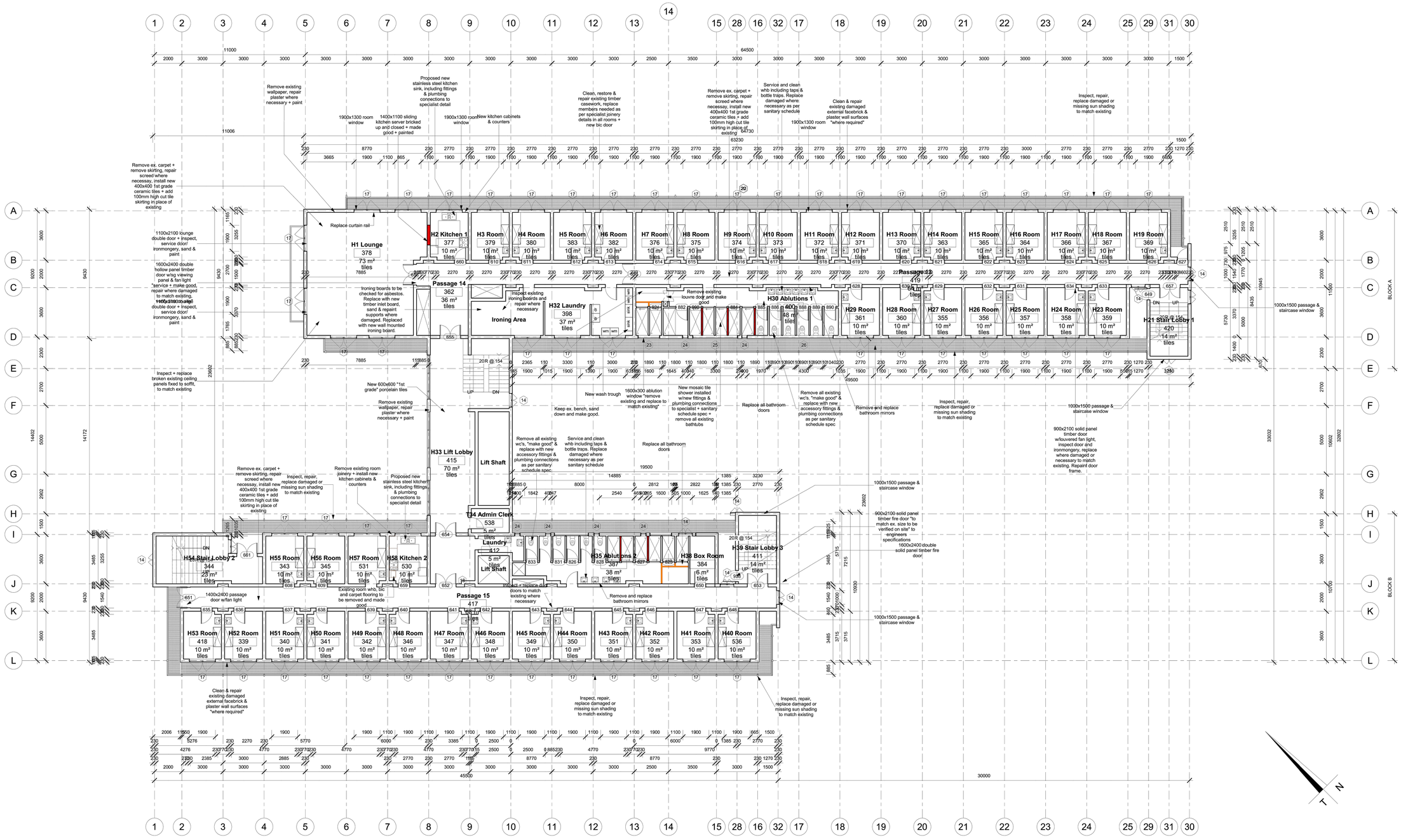
Project Stage
0771262 - STAGE 5: CONSTRUCTION

Drawn	R. Monateng		Date
scale	1 : 100		2022/05/25 09:00:39

drawing number
071262 DOH - NS - A- 2004 - 0

Drawing Number ID
071262 = WIMS no
DOH = Department
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ANNEXURE D - DRAWINGS



1 4th Floor Level
1 : 100

No.	Date	Amendment	Issued to

GENERAL NOTES

1. All drawings to read to be read in conjunction with Room Schedule.
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4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number 071262 | page type A0

DEPARTMENT SIGNATURES

FACILITY

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature | Date

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Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

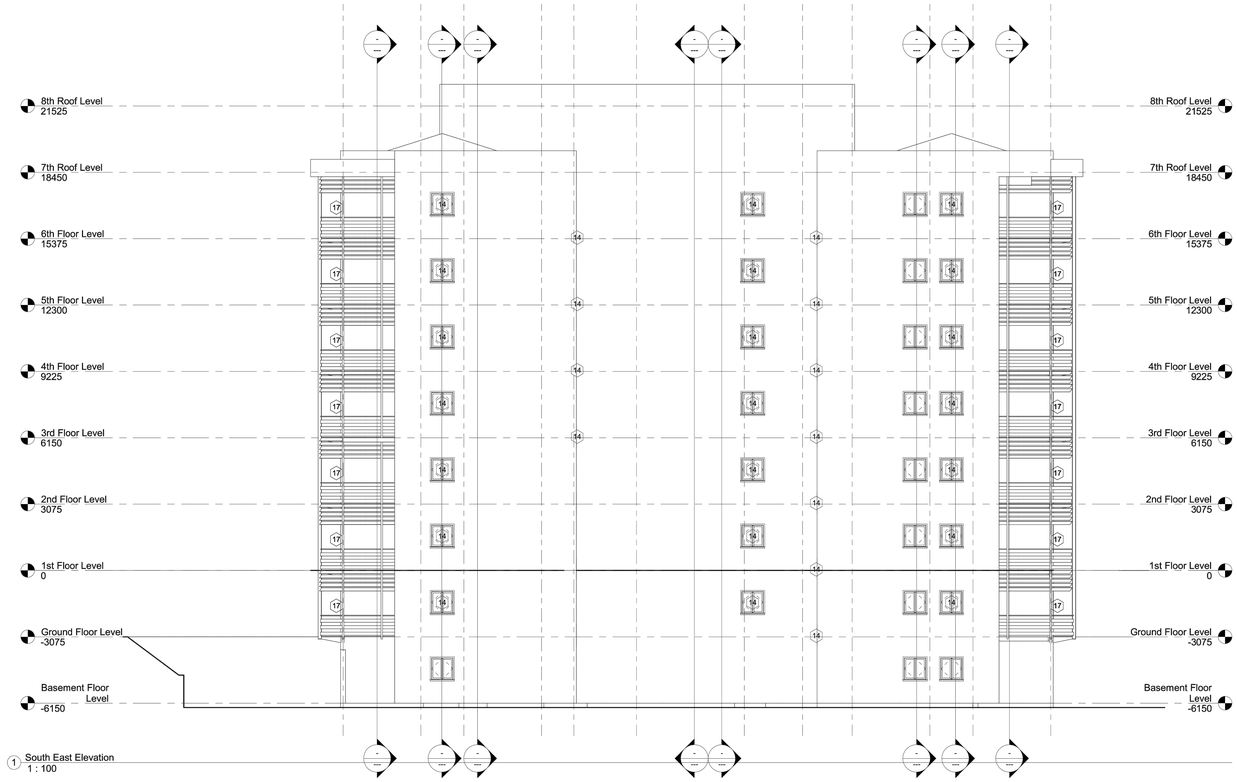
NURSES & DOCTORS ACCOMMODATION - 4th STOREY PLAN

Project Stage
0771262 - STAGE 5: CONSTRUCTION

Drawn R. Morahaeng | Date 2022/05/25 09:00:39
scale 1 : 100
drawing number 071262 DOH - NS - A- 2005 - 0

Drawing Number ID
071262 = WIMS no
DOH = Department
A = Consultant Discipline
0000 = Drawing No
C = Revision No

ANNEXURE D - DRAWINGS



1 South East Elevation
1 : 100



2 North West Elevation
1 : 100

No.	Date	Amendment	Issued to

GENERAL NOTES

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9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name			
Signature		Date	

consultant

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ARCHITECTURE
public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - NORTH WEST ELEVATION

Project Stage

071262 - STAGE 5: CONSTRUCTION

Drawn	R. Morsheng		Date
scale	1 : 100		2022/05/25 09:00:39

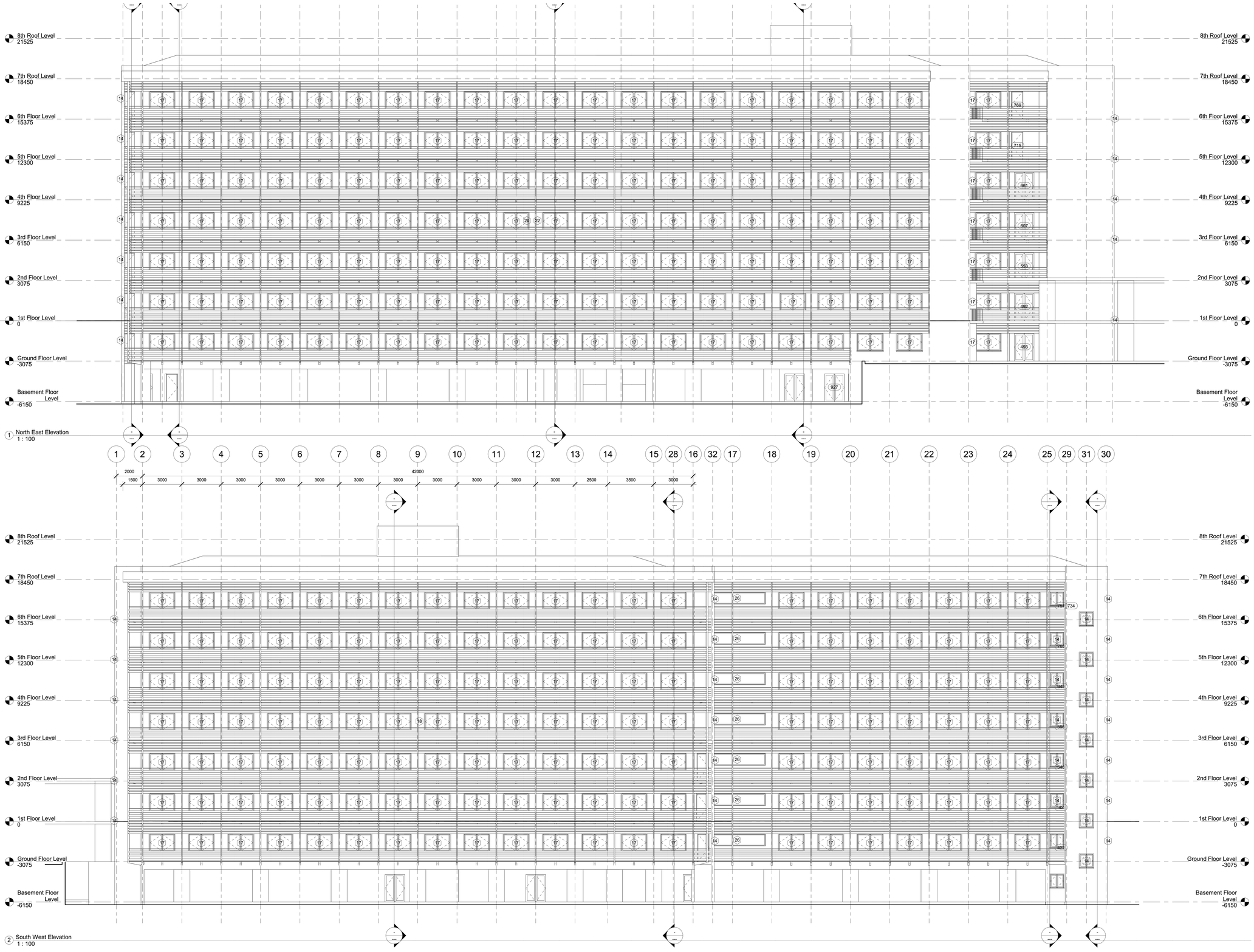
drawing number

071262 DOH - NS - A- 4000 - 0

Drawing Number ID

071262	= WIMS no
DOH	= Department
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ANNEXURE D - DRAWINGS



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1 : 100

2 South West Elevation
1 : 100

No.	Date	Amendment	Issued to

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WIMS number: 071262
page type: A0

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FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

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Tel. 031 265 6444
email. george@ukuza.co.za
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ARCHITECTURE
public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - SOUTH WEST ELEVATION

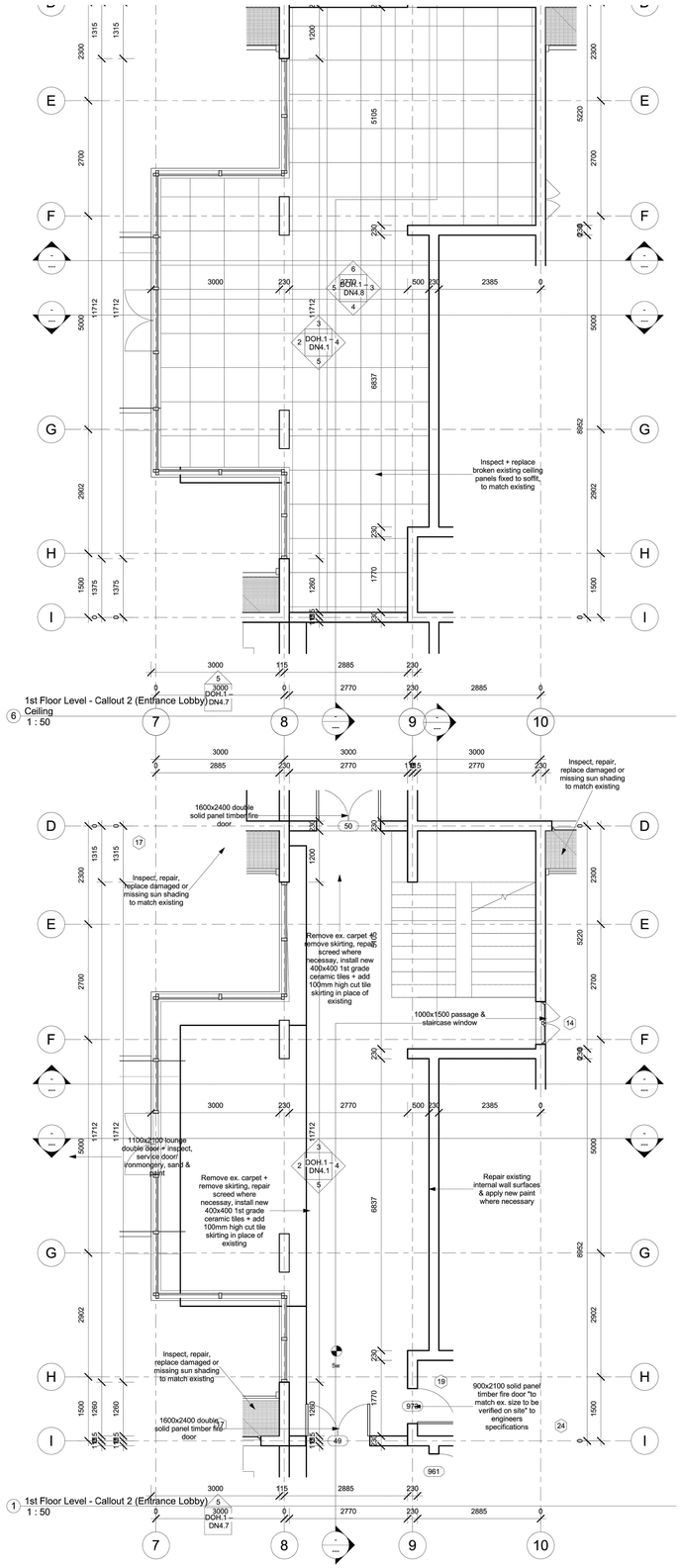
Project Stage
0771262 - STAGE 5: CONSTRUCTION

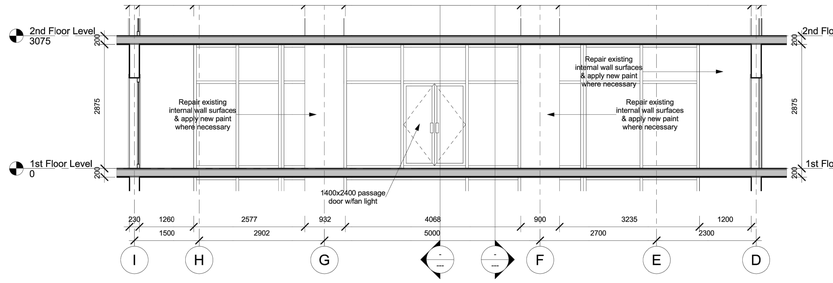
Drawn	R. Monaheng		Date
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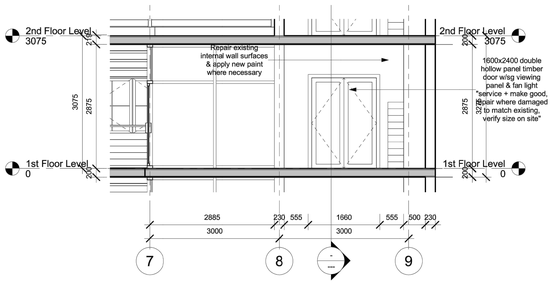
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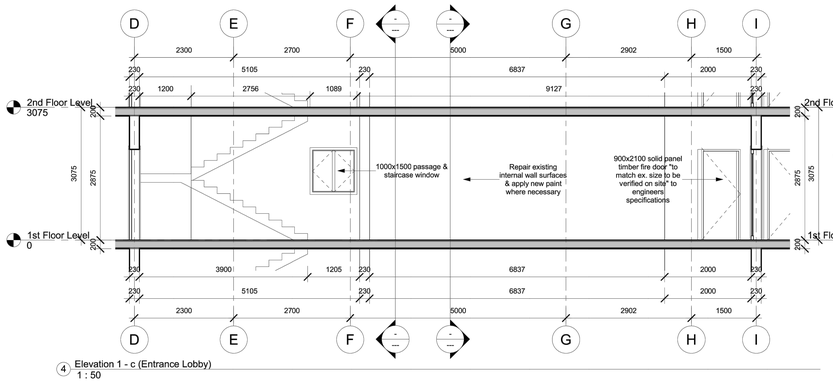
Drawing Number ID
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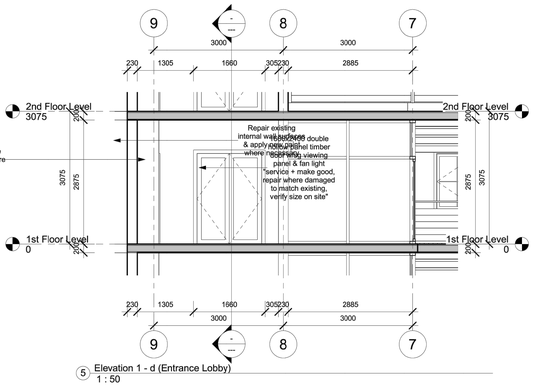
ANNEXURE D - DRAWINGS











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WIMS number: 071262

page type: A0

DEPARTMENT SIGNATURES	
FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

consultant

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UKUZA CONSULTING (PTY) LTD

ARCHITECTURE

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - GF TO FF LVL ENTRANCE LOBBY DETAIL

Project Stage: 0771262 - STAGE 5: CONSTRUCTION

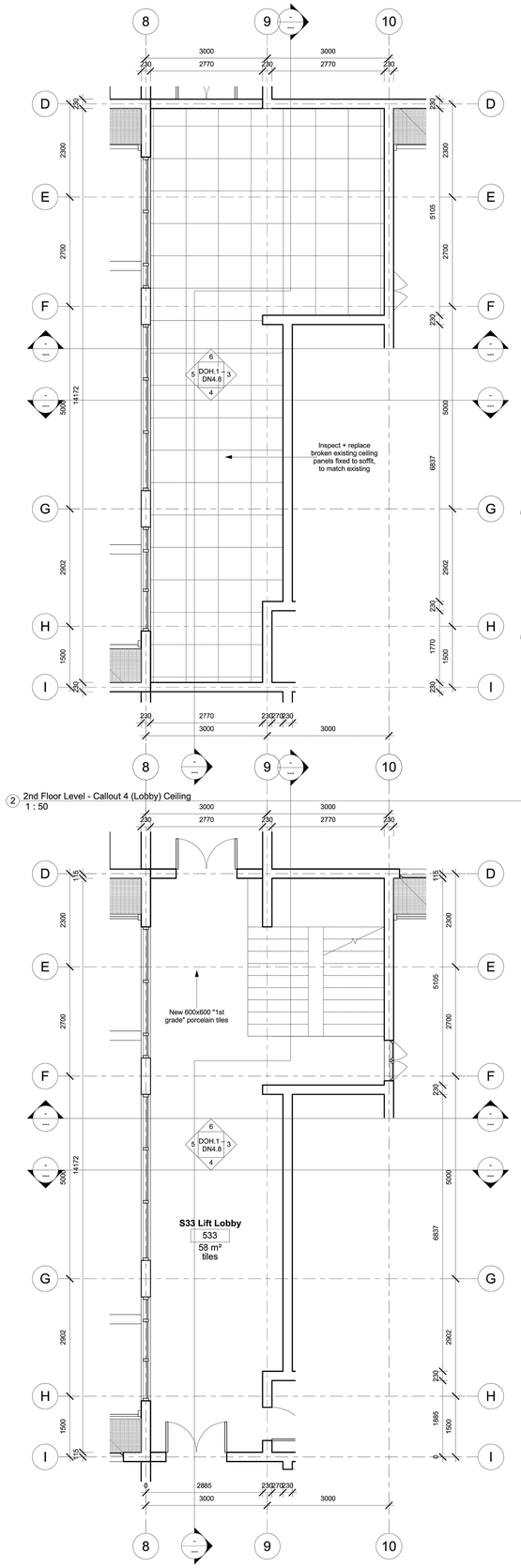
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drawing number: 071262 DOH - NS - A- 5000 - 0

Drawing Number ID

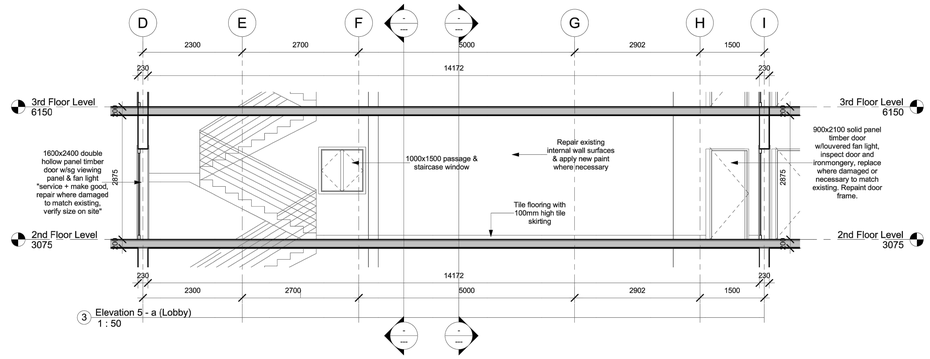
071262	= WIMS no
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ANNEXURE D - DRAWINGS

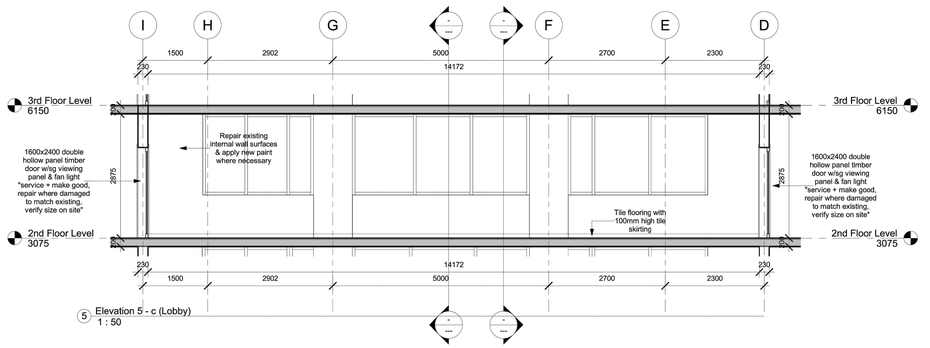


2 2nd Floor Level - Callout 4 (Lobby) Ceiling
1 : 50

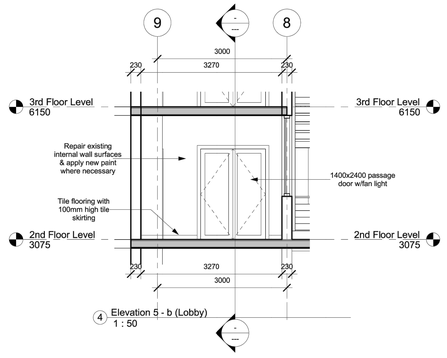
1 2nd Floor Level - Callout 4 (Lobby)
1 : 50



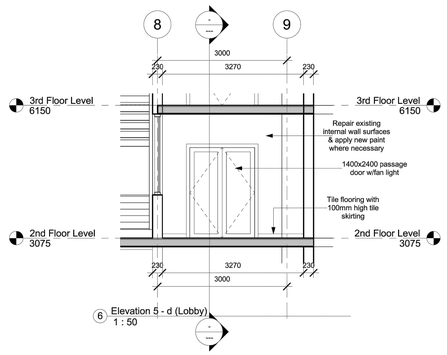
3 Elevation 5 - a (Lobby)
1 : 50



5 Elevation 5 - c (Lobby)
1 : 50



4 Elevation 5 - b (Lobby)
1 : 50



6 Elevation 5 - d (Lobby)
1 : 50

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WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

consultant
15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel: 031 265 0444
email: george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

ARCHITECTURE
public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - 2ND TO 4TH LVL ENTRANCE LOBBY DETAIL

Project Stage: 071262 - STAGE 5: CONSTRUCTION

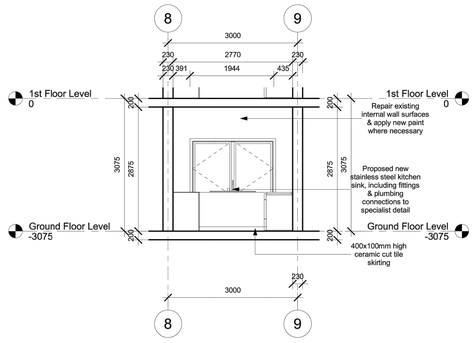
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drawing number: 071262 DOH - NS - A- 5001 - 0

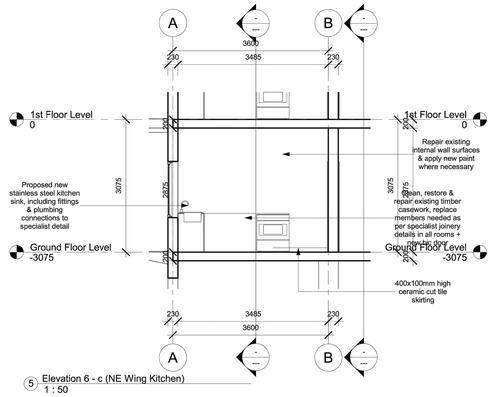
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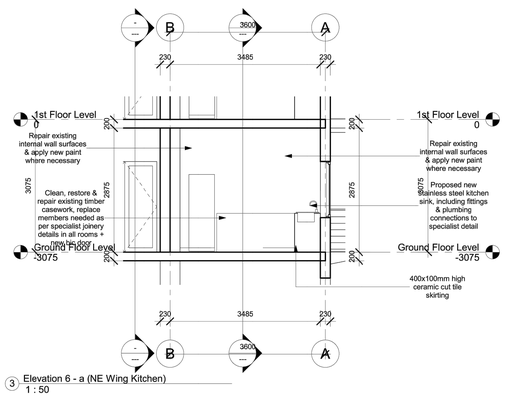
ANNEXURE D - DRAWINGS



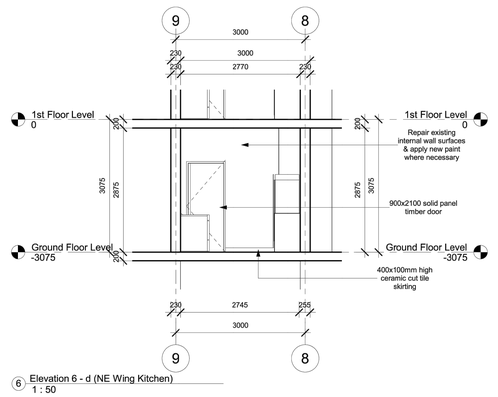
4 Elevation 6 - b (NE Wing Kitchen)
1 : 50



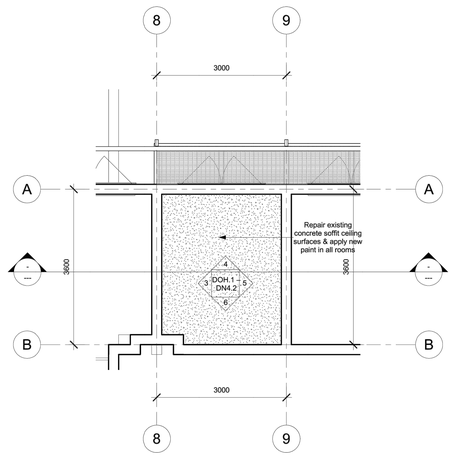
5 Elevation 6 - c (NE Wing Kitchen)
1 : 50



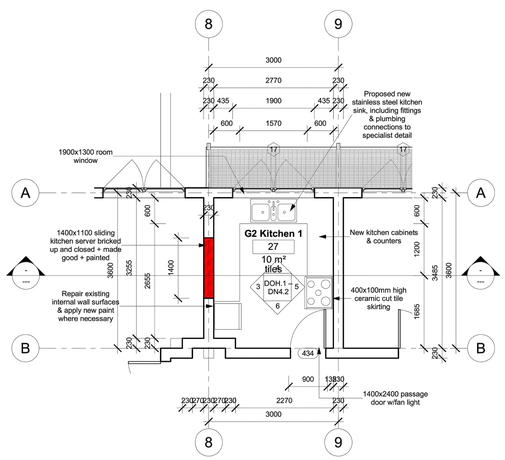
3 Elevation 6 - a (NE Wing Kitchen)
1 : 50



6 Elevation 6 - d (NE Wing Kitchen)
1 : 50



Ground Floor Level - Callout 2 (Kitchen)
Ceiling
2 1 : 50



Ground Floor Level - Callout 2 (Kitchen)
1 1 : 50

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page type: A0

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consultant
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ARCHITECTURE
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Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - GF BLOCK A TYPICAL KITCHEN DETAIL

Project Stage: 071262 - STAGE 5: CONSTRUCTION

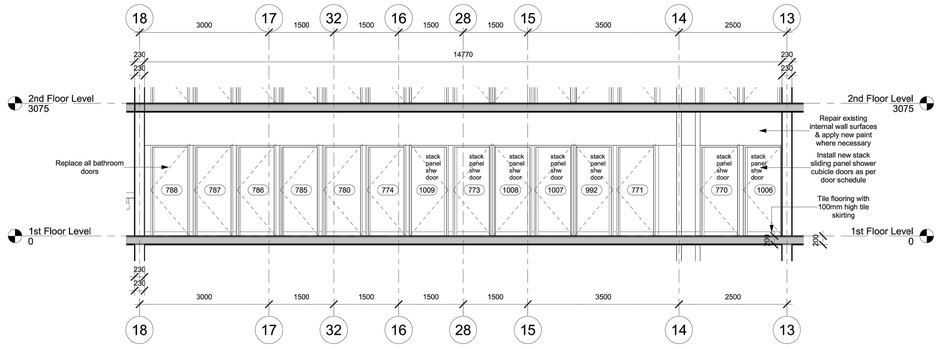
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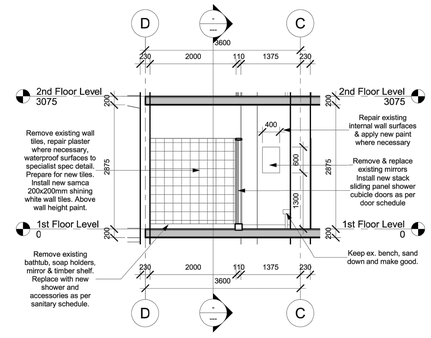
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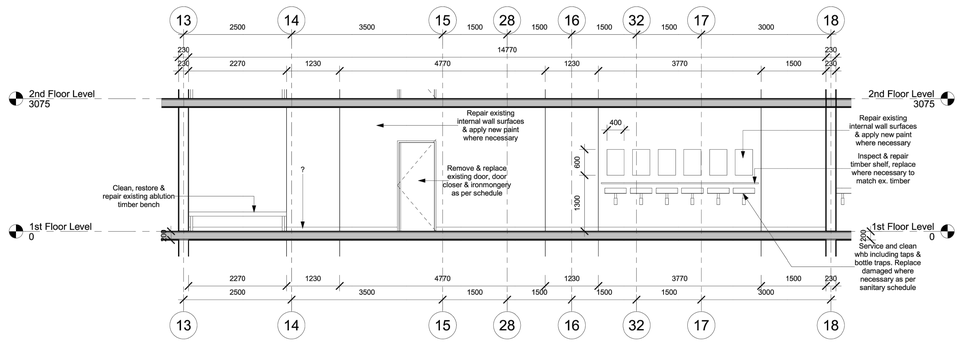
ANNEXURE D - DRAWINGS



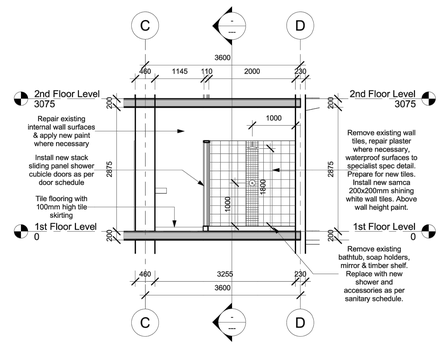
4 Elevation 1 - c
1 : 50



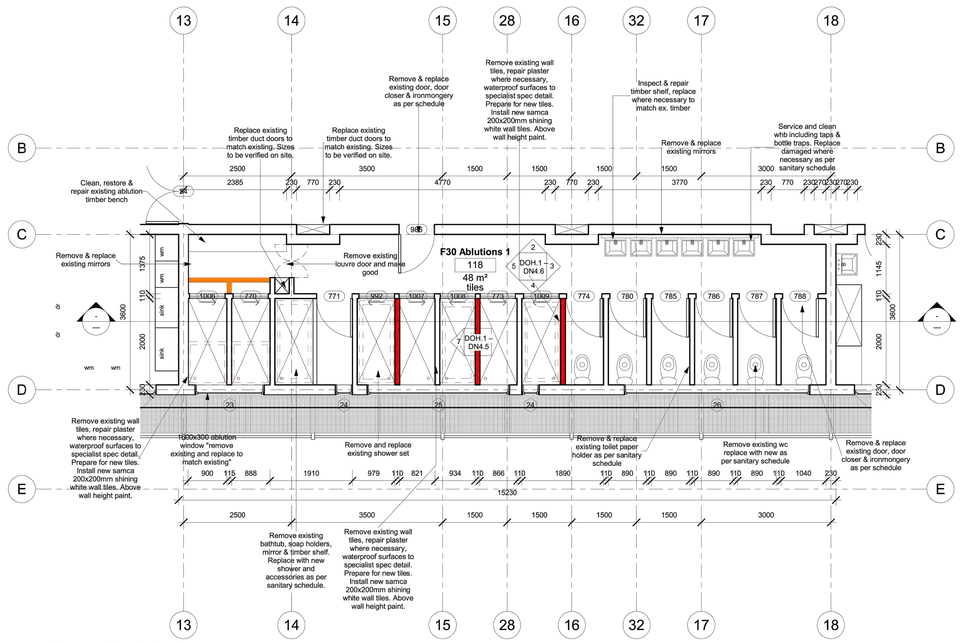
5 Elevation 1 - d
1 : 50



2 Elevation 1 - a
1 : 50



3 Elevation 1 - b
1 : 50



1 1st Floor Level - Callout 1 (Block A Ablutions FF)
1 : 50

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2. All dimensions of rooms and spaces to comply with sans 10400-c
3. All sanitary facilities comply with sans 10400-F
4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name | Signature | Date

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ARCHITECTURE
public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - GF BLOCK A 1ST TO 4TH ABLUTIONS DETAIL

Project Stage: 0771262 - STAGE 5: CONSTRUCTION

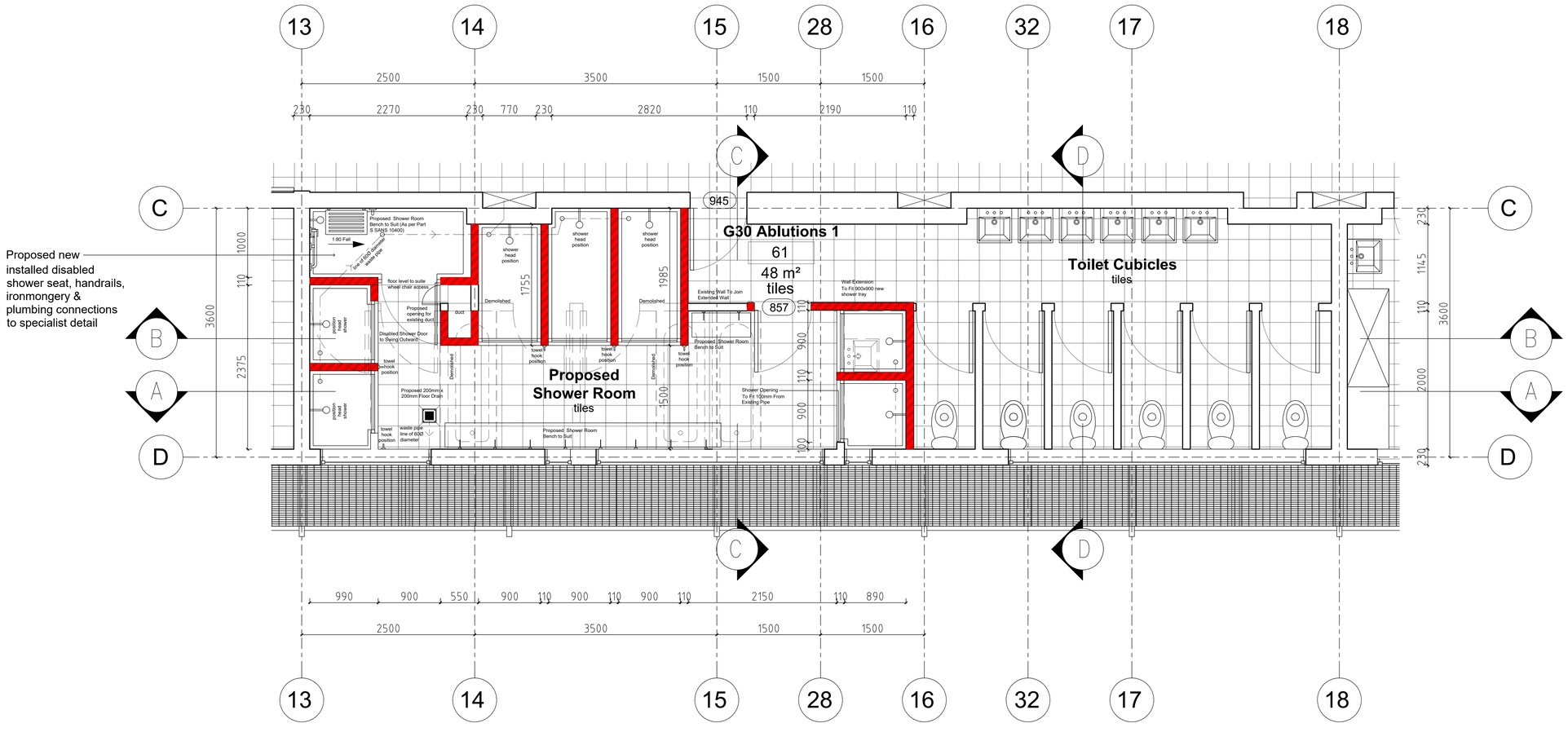
Drawn	R. Monaheng		Date
scale	1 : 50		2022/05/25 09:00:39

drawing number: 071262 DOH - NS - A- 5003 - 0

Drawing Number ID

071262 = WIMS no
DOH = Department
A = Consultant Discipline
0000 = Drawing No
0 = Revision No

ANNEXURE D - DRAWINGS



Ground Floor Level: Call-out 5 (Ablutions)

SCALE – 1 : 25

ALL WALL, FLOOR FINISHES AND SANITARY WARE FITTINGS TO BE REFERENCED FROM THE BILL OF QUANTITIES

No.	Date	Amendment	Issued to
01	25/07/2023	Updated Nurses Block A Ablutions	Site

GENERAL NOTES

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WIMS number: 071262 | page type: A0

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FACILITY

DISTRICT MANAGER

DOH PROJECT LEADER

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Name

Signature | Date

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ARCHITECTURE

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

KWAZULU-NATAL PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - NURSES BLOCK A ABLUTIONS DETAILS

Project Stage

071262 - STAGE 5: CONSTRUCTION

Drawn: NMV | Date:

scale: 1 : 25 | 2023/07/25

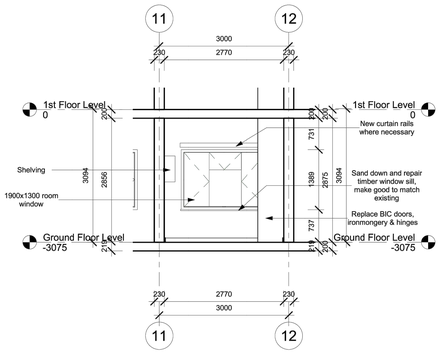
drawing number

071262 REL - A - 5001 - 01

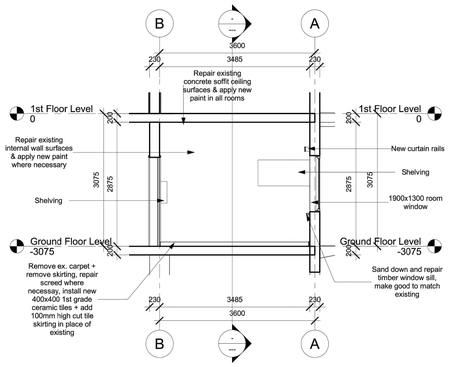
Drawing Number ID

071262	= WIMS no
DPWKZN	= Department
A	= Consultant Discipline
0000	= Drawing No
0	= Revision No

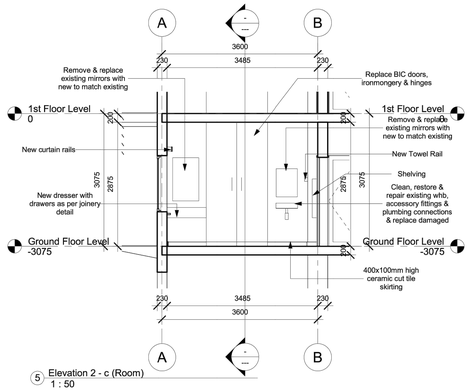
ANNEXURE D - DRAWINGS



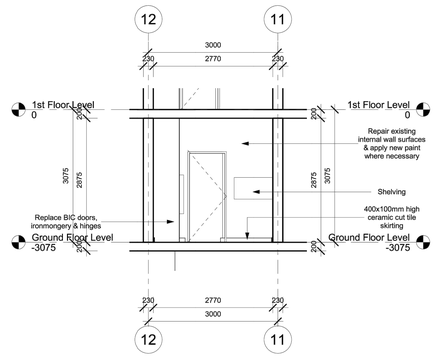
4 Elevation 2 - b (Room)
1 : 50



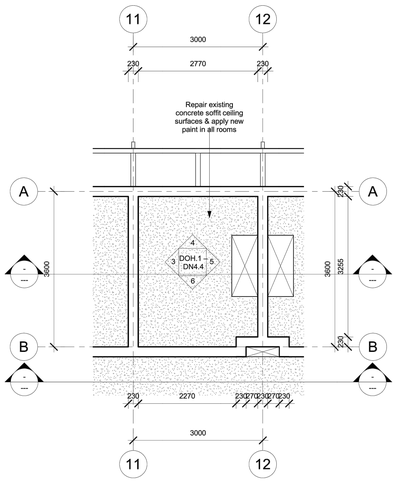
3 Elevation 2 - a (Room)
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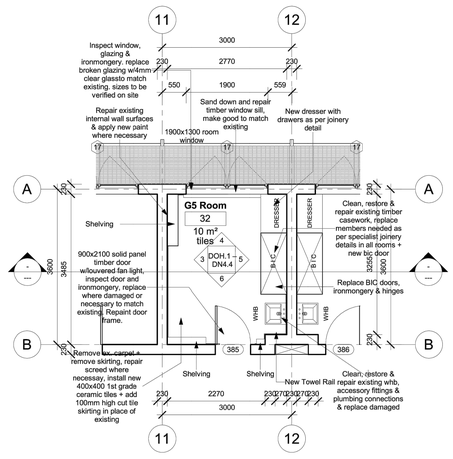
5 Elevation 2 - c (Room)
1 : 50



6 Elevation 2 - d (Room)
1 : 50



Ground Floor Level - Callout 1 (Room)
Ceiling
2 1 : 50



Ground Floor Level - Callout 1 (Room)
1 1 : 50

No.	Date	Amendment	Issued to

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WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	
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Name	
Signature	Date

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public works
Department:
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PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - TYPICAL ROOM PLANS & ELEVATIONS -

Project Stage

071262 - STAGE 5: CONSTRUCTION

Drawn	R. Monaheng		Date
scale	1 : 50		2022/05/25 09:00:39

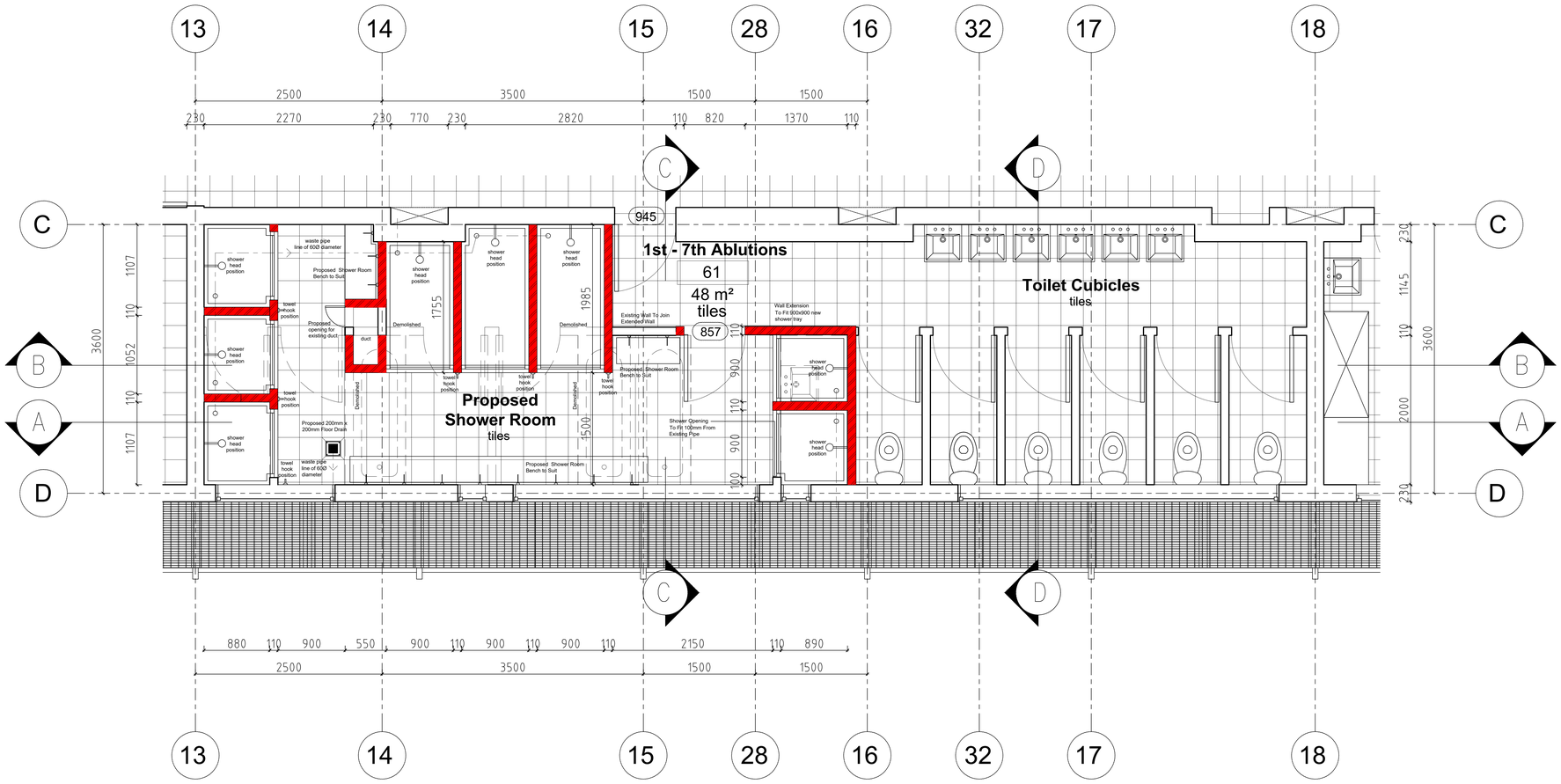
drawing number

071262 DOH - NS - A- 5005 - 0

Drawing Number ID

071262	= WIMS no
DOH	= Department
A	= Consultant Discipline
0000	= Drawing No
C	= Revision No

ANNEXURE D - DRAWINGS



1st – 7th Floor Level: Call–out 5 (Ablutions)

SCALE – 1 : 25

ALL WALL, FLOOR FINISHES AND SANITARY WARE FITTINGS TO BE REFERENCED FROM THE BILL OF QUANTITIES

No.	Date	Amendment	Issued to
01	25/07/2023	Updated Nurses Block A Ablutions	Site

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WIMS number: 071262 | page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature | Date

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ARCHITECTURE

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

KWAZULU-NATAL PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - TYPICAL NURSES BLOCK A ABLUTIONS DETAILS

Project Stage

071262 - STAGE 5: CONSTRUCTION

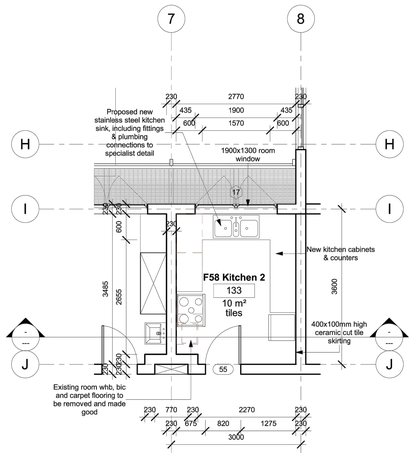
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scale	1 : 25		2023/07/25

drawing number: 071262 REL - A- 5003 - 00

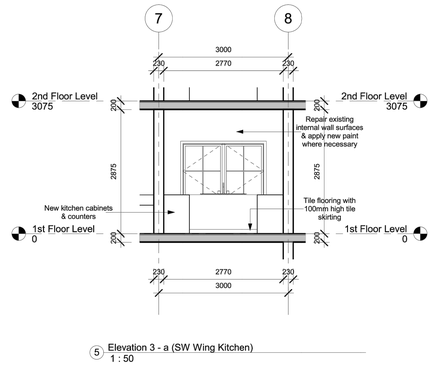
Drawing Number ID

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DPWKZN	= Department
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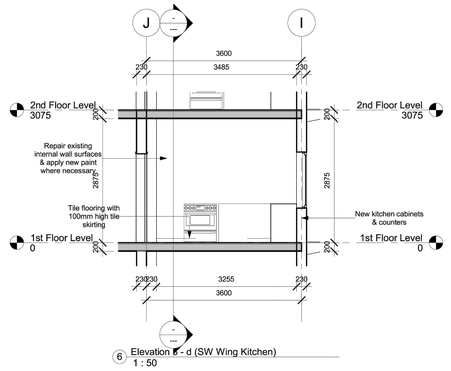
ANNEXURE D - DRAWINGS



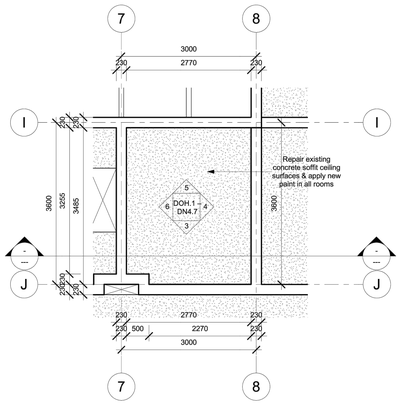
1 1st Floor Level - Callout 1
1 : 50



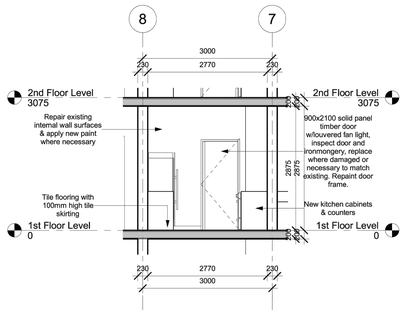
5 Elevation 3 - a (SW Wing Kitchen)
1 : 50



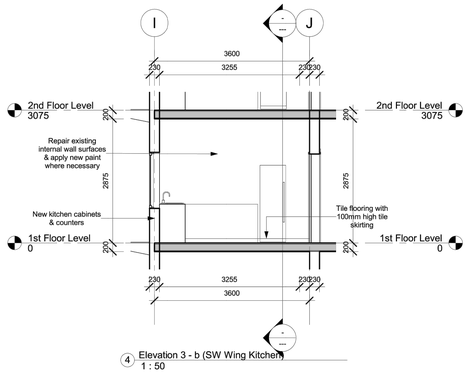
6 Elevation 3 - d (SW Wing Kitchen)
1 : 50



2 1st Floor Level - Callout 1
1 : 48



3 Elevation 3 - c (SW Wing Kitchen)
1 : 50



4 Elevation 3 - b (SW Wing Kitchen)
1 : 50

No.	Date	Amendment	Issued to

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WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

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DISTRICT MANAGER	
DOH PROJECT LEADER	
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Name	
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ARCHITECTURE
public works
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PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - BLOCK B TYPICAL KITCHEN

Project Stage: 071262 - STAGE 5: CONSTRUCTION

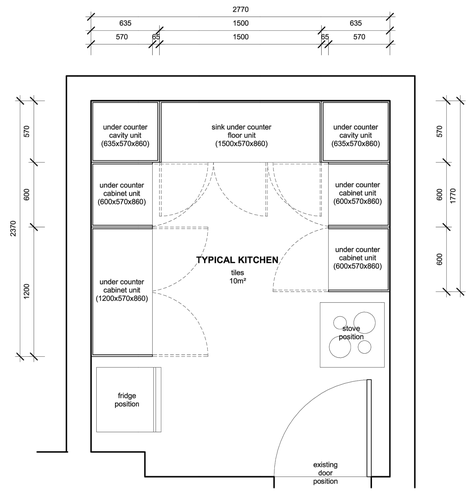
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drawing number: 071262 DOH - NS - A- 5007 - 0

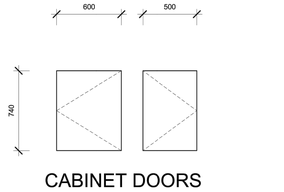
Drawing Number ID

071262 = WIMS no
DOH = Department
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0000 = Drawing No
0 = Revision No

ANNEXURE D - DRAWINGS



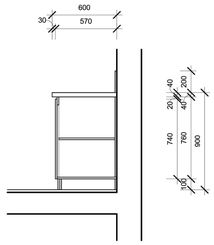
CABINET UNIT PLAN



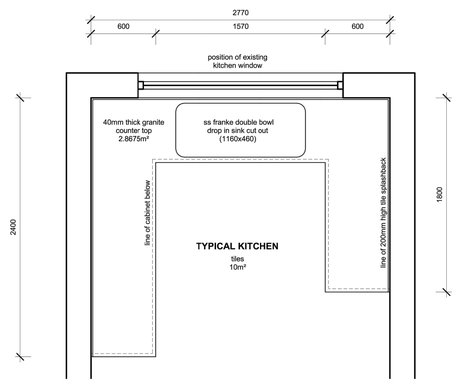
CABINET DOORS

Assembly:

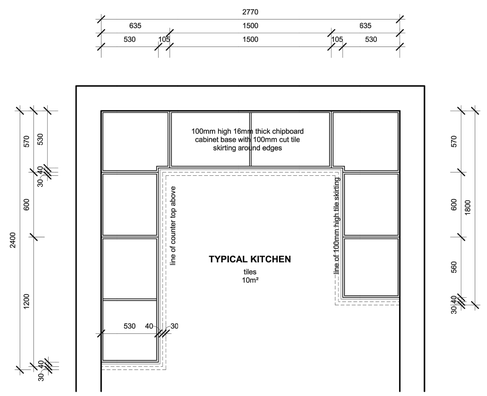
Counter:	20mm thick shimmer proquartz counter tops or similar approved
Cabinets/ Shelves:	16mm thick melamine boards w/ 1mm abs edging
Doors:	16mm melamine w/ 2mm abs edging
Base:	16mm thick particle board w/ 100mm high skirting tiles around exposed edges of bases
Splashback:	200mm high counter top splashback tiling w/ waterproofing to specialist
Handles:	128mm hollow s/steel barrel handle



CABINET SECTION



COUNTER TOP PLAN



CABINET BASE PLAN

TYPICAL KITCHEN JOINERY DETAILS
1 : 20

No.	Date	Amendment	Issued to

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WIMS number: 071262

page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

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ARCHITECTURE
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PROVINCE OF KWAZULU-NATAL

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Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - TYPICAL KITCHEN JOINERY

Project Stage

071262 - STAGE 5: CONSTRUCTION

Drawn	R. Monaheng		Date
scale	1 : 20		2022/05/25 09:00:39

drawing number: 071262 DOH - NS - A- 5008 - 0

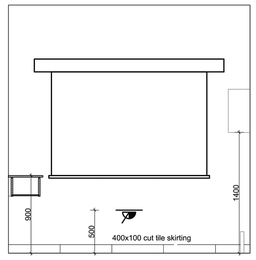
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0000 = Drawing No
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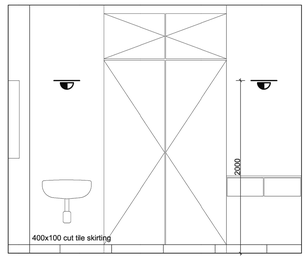
ANNEXURE D - DRAWINGS



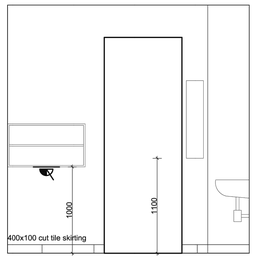
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SCALE 1:25



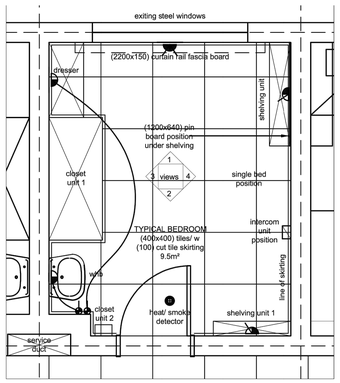
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ELEVATION 3
SCALE 1:25

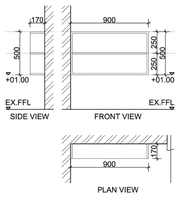


ELEVATION 2
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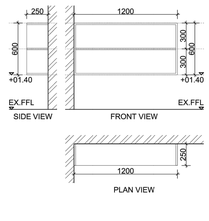


TYPICAL BEDROOM PLAN
SCALE 1:25

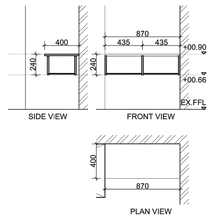
All boards to be 16mm melamine with edging



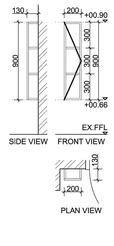
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SCALE 1:25



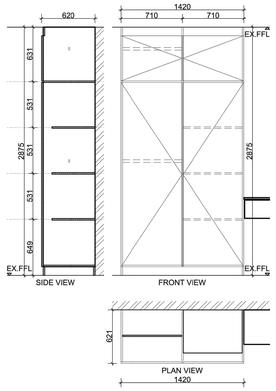
SHELVING UNIT 2
SCALE 1:25



DRESSER
SCALE 1:25



CLOSET UNIT 2
SCALE 1:25



CLOSET UNIT 1
SCALE 1:25

GENERAL NOTES:

- ALL MEASUREMENTS AND HEIGHTS HAVE TO BE CONTROLLED & ADAPTED TO EX BUILDINGS, PRIOR TO COMMENCEMENT OF ANY WORK.
- ANY DISCREPANCIES OR CONTRADICTION HAS TO BE DISCUSSED WITH THE ARCHITECT IMMEDIATELY.
- NO DRAWINGS ARE TO BE SCALED
- ALL BRICKWORK IS TO BE SET OUT USING A PROFILE MARKED AT 85 mm c/c & 128 mm c/c FOR MAXI BRICKS
- THE CONTRACTOR MUST HAVE A FULL SET OF DWG'S ON SITE DURING CONSTRUCTION.
- ALL DIMENSIONS AS INDICATED ON PLAN ARE TO BE SET OUT ON A LEVEL HORIZONTAL PLANE.
- THE CONTRACTOR IS RESPONSIBLE FOR CORRECT SETTING OUT OF BUILDINGS ON THE SITE, WITH PARTICULAR PREFFERENCE TO SITE BOUNDARIES AND BUILDING LINES.
- THE CONTRACTOR IS TO BUILD IN S.A.B.S. APPROVED D.P.C's WHETHER OR NOT THESE ARE SHOWN ON DRAWINGS.
- ALL EXTERNAL WALLS AT EACH FLOOR, BEAM OR PARAPET LEVEL AND TO ALL WINDOWS, DOORS, GRILLES OR OTHER OPENINGS IN EXTERNAL WALLS, CAVITY WALLS TO HAVE STEPPED D.P.C's.
- QUALITY OF ALL MATERIALS AND WORKMANSHIP TO COMPLY WITH THE RELEVENT S.A.B.S. & NBR SPECIFICATIONS.

SANS 10400 NOTES:

- ALL WORK TO COMPLY WITH SANS 10400 STANDARDS AND SPECIFICATIONS
- STRUCTURAL DESIGN TO ARCH'S AND ENG'S SPECIFICATION AND COMPLIES WITH PARTS H, J, K, L, M OR N OF SANS 10400
- ALL DIMENSIONS OF ROOMS AND SPACES TO COMPLY WITH SANS 10400-C
- ALL SANITARY FACILITIES COMPLY WITH SANS 10400-F
- ALL BUILDING RELATED EXCAVATIONS COMPLY TO SANS 10400-G
- ALL FOUNDATIONS TO ENG'S SPECIFICATION AND WORK TO COMPLY WITH SANS 10400-H
- ALL RC FLOOR SLABS TO ENG'S SPECIFICATION AND COMPLY WITH SANS 10400-J
- ALL STRUCTURAL STRENGTH AND STABILITY OF WALLS TO ENG'S DETAIL AND COMPLY WITH PARTS B, K AND T OF SANS 10400
- ALL ROOFS TO COMPLY WITH PARTS L AND T OF SANS 10400
- ALL ROOF GUTTERS AND DOWN PIPES TO COMPLY WITH SANS 10400-R
- ALL STAIRWAYS TO COMPLY WITH PART B, M AND T OF SANS 10400
- ALL GLAZING TO COMPLY WITH PART N OF SANS 10400-N
- SAFETY GLASS TO BE USED WITHIN 300mm OF FFL TO COMPLY WITH SANS 10400-N REGULATIONS
- LIGHT AND VENTILATION TO COMPLY WITH PARTS O AND T OF SANS 10400
- ALL DRAINAGE SUBJECT TO AN AGREEMENT CERTIFICATE AND TO COMPLY WITH SANS 10400-P
- ALL DISPOSAL OF STORM WATER TO COMPLY WITH SANS 10400-R
- FACILITIES FOR DISABILITIES ARE PROVIDED AND ARE IN ACCORDANCE TO SANS 10400-S
- FIRE PROTECTION MEASURES COMPLY WITH SANS 10400-T
- PROVISION OF SPACE HEATING COMPLY WITH SANS 10400-V
- ALL FIRE INSTALLATIONS COMPLY WITH SANS 10400-W

ELECTRICAL LEGEND:

- 5 WATT 620X150 WALL MOUNTED FLORESCENT LIGHT
- 5 WATT 620X150 WALL MOUNTED FLORESCENT LIGHT W/ DRAW CORD SWITCH
- SINGLE 15A PLUG POINT
- AUTOMATED INTERCOM UNIT
- SINGLE LIGHT SWITCH

ROOM FINISHES:

- WALLS: PLASTER + PAINTED
- FLOOR: 600X600 CERAMIC TILES
- CABINETRY: 18MM THICK MELAMINE PARTICLE BOARD.
- SKIRTINGS: 100MM HIGH CERAMIC TILE
- CEILING: PLASTERED + PAINTED SOFFIT
- ALL FINISHES IN TO CORRESPOND WITH QS DETAILED SPECIFICATIONS.

No.	Date	Amendment	Issued to

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2. All measurements and heights have to be controlled & adapted to ex buildings, prior to commencement of any work.
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5. The contractor must have a full set of dwg's on site during construction.All dimensions as indicated on plan are to be set out on a level horizontal plane.
6. The contractor is to build in s.a.b.s. approved d.p.c's whether or not these are shown on drawings, to all external walls at each floor, beam or parapet level and to all windows, doors, grilles or other openings in external

SANS 10400 NOTES:

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2. All dimensions of rooms and spaces to comply with sans 10400-c
3. All sanitary facilities comply with sans 10400-F
4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name | Signature | Date

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health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - TYPICAL ROOM JOINERY

Project Stage

071262 - STAGE 5: CONSTRUCTION

Drawn	R. Monaheng		Date
scale	1 : 25		2022/05/25 09:00:39

drawing number

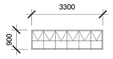
071262 DOH - NS - A- 5009 - 0

Drawing Number ID

071262 = WIMS no
DOH = Department
P = Consultant Discipline
0000 = Drawing No
C = Revision No

ANNEXURE D - DRAWINGS

WINDOW SCHEDULE

SIZE	FRAME	GLAZING	OPENING	POSITION	NUMBER	AREA	QUANTITY	TOTAL
	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED.	4MM CLEAR MONOLITHIC ANNEALED GLASS 5.73 (U- VALUE) 0.66 (SHGC)	TOP HUNG/ SIDE HUNG SASH OUTWARD OPENING// FIXED	MATRONS PASSAGE		1.4 m²		
	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED. TO BE RREPLACED WITH SIMILAR IN ALUMINUM FRAME WHERE NECESSARY	4MM CLEAR MONOLITHIC ANNEALED GLASS 5.73 (U- VALUE) 0.66 (SHGC)	TOP HUNG	ABLUTIONS		0.5 m²		
	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED. TO BE RREPLACED WITH SIMILAR IN ALUMINUM FRAME WHERE NECESSARY	4MM CLEAR MONOLITHIC ANNEALED GLASS 5.73 (U- VALUE) 0.66 (SHGC)	TOP HUNG	ABLUTIONS		3.0 m²		
	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED. TO BE RREPLACED WITH SIMILAR IN ALUMINUM FRAME WHERE NECESSARY	4MM CLEAR MONOLITHIC ANNEALED GLASS 5.73 (U- VALUE) 0.66 (SHGC)	TOP HUNG	ABLUTIONS		0.5 m²		
	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED. TO BE RREPLACED WITH SIMILAR IN ALUMINUM FRAME WHERE NECESSARY	4MM CLEAR MONOLITHIC ANNEALED GLASS 5.73 (U- VALUE) 0.66 (SHGC)	TOP HUNG	ABLUTIONS		3.9 m²		
	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED.	4MM CLEAR MONOLITHIC ANNEALED GLASS 5.73 (U- VALUE) 0.66 (SHGC)	FIXED	LOUNGE		2.3 m²		
	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED.	4MM CLEAR MONOLITHIC ANNEALED GLASS & REFLECTIVE FIXED PANEL 5.73 (U- VALUE) 0.66 (SHGC)	FIXED	SAFETY OFFICE		1 m²		
	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED.	4MM CLEAR MONOLITHIC ANNEALED GLASS 5.73 (U- VALUE) 0.66 (SHGC)	TOP HUNG/ SIDE HUNG SASH OUTWARD OPENING// FIXED	ROOM		2.5 m²		
	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED.	4MM CLEAR MONOLITHIC ANNEALED GLASS 5.73 (U- VALUE) 0.66 (SHGC)	TOP HUNG/ FIXED	PASSAGE & STAIRCASE		1.5 m²		

ALL WINDOW FRAME, MULLION, GLAZING PANEL AND IRONMONGERY SIZES TO BE MEASURED & VERIFIED ON SITE

Window Schedule
1 : 100

No.	Date	Amendment	Issued to

GENERAL NOTES

1. All drawings to read to be read in conjunction with Room Schedule.
2. All measurements and heights have to be controlled & adapted to ex buildings, prior to commencement of any work.
3. Any discrepancies or contradiction has to be discussed with the architect immediately.
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5. The contractor must have a full set of dwg's on site during construction.All dimensions as indicated on plan are to be set out on a level horizontal plane.
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SANS 10400 NOTES:

1. All work to comply with sans 10400 standards and specificationsStructural design to arch's and eng's specification and complies with parts h, j, k, l, m or n of sans 10400
2. All dimensions of rooms and spaces to comply with sans 10400-c
3. All sanitary facilities comply with sans 10400-F
4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature | Date

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PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - WINDOW SCHEDULE

Project Stage
071262 - STAGE 5: CONSTRUCTION

Drawn: R. Monaheng
Date: 2022/05/25 09:00:39
scale: 1 : 100
drawing number: 071262 DOH - NS - A- 5010 - 0

Drawing Number ID

071262 = WIMS no
DOH = Department
A = Consultant Discipline
0000 = Drawing No
C = Revision No

ANNEXURE D - DRAWINGS

DOOR SCHEDULE

SIZE	FRAME	PANEL	OPENING	POSITION	NUMBER	QUANTITY
750 - 1000 AS REQ. 	ALUMINUM FRAME, S.A.B.S. APPROVED.	6mm CLEAR TOUGHENED SAFETY GLASS SLIDING PANELS, S.A.B.S. APPROVED.	SLIDING	BATHROOM SHOWER CUBICLES		
750 	TIMBER FRAME, S.A.B.S. APPROVED.	40mm HOLLOW CORE TIMBER DOOR PANEL (SOLID CORE FIRE RATED IN STAIRCASE AREA), S.A.B.S. APPROVED.	INWARD OPENING	BATHROOM TOILET CUBICLES		
1600 	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED.	40mm SOLID CORE TIMBER DOOR PANEL, S.A.B.S. APPROVED.	OUTWARD OPENING	SERVICE DUCTS & TRANSFORMER ROOMS		
800 	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED.	40mm HOLLOW CORE TIMBER DOOR PANEL (SOLID CORE FIRE RATED IN STAIRCASE AREA), S.A.B.S. APPROVED.	OUTWARD OPENING	BATHROOM & MATRONS QUARTERS (FIRE ESCAPE BELCONY DOOR/ SOLID CORE)		
900 	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED.	40mm SOLID CORE TIMBER DOOR PANEL W/ 6mm TOUGHENED SG VIEWING PANEL, S.A.B.S. APPROVED.	OUTWARD OPENING	ELECTRICAL DUCTS & FIRE ESCAPE BELCONY DOOR		
900 	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED.	40mm HOLLOW CORE TIMBER DOOR PANEL W/ 4mm CLEAR ANEALED GLASS LOUVRE FANLIGHT, S.A.B.S. APPROVED.	INWARD OPENING/ ADJUSTABLE LOUVRE	ROOMS, LAUNDRY & KITCHENS		
1600 	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED.	40mm SOLID CORE TIMBER DOOR PANEL	OUTWARD OPENING	PASSAGES, FIRE ESCAPES,LOUNGE & ENTRANCE LOBBY		
1100 	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED.	6mm TOUGHENED SG PANEL & SOLID STEEL PANEL, S.A.B.S. APPROVED.	OUTWARD OPENING	LOUNGE DOUBLE DOOR		
1400 	MILD STEEL PAINTED FRAME, S.A.B.S. APPROVED.	4mm OPAQUE TOUGHENED LOW E SAFETY GLASS (S.G.) 5.73 (U- VALUE) 0.66 (SHGC)	ADJUSTABLE LOUVRE/ OUTWARD OPENING	MATRON PASSAGE DOOR W/ SIDE LIGHT		

ALL WINDOW FRAME, MULLION, GLAZING PANEL AND IRONMONGERY SIZES TO BE MEASURED & VERIFIED ON SITE

Door Schedule
1 : 100

No.	Date	Amendment	Issued to

GENERAL NOTES

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3. Any discrepancies or contradiction has to be discussed with the architect immediately.
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5. The contractor must have a full set of dwg's on site during construction.All dimensions as indicated on plan are to be set out on a level horizontal plane.
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SANS 10400 NOTES:

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2. All dimensions of rooms and spaces to comply with sans 10400-c
3. All sanitary facilities comply with sans 10400-F
4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name			
Signature		Date	

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health
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Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

NURSES & DOCTORS ACCOMMODATION - DOOR SCHEDULE

Project Stage
071262 - STAGE 5: CONSTRUCTION

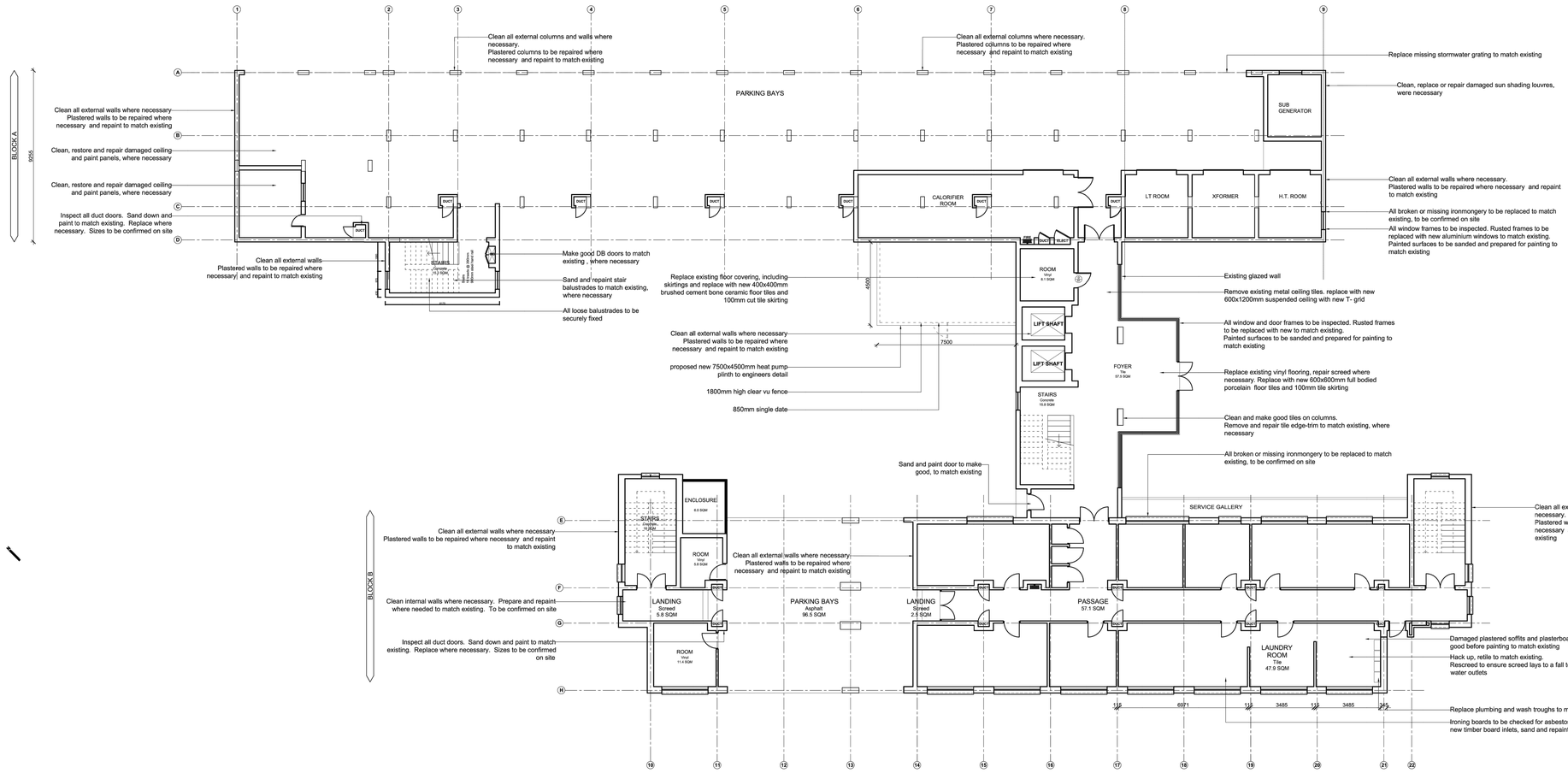
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drawing number
071262 DOH - NS - A- 5011 - 0

Drawing Number ID

071262 = WIMS no
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ANNEXURE D - DRAWINGS



GROUND FLOOR PLAN
SCALE 1:100

No.	Date	Amendment	Issued to

GENERAL NOTES

All curtain rails to be inspeced and repaired where necessary. All pulmets to be repaired and make good.
-Window sills: sand and repaint to match existing where necessary
-Bathroom mirrors with built in cupboards: Replace mirror to match existing, sand and replace doors and repaint to match existing.
-All bedroom BIC: Replace with new doors and replace with new ironmongery. Repaint and make good internal shelves to match existing. Add new 510x1600 mirrors to internal leaf of door. BIC rails to have supports.
-Service all kitchen doors
-Replace all existing bathroom toilet paper holders with new
-All walls enclosed by shower should be tiled
-All windows to be stripped, repainted and made good
-Replace all 2030x530 timber duct doors and ironmongery to match existing. Size to be confirmed on site.
-New kitchen cabinets, see details

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consultant
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ARCHITECTURE
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health
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Project
GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title
DOCTORS' ACCOMMODATION - GROUND STOREY PLAN

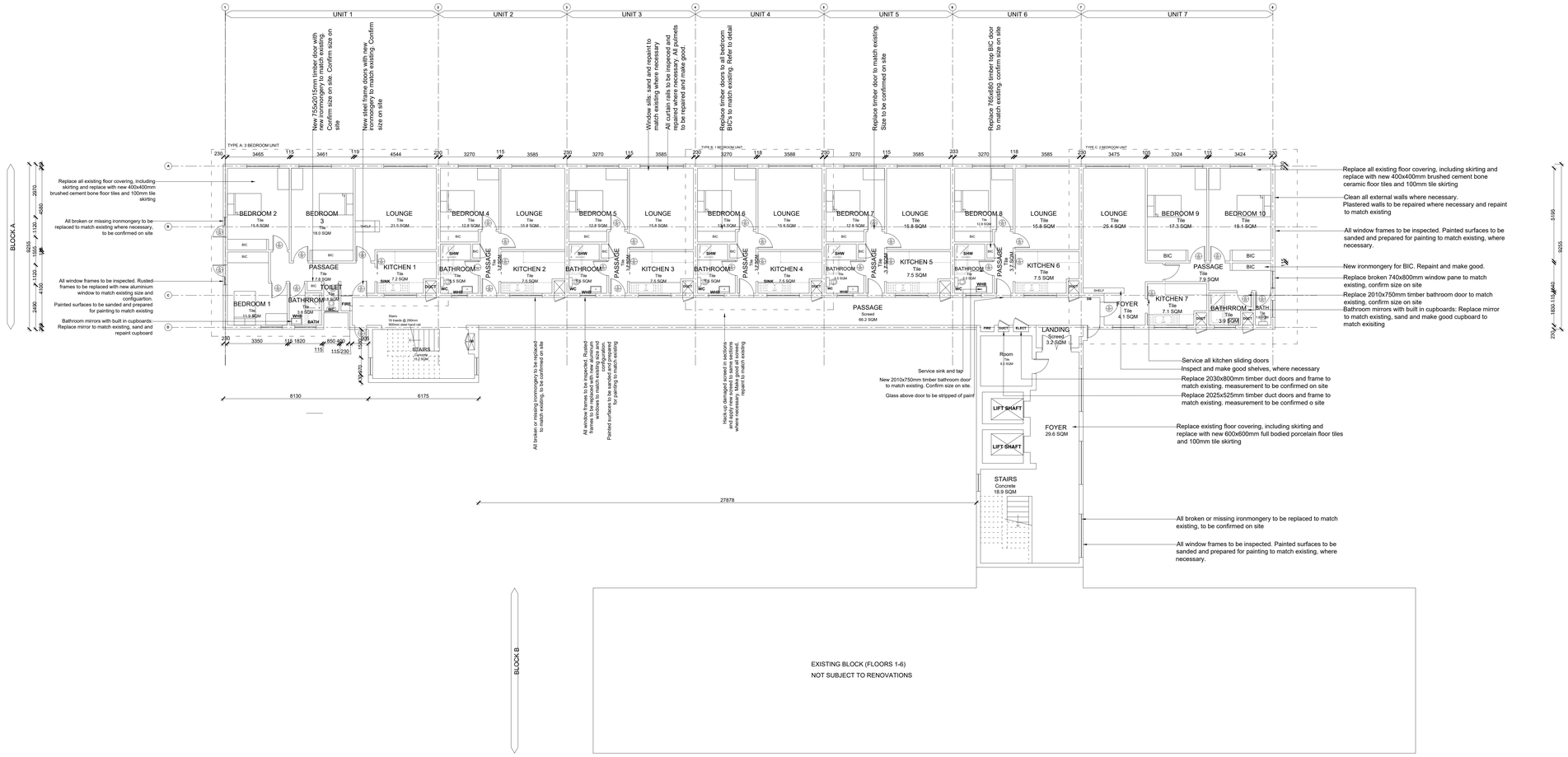
Project Stage
071262 - STAGE 5: CONSTRUCTION

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scale	1 : 100		2022/05/25 09:00:39

drawing number
071262 DOH-DR - A- 2000 - 0

Drawing Number ID
071262 = WIMS no
DOH = Department
A = Consultant Discipline
0000 = Drawing No
0 = Revision No

ANNEXURE D - DRAWINGS



FIRST FLOOR PLAN
SCALE 1:100

AREA SCHEDULE: TYPICAL FLOOR (1-6 FLOORS)

	PER FLOOR		TO
ROOM	Quantity	AREA (sqm)	Quantity
Unit type A	1	92.4	6
Unit type B	5	244.5	30
Unit type C	1	90.4	6
Passage	1	66.2	6
Stairs 1	1	15.2	6
Foyer and landing	1	32.8	6
Stairs 2	1	18.9	6
Building footprint			

No.	Date	Amendment	Issued to

GENERAL NOTES

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3. Any discrepancies or contradiction has to be discussed with the architect immediately.
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5. The contractor must have a full set of dwg's on site during construction.All dimensions as indicated on plan are to be set out on a level horizontal plane.
6. The contractor is to build in s.a.b.s. approved d.p.c's whether or not these are shown on drawings, to all external walls at each floor, beam or parapet level and to all windows, doors, grilles or other openings in external

SANS 10400 NOTES:

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2. All dimensions of rooms and spaces to comply with sans 10400-c
3. All sanitary facilities comply with sans 10400-F
4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

GENERAL NOTES

Repaint and make good internal shelves to match existing. Add new 510x1600
All curtain rails to be inspected and repaired where necessary. All pulmets to be repaired and make good.
-Window sills: sand and repaint to match existing where necessary
-Bathroom mirrors with built in cupboards: Replace mirror to match existing, sand and replace doors and repaint to match existing.
-All bedroom BIC: Replace with new doors and replace with new ironmongery.

mirrors to internal leaf of door. BIC rails to have supports.
-Service all kitchen doors
-Replace all existing bathroom toilet paper holders with new
-All walls enclosed by shower should be tiled
-All windows to be stripped, repainted and made good
-Replace all 2030x530 timber duct doors and ironmongery to match existing. Size to be confirmed on site.
-New kitchen cabinets, see details

WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

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PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

DOCTORS' ACCOMMODATION - FIRST STOREY PLAN

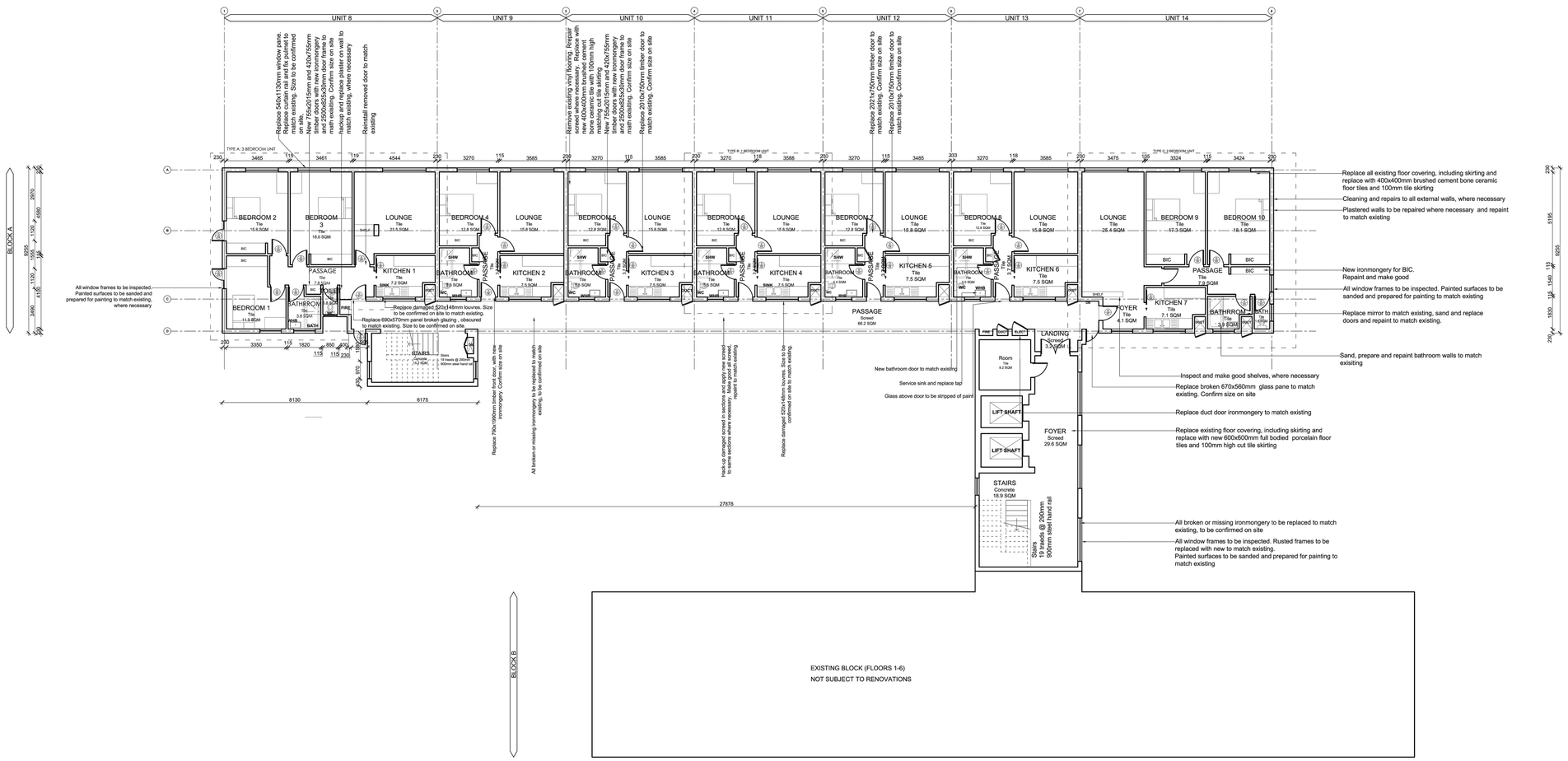
Project Stage: 071262 - STAGE 5: CONSTRUCTION

Drawn	R. Morahenq	Date	
scale	1 : 100		2022/05/25 09:00:39

drawing number: 071262 DOH-DR - A- 2001 - 0

Drawing Number ID
071262 = WIMS no
DOH = Department
A = Consultant Discipline
0000 = Drawing No
0 = Revision No

ANNEXURE D - DRAWINGS



SECOND FLOOR PLAN
SCALE 1:100

No.	Date	Amendment	Issued to

GENERAL NOTES

1. All drawings to read to be read in conjunction with Room Schedule.
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GENERAL NOTES

All curtain rails to be inspeced and repaired where necessary. All pulmets to be repaired and make good.
-Window sills: sand and repaint to match existing where necessary
-Bathroom mirrors with built in cupboards: Replace mirror to match existing, sand and replace doors and repaint to match existing.
-All bedroom BIC: Replace with new doors and replace with new ironmongery. Repaint and make good internal shelves to match existing. Add new 510x1600 mirrors to internal leaf of door. BIC rails to have supports.
-Service all kitchen doors
-Replace all existing bathroom toilet paper holders with new
-All walls enclosed by shower should be tiled
-All windows to be stripped, repainted and made good
-Replace all 2030x530 timber duct doors and ironmongery to match existing. Size to be confirmed on site.
-New kitchen cabinets, see details

SANS 10400 NOTES:

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2. All dimensions of rooms and spaces to comply with sans 10400-c
3. All sanitary facilities comply with sans 10400-F
4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name			
Signature		Date	

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GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

DOCTORS' ACCOMMODATION - SECOND STOREY PLAN

Project Stage: 071262 - STAGE 5: CONSTRUCTION

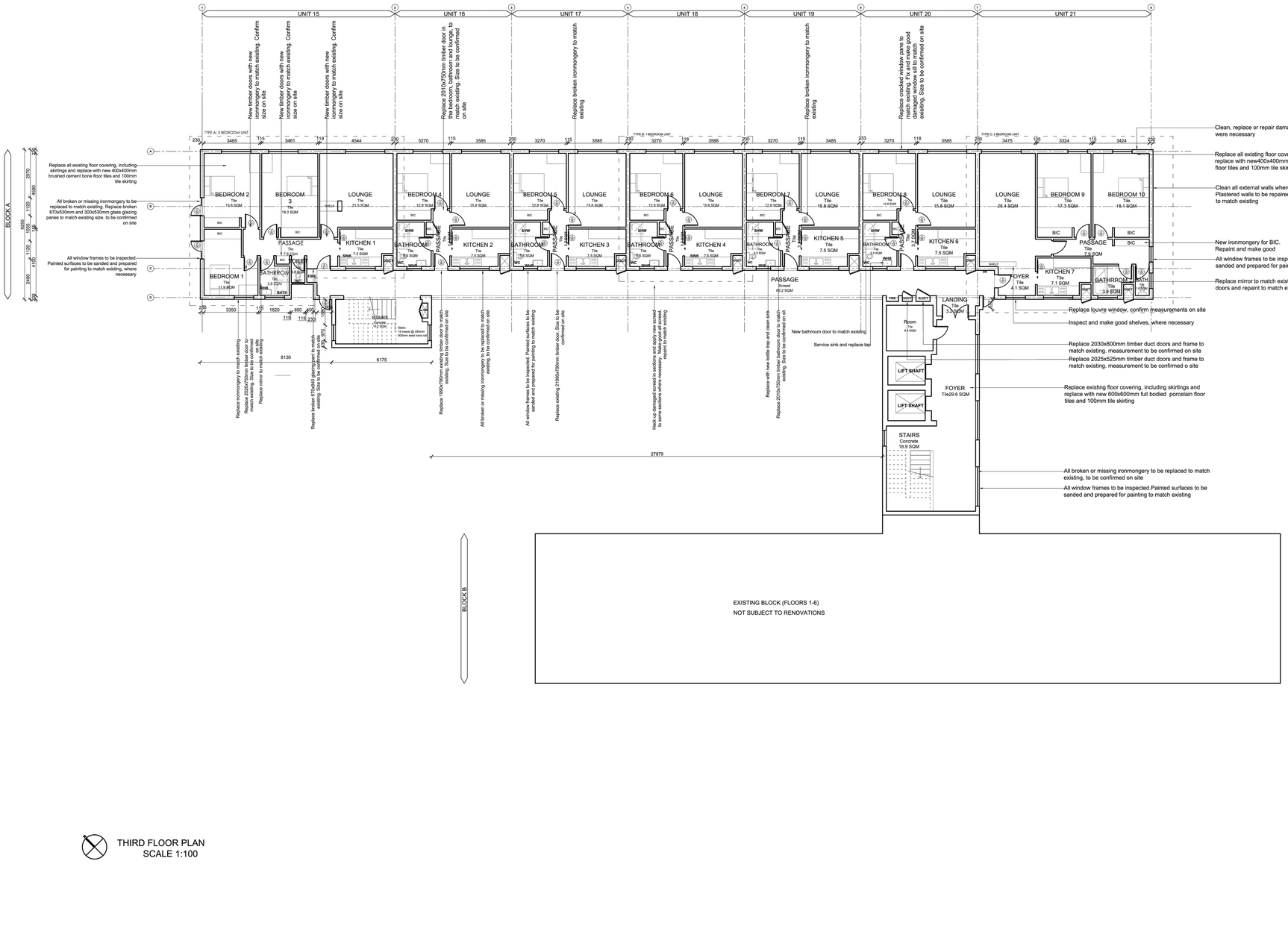
Drawn	R. Monaheng		Date
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drawing number: 071262 DOH-DR - A- 2002 - 0

Drawing Number ID

071262	= WIMS no
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0000	= Drawing No
0	= Revision No

ANNEXURE D - DRAWINGS



THIRD FLOOR PLAN
SCALE 1:100

No.	Date	Amendment	Issued to

GENERAL NOTES

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WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name			
Signature		Date	

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GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

DOCTORS' ACCOMMODATION - THIRD STOREY PLAN

Project Stage: 071262 - STAGE 5: CONSTRUCTION

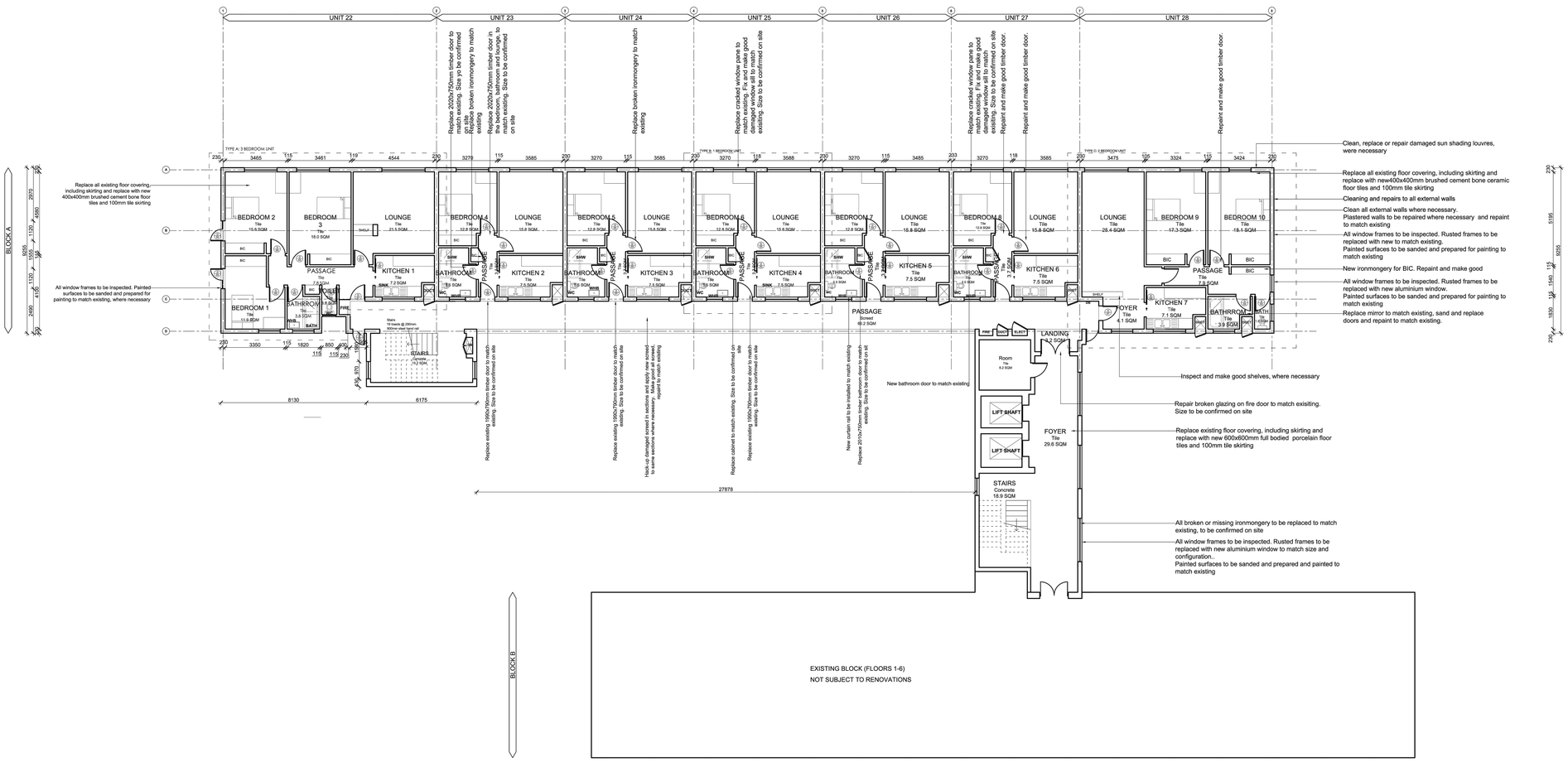
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drawing number: 071262 DOH-DR - A- 2003 - 0

Drawing Number ID

071262 = WIMS no
DOH = Department
A = Consultant Discipline
0000 = Drawing No
C = Revision No

ANNEXURE D - DRAWINGS



FOURTH FLOOR PLAN
SCALE 1:100

GENERAL NOTES

All curtain rails to be inspeced and repaired where necessary. All pulmets to be repaired and make good.
-Window sills: sand and repaint to match existing where necessary
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-All walls enclosed by shower should be tiled
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-Replace all 2030x530 timber duct doors and ironmongery to match existing. Size to be confirmed on site.
-New kitchen cabinets, see details

No.	Date	Amendment	Issued to

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WIMS number 071262 | page type A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

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Department:
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health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

DOCTORS' ACCOMMODATION - FOURTH STOREY PLAN

Project Stage
071262 - STAGE 5: CONSTRUCTION

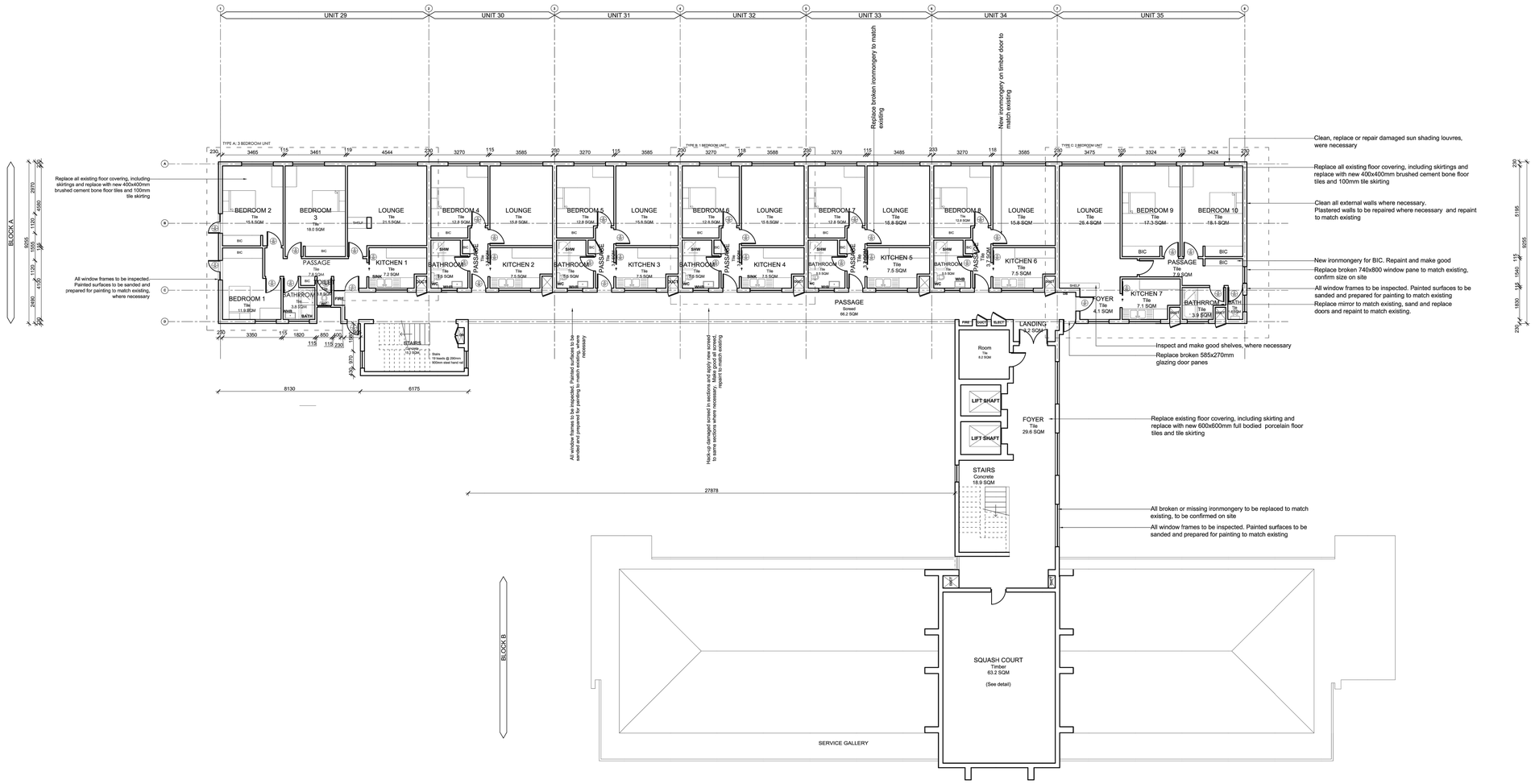
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drawing number
071262 DOH-DR - A- 2004 - 0

Drawing Number ID

071262	= WIMS no
DOH	= Department
A	= Consultant Discipline
0000	= Drawing No
C	= Revision No

ANNEXURE D - DRAWINGS



FIFTH FLOOR PLAN
SCALE 1:100

GENERAL NOTES

All curtain rails to be inspeced and repaired where necessary. All pulmets to be repaired and make good.
-Window sills: sand and repaint to match existing where necessary
-Bathroom mirrors with built in cupboards: Replace mirror to match existing, sand and replace doors and repaint to match existing.
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-Replace all existing bathroom toilet paper holders with new
-All walls enclosed by shower should be tiled
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-Replace all 2030x530 timber duct doors and ironmongery to match existing. Size to be confirmed on site.
-New kitchen cabinets, see details

No.	Date	Amendment	Issued to

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WIMS number 071262 | page type A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

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health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

DOCTORS' ACCOMMODATION - FIFTH STOREY PLAN

Project Stage
071262 - STAGE 5: CONSTRUCTION

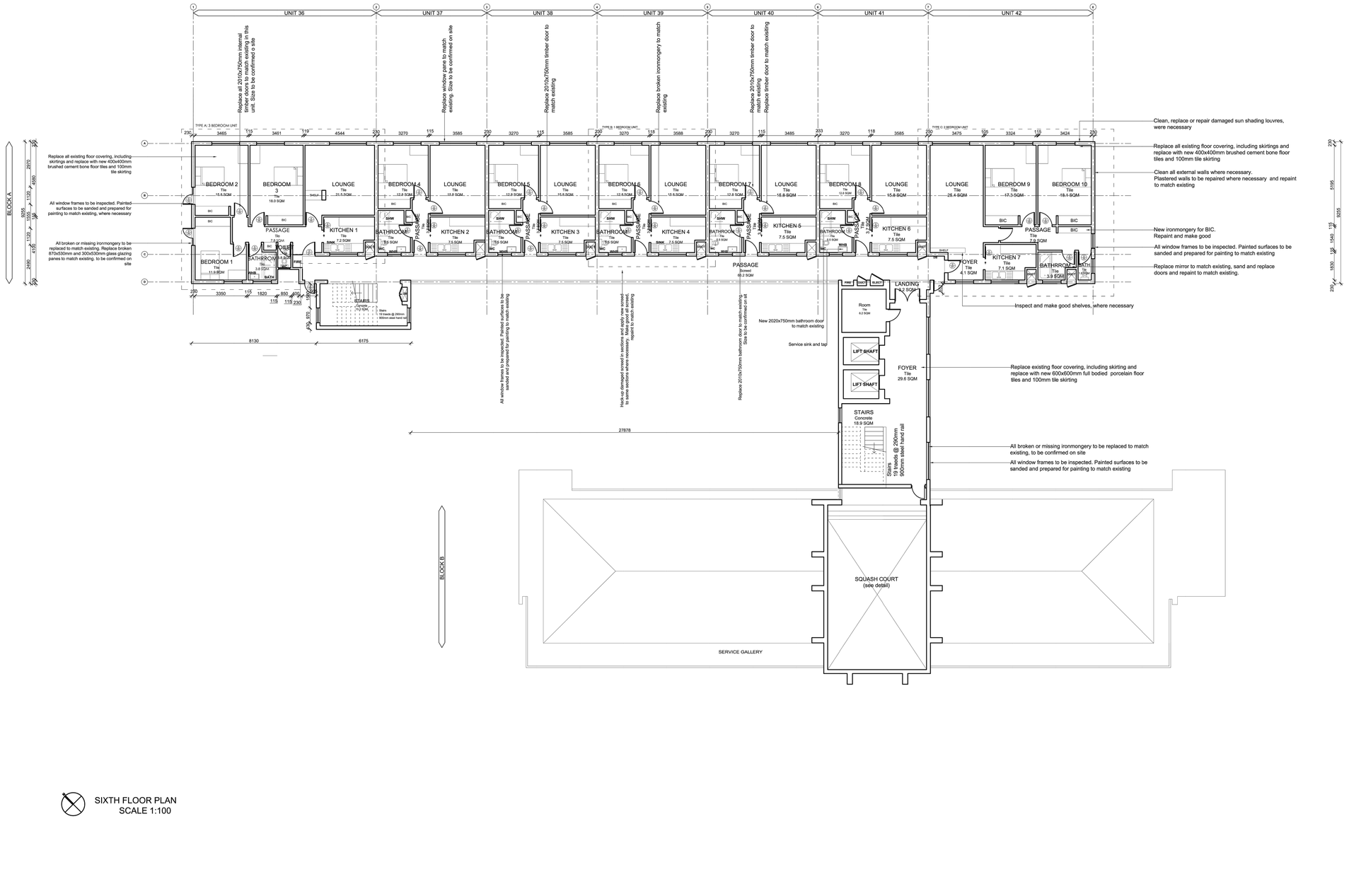
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drawing number
071262 DOH-DR - A- 2005 - 0

Drawing Number ID

071262	= WIMS no
DOH	= Department
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0000	= Drawing No
C	= Revision No

ANNEXURE D - DRAWINGS



SIXTH FLOOR PLAN
SCALE 1:100

No.	Date	Amendment	Issued to

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GENERAL NOTES

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10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature | Date

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email. george@ukuza.co.za
UKUZA CONSULTING (PTY) LTD

ARCHITECTURE
public works
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Public Works
PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

DOCTORS' ACCOMMODATION - SIXTH STOREY PLAN

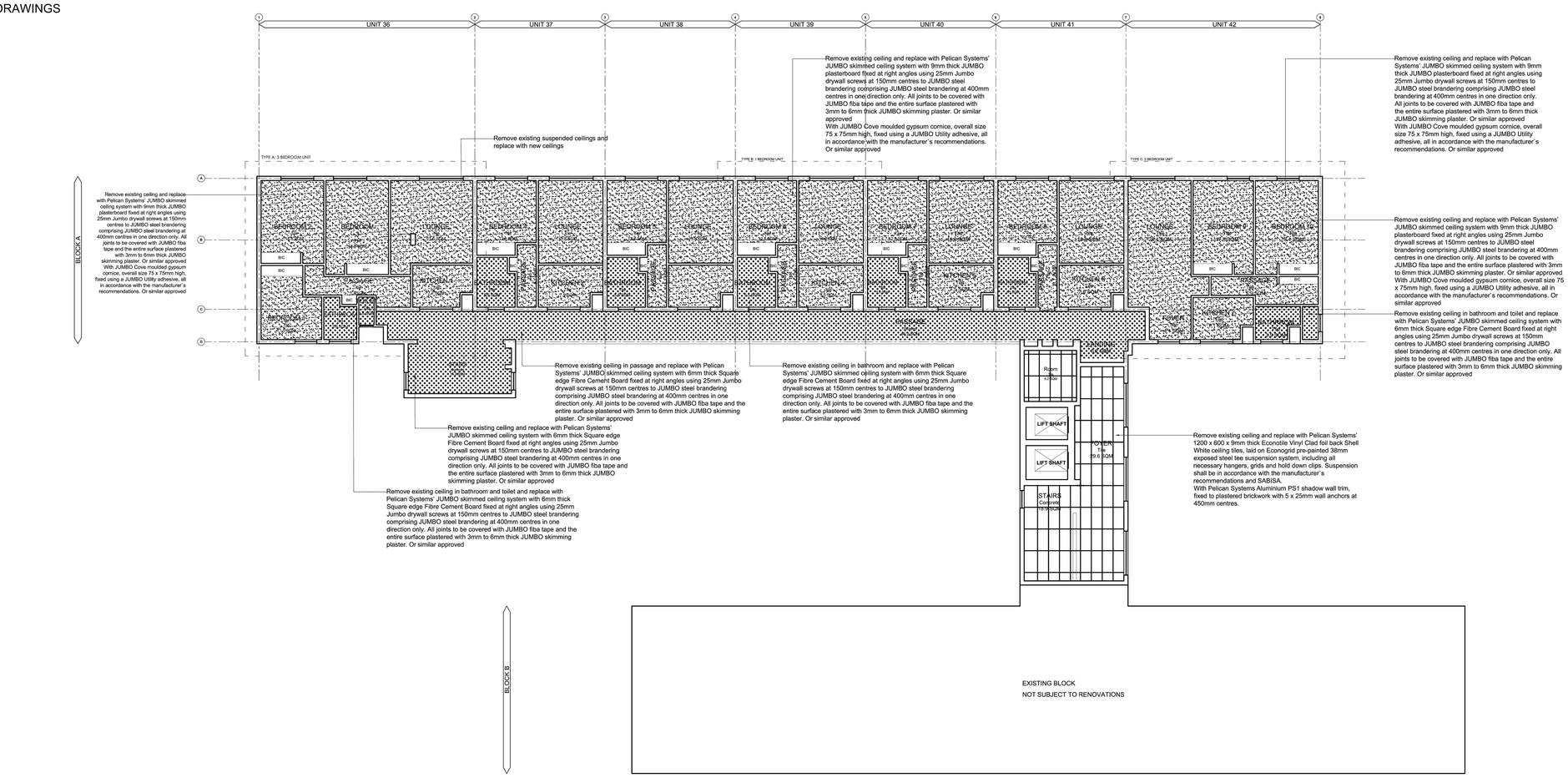
Project Stage
071262 - STAGE 5: CONSTRUCTION

Drawn	R. Monaheng	Date
scale	1 : 100	2022/05/25 09:00:39

drawing number
071262 DOH-DR - A- 2006 - 0

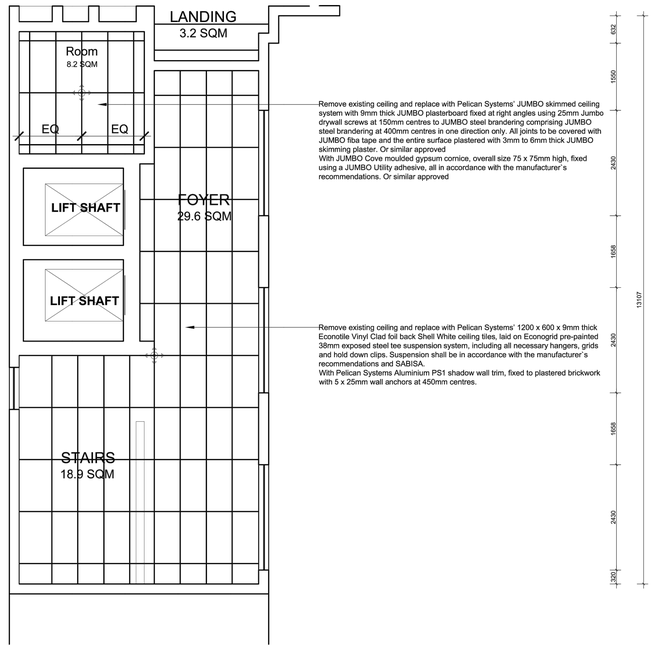
Drawing Number ID
071262 = WIMS no
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A = Consultant Discipline
0006 = Drawing No
C = Revision No

ANNEXURE D - DRAWINGS

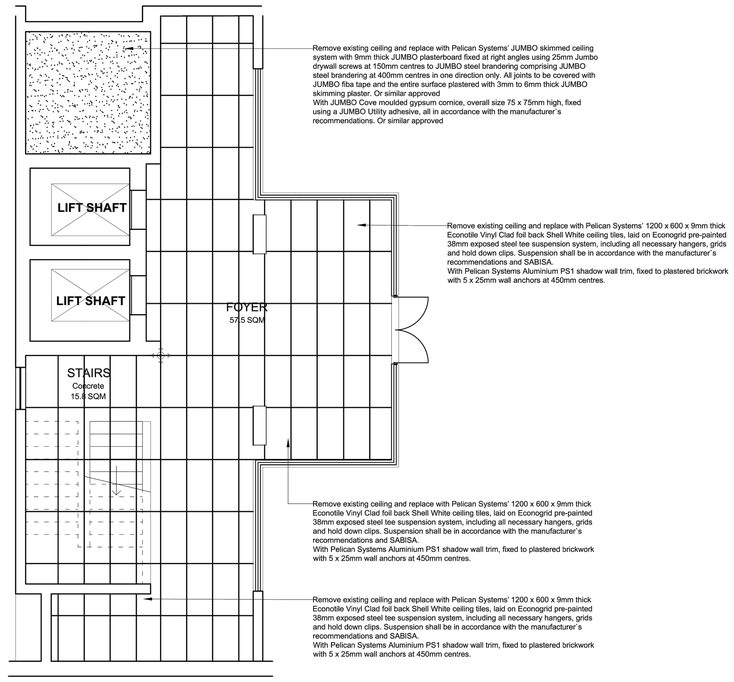


CEILING PLAN LEGEND	
IMAGE	SPECIFICATION
	1200X600mm 6mm thick, Pelican Systems or similar approved Econdek vinyl clad shell white ceiling tiles. Pre-painted gridlock tee suspension system including all nessesary hangers, grids locking type end clips

SIXTH FLOOR CEILING PLAN
SCALE 1:100



TYPICAL LOBBY CEILING PLAN
SCALE 1:50



GROUND FLOOR LOBBY CEILING PLAN
SCALE 1:50

No.	Date	Amendment	Issued to

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5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

consultant
15 The Boulevard
Westway Office Park,
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UKUZA CONSULTING (PTY) LTD

ARCHITECTURE
public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project
GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title
DOCTORS' ACCOMMODATION - SIX STOREY - CEILING LAYOUT

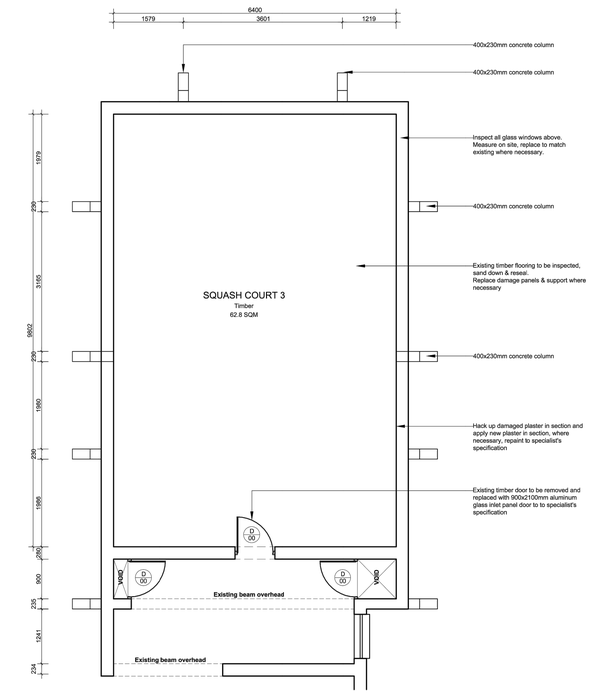
Project Stage
071262 - STAGE 5: CONSTRUCTION

Drawn	R. Morraheng	Date
scale	1 : 100	2022/05/25 09:00:39

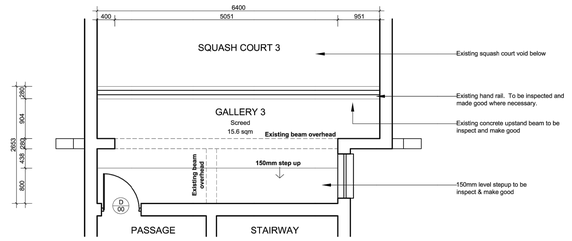
drawing number
071262 DOH-DR - A- 2007 - 0

Drawing Number ID
071262 = WIMS no
DOH = Department
A = Consultant Discipline
0000 = Drawing No
0 = Revision No

ANNEXURE D - DRAWINGS



SQUASH COURT 1 PLAN
SCALE 1:50



SQUASH COURT 1 GALLERY PLAN
SCALE 1:50

SQUASH COURT 1 SECTION
SCALE 1:50

No.	Date	Amendment	Issued to

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PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

DOCTORS' ACCOMMODATION - SQUASH COURT -STOREY PLAN & ELEVATION

Project Stage: 071262 - STAGE 5: CONSTRUCTION

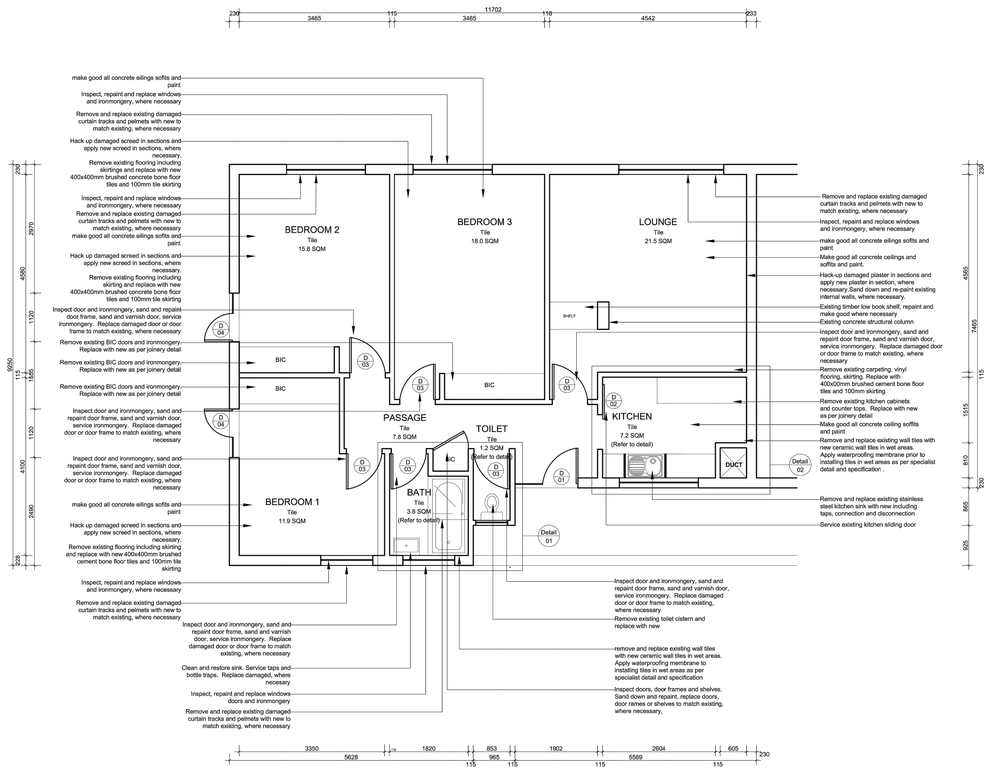
Drawn	R. Monaheng	Date	
scale	1 : 100		2022/05/25 09:00:39

drawing number: 071262 DOH-DR - A- 2008 - 0

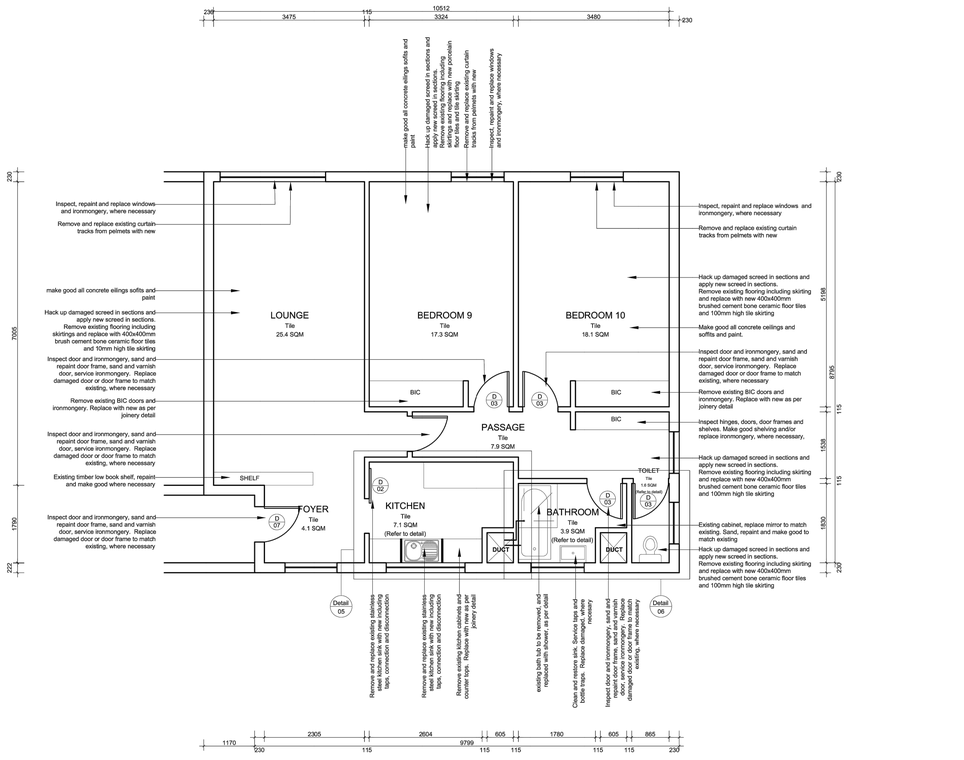
Drawing Number ID

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DOH = Department
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0008 = Drawing No
C = Revision No

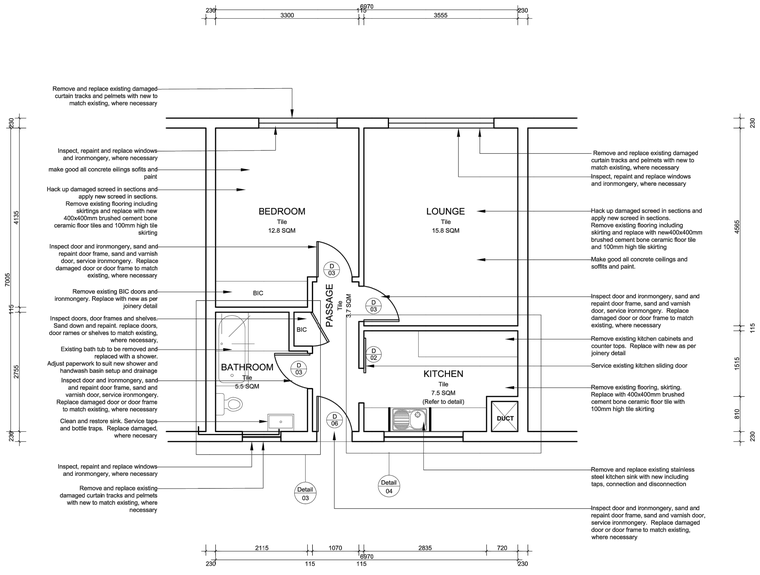
ANNEXURE D - DRAWINGS



TYPE A: 3 BEDROOM FLOOR PLAN
SCALE 1:50



TYPE C: 2 BEDROOM FLOOR PLAN
SCALE 1:50



TYPE B: 1 BEDROOM FLOOR PLAN
SCALE 1:50

AREA SCHEDULE: 3 BEDROOM UNIT

ROOM	AREA (sqm)
Bedroom 1	18.0
Bedroom 2	15.8
Bedroom 3	11.9
Lounge	21.5
Kitchen	7.2
Bathroom	3.8
Toilet	1.2
Other	7.8
Total	87.2 (92.4 incl walls)

AREA SCHEDULE: 1 BEDROOM UNIT

ROOM	AREA (sqm)
Bedroom	12.8
Lounge	15.8
Kitchen	7.5
Bathroom	5.5
Other	3.7
Total	56.00 (48.9 incl walls)

AREA SCHEDULE: 2BEDROOM UNIT

ROOM	AREA (sqm)
Bedroom 1	17.3
Bedroom 2	18.1
Lounge	25.4
Kitchen	7.1
Bathroom	3.9
Toilet	1.6
Other	12.0
Total	85.4 (90.4 incl walls)

GENERAL NOTES

All curtain rails to be inspected and repaired where necessary. All pulmets to be repaired and make good.
-Window sills: sand and repaint to match existing where necessary
-Bathroom mirrors with built in cupboards: Replace mirror to match existing, sand and replace doors and repaint to match existing.
-All bedroom BIC: Replace with new doors and replace with new ironmongery. Repaint and make good internal shelves to match existing. Add new 510x1600 mirrors to internal leaf of door. BIC rails to have supports.
-Service all kitchen doors
-Replace all existing bathroom toilet paper holders with new
-All walls enclosed by shower should be tiled
-All windows to be stripped, repainted and made good
-Replace all 2030x530 timber duct doors and ironmongery to match existing. Size to be confirmed on site.
-New kitchen cabinets, see details

No.	Date	Amendment	Issued to

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WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY			
DISTRICT MANAGER			
DOH PROJECT LEADER			

Checked by (Professional Consultant)

Name			
Signature		Date	

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ARCHITECTURE
public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

DOCTORS' ACCOMMODATION - TYPICAL BEDROOM LAYOUT

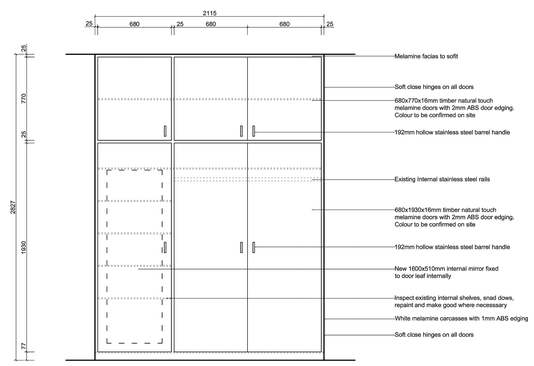
Project Stage: 071262 - STAGE 5: CONSTRUCTION

Drawn	R. Morsheng		Date
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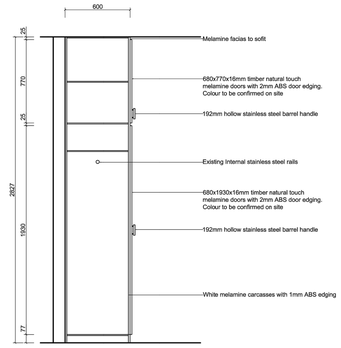
drawing number: 071262 DOH-DR - A- 2008 - 0

Drawing Number ID
071262 = WIMS no
DOH = Department
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0008 = Drawing No
C = Revision No

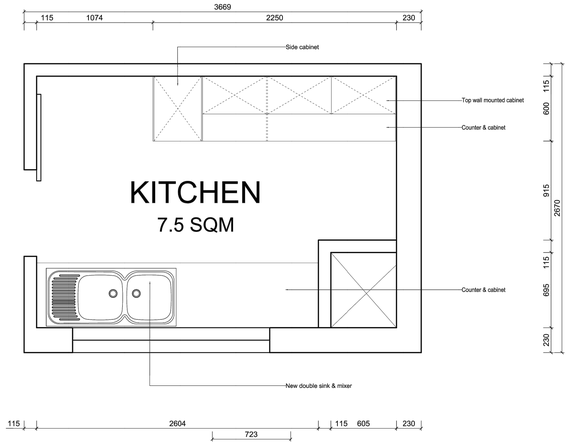
ANNEXURE D - DRAWINGS



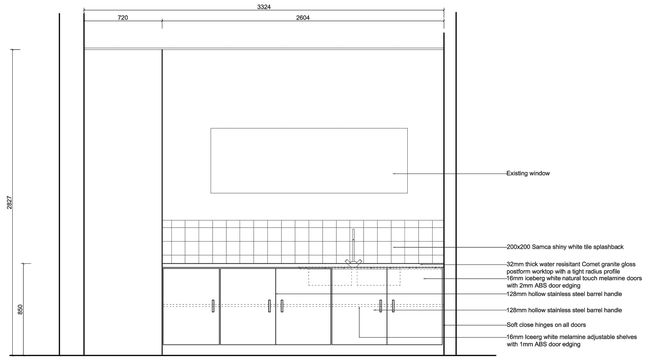
TYPICAL BEDROOM BIC JOINERY ELEVATION DETAIL
SCALE 1:20



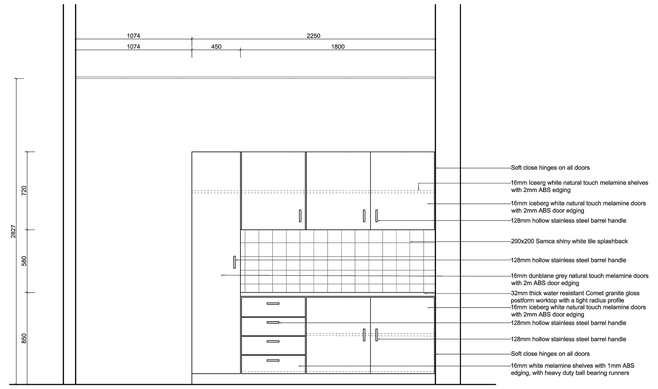
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SCALE 1:20



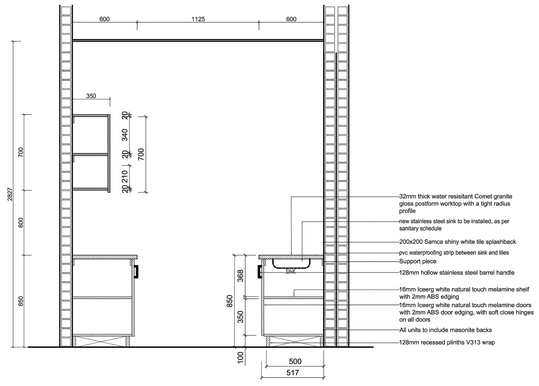
TYPICAL KITCHEN JOINERY PLAN DETAIL
SCALE 1:20



TYPICAL KITCHEN JOINERY ELEVATION DETAIL
SCALE 1:20



TYPICAL KITCHEN JOINERY ELEVATION DETAIL
SCALE 1:20



TYPICAL KITCHEN JOINERY SECTION DETAIL
SCALE 1:20

No.	Date	Amendment	Issued to

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WIMS number 071262 | page type A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

consultant
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Tel. 031 265 0444
email. georgej@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

ARCHITECTURE
public works
Department:
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PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

DOCTORS' ACCOMMODATION - JOINERY DETAILS

Project Stage
071262 - STAGE 5: CONSTRUCTION

Drawn	R. Monaheng		Date
scale	1 : 100		2022/05/25 09:00:39

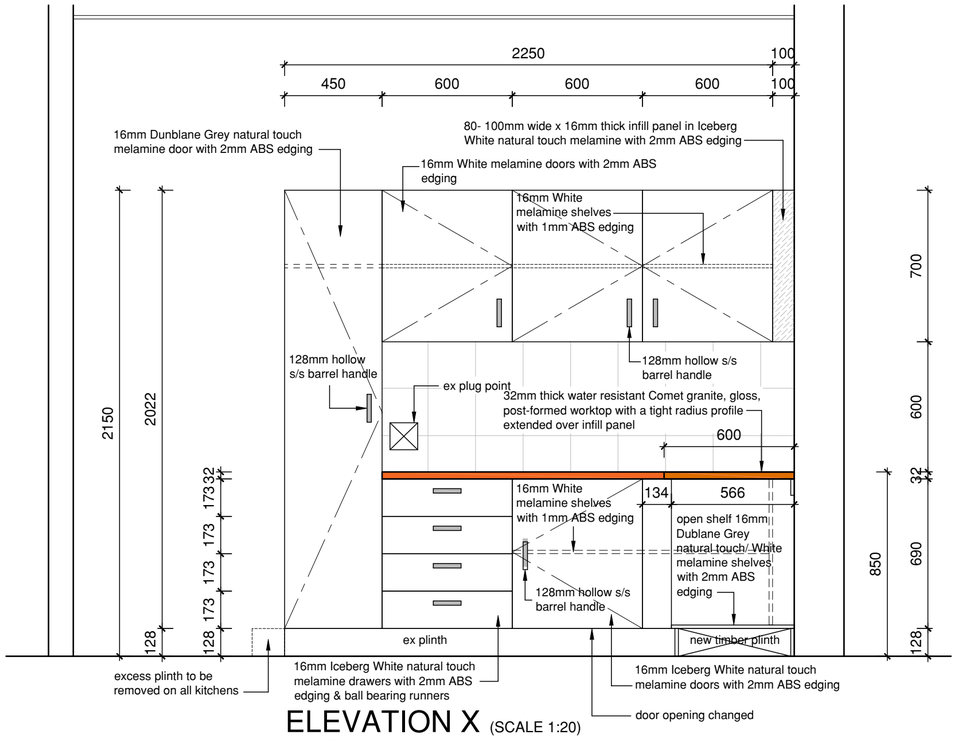
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071262 DOH-DR - A- 5000 - 0

Drawing Number ID

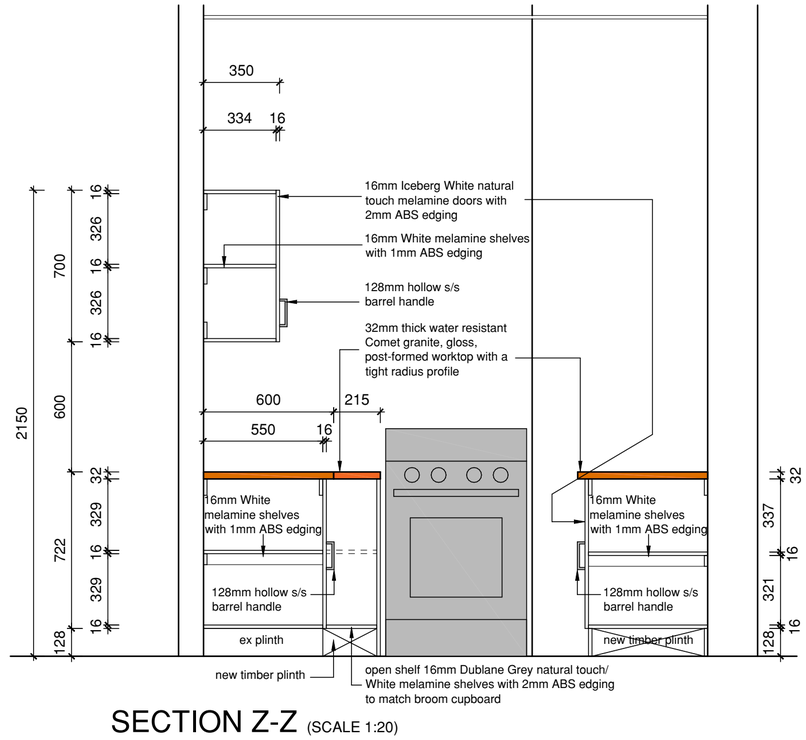
071262 = WIMS no
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0000 = Drawing No
C = Revision No

OPTION 3:

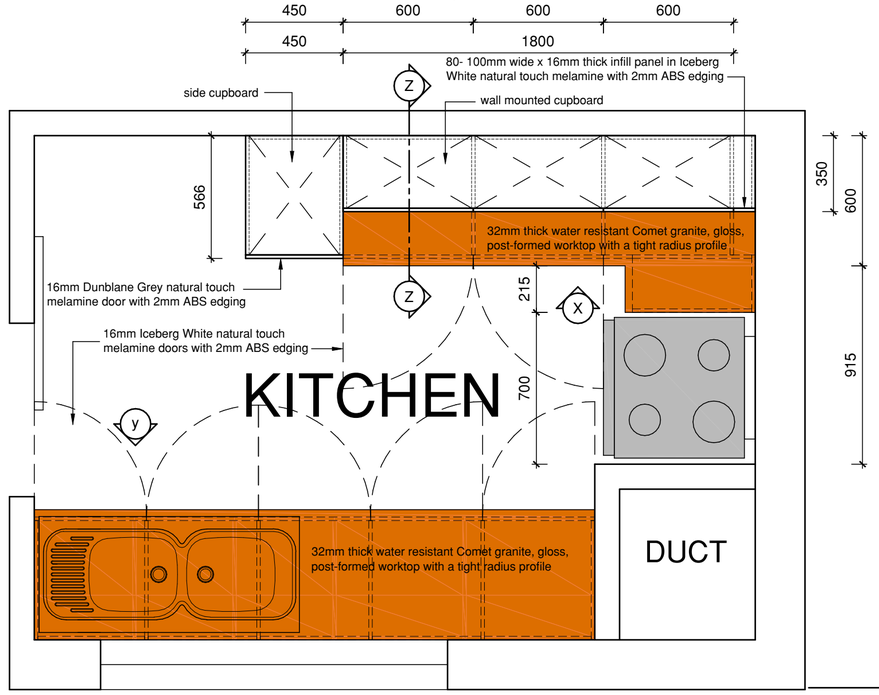
ALL MEASUREMENTS HAVE BEEN VERIFIED ON-SITE

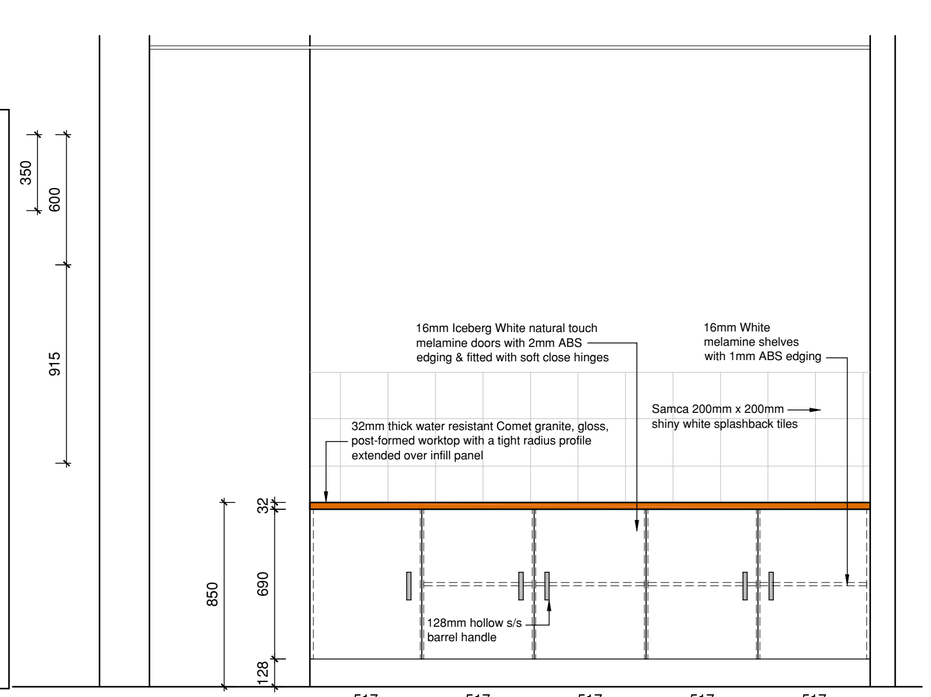


ELEVATION X (SCALE 1:20)



SECTION Z-Z (SCALE 1:20)





GENERAL NOTES:

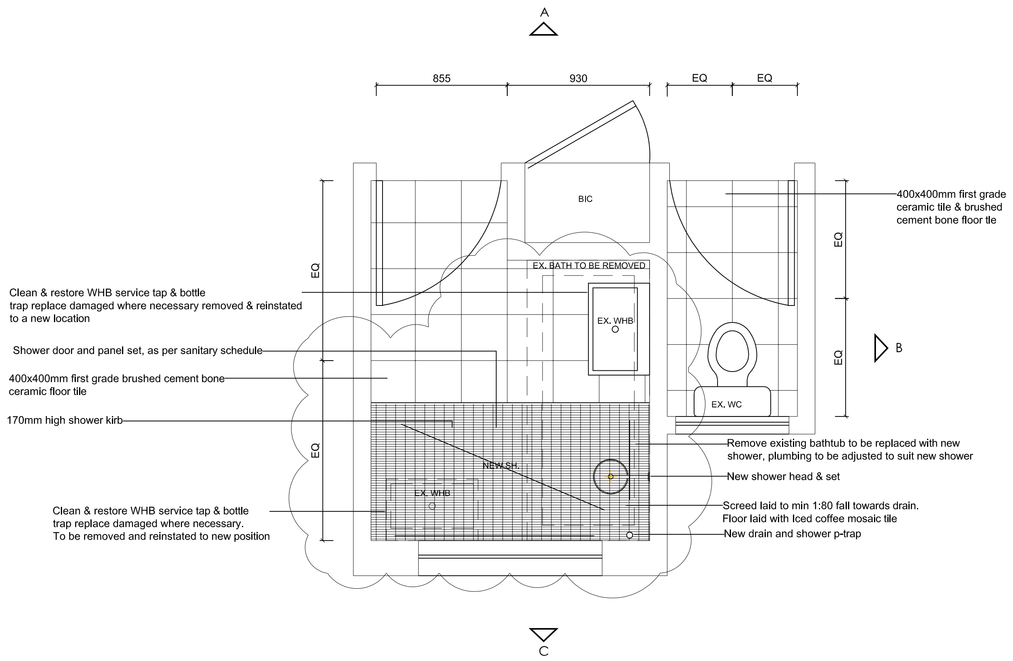
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DEPARTMENT OF HEALTH:
GREYS HOSPITAL:
RENOVATIONS & UPGRADE TO NURSES & DOCTOR'S ACCOMMODATION:

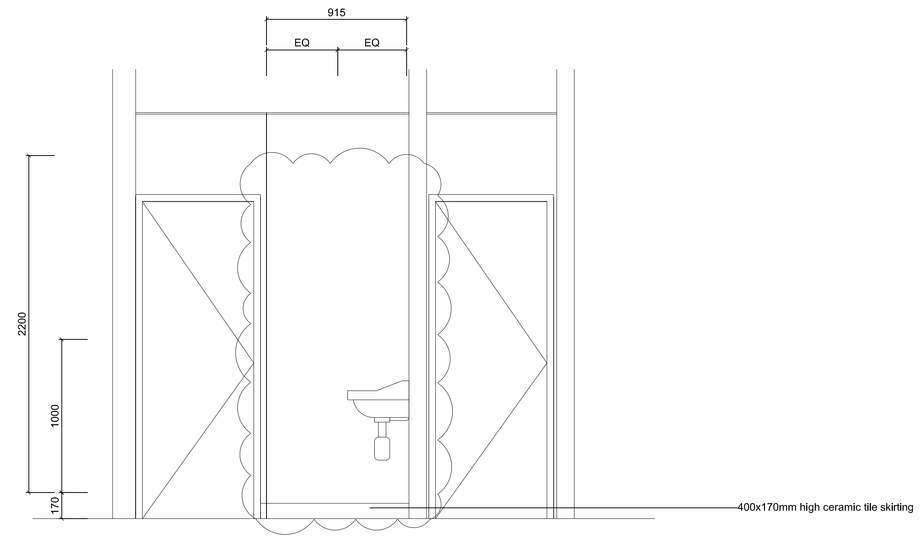
DOCTOR'S QUARTERS KITCHEN:
JOINERY WORKSHOP DRAWING
OPTION 3

DRAWN BY:	SCALE:	DATE:	REF NO:
R. MISSER	1:20	12/10/2022	132

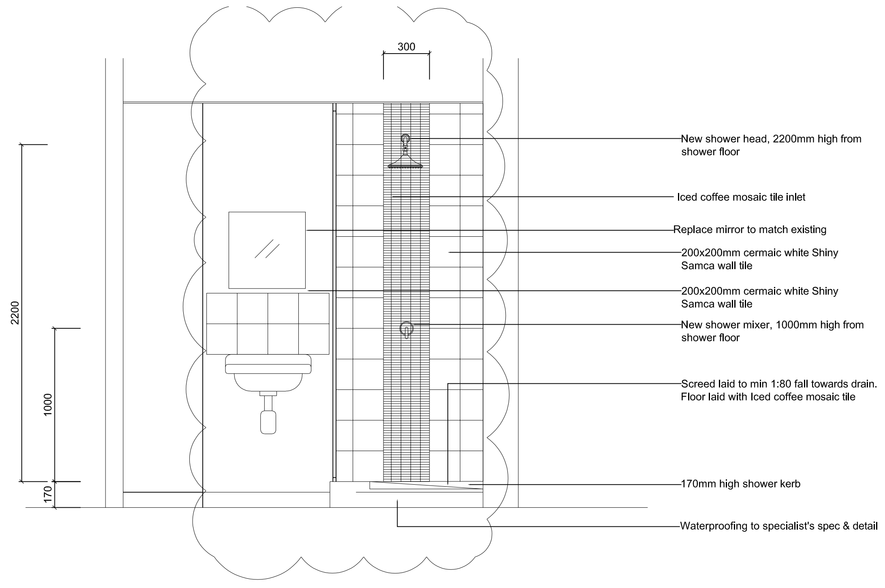
ANNEXURE D - DRAWINGS



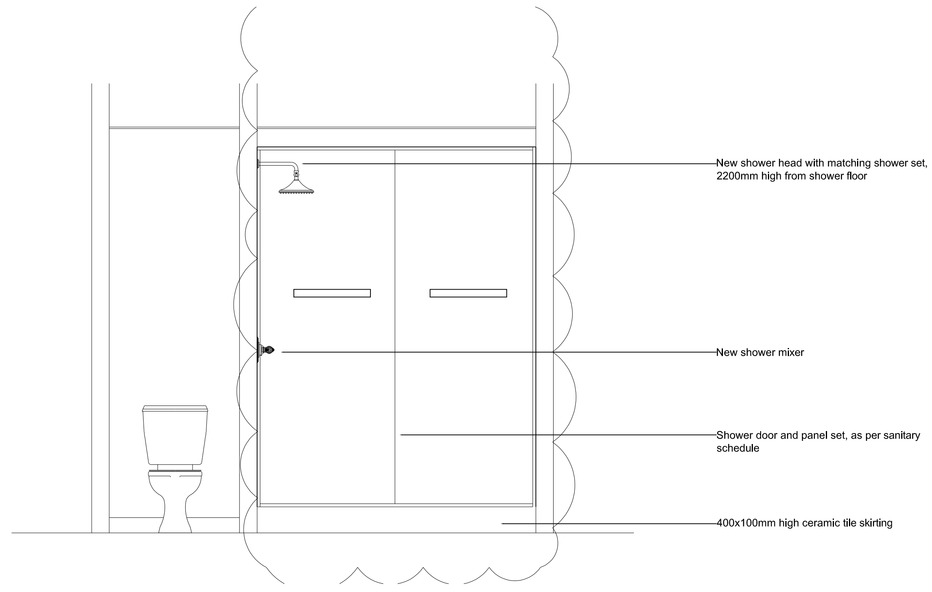
TYPICAL TYPE A BATHROOM DETAIL
FLOOR PLAN
SCALE 1:20



TYPICAL TYPE A BATHROOM DETAIL
ELEVATION A
SCALE 1:20



TYPICAL TYPE A BATHROOM DETAIL
ELEVATION B
SCALE 1:20



TYPICAL TYPE A BATHROOM DETAIL
ELEVATION C
SCALE 1:20

No.	Date	Amendment	Issued to
1	2022-10-21	New shower & WHB relocated	DK

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email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

ARCHITECTURE

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

KWAZULU-NATAL PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

DOCTORS' ACCOMMODATION - BATHROOM DETAILS - TYPE A

Project Stage
071262 - STAGE 5: CONSTRUCTION

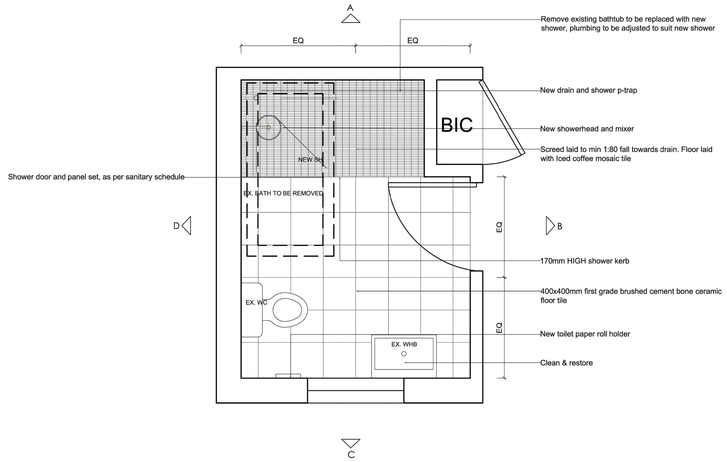
Drawn	R. Monaheng	Date	
scale	1 : 20		2022/10/21

drawing number
071262 DOH - A- 5000 - 1

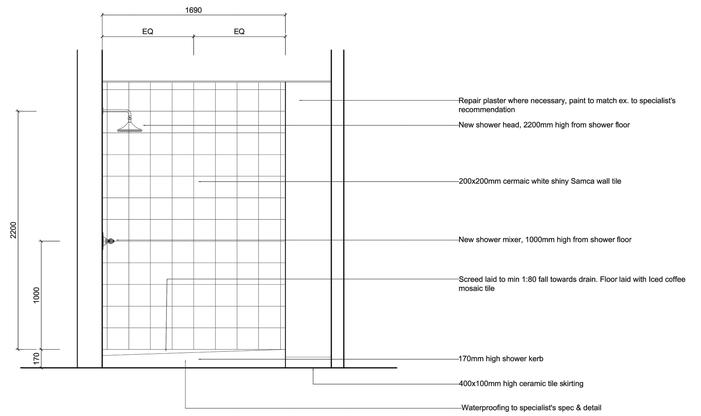
Drawing Number ID

071262	= WIMS no
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000C	= Drawing No
C	= Revision No

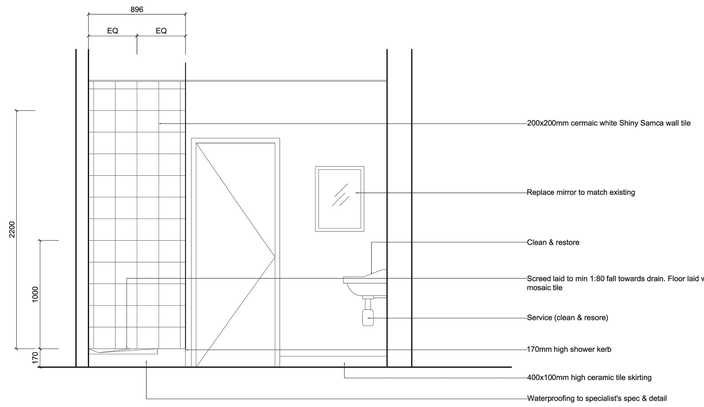
ANNEXURE D - DRAWINGS



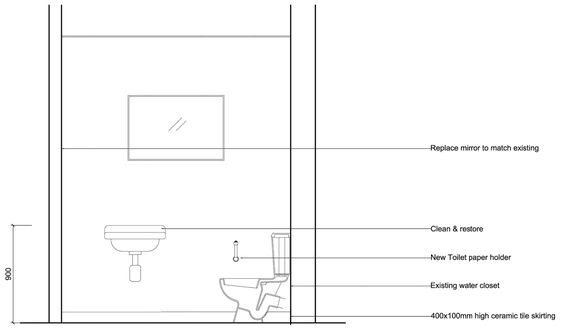
TYPICAL TYPE B BATHROOM DETAIL
FLOOR PLAN
SCALE 1:20



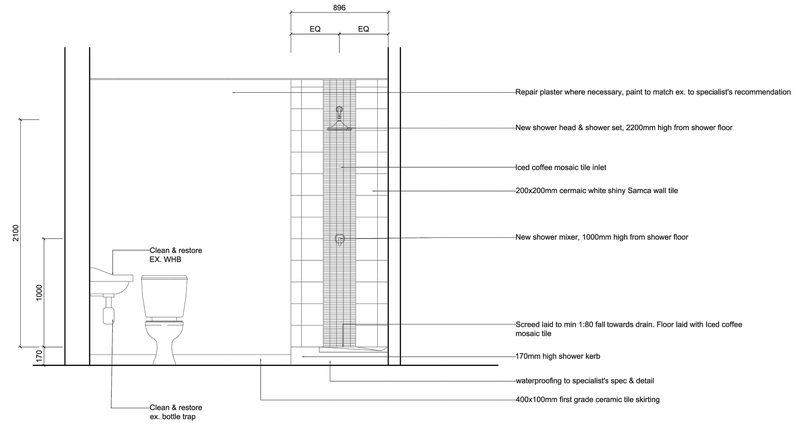
TYPICAL TYPE B BATHROOM DETAIL
ELEVATION A
SCALE 1:20



TYPICAL TYPE B BATHROOM DETAIL
ELEVATION B
SCALE 1:20



TYPICAL TYPE B BATHROOM DETAIL
ELEVATION C
SCALE 1:20



TYPICAL TYPE B BATHROOM DETAIL
ELEVATION D
SCALE 1:20

No.	Date	Amendment	Issued to

GENERAL NOTES

1. All drawings to read to be read in conjunction with Room Schedule.
2. All measurements and heights have to be controlled & adapted to ex buildings, prior to commencement of any work.
3. Any discrepancies or contradiction has to be discussed with the architect immediately.
4. No drawings are to be scaledAll brickwork is to be set out using a profile marked at 85 mm c/c & 128 mm c/c for maxi bricks
5. The contractor must have a full set of dwg's on site during construction.All dimensions as indicated on plan are to be set out on a level horizontal plane.
6. The contractor is to build in s.a.b.s. approved d.p.c's whether or not these are shown on drawings, to all external walls at each floor, beam or parapet level and to all windows, doors, grilles or other openings in external

SANS 10400 NOTES:

1. All work to comply with sans 10400 standards and specificationsStructural design to arch's and eng's specification and complies with parts h, j, k, l, m or n of sans 10400
2. All dimensions of rooms and spaces to comply with sans 10400-c
3. All sanitary facilities comply with sans 10400-F
4. All roof gutters and down pipes to comply with SANS10400- R
5. All glazing to comply with part N of SANS 10400
6. Safety glass to be used within 300mm of FFL to comply with sans 10400-n regulations
7. All drainage subject to an agreement certificate and to comply with sans 10400-P
8. All disposal of storm water to comply with SANS 10400-R
9. Facilities for disabled persons are provided and are in accordance to SANS 10400-S
10. Inspect all fire doors. Replace damaged doors to match existing

WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name			
Signature		Date	

consultant
15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za
UKUZA CONSULTING (PTY) LTD

ARCHITECTURE
public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

DOCTORS' ACCOMMODATION - BATHROOM DETAILS (Sheet 2 of 3)

Project Stage: 071262 - STAGE 5: CONSTRUCTION

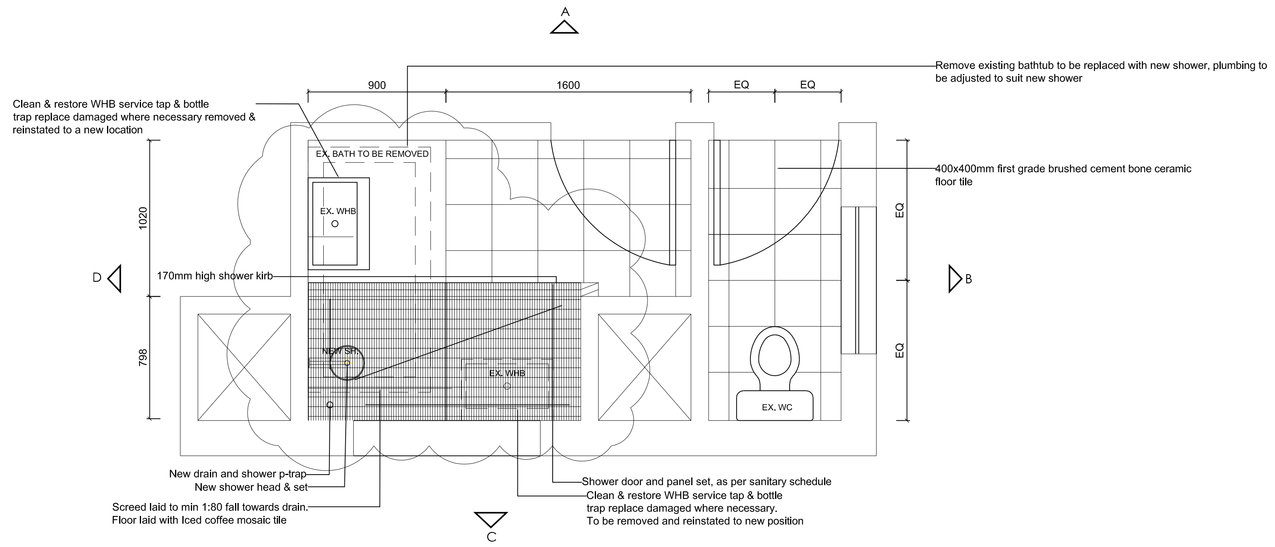
Drawn	R. Morsheng		Date
scale	1 : 100		2022/05/25 09:00:39

drawing number: 071262 DOH-DR - A- 5002 - 0

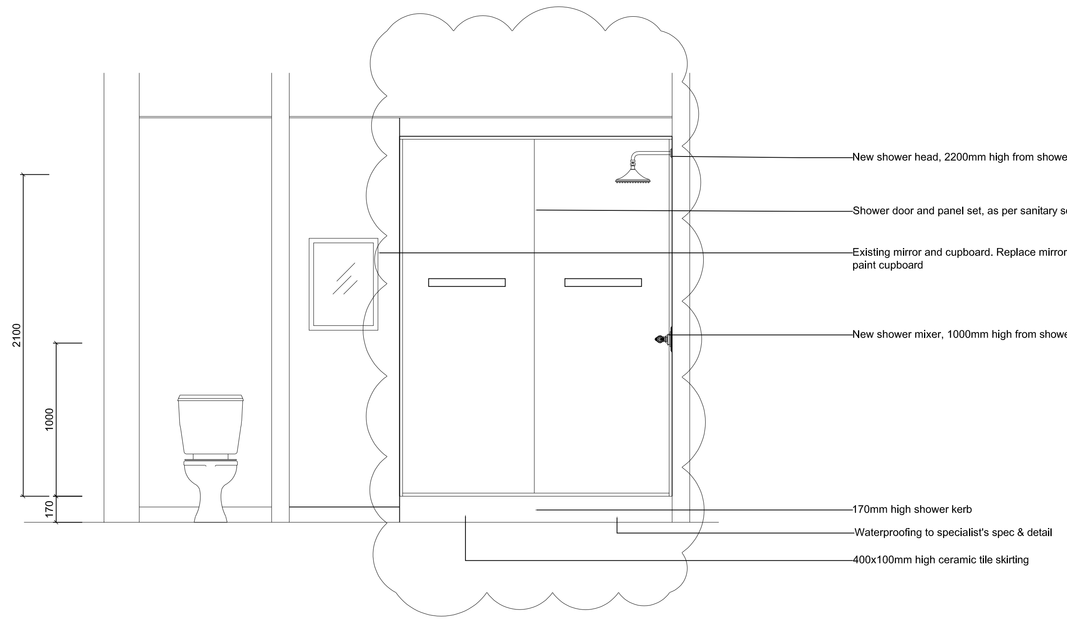
Drawing Number ID

071262 = WIMS no
DOH = Department
A = Consultant Discipline
0002 = Drawing No
0 = Revision No

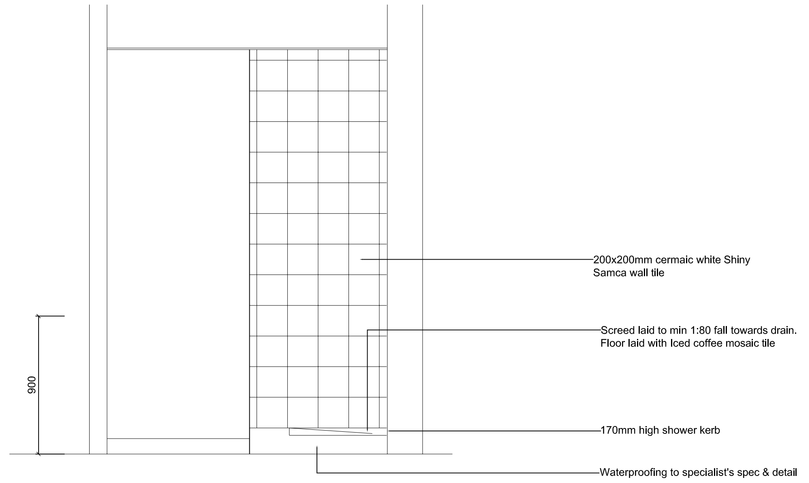
ANNEXURE D - DRAWINGS



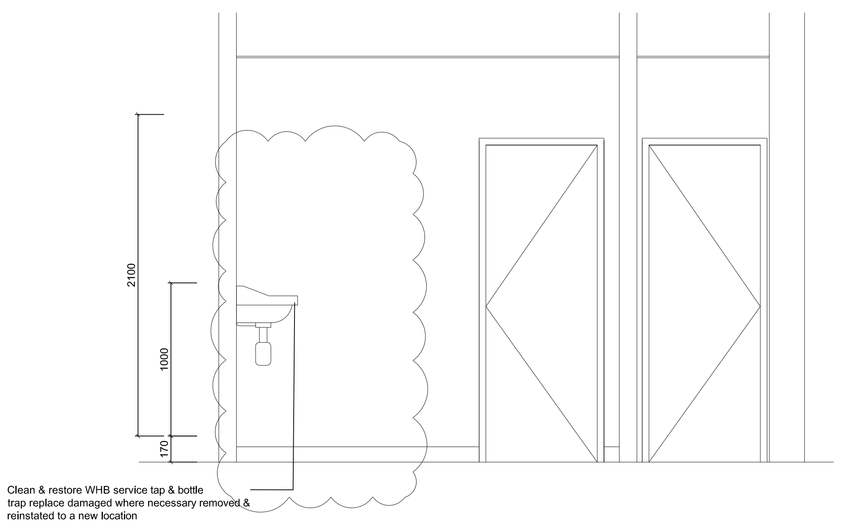
TYPICAL TYPE C BATHROOM DETAIL
FLOOR PLAN
SCALE 1:20



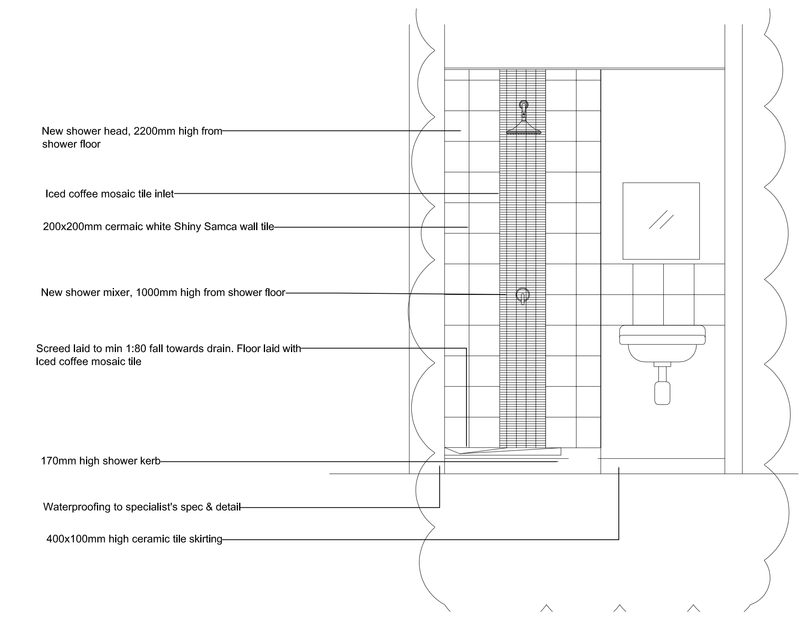
TYPICAL TYPE C BATHROOM DETAIL
ELEVATION C
SCALE 1:20



TYPICAL TYPE C BATHROOM DETAIL
ELEVATION B
SCALE 1:20



TYPICAL TYPE C BATHROOM DETAIL
ELEVATION A
SCALE 1:20



TYPICAL TYPE C BATHROOM DETAIL
ELEVATION D
SCALE 1:20

No.	Date	Amendment	Issued to
1	2022-10-21	New shower & WHB relocated	DK

GENERAL NOTES

- All drawings to read to be read in conjunction with Room Schedule.
- All measurements and heights have to be controlled & adapted to ex buildings, prior to commencement of any work.
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SANS 10400 NOTES:

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- Facilities for disabled persons are provided and are in accordance to SANS 10400-S
- Inspect all fire doors. Replace damaged doors to match existing

WIMS number: 071262
page type: A0

DEPARTMENT SIGNATURES

FACILITY

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature | Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

ARCHITECTURE

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

KWAZULU-NATAL PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

Project

GREYS HOSPITAL - RENOVATIONS & UPGRADES TO DOCTORS & NURSES ACCOMMODATION AT GREY HOSPITAL, TOWN BUSH ROAD, ERF PIETERMARITZBURG, KZN PROVINCE

Drawing title

DOCTORS' ACCOMMODATION - BATHROOM DETAILS - TYPE C

Project Stage

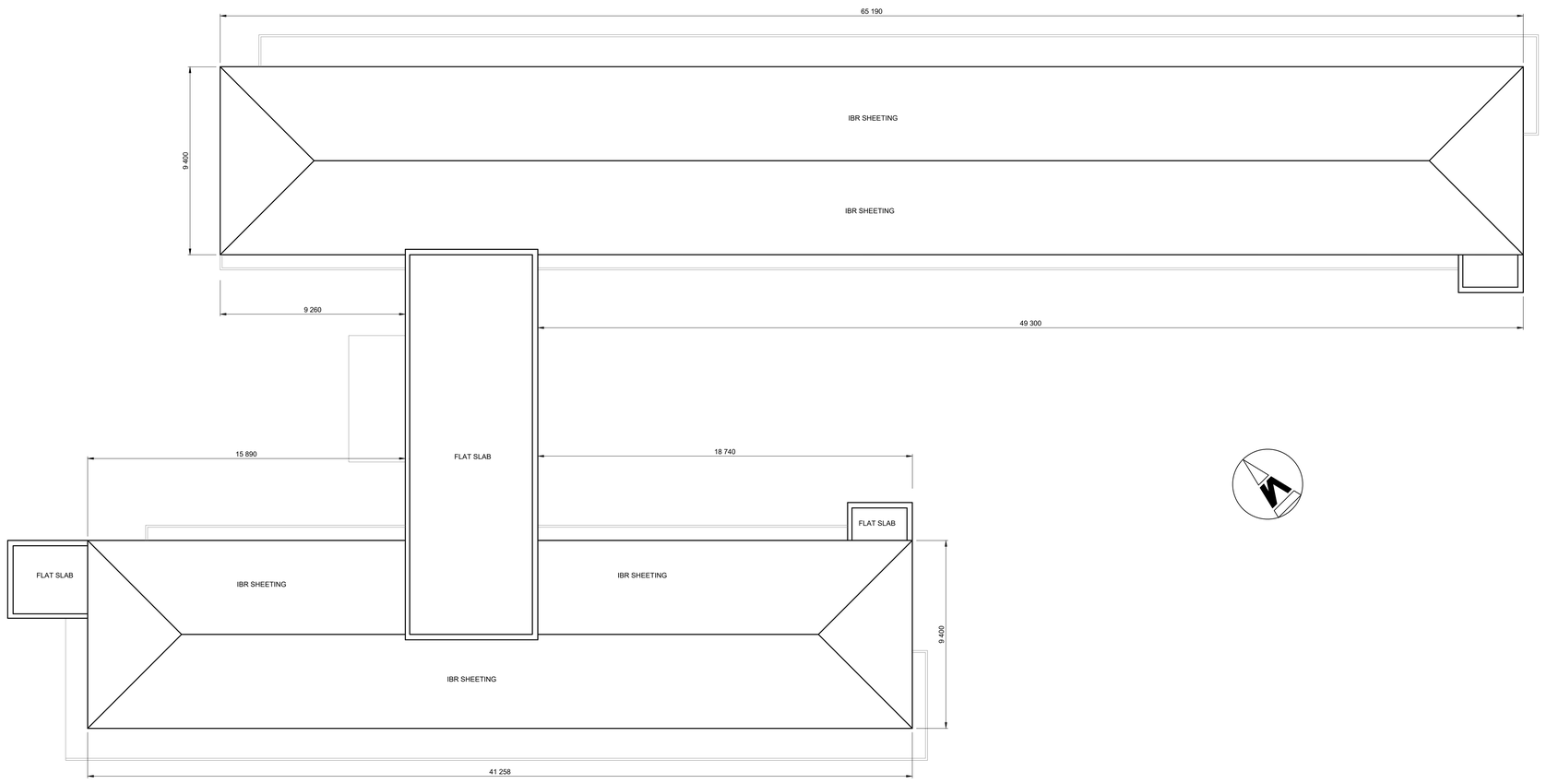
071262 - STAGE 5: CONSTRUCTION

Drawn: R. Monaheng | Date: 2022/10/21
scale: 1 : 20

drawing number
071262 DOH - A- 5001 - 1

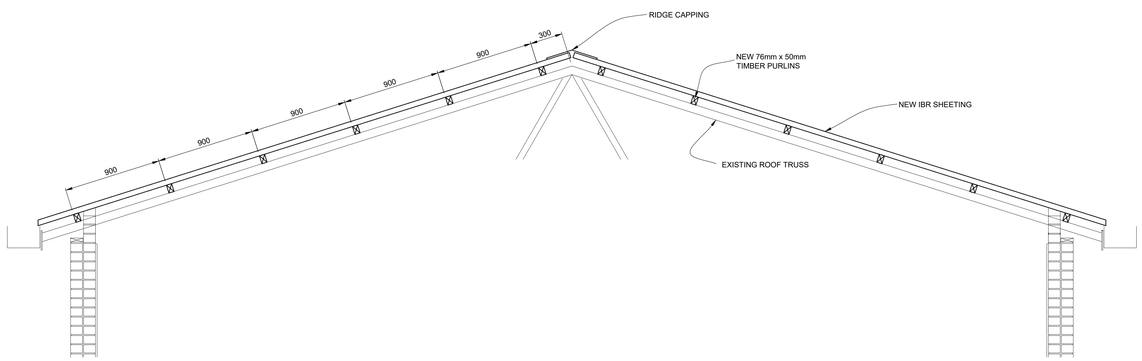
Drawing Number ID

071262 = WIMS no
DOH = Department
A = Consultant Discipline
000C = Drawing No
C = Revision No



ROOF SHEETING LAYOUT
(NURSE'S ACCOMMODATION)

Scale 1 : 100



TYPICAL SECTION

Scale 1 : 20

GENERAL NOTES

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- Fire protection measures comply with SANS 10400-T
- Provision of space heating comply with SANS 10400-V
- All fire installations comply with SANS 10400-W

Revision History

RevID	ChID	Change Name	Date

CLIENT DEPARTMENT SIGNATURES

FACILITY STAMP

FACILITY MANAGER

INFRASTRUCTURE MANAGER

GENERAL MANAGER

Drawn by:

Name C. Manqele

Signature Date

Checked by

Name N.Mvuyana

Signature Date

K:\Professional_Services\Nonmusakhini Masuku\057456_Grey's Hospital Renovations\Drawings\Superseded\dwg_S1150561.dt

SOUTHERN REGION

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL:
RENOVATIONS & UPGRADE TO NURSES
AND DOCTOR'S ACCOMMODATION

Drawing description

Nurse's Quarters
Roof Sheeting

Scale/s 1: 100 & 1:20

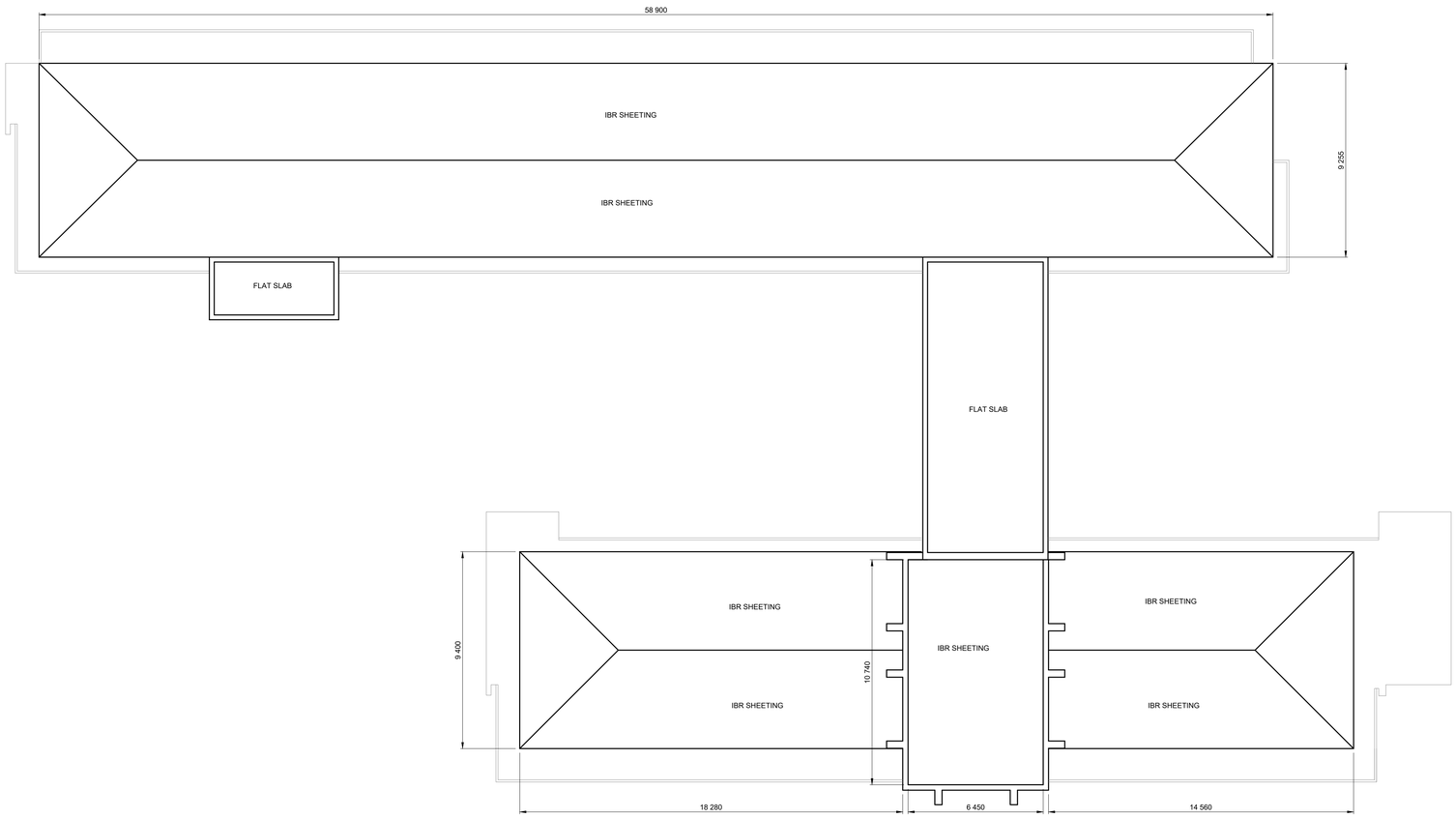
Drawing number: DoH.1-T1.6

Date: 06 July 2021

DOPW Drawing number

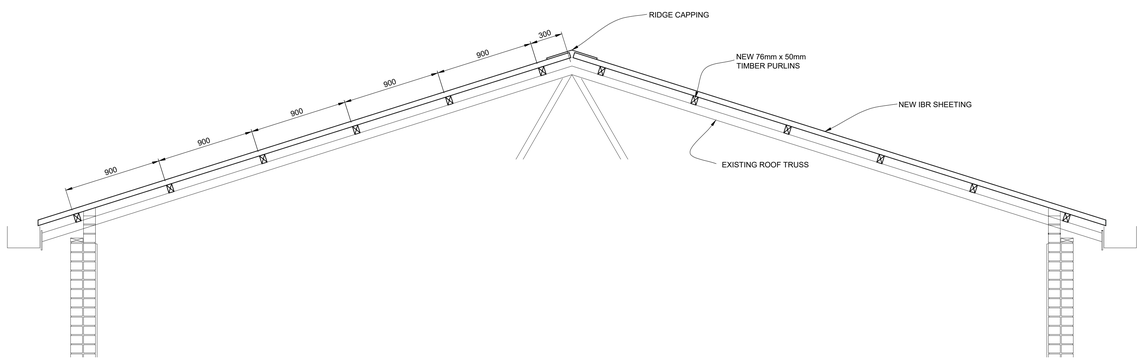
WIMS no.: WIMS 067484

Stamped by Plans Approval Committee



ROOF SHEETING LAYOUT
(DOCTOR'S ACCOMMODATION)

Scale 1 : 100



TYPICAL SECTION

Scale 1 : 20

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- Fire protection measures comply with SANS 10400-T
- Provision of space heating comply with SANS 10400-V
- All fire installations comply with SANS 10400-W

Revision History

RevID	ChID	Change Name	Date

CLIENT DEPARTMENT SIGNATURES

FACILITY STAMP

FACILITY MANAGER

INFRASTRUCTURE MANAGER

GENERAL MANAGER

Drawn by:

Name C. Manqele

Signature Date

Checked by

Name N.Mvuyana

Signature Date

K:\Professional_Services\Technicians\Mnr Khaula\057434_Grey's Hospital Renovations\Drawings\Superseded\dwg_01102020.tif

SOUTHERN REGION

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL:
RENOVATIONS & UPGRADE TO NURSES
AND DOCTOR'S ACCOMMODATION

Drawing description

Doctor's Quarters
Roof Sheeting

Scale/s 1: 100 & 1:20

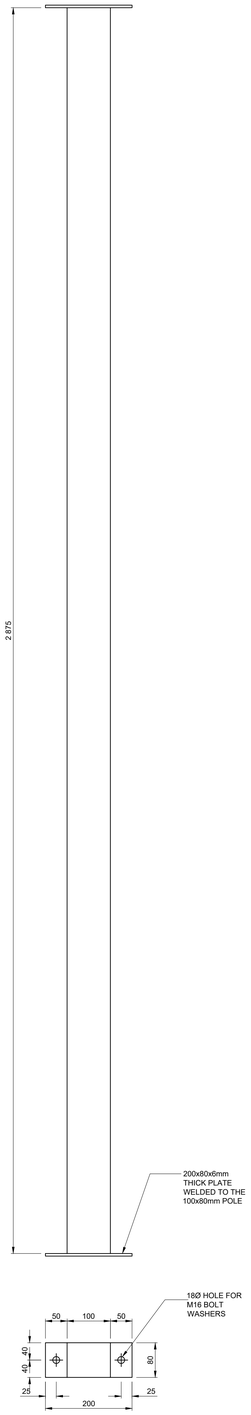
Drawing number: DoH.1-T1.6

Date: 06 July 2021

DOPW Drawing number

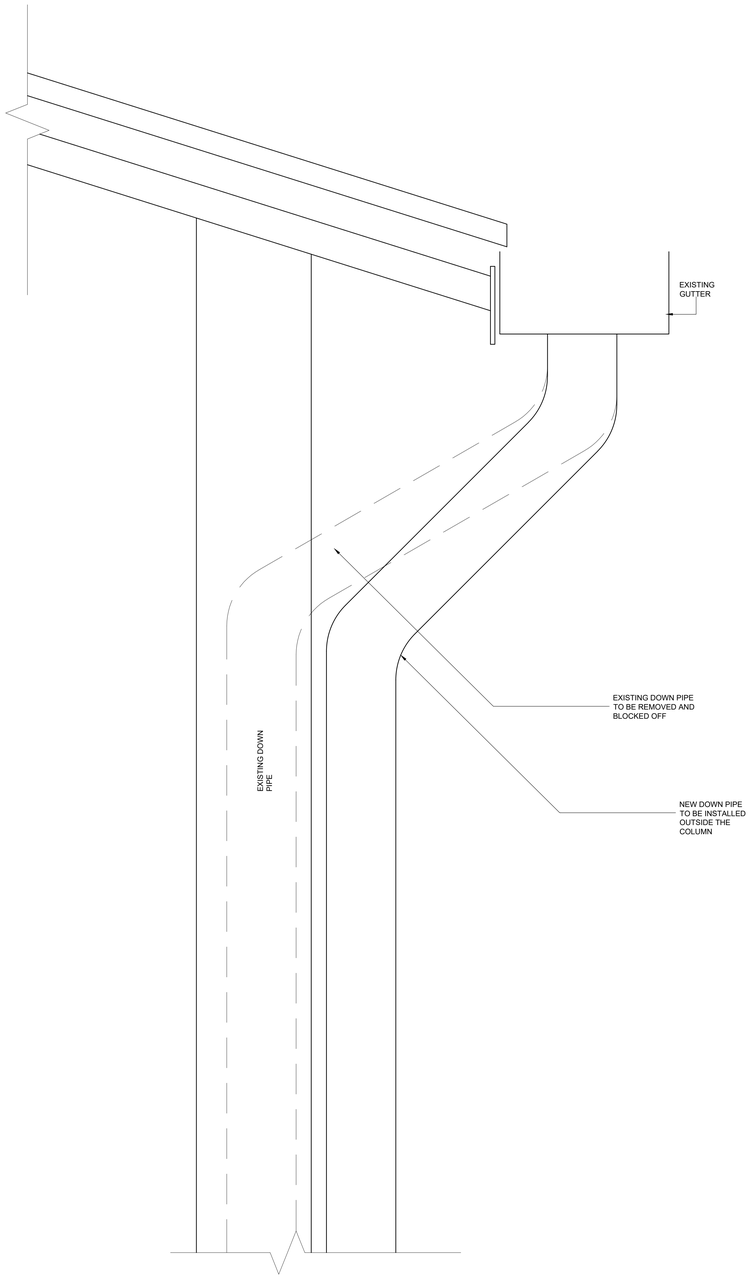
WIMS no.: WIMS 067484

Stamped by Plans Approval Committee



VERANDA COLUMN

Scale 1 : 5



DOWN PIPE
INSIDE COLUMN

Scale 1 : 5

GENERAL NOTES

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Revision History

RevID	ChID	Change Name	Date

CLIENT DEPARTMENT SIGNATURES

FACILITY STAMP

FACILITY MANAGER

INFRASTRUCTURE MANAGER

GENERAL MANAGER

Drawn by:

Name C. Manqele

Signature Date

Checked by

Name N.Mvuyana

Signature Date

K:\Professional_Services\Rooms\wetin files\dwt\DOH\M_Grey's Hospital Renovations\Drawings\Superseded\Dwg_01102021.dwt

SOUTHERN REGION

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL:
RENOVATIONS & UPGRADE TO NURSES
AND DOCTOR'S ACCOMMODATION

Drawing description

Doctor's Quarters
Column and Gutter down pipe

Scale/s 1: 100 & 1:20

Drawing number: DoH.1-T1.6

Date: 06 July 2021

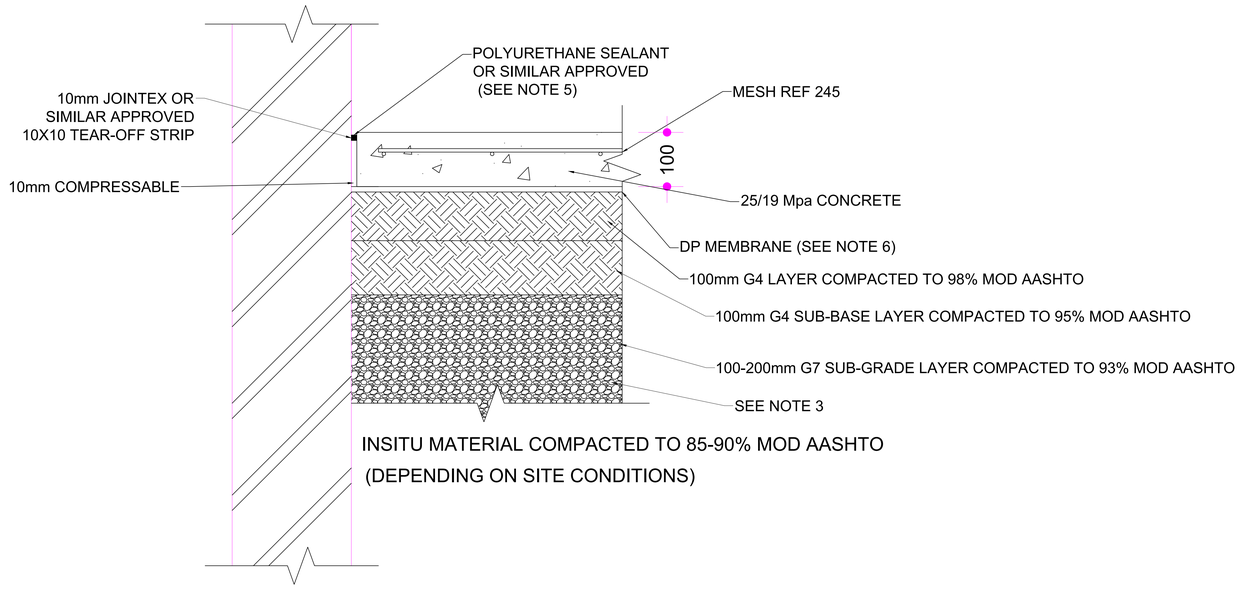
DOPW Drawing number

WIMS no.: WIMS 067484

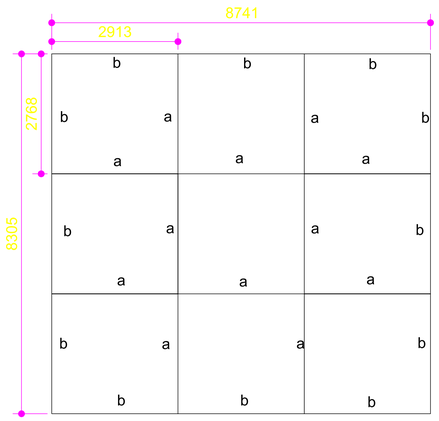
Stamped by Plans Approval Committee

NOTES

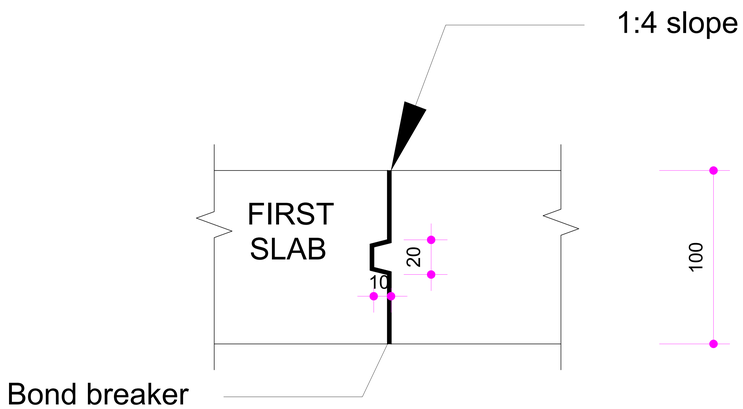
1. Concrete floor:
   a. Strength - 25Mpa/19mm.
   b.Steel mesh - Ref 245 at 30mm from the top of slab.
   c. Aggregate:- Maximum nominal size of coarse aggregate shall be 25mm.
   - Coarse aggregate size smaller than 19mm shall not be used.
   - During the work, no fine aggregate such that the fineness modulus of the
2. G4 Granular material with the following requirements:-
   aggregate varies by more than 0.2 from that on which the original mix design is base on shall be used, unless the mix proportions are adjusted accordingly.
   a. Maximum size: 33mm
   b. Passing 0.075mm sieve: maximum 15%
   c. Plasticity Index: maximum 6
   d. Liquid limit: maximum 25%.
3. The sub-grade depth is preliminary, depending on site conditions and it is subject to change.
4. Bitumen paint bond breaker
5. Joint filler: Compressible material like polystyrene/ cell expanded polyethylene with tear off strip at the top.
6. Damp proof membrane: Polymer film SANS 952 type (green) 0.25mm thick



ISOLATION JOINT(b)
SCALE 1:5



DINING HALL PLAN
SCALE 1:50



TYPICAL CONSTRUCTION JOINT (a)
SCALE 1:8

No.	DATE	AMENDMENT	D.P.W.

WMS number	072621
FACILITY	
FACILITY CEO	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional consultant)	
Name:	
Signature:	Date:

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cad file name — page type A 3

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

KWAZULU-NATAL PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

discipline: ENGINEERING
service: KZN PUBLIC WORKS IN HOUSE

WCS number

drawing title

GREYS HOSPITAL DINING HALL FLOOR SLAB REPAIR/ REPLACEMENT

ref.no.		designed	L
scale	As shown	drawn	T
date	May 2023	checked	S
drawing number		REV	

PROJECT:	PROJECT No.	
GREYS HOSPITAL NURSE'S ACCOMMODATION		25007_2
	SHEET: 1 of 1	DATE: 2025/04/23
SERVICE: Electrical Installation		REV: 0

IBUYA Consulting Engineers
"POWERING DEVELOPMENT"

DISTRIBUTION			DATE
		Current Revision	23/04/2025	24/04/2025
Client: Lunthando Magwaza	luthando.magwaza@kznworks.gov.za		E	E
REVISION		0	0	

DWG. No.	SIZE	SHT	DESCRIPTION		REVISIONS	
101	A0	1	Lighting Plan Ground Floor	0	0	
102	A0	1	Lighting Plan First Floor	0	0	
103	A0	1	Lighting Plan Second Floor	0	0	
104	A0	1	Lighting Plan Third Floor	0	0	
105	A0	1	Lighting Plan Fourth Floor	0	0	
200	A0	1	Small Power Plan Lower Ground Floor	0	0	
201	A0	1	Small Power Plan Ground Floor	0	0	
202	A0	1	Small Power Plan First Floor	0	0	
203	A0	1	Small Power Plan Second Floor	0	0	
204	A0	1	Small Power Plan Third Floor	0	0	
205	A0	1	Small Power Plan Fourth Floor	0	0	
300	A0	1	Electronics Plan Lower Ground Floor	0	0	
301	A0	1	Electronics Plan Ground Floor	0	0	
302	A0	1	Electronics Plan First Floor	0	0	
303	A0	1	Electronics Plan Second Floor	0	0	
304	A0	1	Electronics Plan Third Floor	0	0	
305	A0	1	Electronics Plan Fourth Floor	0	0	
				0	0	
401	A3	1	DB-Heat Pump Nurses Quarters Single Line Diagram	0	0	
600	A4	2	Luminaire Schedule	0		0
701	A0	1	Smoke Detection Plan Ground Floor	0	0	
702	A0	1	Smoke Detection Plan First Floor	0	0	
703	A0	1	Smoke Detection Plan Second Floor	0	0	
704	A0	1	Smoke Detection Plan Third Floor	0	0	
705	A0	1	Smoke Detection Plan Fourth Floor	0	0	
706	A0	1	Smoke Detection Plan Fifth Floor	0	0	
707	A0	1	Smoke Detection Plan Sixth Floor	0	0	
708	A0	1	Smoke Detection Plan Seventh Floor	0	0	
709	A0	1	Smoke Detection Plan Eighth Floor	0	0	

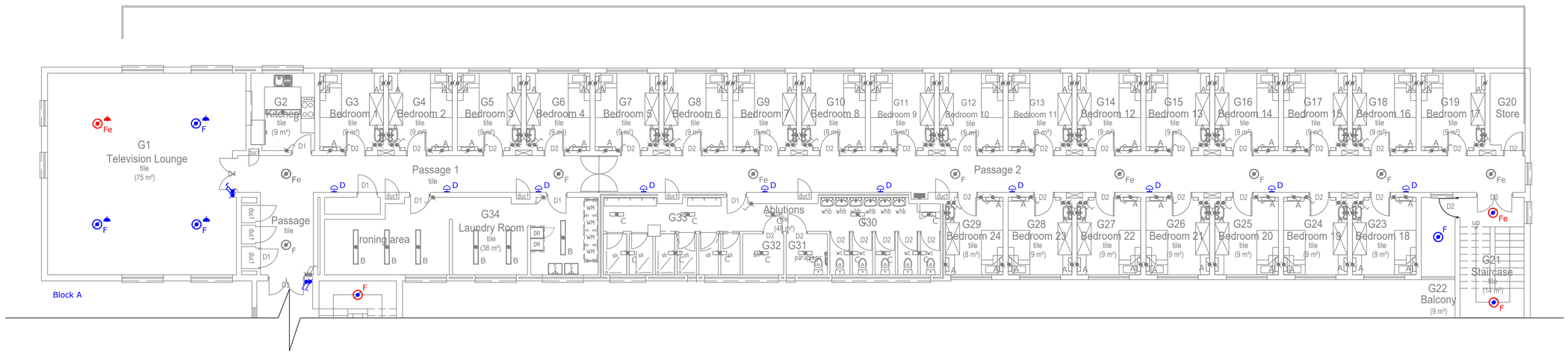
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TENDER DRAWINGS		
APPROVED FOR CONSTRUCTION		
COPIES - COLOUR (C)/PRINTS (P)/E-MAIL(E)/FAXED(F)		X

RECEIVED BY: DATE:

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation and wired to a 5 amp plug if none exists.

The contractor is only to work in areas shown and all areas left blank are not to be worked in



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- C CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

DM CAM etc. ROUND CONDUIT BOX FOR:
- DM – DOOR MONITOR
- CAM – CAMERA
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC
- EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
- TWIN AND EARTH
- CABLE ROUTE

- oc OVERHEAD CAST–IN
- os OVERHEAD ON SURFACE OR LAID ON CEILING.
- rc FLOOR SLAB CAST–IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 100 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (0° SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDESTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- H^{B} LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name | Signature | Date

consultant

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Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

NURSES LIGHTING PLAN
GROUND FLOOR
COMPLETION SCOPE

Drawn CW | Checked JK | Date 2025/04/51

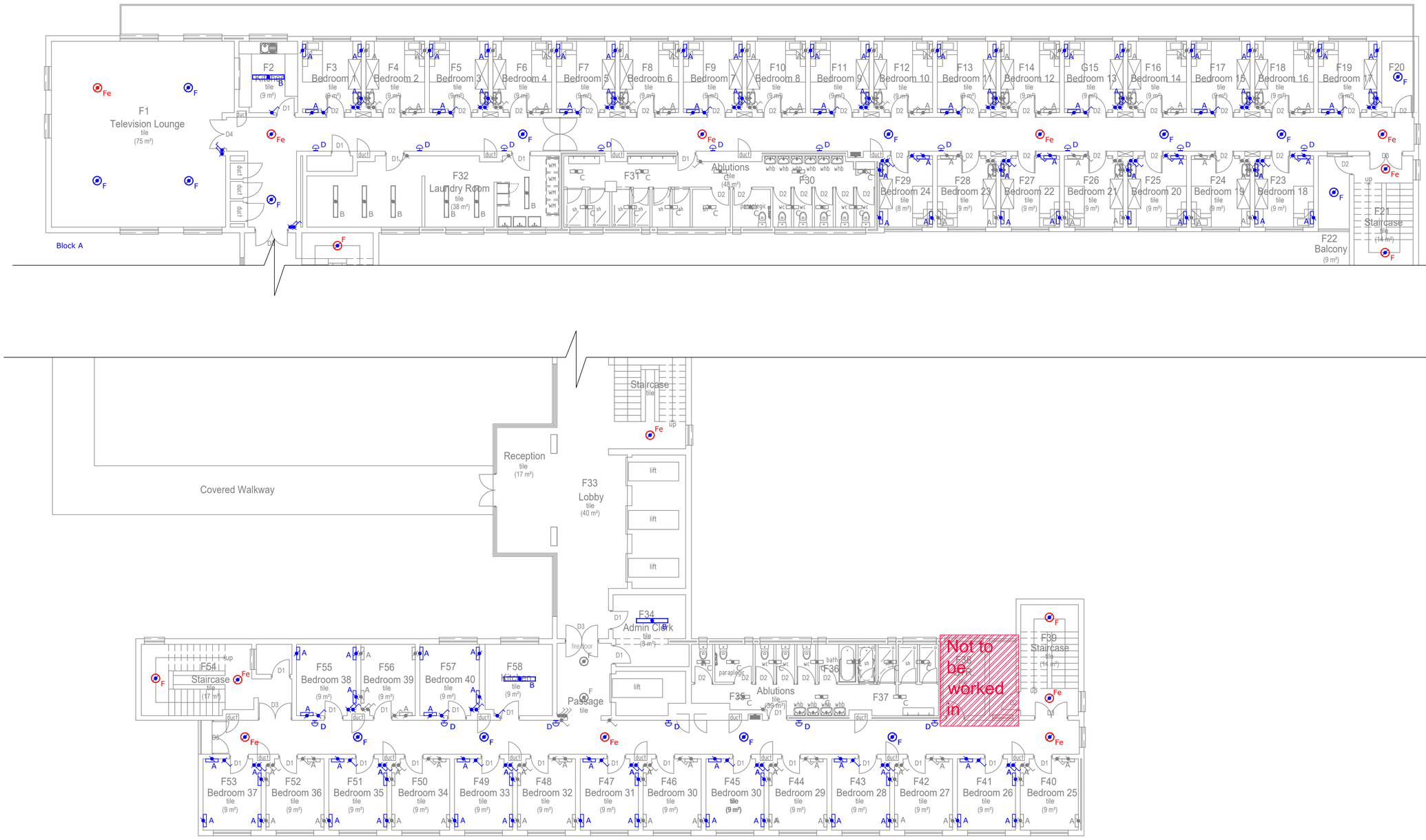
scale 1 : 100

drawing number 25007_2_101

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

The contractor is only to work in areas shown and all areas left blank are not to be worked in



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- C CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

DM, CAM etc. ROUND CONDUIT BOX FOR:
DM – DOOR MONITOR
CAM – CAMERA
AA – ACCESS ALARM
AC – ACCESS CONTROL
CR – CARD READER
COM – COMMUNICATION/INTERCOM
BGM – BACK GROUND MUSIC
EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- S SURFIX
- U TWIN AND EARTH
- CABLE ROUTE

- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (3" SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDISTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- S SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- HD^B LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name | Signature | Date

consultant

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Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

NURSES LIGHTING PLAN
FIRST FLOOR
COMPLETION SCOPE

Drawn CW | Checked JK | Date 2025/04/15

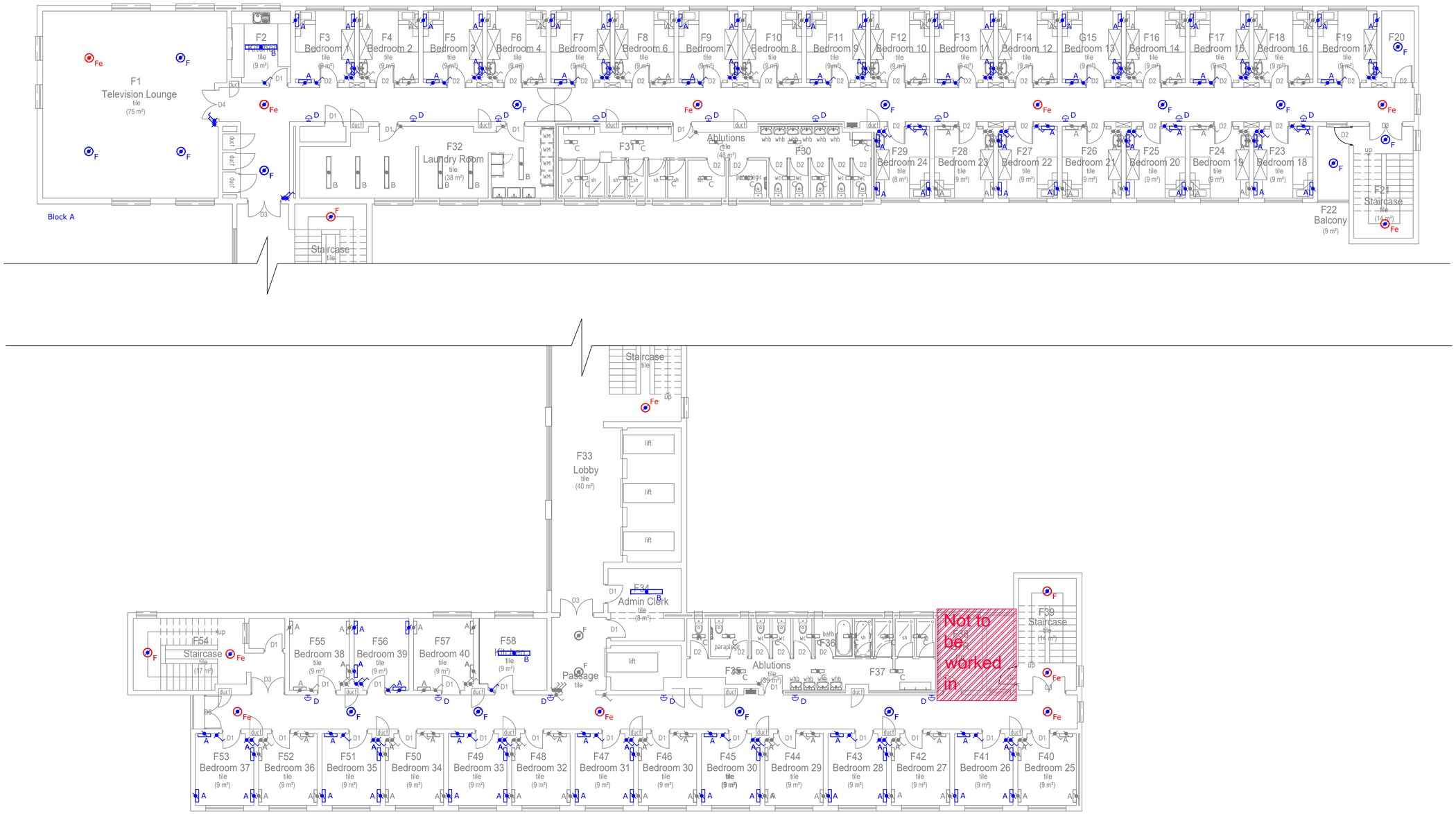
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drawing number 25007_2_102

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

The contractor is only to work in areas shown and all areas left blank are not to be worked in



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL.
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

ROUND CONDUIT BOX FOR:
DM – DOOR MONITOR
CAM – CAMERA
AA – ACCESS ALARM
AC – ACCESS CONTROL
CR – CARD READER
COM – COMMUNICATION/INTERCOM
BGM – BACK GROUND MUSIC
EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
- TWIN AND EARTH
- CABLE ROUTE

- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAD ON CEILING.
- FC FLOOR SLAB CAST-IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (7 SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDESTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
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Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

NURSES LIGHTING PLAN
SECOND FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

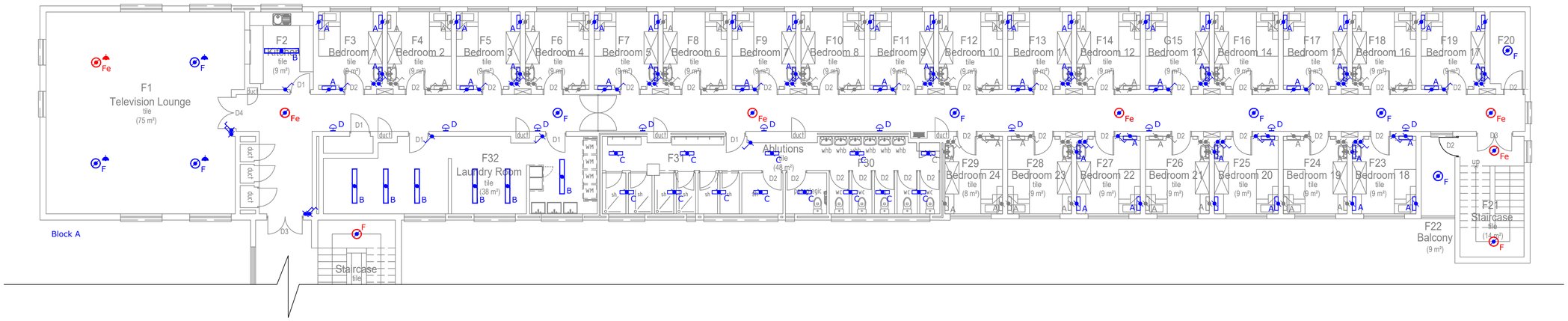
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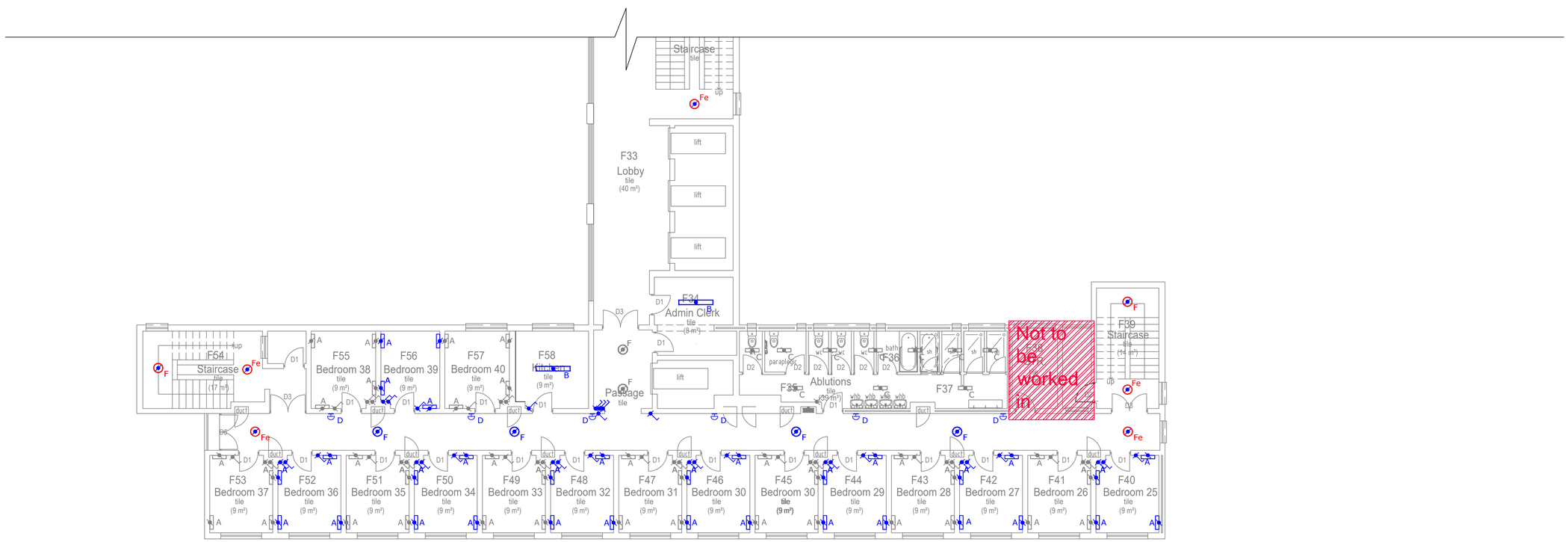
drawing number 25007_2_103

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

The contractor is only to work in areas shown and all areas left blank are not to be worked in





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL.
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

DM, CAM etc. ROUND CONDUIT BOX FOR:
- DM – DOOR MONITOR
- CAM – CAMERA
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC
- EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
- TWIN AND EARTH
- CABLE ROUTE

- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAD ON CEILING.
- FC FLOOR SLAB CAST-IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (7 SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDESTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

NURSES LIGHTING PLAN
THIRD FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date

scale 1 : 100 2025/04/15

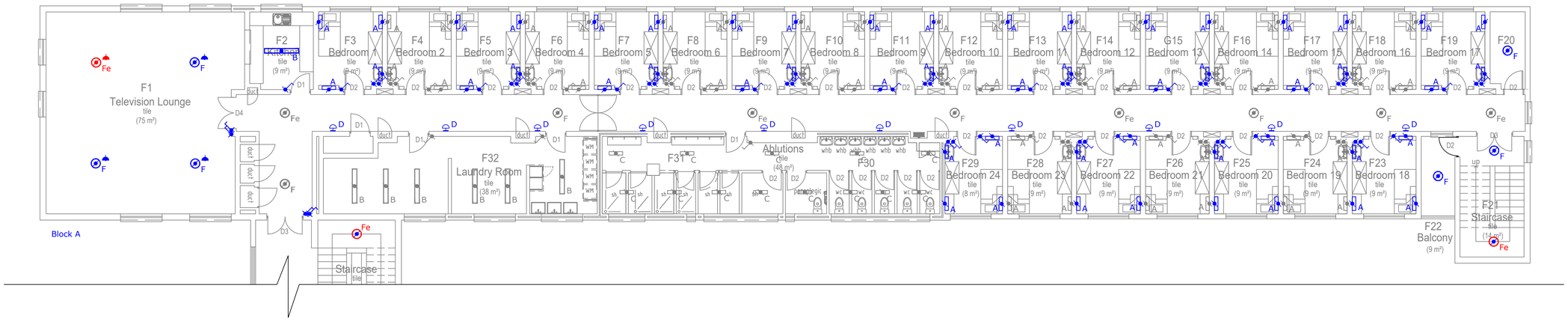
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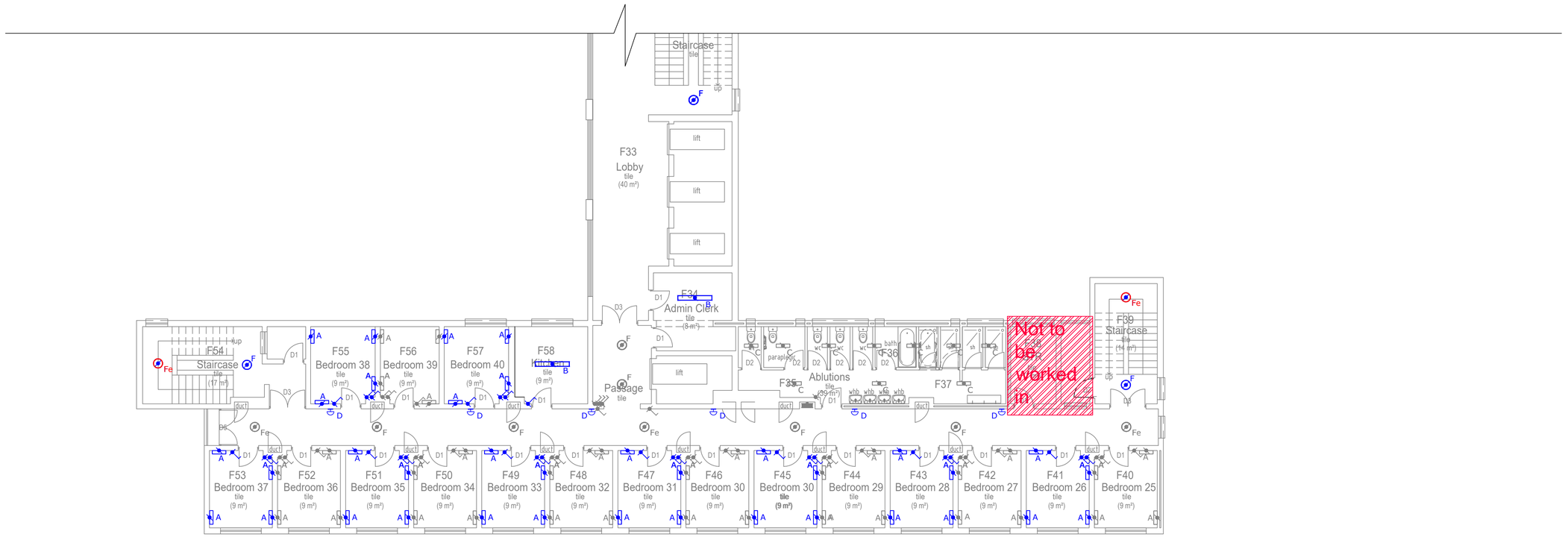
25007_2_104

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

The contractor is only to work in areas shown and all areas left blank are not to be worked in





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL.
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

ROUND CONDUIT BOX FOR:
- DM – DOOR MONITOR
- CAM – CAMERA
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC
- EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
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- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
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- CABLE ROUTE

- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAD ON CEILING.
- FC FLOOR SLAB CAST-IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164-1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164-1 DOUBLE SSO.
- 16A SANS 164-1 SSO ON PEDESTAL.
- 16A SANS 164-2 3 PIN SSO.
- 16A SANS 164-1 & 164-2 COMBINATION SSO.
- 16A SANS 164-4 RED SSO (7 SHAVED EARTH PIN)
- 16A SANS 164-4 RED SSO ON PEDESTAL
- 3 PHASE C-FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164-3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

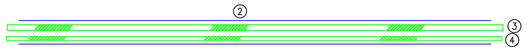
NURSES LIGHTING PLAN
FOURTH FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date

scale 1 : 100 2025/04/15

drawing number

25007_2_105



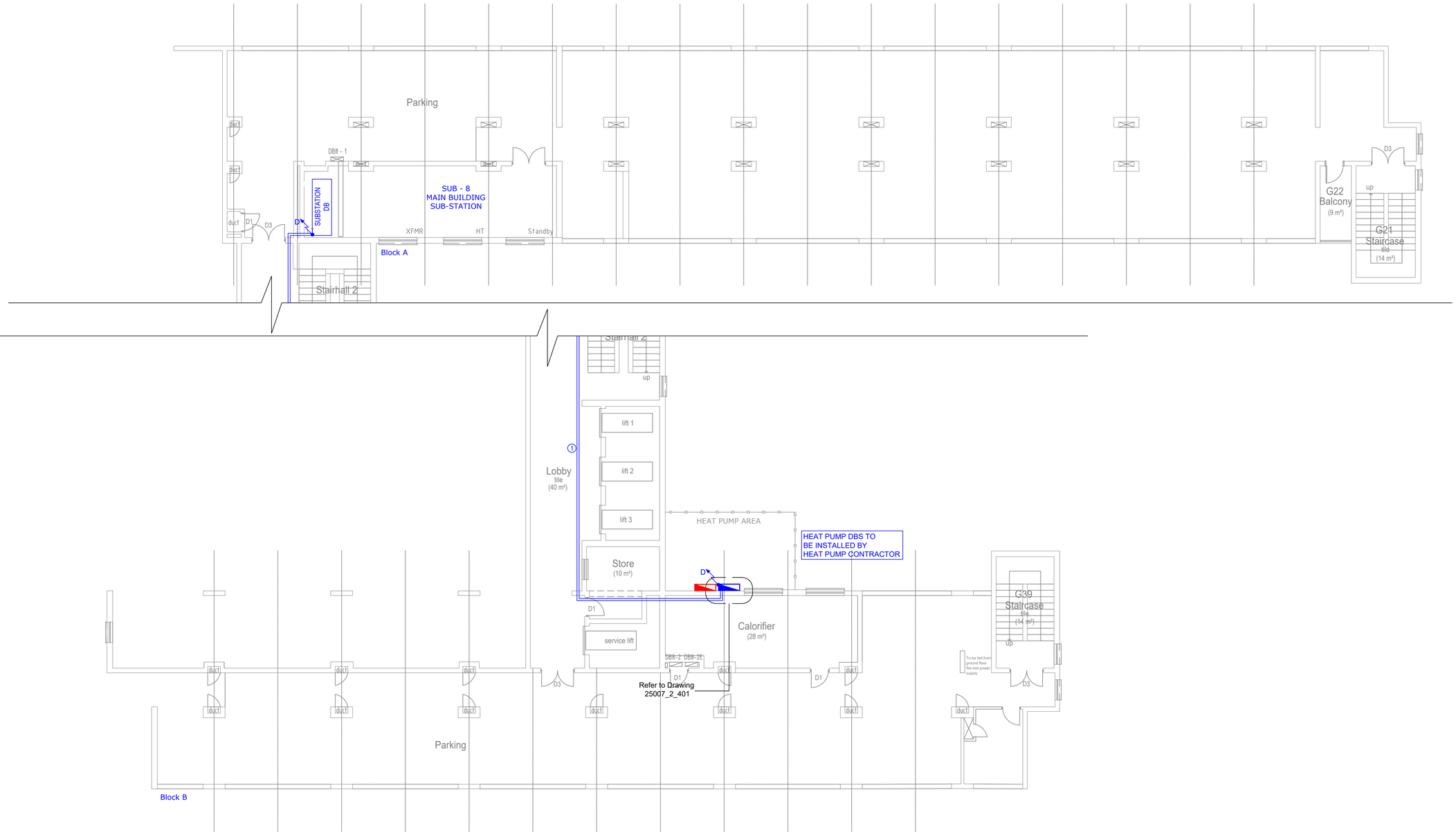
Detail A
NTS

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

The contractor is only to work in areas shown and all areas left blank are not to be worked in

1. Refer to Detail A
2. 100mm Premier Heavy Duty Cable Tray; Hot Dip Galvanized
3. 25mm² 4 core PVC SWA ECC Cable
4. 16mm² 4 Core PVC SWA ECC Cable



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- C CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

DM, CAM etc. ROUND CONDUIT BOX FOR:
DM – DOOR MONITOR
CAM – CAMERA
AA – ACCESS ALARM
AC – ACCESS CONTROL
CR – CARD READER
COM – COMMUNICATION/INTERCOM
BGM – BACK GROUND MUSIC
EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- S SURFIX
- U TWIN AND EARTH
- CABLE ROUTE

- oc OVERHEAD CAST-IN
- os OVERHEAD ON SURFACE OR LAID ON CEILING.
- rc FLOOR SLAB CAST-IN.
- rs FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (0° SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDESTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINARE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINARES
- POLE MOUNTED LUMINARE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- HD^B LUMINARE TYPE "B" – REFER LUMINARE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature | Date

consultant
15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

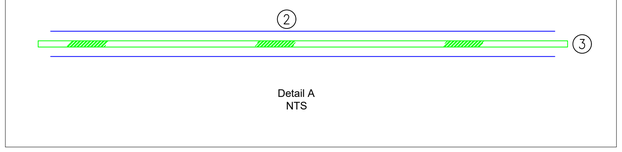
Drawing title

NURSES SMALL POWER PLAN
LOWER GROUND FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number
25007_2_200



① Refer to Detail A

② 16mmx25mm PVC Trunking on soffit and walls

③ 4mm² 2 Core PVC SWA ECC Cable

④ SSO to include USB Port

⑤ Store Isolator in 100x100mm Steel Box mounted on steel(3CR12, 3mm thick) with neon sign for power indication.

⑥ Isolator to be rated IP65

⑦ Isolator for Power Supply

⑧ Supply and Install PM3255

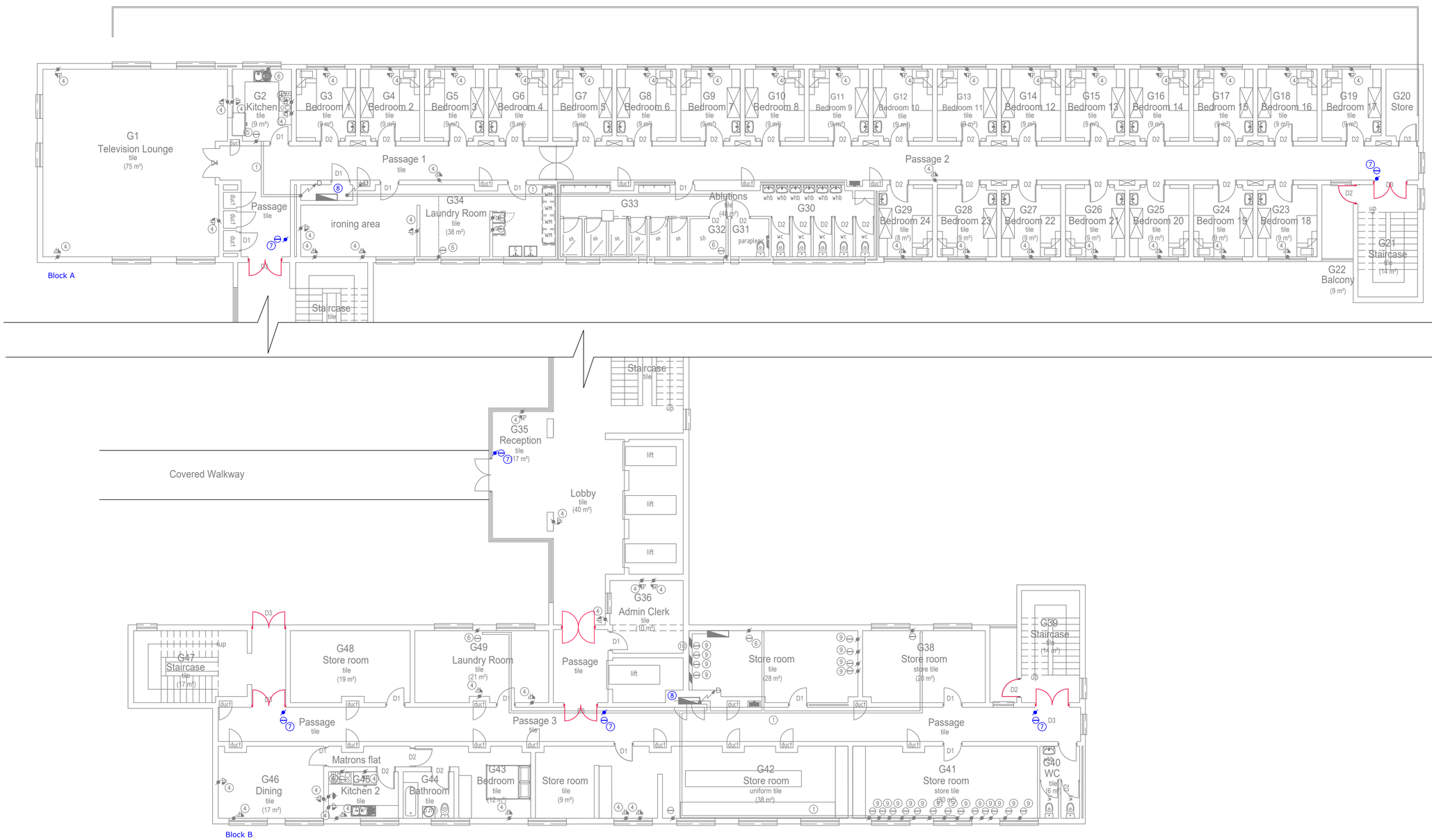
⑨ IP65 rated 35A isolator installed directly below the trunking.

⑩ 50x50mm PVC Trunking complete with clip lock cover.

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

The contractor is only to work in areas shown and all areas left blank are not to be worked in



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

ROUND CONDUIT BOX FOR:
- DM – DOOR MONITOR
- CAM – CAMERA
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC
- EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
- TWIN AND EARTH
- CABLE ROUTE

- OC OVERHEAD CAST–IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST–IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 100 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (0' SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDESTAL.
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

consultant
15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. georget@ukuza.co.za
UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

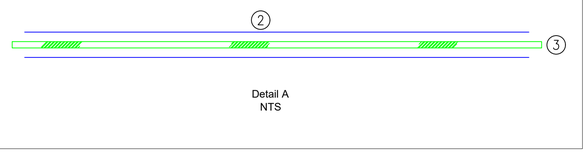
DEPARTMENT OF HEALTH: GREYS HOSPITAL RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

NURSES SMALL POWER PLAN GROUND FLOOR COMPLETION SCOPE

Drawn	CW	Checked	JK
scale	1 : 100	Date	2025/04/15

drawing number 25007_2_201



Detail A
NTS

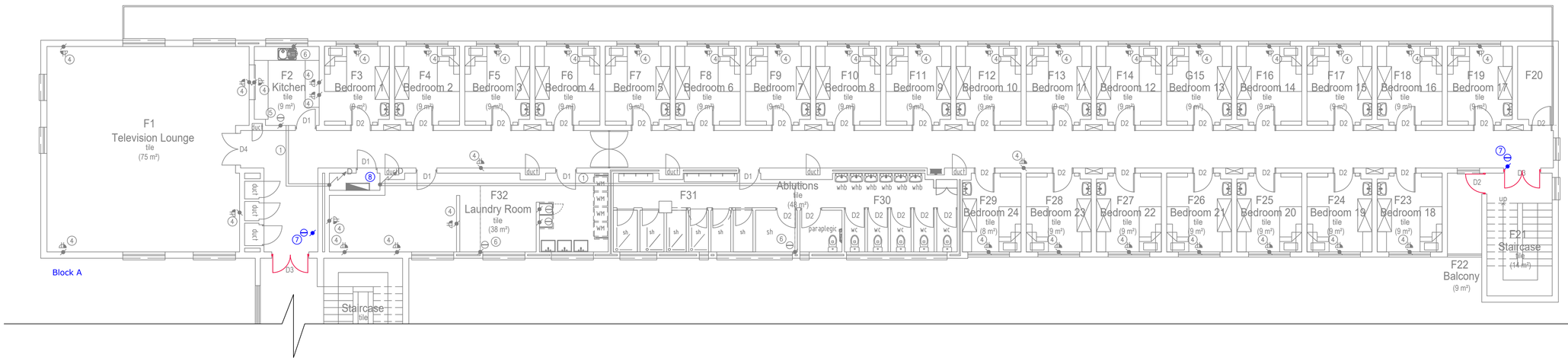
1. Refer to Detail A
2. 16mmx25mm PVC Trunking on soffit and walls
3. 4mm² 2 Core PVC SWA ECC Cable
4. SSO to include USB Port
5. Stove Isolator in 100x100mm Steel Box mounted on steel(3CR12, 3mm thick) with neon sign for power indication.
6. Isolator to be rated IP65
7. Isolator for Power Supply
8. Supply and Install PM3255
9. Conduit installed in void between walls at 1500mm AFFL.
10. P2000 Galvanized Trunking with grey PVC covers at 2800mm AFFL.
11. Conduit installed at 2800mm AFFL.

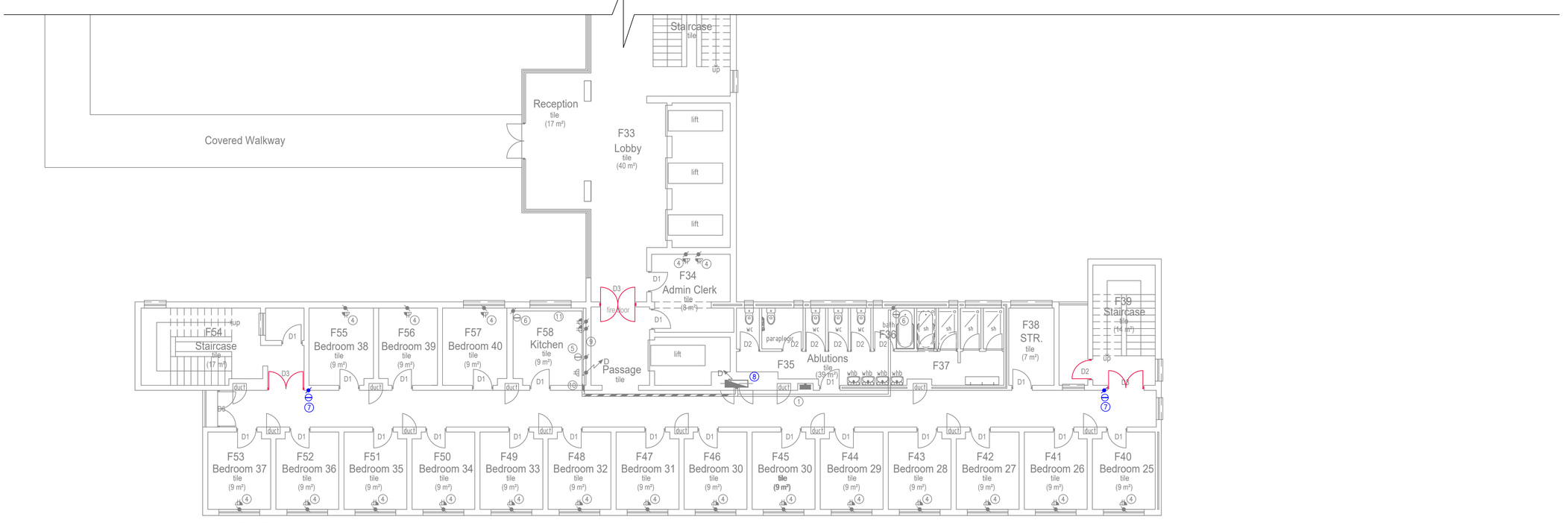
Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation and wired to a 5 amp plug if none exists.

The contractor is only to work in areas shown and all areas left blank are not to be worked in

The contractor is to re-use the existing reticulation





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL.
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- C CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

- DM DAM etc. ROUND CONDUIT BOX FOR:
- DM – DOOR MONITOR
- CAM – CAMERA
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC
- EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- S SURFIX
- U TWIN AND EARTH
- CABLE ROUTE

- oc OVERHEAD CAST-IN
- os OVERHEAD ON SURFACE OR LAID ON CEILING.
- fc FLOOR SLAB CAST-IN.
- fs FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- T TELEPHONE JUNCTION BOX.
- I INTERCOM JUNCTION BOX.
- D DATA/COMMS JUNCTION BOX.
- S SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (3" SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDISTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- S SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- HD^B LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant
15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

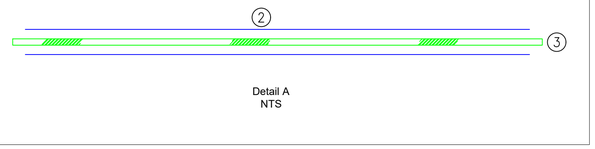
NURSES SMALL POWER PLAN
FIRST FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date

scale 1 : 100 2025/04/15

drawing number

25007_2_202



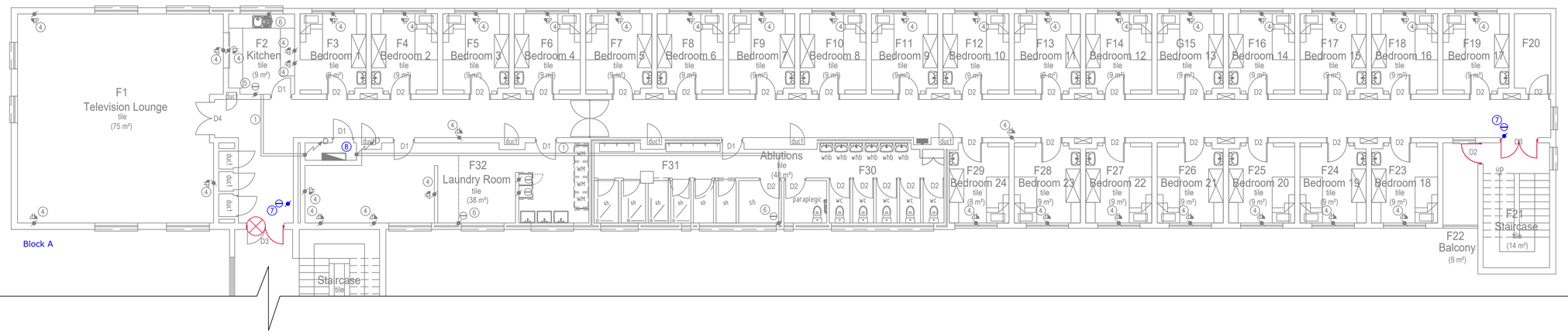
Detail A
NTS

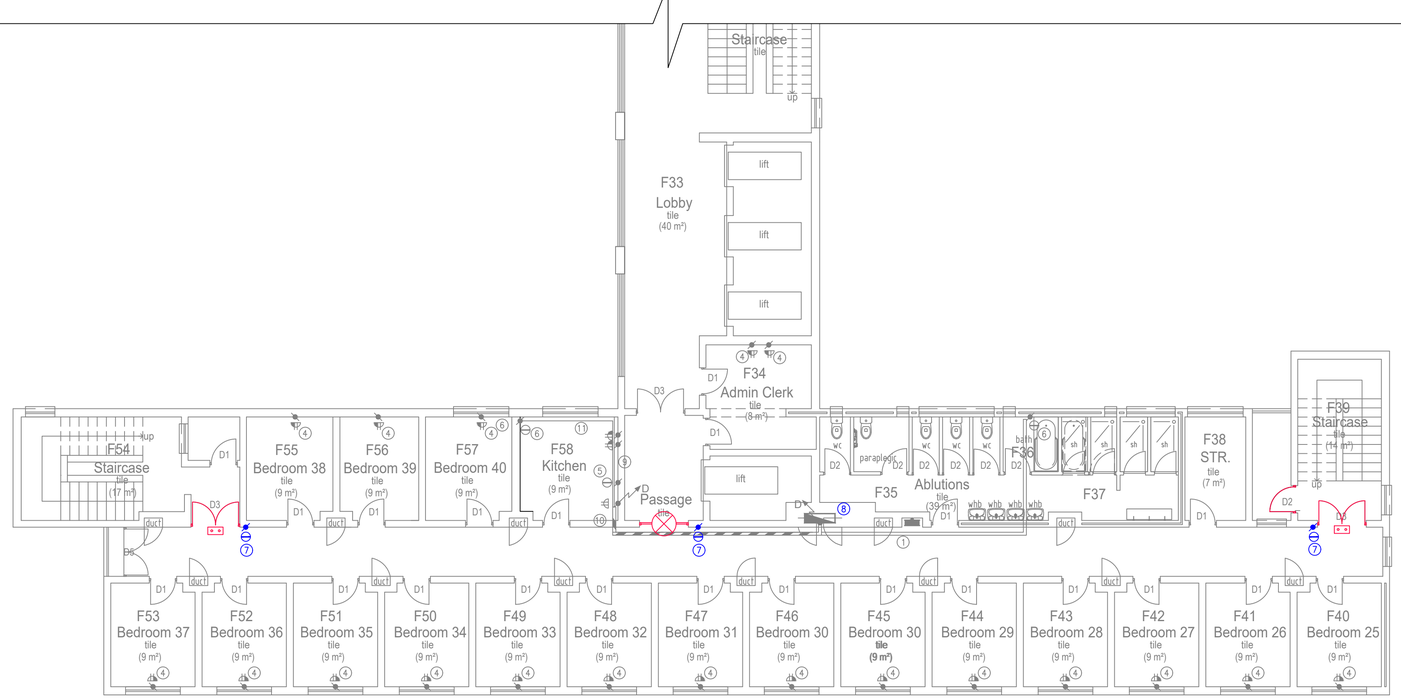
1. Refer to Detail A
2. 16mmx25mm PVC Trunking on soffit and walls
3. 4mm² 2 Core PVC SWA ECC Cable
4. SSO to include USB Port
5. Stove Isolator in 100x100mm Steel Box mounted on steel(3CR12, 3mm thick) with neon sign for power indication.
6. Isolator to be rated IP65
7. Isolator for Power Supply
8. Supply and Install PM3255
9. Conduit installed in void between walls at 1500mm AFFL.
10. P2000 Galvanized Trunking with grey PVC covers at 2800mm AFFL.
11. Conduit installed at 2800mm AFFL.

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation and wired to a 5 amp plug if none exists.

The contractor is only to work in areas shown and all areas left blank are not to be worked in





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL.
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- C CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

ROUND CONDUIT BOX FOR:
DM – DOOR MONITOR
CAM – CAMERA
AA – ACCESS ALARM
AC – ACCESS CONTROL
CR – CARD READER
COM – COMMUNICATION/INTERCOM
BGM – BACK GROUND MUSIC
EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- S SURFIX
- U TWIN AND EARTH
- CABLE ROUTE

- oc OVERHEAD CAST-IN
- os OVERHEAD ON SURFACE OR LAD ON CEILING.
- fc FLOOR SLAB CAST-IN.
- fs FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (7 SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDESTAL.
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- HD^B LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant
15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za
UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

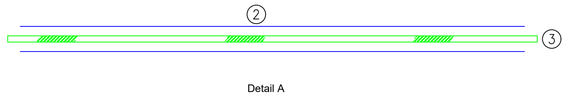
NURSES SMALL POWER PLAN
SECOND FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date

scale 1 : 100 2025/04/15

drawing number

25007_2_203



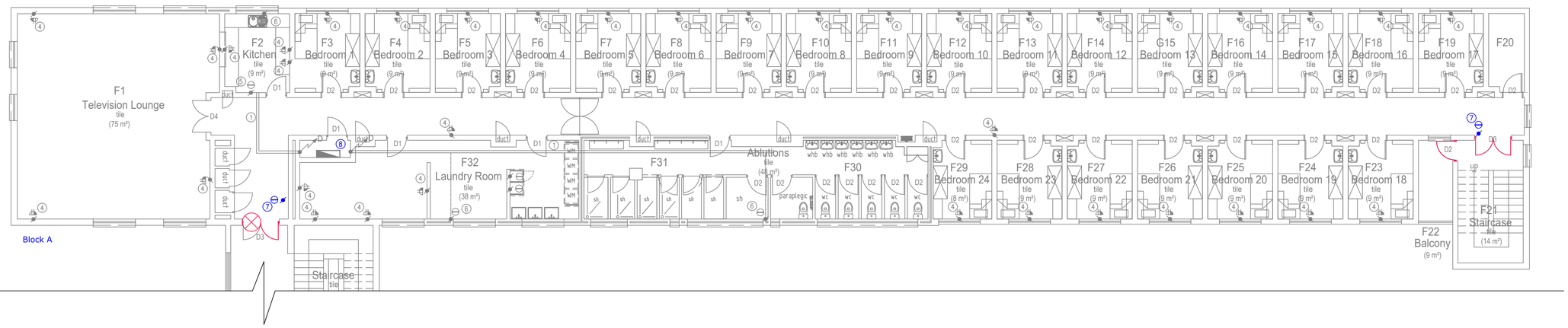
Detail A
NTS

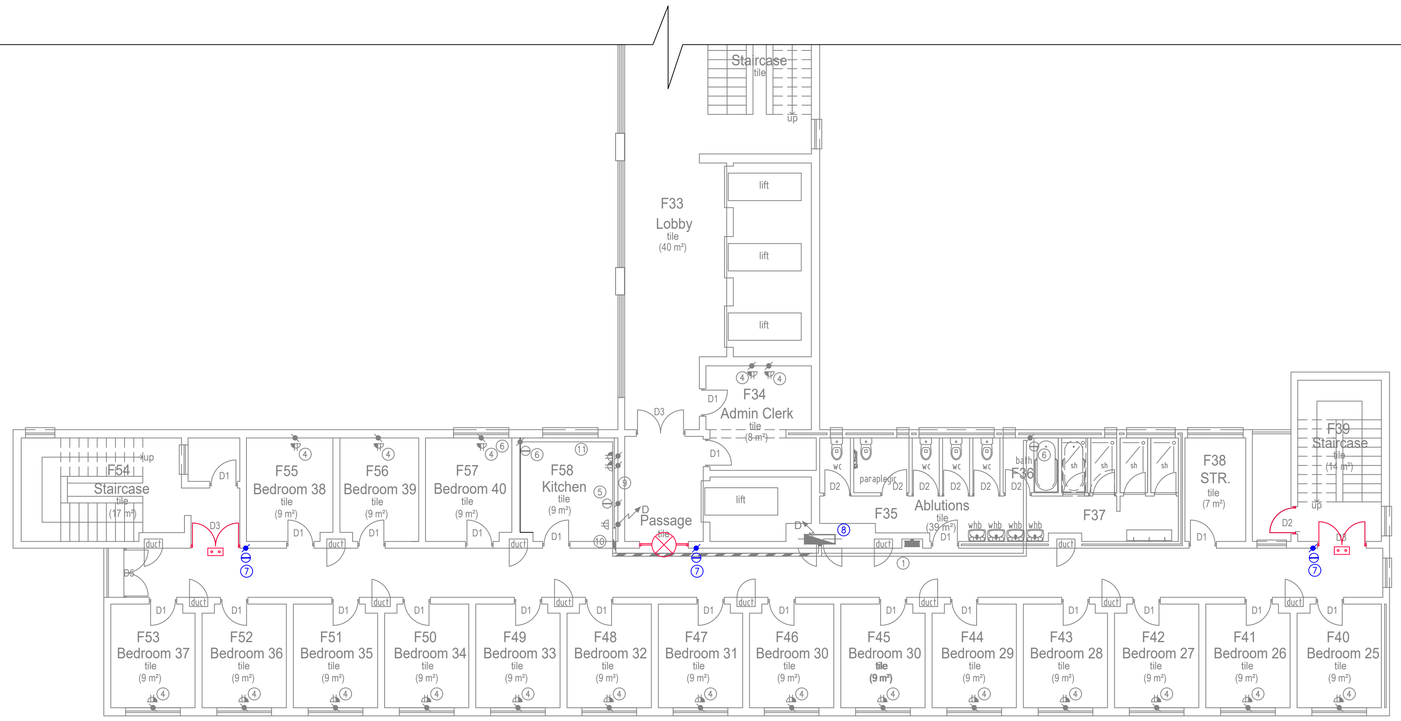
1. Refer to Detail A
2. 16mmx25mm PVC Trunking on soffit and walls
3. 4mm² 2 Core PVC SWA ECC Cable
4. SSO to include USB Port
5. Stove Isolator in 100x100mm Steel Box mounted on steel(3CR12, 3mm thick) with neon sign for power indication.
6. Isolator to be rated IP65
7. Isolator for Power Supply
8. Supply and Install PM3255
9. Conduit installed in void between walls at 1500mm AFFL.
10. P2000 Galvanized Trunking with grey PVC covers at 2800mm AFFL.
11. Conduit installed at 2800mm AFFL.

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation and wired to a 5 amp plug if none exists.

The contractor is only to work in areas shown and all areas left blank are not to be worked in





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL.
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- C CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

ROUND CONDUIT BOX FOR:
DM – DOOR MONITOR
CAM – CAMERA
AA – ACCESS ALARM
AC – ACCESS CONTROL
CR – CARD READER
COM – COMMUNICATION/INTERCOM
BGM – BACK GROUND MUSIC
EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- S SURFIX
- U TWIN AND EARTH
- CABLE ROUTE

- oc OVERHEAD CAST-IN
- os OVERHEAD ON SURFACE OR LAD ON CEILING.
- fc FLOOR SLAB CAST-IN.
- fs FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (7 SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDESTAL.
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #4 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- HD^B LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
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HEALTH DEPARTMENT SIGNATURES

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FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant
15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za
UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

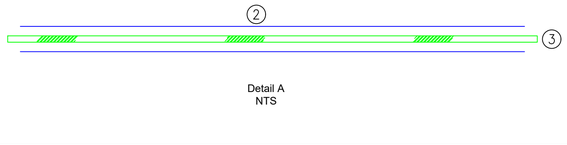
NURSES SMALL POWER PLAN
THIRD FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date

scale 1 : 100 2025/04/15

drawing number

25007_2_204



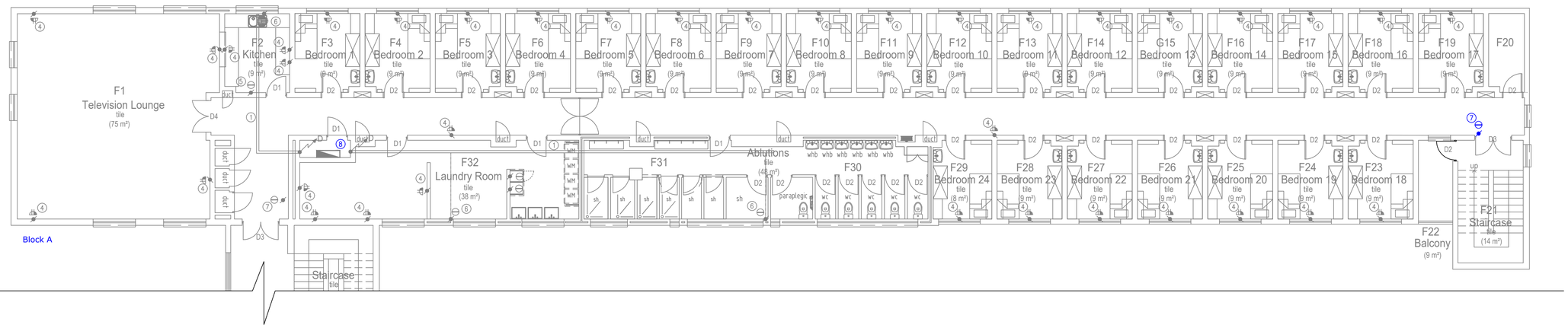
Detail A
NTS

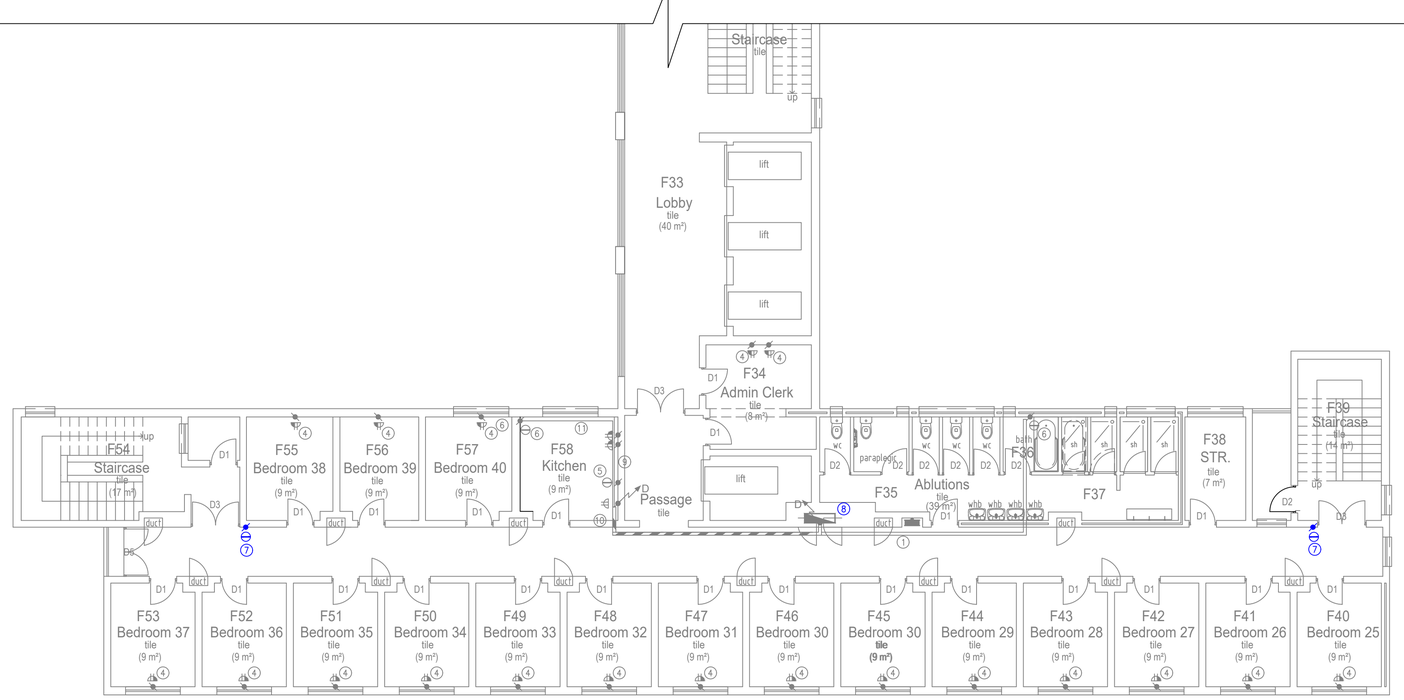
1. Refer to Detail A
2. 16mmx25mm PVC Trunking on soffit and walls
3. 4mm² 2 Core PVC SWA ECC Cable
4. SSO to include USB Port
5. Stove Isolator in 100x100mm Steel Box mounted on steel(3CR12, 3mm thick) with neon sign for power indication.
6. Isolator to be rated IP65
7. Isolator for Power Supply
8. Supply and Install PM3255
9. Conduit installed in void between walls at 1500mm AFFL.
10. P2000 Galvanized Trunking with grey PVC covers at 2800mm AFFL.
11. Conduit installed at 2800mm AFFL.

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation and wired to a 5 amp plug if none exists.

The contractor is only to work in areas shown and all areas left blank are not to be worked in





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL.
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- C CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

- DM CAM etc. ROUND CONDUIT BOX FOR:
- DM – DOOR MONITOR
- CAM – CAMERA
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC
- EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- S SURFIX
- U TWIN AND EARTH
- CABLE ROUTE

- oc OVERHEAD CAST-IN
- os OVERHEAD ON SURFACE OR LAD ON CEILING.
- fc FLOOR SLAB CAST-IN.
- fs FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (7 SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDESTAL.
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- HD^B LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature Date

consultant
15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za
UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

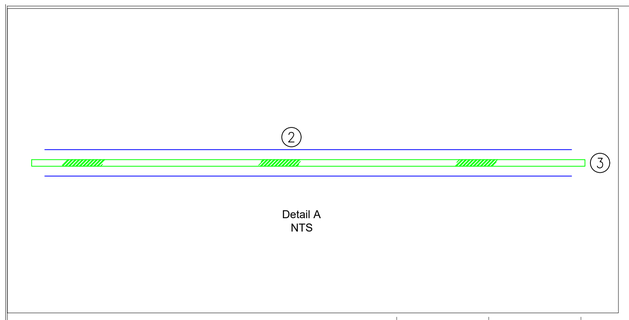
NURSES SMALL POWER PLAN
FOURTH FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date

scale 1 : 100 2025/04/15

drawing number

25007_2_205

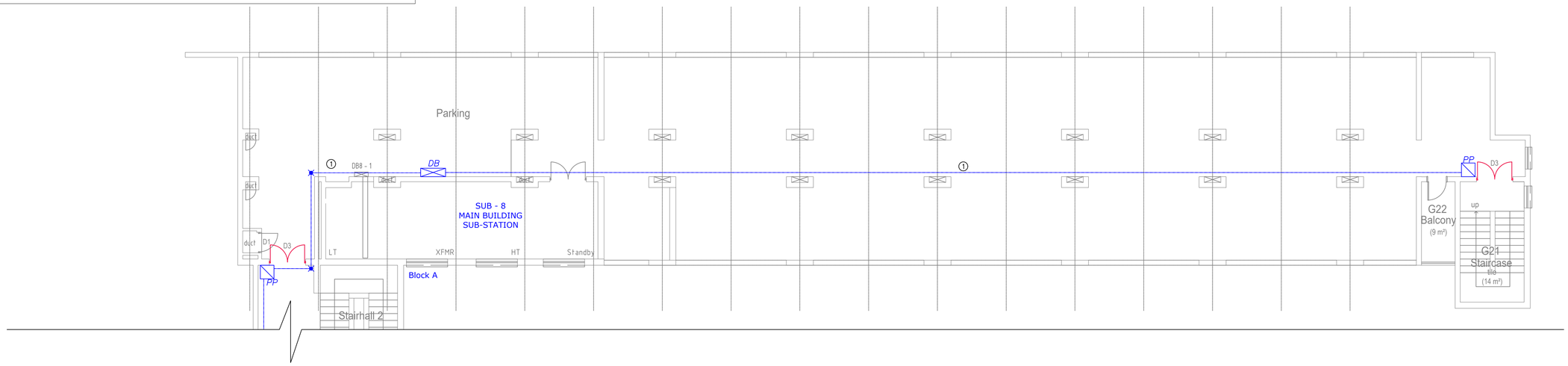


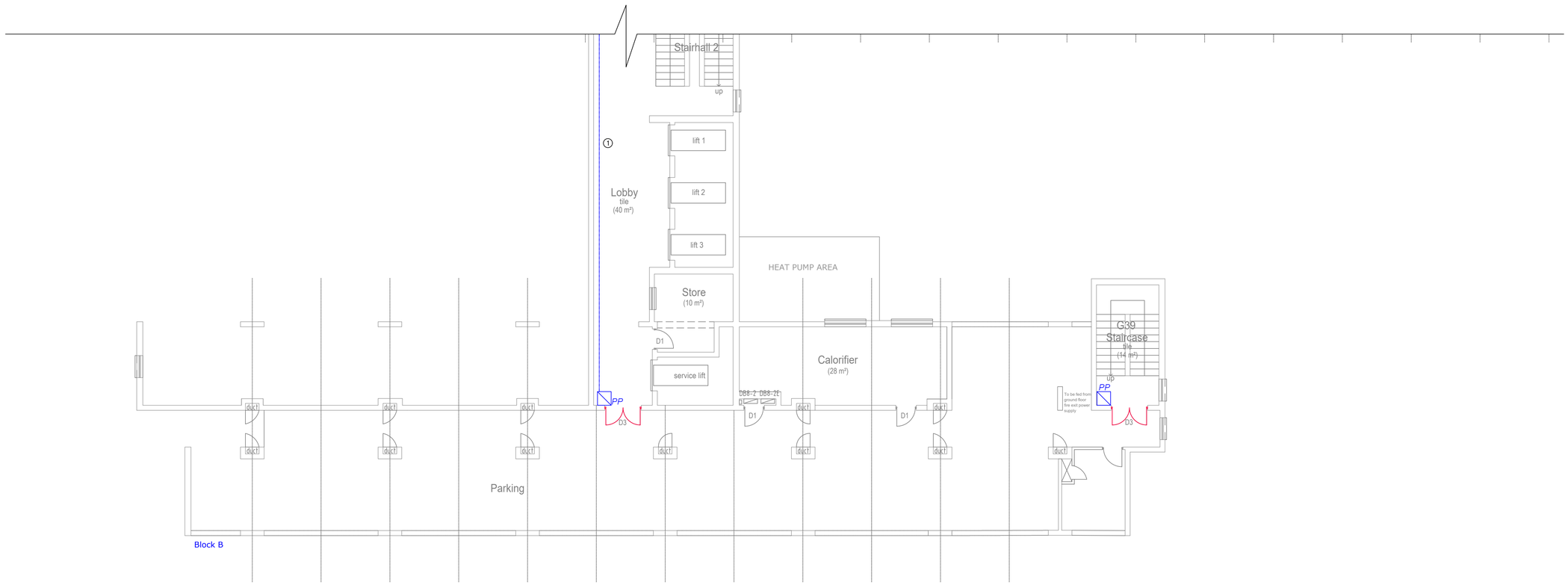
1 Refer to Detail A

2 20mm Galvanised Conduit

3 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S1 100x100 CONDUIT BOX AT 500AFFL.
- S2 100x100 CONDUIT BOX AT 1400AFFL.
- L 100x50 CONDUIT BOX
- L1 100x50 CONDUIT BOX AT 300AFFL.
- L2 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- 150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE
- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- 6 CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB-1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.
- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR
- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X-RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR
- F 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- SECURITY CONTROL PANEL/JUNCTION BOX
- ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FP FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM – CAMERA
- ER – ELECTRIC RELEASE
- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- CR ACCESS CONTROL CARD READER
- POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- ED – EXIT OVERRIDE
- AO – ALARM OVERRIDE
- COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
- TALK-BACK WALL MOUNTED LOUDSPEAKER
- COLUMN SPEAKER
- AT ATTENUATOR
- MU MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SU SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
- CEILING MOUNTED MICROPHONE
- MICROPHONE
- RADIO MICROPHONE
- FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

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WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

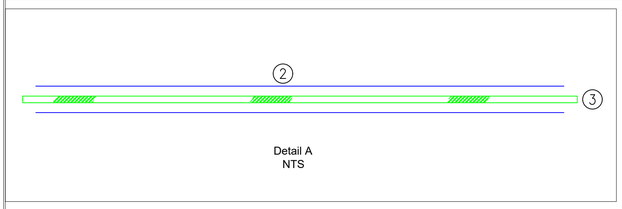
NURSES ELECTRONICS PLAN
LOWER GROUND FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number

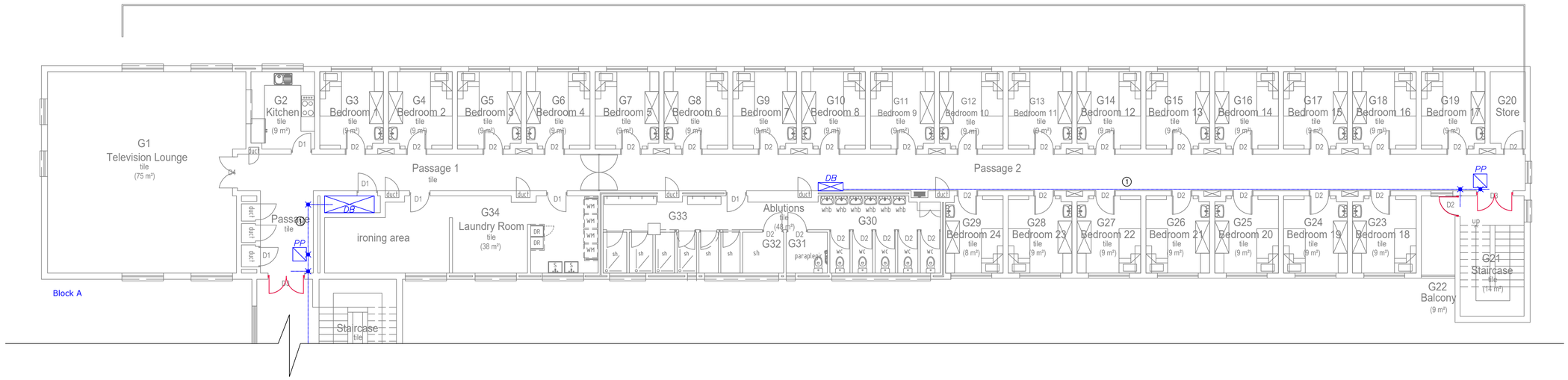
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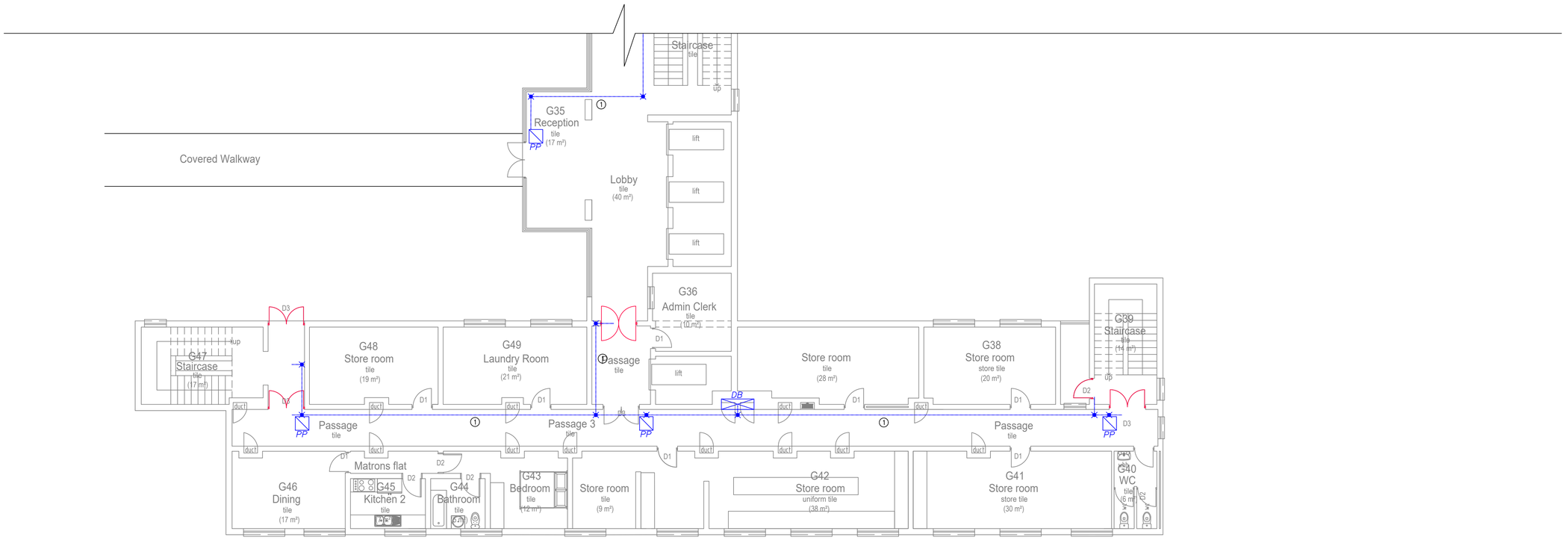


Detail A
NTS

1. Refer to Detail A
2. 20mm Galvanised Conduit
3. 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

S 100x100 CONDUIT BOX.
S 100x100 CONDUIT BOX AT 500AFFL.
S 100x100 CONDUIT BOX AT 1400AFFL.
L 100x50 CONDUIT BOX
L 100x50 CONDUIT BOX AT 300AFFL.
L 100x50 CONDUIT BOX AT 1400AFFL.
ROUND CONDUIT BOX.
ROUND DRAW BOX
S 100x100 DRAW BOX

P 100x50 BOX BEHIND POWER SKIRTING
CONDUIT TURNED UP ("D" FOR DOWN)
DOWN CONDUCTOR TO EARTH OR EARTH TIE.
150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
SECTION OF CONDUIT OMITTED FOR CLARITY
20mm. DIA. CONDUIT.
25mm. DIA. CONDUIT.
32mm. DIA. CONDUIT.
50mm. DIA. CONDUIT.

OC OVERHEAD CAST-IN
OS OVERHEAD ON SURFACE OR LAID ON CEILING.
FC FLOOR SLAB CAST-IN.
POWER SKIRTING
TRUNKING
CABLE SLEEVE.
CABLE TRAY/LADDER
POWER CABLE

REFERENCE TO QUANTITY i.e. 3No.
2 REFERENCE TO A DETAIL i.e. DETAIL 2.
4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
#34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
6 CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS

TELEPHONE JUNCTION BOX.
INTERCOM JUNCTION BOX.
DATA/COMMS JUNCTION BOX.
SECURITY, ETC. JUNCTION BOX
DISTRIBUTION BOARD POSITION.
DB–1 BOARD DESIGNATION NUMBER.
TELEPHONE POINT.
DATA/COMMS OUTLET.

CCTV CAMERA
CCTV CAMERA ON AUTO PANNING MOUNT
CCTV CAMERA ON PAN & TILT MOUNT
CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
CCTV CAMERA FIELD OF VIEW
PASSIVE INFRARED CURTAIN DETECTOR

INFRARED BEAM TRANSMITTER AND RECEIVER
INFRARED OR ULTRASONIC MOTION DETECTOR
DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
X-RAY INSPECTION MACHINE OR LETTER/PARCEL BOMB /EXPLOSIVE DETECTOR
WALK THROUGH METAL DETECTOR

P 220 VOLT POWER OUTLET FACILITY
S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
SECURITY CONTROL PANEL/JUNCTION BOX
ELECTRIC LOCK/STRIKE
KEY SWITCH
FLOOR PEDAL SWITCH
SPRING RETURN PUSH BUTTON/LEVER RELEASE
DM – DOOR MONITOR
CAM– CAMERA
ER – ELECTRIC RELEASE

EL – ELECTRIC LOCK/STRIKE
MA – MOTION ALARM
CR ACCESS CONTROL CARD READER
POLE MOUNTED ACCESS CONTROL CARD READER
VEHICLE BARRIER BOOM CONTROLLER
AA – ACCESS ALARM
AC – ACCESS CONTROL
CR – CARD READER
EO – EXIT OVERRIDE
AO – ALARM OVERRIDE

COMMUNICATION PANEL/JUNCTION BOX
INTERCOM MASTER STATION
INTERCOM SLAVE/SUBSTATION
INTERCOM CALL PUSH BUTTON UNIT
HORN/TRUMPET LOUDSPEAKER
CEILING FLUSH MOUNTED LOUDSPEAKER
WALL MOUNTED LOUDSPEAKER
TALK–BACK WALL MOUNTED LOUDSPEAKER

COLUMN SPEAKER
AT ATTENUATOR
MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
SU SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
FM OR AM ANTENNA AS SPECIFIED
SOUND EQUIPMENT – CABINET RACK

COM – COMMUNICATION/INTERCOM
BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
CEILING MOUNTED MICROPHONE
MICROPHONE
RADIO MICROPHONE

FIRE ALARM PANEL/JUNCTION BOX
ALARM BELL
SMOKE IONISATION DETECTOR
HEAT DETECTOR
B BREAK GLASS UNIT

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature Date

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Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
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UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

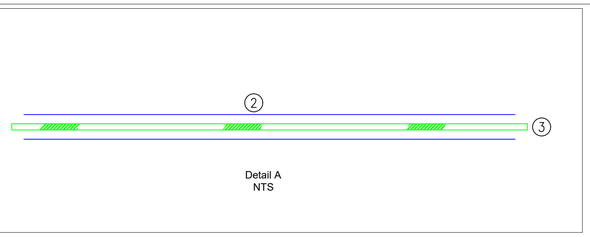
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NURSES ELECTRONICS PLAN
GROUND FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_2_301



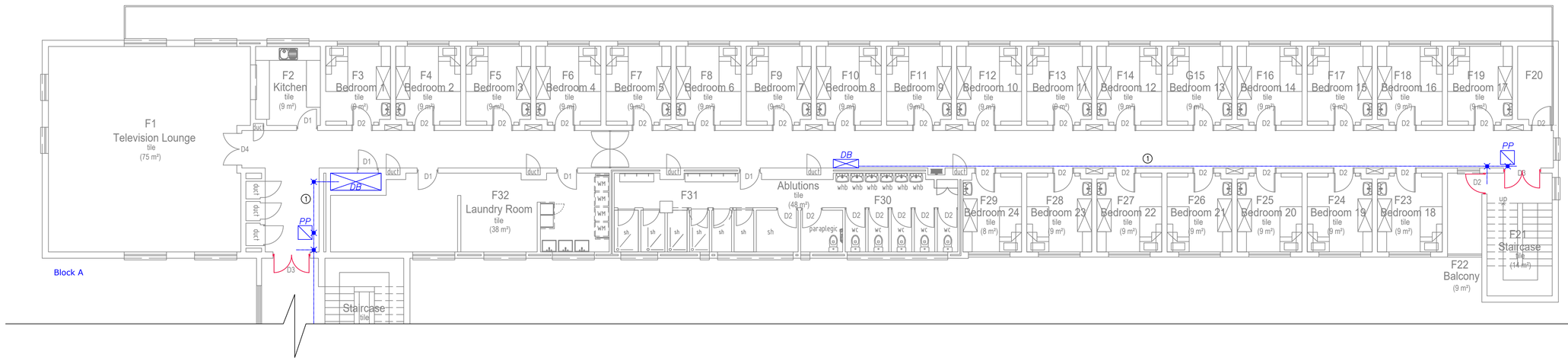
Detail A
NTS

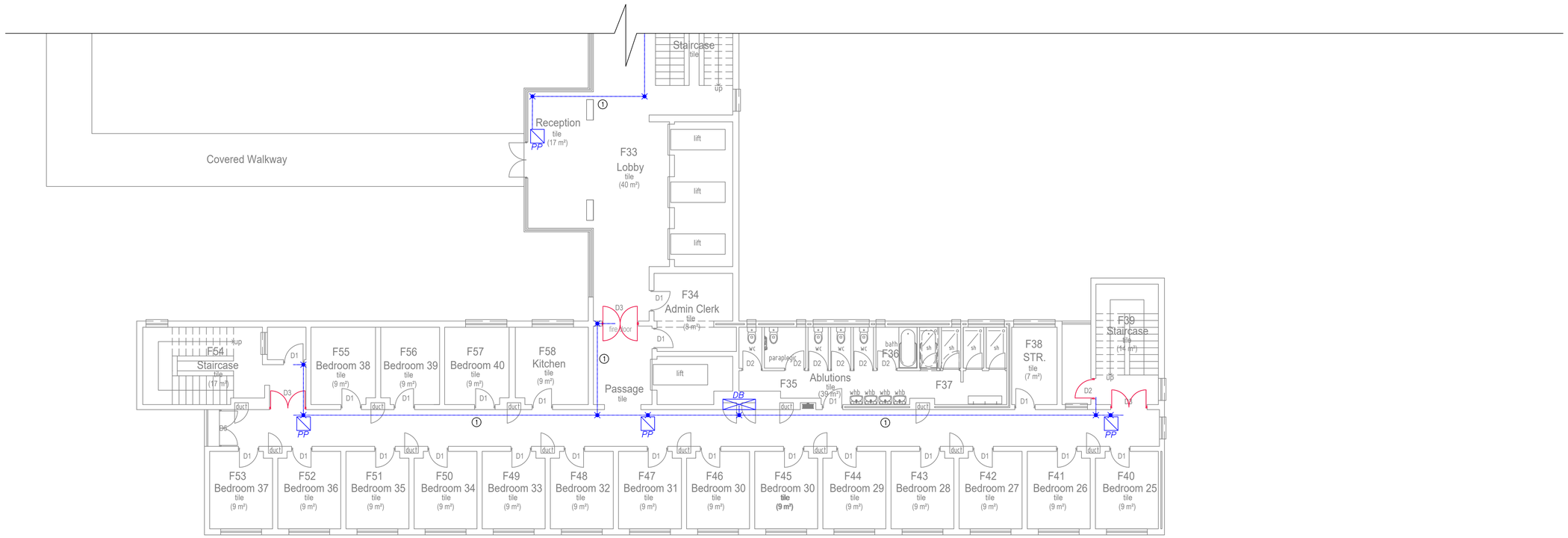
1 Refer to Detail A

2 20mm Galvanised Conduit

3 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL.
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- T 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- S 100x100 DRAW BOX

- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- 150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.

- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
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- POWER CABLE

- REFERENCE TO QUANTITY i.e. 3No.
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- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- 6 CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS

- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.

- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR

- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X-RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR

- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- SECURITY CONTROL PANEL/JUNCTION BOX
- ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FP FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE

- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- ACCESS CONTROL CARD READER
- POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- ED – EXIT OVERRIDE
- AO – ALARM OVERRIDE

- COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
- TALK–BACK WALL MOUNTED LOUDSPEAKER

- COLUMN SPEAKER
- AT ATTENUATOR
- MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- MJ
- SU SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK

- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
- CEILING MOUNTED MICROPHONE
- MICROPHONE
- RADIO MICROPHONE

- FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

No.	DATE	AMENDMENT	Issued By
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WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

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Westville,
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UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

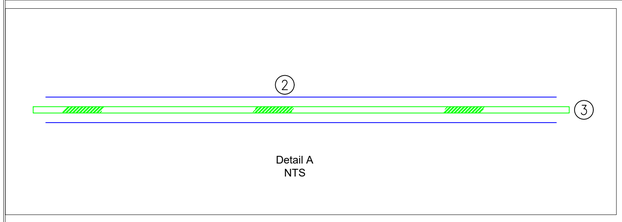
NURSES ELECTRONICS PLAN
FIRST FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date

scale 1 : 100 2025/04/15

drawing number

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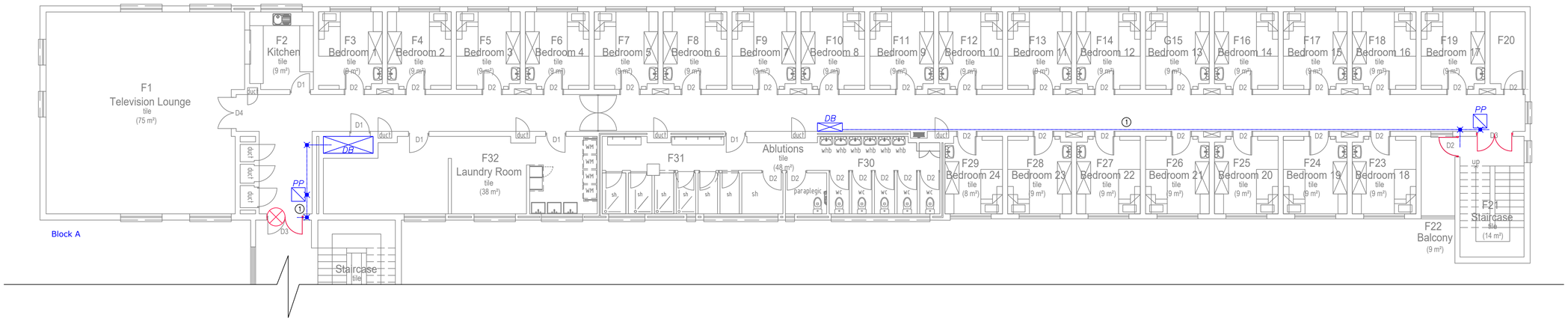
Detail A
NTS

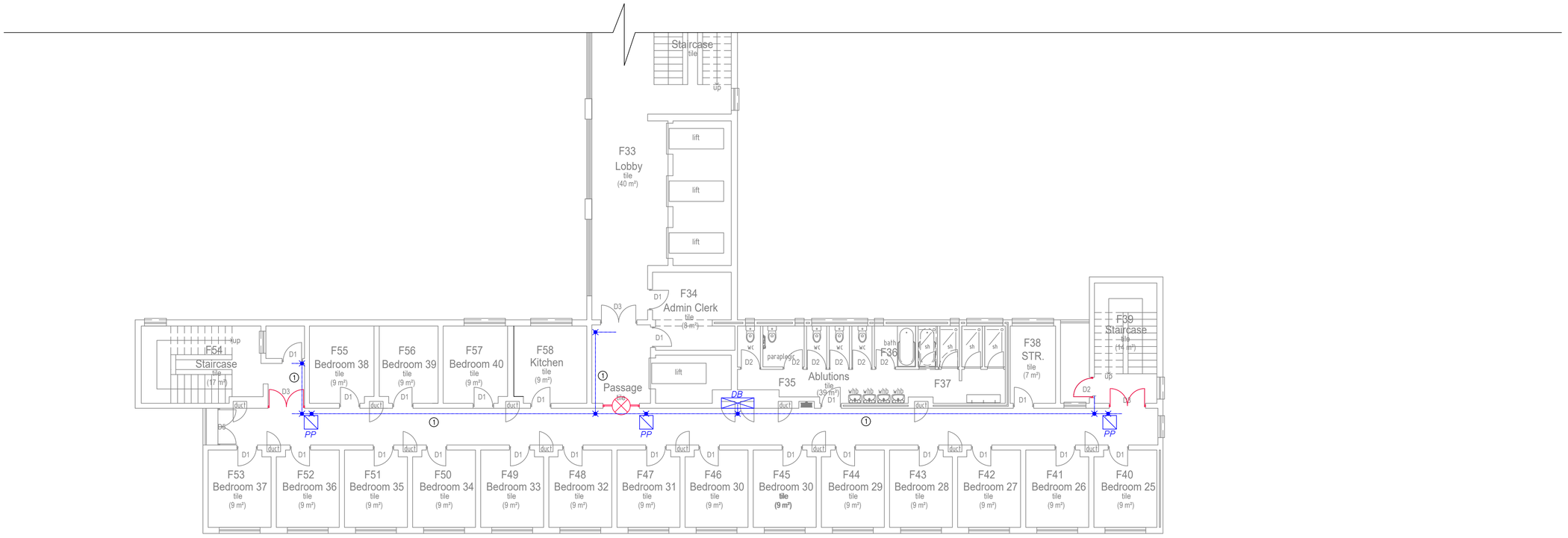
1 Refer to Detail A

2 20mm Galvanised Conduit

3 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL.
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- 100x100 DRAW BOX

- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.

- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS

- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.

- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR

- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X-RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR

- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- SECURITY CONTROL PANEL/JUNCTION BOX
- ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE

- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- ACR – ACCESS CONTROL CARD READER
- PCR – POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- EO – EXIT OVERRIDE
- AO – ALARM OVERRIDE

- COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
- TALK–BACK WALL MOUNTED LOUDSPEAKER

- COLUMN SPEAKER
- AT ATTENUATOR
- MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SU SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK

- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
- CEILING MOUNTED MICROPHONE
- MICROPHONE
- RADIO MICROPHONE

- FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature Date

consultant

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Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

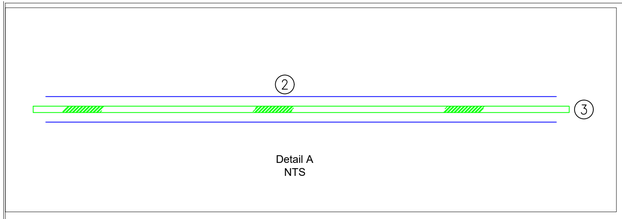
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NURSES ELECTRONICS PLAN
SECOND FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

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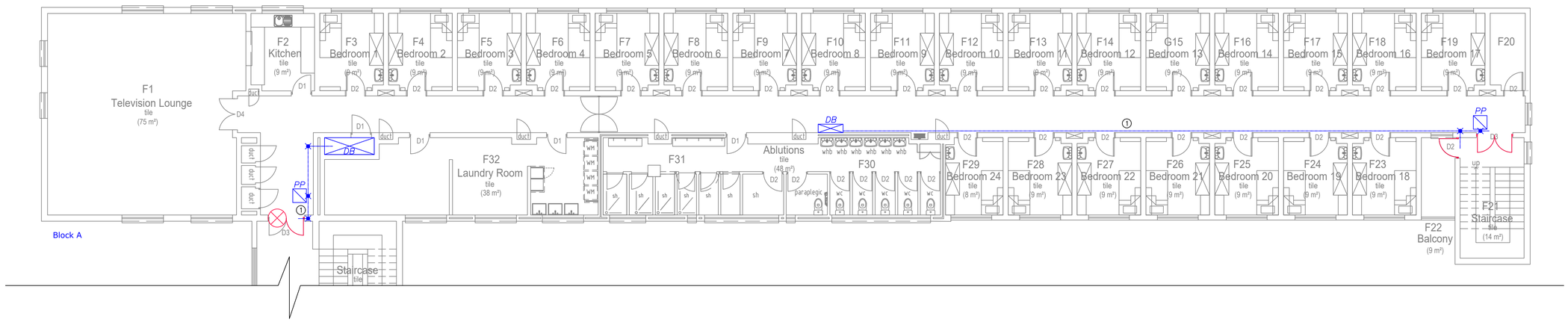
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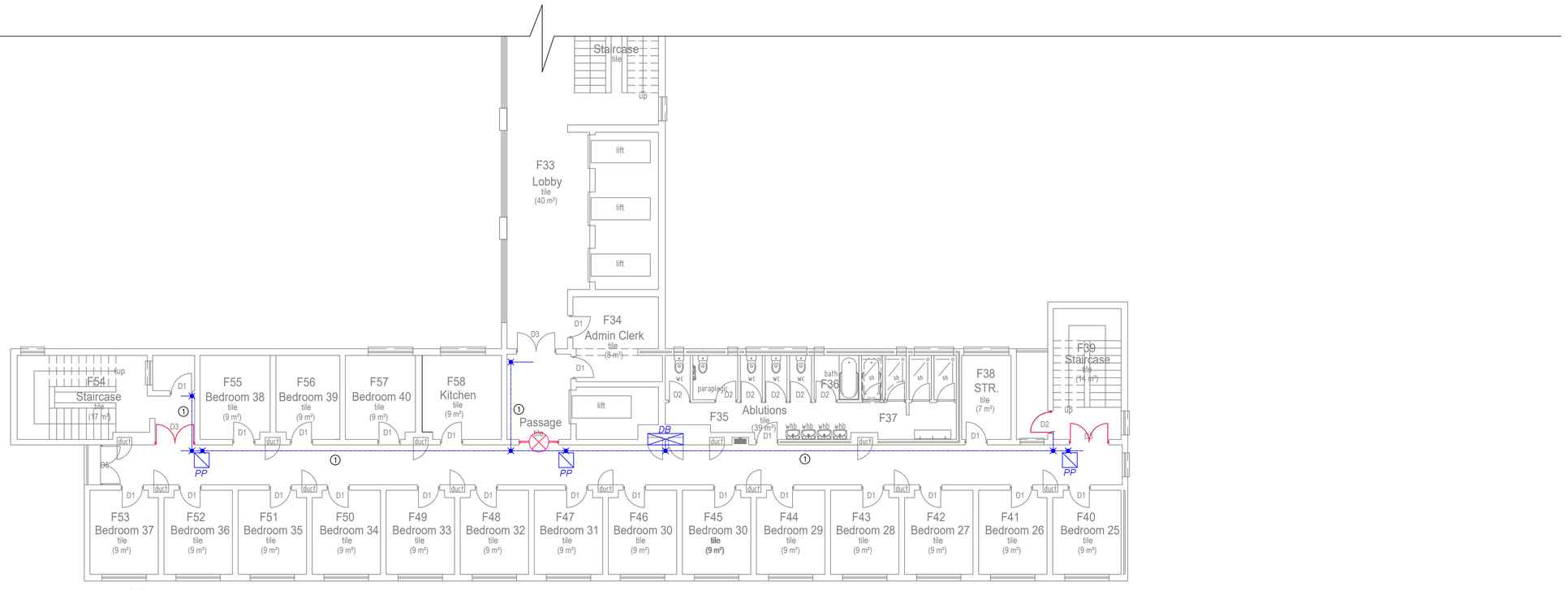


Detail A
NTS

1. Refer to Detail A
2. 20mm Galvanised Conduit
3. 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah





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- ROUND CONDUIT BOX.
- ROUND DRAW BOX
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- KEY SWITCH
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- HORN/TRUMPET LOUDSPEAKER
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- COLUMN SPEAKER
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- MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
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- SU SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
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- CEILING MOUNTED MICROPHONE
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HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature Date

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Westville,
Durban, 3630
Tel. 031 265 0444
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UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

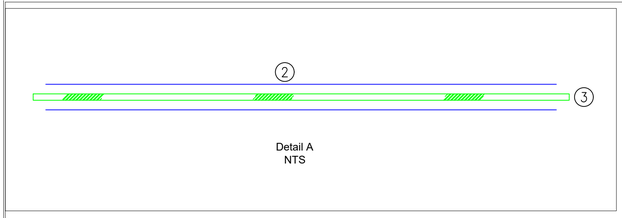
Project
DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title
NURSES ELECTRONICS PLAN
THIRD FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

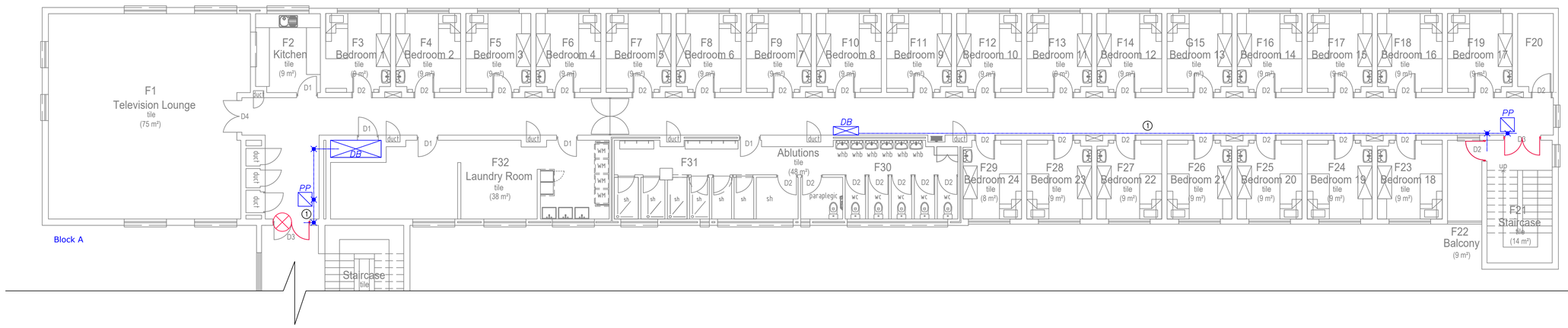
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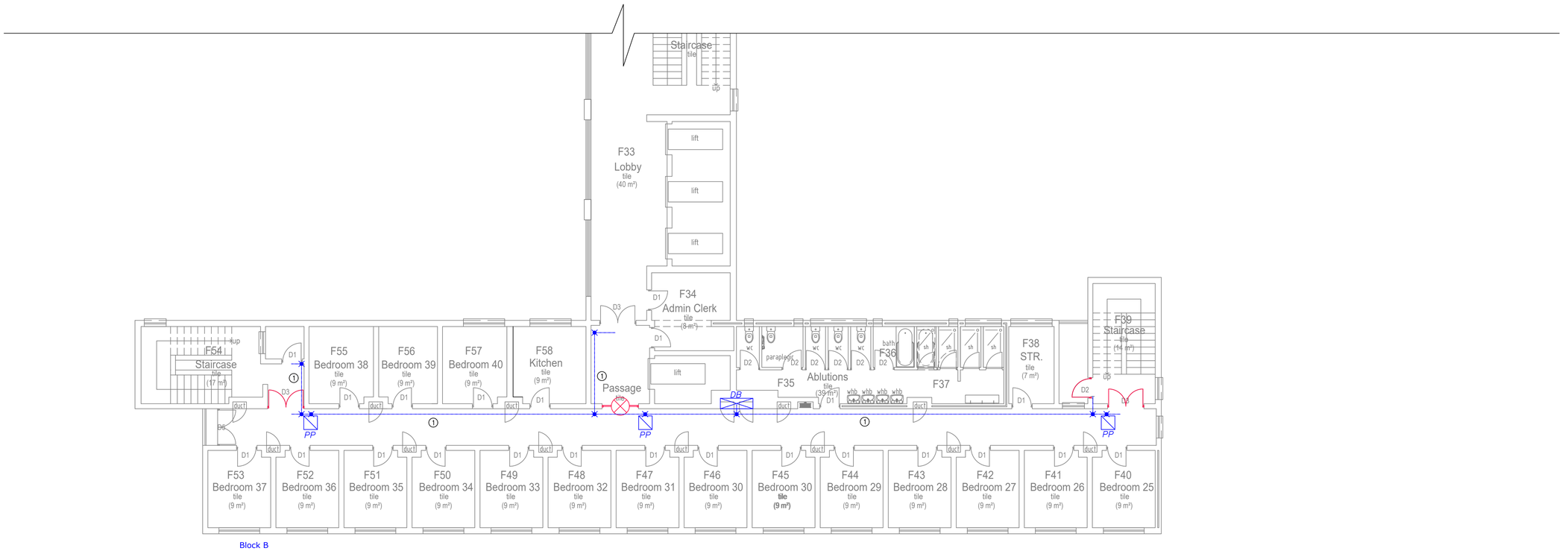
drawing number
25007_2_304



1. Refer to Detail A
2. 20mm Galvanised Conduit
3. 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL.
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- T 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- S 100x100 DRAW BOX

- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- 150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.

- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE

- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- 6 CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS

- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB-1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.

- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR
- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X-RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR

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- ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FP FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE

- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- CR ACCESS CONTROL CARD READER
- POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- EO – EXIT OVERRIDE
- AO – ALARM OVERRIDE

- COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
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- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
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- FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature Date

consultant
15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. georget@ukuza.co.za
UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

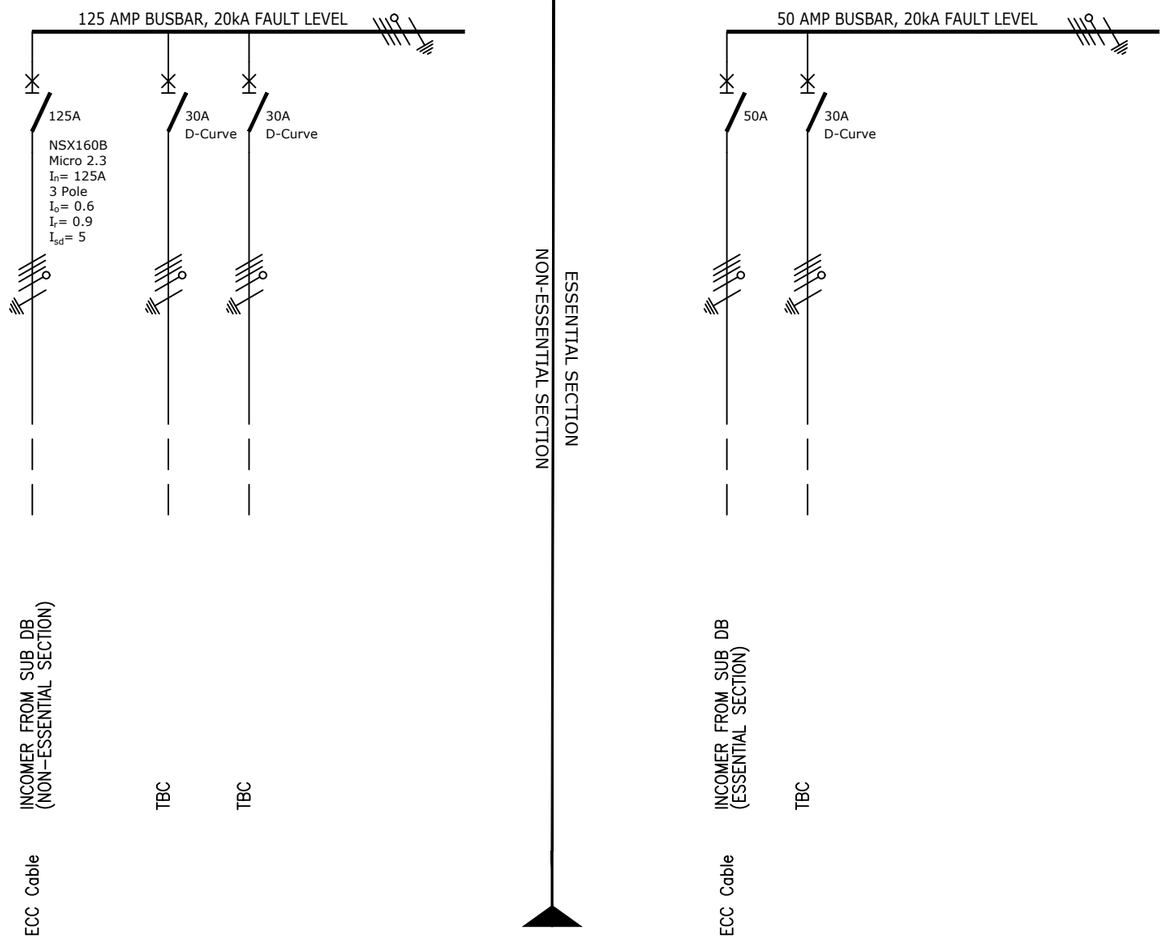
Project
DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title
NURSES ELECTRONICS PLAN
FOURTH FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

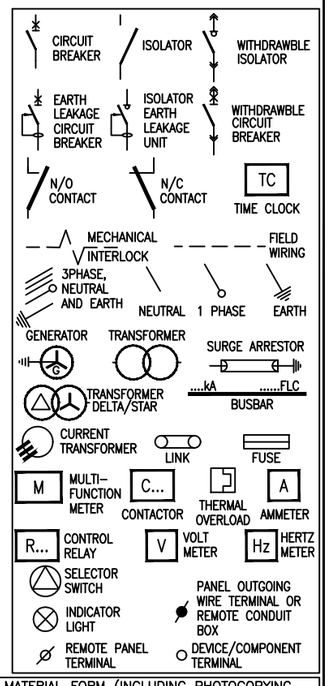
drawing number
25007_2_305



NOTES

1) DROPPERS/TAILS TO BE RATED FOR FULL i^2t LET THROUGH.
2) HARNESSED WIRING TO BE DERATED.
3) TUFFNOL BRACES ARE NOT TO BE USED ABOVE 10kA.
4) COPPER BUSBARS TO BE CONTINUOUS RATED.
5) ALL OUTGOING CIRCUIT BREAKERS TO BE FITTED WITH COPPER TAILS TO FACILITATE CABLE TERMINATIONS IN THE CABLE CHAMBER AND NOT ON THE CIRCUIT BREAKER.
6) COPPER TAILS FROM DROPPER BUSBAR AND OUTGOING COPPER TAILS TO BE ADEQUATELY BRACED FOR FAULT LEVEL AND SHROUDED WITH HEAT SHRINK.
7) ALL CIRCUIT BREAKERS TO BE FITTED WITH TERMINAL SHIELD ON LIVE AND LOAD SIDES.
8) PHASING RWB, TOP TO BOTTOM, LEFT TO RIGHT, BACK TO FRONT.
9) INTERNAL TEMP TO BE LIMITED TO 5° ABOVE AMBIANT, MAX 40°C.
10) ALL CIRCUITS TO BE LABELED.
11) 25% SPARE SPACE. SPARE SPACES ARE TO BE FITTED WITH COPPER BUSBAR TAILS CONNECTED TO DROPPER BUSBARS TO ALLOW INSTALLATIONOF CIRCUIT BREAKERS WITH A MINIMAL SHUTDOWN PERIOD.

PANEL: RED	- ESSENTIAL
ORANGE	- NON-ESSENTIAL
INCOMING CABLE	-BUSBAR / TOP
OUTGOING CIRCUITS	-CABLES / TOP
COLOUR	-
MOUNTING	-SURFACE
ACCESS	-FRONT / REAR
PROTECTIVE DEVICES	-SCHNEIDER
ACB's (1250A-4000A)	-MASTERPACT NW
MCCB'S(800A - 1000A)	-COMPACT NS
MCCB'S(60A-630A)	-EASYPACT CSV
MCB's	-MULTI 9, TYPE 2
CONTACTORS	-AC3 HEAVY DUTY
METERS	-SCHNEIDER



NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF REABOW CONSULTING ENGINEERS.

REV	DESCRIPTION	BY	DATE	CHKD.
0	Completion Scope	RM	15/04/25	JK

ENGINEER: JK	DRAWN: RM	DATE: May'22	SCALE: NTS	CHKD.: JK
			PAPER SIZE: A3	
PROJECT No.: 25007_2	DRAWING No.: 401	SHEET: 1 of 1	REV.: 0	
File Name :	Lyr:			

PROJECT:
Grey's Hospital Renovations & Upgrade to Nurses and Doctors Accommodation

DRAWING TITLE:
DB-Heat Pump
Nurses Quarters - Completion Scope
Single Line Diagram

UKUZA CONSULTING (PTY) LTD

Type		Description	Installation	Lamps		Location	Comments
				Type	Colour		
A		Slim Line Linear 2ft 20W 120lm/W 4000K	Surface Mounted	20W LED	4000K	Nurses rooms	Fittings to have 5yr warranty
B		Slim Line Linear 5ft 60W 120lm/W 4000K	Surface Mounted	60W LED Vapour Proof	4000K	Kitchens/Laundy rooms	Fittings to have 5yr warranty
C		IP65 Triproof 2ft 20W Surface Mount / suspended IK08 130lm/W 4000K	Surface Mounted	20W LED	4000K	Ablutions /Plantrooms	Fittings to have 5yr warranty
D		Foot Light	Recessed in wall	8.5W LED	4000K	Corridors	Fittings to have 5yr warranty
E		60W LED Panel 1200x600 3000K Backlit 110 lm/W cordset	Recessed in ceiling	60W LED	3000K	Lobbies/Reception Areas	Fittings to have 5yr warranty

REV	DESCRIPTION	BY	DATE	CHKD
0	Original Isuue	TM	22/04/25	JK

ENGINEER:	DRAWN:	DATE:	CHKD	P SIZE
JK	TM	April '25	JK	A4
PROJ No.:		DWG No	REV	SCALE
22023_2		600	0	n.t.s

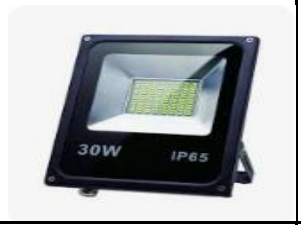
FILE NAME: SHEET: 1 of 2

TITLE:

Greys Hospital - Completion Contract

Nurses Luminaire Schedule

IBUYA Consulting Engineers
"POWERING DEVELOPMENT"
BLOCK D
ESSEX PARK
46 ESSEX TERRACE
WESTVILLE
P.O. BOX 1692
WANDSBECK 3631
TEL: +27 (031) 2667831
FAX: +27 (031) 2667831
E-mail: ibuya@ibuya.co.za

Type		Description	Installation	Lamps		Location	Comments
				Type	Colour		
F		16W LED Bulkhead white trim 90lm/W Opal Diffuser	Surface Mounted	16W LED	4000K	Passages	Fittings to have 5yr warranty
G		IP65 flood light	Surface Mounted	30W LED	4000K	Heat pump area	Fittings to have 5yr warranty
H		4ft IP65 Vapour Proof Integrated	Surface Mounted	35W LED	4000K	Parking	Fitting to have a 5yr warranty

REV	DESCRIPTION	BY	DATE	CHKD
0	Original Isuue	TM	22/04/25	JK

ENGINEER:	DRAWN:	DATE:	CHKD	P SIZE
JK	TM	April '25	JK	A4
PROJ No.:		DWG No	REV	SCALE
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FILE NAME: SHEET: 2 of 2

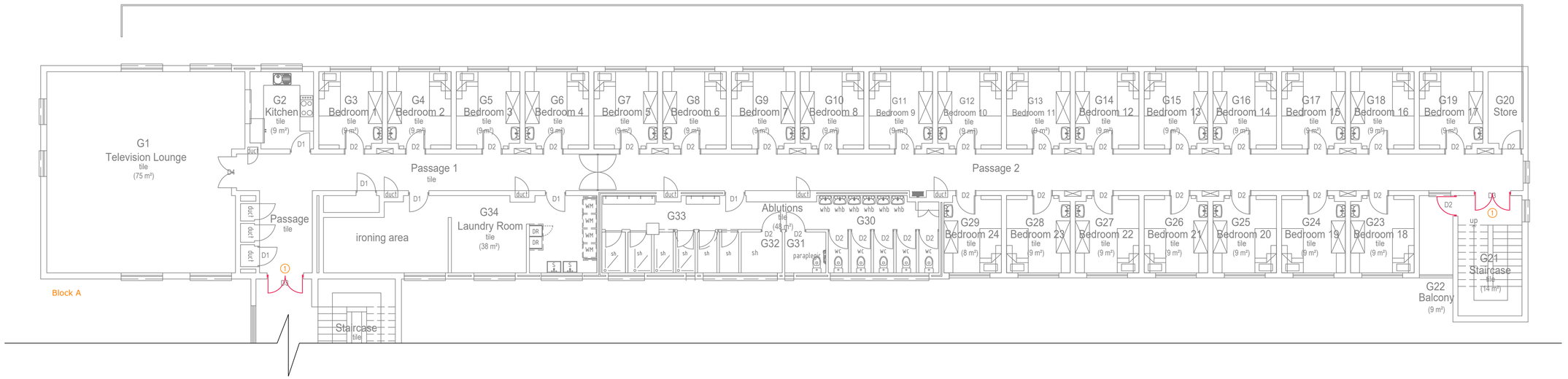
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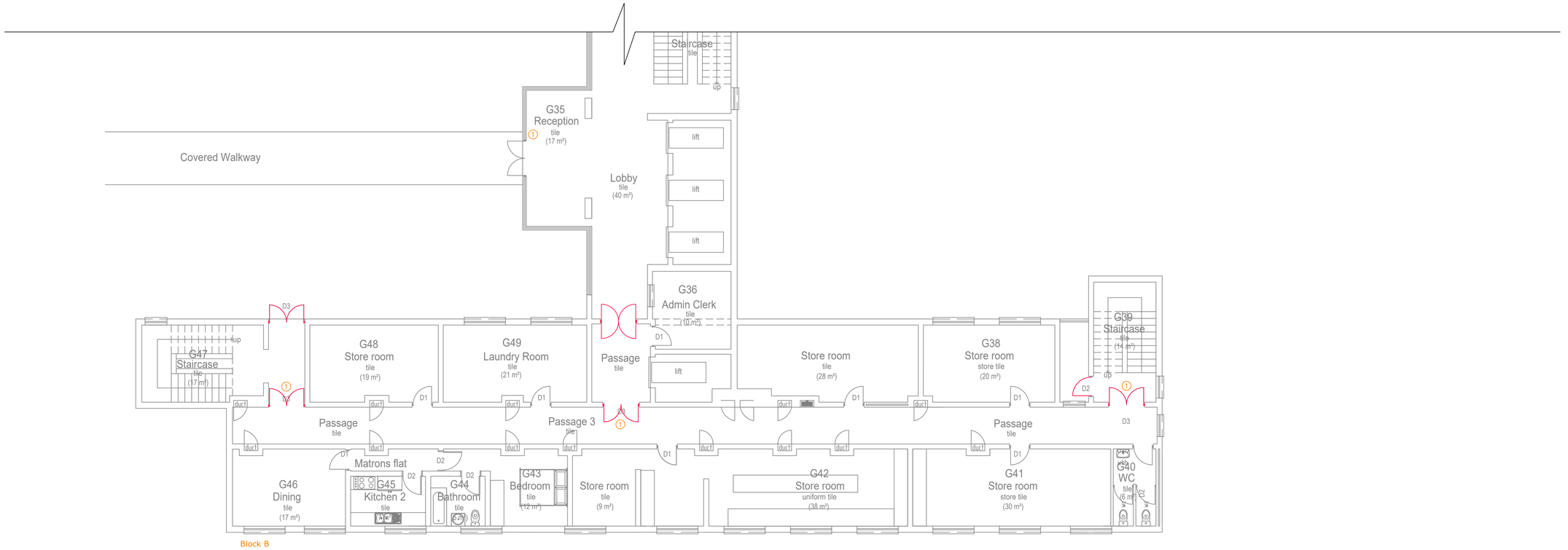
Greys Hospital - Renovations & Upgrades to Nurses and Doctor's Accomodation

Nurses Luminaire Schedule

IBUYA Consulting Engineers
"POWERING DEVELOPMENT"
BLOCK D
ESSEX PARK
48 ESSEX TERRACE
WESTVILLE
P.O. BOX 1692
WANDSBECK 3631
TEL: +27 (031) 2667831
FAX: +27 (031) 2667831
E-mail: ibuya@ibuya.co.za

① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

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- S 100x100 CONDUIT BOX AT 1400AFFL
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
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- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
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- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
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- CCTV CAMERA
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- X–RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
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- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- SC SECURITY CONTROL PANEL/JUNCTION BOX
- EL ELECTRIC LOCK/STRIKE
- MA MOTION ALARM
- CR ACCESS CONTROL CARD READER
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No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant
15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za
UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project
DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

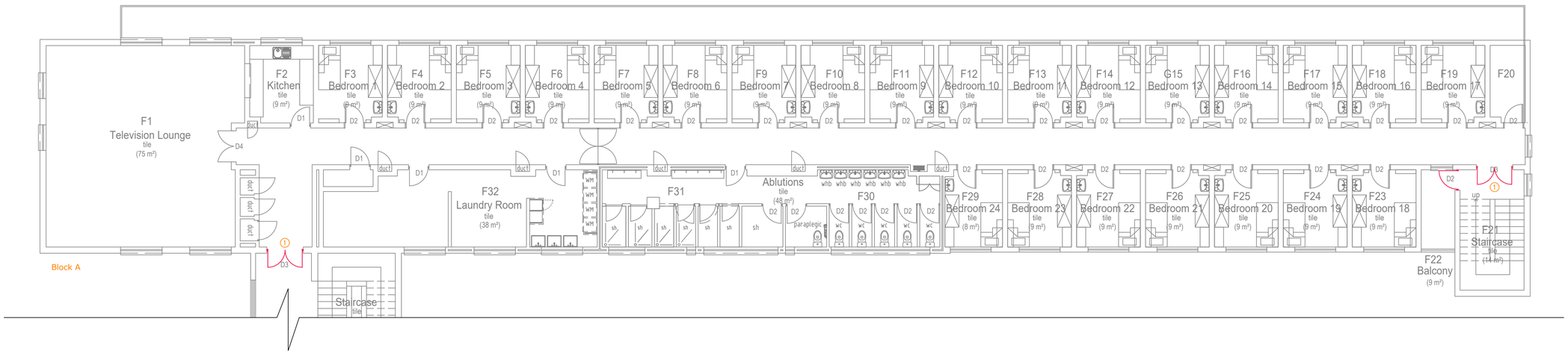
Drawing title
NURSES SMOKE DETECTION PLAN
GROUND FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_2_701

① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

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WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

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UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

NURSES SMOKE DETECTION PLAN
FIRST FLOOR

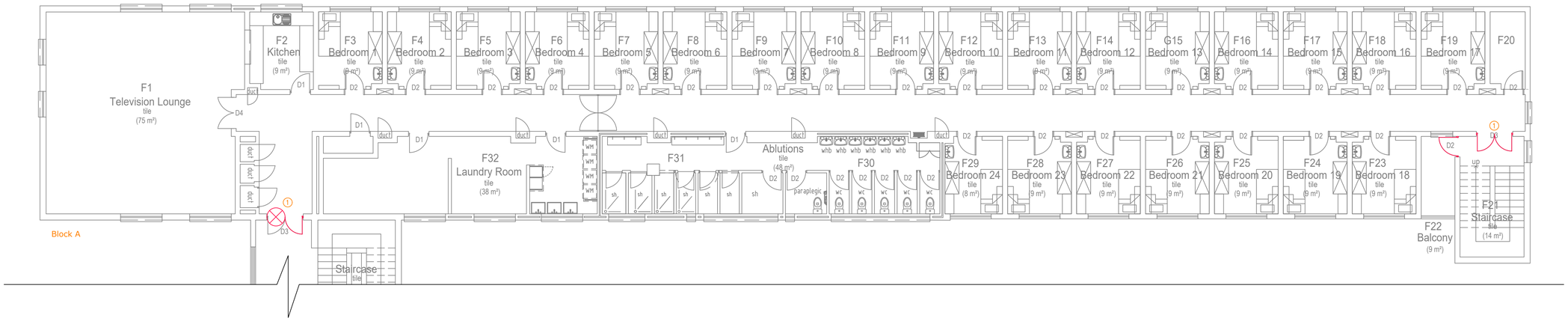
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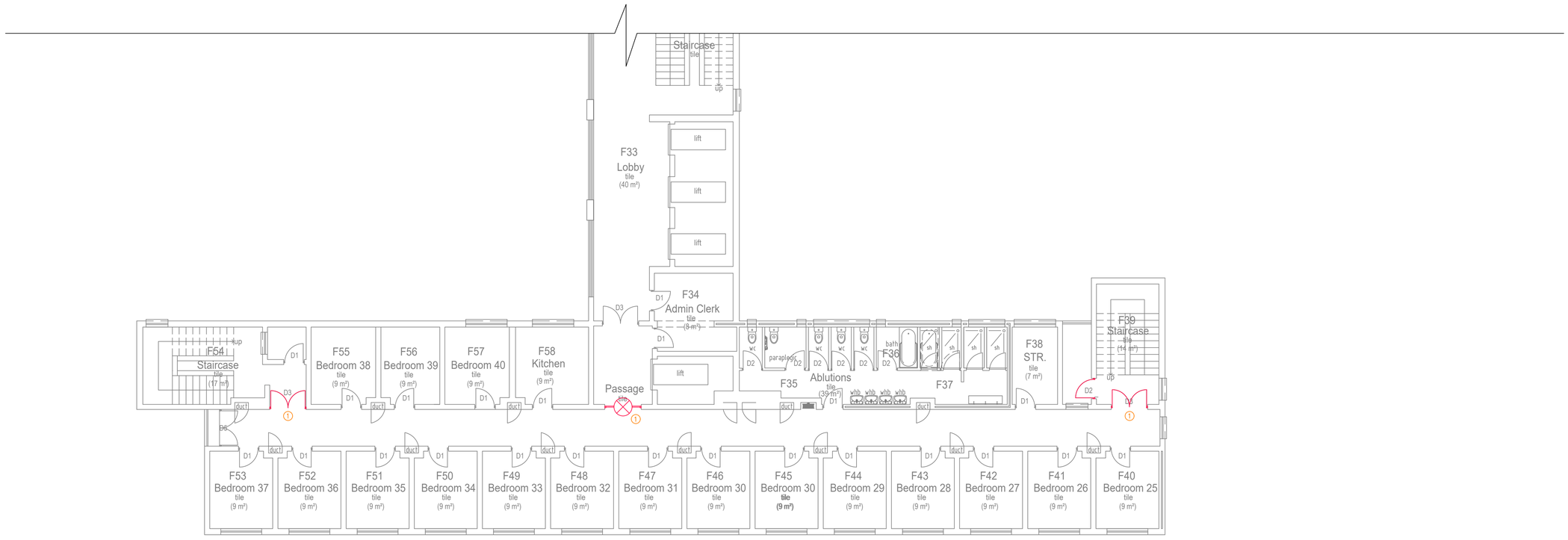
scale 1 : 100 2025/04/10

drawing number

22023_2_702

① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL.
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE
- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB-1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.
- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR
- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X-RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR
- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- SECURITY CONTROL PANEL/JUNCTION BOX
- ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM – CAMERA
- ER – ELECTRIC RELEASE
- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- CR – ACCESS CONTROL CARD READER
- POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- EO – EXIT OVERRIDE
- AO – ALARM OVERRIDE
- COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
- TALK-BACK WALL MOUNTED LOUDSPEAKER
- COLUMN SPEAKER
- AT ATTENUATOR
- MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SU SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
- CEILING MOUNTED MICROPHONE
- MICROPHONE
- RADIO MICROPHONE
- FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name | Signature | Date

consultant

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public works
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PROVINCE OF KWAZULU-NATAL

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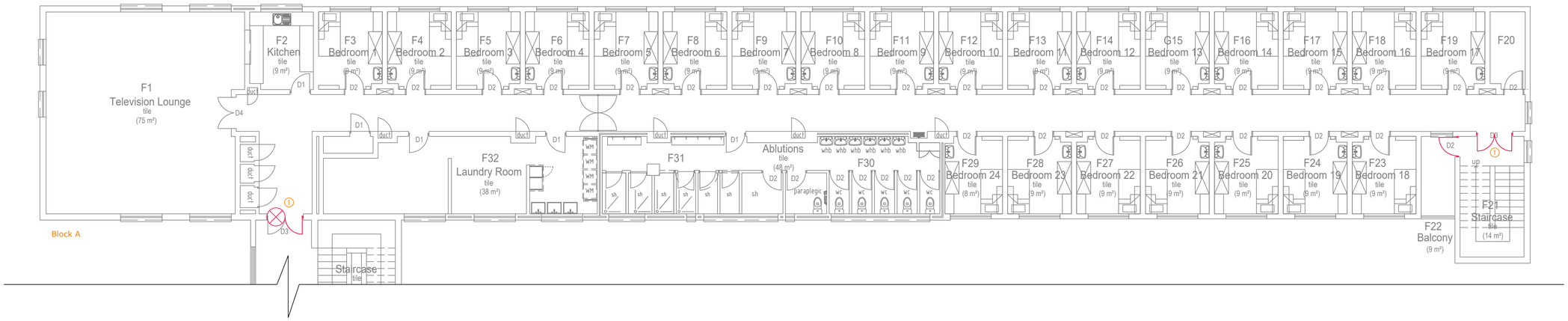
NURSES SMOKE DETECTION PLAN
SECOND FLOOR
COMPLETION SCOPE

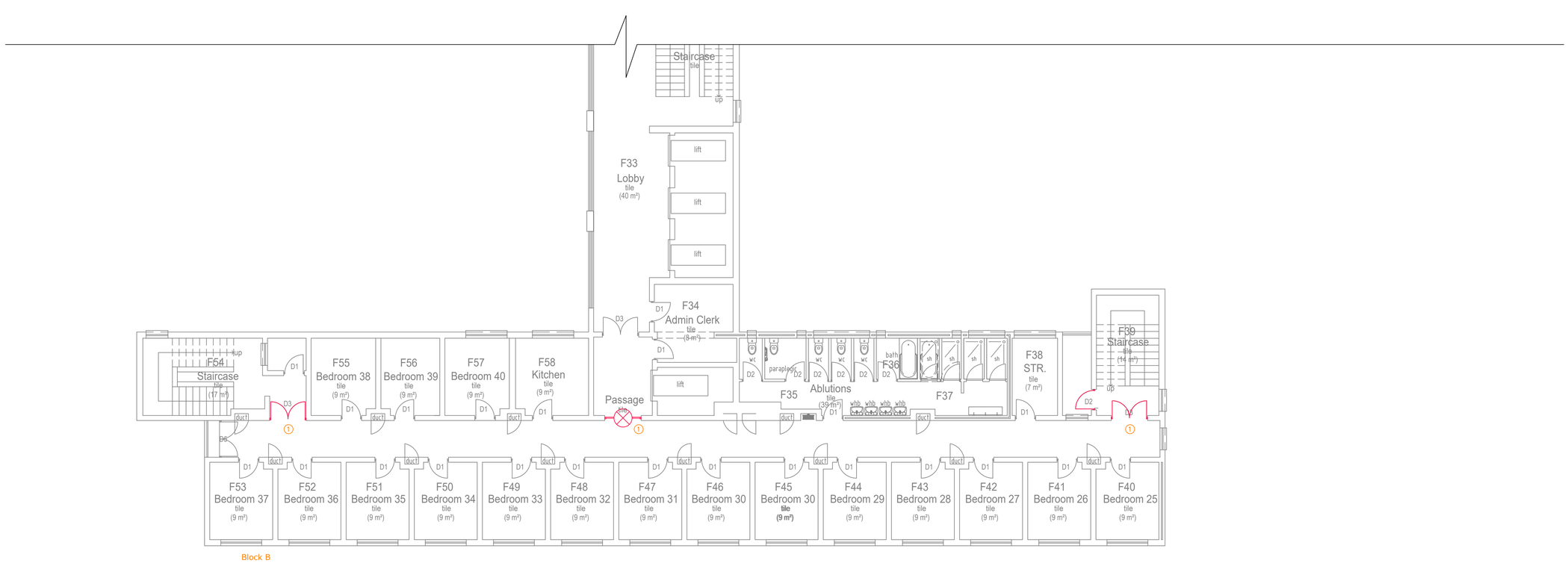
Drawn CW | Checked JK | Date 2025/04/15

scale 1 : 100

drawing number 25007_2_703

① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

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- 100x100 CONDUIT BOX AT 1400AFFL.
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- 100x100 DRAW BOX

- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.

- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS

- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB-1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.

- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR
- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X-RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR

- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- SECURITY CONTROL PANEL/JUNCTION BOX
- ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE

- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- ACR – ACCESS CONTROL CARD READER
- PCR – POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
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- EO – EXIT OVERRIDE
- AO – ALARM OVERRIDE

- COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
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- HORN/TRUMPET LOUDSPEAKER
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- COLUMN SPEAKER
- AT ATTENUATOR
- MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SU SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK

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- CEILING MOUNTED MICROPHONE
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- FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

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Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

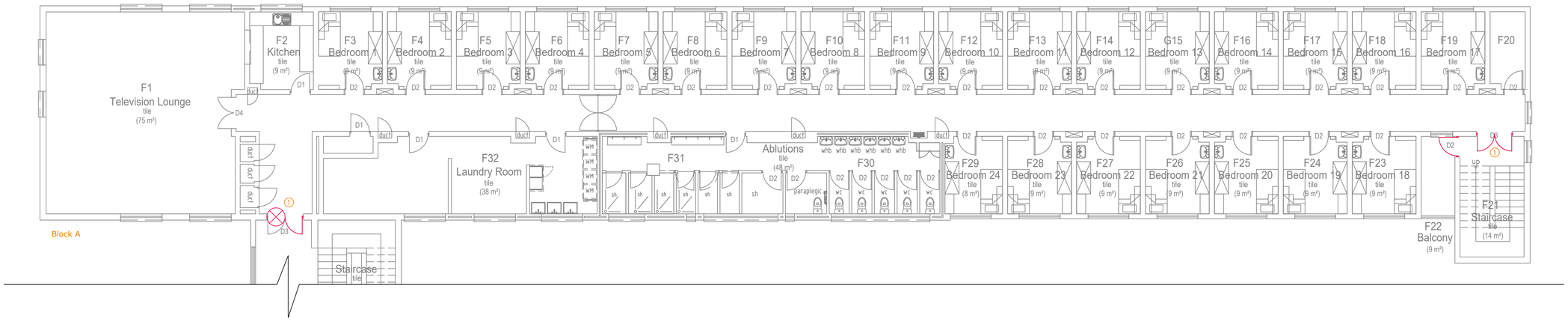
NURSES SMOKE DETECTION PLAN
THIRD FLOOR
COMPLETION SCOPE

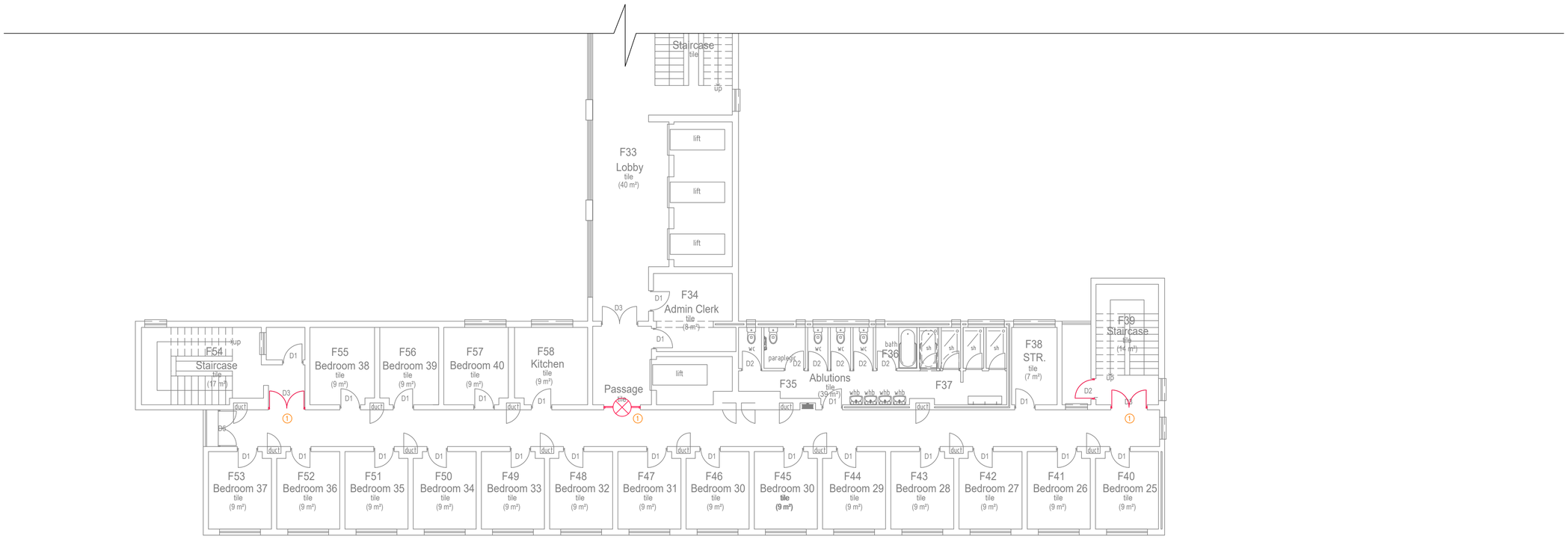
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scale 1 : 100

drawing number 25007_2_704

① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

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- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
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- REFERENCE TO QUANTITY i.e. 3No.
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- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
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- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
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- ED – EXIT OVERRIDE
- AO – ALARM OVERRIDE
- COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
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- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
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- TALK-BACK WALL MOUNTED LOUDSPEAKER
- COLUMN SPEAKER
- AT ATTENUATOR
- MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SU SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
- CEILING MOUNTED MICROPHONE
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- FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

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WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
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Name

Signature Date

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Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
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PROVINCE OF KWAZULU-NATAL

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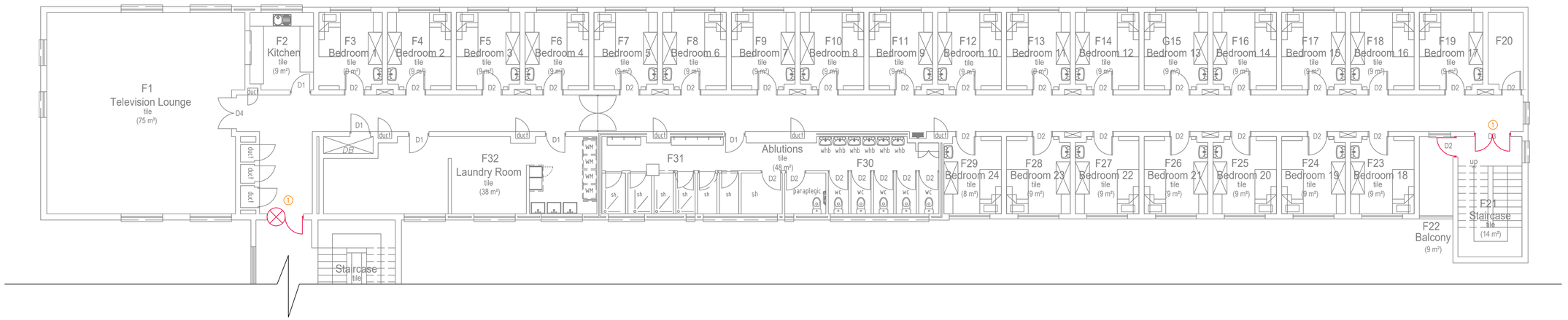
DEPARTMENT OF HEALTH: GREYS HOSPITAL RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

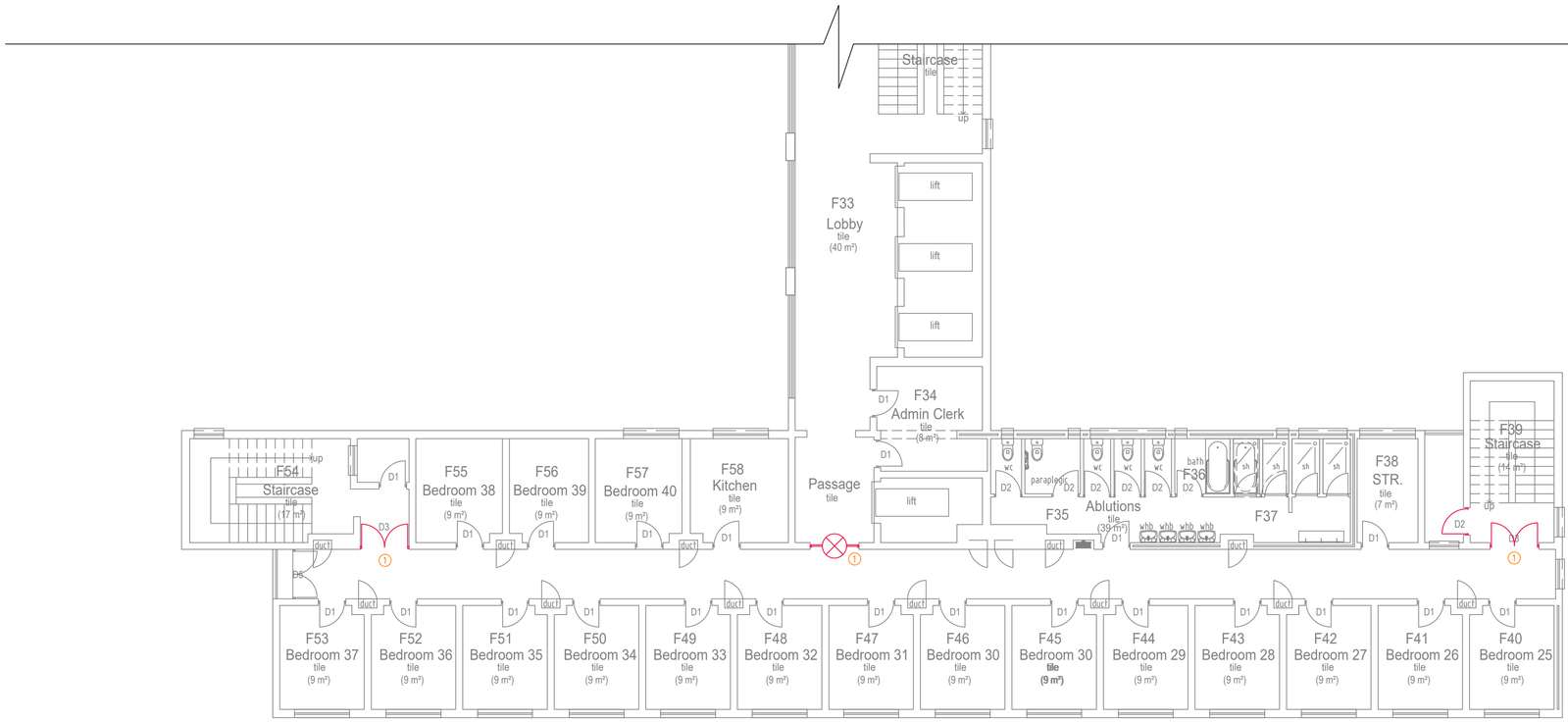
Drawing title

NURSES SMOKE DETECTION PLAN FOURTH FLOOR COMPLETION SCOPE

Drawn	CW	Checked JK	Date
scale	1 : 100		2025/04/15

drawing number 25007_2_705





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- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- C 100x50 CONDUIT BOX AT 1400AFFL.
- R ROUND CONDUIT BOX.
- R ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- 150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
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- POWER CABLE
- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- 6 CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS
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- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- CR ACCESS CONTROL CARD READER
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- EL – ELECTRIC LOCK/STRIKE
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Name

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public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH: GREYS HOSPITAL RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

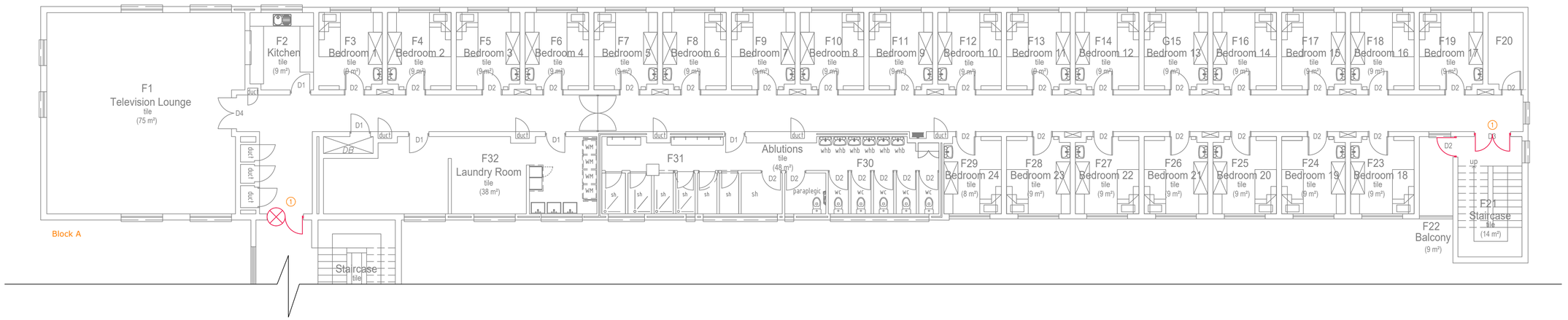
NURSES SMOKE DETECTION PLAN FIFTH FLOOR COMPLETION SCOPE

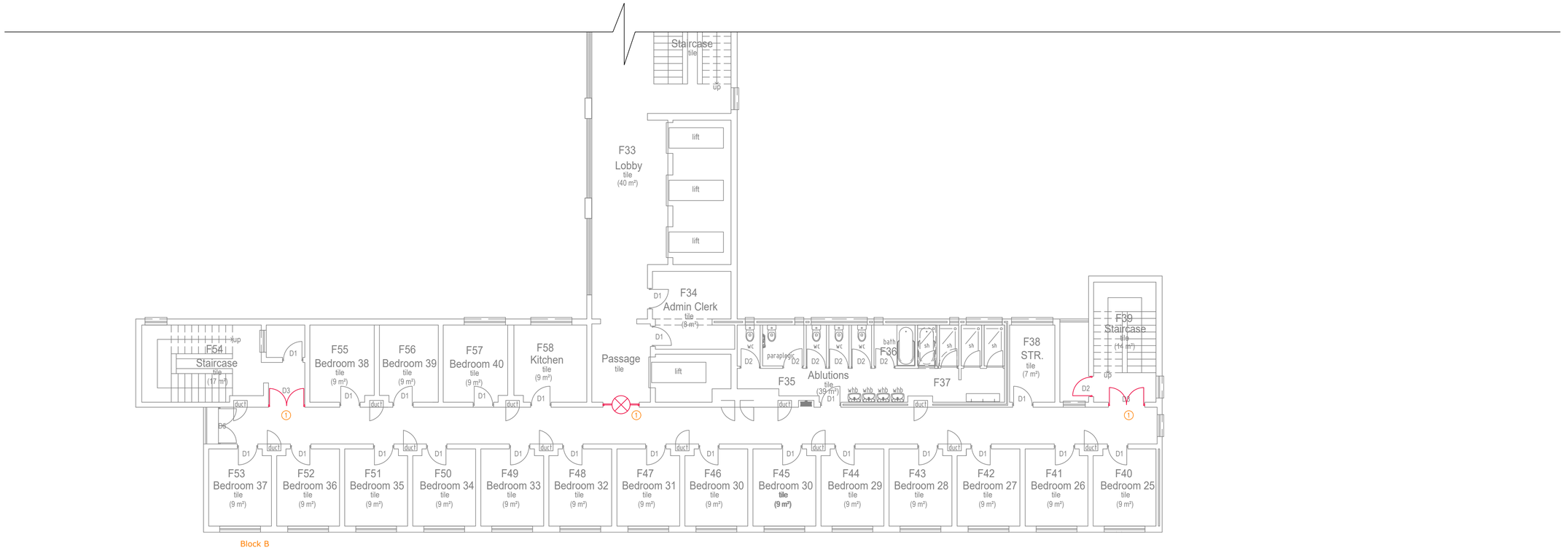
Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_2_706

① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- R ROUND CONDUIT BOX.
- R ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- 150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- OC OVERHEAD CAST–IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST–IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE
- ◇1 REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- 6 CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.
- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR
- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE.
- X–RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR
- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- CR ACCESS CONTROL CARD READER
- PCR POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- S SECURITY CONTROL PANEL/JUNCTION BOX
- EL ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FP FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- EO – EXIT OVERRIDE
- AO – ALARM OVERRIDE
- COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
- TALK–BACK WALL MOUNTED LOUDSPEAKER
- COLUMN SPEAKER
- AT ATTENUATOR
- MJ MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SJ SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
- CEILING MOUNTED MICROPHONE
- MICROPHONE
- RADIO MICROPHONE
- FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

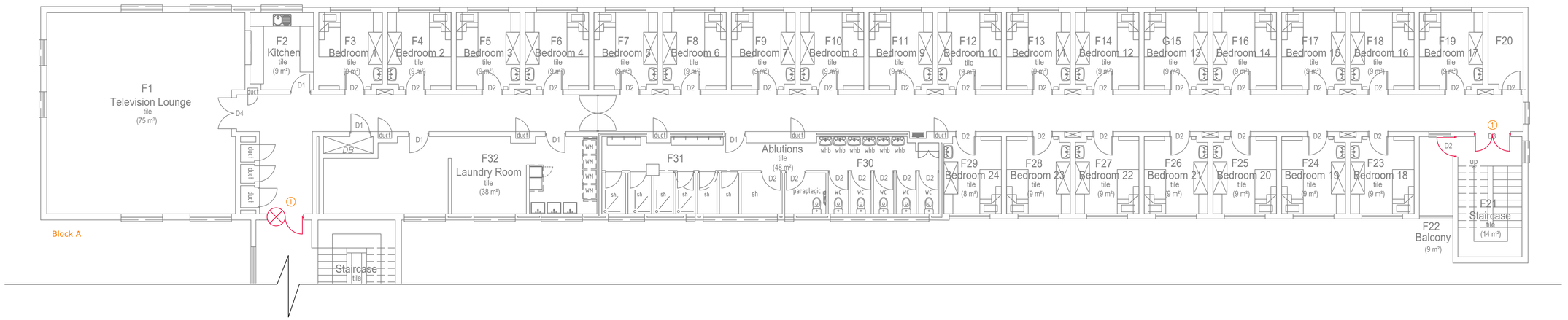
NURSES SMOKE DETECTION PLAN
SIXTH FLOOR
COMPLETION SCOPE

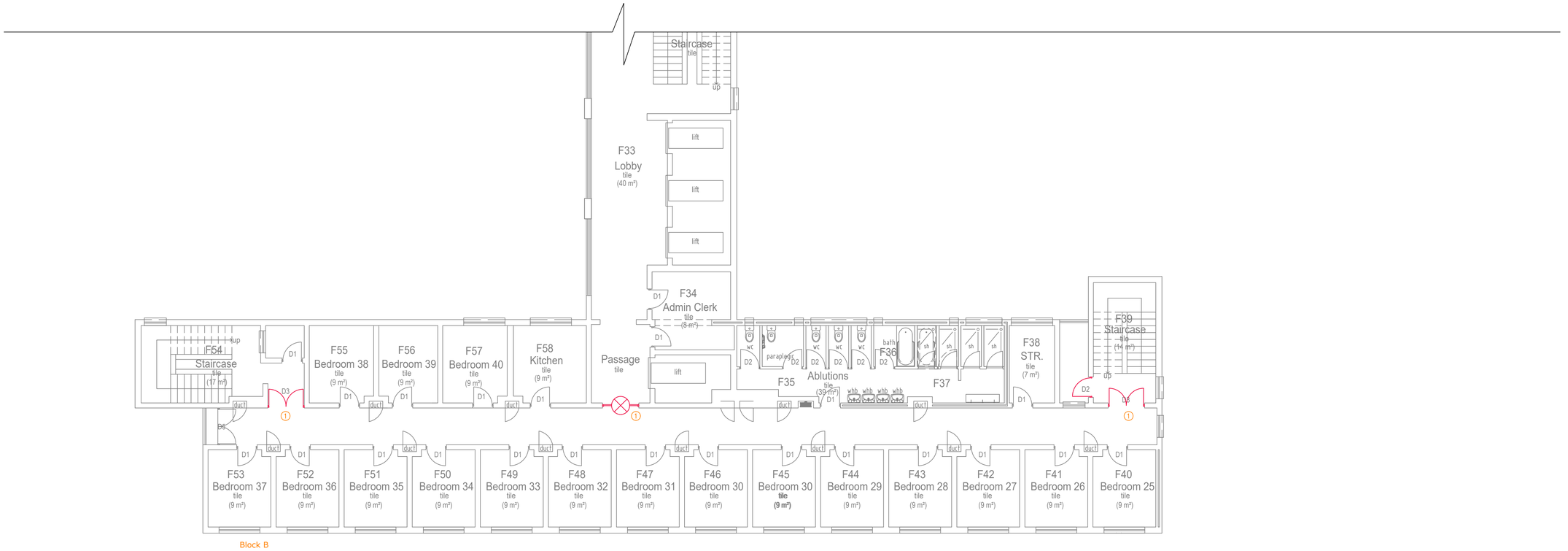
Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_2_707

① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.





NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
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- S 100x100 CONDUIT BOX AT 1400AFFL
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- R ROUND CONDUIT BOX.
- R ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- 150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- OC OVERHEAD CAST–IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST–IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE
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- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.
- CCTV CAMERA
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- CCTV CAMERA ON PAN & TILT MOUNT
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- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR
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- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE.
- X–RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR
- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- KS SECURITY CONTROL PANEL/JUNCTION BOX
- K ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FP FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE
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- MA – MOTION ALARM
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WCS number 071262 page type A0

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FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH: GREYS HOSPITAL RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

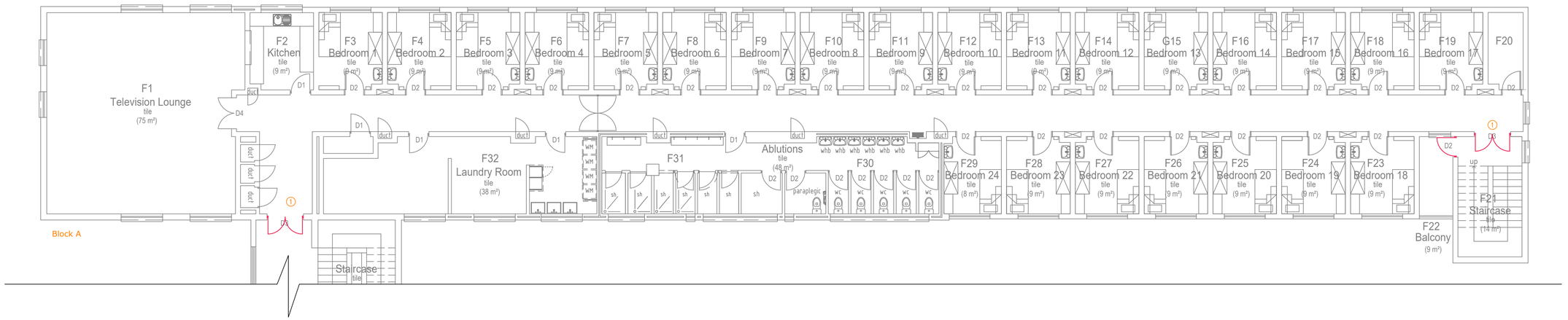
NURSES SMOKE DETECTION PLAN SEVENTH FLOOR COMPLETION SCOPE

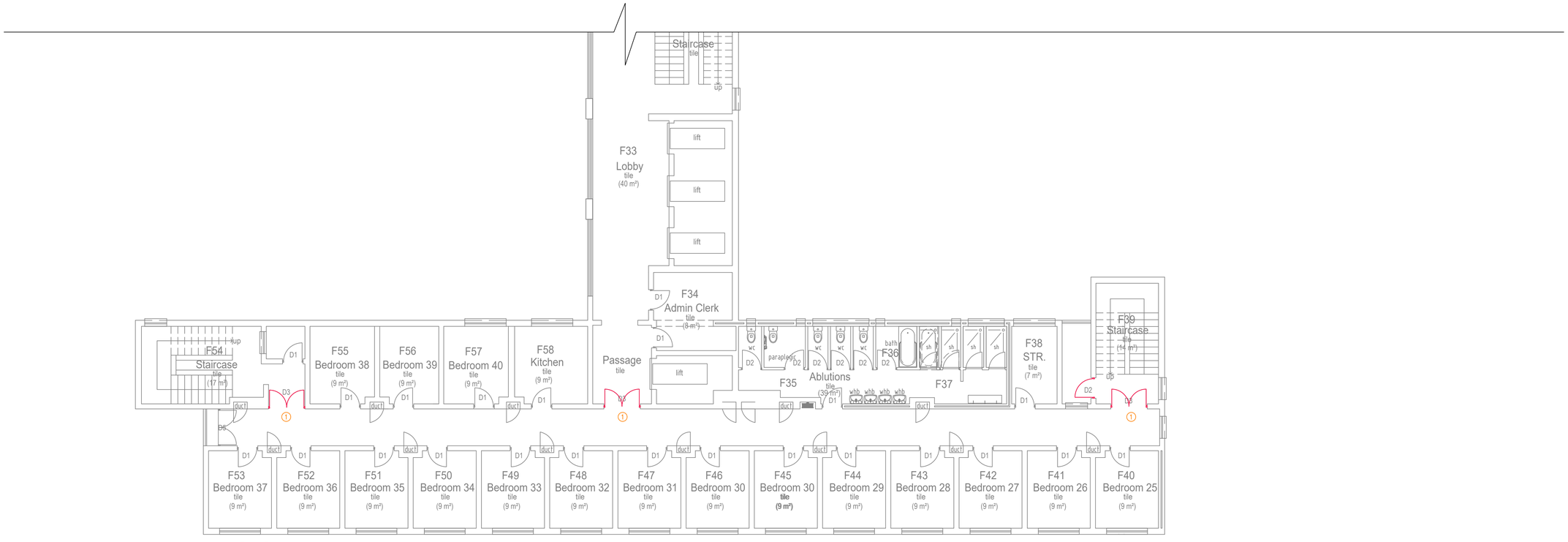
Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_2_708

① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.





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- L 100x50 CONDUIT BOX AT 1400AFFL.
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- ROUND DRAW BOX
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- WALK THROUGH METAL DETECTOR
- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
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- KS KEY SWITCH
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- DM – DOOR MONITOR
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- B BREAK GLASS UNIT

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DISTRICT MANAGER

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Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH: GREYS HOSPITAL RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

NURSES SMOKE DETECTION PLAN EIGHTH FLOOR COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_2_709

PROJECT:	PROJECT No.	
GREYS HOSPITAL DOCTOR'S ACCOMMODATION		25007_1
	SHEET: 1 of 1	DATE: 2025/04/23
SERVICE: Electrical Installation		REV: 0

IBUYA Consulting Engineers
POWERING DEVELOPMENT

DISTRIBUTION			DATE
		Current Revision	23/04/2025	24/04/2025
Client : Luthando Magwaza	luthando.magwaza@kznworks.gov.za		E	E
REVISION		0	0	

DWG. No.	SIZE	SHT	DESCRIPTION		REVISIONS	
100	A0	1	Lighting Plan Ground Floor	0	0	
101	A0	1	Lighting Plan First Floor	0	0	
102	A0	1	Lighting Plan Second Floor	0	0	
103	A0	1	Lighting Plan Third Floor	0	0	
104	A0	1	Lighting Plan Fourth Floor	0	0	
105	A0	1	Lighting Plan Fifth Floor	0	0	
106	A0	1	Lighting Plan Sixth Floor	0	0	
200	A0	1	Small Power Plan Ground Floor	0	0	
201	A0	1	Small Power Plan First Floor	0	0	
202	A0	1	Small Power Plan Second Floor	0	0	
203	A0	1	Small Power Plan Third Floor	0	0	
204	A0	1	Small Power Plan Fourth Floor	0	0	
205	A0	1	Small Power Plan Fifth Floor	0	0	
206	A0	1	Small Power Plan Sixth Floor	0	0	
300	A0	1	Electronics Plan Ground Floor	0	0	
301	A0	1	Electronics Plan First Floor	0	0	
302	A0	1	Electronics Plan Second Floor	0	0	
303	A0	1	Electronics Plan Third Floor	0	0	
304	A0	1	Electronics Plan Fourth Floor	0	0	
305	A0	1	Electronics Plan Fifth Floor	0	0	
306	A0	1	Electronics Plan Sixth Floor	0	0	
401	A3	1	DB-Heat Pump Doctors Quarters Single Line Diagram	0	0	
600	A4	2	Luminaire Schedule	0		0
700	A0	1	Smoke Detection Plan Ground Floor	0	0	
701	A0	1	Smoke Detection Plan First Floor	0	0	
702	A0	1	Smoke Detection Plan Second Floor	0	0	
703	A0	1	Smoke Detection Plan Third Floor	0	0	
704	A0	1	Smoke Detection Plan Fourth Floor	0	0	
705	A0	1	Smoke Detection Plan Fifth Floor	0	0	
706	A0	1	Smoke Detection Plan Sixth Floor	0	0	

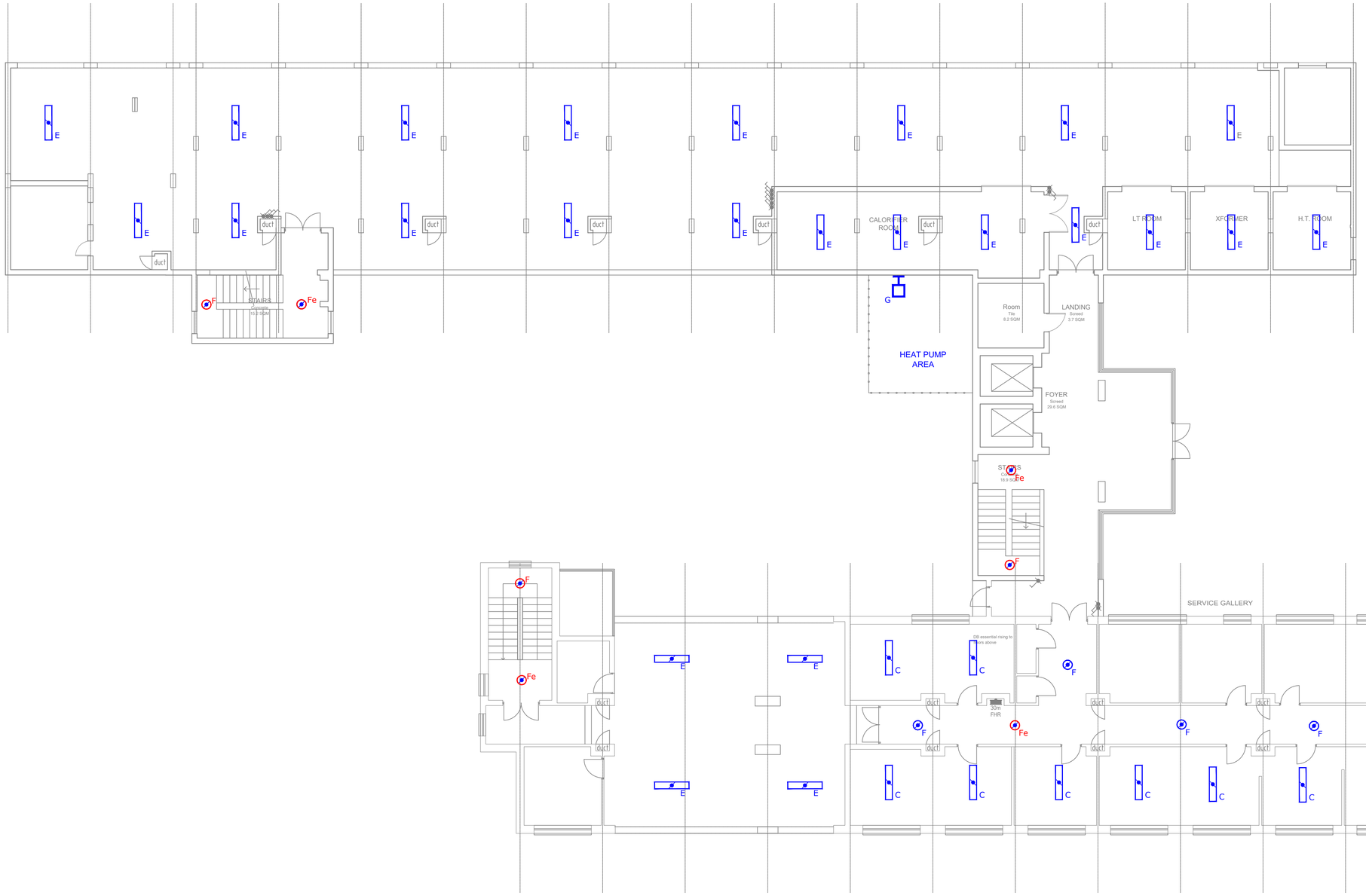
PREMLIMINARY FOR APPROVAL/COMMENTS	X
TENDER DRAWINGS	
APPROVED FOR CONSTRUCTION	
COPIES - COLOUR (C)/PRINTS (P)/E-MAIL(E)/FAXED(F)	X

RECEIVED BY: DATE:

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

The contractor is only to work in areas shown and all areas left blank are not to be worked in



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- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- C CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

- DM CAM etc. ROUND CONDUIT BOX FOR:
- DM – DOOR MONITOR
- CAM – CAMERA
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC
- EL – ELECTRIC LOCK/STRIKE

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- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- S SURFIX
- U TWIN AND EARTH
- CABLE ROUTE

- oc OVERHEAD CAST-IN
- os OVERHEAD ON SURFACE OR LAID ON CEILING.
- rc FLOOR SLAB CAST-IN.
- rs FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (0" SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDISTAL.
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES	
FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

consultant

15 The Boulevard
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UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH: GREYS HOSPITAL RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

DOCTORS LIGHTING PLAN GROUND FLOOR COMPLETION SCOPE

Drawn	CW	Checked JK	Date
scale	1 : 100		2025/04/15

drawing number

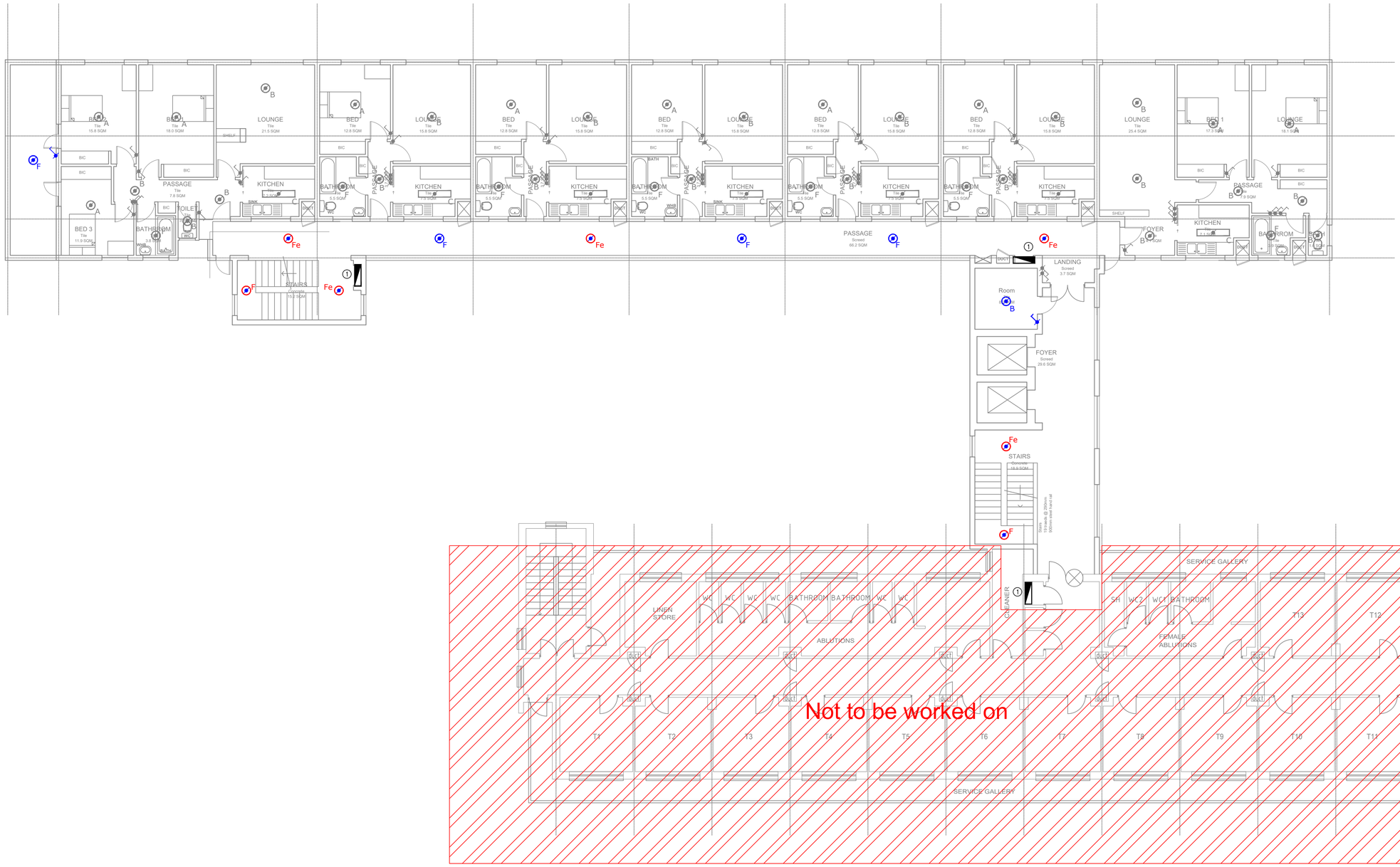
25007_1_100

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

The contractor is only to work in areas shown and all areas left blank are not to be worked in

① Existing DB



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

ROUND CONDUIT BOX FOR:
DM – DOOR MONITOR
CAM – CAMERA
AA – ACCESS ALARM
AC – ACCESS CONTROL
CR – CARD READER
COM – COMMUNICATION/INTERCOM
BGM – BACK GROUND MUSIC
EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
- TWIN AND EARTH
- CABLE ROUTE

- OC OVERHEAD CAST–IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST–IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (0" SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDESTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINARE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINARES
- POLE MOUNTED LUMINARE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINARE TYPE "B" – REFER LUMINARE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature Date

consultant

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Westway Office Park,
Westville,
Durban, 3630
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email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

DOCTORS LIGHTING PLAN
FIRST FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date

scale 1 : 100 2025/04/15

drawing number

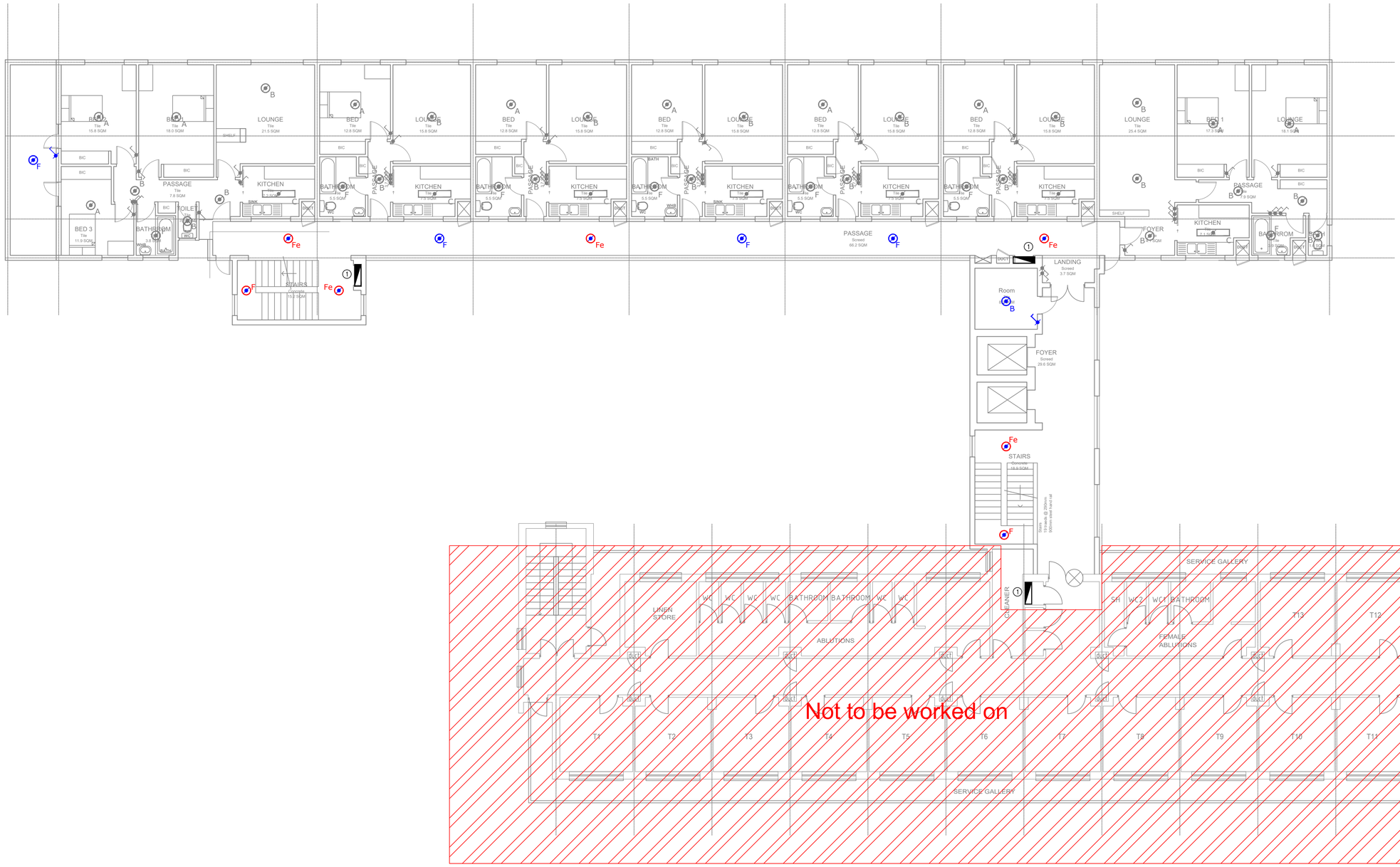
25007_1_101

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

The contractor is only to work in areas shown and all areas left blank are not to be worked in

① Existing DB



No.	DATE	AMENDMENT	Issued By
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WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature | Date

consultant

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Westway Office Park,
Westville,
Durban, 3630
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UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

DOCTORS LIGHTING PLAN
SECOND FLOOR
COMPLETION SCOPE

Drawn CW | Checked JK | Date

scale 1 : 100 | 2025/04/15

drawing number

25007_1_102

NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

ROUND CONDUIT BOX FOR:
DM – DOOR MONITOR
CAM – CAMERA
AA – ACCESS ALARM
AC – ACCESS CONTROL
CR – CARD READER
COM – COMMUNICATION/INTERCOM
BGM – BACK GROUND MUSIC
EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX TWIN AND EARTH CABLE ROUTE

- oc OVERHEAD CAST–IN
- os OVERHEAD ON SURFACE OR LAID ON CEILING.
- rc FLOOR SLAB CAST–IN.
- rs FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (0" SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDESTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINARE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINARES
- POLE MOUNTED LUMINARE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

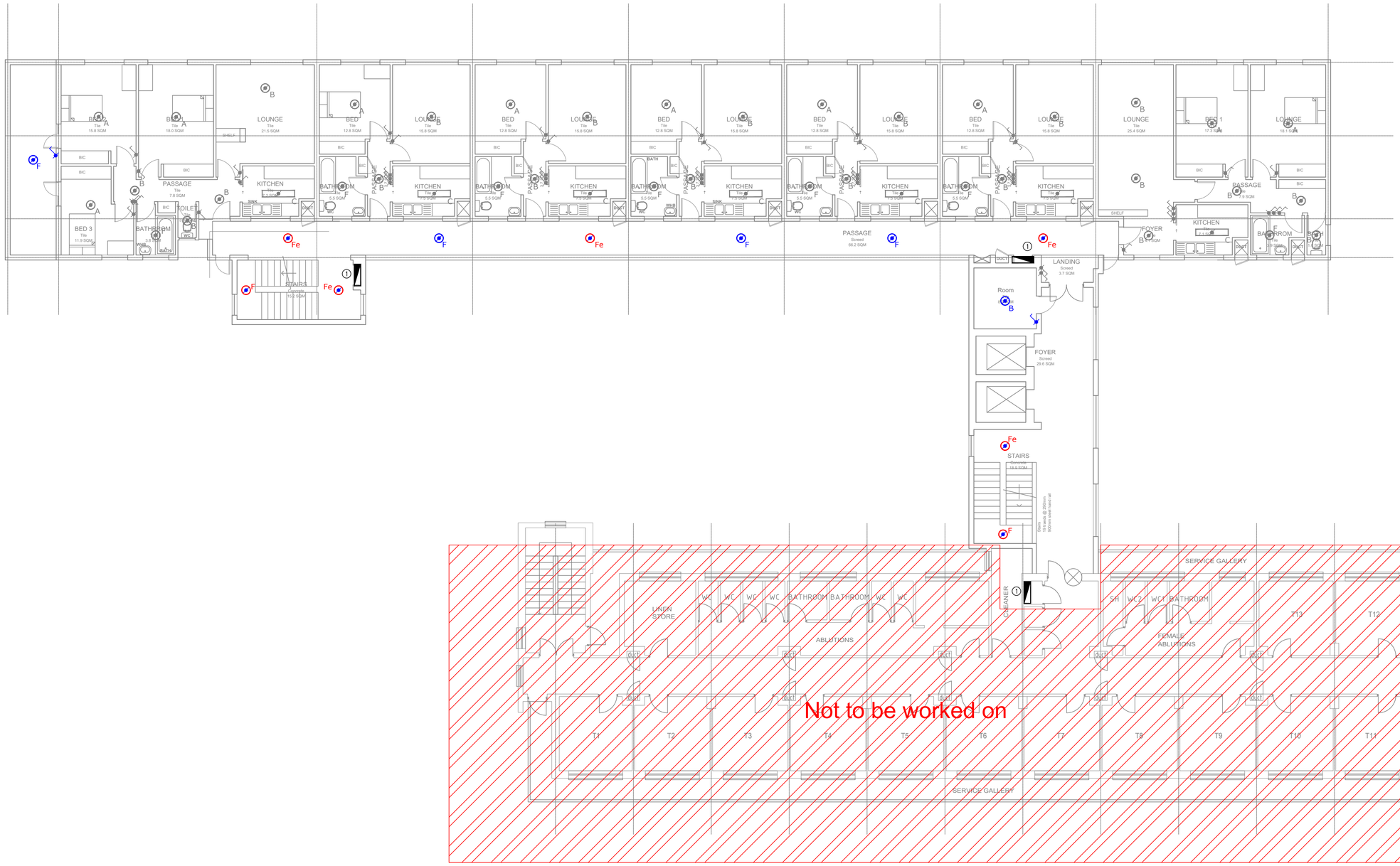
- CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINARE TYPE "B" – REFER LUMINARE SCHEDULE.

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

The contractor is only to work in areas shown and all areas left blank are not to be worked in

① Existing DB



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

DM, CAM etc. ROUND CONDUIT BOX FOR:
DM – DOOR MONITOR
CAM – CAMERA
AA – ACCESS ALARM
AC – ACCESS CONTROL
CR – CARD READER
COM – COMMUNICATION/INTERCOM
BGM – BACK GROUND MUSIC
EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX TWIN AND EARTH CABLE ROUTE

- oc OVERHEAD CAST-IN
- os OVERHEAD ON SURFACE OR LAID ON CEILING.
- fc FLOOR SLAB CAST-IN.
- fs FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (0° SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDESTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINARE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINARES
- POLE MOUNTED LUMINARE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINARE TYPE "B" – REFER LUMINARE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
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WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES	
FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

consultant
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Westway Office Park,
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Tel. 031 265 0444
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UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project:
DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title:
DOCTORS LIGHTING PLAN
THIRD FLOOR
COMPLETION SCOPE

Drawn	CW	Checked JK	Date
scale	1 : 100		2025/04/15

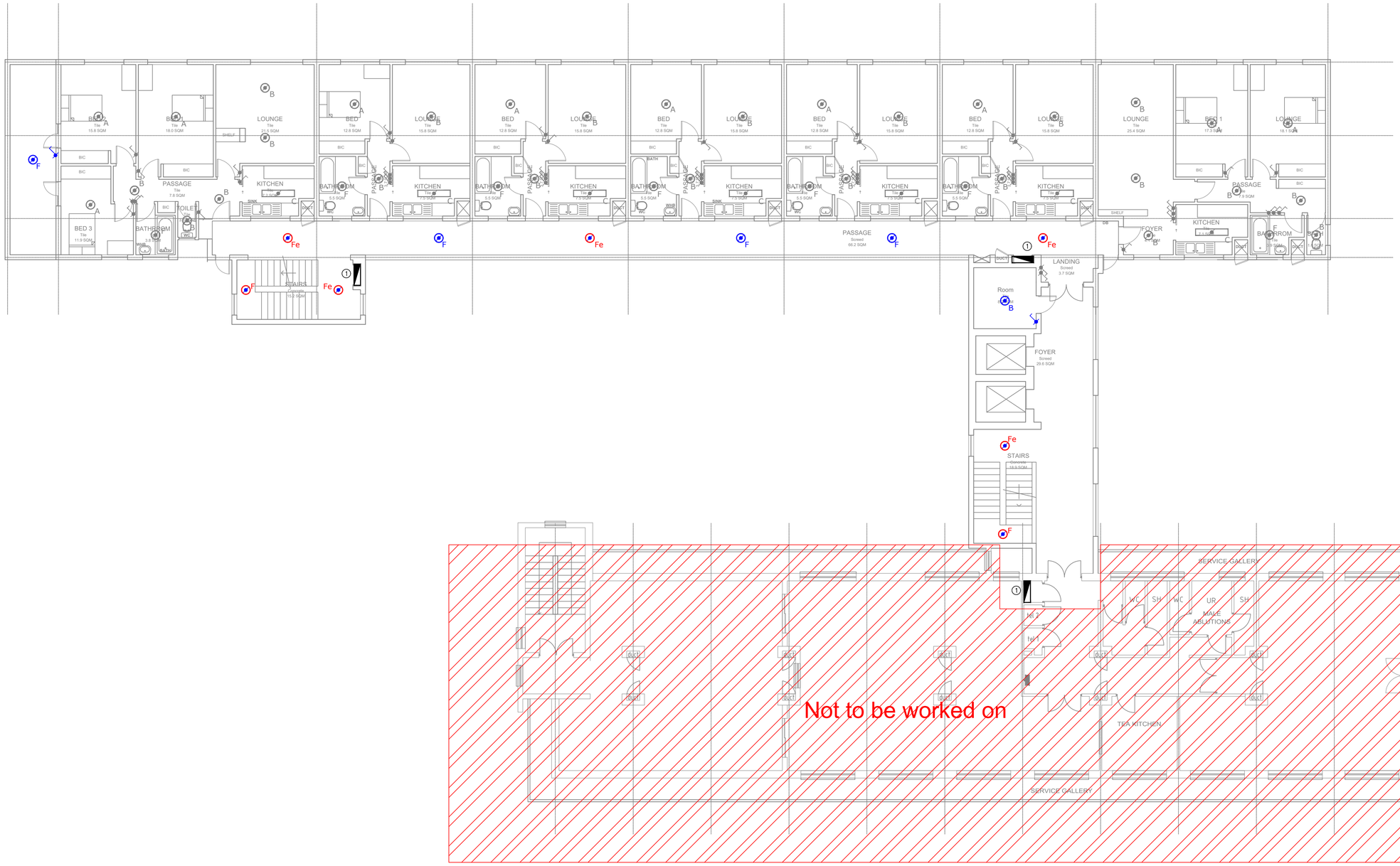
drawing number
25007_1_103

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

The contractor is only to work in areas shown and all areas left blank are not to be worked in

① Existing DB



No.	DATE	AMENDMENT	Issued By
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WCS number 071262

page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature | Date

consultant

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Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

DOCTORS LIGHTING PLAN
FOURTH FLOOR
COMPLETION SCOPE

Drawn CW | Checked JK | Date 2025/04/15

scale 1 : 100

drawing number 25007_1_104

NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- C 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- C CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

- DM, CAM, etc. ROUND CONDUIT BOX FOR:
  - DM – DOOR MONITOR
  - CAM – CAMERA
  - AA – ACCESS ALARM
  - AC – ACCESS CONTROL
  - CR – CARD READER
  - COM – COMMUNICATION/INTERCOM
  - BGM – BACK GROUND MUSIC
  - EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
- S TWIN AND EARTH
- U CABLE ROUTE

- oc OVERHEAD CAST-IN
- os OVERHEAD ON SURFACE OR LAID ON CEILING.
- rc FLOOR SLAB CAST-IN.
- rs FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB-1 BOARD DESIGNATION NUMBER.

- 16A SANS 164-1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164-1 DOUBLE SSO.
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- 16A SANS 164-4 RED SSO ON PEDISTAL
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- 6A SANS 164-3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
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- TELEPHONE POINT ON PEDESTAL.
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- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- S SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- ◇ REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

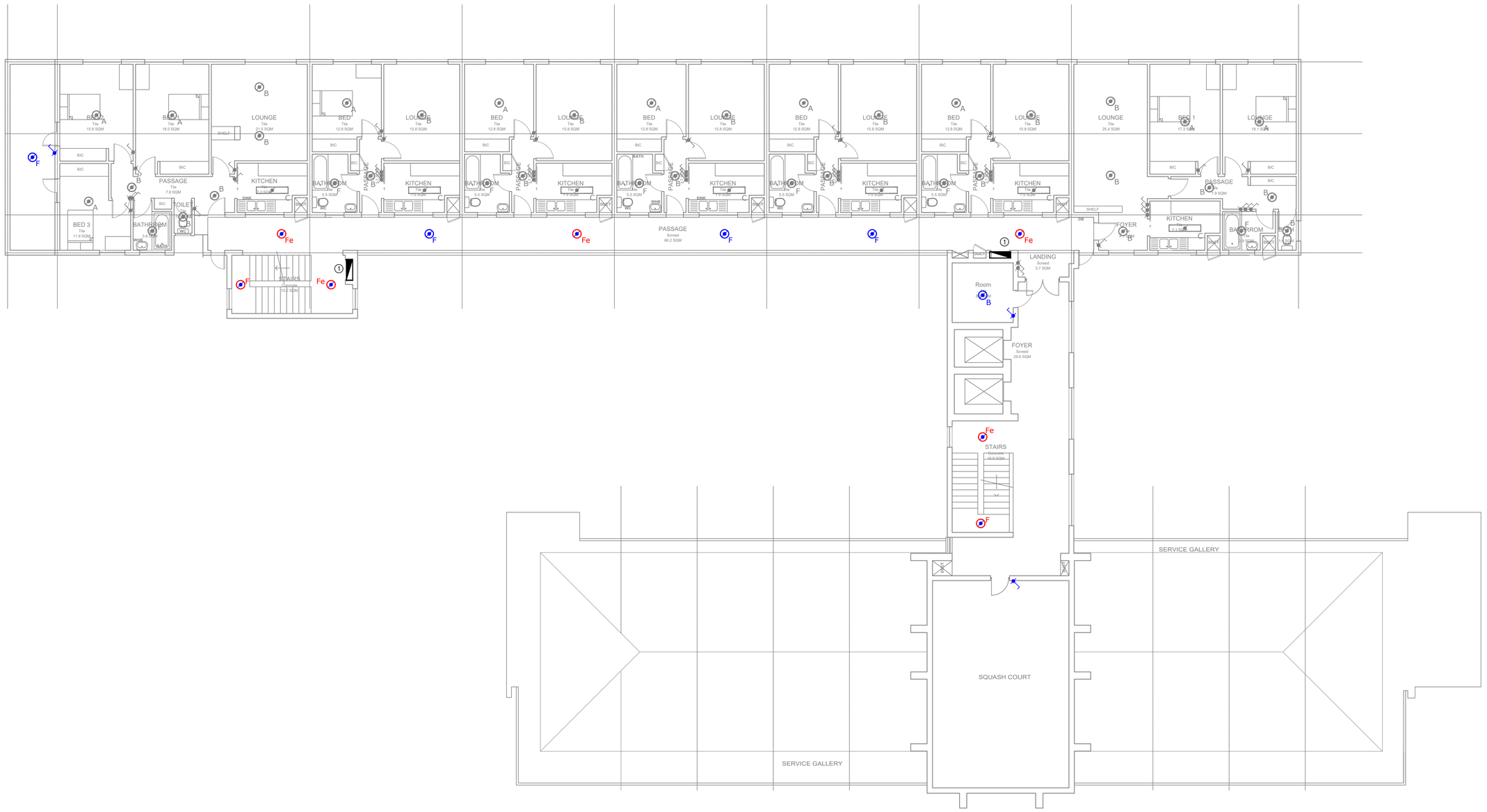
- 6 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- HD^B LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

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① Existing DB



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL.
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

- DM, CAM etc. ROUND CONDUIT BOX FOR:
- DM – DOOR MONITOR
- CAM – CAMERA
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC
- EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
- TWIN AND EARTH
- CABLE ROUTE

- OC OVERHEAD CAST–IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST–IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (0" SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDISTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 / 2 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262

page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature | Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

DOCTORS LIGHTING PLAN
FIFTH FLOOR
COMPLETION SCOPE

Drawn CW | Checked JK | Date 2025/04/15

scale 1 : 100

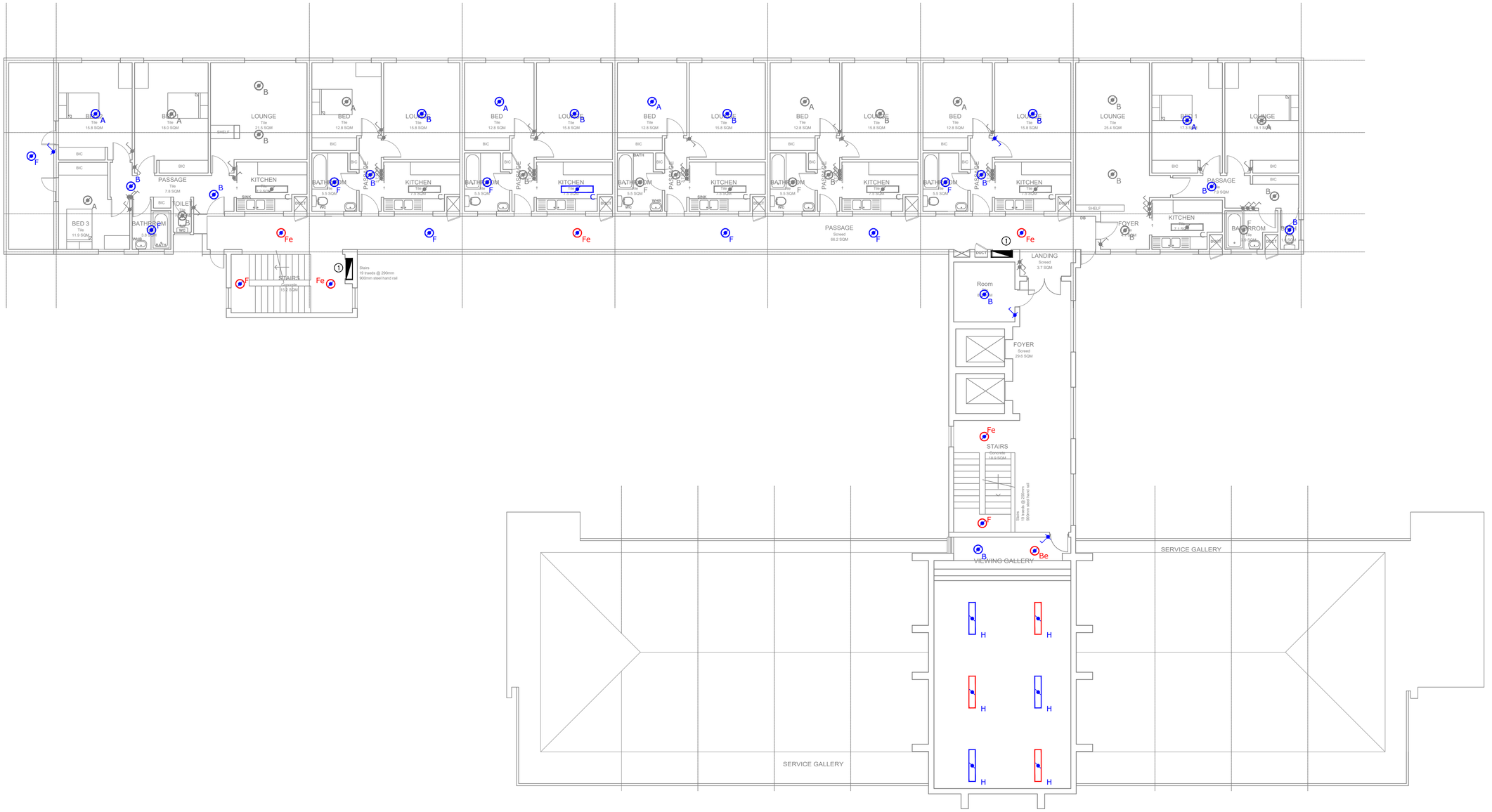
drawing number 25007_1_105

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation.

The contractor is only to work in areas shown and all areas left blank are not to be worked in

① Existing DB



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).
- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- ROUND CONDUIT BOX FOR: DM – DOOR MONITOR; CAM – CAMERA; AA – ACCESS ALARM; AC – ACCESS CONTROL; CR – CARD READER; COM – COMMUNICATION/INTERCOM; BGM – BACK GROUND MUSIC; EL – ELECTRIC LOCK/STRIKE
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
- TWIN AND EARTH
- CABLE ROUTE
- OC OVERHEAD CAST–IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST–IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.
- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (0° SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDISTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR
- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR
- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.
- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.
- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL
- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
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WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name | Signature | Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

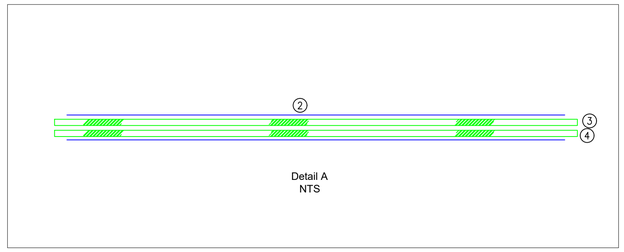
Drawing title

DOCTORS LIGHTING PLAN
SIXTH FLOOR
COMPLETION SCOPE

Drawn CW | Checked JK | Date

scale 1 : 100 | 2025/04/15

drawing number
25007_1_106

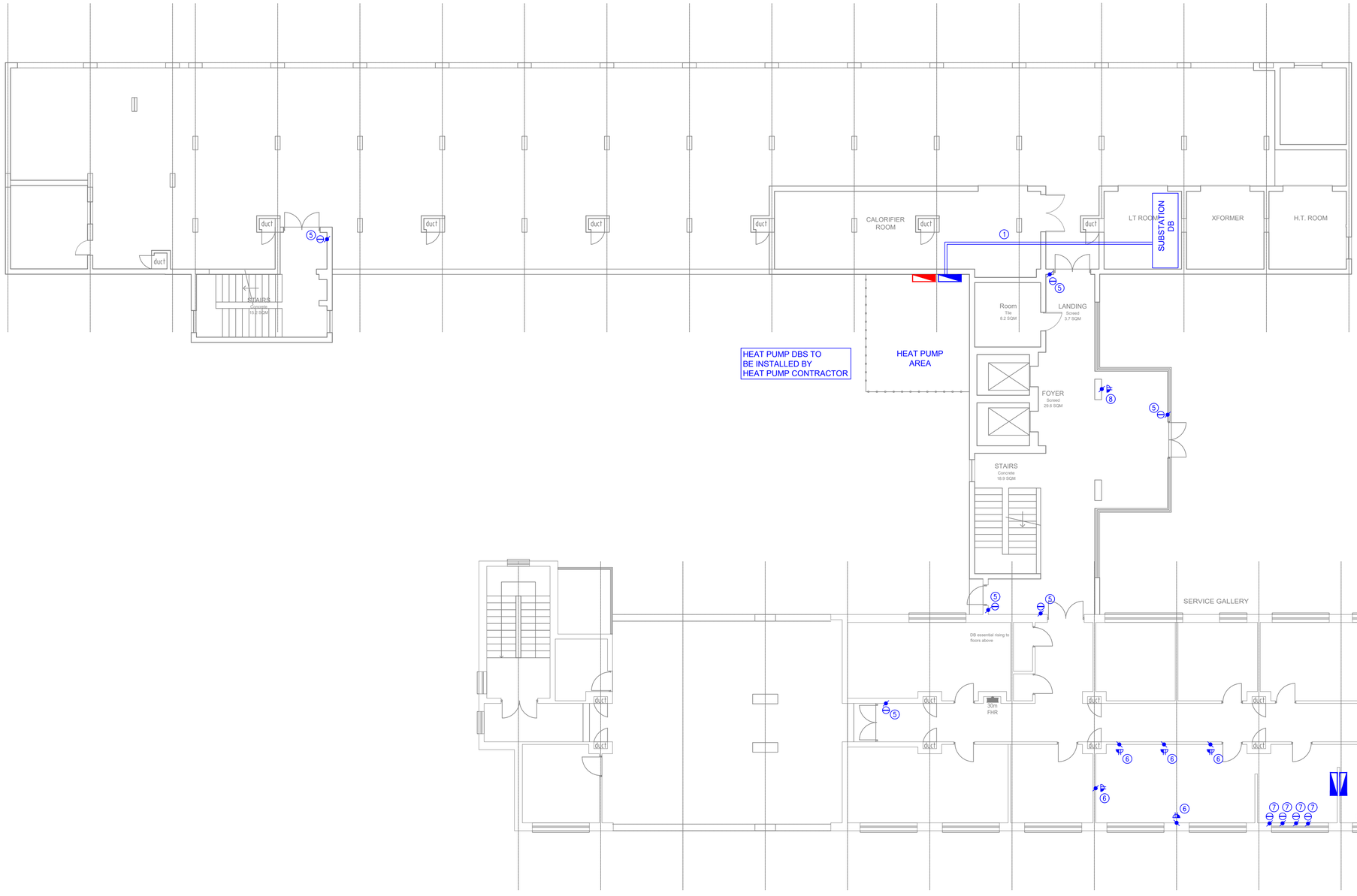


Detail A
NTS

Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation
The contractor is only to work in areas shown and all areas left blank are not to be worked in

1. Refer to Detail A
2. 600mm Galvanized Cable Tray
3. 16mm² 4 Core PVC SWA ECC Cable normal supply
4. 10mm² 4 Core PVC SWA ECC Cable essential supply
5. Isolator for Power Supply
6. SSO to include USB port.
7. IP65 rated 35A isolator installed directly below trunking.
8. SSO For Fire Panel.



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL.
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

ROUND CONDUIT BOX FOR:
DM – DOOR MONITOR
CAM – CAMERA
AA – ACCESS ALARM
AC – ACCESS CONTROL
CR – CARD READER
COM – COMMUNICATION/INTERCOM
BGM – BACK GROUND MUSIC
EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
- TWIN AND EARTH
- CABLE ROUTE

- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 100 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (0' SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDISTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- HD^B LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
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WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature | Date

consultant
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Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

DOCTORS SMALL POWER PLAN
GROUND FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date

scale 1 : 100 2025/04/15

drawing number
25007_1_200

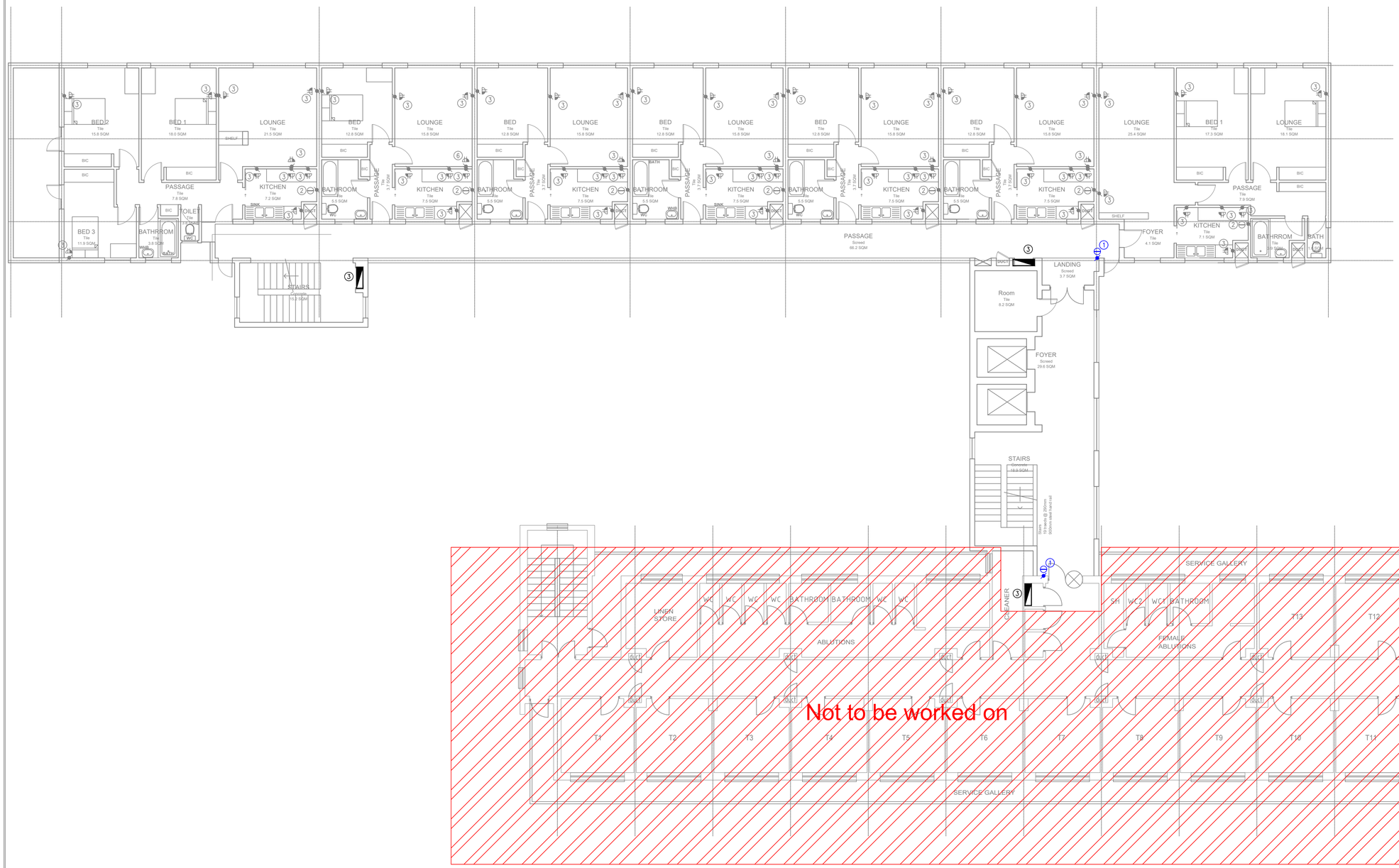
Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation
The contractor is only to work in areas shown and all areas left blank are not to be worked in

① Isolator for Power Supply

② Stove Isolator in 4x4 steel box mounted on 3CR12, 3mm. thick steel mounting plate to cover the hole.

③ SSO to include USB port



NOTES: (6) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 680 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 600x600 CONDUIT BOX.
- 600x600 CONDUIT BOX AT 500AFFL.
- 600x600 CONDUIT BOX AT 640AFFL
- 600x50 CONDUIT BOX
- 600x50 CONDUIT BOX AT 300AFFL.
- 600x50 CONDUIT BOX AT 640OAFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).
- ROUND DRAW BOX
- 600x600 DRAW BOX
- 600x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- DM CAM etc. ROUND CONDUIT BOX FOR: DM – DOOR MONITOR; CAM – CAMERA; AA – ACCESS ALARM; AC – ACCESS CONTROL; CR – CARD READER; COM – COMMUNICATION/INTERCOM; BGM – BACK GROUND MUSIC; EL – ELECTRIC LOCK/STRIKE
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- S SURFIX
- U TWIN AND EARTH CABLE ROUTE
- oc OVERHEAD CAST-IN
- os OVERHEAD ON SURFACE OR LAID ON CEILING.
- rc FLOOR SLAB CAST-IN.
- rs FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- 600 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–6 BOARD DESIGNATION NUMBER.
- 66A SANS 664–6 SWITCHED SOCKET OUTLET (SSO).
- 66A SANS 664–6 DOUBLE SSO.
- 66A SANS 664–6 SSO ON PEDESTAL.
- 66A SANS 664–2 3 PIN SSO.
- 66A SANS 664–6 & 664–2 COMBINATION SSO.
- 66A SANS 664–4 RED SSO (0" SHAVED EARTH PIN)
- 66A SANS 664–4 RED SSO ON PEDESTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR
- 6A SANS 664–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR
- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.
- TELEPHONE POINT.
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- TV OUTLET.
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- PHOTOCELL
- REFERENCE TO QUANTITY i.e. 3No.
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- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 076262 page type A0

HEALTH DEPARTMENT SIGNATURES	
FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	
Checked by (Professional Consultant)	
Name	
Signature	Date

consultant

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Westville,
Durban, 3630
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email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

DOCTORS SMALL POWER PLAN
FIRST FLOOR
COMPLETION SCOPE

Drawn	CW	Checked	JK	Date
scale	1 : 100			2025/04/15

drawing number
25007_1_201

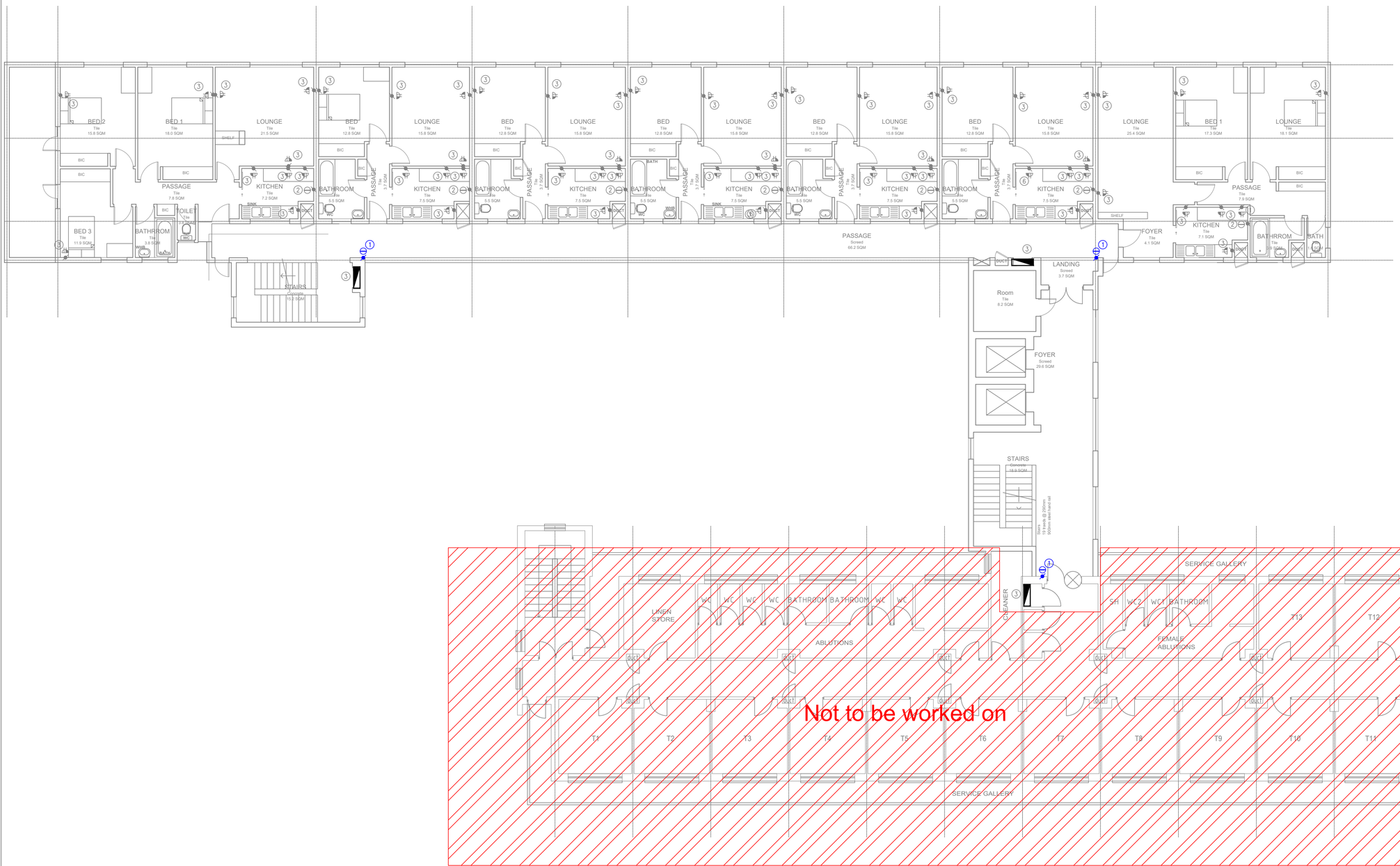
Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation
The contractor is only to work in areas shown and all areas left blank are not to be worked in

(1) Isolator for Power Supply

(2) Stove Isolator in 4x4 steel box mounted on 3CR12, 3mm. thick steel mounting plate to cover the hole.

(3) SSO to include USB port



NOTES: (6) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 680 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 600x600 CONDUIT BOX.
- 600x600 CONDUIT BOX AT 500AFFL.
- 600x600 CONDUIT BOX AT 6400AFFL
- 600x50 CONDUIT BOX
- 600x50 CONDUIT BOX AT 300AFFL.
- 600x50 CONDUIT BOX AT 6400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 600x600 DRAW BOX
- 600x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

- DM CAM etc. ROUND CONDUIT BOX FOR:
- DM – DOOR MONITOR
- CAM – CAMERA
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
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- 20mm. DIA. CONDUIT.
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- 50mm. DIA. CONDUIT.
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- TWIN AND EARTH
- CABLE ROUTE

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- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
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- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 450 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
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- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–6 BOARD DESIGNATION NUMBER.

- 16A SANS 664–6 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 664–6 DOUBLE SSO.
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- 16A SANS 664–6 & 664–2 COMBINATION SSO.
- 16A SANS 664–4 RED SSO (0' SHAVED EARTH PIN)
- 16A SANS 664–4 RED SSO ON PEDISTAL
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- 3 POLE ISOLATOR
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- 6A SANS 664–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
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- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

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- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
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- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- (1) REFERENCE TO QUANTITY i.e. 3No.
- (2) REFERENCE TO A DETAIL i.e. DETAIL 2.
- (4) REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- HDB LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

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WCS number 076262 page type A0

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FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name		
Signature		Date

consultant

65 The Boulevard
Westway Office Park,
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Durban, 3630
Tel. 036 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

DOCTORS SMALL POWER PLAN
SECOND FLOOR
COMPLETION SCOPE

Drawn	CW	Checked JK	Date
scale	1 : 100		2025/04/15

drawing number
25007_1_202

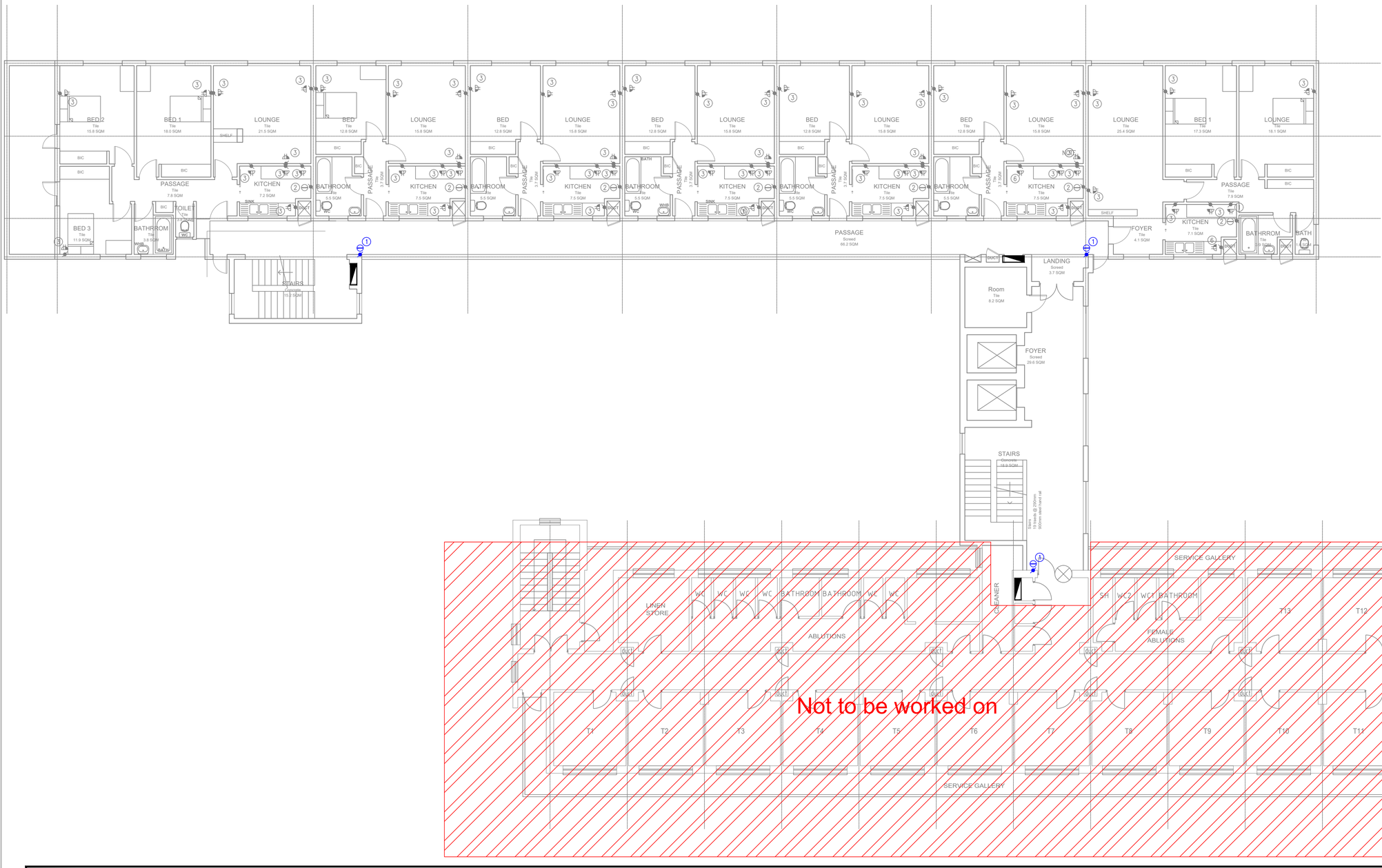
Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation
The contractor is only to work in areas shown and all areas left blank are not to be worked in

(1) Isolator for Power Supply

(2) Stove Isolator in 4x4 steel box mounted on 3CR12, 3mm. thick steel mounting plate to cover the hole.

(3) SSO to include USB port



NOTES: (6) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 680 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 600x600 CONDUIT BOX.
- 600x600 CONDUIT BOX AT 500AFFL.
- 600x600 CONDUIT BOX AT 6400AFFL.
- 600x50 CONDUIT BOX
- 600x50 CONDUIT BOX AT 300AFFL.
- 600x50 CONDUIT BOX AT 6400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 600x600 DRAW BOX
- 600x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

ROUND CONDUIT BOX FOR:
- DM – DOOR MONITOR
- CAM – CAMERA
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC
- EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
- TWIN AND EARTH
- CABLE ROUTE

- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 650 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–6 BOARD DESIGNATION NUMBER.

- 16A SANS 664–6 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 664–6 DOUBLE SSO.
- 16A SANS 664–6 SSO ON PEDESTAL.
- 16A SANS 664–2 3 PIN SSO.
- 16A SANS 664–6 & 664–2 COMBINATION SSO.
- 16A SANS 664–4 RED SSO (0' SHAVED EARTH PIN)
- 16A SANS 664–4 RED SSO ON PEDESTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 664–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- (1) REFERENCE TO QUANTITY i.e. 3No.
- (2) REFERENCE TO A DETAIL i.e. DETAIL 2.
- (4) REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- HDB LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 076262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name		
Signature		Date

consultant

65 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 036 205 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

DOCTORS SMALL POWER PLAN
THIRD FLOOR
COMPLETION SCOPE

Drawn	CW	Checked JK	Date
scale	1 : 100		2025/04/15

drawing number

25007_1_203

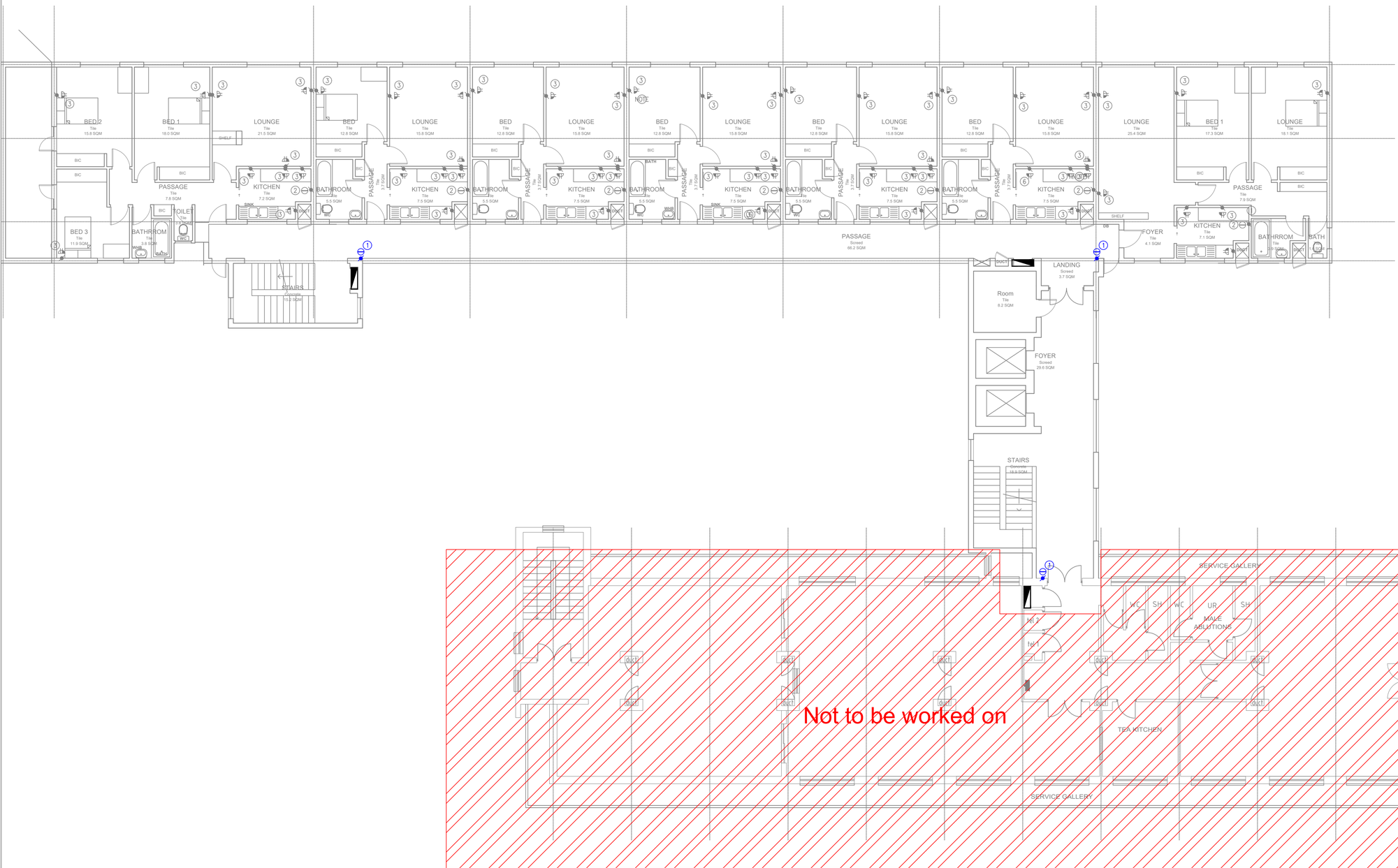
Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation
The contractor is only to work in areas shown and all areas left blank are not to be worked in

(1) Isolator for Power Supply

(2) Stove Isolator in 4x4 steel box mounted on 3CR12, 3mm. thick steel mounting plate to cover the hole.

(3) SSO to include USB port



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

ROUND CONDUIT BOX FOR:
- DM – DOOR MONITOR
- CAM – CAMERA
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC
- EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
- TWIN AND EARTH
- CABLE ROUTE

- OC OVERHEAD CAST–IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST–IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (0" SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDISTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

DOCTORS SMALL POWER PLAN
FOURTH FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_1_204

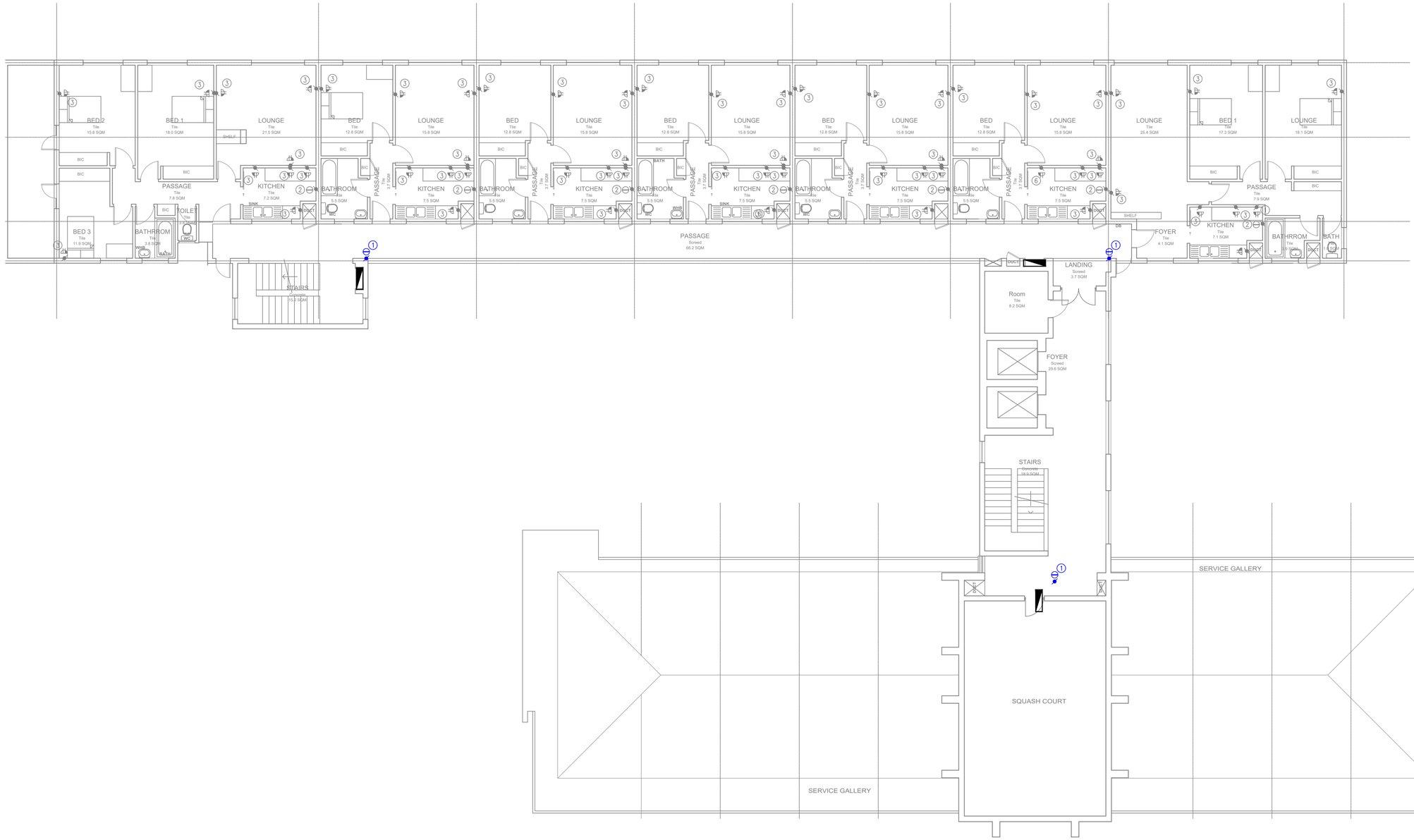
Drawing Notes:

The contractor is remove the existing fitting(s) and replace with the new ones as per drawing using the existing reticulation
The contractor is only to work in areas shown and all areas left blank are not to be worked in

① Isolator for Power Supply

② Stove Isolator in 4x4 steel box mounted on 3CR12, 3mm. thick steel mounting plate to cover the hole.

③ SSO to include USB port



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL.
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

ROUND CONDUIT BOX FOR:
- DM – DOOR MONITOR
- CAM – CAMERA
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC
- EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- SURFIX
- TWIN AND EARTH
- CABLE ROUTE

- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- FS FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164-1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164-1 DOUBLE SSO.
- 16A SANS 164-1 SSO ON PEDESTAL.
- 16A SANS 164-2 3 PIN SSO.
- 16A SANS 164-1 & 164-2 COMBINATION SSO.
- 16A SANS 164-4 RED SSO (0' SHAVED EARTH PIN)
- 16A SANS 164-4 RED SSO ON PEDISTAL
- 3 PHASE C-FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164-3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

DOCTORS SMALL POWER PLAN
FIFTH FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date

scale 1 : 100 2025/04/15

drawing number

25007_1_205

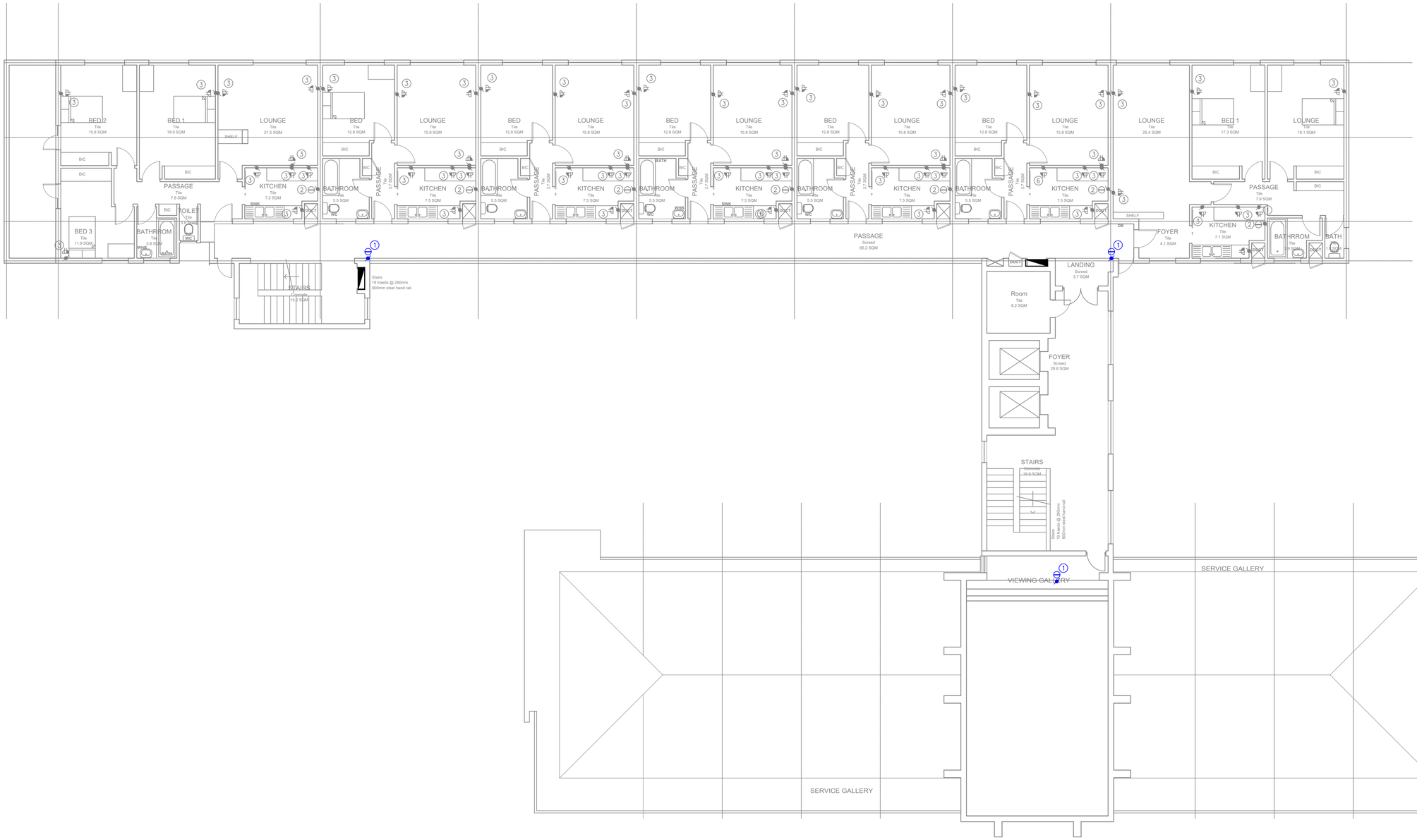
Drawing Notes:

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The contractor is only to work in areas shown and all areas left blank are not to be worked in

① Isolator for Power Supply

② Stove Isolator in 4x4 steel box mounted on 3CR12, 3mm. thick steel mounting plate to cover the hole.

③ SSO to include USB port



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- E 100x100 CONDUIT BOX AT 1400AFFL.
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- T 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- C CLUSTER BOX (SIZE AS NOTED).

- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.

- DM, CAM etc. ROUND CONDUIT BOX FOR:
  - DM – DOOR MONITOR
  - CAM – CAMERA
  - AA – ACCESS ALARM
  - AC – ACCESS CONTROL
  - CR – CARD READER
  - COM – COMMUNICATION/INTERCOM
  - BGM – BACK GROUND MUSIC
  - EL – ELECTRIC LOCK/STRIKE

- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- SECTION OF CONDUIT OMMITED FOR CLARITY.
- S SURFIX
- U TWIN AND EARTH
- CABLE ROUTE

- oc OVERHEAD CAST–IN
- os OVERHEAD ON SURFACE OR LAID ON CEILING.
- fc FLOOR SLAB CAST–IN.
- fs FLOOR SURFACE (IN FLOOR VOID).
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER

- 150 SQUARE GALV. STEEL DRAW TRAY SIZE AS SHOWN.
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.

- 16A SANS 164–1 SWITCHED SOCKET OUTLET (SSO).
- 16A SANS 164–1 DOUBLE SSO.
- 16A SANS 164–1 SSO ON PEDESTAL.
- 16A SANS 164–2 3 PIN SSO.
- 16A SANS 164–1 & 164–2 COMBINATION SSO.
- 16A SANS 164–4 RED SSO (0" SHAVED EARTH PIN)
- 16A SANS 164–4 RED SSO ON PEDISTAL
- 3 PHASE C–FORM SSO.
- 2 POLE ISOLATOR
- 3 POLE ISOLATOR
- 4 POLE ISOLATOR

- 6A SANS 164–3 U/S SOCKET OUTLET.
- SINGLE LEVER ONE WAY LIGHT SWITCH.
- INTERMEDIATE LIGHT SWITCH
- TWO WAY LIGHT SWITCH
- MOTION SENSOR
- LIGHT SWITCH WITH MOTION SENSOR

- LINEAR LUMINAIRE
- BULKHEAD/DOWNLIGHTER, ETC.
- WALL MOUNTED LUMINAIRES
- POLE MOUNTED LUMINAIRE.

- TELEPHONE POINT.
- TELEPHONE POINT ON PEDESTAL.
- DIRECT OUTSIDE LINE TELEPHONE POINT (CALL BOX).
- TV OUTLET.
- DATA/COMMS OUTLET.

- BELL PUSH.
- BELL OUTLET.
- SIGN POINT.
- CLOCK OUTLET.
- PHOTOCELL

- 1 REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34

- 6 / B CABLE NUMBER – REFER CABLE SCHEDULE FOR DETAILS.
- LUMINAIRE TYPE "B" – REFER LUMINAIRE SCHEDULE.

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

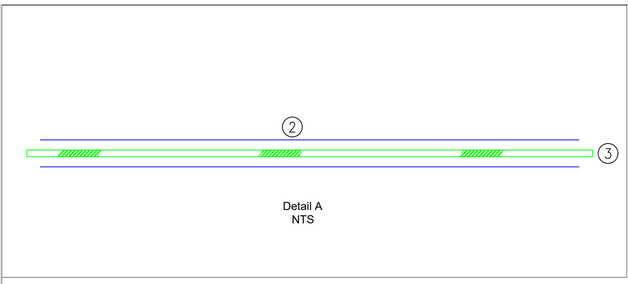
Drawing title

DOCTORS SMALL POWER PLAN
SIXTH FLOOR
COMPLETION PLAN

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_1_206



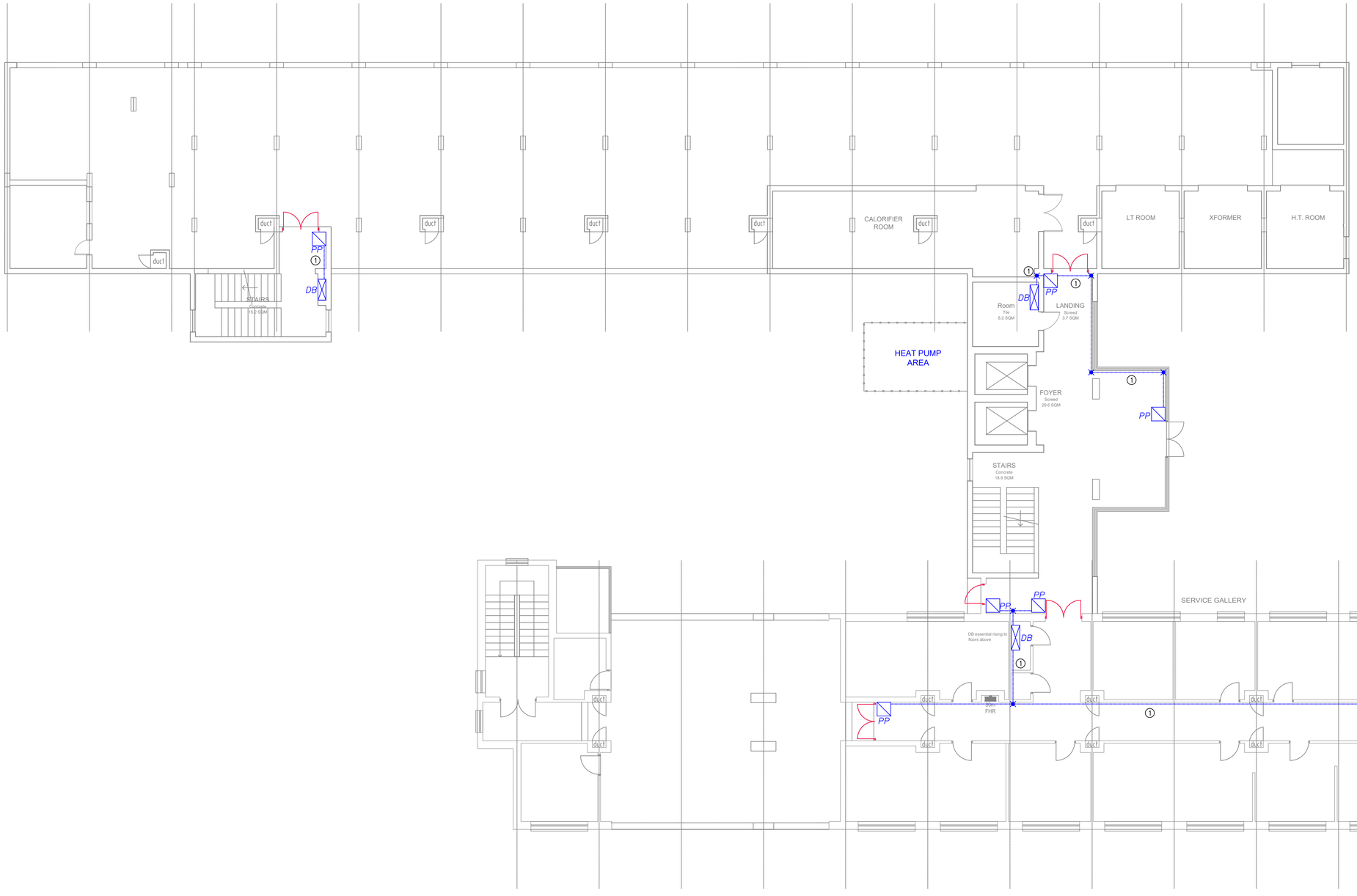
Detail A
NTS

① Refer to Detail A

② 20mm Galvanised Conduit

③ 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- T 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- 150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- OC OVERHEAD CAST–IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST–IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE
- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- 6 CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.
- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR
- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X–RAY INSPECTION MACHINE OR LETTER/PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR
- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- S SECURITY CONTROL PANEL/JUNCTION BOX
- ELECTRIC LOCK/STRIKE
- KEY SWITCH
- PB FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE
- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- CR ACCESS CONTROL CARD READER
- CR POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- ED – EXIT OVERRIDE
- AO – ALARM OVERRIDE
- C COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
- TALK–BACK WALL MOUNTED LOUDSPEAKER
- COLUMN SPEAKER
- AT ATTENUATOR
- MJ MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SJ SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
- CEILING MOUNTED MICROPHONE
- MICROPHONE
- RADIO MICROPHONE
- FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
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Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

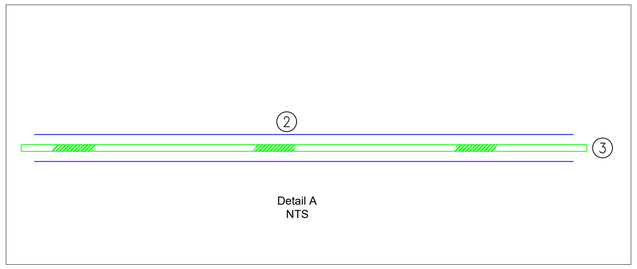
Drawing title

DOCTORS ELECTRONICS PLAN
GROUND FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_1_300



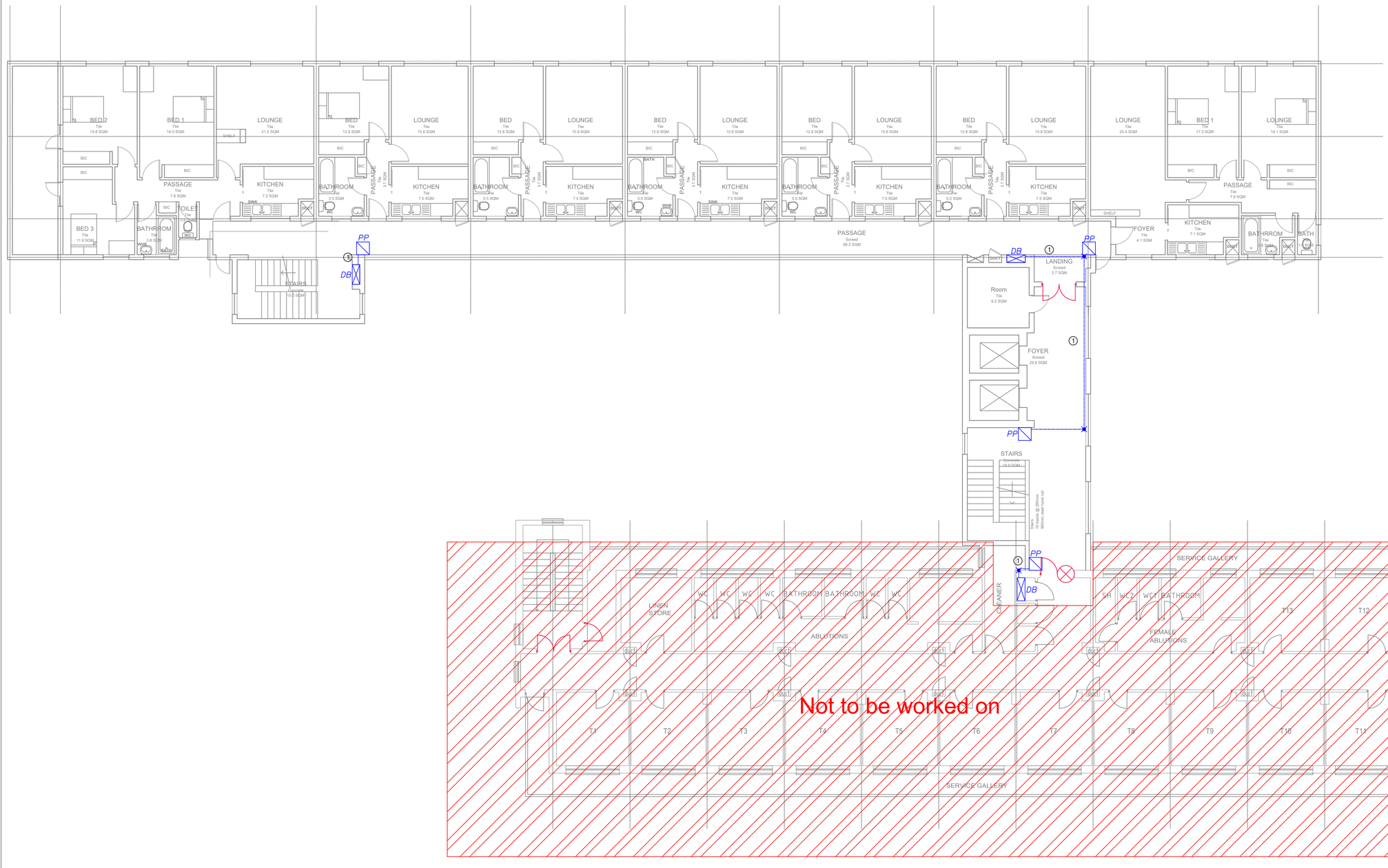
Detail A
NTS

① Refer to Detail A

② 20mm Galvanised Conduit

③ 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah



No.	DATE	AMENDMENT	Issued By
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WCS number 071262

page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature | Date

consultant

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Westway Office Park,
Westville,
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Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH: GREYS HOSPITAL RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

DOCTORS ELECTRONICS PLAN FIRST FLOOR COMPLETION SCOPE

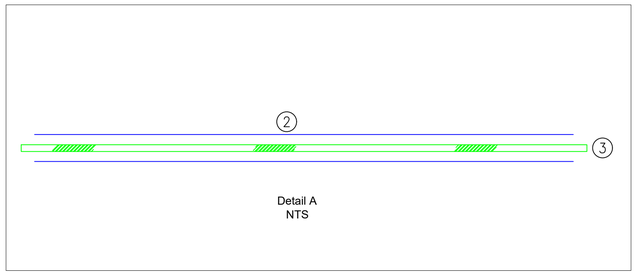
Drawn CW | Checked JK | Date 2025/04/15

scale 1 : 100

drawing number 25007_1_301

NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL.
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- T 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- 150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE
- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- 6 CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB-1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.
- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR
- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X-RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR
- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- SC SECURITY CONTROL PANEL/JUNCTION BOX
- ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FP FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE
- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- ACR ACCESS CONTROL CARD READER
- CCR POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- EO – EXIT OVERRIDE
- AO – ALARM OVERRIDE
- COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
- TALK–BACK WALL MOUNTED LOUDSPEAKER
- COLUMN SPEAKER
- AT ATTENUATOR
- MJ MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SJ SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
- CEILING MOUNTED MICROPHONE
- MICROPHONE
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- FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

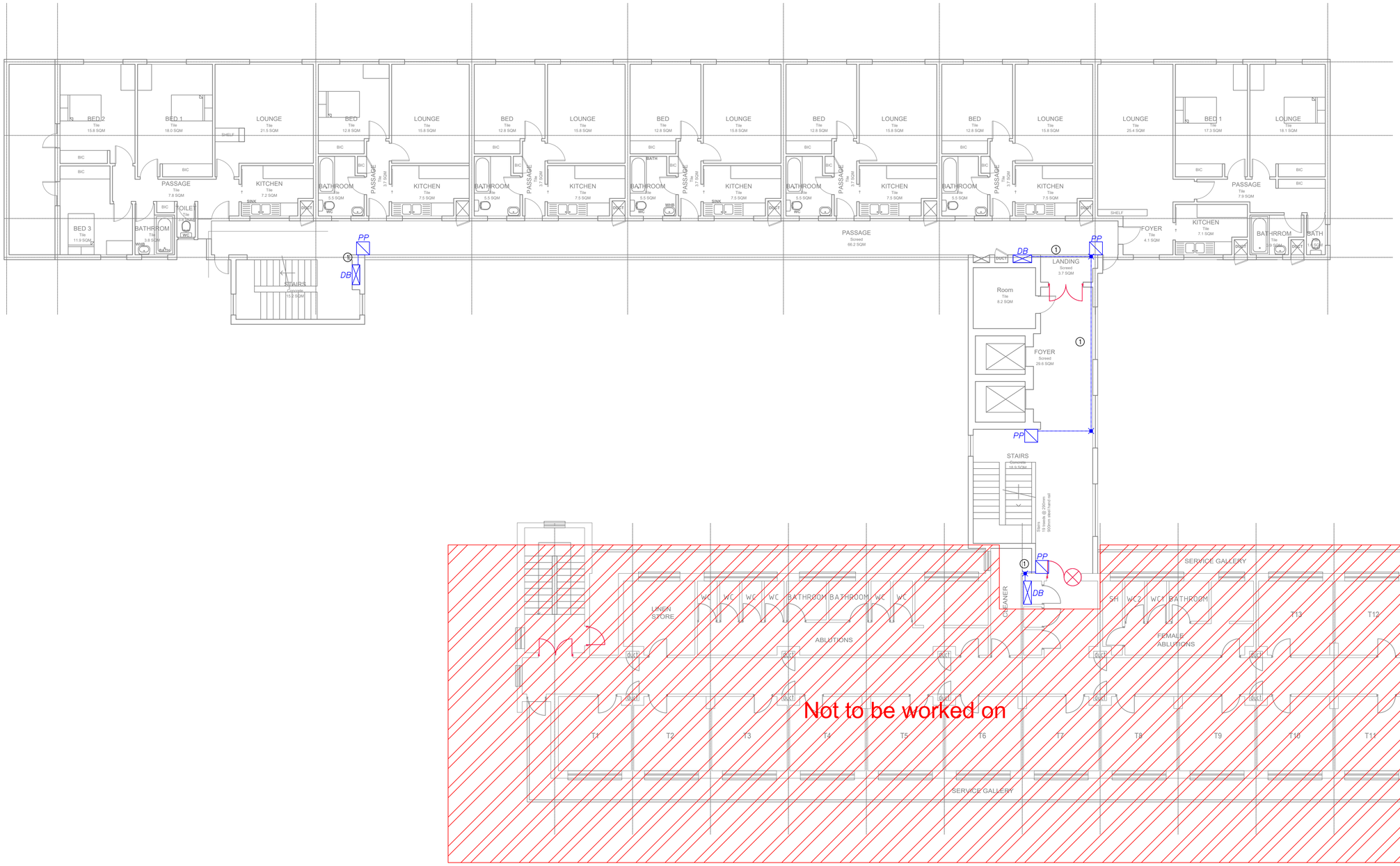


① Refer to Detail A

② 20mm Galvanised Conduit

③ 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah



No.	DATE	AMENDMENT	Issued By
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WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

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email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

DOCTORS ELECTRONICS PLAN
SECOND FLOOR
COMPLETION SCOPE

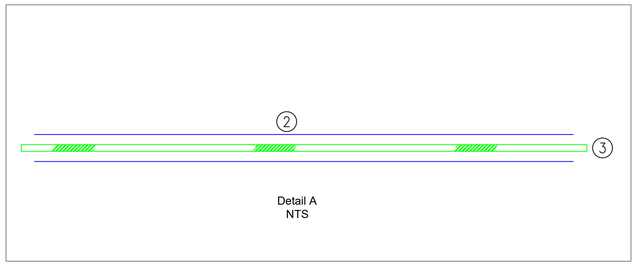
Drawn CW Checked JK Date 2025/04/15

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drawing number 25007_1_302

NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL.
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- 150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE
- ◇ REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- 6 CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS
- T TELEPHONE JUNCTION BOX.
- I INTERCOM JUNCTION BOX.
- D DATA/COMMS JUNCTION BOX.
- S SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.
- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR
- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X-RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR
- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- CR SECURITY CONTROL PANEL/JUNCTION BOX
- EL ELECTRIC LOCK/STRIKE
- KEY SWITCH
- PB FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE
- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- CR ACCESS CONTROL CARD READER
- CR POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- ED – EXIT OVERRIDE
- AO – ALARM OVERRIDE
- IC COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
- TALK–BACK WALL MOUNTED LOUDSPEAKER
- COLUMN SPEAKER
- AT ATTENUATOR
- MJ MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SJ SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK
- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
- CEILING MOUNTED MICROPHONE
- MICROPHONE
- RADIO MICROPHONE
- FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

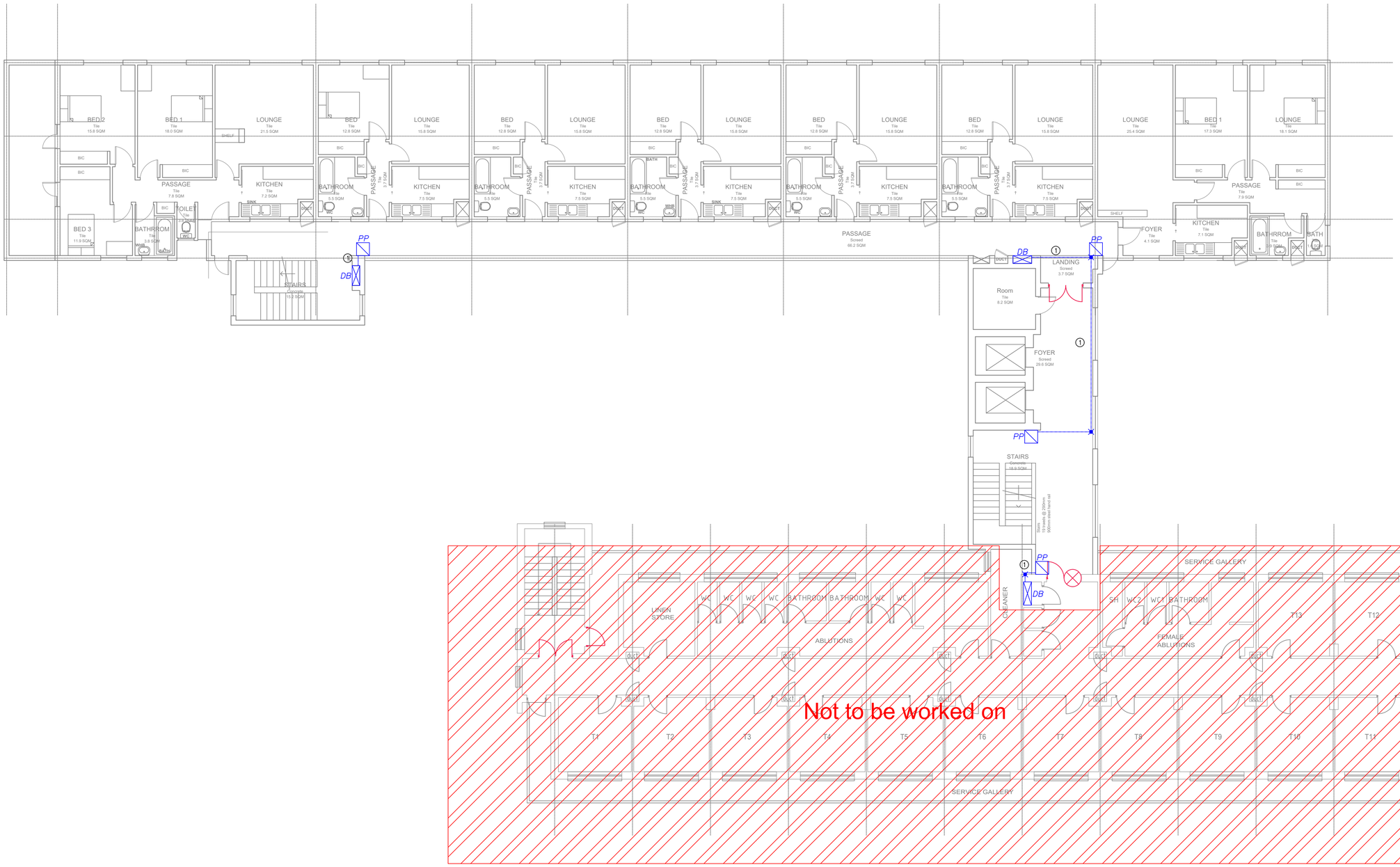


1 Refer to Detail A

2 20mm Galvanised Conduit

3 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- 100x100 CONDUIT BOX.
- 100x100 CONDUIT BOX AT 500AFFL.
- 100x100 CONDUIT BOX AT 1400AFFL.
- 100x50 CONDUIT BOX
- 100x50 CONDUIT BOX AT 300AFFL.
- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- 100x100 DRAW BOX

- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.

- OC OVERHEAD CAST–IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST–IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE

- REFERENCE TO QUANTITY i.e. 3No.
- REFERENCE TO A DETAIL i.e. DETAIL 2.
- REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS

- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.

- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR

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- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X–RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR

- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- SECURITY CONTROL PANEL/JUNCTION BOX
- ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA.
- ER – ELECTRIC RELEASE

- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- ACS ACCESS CONTROL CARD READER
- ACR POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- ED – EXIT OVERRIDE
- AO – ALARM OVERRIDE

- COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
- TALK–BACK WALL MOUNTED LOUDSPEAKER

- COLUMN SPEAKER
- AT ATTENUATOR
- MJ MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SJ SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK

- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
- CEILING MOUNTED MICROPHONE
- MICROPHONE
- RADIO MICROPHONE

- FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Completion Scope	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

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Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

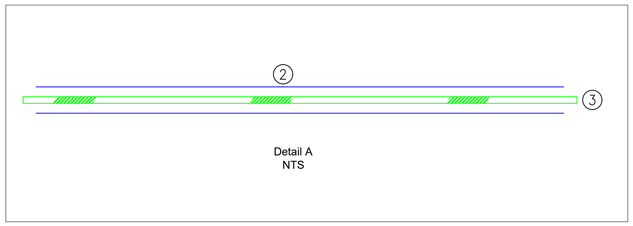
Drawing title

DOCTORS ELECTRONICS PLAN
THIRD FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_1_301



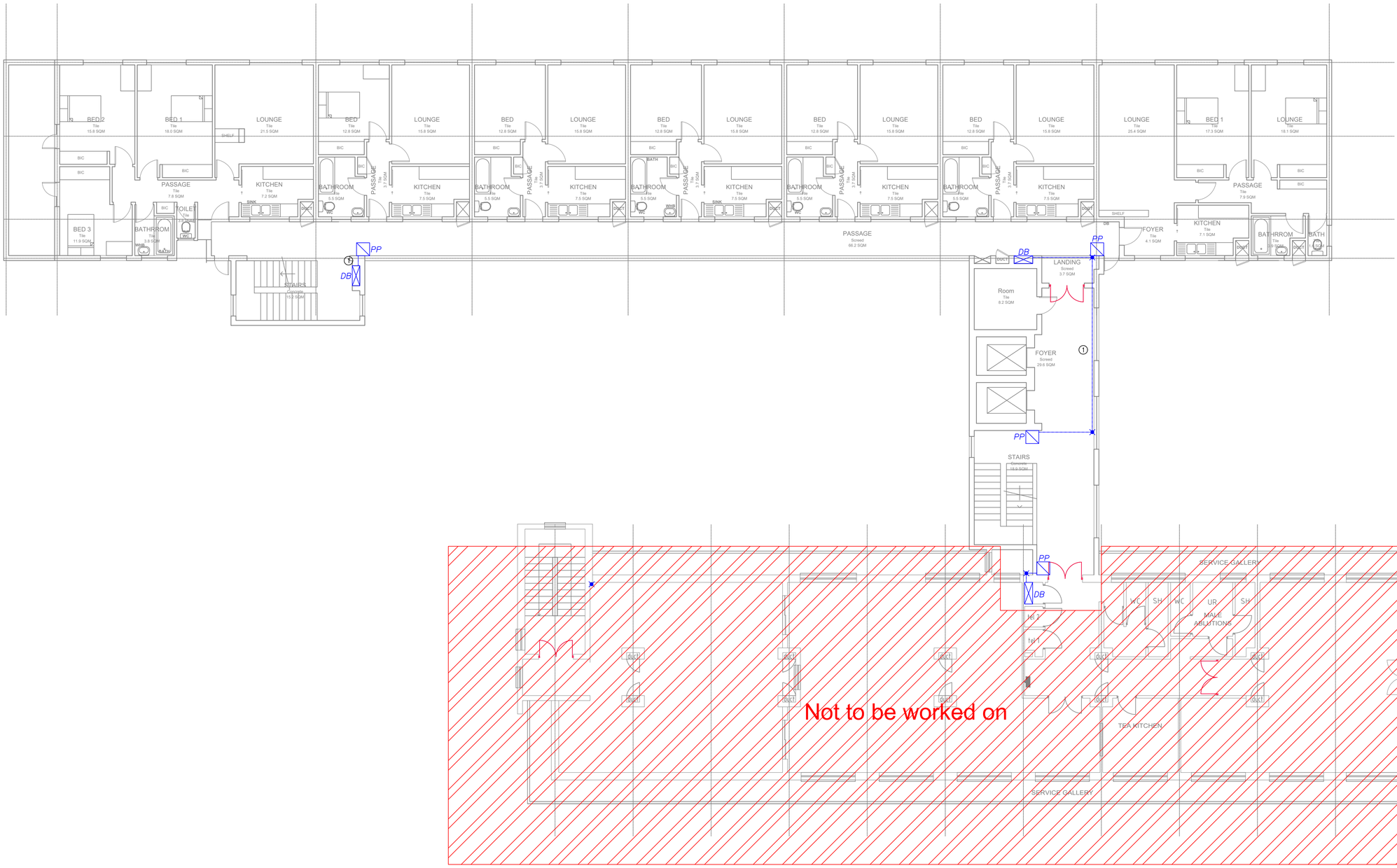
Detail A
NTS

① Refer to Detail A

② 20mm Galvanised Conduit

③ 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah



No.	DATE	AMENDMENT	Issued By
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page type A0

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FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature | Date

consultant

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Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

DOCTORS ELECTRONICS PLAN
FOURTH FLOOR
COMPLETION SCOPE

Drawn CW | Checked JK | Date 2025/04/15

scale 1 : 100

drawing number 25007_1_304

NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- S 100x100 DRAW BOX

- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("b" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- 150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.

- OC OVERHEAD CAST–IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST–IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE

- ◇1 REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- 6 CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS

- TJB TELEPHONE JUNCTION BOX.
- IJB INTERCOM JUNCTION BOX.
- DJB DATA/COMMS JUNCTION BOX.
- SJB SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.

- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR

- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X–RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR

- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- SCP SECURITY CONTROL PANEL/JUNCTION BOX
- D ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FP FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE

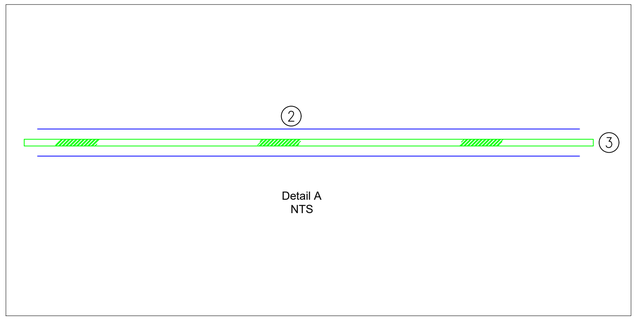
- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- CR ACCESS CONTROL CARD READER
- CR POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- ED – EXIT OVERRIDE
- AO – ALARM OVERRIDE

- C COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
- TALK–BACK WALL MOUNTED LOUDSPEAKER

- COLUMN SPEAKER
- AT ATTENUATOR
- MJ MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SJ SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK

- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
- CEILING MOUNTED MICROPHONE
- MICROPHONE
- RADIO MICROPHONE

- FP FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT



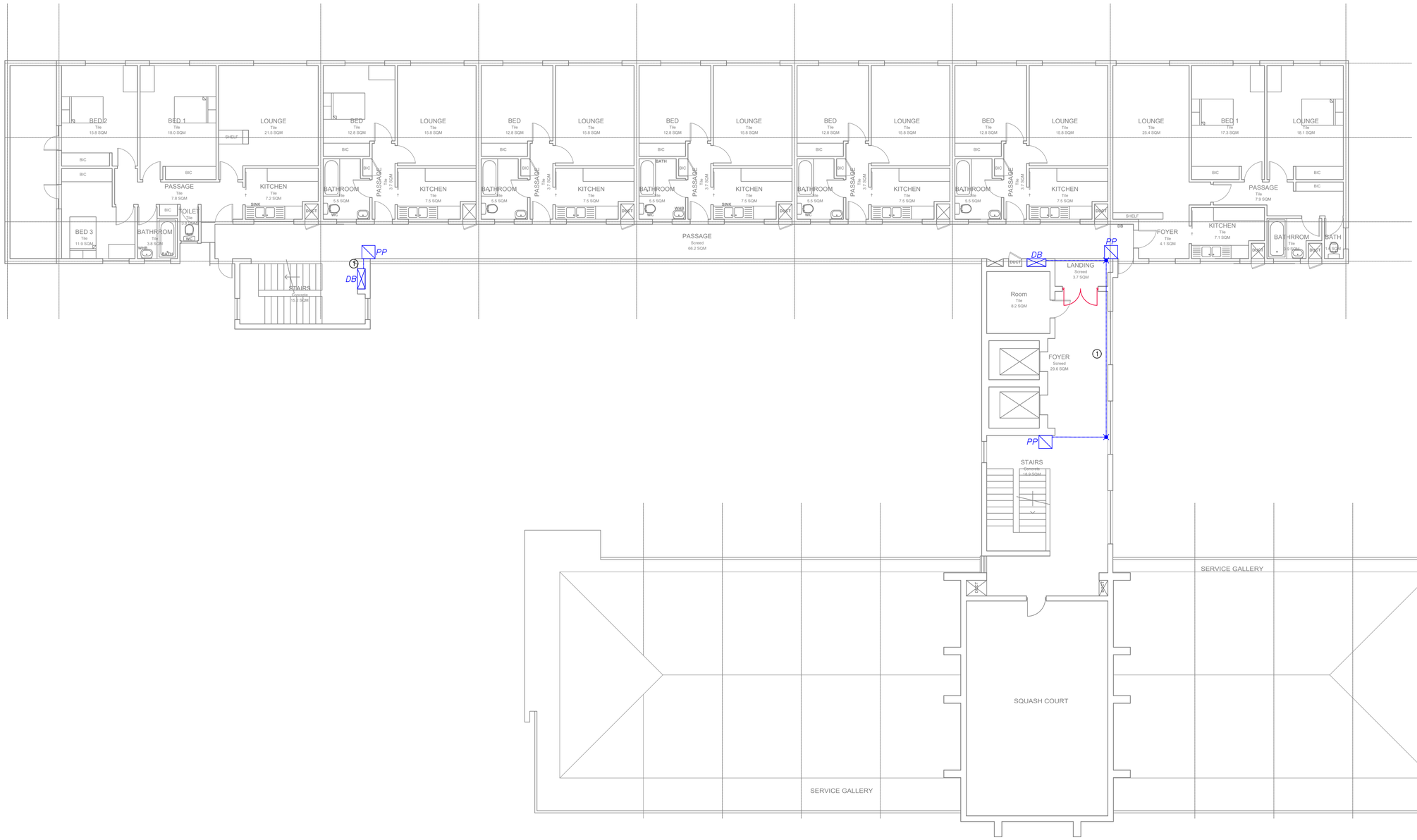
Detail A
NTS

① Refer to Detail A

② 20mm Galvanised Conduit

③ 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah



No.	DATE	AMENDMENT	Issued By
0	15/04/25	Completion Scope	JMK

WCS number 071262

page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature | Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status: STAGE 5 - WORKS

Discipline: ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

DOCTORS ELECTRONICS PLAN
FIFTH FLOOR
COMPLETION SCOPE

Drawn CW | Checked JK | Date 2025/04/15

scale 1 : 100

drawing number 25007_1_303

NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL.
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- L 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- S 100x100 DRAW BOX

- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
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- DATA/COMMS JUNCTION BOX.
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- DISTRIBUTION BOARD POSITION.
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- INFRARED BEAM TRANSMITTER AND RECEIVER
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- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE.
- X–RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR

- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- S ACCESS CONTROL CARD READER
- ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FP FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE

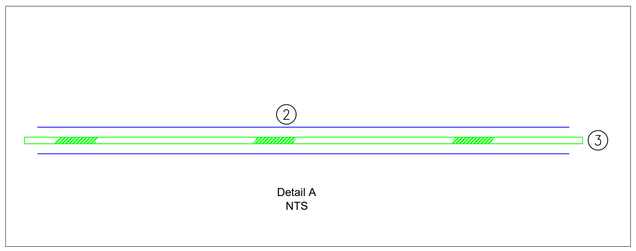
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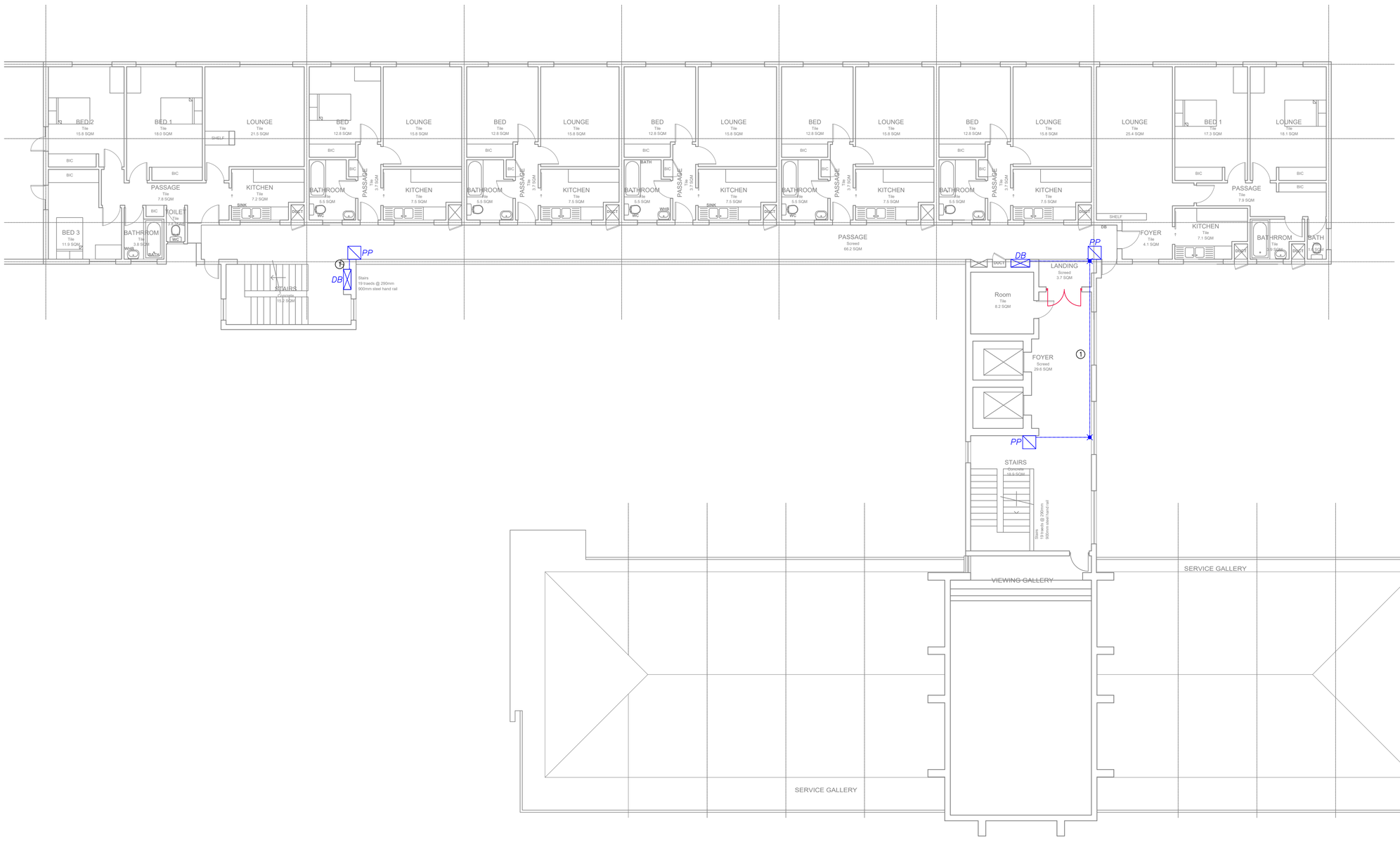
Detail A
NTS

① Refer to Detail A

② 20mm Galvanised Conduit

③ 2.5mm² Norsk Black Cable

PP Boxed Power Supply Unit, 220V AC to 12VDC; 2A regulated; 12V DC Battery, 7Ah



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

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- K ELECTRIC LOCK/STRIKE
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- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
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- ALARM BELL
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- HEAT DETECTOR
- B BREAK GLASS UNIT

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

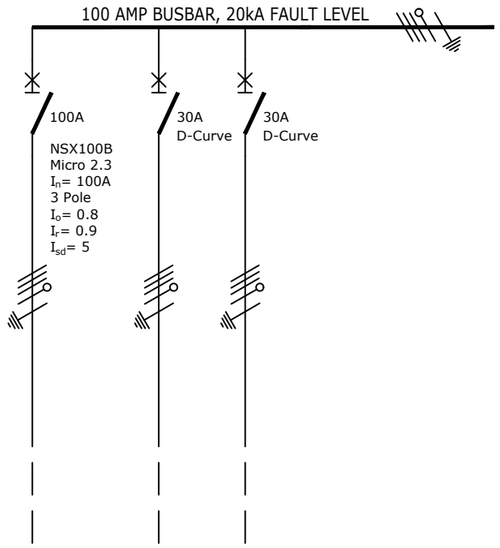
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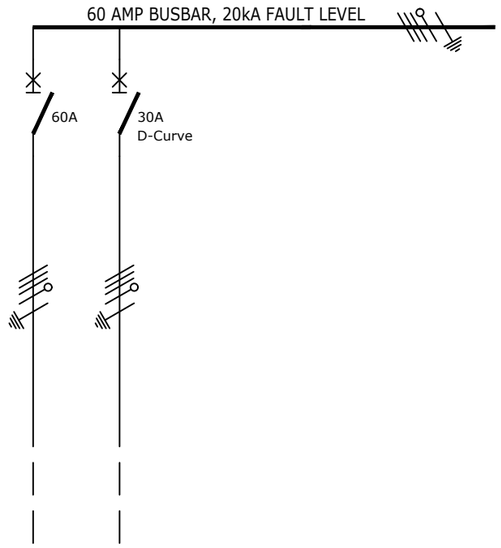
DOCTORS ELECTRONICS PLAN
SIXTH FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_1_306





ESSENTIAL SECTION

NON-ESSENTIAL SECTION

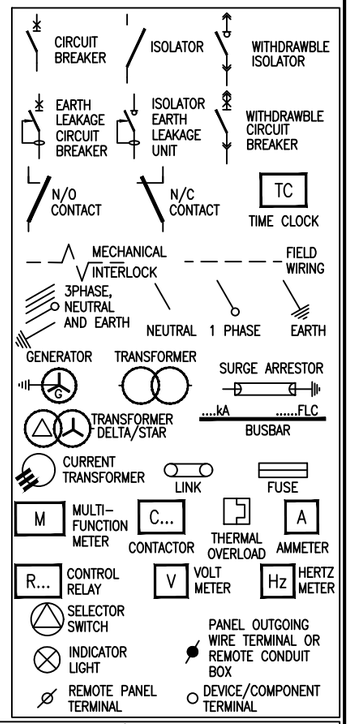
FIELD			
CIRCUIT No./PHASE			
DESIGNATION	INCOMER FROM SUB DB (NON-ESSENTIAL SECTION)	TBC	TBC
WIRING	16mm² PVC SWA ECC Cable		
LOAD (AMPS)			
No. OF POINTS			

FIELD			
CIRCUIT No./PHASE			
DESIGNATION	INCOMER FROM SUB DB (ESSENTIAL SECTION)	TBC	
WIRING	16mm² PVC SWA ECC Cable		
LOAD (AMPS)			
No. OF POINTS			

NOTES

1) DROPPERS/TAILS TO BE RATED FOR FULL i^2t LET THROUGH.
2) HARNESSED WIRING TO BE DERATED.
3) TUFFNOL BRACES ARE NOT TO BE USED ABOVE 10kA.
4) COPPER BUSBARS TO BE CONTINUOUS RATED.
5) ALL OUTGOING CIRCUIT BREAKERS TO BE FITTED WITH COPPER TAILS TO FACILITATE CABLE TERMINATIONS IN THE CABLE CHAMBER AND NOT ON THE CIRCUIT BREAKER.
6) COPPER TAILS FROM DROPPER BUSBAR AND OUTGOING COPPER TAILS TO BE ADEQUATELY BRACED FOR FAULT LEVEL AND SHROUDED WITH HEAT SHRINK.
7) ALL CIRCUIT BREAKERS TO BE FITTED WITH TERMINAL SHIELD ON LIVE AND LOAD SIDES.
8) PHASING RWB, TOP TO BOTTOM, LEFT TO RIGHT, BACK TO FRONT.
9) INTERNAL TEMP TO BE LIMITED TO 5° ABOVE AMBIANT, MAX 40°C.
10) ALL CIRCUITS TO BE LABELED.
11) 25% SPARE SPACE. SPARE SPACES ARE TO BE FITTED WITH COPPER BUSBAR TAILS CONNECTED TO DROPPER BUSBARS TO ALLOW INSTALLATIONOF CIRCUIT BREAKERS WITH A MINIMAL SHUTDOWN PERIOD.

PANEL: RED	- ESSENTIAL
ORANGE	- NON-ESSENTIAL
INCOMING CABLE	-BUSBAR / TOP
OUTGOING CIRCUITS	-CABLES / TOP
COLOUR	-
MOUNTING	-SURFACE
ACCESS	-FRONT / REAR
PROTECTIVE DEVICES	-SCHNEIDER
ACB's (1250A-4000A)	-MASTERPACT NW
MCCB'S(800A - 1000A)	-COMPACT NS
MCCB'S(60A-630A)	-EASYPACT CSV
MCB's	-MULTI 9, TYPE 2
CONTACTORS	-AC3 HEAVY DUTY
METERS	-SCHNEIDER



NOT WITHSTANDING ANYTHING TO THE CONTRARY, ALL RIGHTS RESERVED. NO PART OF THIS DRAWING MAY BE REPRODUCED IN ANY MATERIAL FORM (INCLUDING PHOTOCOPYING OR STORING IN ANY MEDIUM OR BY ELECTRONIC MEANS WHETHER OR NOT TRANSIENTLY OR INCIDENTLY TO SOME OTHER USE OF THIS DRAWING) AND ALSO, THIS DRAWING MAY NOT BE USED FOR ANY PURPOSE OR REASON OTHER THAN FOR WHICH IT WAS ORIGINALLY ISSUED, WITHOUT THE WRITTEN PERMISSION OF REABOW CONSULTING ENGINEERS.

REV	DESCRIPTION	BY	DATE	CHKD.
0	Original Issue	CW	15/04/25	JK

ENGINEER: JK	DRAWN: RM	DATE: May'22	SCALE: NTS	CHKD.: JK
			PAPER SIZE: A3	
PROJECT No.: 25007_1	DRAWING No.: 401	SHEET: 1 of 1	REV.: 0	
File Name :	Lyr:			

PROJECT:
Grey's Hospital Renovations & Upgrade to Nurses and Doctors Accommodation

DRAWING TITLE:
DB-Heat Pump
Doctors Quarters Completion Scope
Single Line Diagram

UKUZA CONSULTING (PTY) LTD

Type		Description	Installation	Lamps		Location	Comments
				Type	Colour		
A		E27 Pendant Spun Aluminium Dome 1,5m suspension	Surface Mounted	20W LED	4000K	Bedrooms	Fitting to have a 5yr warranty
B		16W LED Bulkhead white trim 90lm/W Opal Diffuser	Surface Mounted	16W LED	4000K	Lounges	Fitting to have a 5yr warranty
C		Slim Line Linear 5ft 60W 120lm/W 4000K	Surface Mounted	60W LED Vapour Proof	4000K	Kitchens	Fitting to have a 5yr warranty
D		60W LED Panel 1200x600 3000K Backlit 110 lm/W cordset	Recessed in ceiling	60W LED	3000K	Lobbies/Reception Areas	Fitting to have a 5yr warranty
E		4ft IP65 Vapour Proof Integrated	Surface Mounted	35W LED	4000K	Parking	Fitting to have a 5yr warranty

REV	DESCRIPTION	BY	DATE	CHKD
0	Original Isuue	TM	25/04/22	JK

ENGINEER:	DRAWN:	DATE:	CHKD	P SIZE
JK	RM	April '25	JK	A4
PROJ No.:		DWG No	REV	SCALE
25007_1		600	0	n.t.s

FILE NAME: SHEET: 1 of 2

TITLE:

Greys Hospital - Renovations & Upgrades to Nurses and Doctor's Accomodation

Doctors Luminaire Schedule

IBUYA Consulting Engineers
"POWERING DEVELOPMENT"
BLOCK D
ESSEX PARK
46 ESSEX TERRACE
WESTVILLE
P.O. BOX 1692
WANDSBECK 3631
TEL: +27 (031) 2667831
FAX: +27 (031) 2667831
E-mail: ibuya@ibuya.co.za

Type		Description	Installation	Lamps		Location	Comments
				Type	Colour		
F		IP65 LED Bulkhead white trim	Surface Mounted	20W LED	4000K	Bathrooms	Fitting to have a 5yr warranty
G		IP65 flood light	Surface Mounted	30W LED	4000K	Heat pump area	Fitting to have a 5yr warranty
H		5ft IP65 Vapour Proof Integrated	Surface Mounted	60W LED	4000K	Squash Courts	Fitting to have a 5yr warranty

REV	DESCRIPTION	BY	DATE	CHKD
0	Original Isuue	TM	25/04/22	JK

ENGINEER:	DRAWN:	DATE:	CHKD	P SIZE
JK	RM	April '25	JK	A4
PROJ No.:		DWG No	REV	SCALE
22023_1		600	0	n.t.s

FILE NAME: SHEET: 2 of 2

TITLE:

Greys Hospital -Completion Contract

Doctors Luminaire Schedule

IBUYA Consulting Engineers
"POWERING DEVELOPMENT"
BLOCK D
ESSEX PARK
46 ESSEX TERRACE
WESTVILLE
P.O. BOX 1692
WANDSBECK 3631
TEL: +27 (031) 2687831
FAX: +27 (031) 2687831
E-mail: ibuya@ibuya.co.za

Type		Description	Installation	Lamps		Location	Comments
				Type	Colour		
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REV	DESCRIPTION	BY	DATE	CHKD
0	Original Isuue	TM	25/04/22	JK

ENGINEER:	DRAWN:	DATE:	CHKD	P SIZE
JK	RM	April '25	JK	A4
PROJ No.:		DWG No	REV	SCALE
25007_1		600	0	n.t.s

FILE NAME: SHEET: 1 of 2

TITLE:

Greys Hospital - Renovations & Upgrades to Nurses and Doctor's Accomodation

Doctors Luminaire Schedule

IBUYA Consulting Engineers
"POWERING DEVELOPMENT"
BLOCK D
ESSEX PARK
46 ESSEX TERRACE
WESTVILLE
P.O. BOX 1692
WANDSBECK 3631
TEL: +27 (031) 2667831
FAX: +27 (031) 2667831
E-mail: ibuya@ibuya.co.za

Type		Description	Installation	Lamps		Location	Comments
				Type	Colour		
F		IP65 LED Bulkhead white trim	Surface Mounted	20W LED	4000K	Bathrooms	Fitting to have a 5yr warranty
G		IP65 flood light	Surface Mounted	30W LED	4000K	Heat pump area	Fitting to have a 5yr warranty
H		5ft IP65 Vapour Proof Integrated	Surface Mounted	60W LED	4000K	Squash Courts	Fitting to have a 5yr warranty

REV	DESCRIPTION	BY	DATE	CHKD
0	Original Isuue	TM	25/04/22	JK

ENGINEER:	DRAWN:	DATE:	CHKD	P SIZE
JK	RM	April '25	JK	A4
PROJ No.:		DWG No	REV	SCALE
22023_1		600	0	n.t.s

FILE NAME: SHEET: 2 of 2

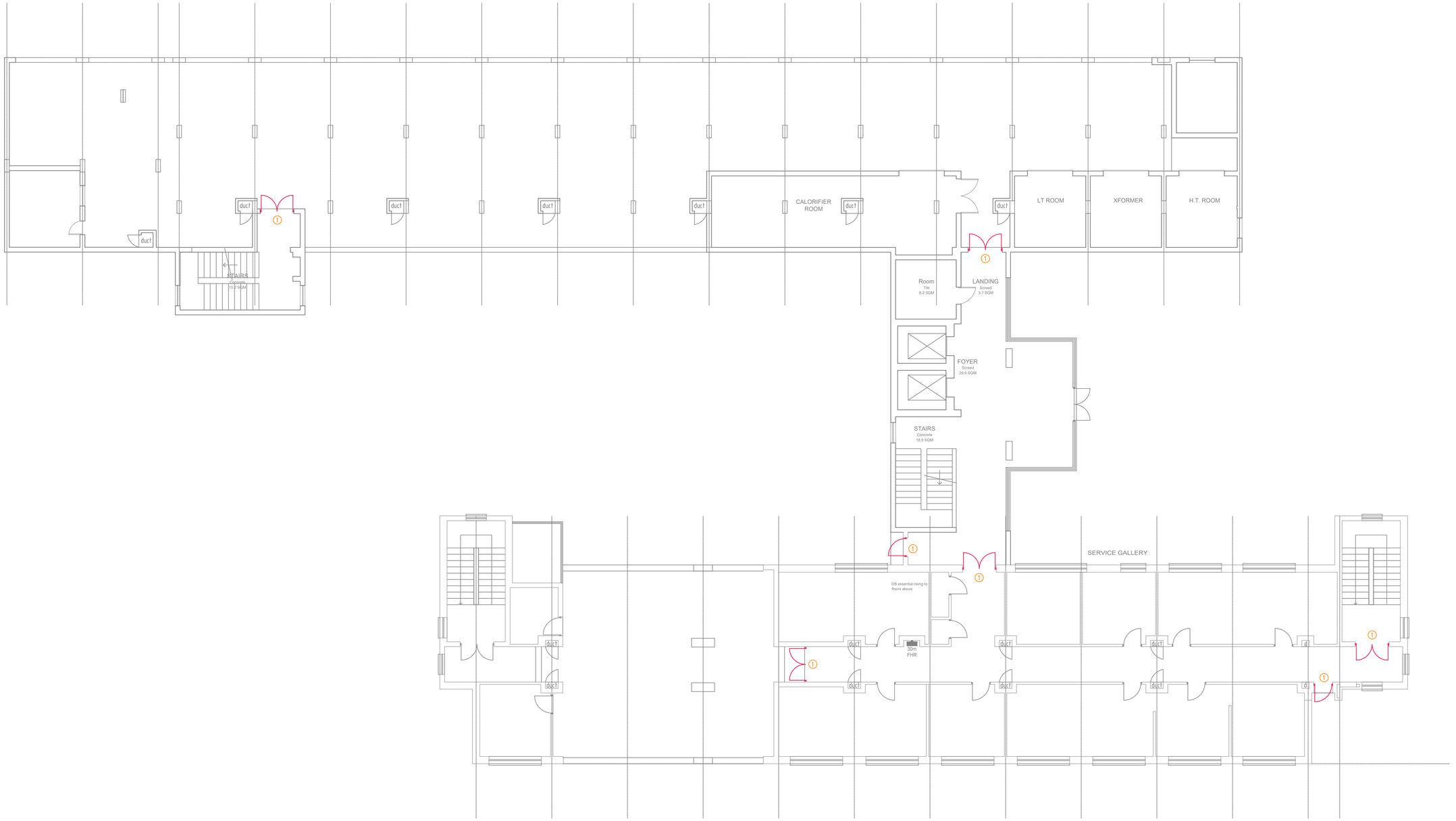
TITLE:

Greys Hospital -Completion Contract

Doctors Luminaire Schedule

IBUYA Consulting Engineers
"POWERING DEVELOPMENT"
BLOCK D
ESSEX PARK
46 ESSEX TERRACE
WESTVILLE
P.O. BOX 1692
WANDSBECK 3631
TEL: +27 (031) 2667831
FAX: +27 (031) 2667831
E-mail: ibuya@ibuya.co.za

① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
- S 100x100 CONDUIT BOX AT 500AFFL.
- S 100x100 CONDUIT BOX AT 1400AFFL
- L 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- T 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- S 100x100 DRAW BOX

- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN. 150
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
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- OC OVERHEAD CAST–IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST–IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE

- REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- 6 CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS

- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.

- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR

- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X–RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR

- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- S CONTROL PANEL/JUNCTION BOX
- ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FP FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE

- EL – ELECTRIC LOCK/STRIKE
- MA – MOTION ALARM
- ACCESS CONTROL CARD READER
- POLE MOUNTED ACCESS CONTROL CARD READER
- VEHICLE BARRIER BOOM CONTROLLER
- AA – ACCESS ALARM
- AC – ACCESS CONTROL
- CR – CARD READER
- EO – EXIT OVERRIDE
- AO – ALARM OVERRIDE

- C COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
- TALK–BACK WALL MOUNTED LOUDSPEAKER

- COLUMN SPEAKER
- AT ATTENUATOR
- MJ MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SJ SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
- FM OR AM ANTENNA AS SPECIFIED
- SOUND EQUIPMENT – CABINET RACK

- COM – COMMUNICATION/INTERCOM
- BGM – BACK GROUND MUSIC SYSTEM WITH OR WITHOUT AUDIBLE VOICE REINFORCEMENT (P.A.)
- CEILING MOUNTED MICROPHONE
- MICROPHONE
- RADIO MICROPHONE

- F FIRE ALARM PANEL/JUNCTION BOX
- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

No.	DATE	AMENDMENT	Issued By
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WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

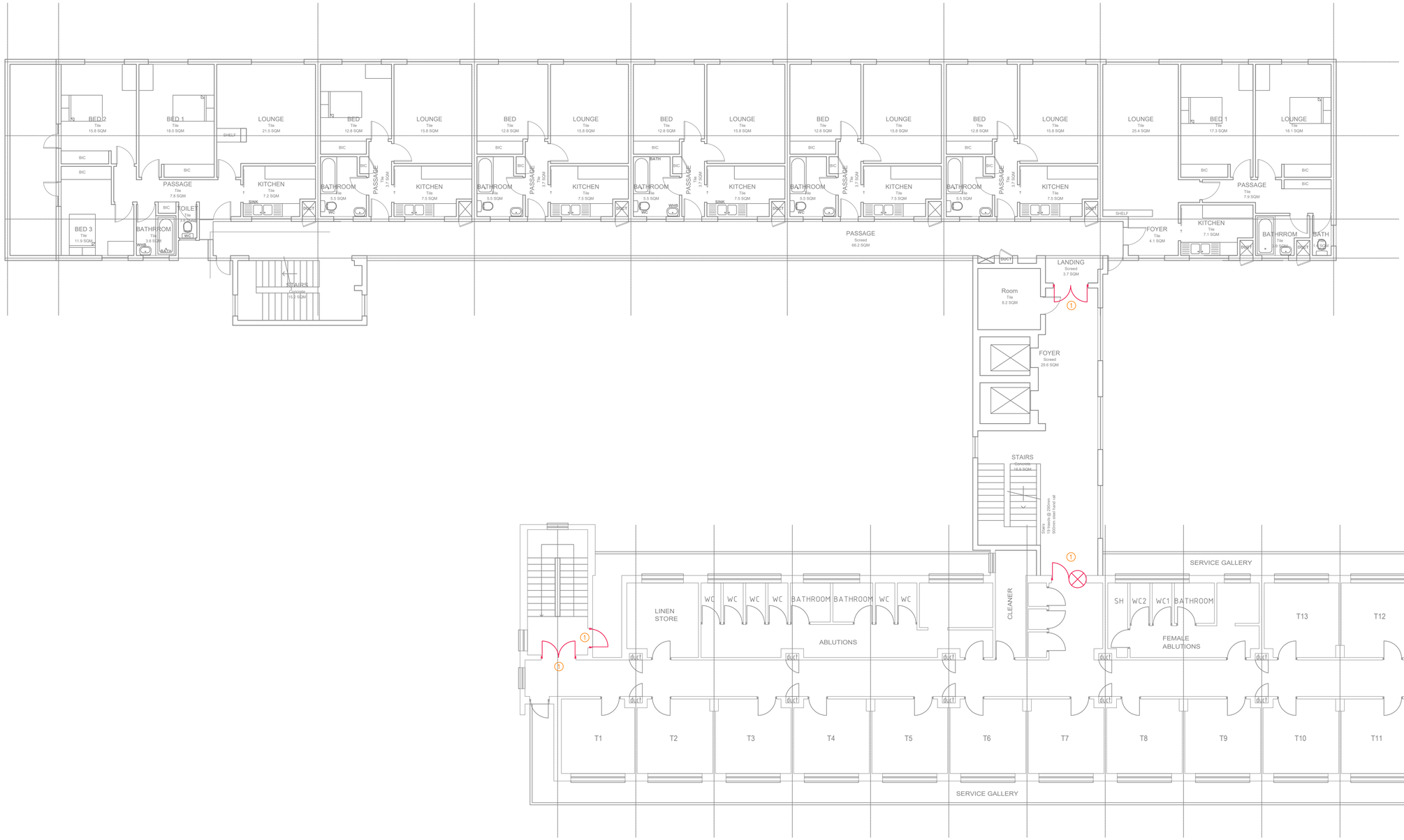
DOCTORS SMOKE DETECTION PLAN
GROUND FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_1_700

① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.



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UKUZA CONSULTING (PTY) LTD

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Department:
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PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH: GREYS HOSPITAL RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

DOCTORS SMOKE DETECTION PLAN FIRST FLOOR COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_1_702

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- 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- 100x100 DRAW BOX

- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
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- DB–1 BOARD DESIGNATION NUMBER.
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- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
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- EL ELECTRIC LOCK/STRIKE
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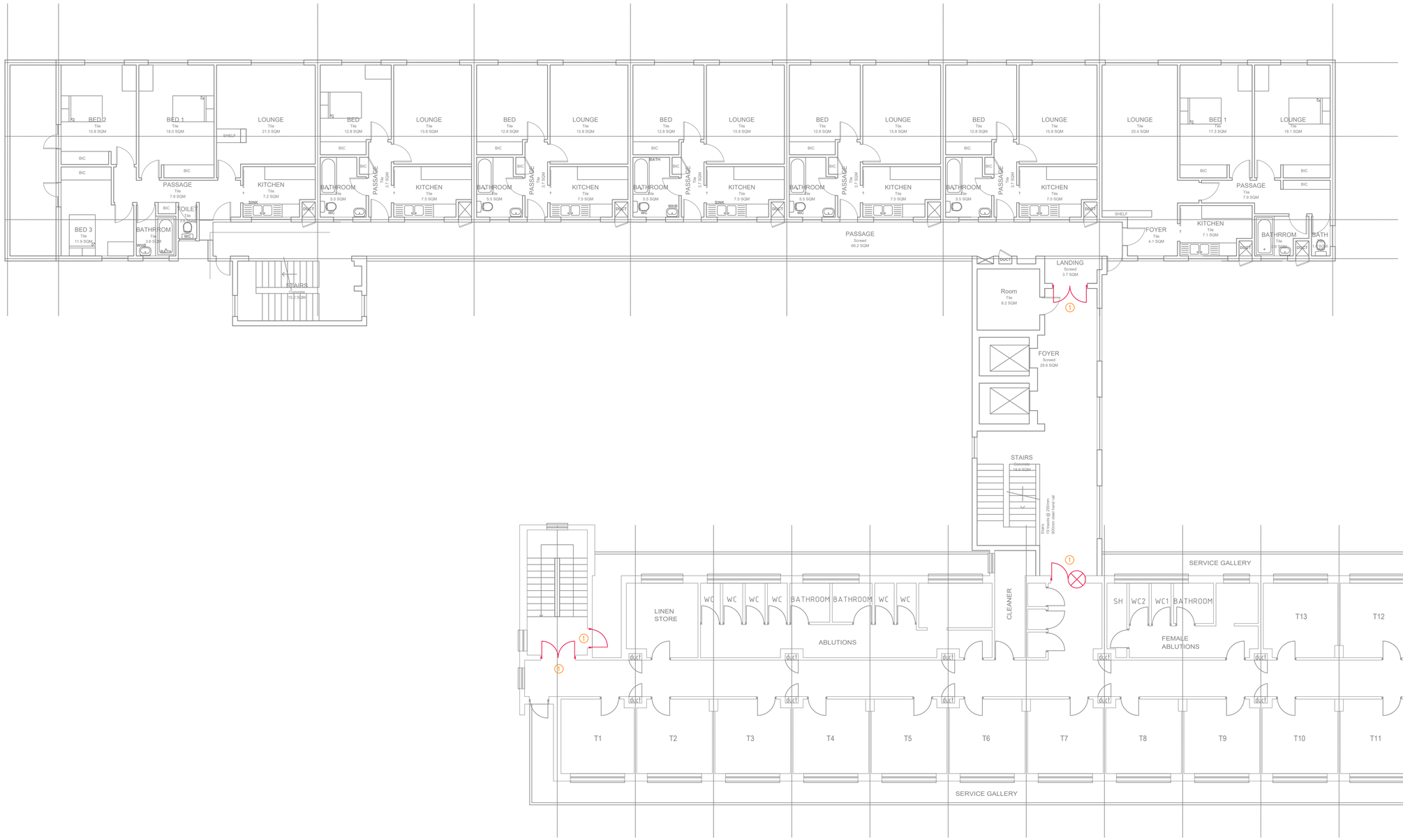
- EL – ELECTRIC LOCK/STRIKE
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- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
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- TALK–BACK WALL MOUNTED LOUDSPEAKER

- COLUMN SPEAKER
- AT ATTENUATOR
- MJ MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
- SJ SPEAKER OUTPUT JACK IN 100x100 CONDUIT BOX
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- HEAT DETECTOR
- B BREAK GLASS UNIT



1 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.

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- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- 100x100 DRAW BOX
- 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("U" FOR DOWN)
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- WALK THROUGH METAL DETECTOR
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HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant
15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za
UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH: GREYS HOSPITAL RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

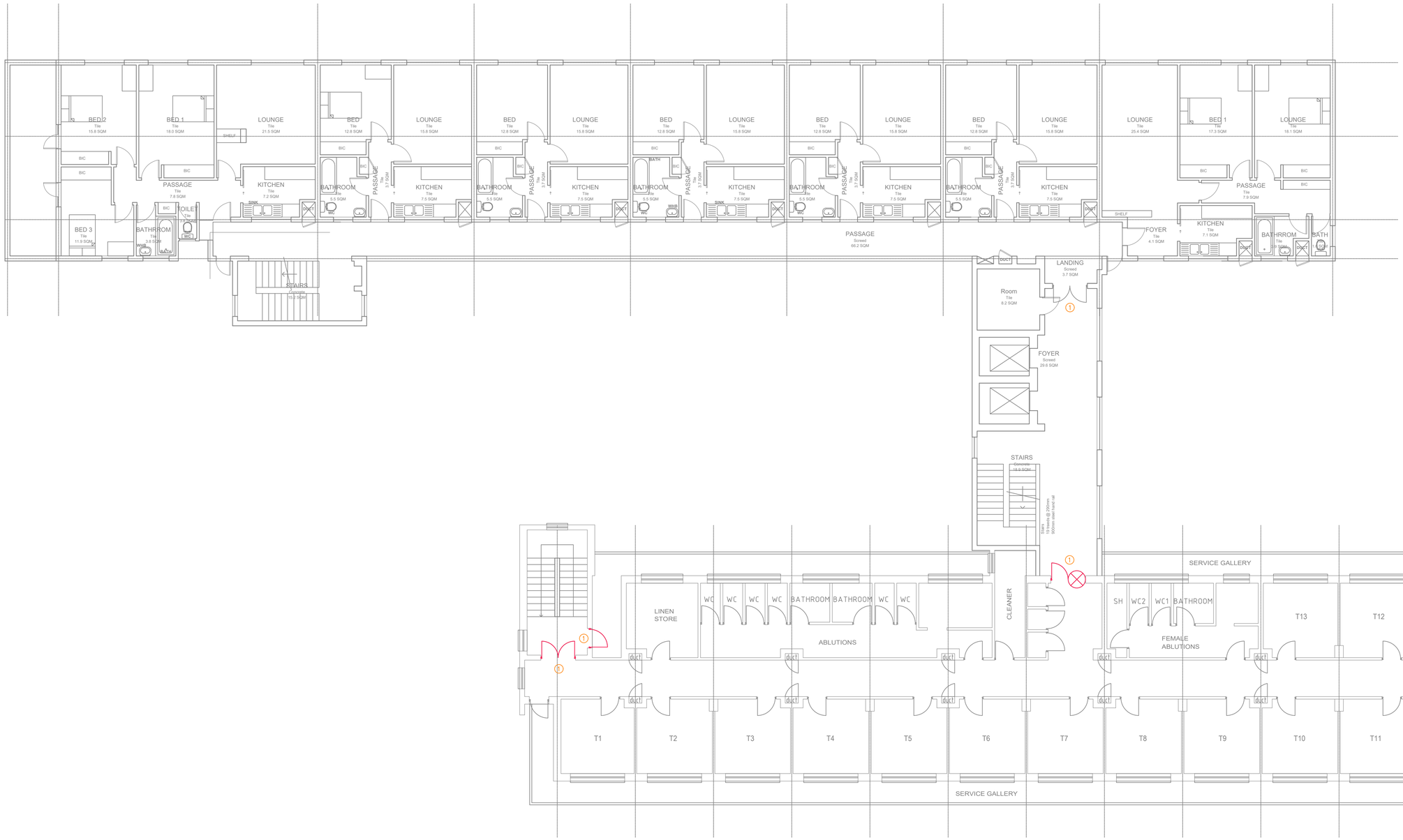
Drawing title

DOCTORS SMOKE DETECTION PLAN SECOND FLOOR COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_1_702



① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.

NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

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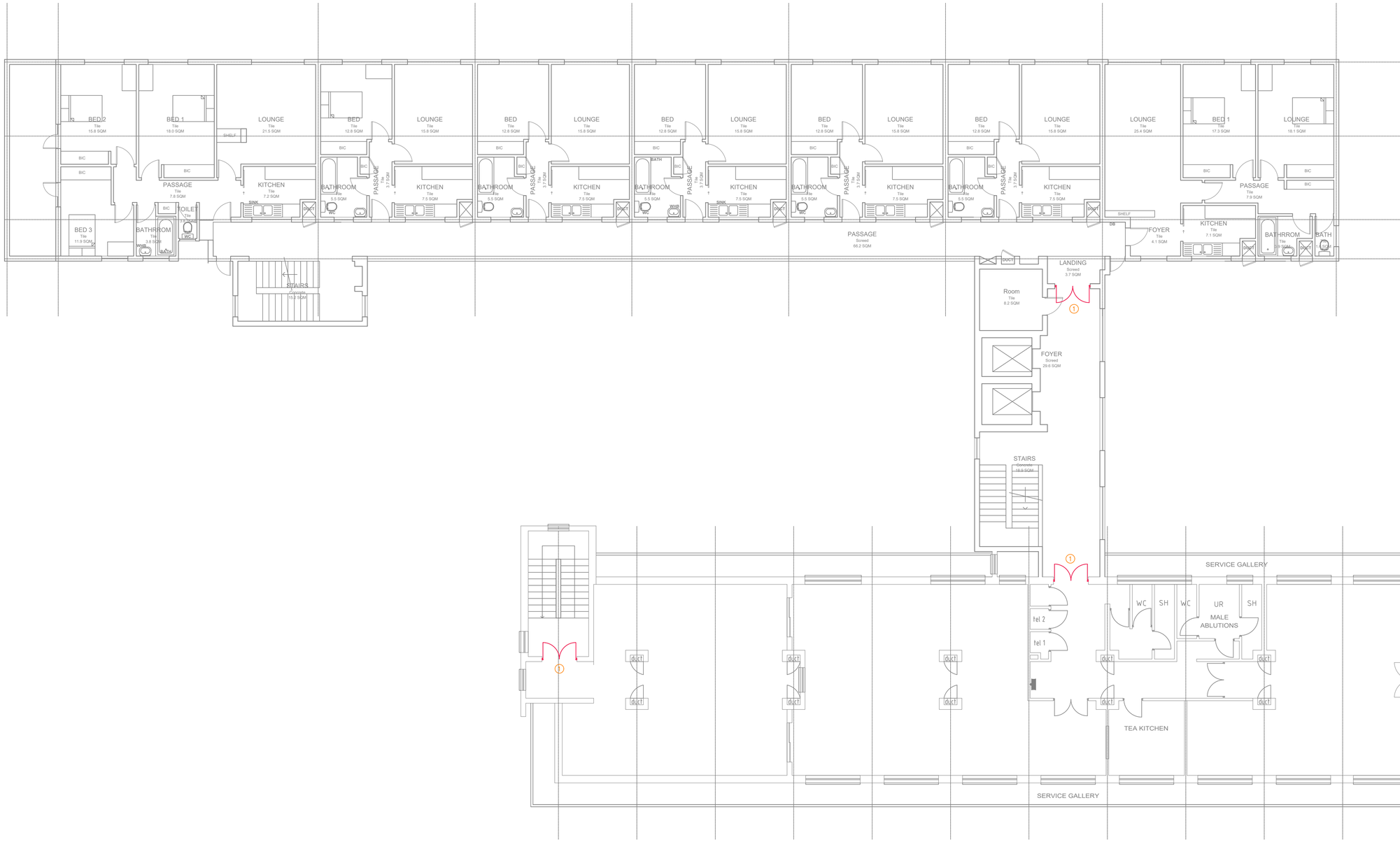
DOCTORS SMOKE DETECTION PLAN THIRD FLOOR COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_1_703

① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.



NOTES: (1) – Contractor to ensure max distance between draw boxes 20 metres notwithstanding anything to contrary. (2) – Draw boxes required after every second 90 deg. bend or 180 deg. total of slow bends. (3) – All unwired conduits to be provided with draw wires. These will be withdrawn and checked at random. (4) – Cast in conduits to be spaced 35mm. minimum.

- S 100x100 CONDUIT BOX.
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- S 100x100 CONDUIT BOX AT 1400AFFL.
- S 100x50 CONDUIT BOX
- L 100x50 CONDUIT BOX AT 300AFFL.
- T 100x50 CONDUIT BOX AT 1400AFFL.
- ROUND CONDUIT BOX.
- ROUND DRAW BOX
- S 100x100 DRAW BOX
- P 100x50 BOX BEHIND POWER SKIRTING
- CONDUIT TURNED UP ("D" FOR DOWN)
- DOWN CONDUCTOR TO EARTH OR EARTH TIE.
- 150 SQUARE GALV. STEEL DRAW TRAY AS SHOWN SHOWN.
- SECTION OF CONDUIT OMITTED FOR CLARITY
- 20mm. DIA. CONDUIT.
- 25mm. DIA. CONDUIT.
- 32mm. DIA. CONDUIT.
- 50mm. DIA. CONDUIT.
- OC OVERHEAD CAST-IN
- OS OVERHEAD ON SURFACE OR LAID ON CEILING.
- FC FLOOR SLAB CAST-IN.
- POWER SKIRTING
- TRUNKING
- CABLE SLEEVE.
- CABLE TRAY/LADDER
- POWER CABLE
- ◇ REFERENCE TO QUANTITY i.e. 3No.
- 2 REFERENCE TO A DETAIL i.e. DETAIL 2.
- 4 REFERENCE TO AN ELECTRICAL NOTE i.e. NOTE 4.
- #34 REFERENCE TO A STANDARD DRAWING i.e. STANDARD DRAWING No.34
- 6 CABLE NUMBER – REFER TO SCHEDULE FOR DETAILS
- TELEPHONE JUNCTION BOX.
- INTERCOM JUNCTION BOX.
- DATA/COMMS JUNCTION BOX.
- SECURITY, ETC. JUNCTION BOX
- DISTRIBUTION BOARD POSITION.
- DB–1 BOARD DESIGNATION NUMBER.
- TELEPHONE POINT.
- DATA/COMMS OUTLET.
- CCTV CAMERA
- CCTV CAMERA ON AUTO PANNING MOUNT
- CCTV CAMERA ON PAN & TILT MOUNT
- CCTV CAMERA ON AUTO PANNING IN DISCRETE OPAQUE DOME COVER
- CCTV CAMERA FIELD OF VIEW
- PASSIVE INFRARED CURTAIN DETECTOR
- INFRARED BEAM TRANSMITTER AND RECEIVER
- INFRARED OR ULTRASONIC MOTION DETECTOR
- DOOR MONITOR – FLATLINE OF SYMBOL FACES ATTACK SIDE
- X–RAY INSPECTION MACHINE OR LETTER/ PARCEL BOMB /EXPLOSIVE DETECTOR
- WALK THROUGH METAL DETECTOR
- P 220 VOLT POWER OUTLET FACILITY
- S SIGNAL OUTLET 2x4/4x4 FLUSH CONDUIT BOX.
- SECURITY CONTROL PANEL/JUNCTION BOX
- ELECTRIC LOCK/STRIKE
- KEY SWITCH
- FP FLOOR PEDAL SWITCH
- SPRING RETURN PUSH BUTTON/LEVER RELEASE
- DM – DOOR MONITOR
- CAM– CAMERA
- ER – ELECTRIC RELEASE
- EL – ELECTRIC LOCK/STRIKE
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- CR ACCESS CONTROL CARD READER
- CR POLE MOUNTED ACCESS CONTROL CARD READER
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- AA – ACCESS ALARM
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- ED – EXIT OVERRIDE
- AO – ALARM OVERRIDE
- COMMUNICATION PANEL/JUNCTION BOX
- INTERCOM MASTER STATION
- INTERCOM SLAVE/SUBSTATION
- INTERCOM CALL PUSH BUTTON UNIT
- HORN/TRUMPET LOUDSPEAKER
- CEILING FLUSH MOUNTED LOUDSPEAKER
- WALL MOUNTED LOUDSPEAKER
- TALK–BACK WALL MOUNTED LOUDSPEAKER
- COLUMN SPEAKER
- AT ATTENUATOR
- MJ MICROPHONE INPUT JACK IN 100x100 CONDUIT BOX
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- ALARM BELL
- SMOKE IONISATION DETECTOR
- HEAT DETECTOR
- B BREAK GLASS UNIT

No.	DATE	AMENDMENT	Issued By
0	15/04/25	Original Issue	JMK

WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

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Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title

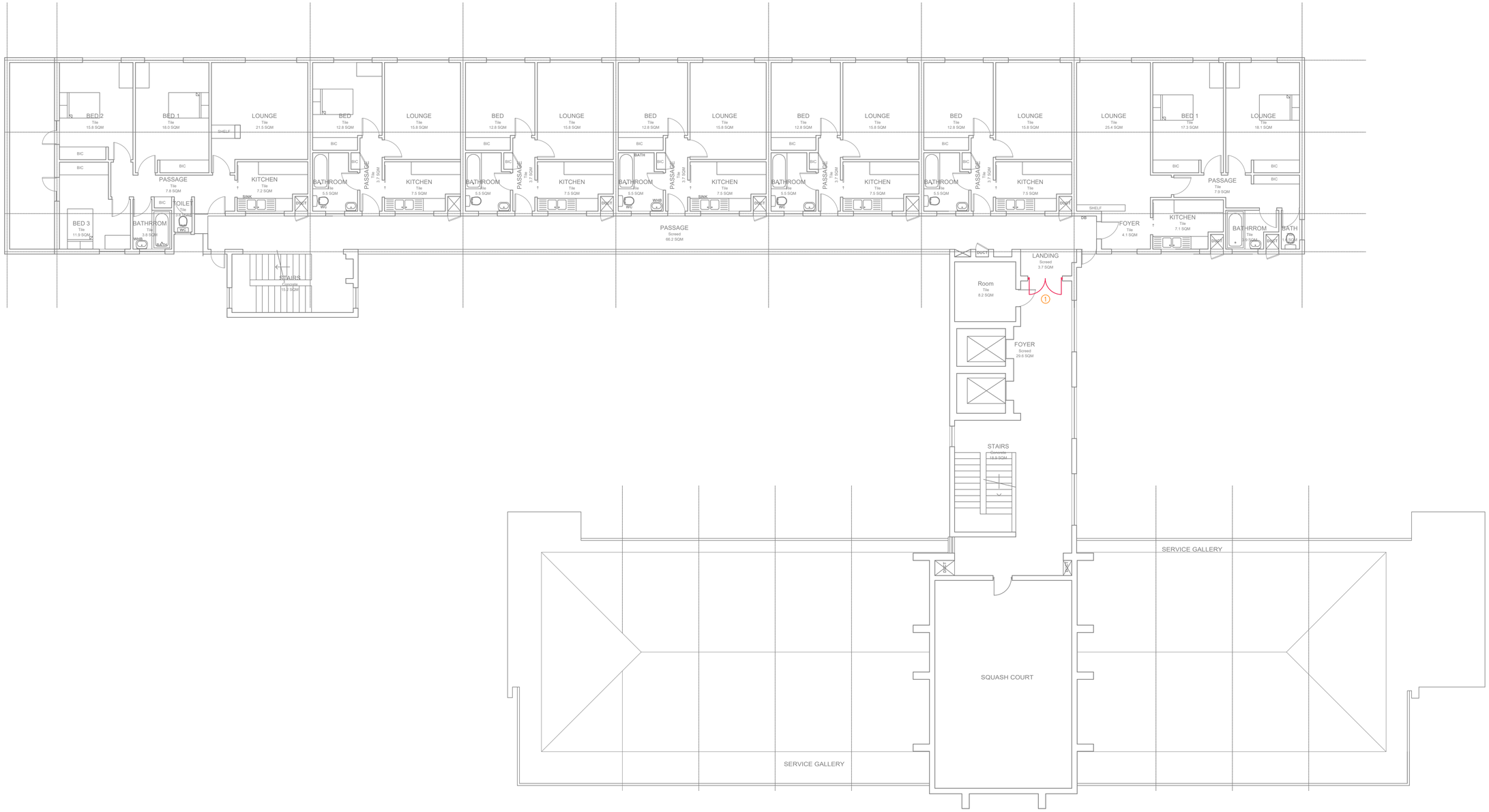
DOCTORS SMOKE DETECTION PLAN
FOURTH FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_1_704

① 12V, 5A Power Supply to 500kg Full Strength Maglock, Green Breakglass Unit.



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- ROUND DRAW BOX
- 100x100 DRAW BOX

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WCS number 071262 page type A0

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FACILITY

FACILITY MANAGER

DISTRICT MANAGER

DOH PROJECT LEADER

Checked by (Professional Consultant)

Name

Signature Date

consultant

15 The Boulevard
Westway Office Park,
Westville,
Durban, 3630
Tel. 031 265 0444
email. george@ukuza.co.za

UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing title

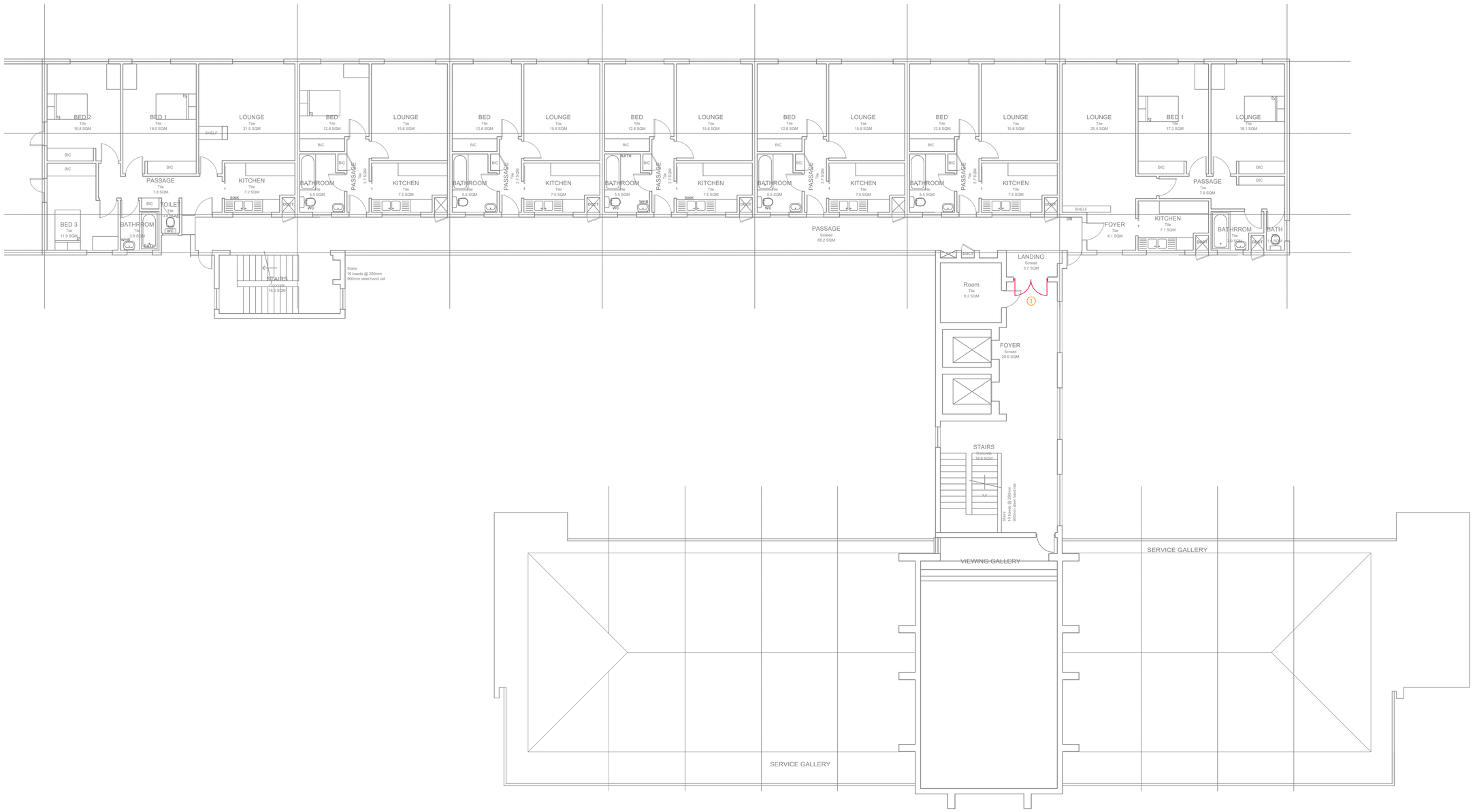
DOCTORS SMOKE DETECTION PLAN
FIFTH FLOOR
COMPLETION SCOPE

Drawn CW Checked JK Date 2025/04/15

scale 1 : 100

drawing number 25007_1_705

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WCS number 071262 page type A0

HEALTH DEPARTMENT SIGNATURES

FACILITY	
FACILITY MANAGER	
DISTRICT MANAGER	
DOH PROJECT LEADER	

Checked by (Professional Consultant)

Name		
Signature		Date

consultant
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UKUZA CONSULTING (PTY) LTD

Project Status STAGE 5 - WORKS

Discipline ELECTRICAL

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Project
DEPARTMENT OF HEALTH:
GREYS HOSPITAL
RENOVATIONS & UPGRADE TO
NURSES AND DOCTOR'S
ACCOMMODATION

Drawing title
DOCTORS SMOKE DETECTION PLAN
SIXTH FLOOR
COMPLETION SCOPE

Drawn	CW	Checked JK	Date
scale	1 : 100		2025/04/15

drawing number
25007_1_706

GREYS HOSPITAL: DOCTORS & NURSES RESIDENCE RENOVATIONS

VENTILATION & HOT WATER INSTALLATION

SCHEDULE OF DRAWINGS

The following Tender drawings form part of the specifications:

1.1 Doctors – Hot water

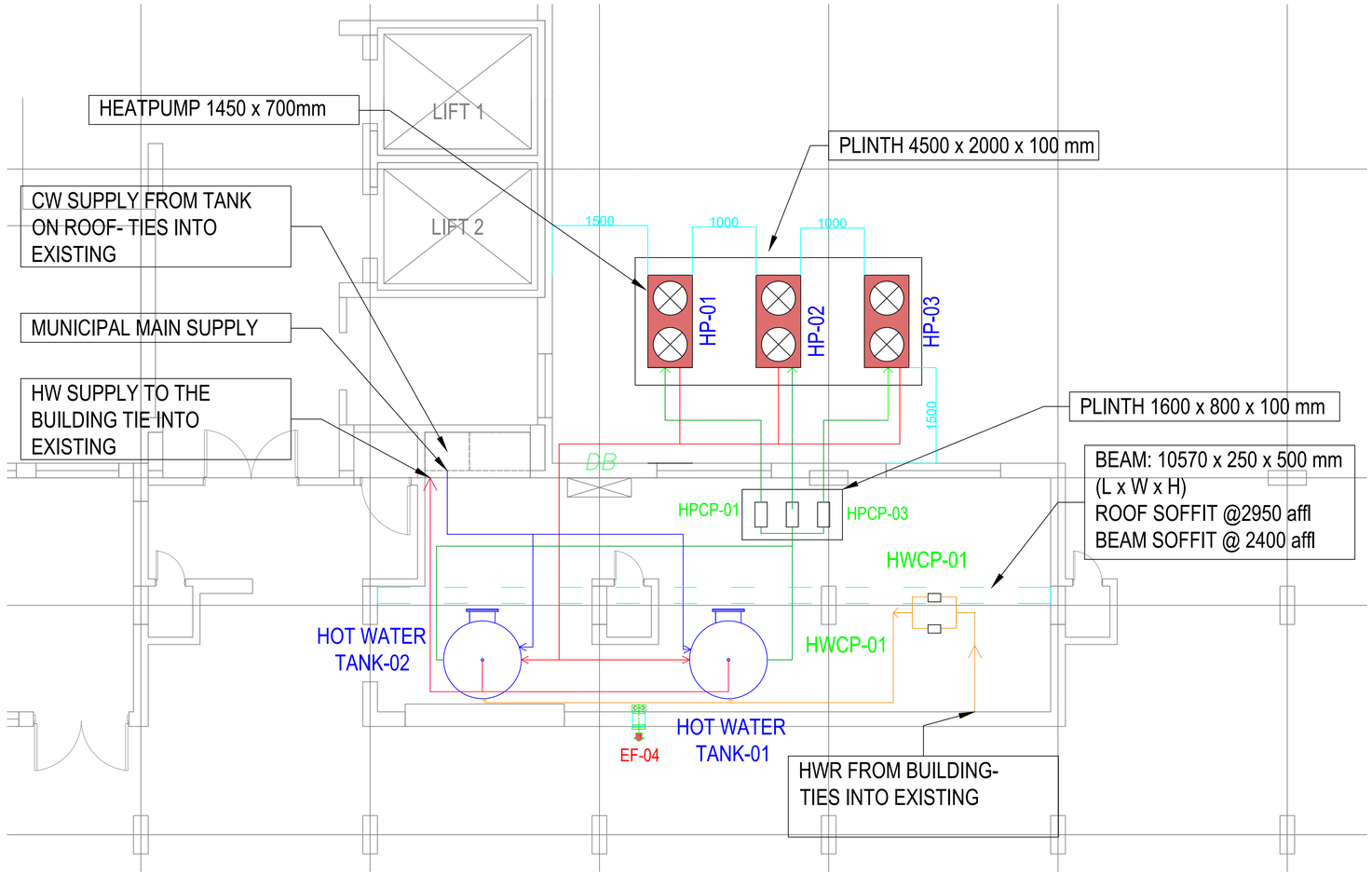
Drawing Number	Description	Revision
DOH.1-T-DOC/HW-01	DOCTORS - Hot water: lower ground floor plan	0
DOC.1-T-DOC/HW-02	DOCTORS - Hot water Schematic	0

1.2 Nurses – Hot water

Drawing Number	Description	Revision
DOH.1-T-NUR/HW-01	NURSES - Hot water: lower ground floor plan	0
DOH.1-T-NUR/HW-02	NURSES Hot water schematic	0

1.3 Nurses – Ventilation

Drawing Number	Description	Revision
DOH.1-T-NUR/HVAC-01	HVAC: Ground Floor Plan	0
DOH.1-T-NUR/HVAC-02	HVAC: Typical Floor Plan (1st to 4th)	0



Ground Floor Layout

1 : 100

GENERAL NOTES

1. DRAWING TO BE READ IN CONJUNCTION WITH RELEVANT ARCHITECTURAL AND ELECTRICAL DRAWINGS.
2. ALL POSITIONS, DIMENSIONS, LEVELS ETC MUST BE CONFIRMED ON SITE PRIOR TO COMMENCEMENT OF ANY WORK.
3. DRAWING MUST NOT BE SCALED.

HOT WATER NOTES

1. THIS HOT WATER INSTALLATION SHALL STRICTLY COMPLY WITH THE REQUIREMENTS OF THE LATEST SANS 10-400, SANS-10252-1: 2018, SANS-10254: 2017, THE LOCAL AUTHORITY, DOPW STANDARD SPECIFICATIONS AND THE OCCUPATIONAL HEALTH & SAFETY ACT OF 1993.
2. EQUIPMENT SUBMITTALS TO BE SIGNED OFF BY THE ENGINEER BEFORE ORDERING OF EQUIPMENT.
3. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ORDERING OF EQUIPMENT.
4. ALL COLD WATER TO MATCH EXISTING
5. ALL HOT WATER PIPING TO BE COPPER CLASS 2 UNLESS OR OTHERWISE SPECIFIED.
6. ALL INTERNAL & EXTERNAL HOT WATER SUPPLY & RETURN PIPING TO BE INSULATED & CLAD AS PER SPECIFICATION AND IN COMPLIANCE WITH SANS 10400-XA.
7. ALL MATERIALS MUST BE SANS APPROVED.
8. OPERATING WATER PRESSURE TO BE 600KPA
9. ALL PIPEWORK TO BE PRESSURE TESTED TO 900KPA
10. INSTALLATION TO BE STERILIZED AND COMMISSIONED ON COMPLETION, TO ENGINEER'S SPECIFICATIONS.
11. PIPE SPACING AND SUPPORTS TO BE IN ACCORDANCE WITH DOPW STANDARD SPECIFICATIONS
12. ALL H&C PIPEWORK AND VALVES TO BE PAINTED AND LABELED TO SPECIFICATION
13. AUTOMATIC RELIEF VALVES TO BE FITTED BE FITTED AT ALL HIGH POINTS OF HOT AND COLD WATER LINES.
14. HOT WATER TANKS MUST HAVE A DATA PLATE FIXED PERMANENTLY WITH THE FOLLOWING MINIMUM PARTICULARS:
    - NAME OF MANUFACTURER
    - COUNTRY OF ORIGIN
    - YEAR OF MANUFACTURE
    - MANUFACTURER SERIAL NUMBER
    - DESIGN PRESSURE IN PASCALS
    - MIN & MAX DESIGN TEMPERATURE
    - CAPACITY IN m3
    - UNIQUE MARK OF APPROVED INSPECTION AUTHORITY AS APPLICABLE
    - HAZARD CATEGORY IN ACCORDANCE SANS 347

SYMBOL:	LEGEND
	INLINE BOOSTER PUMP
	BALL VALVE
	NON-RETURN VALVE
	PRESSURE REDUCING VALVE
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	STRAINER
	SAFETY VALVE
HW TANK- 01	HOT WATER TANK- 01: 2.5KL (EXISTING)
HW TANK- 02	HOT WATER TANK- 02: 3KL (NEW)
HP - 01 TO HP - 03	AIR TO WATER THERMOWISE HEATPUMP TKRS - 380E/SN2-M, OR OTHER APPROVED 38KW OUTPUT 9.2KW INPUT
HPCP - 01 TO HPCP - 03	HEATPUMP CIRCULATING PUMP GRUNDFOS CM 10-2, OR OTHER APPROVED.
HWCP - 01 TO HWCP - 03	HOT WATER CIRCULATING PUMP GRUNDFOS UPS 25-60-180, OR OTHER APPROVED.

LEGEND:

WATER RETICULATION:

- COLD WATER PIPE RETICULATION
- HOT WATER PIPE RETICULATION
- HOT WATER RETURN PIPE RETICULATION

GENERAL NOTES

EXISTING STEAM LINES:

STEAM LINE TO BE ISOLATED AT ISOLATING VALVE OUTSIDE HOSPITAL KITCHEN

STEAM SUPPLY AND RETURN LINES OUTSIDE KITCHEN TO BE DISCONNECTED AND BLANKED OFF; TERMINATED STEAM LINES TO REMAIN IN SITU IE MUST NOT BE REMOVED.

EXISTING EQUIPMENT IN HOT WATER PLANTROOM

TWO EXISTING OLD 1.8 KL HOT WATER TANKS TO BE DECOMMISSIONED, DISCONNECTED, REMOVED AND HANDED OVER TO GREYS HOSPITAL MAINTENANCE DEPARTMENT

EXISTING NEW 2.5 KL HOT WATER TANK TO BE RETAINED; PLATE HEAT EXCHANGER TO BE DISCONNECTED, REMOVED AND HANDED OVER TO GREYS HOSPITAL MAINTENANCE DEPARTMENT.

ALL ASSOCIATED PIPEWORK (HOT WATER, COLD WATER AND STEAM), VALVES AND FITTINGS INSIDE PLANTROOM TO BE DISCONNECTED, REMOVED AND HANDED OVER TO GREYS HOSPITAL MAINTENANCE DEPARTMENT.

DOSING PLANT TO BE DISCONNECTED, REMOVED AND HANDED OVER TO GREYS HOSPITAL MAINTENANCE DEPARTMENT

NEW HOT WATER EQUIPMENT & PIPEWORK

1 (ONE) NEW 3 KL HOT WATER TANK TO BE INSTALLED AND CONNECTED IN PARALLEL WITH EXISTING 2.5 KL HOT WATER TANK. TANKS TO BE CONNECTED TO HEATPUMPS.

3 (THREE) NEW HEATPUMPS TO BE CONNECTED IN PARALLEL AND INSTALLED EXTERNALLY ADJACENT TO PLANTROOM.

3 (THREE) NEW HEATPUMP CIRCULATION PUMPS TO BE INSTALLED IN PLANTROOM AND CONNECTED AS PER SCHEMATIC.

2 (TWO) NEW HOT WATER RETURN CIRCULATING PUMPS TO BE INSTALLED IN PLANTROOM AND CONNECTED AS PER SCHEMATIC (RUN / STANDBY).

ONE HEATPUMP, ONE HEATPUMP CIRCULATION PUMP AND ONE HOT WATER RETURN PUMP TO BE CONNECTED TO ESSENTIAL SUPPLY. ALL OTHER EQUIPMENT TO BE CONNECTED TO NORMAL SUPPLY.

HOT WATER TANKS TO BE SUPPLIED WITH MUNICIPAL WATER SUPPLY, WITH PRV TO CONTROL OPERATING PRESSURE. COLD WATER SUPPLY FROM DOMESTIC COLD WATER TANKS ON ROOF TO BE CONNECTED TO TANKS ON MANUAL BYPASS AS BACKUP WHEN MUNICIPAL WATER IS SWITCHED OFF.

HOT WATER SUPPLY FROM TANKS TIE INTO EXISTING HOT WATER SUPPLY TO BUILDING.

EXISTING HOT WATER RETURN FROM BUILDING TO TIE INTO HOT WATER RETURN TO TANKS, VIA CIRCULATION PUMPS.

Revision History

RevID	ChID	Change Name	Date
Rev 0		Issued for tender	05/05/21

Drawn by:

Name S. GUBHUZA

Checked by:

Name ALANA SHUTTLEWORTH Reg. No. 20090319

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

SOUTHERN REGION

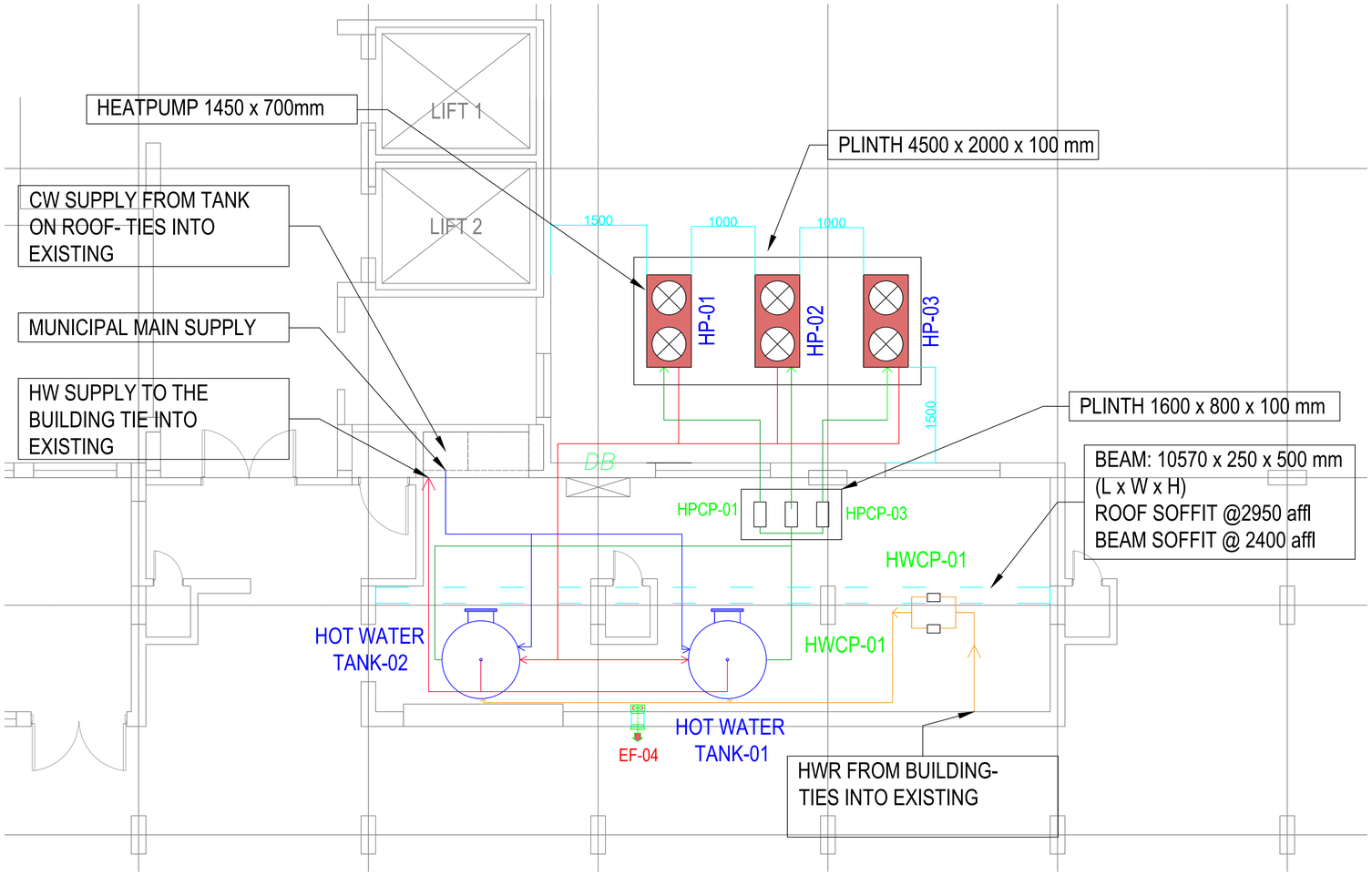
Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL:
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing description

DOCTORS QUARTERS
GROUND FLOOR:
HOT WATER HEAT PUMP LAYOUT

Scale/s: NTS	Page Size: A1
Drawing number: **DOH-1-T-DOC/HW-01**	Date: **19 NOV. 2020**
DOPW Drawing number **WIMS no.:** WIMS 053651	Revision: **0**



Ground Floor Layout

1 : 100

GENERAL NOTES

1. DRAWING TO BE READ IN CONJUNCTION WITH RELEVANT ARCHITECTURAL AND ELECTRICAL DRAWINGS.
2. ALL POSITIONS, DIMENSIONS, LEVELS ETC MUST BE CONFIRMED ON SITE PRIOR TO COMMENCEMENT OF ANY WORK.
3. DRAWING MUST NOT BE SCALED.

HOT WATER NOTES

1. THIS HOT WATER INSTALLATION SHALL STRICTLY COMPLY WITH THE REQUIREMENTS OF THE LATEST SANS 10-400, SANS-10252-1: 2018, SANS-10254: 2017, THE LOCAL AUTHORITY, DOPW STANDARD SPECIFICATIONS AND THE OCCUPATIONAL HEALTH & SAFETY ACT OF 1993.
2. EQUIPMENT SUBMITTALS TO BE SIGNED OFF BY THE ENGINEER BEFORE ORDERING OF EQUIPMENT.
3. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ORDERING OF EQUIPMENT.
4. ALL COLD WATER TO MATCH EXISTING
5. ALL HOT WATER PIPING TO BE COPPER CLASS 2 UNLESS OR OTHERWISE SPECIFIED.
6. ALL INTERNAL & EXTERNAL HOT WATER SUPPLY & RETURN PIPING TO BE INSULATED & CLAD AS PER SPECIFICATION AND IN COMPLIANCE WITH SANS 10400-XA.
7. ALL MATERIALS MUST BE SANS APPROVED.
8. OPERATING WATER PRESSURE TO BE 600KPA
9. ALL PIPEWORK TO BE PRESSURE TESTED TO 900KPA
10. INSTALLATION TO BE STERILIZED AND COMMISSIONED ON COMPLETION, TO ENGINEER'S SPECIFICATIONS.
11. PIPE SPACING AND SUPPORTS TO BE IN ACCORDANCE WITH DOPW STANDARD SPECIFICATIONS
12. ALL H&C PIPEWORK AND VALVES TO BE PAINTED AND LABELED TO SPECIFICATION
13. AUTOMATIC RELIEF VALVES TO BE FITTED BE FITTED AT ALL HIGH POINTS OF HOT AND COLD WATER LINES.
14. HOT WATER TANKS MUST HAVE A DATA PLATE FIXED PERMANENTLY WITH THE FOLLOWING MINIMUM PARTICULARS:
    - NAME OF MANUFACTURER
    - COUNTRY OF ORIGIN
    - YEAR OF MANUFACTURE
    - MANUFACTURER SERIAL NUMBER
    - DESIGN PRESSURE IN PASCALS
    - MIN & MAX DESIGN TEMPERATURE
    - CAPACITY IN m3
    - UNIQUE MARK OF APPROVED INSPECTION AUTHORITY AS APPLICABLE
    - HAZARD CATEGORY IN ACCORDANCE SANS 347

SYMBOL:	LEGEND
	INLINE BOOSTER PUMP
	BALL VALVE
	NON-RETURN VALVE
	PRESSURE REDUCING VALVE
T	TEMPERATURE GAUGE
P	PRESSURE GAUGE
	STRAINER
	SAFETY VALVE
HW TANK- 01	HOT WATER TANK- 01: 2.5KL (EXISTING)
HW TANK- 02	HOT WATER TANK- 02: 3KL (NEW)
HP - 01 TO HP - 03	AIR TO WATER THERMOWISE HEATPUMP TKRS - 380E/SN2-M, OR OTHER APPROVED 38KW OUTPUT 9.2KW INPUT
HPCP - 01 TO HPCP - 03	HEATPUMP CIRCULATING PUMP GRUNDFOS CM 10-2, OR OTHER APPROVED.
HWCP - 01 TO HWCP - 03	HOT WATER CIRCULATING PUMP GRUNDFOS UPS 25-60-180, OR OTHER APPROVED.

LEGEND:

WATER RETICULATION:

- COLD WATER PIPE RETICULATION
- HOT WATER PIPE RETICULATION
- HOT WATER RETURN PIPE RETICULATION

GENERAL NOTES

EXISTING STEAM LINES:

STEAM LINE TO BE ISOLATED AT ISOLATING VALVE OUTSIDE HOSPITAL KITCHEN

STEAM SUPPLY AND RETURN LINES OUTSIDE KITCHEN TO BE DISCONNECTED AND BLANKED OFF; TERMINATED STEAM LINES TO REMAIN IN SITU IE MUST NOT BE REMOVED.

EXISTING EQUIPMENT IN HOT WATER PLANTROOM

TWO EXISTING OLD 1.8 KL HOT WATER TANKS TO BE DECOMMISSIONED, DISCONNECTED, REMOVED AND HANDED OVER TO GREYS HOSPITAL MAINTENANCE DEPARTMENT

EXISTING NEW 2.5 KL HOT WATER TANK TO BE RETAINED; PLATE HEAT EXCHANGER TO BE DISCONNECTED, REMOVED AND HANDED OVER TO GREYS HOSPITAL MAINTENANCE DEPARTMENT.

ALL ASSOCIATED PIPEWORK (HOT WATER, COLD WATER AND STEAM), VALVES AND FITTINGS INSIDE PLANTROOM TO BE DISCONNECTED, REMOVED AND HANDED OVER TO GREYS HOSPITAL MAINTENANCE DEPARTMENT.

DOSING PLANT TO BE DISCONNECTED, REMOVED AND HANDED OVER TO GREYS HOSPITAL MAINTENANCE DEPARTMENT

NEW HOT WATER EQUIPMENT & PIPEWORK

1 (ONE) NEW 3 KL HOT WATER TANK TO BE INSTALLED AND CONNECTED IN PARALLEL WITH EXISTING 2.5 KL HOT WATER TANK. TANKS TO BE CONNECTED TO HEATPUMPS.

3 (THREE) NEW HEATPUMPS TO BE CONNECTED IN PARALLEL AND INSTALLED EXTERNALLY ADJACENT TO PLANTROOM.

3 (THREE) NEW HEATPUMP CIRCULATION PUMPS TO BE INSTALLED IN PLANTROOM AND CONNECTED AS PER SCHEMATIC.

2 (TWO) NEW HOT WATER RETURN CIRCULATING PUMPS TO BE INSTALLED IN PLANTROOM AND CONNECTED AS PER SCHEMATIC (RUN / STANDBY).

ONE HEATPUMP, ONE HEATPUMP CIRCULATION PUMP AND ONE HOT WATER RETURN PUMP TO BE CONNECTED TO ESSENTIAL SUPPLY. ALL OTHER EQUIPMENT TO BE CONNECTED TO NORMAL SUPPLY.

HOT WATER TANKS TO BE SUPPLIED WITH MUNICIPAL WATER SUPPLY, WITH PRV TO CONTROL OPERATING PRESSURE. COLD WATER SUPPLY FROM DOMESTIC COLD WATER TANKS ON ROOF TO BE CONNECTED TO TANKS ON MANUAL BYPASS AS BACKUP WHEN MUNICIPAL WATER IS SWITCHED OFF.

HOT WATER SUPPLY FROM TANKS TIE INTO EXISTING HOT WATER SUPPLY TO BUILDING.

EXISTING HOT WATER RETURN FROM BUILDING TO TIE INTO HOT WATER RETURN TO TANKS, VIA CIRCULATION PUMPS.

Revision History

RevID	ChID	Change Name	Date
Rev 0		Issued for tender	05/05/21

Drawn by:

Name S. GUBHUZA

Checked by:

Name ALANA SHUTTLEWORTH Reg. No. 20090319

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

SOUTHERN REGION

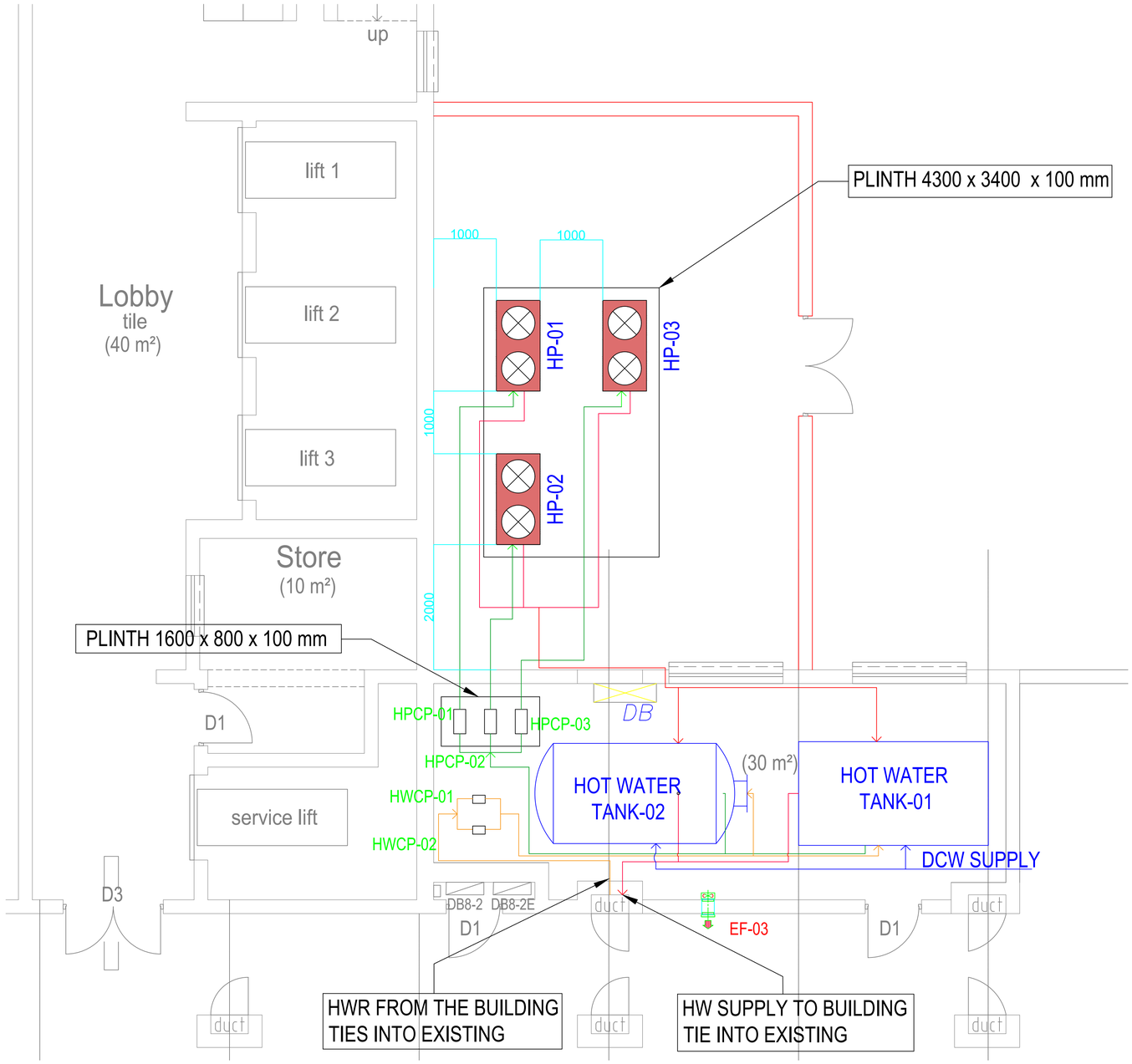
Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL:
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing description

DOCTORS QUARTERS
GROUND FLOOR:
HOT WATER HEAT PUMP LAYOUT

Scale/s: NTS	Page Size: A1
Drawing number: **DOH-1-T-DOC/HW-02**	Date: **19 NOV. 2020**
DOPW Drawing number **WIMS no.:** WIMS 053651	Revision: **0**



Lower Ground Floor Layout

1 : 100

GENERAL NOTES

1. DRAWING TO BE READ IN CONJUNCTION WITH RELEVANT ARCHITECTURAL AND ELECTRICAL DRAWINGS.
2. ALL POSITIONS, DIMENSIONS, LEVELS ETC MUST BE CONFIRMED ON SITE PRIOR TO COMMENCEMENT OF ANY WORK.
3. DRAWING MUST NOT BE SCALED.

HOT WATER NOTES

1. THIS HOT WATER INSTALLATION SHALL STRICTLY COMPLY WITH THE REQUIREMENTS OF THE LATEST SANS 10-400, SANS-10252-1: 2018, SANS-10254: 2017, THE LOCAL AUTHORITY, DOPW STANDARD SPECIFICATIONS AND THE OCCUPATIONAL HEALTH & SAFETY ACT OF 1993.
2. EQUIPMENT SUBMITTALS TO BE SIGNED OFF BY THE ENGINEER BEFORE ORDERING OF EQUIPMENT.
3. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ORDERING OF EQUIPMENT.
4. ALL COLD WATER TO MATCH EXISTING
5. ALL HOT WATER PIPING TO BE COPPER CLASS 2 UNLESS OR OTHERWISE SPECIFIED.
6. ALL INTERNAL & EXTERNAL HOT WATER SUPPLY & RETURN PIPING TO BE INSULATED & CLAD AS PER SPECIFICATION AND IN COMPLIANCE WITH SANS 10400-XA.
7. ALL MATERIALS MUST BE SANS APPROVED.
8. OPERATING WATER PRESSURE TO BE 600KPA
9. ALL PIPEWORK TO BE PRESSURE TESTED TO 900KPA
10. INSTALLATION TO BE STERILIZED AND COMMISSIONED ON COMPLETION, TO ENGINEER'S SPECIFICATIONS.
11. PIPE SPACING AND SUPPORTS TO BE IN ACCORDANCE WITH DOPW STANDARD SPECIFICATIONS
12. ALL H&C PIPEWORK AND VALVES TO BE PAINTED AND LABELED TO SPECIFICATION
13. AUTOMATIC RELIEF VALVES TO BE FITTED BE FITTED AT ALL HIGH POINTS OF HOT AND COLD WATER LINES.
14. HOT WATER TANKS MUST HAVE A DATA PLATE FIXED PERMANENTLY WITH THE FOLLOWING MINIMUM PARTICULARS:

- NAME OF MANUFACTURER
- COUNTRY OF ORIGIN
- YEAR OF MANUFACTURE
- MANUFACTURER SERIAL NUMBER
- DESIGN PRESSURE IN PASCALS
- MIN & MAX DESIGN TEMPERATURE
- CAPACITY IN m3
- UNIQUE MARK OF APPROVED INSPECTION AUTHORITY AS APPLICABLE
- HAZARD CATEGORY IN ACCORDANCE SANS 347

SYMBOL:	LEGEND:
	INLINE BOOSTER PUMP
	BALL VALVE
	NON-RETURN VALVE
	PRESSURE REDUCING VALVE
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	STRAINER
	SAFETY VALVE
HW TANK- 01	HOT WATER TANK- 01: 5.5KL (EXISTING)
HW TANK- 02	HOT WATER TANK- 02: 6KL (NEW)
HP - 01 TO HP - 03	AIR TO WATER THERMOWISE HEATPUMP TKRS - 800E/SN2,80kW OUTPUT, 19.3 kW INPUT, OR OTHER APPROVED
HPCP - 01 TO HPCP - 03	HEATPUMP CIRCULATING PUMP GRUNDFOS CM 15 -2, OR OTHER APPROVED.
HWCP - 01 TO HWCP - 03	HOT WATER CIRCULATING PUMP GRUNDFOS UPS 25-60-180, OR OTHER APPROVED.

LEGEND:

WATER RETICULATION:

- COLD WATER PIPE RETICULATION
- HOT WATER PIPE RETICULATION
- HOT WATER RETURN PIPE RETICULATION

GENERAL NOTES

EXISTING STEAM LINES:

STEAM LINE TO BE ISOLATED AT ISOLATING VALVE OUTSIDE HOSPITAL KITCHEN

STEAM SUPPLY AND RETURN LINES OUTSIDE KITCHEN TO BE DISCONNECTED AND BLANKED OFF; TERMINATED STEAM LINES TO REMAIN IN SITU IE MUST NOT BE REMOVED.

EXISTING EQUIPMENT IN HOT WATER PLANTROOM

EXISTING OLD 5KL HOT WATER TANK TO BE DECOMMISSIONED, DISCONNECTED, REMOVED AND HANDED OVER TO GREYS HOSPITAL MAINTENANCE DEPARTMENT

EXISTING NEW 5.5KL HOT WATER TANK TO BE RETAINED; PLATE HEAT EXCHANGER TO BE DISCONNECTED, REMOVED AND HANDED OVER TO GREYS HOSPITAL MAINTENANCE DEPARTMENT.

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DOSING PLANT TO BE DISCONNECTED, REMOVED AND HANDED OVER TO GREYS HOSPITAL MAINTENANCE DEPARTMENT

NEW HOT WATER EQUIPMENT & PIPEWORK

1 (ONE) NEW 6KL HOT WATER TANK TO BE INSTALLED AND CONNECTED IN PARALLEL WITH EXISTING 5.5KL HOT WATER TANK. HOT WATER TANKS TO BE CONNECTED TO HEATPUMPS.

3 (THREE) NEW HEATPUMPS TO BE CONNECTED IN PARALLEL AND INSTALLED EXTERNALLY ADJACENT TO PLANTROOM.

3 (THREE) NEW HEATPUMP CIRCULATION PUMPS TO BE INSTALLED IN PLANTROOM AND CONNECTED AS PER SCHEMATIC.

2 (TWO) NEW HOT WATER RETURN CIRCULATING PUMPS TO BE INSTALLED IN PLANTROOM AND CONNECTED AS PER SCHEMATIC.

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HOT WATER TANKS TO BE SUPPLIED WITH MUNICIPAL WATER SUPPLY, WITH PRV TO CONTROL OPERATING PRESSURE.

COLD WATER SUPPLY FROM DOMESTIC COLD WATER TANKS ON ROOF TO BE CONNECTED TO TANKS ON MANUAL BYPASS AS BACKUP WHEN MUNICIPAL WATER IS SWITCHED OFF.

HOT WATER SUPPLY FROM TANKS TIE INTO EXISTING HOT WATER SUPPLY TO BUILDING.

EXISTING HOT WATER RETURN FROM BUILDING TO TIE INTO HOT WATER RETURN TO TANKS, VIA CIRCULATION PUMPS (RUN / STANDBY).

Revision History

RevID	ChID	Change Name	Date
Rev 01		Issued for tender	05/05/21

Drawn by:

Name S. GUBHUZA

Checked by:

Name ALANA SHUTTLEWORTH Reg. No. 20090319

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

SOUTHERN REGION

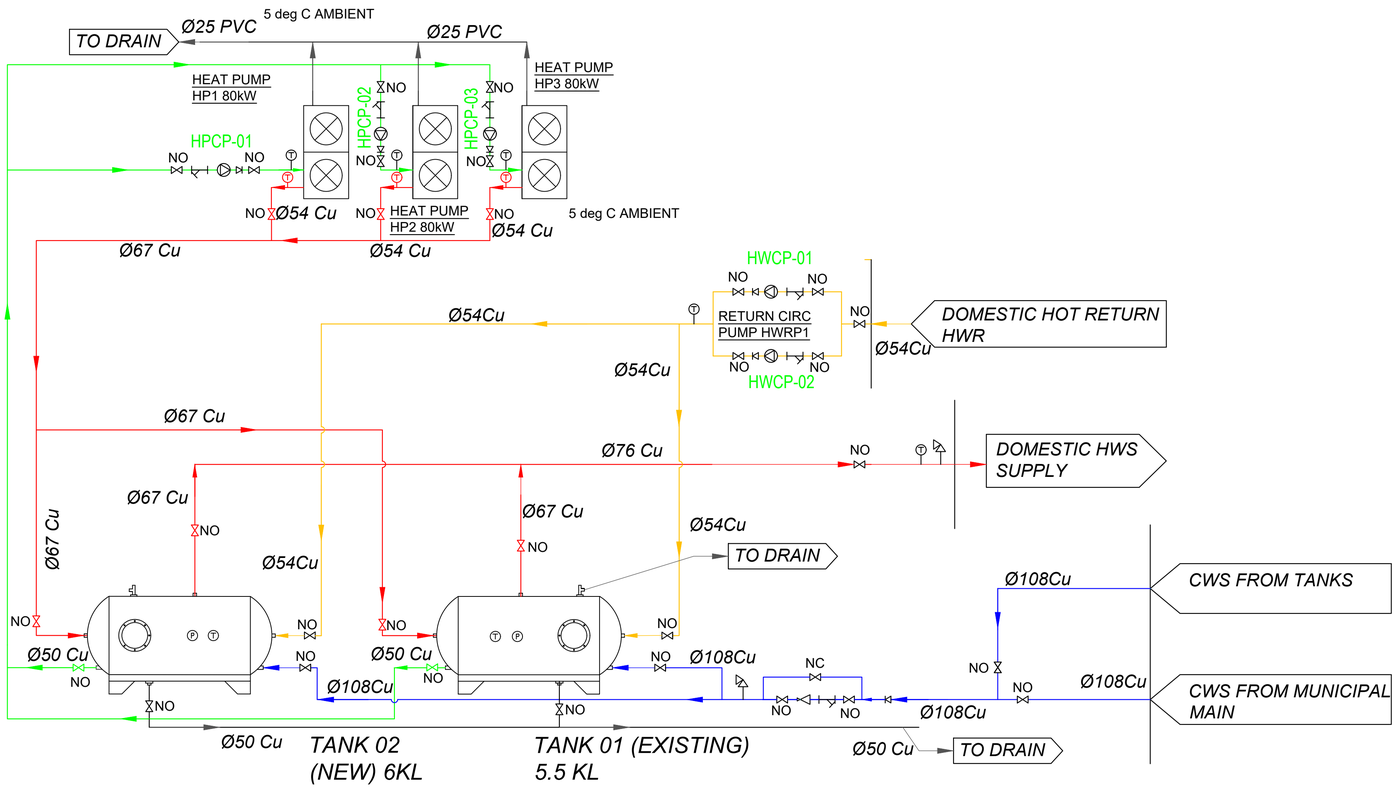
Project

DEPARTMENT OF HEALTH:
GREYS HOSPITAL:
RENOVATIONS & UPGRADE TO NURSES AND DOCTORS ACCOMMODATION

Drawing description

NURSES QUARTERS
LOWER GROUND FLOOR:
HOT WATER HEAT PUMP LAYOUT

Scale/s: 1:100	Page Size: A1
Drawing number: **DOH-1-T-NUR/HW-01**	Date: **19 NOV. 2020**
DOPW Drawing number **WIMS no.:** WIMS 053651	Revision: **0**



Schematic
NTS

SYMBOL:	LEGEND:
	INLINE BOOSTER PUMP
	BULL VALVE
	NON-RETURN VALVE
	PRESSURE REDUCING VALVE
	TEMPERATURE GAUGE
	PRESSURE GAUGE
	STRAINER
	SAFETY VALVE
HW TANK- 01	HOT WATER TANK- 01: 5.5KL (EXISTING)
HW TANK- 02	HOT WATER TANK- 02: 6KL (NEW)
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- COLD WATER PIPE RETICULATION
- HOT WATER PIPE RETICULATION
- HOT WATER RETURN PIPE RETICULATION

GENERAL NOTES

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    - YEAR OF MANUFACTURE
    - MANUFACTURER SERIAL NUMBER
    - DESIGN PRESSURE IN PASCALS
    - MIN & MAX DESIGN TEMPERATURE
    - CAPACITY IN m3
    - UNIQUE MARK OF APPROVED INSPECTION AUTHORITY AS APPLICABLE
    - HAZARD CATEGORY IN ACCORDANCE SANS 347

Revision History

RevID	ChID	Change Name	Date
Rev 01		Issued for tender	05/05/21

Drawn by:
Name S. GUBHUZA
Checked by:
Name ALANA SHUTTLEWORTH Reg. No. 20090319

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

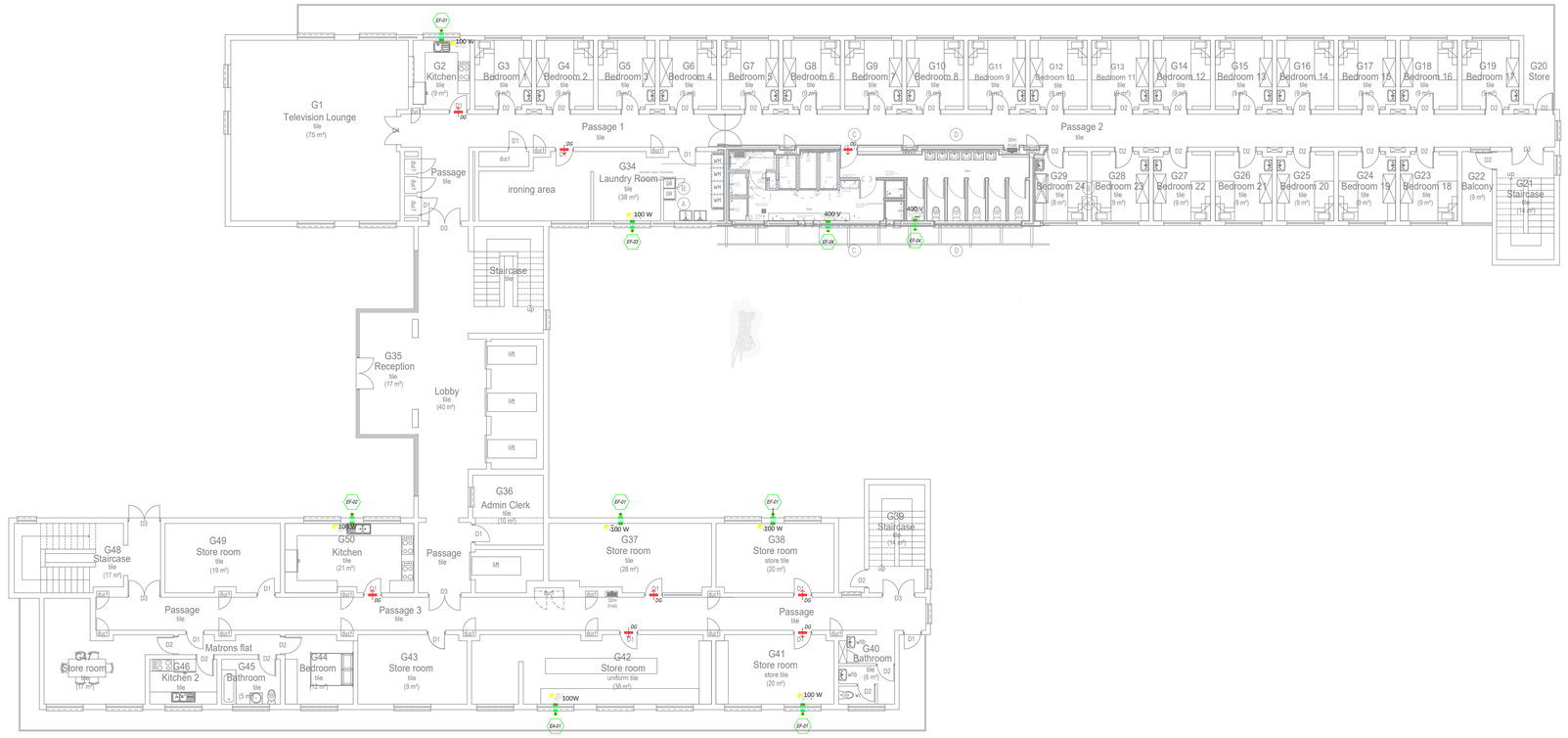
SOUTHERN REGION

Project
DEPARTMENT OF HEALTH:
GREYS HOSPITAL:
RENOVATIONS & UPGRADE TO NURSES AND DOCTORS ACCOMMODATION

Drawing description
NURSES QUARTERS:
HOT WATER HEAT PUMP SCHEMATIC

Scale/s: NTS	Page Size: A1
Drawing number: **DOH-1-T-NUR/HW-02**	Date: **19 NOV. 2020**
DOPW Drawing number **WIMS no.:** WIMS 053651	Revision: **0**

BLOCK A



BLOCK B

Ground Floor Layout

1 : 100

North

GENERAL NOTES

HVAC NOTES:

1. THIS HVAC INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF SANS-10400 PART O AND THE OCCUPATIONAL HEALTH & SAFETY ACT OF 1993.
2. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ORDERING OF EQUIPMENT.
3. EQUIPMENT SUBMITTALS TO BE SIGNED OFF BY THE ENGINEER BEFORE ORDERING OF EQUIPMENT.
4. EXTRACT FAN ISOLATORS TO BE INSTALLED BELOW SOFFIT AND WITHIN 1 METRE OF THE FAN
5. DOOR GRILLES TO BE SUPPLIED BY HVAC CONTRACTOR AND INSTALLED BY OTHERS

LEGEND:

EF - 01: WALL MOUNTED EXTRACT FAN ELICENT VITRO 6/150 PA, OR OTHER APPROVED DUTY 70 l/s, 5A, 220V/1PH/50Hz CONTROLLED VIA LIGHT SWITCH.

EF - 02: WALL MOUNTED EXTRACT FAN ELICENT VITRO 9/230 PA, OR OTHER APPROVED DUTY 156 l/s, 5A, 220V/1PH/50Hz CONTROLLED VIA LIGHT SWITCH

EF - 03: PLATE MOUNTED EXTRACT FAN ELTA CP - 315/4-1, OR OTHER APPROVED DUTY 300l/s, 5A, 220V/1PH/50Hz CONTROLLED VIA TIMER.

EF - 04: PLATE MOUNTED EXTRACT FAN ELTA CP - 350/4-1, OR OTHER APPROVED DUTY 760 l/s, 5A, 220V/1PH/50Hz CONTROLLED VIA TIMER

DG: DOOR GRILLE 400X500mm NATURAL ANODIZED

Revision History

RevID	ChID	Change Name	Date
Rev 0		Issued for tender	05/05/21
Rev 01		Issued for Construction	14/04/25

Drawn by:

Name S. GUBHUZA

Checked by:

Name ALANA SHUTTLEWORTH Reg. No. 20090319

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

SOUTHERN REGION

Project

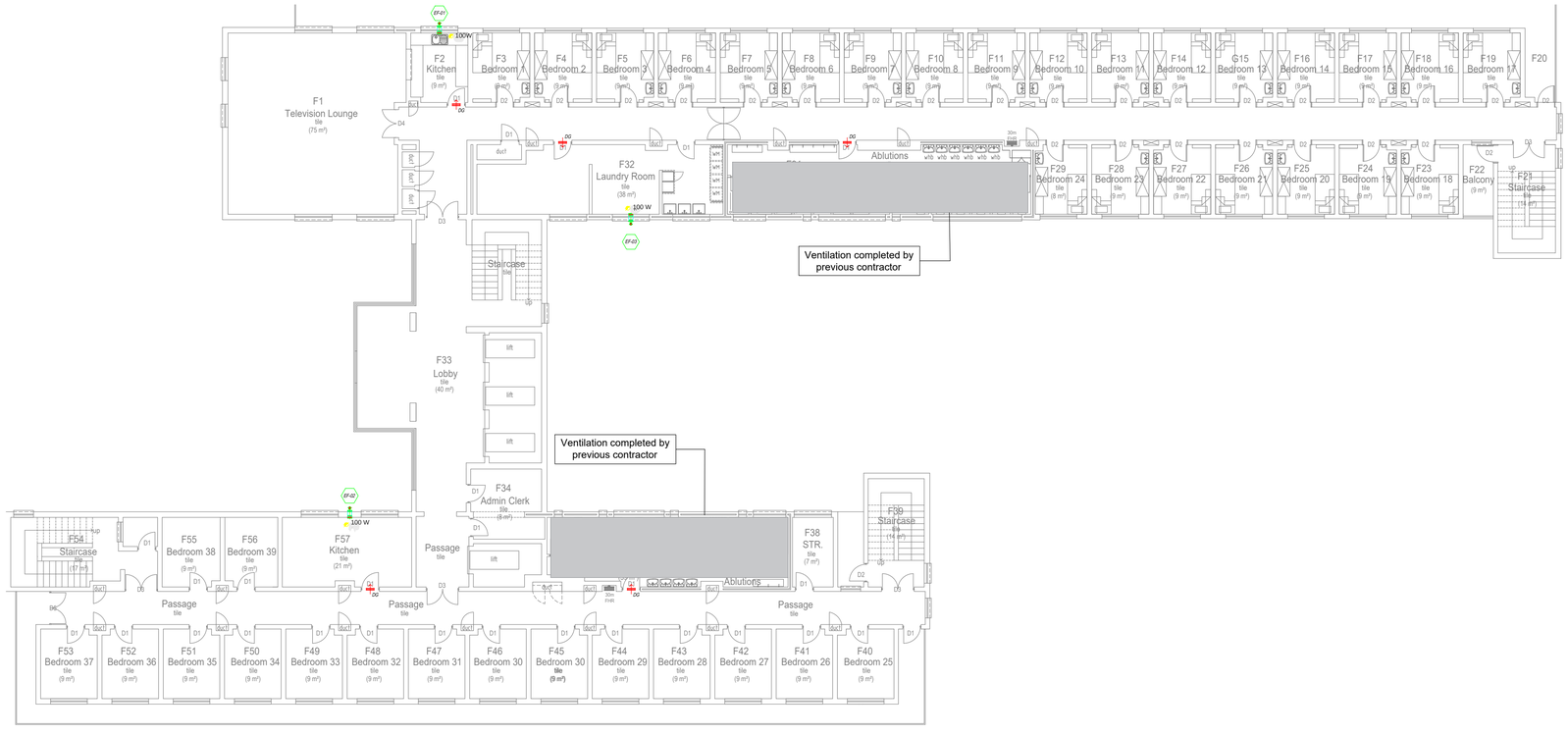
DEPARTMENT OF HEALTH:
GREYS HOSPITAL:
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing description

NURSES QUARTERS:
GROUND FLOOR HVAC LAYOUT

Scale/s: 1:100	Page Size: A0
Drawing number: **DOH-1-T-NUR/HVAC-01**	Date: **19 NOV. 2020**
DOPW Drawing number **WIMS no.:** WIMS 053651	Revision: **0**

BLOCK A



BLOCK B

First - Fourth Floor Layout

1 : 100

North

GENERAL NOTES

HVAC NOTES:

1. THIS HVAC INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF SANS-10400 PART O AND THE OCCUPATIONAL HEALTH & SAFETY ACT OF 1993.
2. ALL DIMENSIONS TO BE CHECKED ON SITE BEFORE ORDERING OF EQUIPMENT.
3. EQUIPMENT SUBMITTALS TO BE SIGNED OFF BY THE ENGINEER BEFORE ORDERING OF EQUIPMENT.
4. EXTRACT FAN ISOLATORS TO BE INSTALLED BELOW SOFFIT AND WITHIN 1 METRE OF THE FAN
5. DOOR GRILLES TO BE SUPPLIED BY HVAC CONTRACTOR AND INSTALLED BY OTHERS

LEGEND:

EF - 01: WALL MOUNTED EXTRACT FAN ELICENT VITRO 6/150 PA, OR OTHER APPROVED DUTY 70 l/s, 5A, 220V/1PH/50Hz CONTROLLED VIA LIGHT SWITCH.

EF - 02: WALL MOUNTED EXTRACT FAN ELICENT VITRO 9/230 PA, OR OTHER APPROVED DUTY 156 l/s, 5A, 220V/1PH/50Hz CONTROLLED VIA LIGHT SWITCH

EF - 03: PLATE MOUNTED EXTRACT FAN ELTA CP - 315/4-1, OR OTHER APPROVED DUTY 300l/s, 5A, 220V/1PH/50Hz CONTROLLED VIA TIMER.

EF - 04: PLATE MOUNTED EXTRACT FAN ELTA CP - 350/4-1, OR OTHER APPROVED DUTY 760 l/s, 5A, 220V/1PH/50Hz CONTROLLED VIA TIMER

DG: DOOR GRILLE 400X500mm NATURAL ANODIZED

Revision History

RevID	ChID	Change Name	Date
Rev 0		Issued for tender	05/05/21
Rev 01		Issued for Construction	14/04/25

Drawn by:
Name S. GUBHUZA

Checked by:
Name ALANA SHUTTLEWORTH Reg. No. 20090319

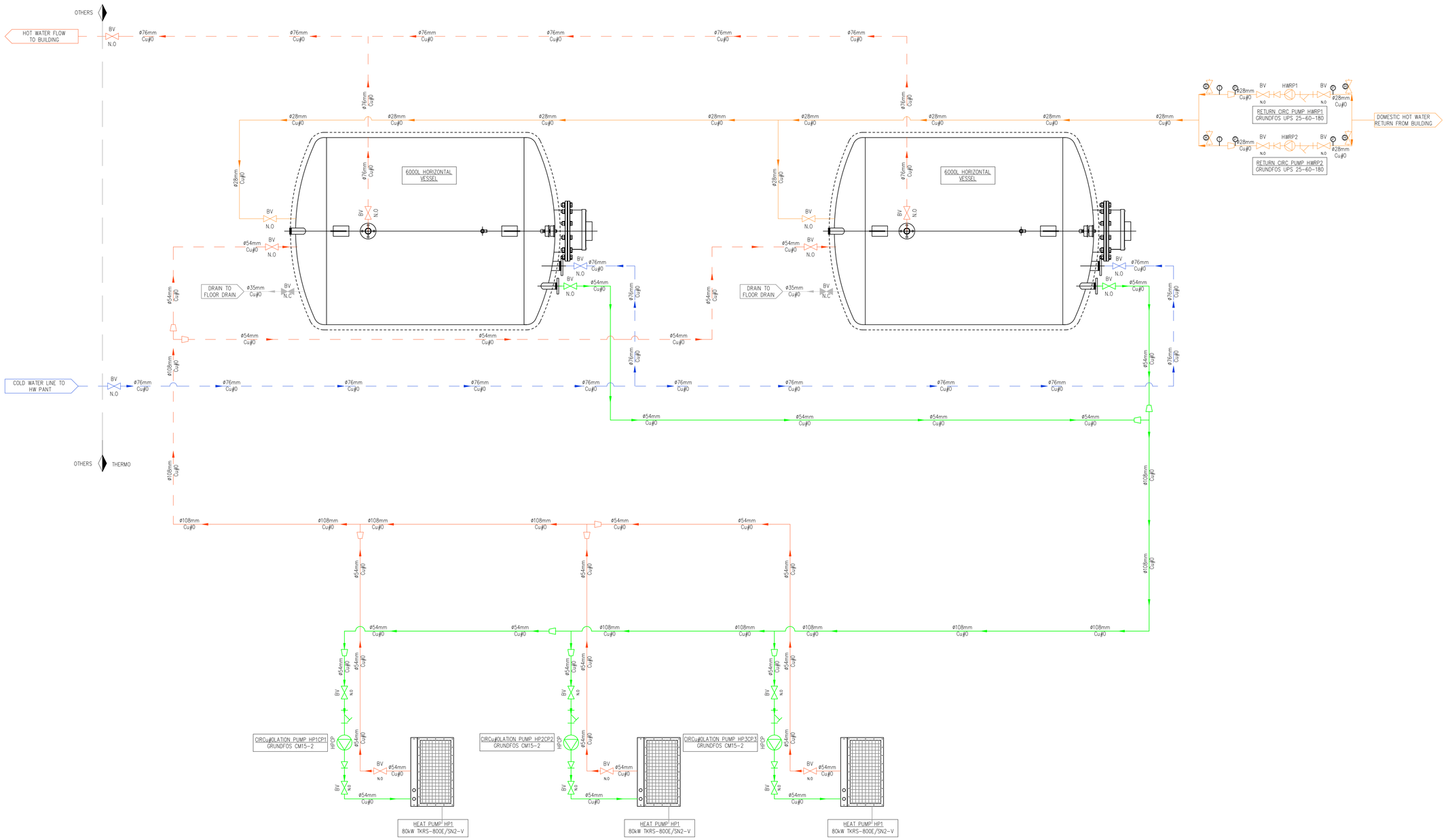
public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

SOUTHERN REGION

Project
DEPARTMENT OF HEALTH:
GREYS HOSPITAL:
RENOVATIONS & UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drawing description
NURSES QUARTERS:
1ST TO 4TH FLOOR HVAC LAYOUT

Scale/s: 1:100	Page Size: A0
Drawing number: **DOH-1-1-NUR/HVAC-02**	Date: **19 NOV. 2020**
DOPW Drawing number **WIMS no.:** WIMS 053651	Revision: **0**



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REFERENCE DRAWING

REF.DWG_NUMBER	REF_DESCRIPTION
-	-

REV	DESCRIPTION	DR.	APP.	DATE
A	ISSUE FOR INFORMATION	RN	LP	24.06.2020

	INITIALS	SIGN	DATE
DESIGNED	LP		
DRAWN	RN		
PROJECT ENG.	–		
APPROVED	LP		

ThermoWise
INTELLIGENT ENERGY SAVING SOLUTIONS

3 JACK SMITH RD, BALLITO SERVICE PARK, BALLITO.

CLIENT LOGO

CLIENT

–

PROJECT

GREYS HOSPITAL

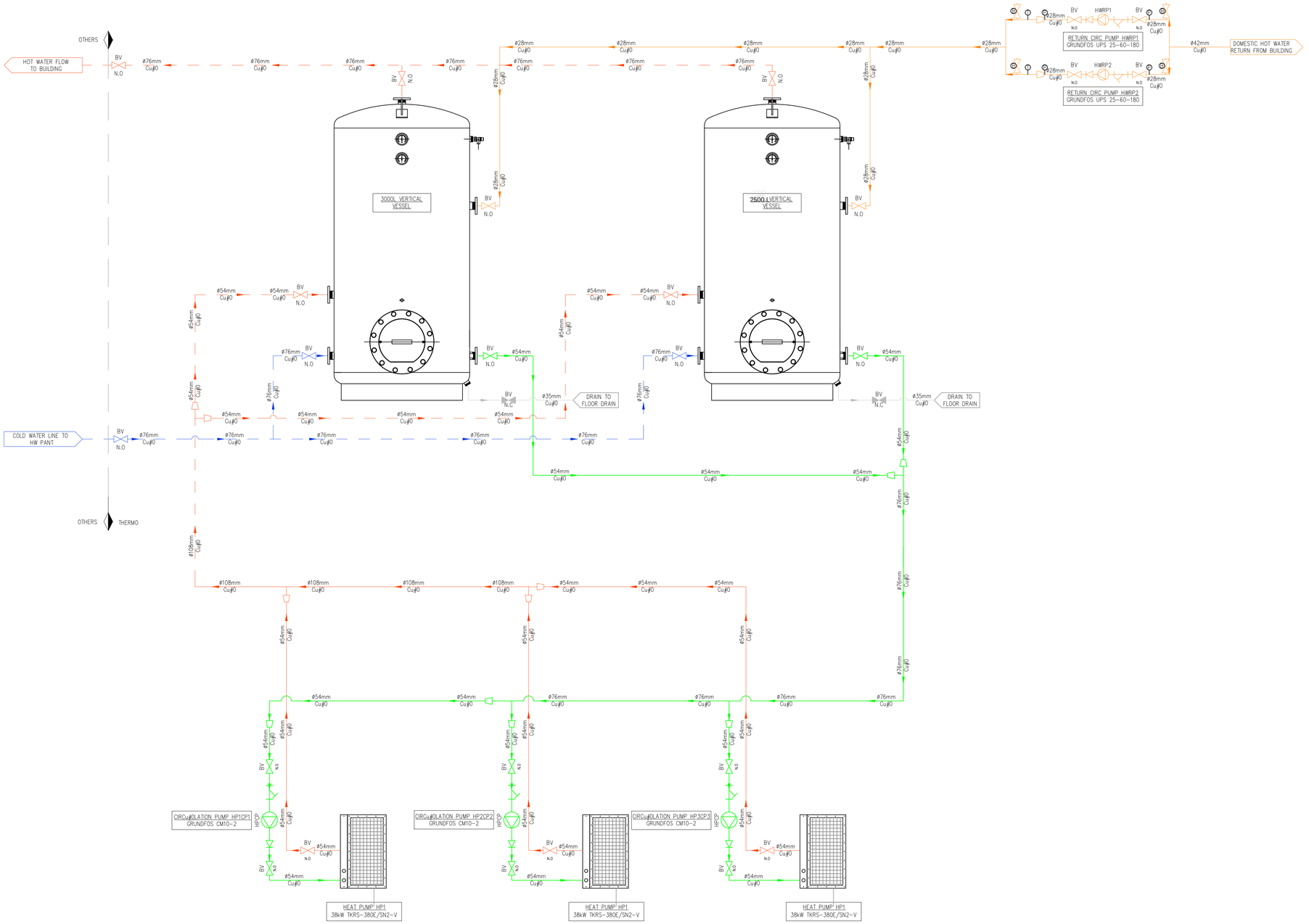
TITLE

PROPOSED
80kw PLANT ROOM SCHEMATIC
PLANT 1

SCALE : SHOWN

DRAWING No. 9372-TM-PS-001 REV A

Thermowise-A1.dwg (SCALE) A1 SHEET



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REFERENCE DRAWING

REF.DWG._NUMBER	REF._DESCRIPTION
-	-

REV	DESCRIPTION	DR.	APP.	DATE
A	ISSUE FOR INFORMATION	RN	LP	24.06.2020

	INITIALS	SIGN	DATE
DESIGNED	LP		
DRAWN	RN		
PROJECT ENG.	–		
APPROVED	LP		

ThermoWise
INTELLIGENT ENERGY SAVING SOLUTIONS

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PROJECT

GREYS HOSPITAL

TITLE

PROPOSED
80kw PLANT ROOM SCHEMATIC
PLANT 2

SCALE : SHOWN

DRAWING No. 9372-TM-PS-002 REV A

Thermowise-A1.dwg (SCALE) A1 SHEET

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

ANNEXURES

ANNEXURE 1

STANDARD PREAMBLES FOR ALL TRADES

(REV 3) – DOH 2009



KWAZULU-NATAL

DEPARTMENT OF HEALTH

STANDARD PREAMBLES TO ALL TRADES

REV 3 – JANUARY 2009

Compiled by:
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Infrastructure Development
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INDEX

1. ALTERATIONS 1
- Site Visit ---- 1
- Materials from the Alterations ---- 1
- Asbestos Regulations 2001 ---- 1
- Notice of Disconnections ---- 2
- Dust ---- 2
- Shoring ---- 2
- Matching Existing Work ---- 2
- Forming New Openings etc in Existing Walls ---- 2

2. EARTHWORKS 2
- Site Clearance ---- 2
- Excavations ---- 3
- Water ---- 4
- Working Space ---- 4
- Risk of Collapse ---- 4
- Filling, etc. ---- 4
- Compaction of Filling, etc ---- 5
- Protection against Subterranean Wood-destroying Termites ---- 5
- Re-use of Excavated Material ---- 6
- Demolitions ---- 6
- Grass Planting and Turfing ---- 6

3. CONCRETE, FORMWORK AND REINFORCEMENT
- Interpretations ---- 8
- Definitions ---- 8
- Materials ---- 8
- Reinforcement ---- 9
- Form Work ---- 10
- Concrete Quality ---- 12
- Transportation and Placing ---- 16
- Construction Joints---- 16
- Construction Details ---- 17
- Records ---- 18
- Tests ---- 18
- Acceptance Criteria for Strength of Concrete ---- 19
- Procedure in the Event of Failure ---- 19
- Non-structural Prescribed Mix Concrete ---- 20
- “No Fines” Concrete ---- 20
- Breeze Concrete ---- 21
- Finishes to In-situ Concrete ---- 21
- Unformed Finishes ---- 21
- Tolerances ---- 22
- Supervision ---- 22
- General ---- 22

4. BRICKWORK 23
- Sand ---- 23
- Cement ---- 23
- Lime ---- 24
- Water ---- 24
- Cement Mortar ---- 24
- Compo Mortar ---- 24
- Strength Mortar ---- 24
- Mixing of Mortar ---- 24
- Testing of Strength Mortar ---- 24
- Burnt Clay Common Bricks ---- 24

Bricks for Foundations ---------- 24
Brickwork ---------- 24
Hollow Walls ---------- 25
Brick Linings to Concrete ---------- 25
Reinforced Brick Lintels ---------- 25
Pre-cast, Pre-stressed Concrete Lintels ---------- 25
Bagging Down Brickwork ---------- 25
Cramps ---------- 25
Ties to Wall Plates, Rafters etc. ---------- 25
Welded Mesh Brick Reinforcement ---------- 25
Bitumen Emulsion Waterproofing to Brickwork ---------- 26
Facing Bricks, Paving Bricks, Quarry Tiles etc. ---------- 26
Faced Brickwork ---------- 26
Paving Bricks and Quarry Tiles ---------- 26
Fibre Cement Sills ---------- 26
Rates ---------- 26

5. WATERPROOFING 27
General ---------- 27
Workmanship ---------- 27
Polyethylene Sheeting ---------- 27
Mastic Asphalt Roofing ---------- 27
Flexible Glass Fibre Reinforced Polyester Waterproofing ---------- 28
Expansion Joint Sealants ---------- 28
Rates ---------- 28

6. ROOF COVERINGS 29
Concrete Roofing Tiles ---------- 29
Chromodek roof sheeting ---------- 29
Rates ---------- 29
Corrugated Iron roofing, cladding and filling---------- 30
Fluted steel roofing, cladding and filling---------- 30
Rates for roofing, cladding and filling---------- 31

7. CARPENTRY AND JOINERY 31
Nomenclature of Timbers ---------- 31
Timber Sizes ---------- 31
Storage of Timbers ---------- 32
Orders ---------- 32
Pre-treatment of Timbers ---------- 32
Stress Grading of Softwood Timber ---------- 32
Structural Timber ---------- 32
Brandering and Battens ---------- 32
Joinery and Shelving ---------- 32
Structural Laminated Timbers ---------- 32
Finger-jointed Timbers ---------- 32
Jointing of Purlins, Fascias, Rails, Beams etc ---------- 33
Hard Woods ---------- 33
Prefabricated Timber Roof Trusses ---------- 33
Fabrication and storage---------- 34
Erection and bracing---------- ---------- 35
Rates ---------- 35
Insulation, Waterproofing and Dust Proofing Material for Roofs ---------- 35
Gypsum Plasterboard ---------- 35
Gypsum Coved Cornices ---------- 35
Fibre Cement Sheets ---------- 35
Fibre Cement Cellulose Sheets ---------- 35
Hardboard ---------- 35
Veneers ---------- 35

Plywood ---------- 36
Chip Board---------- 36
Batten Boarding ---------- 36
Decorative Laminate Linings ---------- 36
Nails and Screws ---------- 36
Plugs, etc ---------- 36
Shot Fixing ---------- 36
Carpentry ---------- 36
Ceilings ---------- 36
Flush Plastered Ceilings ---------- 36
Trap Doors---------- 37
Suspended Ceilings Boards---------- 37
Exposed Tee-System Suspended Ceilings---------- 37
Concealed Tee-System Suspended Ceilings---------- 37
Aluminium Trims to Ceilings ---------- 37
Insulation Material for Ceilings---------- 37
Doors ---------- 38
Framed, Ledged and Braced Batten Doors etc ---------- 38
Entrances to Seclusion Wards ---------- 38
Doors to X-Ray Units---------- 38
Joinery ---------- 38
Partitions---------- 39
De-mountable Partitions ---------- 41
Drywall Partitions ---------- 41

8. FLOOR COVERINGS, PLASTIC LININGS, ETC 42
Floor Sheeting ---------- 42
Skirtings, Stair Nosings, Edging Strips etc ---------- 42
Carpet Tiles and Sheeting ---------- 42
Laying ---------- 43
Floor Preparation---------- 43
Construction Joints---------- 44
Glazing---------- 44
Rates ---------- 44

9. IRONMONGERY ---------- 45

10. STRUCTURAL STEELWORK 46
Generally ---------- 46
Interpretations ---------- 46
Definitions ---------- 46
Sub-Contractors ---------- 46
Materials ---------- 46
Shop Details Drawings ---------- 46
Substitution of Sizes etc ---------- 46
Fixings ---------- 46
Fabrication, Assembly and Erection ---------- 47
Inspection and Testing ---------- 47
Priming of Structural Steelwork ---------- 47
Measurement and Payment ---------- 49
Rates ---------- 49

11. METALWORK 49
Rates ---------- 49
Welding and Brazing ---------- 49
Screw Fixings ---------- 49
Pipe Members ---------- 50
Priming of Steelwork ---------- 50
Galvanising of Steelwork ---------- 50

Chromium Plating of Steelwork ---------- 50
Pressed Steel Door Frames ---------- 50
Stainless Steel Door Frames---------- 51
Pressed Steel Cupboard Door Frames ---------- 51
Steel Windows and Doors ---------- 52
Stainless Steel ---------- 54
Anodised Aluminium Welded Windows and Doors ---------- 55
Glazing to Dorrs / Aluminium Glazed Screens---------- 57
Strong Room Doors ---------- 58
Burglar Resisting Safes ---------- 58
Adjustable Louver Gear Sets ---------- 58
Rates ---------- 58

12. PLASTERING 58
Mixing---------- 58
Materials ---------- 58
Measurement of Constituent Parts of Floor Finishes, Toppings, Screeds and Plaster Finishes ---------- 59
Preparation of Surfaces ---------- 59
Floor Screeds etc ---------- 59
Granolithic Finish to Concrete Floors etc ---------- 59

13. PLASTER 60
General ---------- 60
Cement Plaster ---------- 60
Barium Plaster ---------- 60
Curing, Protection, etc ---------- 60
Rates ---------- 60
Generally ---------- 61

14. TILING 61
Materials ---------- 61
Measurement of Constituent Parts of Backings, etc ---------- 61
Preparation of Surfaces ---------- 61
Glazed Ceramic Wall Tiles and Fittings ---------- 62
Mosaics ---------- 62
Unglazed Ceramic Floor Tiles and Fittings ---------- 62
Rates ---------- 62
Transition Trims---------- 62
Movement Joints---------- 62

15. DRAINAGE AND PLUMBING 62
Generally ---------- 62
Subsoil Drains ---------- 63
Storm water and Soil Drain Pipes ---------- 63
Concrete Beds and Encasement to Drain Pipes ---------- 63
Pipe Laying ---------- 63
Gulley traps ---------- 63
Grease Traps ---------- 63
Rodding Eyes ---------- 64
Inspection Eye Blocks ---------- 64
Surface Water Channels ---------- 64
Cast Iron Gratings for Gulleys and Storm Water Drains and Cast Iron Surface Boxes, Manhole Covers and Frames ---------- 64
Storm Water Sumps, Junction Boxes, Manholes, Inspection Chambers, Cable Inspection Chambers and Valve Chambers ---------- 64
Soil Drain Manholes and Inspection Chambers ---------- 65
Manhole Covers and Frame---------- 65
Soak Pits ---------- 65

Septic Tanks ---- 65
Testing of Drains, Manholes and Inspection Chambers ---- 66
Defects to be Made Good ---- 67
Sheet Metalwork ---- 67
Linings to Valleys ---- 67
Linings to Secret Gutters ---- 67
Soakers ---- 67
Under-Flashings ---- 67
Cover Flashings ---- 67
Flashings Around Pipes through Roof Coverings ---- 68
Rainwater Pipes ---- 68
Generally ---- 68
Eaves Gutters ---- 68
Sanitary Plumbing and Fittings ---- 69
Sanitary Fittings ---- 69
Rates for Sanitary Ware ---- 70
Below Ground Water Reticulation ---- 70
Above Ground Water Supplies ---- 71
Water Taps and Valves ---- 72
Concrete Thrust and Anchor Blocks ---- 72
Testing of Water Mains ---- 72
Excavations for Pipe Trenches ---- 72
Backfilling ---- 73
Sizes of Pipes ---- 73
Rates for Pipes ---- 73
Rates for Chases, Holes Etc ---- 73
Fire Extinguishers ---- 73
Fire Hose Reels ---- 74
Fire Hydrants ---- 74

16. GLAZING 74
Materials ---- 74
Glazing ---- 75
Rates ---- 75

17. PAINTING 75
Materials ---- 75
Preparatory Work ---- 76
Application of Paints, etc ---- 77
Rates ---- 77

18. ROADWORK 77
Sub-Grade ---- 77
Sub-Base ---- 78
Stabilisation ---- 79
Base Course ---- 80
Chip and Spray Surfacing ---- 80
Double Seal Coat with Black Top Surfacing ---- 82
Slurry Seal Surfacing ---- 82
Premix Tar macadam Surfacing ---- 83
Pre-cast Concrete Paving Blocks ---- 84
Kerbs ---- 85

19. FENCING AND GATES 85
Generally ---- 85
Security Fencing ---- 86
Gates ---- 87

20. SUBMISSIONS FOR PREFABRICATED TIMBER ROOF TRUSSES 90
Letter Ref TR 1---------- 90
Letter Ref TR 2 ---------- 90

21. SUPPLEMENTARY PREAMBLES 91
Alterations ---------- 91
Concrete, Form Work and Reinforcement ---------- 92
Masonry ---------- 92
Roof Coverings, etc ---------- 92
Carpentry and Joinery ---------- 92
Ceilings and Partitions ---------- 93
Ironmongery ---------- 93
Metalwork ---------- 94
Plastering ---------- 94
Tiling ---------- 95
Plumbing and Drainage ---------- 95
Glazing ---------- 95

TABLES

A Removal of Formwork (Minimum Times in Days [24 hours]) ---------- 12
B Concrete Classes: Strength, Aggregate Size and Compaction ---------- 14
C Maximum Cement / Water Ratios for Different Conditions of Exposure ---------- 15
D Slump Limits ---------- 15
E Prescribed Mix Concrete for Non-Structural Purposes ---------- 20
F Crusher Run Base Course: Stone Specifications ---------- 80
G Single coat Pre-mix Wearing Course: Specifications ---------- 83
H Carpentry and Joinery: SANS Specifications ---------- 93

NOTE:

Only those clauses or portions of clauses in the following preambles, which refer to items in the Bills of Quantities, shall be considered as applying to the performance of this Contract.

2.

1. ALTERATIONS

SITE VISIT: — Tenderers are advised to visit the site prior to tendering and satisfy themselves as to the nature and extent of the work to be done, also to examine the condition of all existing buildings as no claim will be entertained on the grounds of ignorance of the conditions under which the work was to be executed.

MATERIALS FROM THE ALTERATIONS: — unless otherwise stated, will become the property of the Contractor and all these materials, together with all rubbish and debris must be carried away and the site left clean and unencumbered.

Items described as "removed" shall mean removed from the site.

Credit for the value of materials from the alterations is to be allowed for on the Summary/ Final Summary page.

Items described as to be re-used or to be handed over to the Administration are to be dismantled where necessary and stacked on site where directed, and the Contractor will be responsible for their removal and storage until required, and shall make good all items missing, damaged or broken at his own expense.

Unless otherwise described, no materials from the alterations shall be re-used in any new work without the written approval of the Department.

Prior to the removal of any timbers from the site, these are to be inspected by Government Entomologists. If any of these timbers are infested by wood destroying agencies, these timbers are to be disposed of in the manner prescribed by the Government Entomologist.

In taking down and removing existing work, particular care must be taken to avoid any structural or other damage to the remaining portions of the buildings.

ASBESTOS REGULATIONS 2001:

In terms of Asbestos Regulations 2001, no individual person, contractor or agent shall remove, demolish or strip any building containing asbestos or products containing asbestos (including asbestos roof sheeting, ceilings, guttering and down pipes) unless the work is performed by a **"Registered Contractor", registered with the Department of Labour**. All asbestos work shall be carried out under the supervision of an "Approved Inspection Authority".

It is a requirement that before any work involving asbestos removal is carried out, the following procedure and documentation is followed: -

1. Prior to the commencement of any demolition work, written notification shall be given to the Assistant Manager (Inspection and Enforcement), Durban Labour Centre, Masonic Grove, Durban, stating the name, address and details of the person(s) removing or stripping the asbestos. The notification shall include the date, time and place where the proposed work is to be carried out. (Regulation 3).

2. The name and details of the Approved Inspection Authority that is to supervise and confirm that the work is being carried out according to the specific requirements of the Asbestos Regulations 2001 (as amended), including the approved "written work procedure" document. This document shall be submitted and signed at least 14 days prior to commencement of demolition work by the Approved Inspection Authority. (Regulation 21).

3. The production of valid accreditation certification of training for all employees involved in the asbestos removal work.

4. On completion of the asbestos related work a “Clearance Certificate” which includes the asbestos disposal certificate shall be forwarded to the Department by the Approved Inspection Authority.

In terms of the above regulations, it is an offence to carry out any asbestos work as defined in the above regulations without the necessary approval / requirements being met.

Individual persons or contractors found to contravene these regulations will be issued with a **PROHIBITION NOTICE** which in effect will stop all work on site and the offenders will then be liable for prosecution.

Any employer found guilty under the Asbestos Regulations 2001 may be liable to a fine and or imprisonment not exceeding 12 months.

NOTICE OF DISCONNECTIONS: — The Contractor is to give ample notice to the Department and Local Authorities regarding any disconnections necessary prior to the removal or interruption of electrical or telephone cables, water supply and sanitary services, etc.

DUST: — The Contractor is to allow in his rates for taking all precautions necessary to prevent any nuisance from dust whilst carrying out the works.

SHORING: — Rates for shoring are to include for the use and waste of all props, needles, wedges, braces, nails and screws, etc. required and for all cutting, notching, framing and fitting, maintaining in position for the required periods and removing at completion. All shoring is to be executed in a manner approved by the Department.

MATCHING EXISTING WORK: — The terms “make good” or “making good” to existing work as described in the items shall mean making good with materials to match, all joined to existing.

FORMING NEW OPENINGS, ETC. IN EXISTING WALLS: — Rates for items of forming new or altering existing openings are, unless otherwise stated, to include for the following: -

a) Breaking out for and inserting adequate lintels over the new openings (except where stated in the items as being below an existing beam, slab or lintel), to the approval of the Department. The lintels are to be of in-situ concrete Class C, or of pre-cast pre-stressed concrete or of brickwork in 1:3 cement mortar, with a minimum bearing of 230mm at each end and suitably reinforced, and rates are to include for all necessary formwork, turning pieces, etc. and for wedging and pinning up to existing brickwork over in 1:3 cement mortar.
b) All shoring and propping required.
c) Facing up jambs in new brickwork in cement mortar properly bonded to existing,
d) Building up the portions of the openings stated in the items in new brickwork in cement mortar properly bonded to existing.
e) Formwork for concrete sills and thresholds where required.
f) Making good only to the finishes as stated in the items. (Note: — The making good of paint finishes has been measured separately).
g) Forming rounded angles, throats on external plastered soffits, mitres, etc. where required in all new plaster, render and granolithic finishes.

The supply, building in, fixing, etc. of all windows, doors, frames, etc. to the newly formed openings and the removal of all existing windows, doors, frames, etc. from openings to be altered, have been elsewhere measured.

2. EARTHWORKS

SITE CLEARANCE: —The item given in the Bills of Quantities for site clearance shall be deemed to include the removal from the site, or burning if permitted by the Local Authority, of shrubs and trees with trunks under 200mm girth measured at 1m above ground level,

hedges, bushes, other vegetation, rubbish and debris.
Holes left by roots are to be backfilled with earth and rammed.

EXCAVATIONS: — Rates for excavations are to include for forming and trimming to the correct levels, falls, slopes, curves, etc. for trimming sides, stepping, levelling and ramming bottoms, staging and disposing of the excavated material as described in the items. Rates for excavations to reduce levels over site are also to include for forming and trimming banks to the required batter. The Contractor is to allow in his rates for the bulking of excavated material.

The term "excavate", unless otherwise stated, shall mean excavate in "soft excavation" as defined below and for the purpose of classifying excavations the following will apply: —

a) **Soft excavation**: — shall be excavation in material that can be efficiently removed by a back-acting excavator of flywheel power approximately 0, 10 kW per millimetre of tined-bucket width without the assistance of pneumatic tools such as paving breakers, or that can be efficiently loaded without prior ripping or stockpiling by a rubber tired front-end loader of approximately 15t mass and a flywheel power of approximately 100 kW.

b) **Intermediate excavation**: — shall be excavation in material that requires a back-acting excavator of flywheel power exceeding 0,10kW per millimetre of tined-bucket width and the assistance of pneumatic tools prior to removal by equipment equivalent to that specified in (a) above.

c) **Hard rock excavation**: — shall be excavation in material that cannot be efficiently removed without blasting or without wedging and splitting prior to removal.

d) **Class A Boulder excavation**: — shall be excavation in material containing more than 40% by volume of boulders of size between 0.03m³ and 20m³ in a matrix of softer material or smaller boulders.
***Note**: —* Excavation of solid boulders or lumps of size exceeding 20m³ will be classed as hard rock excavation. (2) Excavation of fissured or fractured rock will not be classed as boulder excavation but as hard rock or intermediate excavation according to the nature of the material.

e) **Class B Boulder excavation:** — shall be excavation of boulders only in a material containing 40% or less by volume of boulders of size between 0.03m³ and 20m³ in a matrix of softer material or smaller boulders.
***Note**: —* Those boulders requiring individual drilling and blasting in order to be loaded by a back-acting excavator as specified in (a) above, or by a track type front-end loader, will each be separately measured as Class B boulder excavation.
The excavation of the rest of the material will be classed as soft or intermediate excavation according to the nature of the material.

Method of Classifying: —The Contractor may use any method he chooses to excavate any class of material but his chosen method of excavation shall not determine the classification of the excavation. The Department will decide on the classification of the materials. The classification will be based on inspection of the material to be excavated and the criteria given in (a) to (e) above, as applicable. The decision of the Department shall be, subject to the relevant provisions of the contract, final and binding.

Should the Contractor consider that the excavation is other than "soft excavation" he must notify the Department immediately in order that an inspection be made and a decision arrived at by the Department as to the category of such excavation. Should the Contractor fail to give such notification, the excavation shall be deemed to be "soft excavation" and shall be measured and valued accordingly.

Blasting will only be permitted with the written authority of the Department, if and when permission is granted, it is to be executed only by persons holding the necessary Government Blasting Certificate and subject to all regulations imposed by the Department and/or Local Authority. In addition, the Contractor is to indemnify the Provincial Administration against all claims in respect of damage to persons and property resulting from such blasting operations.

Before commencing any excavations, the Contractor must satisfy himself as to the accuracy of any levels indicated on the drawings, as no claim will be entertained at a later date for any alleged inaccuracy in such levels.

Excavation shall be carried down to such depths as are necessary to obtain firm foundations, but before proceeding to greater depths than are shown on the drawings, the Department's approval must be obtained.

The Contractor will be responsible if he excavates wider or deeper than shown or required. If the excavations are deeper than shown or required such extra excavations are to be filled in with mass concrete at the Contractor's expense. If the excavations are wider than shown or required, any form-wait or mass concrete filling required to the side of the concrete foundations is to be executed at the Contractor's expense and to the approval of the Department.

Depths of excavations as approved shall be checked and recorded by the a Departmental Official and the Contractor's Foreman before any concrete is laid or the excavations are otherwise covered or filled in.

Notwithstanding such approval, any excavations which become waterlogged or otherwise spoilt after approval, shall be cleaned out and reformed, at the Contractor's expense and to the satisfaction of the Department, before any concrete, etc. is laid.

WATER: — The Contractor shall keep all excavations free from water or mud by pumping, baling or otherwise.

WORKING SPACE: — The Contractor is to allow against the items of "excavate to provide working space" for excavating beyond the extent of the net excavations measured to provide the necessary working space for the carrying out of such work as is described in the items. Rates are to include, in addition to the extra excavation, for any additional risk of collapse so incurred and for filling back and compacting the excavated material.

No separate item for working space is provided or will be considered where the face of the measured excavation is 750mm or more away from the finished face of the structure. Separate items for working space for the building of brick foundation walls on ordinary concrete wall footings will not be considered.

In the case of column base and pile cap excavations, where the dimensions between the column face and the excavation face is less than 500mm, working space has been measured for the width of the column face from the commencing level of excavation to the top of the column base or pile cap only where the top of the column base or pile cap exceeds 1.5m below the commencing level of excavation.

RISK OF COLLAPSE: — The Contractor shall maintain all excavated faces affecting the safety of the works and workmen. He must either provide all necessary temporary planking, strutting or shoring to all vertical excavated faces or carry the risk of collapse of these faces with all its implications. He must assume full responsibility in this connection and must allow in his rates accordingly. In addition, all excavated faces exceeding 1.5m deep are to be maintained in accordance with Government Regulations.

Quantities reflect the total superficial areas of the vertical excavated faces and will be subject to variation only in so far as these areas may vary, notwithstanding whether any temporary supports are used or not.

FILLING, ETC.: — All backfilling and filling under floors and paving must be of selected material from the excavations, unless otherwise stated, returned and compacted in layers as later described and with the top surface dressed to the correct levels and grades, all to the approval of the Department. Under no circumstances will the Contractor be allowed to use clay, peat or other unsuitable material for filling.

Rates for all items of filling with material from the excavations are to include haulage not exceeding 100m from the perimeter of the excavations.

Any filling supplied by the Contractor is to be of suitable material approved by the Department.

COMPACTION OF FILLING ETC.: — All filling and backfilling is to be done in layers not exceeding 200mm thick before compaction, with the layers level to ensure uniform compaction. Each layer is to be thoroughly compacted over the whole of the area to a dry density not less than 90% of Mod. A.A.S.H.O. density. The surface of each compacted layer shall be uniform and tightly bonded. Care is to be taken that no damage is done to foundation walls, drains and other services.

The densities of compaction referred to are to be determined by tests carried out in accordance with A.S.T.M. Designation D 1557-58 and at an optimum moisture content of not more or less than 5% of the required Mod. A.A.S.H.O. The Contractor shall be responsible for having sufficient tests taken of the density of the compacted filling to ensure that the required compaction is being attained to the satisfaction of the Department. These tests are to be undertaken by an independent testing authority nominated by the Contractor to the approval of the Department. The costs of all tests in this connection shall be borne by the Contractor and shall be allowed for in his rates.

PROTECTION AGAINST SUBTERRANEAN WOOD-DESTROYING TERMITES: — Where protection against termites is to be provided: —

a) Remove vegetable matter
All dead roots and other vegetable matter likely to encourage termites must be removed from the ground under, against the building and from all filling material.

b) Treating the ground
The ground under surface beds, and below suspended wood floors, must be treated by the application of Soil Insecticides of Chlordane or Aldrin types complying with SANS Specifications 1165 and 1164 respectively, mixed with water and applied at the rate of not less than *5* litres of solution per square metre uniformly over the whole surface. The concentration of the solution must be strictly in accordance with the manufacturer's instructions and to the approval of the Department.

The Department reserves the right to take samples of the diluted solution, at any time, in order to test the concentration of the chemicals used.

Where the ground to be treated is of earth filling, the upper 50mm layer of filling must be levelled by raking, but must not be rammed until after the solution has been applied, and where of natural ground, it must be loosened to a depth of not less than 50mm and similarly levelled, in order to enable the solution to penetrate into the soil. After the solution has been applied and allowed to penetrate the surface, the soil must be well rammed and consolidated.

Before applying the solution to the ground under the floors, splay back earth for a depth and width of 75mm from the internal faces of walls enclosing the floors, against internal walls, sleeper piers, etc. and thoroughly saturate with the solution. After the solution has soaked into the earth, the splayed grooves must be filled with earth and consolidated.

The treated layer of soil under suspended wood floors must be protected with a 75mm thick layer of approved clean gravel, finished to an even surface.

The treated layer of soil under concrete surface beds must be protected with a 25mm thick layer of well-consolidated approved grit prior to laying the waterproofing membrane.

Great care must be taken when laying concrete surface beds, protective layers, etc. in order to avoid rupturing the treated layer of soil. Should the treated layer be ruptured at any

point it must be made good and the area affected re-treated with the soil insecticide.

Contractors are advised that:

a. Special precautions must be taken to protect the workmen whilst using the soil insecticide.
b. The treatment of filling or ground under floors shall be done as soon as practicable, so that treatment may dry out before the floors are laid.
c. The treatment of the ground must be carried out under the supervision of the Department.
d. The soil insecticide to be delivered to the site in sealed drums clearly labelled or stamped with the name of the product.
e. In addition to the foregoing the application of the soil insecticide to be carried out in accordance with SANS Code of Practice 0124 — the application of Certain Soil Insecticides for the Protection of Buildings.
f. The protective layers of gravel or grit have been measured separately.

RE-USE OF EXCAVATED MATERIAL: — Material of any kind that may be discovered on the site during the excavation shall remain the property of the Administration. Such material may, if approved, be used for aggregate. Material so used shall be valued and the value deducted from the Contract Sum.

DEMOLITIONS: — The Contractor is referred to the preambles for "Alterations" insofar as they apply and the following: —

The demolition of existing buildings is to be done in a practical and safe manner, under the continuous supervision of a competent Foreman. Rates for the demolition of existing buildings are to include for breaking up and removing all external screen walls, steps and ramps, surface water channels, rainwater sumps, gulleys, etc. and grubbing up and removing all foundation walls and footings, disconnecting and removing all services to a point not less than 1m beyond the perimeter of the buildings, plugging off ends of all remaining pipes, and for filling in all holes with clean earth and ramming up to ground level. All movable fittings and furniture, fire extinguishers and electrical and other equipment in the buildings to be demolished are to remain the property of and will be removed by the Administration prior to the commencement of the demolition.

Before commencing the demolitions, the Contractor shall comply with any Local Authority regulations in force in respect of rodent extermination, etc. and he shall obtain the required Clearance Certificate. Items to cover the cost of obtaining the certificate and the fumigation, etc. of the buildings to be demolished have been provided elsewhere in the Bills of Quantities, and the fumigation is to be carried out by a firm specialising in this type of work. The fumigation of the buildings to be demolished shall only be carried out if called for by the Local Authorities and if not required the value of the relevant items in the Bills of Quantities will be deducted from the Contract Sum.

After handing over the site to the Contractor, the risk of any loss or damage to the buildings to be demolished and the materials therein, caused by theft, vandalism, etc. shall be the responsibility of the Contractor and he shall take such precautions as he deems necessary against such loss or damage.

GRASS PLANTING AND TURFING: — Is to be "Cape Kweek" or "Umgeni" grass scientifically known as *Cynodon dactylon* or other local fine grass approved by the Department. In areas where fine grass does not grow readily, Kikuyu grass *Pennisetum clandestinum* may be substituted. The areas must be identified and the approval of the Department obtained before Kikuyu grass is to be planted.

Grass Planting To Level Areas: — The areas to receive grass are to be weeded and raked free of stones and other superfluous matter and all depressions left by the earthworks plant are to be filled in with approved topsoil. The planting of grass is to be carried out in continuous root planting in rows 200mm apart. The method of planting called "sprigging" may be used as an alternative.

Immediately after completion of each strip or square, the area thus grassed is to be thoroughly watered and lightly rolled. Any drifting or piling up of the top soil due to wind or any other cause must be prevented as far as possible and should such piling up of soil against newly planted grass occur the soil must immediately be raked level and lightly rolled.

Turfing: — Banks are to be carefully trimmed to an even surface and weeded and raked free of stones, etc. and all depressions filled in with approved topsoil as before described. Turfing of banks is to be carried out with 25mm thick maximum 500mm x 1000mm weed-free grass sods, of grass as before described, and as approved by the Department. The grass sods are to be set in position in horizontal rows to broken bond and closely fitted together and tamped flat with a timber pummel, a maximum of two sods in every square metre of area covered being staked to the bank to maintain position, with and including one sharpened wood or bamboo skewer 250mm long and with all cavities between sods filled in with approved top soil and the whole area lightly top soil dressed on completion.

Established Lawn: — The use of established lawn in pieces size approximately 500mm x 1000mm x 25mm thick in lieu of grass sods on banks will be permitted provided that the established lawn is supplied and laid by a firm experienced in this type of work and to the approval of the Department. The fitting, tamping, staking and top dressing must all be as described for turfing, except that one piece per square metre is required to be staked as described.

Fertilizer: — An approved fertilizer of the following types— Type 2:3:2 for grass planted levelled areas and Type 3:2:1 for turfed or established lawn covered banks is to be supplied and applied by the Contractor at the rate of 400 kg per hectare. In the case of grass planted levelled areas the fertilizer is to be applied either before or after grass planting and in the case of turfed or established lawn covered banks the fertilizer is to be applied after the sods or pieces have been laid.

The fertilizer above described is to in addition to any fertilizer which may have been specified to be applied during either the operation of scarifying and grading the area to be grassed or the re-spreading of top soil.

A sample of the existing topsoil or the topsoil to be re-spread is to be sent to an approved fertilizer manufacturer for testing and advice on the acid or alkaline content of the soil. The cost of this test is to be borne by the Contractor if this is not provided free by the fertilizer manufacturer.

The requisite quantities of limestone ammonium nitrate for acidic soil or ammonium sulphate for alkaline soil as determined by the soil test will be supplied to the Contractor by the Department and the cost thereof is to be included in a Provisional Sum elsewhere in the Bills of Quantities. The application of this treatment is to be undertaken by the Contractor and his rates for grassing, etc. must include for same.

Weed killer: — "Weed Master or Turf Master" or other approved weed killer is to be applied to the entire grassed or turfed areas at a rate of 4 litres mixed with 200 litres of water per hectare, this being equivalent to 40-45 millilitres mixed with 5 litres of water per fifty square metres. The solution is to be sprayed on with a suitable spraying apparatus to achieve an even distribution. Six to eight weeks later, the operation is to be repeated. The application of weed killer is not to take place during wet weather. Weather conditions should be such as to allow a minimum of two hours or absorption before the likelihood of rain.

Watering and Rolling: — The entire turfed area is to be kept clear of weeds, lightly rolled and thoroughly watered throughout the period of the Contract and or at least three months from the time of acceptance of the grounds or until the grassing or turfing is well established if that is sooner, all to the satisfaction of the Department.

In the absence of rain, the initial watering of grassed or turfed areas is to be carried out as follows: —

Grass planted levelled areas: - at least twice a week.
Established lawn areas: - at least once a week.
Turfed areas: - at least once a day for the first ten to fourteen days, thereafter at least once a week.

The Contractor must allow in his rates for providing and removing at completion all necessary temporary water piping complete with fittings, sprinklers, hoses, etc. as required for the proper watering of the grassed or turfed areas of the plateaux and banks.

Cutting of Grass: — The Contractor must commence mowing as soon as possible once turfed areas have become established and undertake regular mowing at approximately one-week intervals up to the date of final delivery, except that, during the maintenance period, the mowing of the plateaux will be undertaken by the Institution.

Note: — All stages of grass planting and turfing are to be supervised on a full time basis by a competent person with the necessary experience and knowledge.

It shall be the responsibility of the Contractor to advise the Department when the following operations are to be carried out in order that his representative may be present: —

a) the application of fertilizer
b) the application of weed killer.

Should the Contractor fail to do so, the Department shall have the right to instruct the Contractor to repeat the operation at his own expense.

3. CONCRETE, FORMWORK AND REINFORCEMENT

GENERAL: — This specification applies to concrete work formed into its final shape and position in-situ.

All concrete and formwork shall be carried out in accordance with SANS Specification 1200 G — Concrete (Structural) (a copy of which the Contractor will be required to keep on the site so that it can be referred to at all times during the Contract), with the following amplifications and amendments: —

INTERPRETATIONS: — Clauses 2.1 and 2.2 of SANS Specification 1200G refer. This preamble, together with any other supplementary preambles appearing in these Bills of Quantities shall be deemed to be the project specification and are the “Portion 2” referred to in Clause 2.2.

DEFINITIONS: — Clause 2.3 of SANS Specification 1200 G refers. All references to the Engineer shall be deemed to mean the Department.

MATERIALS
Cement: —unless otherwise specified, shall be one or more of the following and shall, in each case, comply with the requirements of the relevant standard specification: —
Portland cement and rapid-hardening cement to SANS 471 Specification
Portland blast-furnace cement to SANS Specification 626.
Portland cement 15 to SANS Specification 831.
Nevertheless, no cement other than ordinary Portland cement shall be used without the approval of the Department. Cement containing more than 15% blast-furnace slag will not be permitted in columns or in members less than 50mm thick.

In addition (for the abovementioned items) where Ordinary Portland cement is used, blast-furnace slag (from separate containers) **must not** be added in any proportion whatsoever.

No mixing of two different types of cement in the same batch will be allowed, and unless otherwise approved by the Department, the same brand and type shall be used in all exposed concrete.

Lumpy cement, broken sacks and sweepings shall not be used.

Cement supplied in sacks shall be used in the order in which it was delivered and shall not be kept in storage for longer than six (6) weeks without the approval of the Department.

Water: — Shall be clean and free from injurious amounts of acids, alkalis, sugar, organic matter and other substances that could impair the strength or durability of the concrete. If so required by the Department, the suitability of the water shall be proved by tests carried out by an approved laboratory.

Aggregates: — Unless otherwise specified both the coarse aggregate (stone) and the fine aggregate (sand) shall comply with the requirements of SANS Specification 1083. The Contractor is to prove compliance by means of either a certificate from the supplier or by grading analysis tests.

Admixtures: — i.e. materials other than cement, aggregate and water shall not be used in the concrete mix without the approval of the Department. The onus for proof of satisfaction to the Department for any admixture proposed shall be with Contractor.

Reinforcement: — for concrete shall be as specified and shall, in each case, comply with one of the following: —

a) Type A hot rolled mild steel bars of plain round cross section to SANS Specification 920
b) Type C Class 2 hot rolled high yield stress Grade 1 deformed bars to SANS Specification 920
c) Type D Grade 1 cold worked deformed bars to SANS Specification 920.
d) Welded steel fabric to SANS Specification 1024 manufactured from plain hard-drawn mild steel wire.

A sample reinforcing rod, approximately 600mm long, may be taken from each consignment of rods of similar diameter, for testing. If any sample is found unsatisfactory the whole consignment of rods from which the sample was taken will be rejected.

No substitution of the bars specified shall be made without the prior approval of the Department.

REINFORCEMENT

Bending: — Reinforcing bars shall be cut and bent according to the dimensions shown on the working drawings and in accordance with SANS Specification 82.

Except as allowed for below, all bars shall be bent cold and bending shall be done slowly, a steady even pressure being used without jerk or impact.

If approved by the Department, hot bending of bars of diameter at least 32mm shall be permitted, provided that the bars do not depend for their strength on cold working. When hot bending is approved, the bars shall be heated slowly to a cherry red heat (not above 840 C°) and after bending shall be allowed to cool slowly in air. Quenching with water shall not be permitted.

Fixing: — All steel reinforcement, at the time of placing of the concrete, must be free from loose rust, scale, oil and other agents which will reduce the bond between the steel and the concrete or initiate corrosion of the reinforcement. Reinforcement exposed to sea spray shall be washed down, and the formwork drained, just prior to concreting.

Reinforcement shall be positioned as shown on the working drawings or as directed by the Department and maintained in those positions within the tolerances given in the Specification for Tolerances. It shall be secured against displacement by tying at intersections with 1.6 or 1.25mm diameter annealed wire or by the use of suitable clips or, if permitted by the Department, by welding in accordance with SANS 1856. Welding will not

be permitted on cold worked bars. Reinforcement shall be supported in its correct position by hangers, saddles or cover blocks and aligned by chairs and spacers all of approved design and material. Where such hangers, saddles, chairs or spacers are of steel, they will be detailed on the drawings or in bending schedules.

Cover: —The minimum cover of concrete over reinforcement, excluding any applied finish, shall be as shown on the working drawings, or as directed by the Department.

Cover shall be maintained by using cover blocks, which shall be made of small aggregate concrete, not mortar, using the same cement and aggregate type and ratio as the parent concrete. Alternatively, cover blocks may be of the plastic type provided that sufficient number are used to prevent their collapse, that they are of a colour compatible with that of concrete and that the prior approval of the Department is given. Metal cover blocks shall not be used.

If the concrete face has a Class F2 smooth finish or some other special finish as is described elsewhere, hemispherical or pyramid shaped concrete cover blocks shall be used unless otherwise specifically approved by the Department.

Splicing: — or joining of reinforcing bars shall be made only as and where shown on the working drawings or as otherwise approved. The length of the overlap in a splice shall be not less than that shown on the working drawings or forty-five times the diameter of the bar if not shown.

Protection of Exposed Bars: — If left exposed for future bonding of extensions to the works, reinforcement shall be protected from corrosion as specified by the Department.

Electric Current: — Reinforcement shall not be used as a means for conducting electric current unless there is conformity with the requirements of SANS Code of Practice 03.

Inspection of Reinforcement: — Reinforcement shall be subject to inspection by the Department after the Contractor is satisfied that it has been completely and correctly fixed. The amount of notice given by the Contractor to the Department before concreting commences that reinforcement is ready for his inspection shall be agreed between the Department and the Contractor at the commencement of the Contract.

FORM WORK

Design: — Formwork shall be so designed and constructed by the Contractor that the concrete can be properly placed and compacted and that the required shapes, finishes, positions, levels and dimensions shown on the working drawings are maintained, subject to the tolerances given in the Specification for Tolerances. Unless otherwise directed by the Department, all formwork to beams and slabs shall be evenly cambered, unless otherwise specified or shown on the drawings, to the mid-point of the span of the member at the rate of 2mm per metre of span, all to the approval of the Department and the full cross section of the member shall be maintained after placing of concrete.

The formwork and joints shall be capable of resisting the dead load and pressure of the wet concrete, effect of vibration equipment, wind forces and all other superimposed loads and forces it is necessary for it to carry.

Should it be necessary to support formwork off suspended or ground bearing slabs, the manner of execution of the support shall be agreed with the Department so that overstress of, or damage to, those members is prevented.

In structures having, in whole or part, two or more reinforced concrete floors, props to the approval of the Department shall be provided under the soffits of beams and slabs of any floor which is being used to support the formwork and new concrete of the floor above. These props shall not be removed until the formwork for the new concrete has been struck.

Wedges and clamps shall be used in preference to nails. Joints in forms shall be tight enough to prevent leakage of cement paste.

Finish: — The quality of the finished surface of the concrete shall be as shown on the working drawings or as otherwise specified, and the type of formwork used shall be adequate to provide such finishes.

Ties: — The type of ties used and their position shall be such that the finish required in terms of the clause “Finish” is achieved. Tie rods are preferable to wire ties and the forms shall not be secured to the reinforcement. No corrodible tie rod or wire tie shall be allowed within the depth of concrete cover, and in the case of water-retaining or tanked structures, no removable tie rod or wire shall pass right through the concrete member.

Preparation of Formwork: — Surfaces that are to be in contact with fresh (wet) concrete shall be so treated by coating with a non-staining mineral oil or other approved material, or, in the case of timber forms, by thoroughly wetting surfaces so as to ensure easy release and non-adhesion to formwork during stripping. If any substance other than water is used, every precaution shall be taken to avoid contamination of the reinforcement.

Re-use of Formwork: — Before re-use, all formwork shall be reconditioned, and all form surfaces that are to be in contact with the concrete shall be thoroughly cleaned without unduly damaging the surfaces of the formwork.

Openings: — Where necessary for the proper placing of the concrete, temporary openings for cleaning, inspection or placing purposes shall be provided, taking cognisance of the finishes specified.

Removal of Formwork: — Formwork shall not be removed before the concrete has attained sufficient strength to support its own mass and any loads that may be imposed on it. Except where the Contractor can prove by means of cube tests, at his own expense to the satisfaction of the Department that, because of its strength development characteristics the concrete has attained sufficient strength and that shorter periods are practicable, formwork shall not be removed within shorter periods than those given in Table A. The number of cube tests required shall be equal to the number required for testing at 28 days. Where full design loads are carried, no soffit forms and props may be removed until the full design strength is attained.

In structures having, in whole or part, two or more reinforced concrete floors, props to the approval of the Department shall be provided under the soffits of beams and slabs of any floor which is being used to support the formwork and concrete of the new floor above. These props shall not be removed until the formwork for the new concrete has been struck.

All formwork props shall have been removed from under beams and slabs before the commencement of construction of brickwork thereon, unless otherwise agreed with the Department. Formwork shall be removed carefully so that shock and damage to the concrete are avoided.

TABLE A—REMOVAL OF FORMWORK (MINIMUM TIMES IN DAYS (24 hrs))

1	2	3	4	5	6	7	8	9	10
Type of structural member or formwork	Type of cement used								
	Portland cement and Portland cement 15			Rapid-hardening Portland cement* and rapid-hardening Portland cement 15			Portland blast-furnace cement		
				Weather					
	Hot or normal	Cool	Cold	Hot or normal	Cool	Cold	Hot or normal	Cool	Cold
(a) Beam sides, walls, and unloaded columns.	0,75	+	1,5	0,5	+	1	2	+	4
(b) Slabs with props left underneath	4	+	7	2	+	4	6	+	10
(c) Beam soffits with props left underneath, and ribs of a ribbed floor construction	7	+	12	3	+	5	10	+	17
(d) Slab props including cantilevers	10	+	17	5	+	9	10	+	17
(e) Beam props including cantilevers	14	+	21	7	+	12	14	+	21

* Shorter periods may be used for sections of thickness 300mm or more.
+ In cool weather, stripping times shall be determined by interpolation between the periods specified for normal and cold weather.

CONCRETE QUALITY

General: — Concrete shall comply with the requirements for “Strength Concrete” as specified. The type of aggregate and cement, and their sources of supply, shall not be altered during the currency of the Contract without the prior written agreement of or instruction from the Department.

Strength Concrete: — The Contractor shall be responsible for the design of the concrete mix and for the proportions of its constituent materials, measured as described, necessary to produce concrete that complies with the requirements specified by the Department thus:-

a) For each section of the work, the class of concrete and position on the Works, as shown on the drawings:
b) For each class of concrete:
   i) the minimum compressive strength at 28 days as shown in Table B
   ii) the maximum nominal size of coarse aggregate as shown in Table B

iii) the stump as shown in Table D
iv) the maximum cement/water ratios as shown in Table C.

At the earliest possible stage in the Contract, at least 35 (thirty-five) days before the first concrete is placed, or as otherwise agreed with the Department, the Contractor shall submit samples of the aggregates which he proposes to use on the works to the Department.

The Contractor, under the supervision of the Department, shall prepare trial mixes using these same aggregates, to establish his ability to achieve the strengths specified, and satisfactory workability of the concrete. The Contractor shall provide all necessary equipment for, and carry out tests of moisture content of aggregates at the time of preparation of the trial mixes, tests of the slump of the mixes and at the same time cast not less than six standard cubes from each mix for compression tests.

The target strengths to be achieved under trial mix procedure shall exceed the specified minimum compressive strengths by a factor which is acceptable to the Department.

The Contractor shall also, when required to do so, prove the concrete yield obtained per sack of cement by suitable measurement of batches after placing.

No structural concrete work shall be poured until trial mix procedure has been properly followed and satisfactory 7 (seven) day compression strengths achieved. (Equivalent 28 (twenty-eight) day strength = 4/3 x 7 day strength + 5 MPA).

Thereafter, the materials, preparation of and method of manufacture of subsequent concrete shall conform accurately to those used in the trial mixes. If materials vary in the course of the Contract from the samples first submitted, the Contractor shall, on the instructions of the Department, repeat the trial mix procedure and vary the proportions to attain the specified qualities.

The costs of preparation of trial mixes, with tests associated with them, shall be borne by the Contractor and must be allowed for in the pricing of the concrete.

A valid concrete test result shall be the average obtained from the testing of three test cubes of concrete in accordance with SANS Method 863.

TABLE B—CONCRETE CLASSES: STRENGTH, AGGREGATE SIZE AND COMPACTION

Class	Minimum 28 day cube compressive strength (MPA)	Maximum nominal size of coarse aggregate (mm)	Method of Compaction
50/26 50/19	50	26,5 19,0	Mechanical (see clause "Compaction")
45/26 45/19	45	26,5 19,0	
40/26 40/19	40	26.5 19,0	
35/26 35/19	35	26,5 19,0	
30/37 30/26 30/19 30/13	30	375 26,5 19,0 13,2	
25/37 25/26 25/19 25/13	25	37,5 26,5 19,0 13.2	
20/37 20/26 20/19 20/13	20	37,5 26,5 19,0 13,2	
15/37 15/26 15/19	15	37,5 26,5 19,0	Non-mechanical (See clause "Compaction")
10/37 10/26 10/19	10	37,5 26,5 19,0	

The Contractor shall be deemed to have satisfied himself, before tendering, of his ability to produce concrete of the required quality with available materials conforming to the specification, and mixed in the proportions on which his tendered rates are based. Any subsequent alterations of the mix proportions to meet these requirements shall be at the Contractors expense.

If, in the opinion of the Department, the concrete proportions are likely to lead to excessive segregation, honeycombing, bleeding or shrinkage cracking, he shall have the right to order the Contractor to amend the proportions at the Contractors own cost.

TABLE C — MAXIMUM CEMENT / WATER RATIOS FOR DIFFERENT CONDITIONS OF EXPOSURE

1	2	3	4	5
Type of structure	**Exposure Conditions**			
	Mild	**Moderate**	**Severe**	**Very Severe**
Thin sections; reinforced piles; all sections with less than 25mm cover reinforcement.	*	0.53	0.48	0.40
Moderate sections; retaining walls, piers, beams	*	*	0.53	0.43
Exterior portions of mass concrete	*	*	0.53	0.43
Concrete slabs laid on ground	*	0.53	0.48	*
Concrete protected from the weather, inside buildings, or in ground below frost level	*	*		*

* In these cases the ratio will be based on the strength for the workability desired.

Consistency and Workability: — Slump measurements taken in accordance with SANS Method 862 shall be within the limits given in Table D appropriate to the type of construction, or within such other limits as are laid down by the Department.

The concrete shall be of such workability that it can readily be compacted into the corners of the formwork and around reinforcement without segregation of the materials or excessive “bleeding” of free water at the surface.

TABLE D—SLUMP LIMITS

1	2	3	4	5
Type of construction	Slump, mm			
	Non-mechanical compaction		Mechanical compaction	
	Max.	mm.	Max.	mm.
Paving and pre-cast units	75	50	50	30
Heavy mass construction	75	25	50	20
Reinforcing foundation walls and footings	125	50	80	30
Slabs, beams, columns, and reinforced walls	125	50	80	30
Slabs and industrial floors on ground	125	75	80	50
Plain footings, caissons, and substructure walls	100	25	60	20

Ready-mixed Concrete: — This may be used subject to the approval of the Department. This approval may be withdrawn on 24 (twenty-four) hours notice to the Contractor if at any time if documents do not conform to the requirements of this Specification. Ready-mixed concrete shall also comply with the requirements of SANS Specification 878. Details of the

mix ingredients and tests thereon, the mix designs and relevant tests shall be forwarded to the Department for his approval. Ready-mixed concrete shall be cast within 3 (three) hours of placing all the ingredients in the mixing plant. Ready-mixed concrete shall be subject to the same sampling and testing at the site as that mixed on site and only the results of these tests will be regarded as valid.

TRANSPORTATION AND PLACING

Transportation: — Unless agreed with the Department, concrete shall not be pumped into its final position.

The Contractor must provide suitable runways for the distribution of concrete to the various parts of the structure and these must be solidly constructed in such a manner so as to obviate the possibility of interference with the steel reinforcement.

Placing: — Unless otherwise agreed with the Department, the Contractor shall give the Department at least 24 (twenty-four) hours notice of his intention to place concrete. No concrete shall be placed without the prior approval of the Department and without a representative of the Department being present. Concrete shall be placed within one hour of the time of its discharge from the mixer. Concrete shall not be re-tempered by the addition of water or other material. The forms to be filled shall be clean internally. All excavations and other surfaces of an absorbent nature that are to come into contact with the concrete shall be dampened with water. There shall be no free-water on the surface against which concrete is to be placed. Wherever possible, the concrete shall be deposited directly into its final position to avoid segregation and displacement of reinforcement and other items that are to be embedded. Deposited concrete shall not be so worked (whether by means of vibrators or otherwise) as to cause it to flow laterally in such a way that segregation occurs. Where possible, the concrete shall be brought up in horizontal layers of compacted thickness not exceeding 450mm and heaping shall be avoided.

Where a chute is used to convey the concrete, its slope shall be such as will not cause segregation, and a suitable spout or baffles shall be provided for the discharge of the concrete. Concrete shall not be allowed to fall freely through a height of more than 3 m, unless otherwise approved. Concrete shall not be placed during periods of heavy or prolonged rainfall.

Compaction: — The concrete shall be fully compacted by approved means during and immediately after placing. It shall be thoroughly worked against the formwork and around reinforcement and other embedded fittings without displacing them.

The concrete shall be free of honeycombing and planes of weakness. Successive layers of the same lift shall be thoroughly worked together.

The method of compaction shall be as specified. Mechanical compaction shall be undertaken by means of high frequency immersion vibrators of minimum frequency of 6000 vibrations per minute and a maximum acceleration of 4 g when under load, being capable of visibly affecting concrete over a radius of at least 500mm. Vibrators shall be inserted at about 500mm centres and withdrawn slowly to close the hole formed by the vibrator.

Non-mechanical compaction shall be undertaken by means of spading, rodding or forking.

Over-compaction resulting in segregation, surface laitance or leakage (or any combination of these) shall not be allowed.

Vibrators shall not be allowed to come within 30mm of the face of the formwork in the case of formed finishes, nor within 75mm of the face of the formwork in the case of special finishes.

Construction Joints: — Concreting shall be carried out continuously up to the construction joints shown on the working drawings or as prior approved by the Department, except that

if, because of an emergency (such as a breakdown of the mixing plant or the occurrence of unsuitable weather), concreting has to be interrupted a construction joint shall be formed at the place of stoppage in conformity with the detail shown on the drawings for construction joints generally and in the manner which will least impair the durability, appearance and proper functioning of the concrete. The Department shall approve the method adopted for forming the construction joints, one of the following methods being adopted, as relevant: —

a) Construction joints when concrete is not more than 24h old: —The surface of the concrete shall be brushed with a steel wire brush before new mortar and concrete are placed as specified in (b) below.
b) Construction joints when concrete is more than 24h but not more than 3 days old: — The surface of the concrete shall be sand-blasted or chipped with a light hammer, swept clean, and thoroughly wetted and covered with a 10mm thick layer of mortar composed of cement and sand mixed in the same ratio as the cement and sand in the concrete mixture. This mortar shall be freshly mixed and placed immediately before the new concrete is placed.
c) Construction joints when concrete is more than 3 days old: — The procedure specified in (b) above shall be followed, except that the old surface shall be prepared and kept continuously wet for at least 24h before the mortar and new concrete are placed.
d) Construction joints at tops of columns: — The procedure for brushing or cleaning specified in (a) or (b) above, as applicable, shall be followed before the steel reinforcement of the slab or floor to be cast on the columns is placed in position.

Curing and protection: — Formwork shall be retained in position for the appropriate period given in the clause “Removal of Formwork” and shall be considered as providing adequate curing on those surfaces for that period. Should this curing period still be less than that specified, alternatively, should surfaces not be cured by forms then all such concrete shall immediately be protected from contamination and loss of moisture by one or more of the following methods: —

a) ponding the exposed surfaces by means of water, except where atmospheric temperatures are low, i.e., less than 2°C,
b) covering the concrete with sand, or mats made of a moisture-retaining material, and keeping the covering continuously wet;
c) continuous spraying of the exposed surfaces with water;
d) covering with a waterproof or plastic sheeting firmly anchored at the edges,
e) using a prior approved curing compound applied in accordance with the manufacturer’s instructions, provided that in this case, the presence of the compound is not detrimental to subsequently applied finishes.

Whatever method of curing is adopted, its application shall not cause staining, contamination, or marring of the surface of the concrete.

The curing period shall be at least 5 days for concrete made with Portland cement, at least 2 days for that made with rapid-hardening Portland cement and at least 7 days if Portland blast-furnace cement is used. When atmospheric temperatures are below 5° C these minimum curing periods shall be extended by 72, 36 and 72 hours respectively.

CONSTRUCTION DETAILS

Holes, Chases and Fixing Blocks: — No holes or chases other than those shown on the working drawings or approved by the Department shall be cut or otherwise formed in the concrete. No blocks for the attachment of fixtures shall be embedded in the concrete unless approved by the Department.

Pipes and Conduits: — No pipes or conduits other than those shown on the working drawings shall be embedded in the concrete without the approval of the Department. The clear space between any such pipes and the clear distance between such-a pipe and any reinforcement shall be at least 25mm or the maximum size of the coarse aggregate plus 5mm, whichever is greater. The amount of concrete cover over pipes and fittings shall be at least 25mm.

Honeycombing and Other Defects: — After removal of the forms, if the concrete shows any defect in terms of the Specification for Finishes for that concrete, the Contractor shall, on the instructions of the Department, make good the defect at his own cost, by either removing and replacing the defective concrete, or by patching, all as approved by the Department and to the standard of finish required. No remedial work shall be carried out by the Contractor without the prior approval of the Department.

Building on Concrete Footings: — No structural load shall be imposed on concrete footings until at least three days after depositing the concrete in the case of mass concrete footings and after seven days in the case of reinforced concrete footings, or as may be directed by the Department.

RECORDS: —The Contractor shall maintain written records indicating: —

a) the date on which each section was concreted, the time taken to place the concrete, and the position of that section in the Works and its construction joints;
b) daily weather conditions with temperatures being recorded by maximum and minimum thermometers and
c) the nature of samples and dates on which they were taken. In the case of cubes these shall also state the identification marks, test results and age, minimum strength required and position of parent concrete.

TESTS

Compressive Strength: — During the time in which each class of concrete, having a specified 28 day compressive strength equal to or greater than 20 MPA, is being placed, samples of the concrete shall be taken from the point of deposit at the rate of at least one sample from each 5m³ of concrete placed in columns, and from each 30 m³ or part thereof of concrete placed elsewhere, but in either case, nevertheless at least once a week. A group of at least three 150mm test cubes shall be made from each sample for testing at 28 days age. If the Contractor plans to execute further work which relies on previously completed work for support but for which the results of 28 day tests are not available, he is to prove the strength of that concrete by taking and testing at 7 days age an equal number of test cubes to that which is to be tested at 28 days age, prior to the commencement of the planned further work.

The cost of the necessary extra test cubes and testing will be for the Contractor's account. Each group of test cubes shall be deemed to represent the whole of the concrete from which sample was taken and shall be identifiable with the concrete.

The Contractor shall provide, at his own expense, sufficient moulds to keep pace with the rate of concreting. He shall also perform all tasks in respect of compressive strength testing except the actual crushing.

If ready-mixed concrete is used, site testing as specified herein shall still be undertaken, and only the results of such site testing shall be considered in determining the acceptance or otherwise of the concrete.

Grading Analysis: — If so directed by the Department, a grading analysis shall be made for each 40m³ of fine aggregate to be used and for each *75* m³ of the coarse aggregate to be used. The analysis shall be made by the method given in SANS Specification 1083.

Determination of Consistency: — When the slump test is used to measure the consistency of the concrete mix, it shall be carried out by the method given in SANS Method 862 with samples taken in accordance with SANS Method 861.

Costs of Tests: — to concrete, trial mixes, cement, aggregates, water and reinforcing steel shall be borne by the Contractor. The Contractor shall also bear the costs of any other tests (including load tests), which are required as a result of failure on the part of the Contractor to meet the requirements of the Specification.

An item against which the Contractor may allow for all costs in connection with tests on concrete cubes has been included elsewhere in these Bills of Quantities.

Testing Authority: — The crushing of cubes and testing of other samples except in the case of the clause "Determination of Consistency" shall be undertaken by an independent Authority as approved by the Department. The Contractor shall arrange with the Authority that copies of the results of all tests are sent direct to the Department.

ACCEPTANCE CRITERIA FOR STRENGTH OF CONCRETE: — Should any test result obtained from a set of three test cubes of concrete of a specific grade that have been made and tested as specified show that the strength is more than 3 MPA below the specified strength, the concrete represented by such results shall be deemed to have failed to meet the Specification. Should an examination carried out in terms of the clause "Procedure in the event of failure" satisfy the Department that the structural adequacy and durability of that part of the structure where the concrete concerned has been used, is not impaired, the concrete will be acceptable. The Contractor will however be required to review the mix design and any other factors influencing the quality to ensure that further concrete is acceptable.

Where three or more consecutive valid test results (i.e., results of sets of three test cubes that have been made and tested as specified) become available, the following criteria shall apply: —

a) The average of any three consecutive valid test results obtained on concrete of a specific grade must exceed the specified strength by at least 2 MPA.
b) If the criterion given in (a) above is not met but the average is at least equal to the specified strength, the concrete cast will be acceptable but the Contractor will be required to adjust the mix design and standard of control.
c) Should the average result be less than the specified strength, an examination must be carried out in terms of the clause "Procedure in the event of failure" on that part of the structure in which concrete represented by the result has been used.

Alternatively, should a concreting operation be of such size or the testing be of such frequency that thirty or more valid test results (i.e., results of sets of three test cubes that have been made and tested as specified) become available within three months, the Contractor may choose, subject to the approval of the Department, to have the results assessed statistically. In such a case, the average of all the test results of a specific trade of concrete at *any stage* must exceed the specified strength by at least 1,7 standard deviations, failing which the Contractor will be required to adjust the mix design to ensure compliance with this criterion.

PROCEDURE IN THE EVENT OF FAILURE: — If after the evaluation of the test results in terms of the clause "Acceptance criteria for strength concrete" an examination of the concrete in the structure is necessary, one or more of the following procedures in the sequence given may be adopted at the discretion of the Department, and for the account of the Contractor, to determine the acceptability or otherwise of the concrete in that particular part of the structure: —

a) An assessment of the stress level in the structure concerned in relation to the test result obtained.

b) Non-destructive testing, subject to the availability of similar concrete of proven acceptable quality in comparable members in the same construction as a reference.

c) The testing of drilled cores in accordance with the relevant SANS Standard Methods.

d) Full scale load tests in accordance with Section 6 of SANS Code of Practice 0100: Part II.

Where load tests are, in the opinion of the Department, unsuitable or impracticable, and if an examination carried out in terms of the above does not show the concrete strength

to be acceptable, or if a tested portion of the structure fails to pass the tests, the Contractor shall, on the instructions of the Department, replace or strengthen by approved means: —

a) each portion that failed or contains concrete that failed, as relevant, and
b) any other portion, irrespective of strength, the functional purpose of which is affected by the portion or concrete referred to in (a) above.

NON-STRUCTURAL PRESCRIBED MIX CONCRETE: — Concrete for non-structural purposes shall be "Prescribed mix concrete" produced in accordance with the requirements indicated in the table below, and the Contractor is also referred to the foregoing Preambles insofar as they apply: —

TABLE E – PRESCRIBED MIX CONCRETE FOR NON-STRUCTURAL PURPOSES

Class of Concrete	Estimated minimum compressive strength in MPA at 28 days	Maximum nominal size of coarse aggregate in mm	Proportion of Constituents		
			Cement (Parts)	Fine Aggregate (Parts)	Coarse Aggregate (Parts)
A	1	37,5	1	4	8
B	15	19,0	1	3	5
C	20	19,0	1	2 ½	3 ½

Cement and aggregates shall be mixed by volume and the contents of a 50 kg sack of cement shall be taken to be 0.033 m^3

The cement / water ratios and the maximum and minimum slumps for concrete shall be as previously listed in Tables C and D.

The Department shall have the right to vary the proportions of the constituents in any of the prescribed mixes as necessary to obtain the required compressive strength, optimum density and workability of the concrete. Any variation in the rates of the concrete will only be considered if the proportion of cement to the total volume of aggregate, in each case, is varied from that Specified.

Notwithstanding any requirements previously described, the Department may permit certain items of non-structural concrete in small quantities to be mixed by hand.

Where concrete is mixed by hand, the coarse aggregate shall be spread out on a timber, concrete or metal platform in a flat heap, the sand-then spread evenly over the heap, followed by the cement also spread evenly, and the whole thoroughly mixed by shovelling from the centre to the side to form a ring, then back to the centre and again to the side. Water shall then be poured into the ring and the materials mixed into it and then back into the ring, the remainder of the water then added slowly as materials are mixed into it. Mixing shall continue until the colour is uniform and the consistency the same throughout the pile.

"NO-FINES" CONCRETE: — shall consist of one part of cement to eight parts of 19mm aggregate (1:8— 19mm stone) with a water/cement ratio of approximately 0, 46. This water/cement ratio may be varied slightly to suit conditions on approval by the Department.

The quantity of water used shall be just sufficient to form a smooth grout, which shall completely coat every particle of aggregate, and also to ensure that the grout is just wet enough to form a small fillet at each point of contact between the stones. 'No-fines" concrete mixed with excessive water, which results in a thin grout which drops off the aggregate, will be rejected.

"No-fines" concrete shall be placed in its final position within 20 minutes of mixing and shall be placed in continuous horizontal layers. "No-fines" concrete shall be spade worked sufficiently to ensure that it fills the forms but vibrating, tampering or ramming will not be permitted.

BREEZE CONCRETE: — shall consists of one part cement to eight parts clean dry furnace ashes, the ashes being free from all coal or other foreign matter and graded up to particles which will pass a 26. 5mm ring from a minimum which passes a 4.75mm mesh. The finer materials from the screening to be first mixed with the cement into the mortar and the ashes added afterwards and thoroughly incorporated. The breeze concrete is to be mixed in batches not exceeding 0, 1 in 3 and each batch is to be immediately placed in position. The ashes for breeze concrete are to be obtained in an unscreened state and are to be kept dry so that sufficient fine material will be obtained from the screening to make the mortar.

FINISHES TO IN-SITU CONCRETE

Formed Finishes: — are the concrete surface finishes developed using formwork and whose standard of finish in each class shall be as described.

The Department shall be informed by the Contractor of any defect in terms of this Specification, and no remedial work shall be carried out by the Contractor without the prior approval of the Department. Any defect shall be made good at the Contractor's expense by either removing and replacing the defective concrete, or, in certain instances only, by patching, all as approved by the Department and to the standard of finish required.

Class F1 Ordinary Finish: — Formwork panels shall be of such quality that upon removal, the concrete is true and even, free from fins and recesses greater than 5mm size, honeycombing, large air holes and the like. Bolt holes shall be filled if so required by the Department.

Class F2 Smooth Finish: —This class of finish requires a high standard of concrete work, formwork and technique.

Concrete placed in any one structure to give this finish shall be made from cement and aggregates from the same source, and similarly, the grading of the aggregate shall be kept constant.

Formwork shall be metal or wrot timber in a new condition designed and constructed to suit the particular job in hand and with shutter bolts and joints between panes in a pattern approved by the Department. Joints between panels shall be watertight, but the use of sealing tape, which marks the concrete, shall not be permitted.

Construction joints shall be in the position and of the detail shown upon the working drawings. Should the Contractor wish to incorporate further construction joints or amend the position of those shown to suit his own requirements or technique, this may be allowed provided that all design considerations are met, that the prior approval of the Department is obtained and that any extra costs are borne by the Contractor. In the case of horizontal construction joints, the top edge of the concrete on the Class F2 smooth finish side is to be struck true and level with a trowel.

Special care shall be taken to ensure that forms are clean of all pieces of tying wire, nails and other debris at the time of concreting.

The standard of finish shall be such that, upon removal of the formwork, no further treatment, other than treatment of bolt holes if required shall be found necessary to provide a straight, smooth and uniform finish of good quality and consistent colour and texture, free of all honeycombing and large air holes.

UNFORMED FINISHES: — are those concrete surface finishes developed without the use of formwork -

Class U1 Ordinary Finish: — Immediately after placing, the concrete shall be finished by screeding with the edge of a wooden board of straight and true line and working between guides set accurately to level. No mortar shall be added and noticeable surface

irregularities caused by the displacement of coarse aggregate shall be made good by re-screeding after removing or tamping down the offending aggregate.

Class U2 Wood Float Finish: — The concrete surface shall first be brought to the standard Class U1 ordinary finish and then floated with a wood float. Floating shall be started as soon as the screeded finish is stiffened sufficiently and the bleed water has evaporated or been removed and it shall be the minimum necessary to produce a surface free from screed marks and uniform in texture.

Class U3 Steel Trowel Finish: — The concrete surface shall first be brought to the standard of Class U2 wood float finish with floating being continued until a small amount of mortar without excess water is brought to the surface and then when the floated surface has hardened sufficiently to prevent any more excess fine material from being drawn to the surface, troweling with a steel trowel. Troweling shall be performed with firm pressure such as will flatten the sandy texture of the floated surface and produce a dense uniform surface free from blemishes and trowel marks. Gradual surface irregularities shall not exceed 5mm over any 3m. The sprinkling of sand and/or neat cement on the surface to absorb excess moisture shall not be permitted.

Class U4 Power Float Finish: — The concrete surface shall first be brought to the standard of Class U1 ordinary finish using wooden screeding boards or steel rollers. After evaporation or removal of all bleed water and immediately the concrete is stiff enough to support the machine the surface shall be closed with a mechanical power float and then finished with a mechanical power trowel. The texture of the finished surface shall be either non-slip or polished as shown on the drawings. Irregularities shall be of long wavelength not exceeding a curvature of 2mm in 600mm. Under no circumstances shall sand and/or neat cement be sprinkled over the surface either to absorb excess moisture or to fill surface blemishes or irregularities. Power floats and trowels shall be operated by skilled operators.

TOLERANCES: — Clause 6 of SANS Specification 1200G refers. Unless otherwise agreed by the Department, 'Degree of Accuracy' shall apply to all concrete work and steel reinforcing.

SUPERVISION: — The construction of all concrete work shall, at all times, be under the supervision of a competent person experienced in the production and placing of high-grade concrete. He shall personally supervise all work relating to the concrete construction and pay special regard to: —

a) The quality, testing and mixing of materials.
b) The finish, stability and cleanliness of formwork and excavations.
c) The cleanliness, correct positioning and maintenance in position of steel reinforcement.
d) The transporting, placing, compacting and curing of the concrete. The construction and stripping of formwork.
e) The production of samples, test cubes, slump and other tests.

GENERAL

Measurement and Payment: — The provisions of Clause 8 of SANS Specification 1200G will NOT apply and the system of measurement that is adopted in these Bills of Quantities is the only system of measurement that will be recognised in this Contract.

No deductions have been made for pipes not exceeding 200mm internal diameter, reinforcement, conduits, structural steel, bolts and the like.

Rates for Concrete: — are to include for mixing, handling and depositing (by hoisting or lowering) in the forms. Rates for items of reinforced concrete are to include for thoroughly working and packing around the steel reinforcement. All reinforcement, except where otherwise described, has been measured separately.

Rates for concrete surface beds are to include for laying in suitable size panels not exceeding $20m^2$ or as may be directed. The Contractor is to allow in his pricing of the concrete for all construction joints.

Striking off and Curing: — of concrete slabs and surface beds has been measured separately. The rates for all other items of concrete including stairs and landings and concrete bindings, are, except where otherwise described, to include for all necessary striking off of surfaces and curing.

The rates for items of striking off and curing top surfaces of concrete shall, unless otherwise described, apply to level surfaces.

Where exposed sloping surfaces of concrete do not exceed the limits of pitches laid down for the measurement of back shuttering, the striking off and curing of the sloping top surfaces has been measured in the case of concrete slabs and surface beds, and in other-cases provision has been made for dressing the concrete surfaces to splay.

Where items of striking off and curing are described as to falls or ramps this shall include cross-falls, etc.

The rates for striking off and curing of surface beds formed in panels must also include for all necessary temporary formwork in forming the panels.

Rates for Formwork: — are to be for use and waste only (except where described as "permanent") and are to include for fitting together in the required forms, propping, strutting, shoring, wedging, plumbing and fixing to true angles and surfaces, cambering formwork to slabs and beams where required, preparation and treatment of surfaces as necessary to ensure easy release during stripping, reconditioning as necessary before re-use, providing necessary temporary openings for the purpose of cleaning, inspection and placing of concrete, and for all straight cutting, splayed edges, intersections, notching and narrow widths, including waste and properly fitting at intersections, maintaining in position for periods as directed and for striking and removing.

Rates for items of formwork to soffits of slabs and to sides and soffits of beams, lintels and the like are to include for horsing exceeding 1,5m and not exceeding 4,5m high unless otherwise stated in the items.

Rates for formwork to soffits of stairs and landings are to include for all necessary horsing.

Rates for Permanent Formwork: — are to include for leaving in all formwork, props, etc. as permanent formwork shall be regarded as not being recoverable.

Rates for Steel Fabric Reinforcement: — are to include for lapping the reinforcement at all edges, as specified, for all cutting and waste, notching, etc. bending where required, wiring together at laps and for maintaining in position during placing of concrete.

Rates for Steel Bar Reinforcement: — are to include for all cutting, bending, hooked ends, wiring together at passing points, hoisting or lowering to the required levels, fixing in accordance with the detail drawings, cover blocks and maintaining in position during placing of concrete. The mass of mild and high yield stress steel bars shall be based on the values shown in Table EI of SANS Specification 920— Appendix E (with no allowance being made for rolling margin and waste).

The mass of the binding wire required for fastening the reinforcement together is not included in the mass of the reinforcement. Provision for the cost of this wire shall be deemed to have been made by the Contractor in calculating the unit rate for the net mass (i.e. excluding the mass of binding wire) of the reinforcement.

4. BRICKWORK

SAND: — shall comply with the requirements of SANS Specification 1090, washed where necessary and screened through a 2360 micrometer mesh sieve.

CEMENT: — shall be Portland cement of normal setting quality complying with SANS

Specification 471 or Portland cement 15 complying with SANS specification 831. Cement containing more than 15 % blast furnace slag will not be permitted to be used.

LIME: — shall be hydrated lime complying with SANS Specification 523.

WATER: — shall be clean and free from injurious amounts of acids, alkalis, and other organic substances. If so required by the Department, the suitability of the water shall be proved by tests carried out by an approved laboratory.

CEMENT MORTAR: — unless otherwise described, shall be composed of one part by volume of cement to five parts by volume of sand.

COMPO MORTAR: — unless otherwise described, shall be composed of one part by volume of cement, one part by volume of lime to ten parts by volume of sand.

STRENGTH MORTAR: —where required, shall be of the class specified and as defined in Table C-I of SANS Code of Practice 0164—Part I.

MIXING OF MORTAR: — the materials are to be mixed dry on a non-absorbent and close jointed timber or iron platform until the mixture is of uniform colour with water added and the mixture turned over until the ingredients are thoroughly incorporated.

No cement mortar that has once commenced to set will be allowed to be used. Mixing platforms are to be cleaned and old mortar removed before any new batch of mortar is prepared for mixing. No mortar mixing by adding additional materials is permitted after 5 (five) hours.

TESTING OF STRENGTH MORTAR: — During the time brickwork is being laid samples shall be taken of the mortar being used as shall be directed by the Department. A group of three 70mm x 70mm x 70mm test cubes shall be made from each sample for testing at 28 days of age. Each group test cubes shall be deemed to represent the whole of the batch from which the sample was taken and shall be identifiable with the batch.

The testing shall be undertaken by an independent firm or institution nominated by the Contractor to the approval of the Department. An item for the testing of mortar cubes has been provided elsewhere in these Bills of Quantities.

BURNT CLAY COMMON BRICKS: — shall comply with SANS Specification 227 and are to be good quality, sound, hard, well burnt bricks, uniform in size and shape.

A sample load of bricks is to be approved by the Department and all subsequent loads are to be equal thereto.

BRICKS FOR FOUNDATIONS: — are to be as above but extra hard burnt bricks.
Reject facing bricks may be used in lieu of extra hard burnt foundation bricks provided they are equal to a sample to be submitted to and approved by the Department. These bricks are also to be used for septic tank walls.

BRICKWORK: —unless otherwise described is to be in burnt clay common bricks and wherever practicable is to be in stretcher bond with the skins tied together with and including galvanized crimped wire wall ties in accordance with SANS Specification 28. The wire ties are to be of sufficient length to allow each end to be built into brickwork built into every fourth course and spaced at 450mm staggered centres (seven ties per square metre). The bricks are to be well wetted before being laid and the course of bricks laid last is to be well wetted before bedding the next course of bricks upon it. The brickwork is to have all perpends flushed up solid and each course is to be laid on a solid bed of mortar. No false headers are to be used. Whole bricks are to be used except where bats or closers are legitimately required to form bond.

Unless otherwise described one brick walls are taken at a nominal thickness of 230mm.

The joints of all walls to be plastered are to be raked out as the work proceeds to form key for plaster. All walls are to be carried up regularly so that no part is built more than 1,2m higher than the adjoining walls.

Mortar joints generally are not to exceed 10mm thickness unless otherwise indicated on the drawings. If a specific brick scale is indicated on the drawings, either drawn or written, it must be adhered to.

Solid bricks to X-Ray Room walls are to be used. If hollow core bricks are used, these are to be grouted up solid.

HOLLOW WALLS: — are to be formed of two thicknesses of brickwork as specified with cavity between, tied together, unless otherwise specified, with and including A.I.S.I. Type 304 stainless steel wire butterfly type wall ties in accordance with SANS Specification 23, of sufficient length to allow each end to be built into brickwork, built into every fourth course and spaced at 450mm staggered centres (seven ties per square metre). Cavities are to be kept clear of all rubbish, mortar droppings and projecting mortar.

BRICK LININGS TO CONCRETE: — unless otherwise described are to be tied to concrete with and including A.I.S.I. Type 304 stainless steel wire wall ties complying with SANS Specification 28 with one end embedded is to deep into concrete and other end built into the brick joints and spaced not less than seven ties per square metre.

REINFORCED BRICK LINTELS: — unless otherwise detailed are to be constructed in accordance with KZN Public Works Type Drawing.

PRE-CAST AND PRE-STRESSED CONCRETE LINTELS: — where specified, are to be of approved manufacture and the Contractor is to provide the Department with a certificate issued by the manufacturer certifying that the lintels are adequate for the purpose in terms of span, loading and number of courses and construction of brickwork above the lintel. The manufacturer is also to specify the minimum bearing required at each bearing end and the nature and period of temporary propping required. Rates or pre-cast pre-stressed concrete lintels are to include for any cement mortar filling required and for temporary propping in accordance with the manufacturer's instructions.

BAGGING DOWN BRICKWORK: — shall be carried out when the mortar in joints is still soft by rubbing over with wet rough sacking until all joints and crevices are evenly filled, including additional mortar if necessary to obtain an even surface or, when the mortar in joints is set, by rubbing over as described but including cement grout as necessary to fill up the joints and crevices.

CRAMPS: — for timber door frames shall be 1.6mm thick galvanized hoop iron 32mm wide with one end turned up 50mm and twice screwed to stile of frame and built 450mm deep into wall with other end turned up into brick joint and cranked as necessary where built into cavity wall. Cramps shall be built in approximately 330mm from top and bottom of stile and intermediately at not exceeding 825mm.

TIES TO WALL PLATES, RAFTERS, ETC.: — shall be 1.6mm thick galvanized hoop iron 32mm wide and at least 1500mm long with one end turned up and built in not less than ten courses deep into brickwork or embedded in concrete beams or slab and with end left projecting and wrapped around timber rafter and spiked to timber wall plate. Where ties are embedded to concrete beam or slab, they must be wrapped around the bottom steel bar reinforcement of the beam or slab.

WELDED MESH BRICK REINFORCEMENT: — shall be 55mm, 80mm, 155mm or 235mm wide consisting of two 3.55mm main high tensile steel wires at 50mm, 75mm, 150mm or 230mm centres respectively with 2.80mm high tensile-steel cross wires electrically welded at 300mm centres, lapped 150mm at end joints, 75mm at angles and built 110mm into connecting walls. No allowance has been made for laps.

BITUMEN EMULSION WATERPROOFING TO BRICKWORK: — The inner thickness of external superstructure walls whether hollow or solid, behind facing bricks, is to be bagged and painted with two coats of approved bitumen emulsion waterproofing compound.

FACING BRICKS. PAVING BRICKS, QUARRY TILES, ETC.: — Facing bricks shall comply with SANS specification 227. Facing bricks, paving bricks, quarry tiles, terra cotta grille blocks, etc. are to be of the types and colours specified, specially selected, free from blemishes, square on all faces, uniform in size, shape and colour and equal to a sample to be deposited with and approved by the Department.

Special care must be taken to preserve the arrases and faces of facing bricks, paving bricks, quarry tiles, etc. during transit and handling.

FACED BRICKWORK: — Facing bricks shall be sorted to ensure proper mixing of the bricks within the colour range of each type of facing bricks. Sudden changes in the general colour of faced brickwork in any one type of facing brick will not be acceptable. Sand used in mortar for faced brickwork is to be clean washed sand and sand from the same source is to be used throughout to maintain a uniform appearance. Faced brickwork is to be pointed as specified as the work proceeds. Keyed-in joints are to be formed with a round jointing tool and square recessed joints are to be approximately 6mm deep formed with a square jointing tool. All perpends are to be accurately kept. The bond is to be broken, if necessary, in the centre of panels above and below windows, above doors, between openings and in the centre of sides to piers. No broken bond will be allowed at reveals or quoins. All cutting to face bricks is to be done with a carborundum or other approved high-speed brick saw. Faced brickwork is to be protected from injury, mortar splashes, etc. and cleaned down with spirits of salts and scrubbed down with water at completion to the approval of the Department.

PAVING BRICKS AND QUARRY TILES: — unless otherwise described are to be pointed as the work proceeds with 6mm wide keyed-in joints. Paving bricks and quarry tile paving, sills, etc. are to be protected from injury, mortar splashes, etc. and cleaned down with spirits of salts and scrubbed down with water at completion to the approval of the Department.

FIBRE CEMENT SILLS: — are to be of approved manufacture without fixing lugs, even in shape, uniform in colour, free from cracks, twists and other defects, in single length between reveals and of the thickness and colour specified and equal to approved sample.

RATES

Brickwork Generally: — Rates for brickwork are to include for hacking the face, or raking out the joints, of brickwork where necessary to form key for plaster, etc. and for plumbing angles and surfaces, all square cutting, wedging and pinning against columns, beams, slabs, etc. for all waste in cutting and wire ties required in tying skins together as described.

Rates for hollow walls are to include in addition to the above for keeping the cavities clean and free of mortar droppings and for butterfly type wall ties, all as described.

Where items are described as cut and pinned, built in, bedded, wedged and pinned, etc. rates are to include for grouting in or bedding solid with 1:3 cement mortar, unless otherwise stated.

Where window units, etc. are described for building in as composite, rates are to include for assembling of units as required and, unless otherwise described, for tap screwing to coupling mullions or transoms, including holes:

Faced Brickwork, etc.: — Rates for all fair and faced brickwork, brick paving, grille block walls and the like are to include in addition to the foregoing for building or laying to true surfaces and angles, all fair square cutting and fitting and cleaning down to approval at

completion.

Rates for brick sills, copings, steps, margins, thresholds and the like shall include for fair ends and angles unless different bricks or tiles are used or special cutting is required.

Rates for items described as “Extra over ordinary brickwork” are to be for the extra cost of the facing bricks specified over common brickwork built in stretcher bond, and are to include for building in cement mortar consisting of one part cement to five parts clean washed sand and for pointing as described.

Rates for items described as “Labour and Material” are to be for the full cost of the facing bricks specified, and otherwise as above described.

Rates for all cut face brick linings are to include for cutting and bonding at ends.

Quarry Tiles: —Rates are to include for all square cutting and fitting, bedding and jointing in cement mortar consisting of one part cement to three parts clean washed sand, for pointing as described as the work proceeds and cleaning down to approval at completion.

Rates for treads, sills, copings, cappings, skirtings etc. are to include for pointing to exposed edges, ends and projecting soffits.

Air Bricks: — Rates for air bricks and air vent, gratings are to include for forming openings through the walls, for all necessary jack arches and turning pieces, for plastering all round the openings in cement mortar, and where in hollow walls, for building cavity solid all round in addition.

Fibre Cement Sills: — Rates are to include for all square cutting, waste, and fitting and for bedding in an approved epoxy adhesive.

Terra Cotta Grille Blocks: — Rates are to include for all square cutting and waste and fitting, bedding and jointing in cement mortar consisting of one part cement to three parts clean washed sand and for pointing with keyed in joints on both faces and into reveals of openings as the work proceeds.

5. WATERPROOFING

GENERAL: — All measurements are nett — no allowance being made for laps in sheet materials or for waste in cutting.

WORKMANSHIP: — All work is to be carried out to the approval of the Department by skilled and qualified workmen and in accordance with the methods prescribed in SANS Code of Practice 021 for waterproofing of buildings.

All work is to be executed in accordance with the instructions issued by the manufacturer of the material being used. Roof coverings and linings are to be laid to the fails, cross falls, etc. provided in the screeds or other surfaces to which they are to be applied.

Surfaces to be waterproofed are to be dry and cleaned of all dust, chips, etc. immediately prior to the commencement of this work and are to be free of any contaminating substances or projections that may damage the waterproofing materials being used.

POLYETHYLENE SHEETING: — is to comply with SANS Specification 952 and bear the SANS mark. The sheeting is to be laid with a minimum lap of 150mm, unless otherwise specified, at angles and junctions with laps sealed in accordance with the manufacturer’s instructions.

MASTIC ASPHALT ROOFING: — is to conform to SANS Specification 297 and is to be laid hot in two or three layers, as stated, with each layer of minimum 4mm thickness and laid to break joint with the underlying layer by not less than 150mm.

Prior to the commencement of any work, the specialists who lay the mastic asphalt roofing are to satisfy themselves as to the acceptability of the surfaces upon which the mastic asphalt is to be laid, as the said specialists will be held fully responsible therefore.
Mastic asphalt to surfaces not exceeding 10-degree slope is to be laid in two layers on and including one layer of approved reinforced waterproof building paper lapped 75mm at all edges. Rates are to include for all cutting and waste on building paper.

Mastic asphalt to surfaces exceeding 100 and not exceeding 200 slope is to be laid in two layers on surfaces which have been hacked, grooved or scoured to provide an adequate key. Rates are to include for the necessary preparation of the surfaces.

Mastic asphalt to vertical surfaces and surfaces exceeding 20-degree slope is to be laid in three layers on and including any necessary expanded metal lathing securely fixed to the surfaces to prevent creeping. Where vertical surfaces do not exceed 300mm in height the surfaces to receive mastic asphalt may alternatively be prime coated with a latex based bitumen emulsion primer prior to the application of the mastic asphalt.

Anile fillets to all internal angles are to be run in one operation.

Finishing coats of bituminous-based aluminium paint on mastic asphalt roofing have been measured separately.

FLEXIBLE GLASS-FIBRE REINFORCED POLYESTER WATERPROOFING: — shall be of the type specified, or other approved, supplied and laid in-situ by a specialist sub-contractor, all to the approval of the Department and shall carry a written 10 (ten) year guarantee.

The waterproofing applied in-situ shall consist of one layer of three-ply bituminous felt underlay bonded to the substrate and covered with flexible glass-fibre reinforced polyester waterproofing comprising a chopped strand glass-fibre mat having a minimum mass of 450g / m², impregnated with flexible unsaturated polyester resin and finished with two coats of abrasion-resistant flexible unsaturated polyester surface coating which shall not show any sign of the glass-fibre reinforcement. The total mass of the waterproofing (excluding the bituminous felt underlay) shall be not less than 1.8kg / m².

Chopped strand glass-fibre mat reinforcement is to comply with the requirements of SANS Specification 419.

All unsaturated polyester resins are to be suitable for their intended use and comply with SANS Specification 713 and are to be ultra-violet ray stabilised.

All flexible glass-fibre reinforced polyester waterproofing is to be finished to approved opaque colours (excluding red or orange tints), is to be properly cured, and is to be free from porosity, blisters, cracks, surface crazing or other defects which may affect its appearance or its performance, with the surface colours consistent throughout.

Samples of flexible glass-fibre reinforced polyester waterproofing are to be submitted to and approved by the Department and all work executed is to be equal to the approved samples.

EXPANSION JOINT SEALANTS: — Polysulphide sealants, where specified, are to be approved polysulphide sealants complying with SANS Specification 110 Type 2, well compacted into joint.

Rates are to include for priming joints where recommended by the manufacturer of the sealant being used with a suitable and approved primer.

All work is to be executed by the manufacturer of the material, or other specialist firm, all in accordance with the manufacturer's instructions.

RATES: — for all roofing and linings are to include for cleaning and preparing the surfaces to be waterproofed as before described, for protecting from damage and cleaning down, flood-testing if required and handing over in an acceptable and guaranteed watertight condition at completion.
Rates for sheet waterproofing materials are to include for all dressing, bending, narrow widths, angles, intersections, cutting and waste and where applicable for the extra material required for lapping and for sealing laps as described.

Rates for roofing described as laid on "flat" roofs are to include for laying to slopes not exceeding 100mm from the horizontal.

6. ROOF COVERINGS

CONCRETE ROOFING TILES: — shall conform to SANS Specification 542. The tiles are to be of pattern and colour specified and is to be even in thickness, uniform in shape and colour and free from cracks and blemishes. The tiles are to be laid to "straight bond" in accordance with SANS Code of Practice 062 with vertical joints and bottom edges of each course ranging perfectly straight.

Unless otherwise specified each tile in every third course, all tiles in eaves and ridge courses and tiles in every course on each side of hips and valleys shall be secured with copper clout headed nails driven into the battens or with approved non-corrodible tile clips and nails in accordance with the manufacturer's instructions. Where nail holes in tiles have been cut off at hips, valleys, top edges, etc. new holes are to be drilled.

All ridge and hip cappings are to be of the types specified and of colour to match the roofing tiles. The cappings are to be bedded, jointed, pointed and torched up over roofing tiles in 1:3 cement mortar tinted to match the tiles. Where cappings having butt jointed ends are specified, an approved damp proof course conforming to Type C of SANS Specification 952 is to be fixed under, laid over the roofing tiles in accordance with the manufacturer's instructions.

Barge cappings are to be of the types specified and of colour to match the roofing tiles. The barge capping tiles are, unless otherwise specified, to be bedded, jointed, pointed and touched up over roofing tiles in 1:3 cement mortar tinted to match the tiles with every tile drilled and secured with copper clout headed nails to timber barge boards or bearers (elsewhere measured).

Concrete tiles to residential units in non hail area's are permitted.

"**CHROMODEK" ROOFING SHEETS: -** Shall be the secret fixed type, supplied with all fittings in full-length sheets in the profile and colour as specified. Sheets shall be a minimum of .58mm and maximum of .8mm thickness. When .58 thick sheets are used, purlin spacings shall be a maximum of 1.2mtr¢ and maximum 1.5mtr¢ for .8 thickness. Sheets shall leave the factory in the specified colour and any scratches etc., due to handling are to be 'touched up' on site after installation. All fixings, valleys, cappings and securing clips shall be to manufacturers' recommendations and no variations shall be accepted without prior approval from the department.
0,58mm thick roof sheeting for purlins up to 1,2m spacing and 0,8mm thick roof sheeting for purlins exceeding 1,2m – 1,5m spacing.
In area's up to 30Km from the coast, metal roof sheeting to be 0,58mm thick with special corrosion protection as supplied in " Global- Duro" roofing sheets. All other area's to be 0,58mm as "Global-Tech corrosion protection. 0,58mm "Klip Lock 700 " or "Craflock " and 0,8mm " Brownbuilt ". (0,8mm is recommended for high rainfall and snow fall area's due to deeper trough.)

RATES: **—** for roof coverings, are to include for all necessary half tiles at verges and for all square cutting and waste at verges, abutments, and top and bottom edges and to both sides of ridges.

Rates for cappings, etc. are to include for all short lengths, cutting, waste and fitting at intersections.

All measurements are nett. No allowances have been made for overlaps.

CORRUGATED IRON ROOFING, CLADDING AND FITTINGS: — are to be of an approved brand and are to be manufactured from galvanized steel sheets of the thickness specified after galvanising and having a galvanized coating of "Iscor Coating Designation Z275" for inland areas and 'Z600" for coastal areas as specified.

Roofing, etc. shall be lapped one and a half corrugations at sides and 30mm at ends unless otherwise specified. Roofing, etc. shall be fixed to timber purlins, rails etc. with standard galvanized drive screws 65mm long and to steel purlins, etc. with 8mm galvanized hook bolts of the lengths stated.

Each screw or bolt shall be fitted with one lead washer and one bituminous felt washer and shall be spaced not less than one screw or bolt to every alternate corrugation across the width at end laps and ends of sheets and at each intermediate purlin or rail.

Rates for roofing, cladding and fittings are to include for: —

a) Fixing as described.
b) Bedding washers in an approved mastic sealing compound
c) Coating projecting ends of hook bolts and nuts with bitumen after fixing
d) All square notches, square cutting and waste, laps, fitting and drilling. All measurements are nett. No allowance has been made for laps.

FLUTED STEEL ROOFING, CLADDING AND FITTINGS: **—** are to be approved galvanized fluted steel sheets and fittings manufactured from galvanized steel sheets of the thickness specified after galvanising

(a) **Galvanized steel sheets and fittings**: **—** are to be manufactured from galvanized steel having a galvanized coating of "Iscor Coating Designation Z275" for inland areas and of "Z600" for coastal areas as specified with the sheets having a plain galvanized finish and the fittings an embossed galvanized finish.
Roofing, etc. shall be fixed to timber purlins, rails, etc. with standard drive crews of the lengths stated and to steel purlins, rails, etc. with 8mm galvanized hook bolts of the lengths stated. Each fixing screw or bolt shall be fitted with washers as recommended by the manufacturer of the roofing

Vertical cladding shall be fixed with broad flutes externally - unless otherwise described - to timber rails with standard galvanized drive screws 50mm long and to steel rails with 6mm diameter x 25mm long galvanized sheet bolts. Each fixing screw or bolt shall be fitted with washers as recommended by the manufacturer of the cladding including drilling steel rails as necessary.

(b) **Baked enamel finished galvanized steel sheets and fittings**: **—** are to be manufactured from un-passivated galvanized steel having a galvanized coating of "Iscor Coating Designation Z275" and finished where described in the items, with approved factory applied baked enamel finish of colours to be selected by the Department.

Roofing, etc. shall be fixed to timber purlins, rails, etc. with sherardised or stainless steel drive screws of the lengths stated and to steel purlins, rails, etc. with 8mm diameter sherardised or stainless steel hook bolts of the lengths stated. Each fixing screw or bolt shall be fitted with washers as recommended by the manufacturer of the roofing.

Vertical cladding shall be fixed with broad flutes externally, unless otherwise described, to timber rails with sherardised or stainless steel drive screws 50mm long and to steel rails with 6mm diameter x 25mm long sherardised or stainless steel sheet

bolts. Each fixing screw or bolt shall be fitted with washers as recommended by the manufacturer of the cladding including drilling rails as necessary.

(c) **Generally**: **—** where sheet lengths are in excess of 12m these have been measured separately.

Roofing, etc. shall be lapped one flute at sides and 230mm at ends unless otherwise specified. Fixing roofing sheets are to be spaced one every crest along purlins at top and bottom edges of roof slopes and one to every alternate crest along intermediate purlins. Fixings to vertical cladding are to be spaced one to even alternate trough to each rail.

Fittings, unless otherwise specified, are to be lapped a minimum of 150mm and where necessary are to be drilled for and fixed with the fixings securing the roofing and cladding sheets.

Rates for roofing, cladding and fittings are to include for: —

(a) Fixing as described and in accordance with the manufacturer's instructions.
(b) Seam bolting all side laps at not exceeding 450mm centres with 6mm diameter x 25mm long sheet bolts or with 20mm x No. 14 self-tapping screws and each screw or bolt is to be fitted with washers as recommended by the manufacturer of the roofing.
(c) Fixing of fittings where described as fastened to roofing, cladding, etc. with approved pop rivets spaced at not more than 340mm centres.
(d) Sealing side and end laps of sheeting and end laps of fittings with one continuous strip of approved 5mm diameter pre-formed flexible sealant strip.
(e) Coating the exposed heads of fixings and fasteners to baked enamel finished materials and cut edges of sheets and fittings with matching touch-up compound supplied by the manufacturer of the sheeting and in accordance with his instructions.
(f) All square notches, square cutting and waste, laps fitting and drilling. No punched holes will be permitted.
(g) Taking special care at all times to prevent damage to the finished surfaces of the baked enamel finished materials.

All measurements are nett. No allowance has been made for laps.

7. CARPENTRY AND JOINERY

NOMENCLATURE OF TIMBERS: — Timber described as "softwood" is to be South African softwood of the relevant type, grade, etc. as specified.

The names used for imported timbers are those given in Supplement No. 1 to SANS Code of Practice 12 under "Nomenclature of Standard Trade Names of Imported Commercial Timbers used in South Africa" and the Contractor is referred thereto.

TIMBER SIZES: **—** Sawn and wrot timbers are to be of the full sizes stated.

Where "out of" sizes have been shown for wrot timbers on the drawings, an allowance of 4mm for each wrot face off the sizes shown has been made.

Doors, fanlight, sashes, manufactured boarding, plywood, veneers, etc. must be of the full thickness specified.

Where doors, door frames, fanlights and frames; sashes, windows and frames are measured as numbered items, the overall sizes are given to the nearest 10mm.

Tolerances in nominal dimensions for imported timber shall not exceed the following:

a) For nominal dimensions up to 76mm the actual dimension may be 2.5mm under for each 25mm
b) For nominal dimensions 76mm and over the actual dimension may be 1.6mm under for

each 25mm.

STORAGE OF TIMBERS: — Timber delivered to the site is to be property stacked above ground, either on bearers or platforms under cover and protected from inclement weather.

ORDERS: — for timber, are to be placed immediately after the Contract is signed, as the Contractor will be held responsible for any delay in delivery.

PRE-TREATMENT OF TIMBERS: — All permanent timbers installed in the buildings are to be treated against borer, cryptotermes, termites, and all wood destroying agencies with an approved preventative, all in accordance with SANS Code of Practice 05.

Any surface subsequently exposed by cutting or planing must be touched up with the same preservative solution and rates are to include for all preservative required.

The Contractor is to obtain a certificate from the merchants supplying the treated timber, to the effect that the timber has been treated against wood destroying agencies. The Department has the right to remove samples of the treated timber to have tests carried out by the Division of Entomology or any other Authority.

Temporary timber on the site, e.g. shuttering props, etc. must be free from wood destroying agencies. Any timber so affected is to be immediately removed from the site.

Materials which do not comply with the above requirements or are in any way damaged or discoloured by the pre-treatment must be replaced by the Contractor at his own expense, if so directed by the Department.

STRESS GRADING OF SOFTWOOD TIMBER: —The Mechanical Stress Grading of Softwood Timber (Flexural Method) shall be in accordance with SANS Code of Practice 0149.

STRUCTURAL TIMBER: — for carpentry is to be South African softwood in accordance with SANS Specification 563 and, unless otherwise specified, of Stress Grade V4, and branded accordingly. If it is necessary to use sizes that have to be re-sawn, these shall be re-graded and stamped with the respective SANS stress grade mark. Unless this is done, timber which is re-sawn is no longer considered as complying with the specification and shall on no account be used.

BRANDERING / BATTENS: — of cross-sectional size 50 x 50mm and under shall be South African softwood in accordance with SANS Specification 653 and branded accordingly.

JOINERY AND SHELVING: — Softwood for joinery and shelving shall be South African softwood (S. A. Pine) in accordance with SANS Specification 1359 and branded accordingly. All timber for joinery is to be air or kiln-dried to a moisture content of approximately 12 %.
Shelving to linen stores to be timber slatted with wall bands or free standing units as specified.

STRUCTURAL LAMINATED TIMBERS: — are to be of the sizes detailed, wrot on all faces and are to be manufactured by an experienced fabricator to the approval of the Department. Adhesives used must meet the requirements of the current SANS 1204 for external use.

The surface appearance of members shall be Class C (Constructional) or Class S (Selected) as defined in SANS Specification 876 and as stated in the items

FINGER-JOINTED TIMBERS: **—** are to be manufactured in accordance with SANS Code of Practice 096— “The manufacture of finger-jointed structural timber”.

Contractors wishing to use finger-jointed timber must supply a guarantee that the finger jointing complies with the above Code of Practice and that the glue is suitable for the particular member.

JOINTING OF PURLINS, FASCIAS, RAILS, BEAMS, ETC.: —shall, unless otherwise detailed, be as follows: —

Purlins, slating battens, etc. of cross-sectional size 50 x 76mm and under shall be jointed over the rafter. Larger sized purlins may be dealt with in the same way or by using some other suitable, recognised method. All purlins and battens shall be fixed to the supporting rafter by at least one nail skew driven from the direction of the ridge. Where the purlin or batten is fixed at more than 900mm centres, at least two nails shall be used at every fixing point.

Fascias shall be jointed over rafters.

Beams, rails, etc. shall be jointed over a support or at 1/5th span with a recognised joint using bolts, etc.

Roof and floor plates are to be halved at joints, angles and intersections and nailed together.

Floor joists and bearers are to have splayed heading joints nailed together and staggered to occur over bearers and sleeper piers respectively.

Sawn brandering is to be butt-jointed at heading joints and angles and where wrot, is to have splayed heading joints and mitred angles over all point of support.

HARD WOODS: — (Red Meranti and Sapele) are to be best quality, specially selected and well seasoned, free from all sapwood to the approval of the Department and are to be well kiln-dried.

Red Meranti is to be even in grain and colour, selected from “Standard and Better” grade from Malaysia. Sapele is to be *Entaindrophragma cylindrium* of F..A.S. grade.

PREFABRICATED TIMBER ROOF TRUSSES: -

Design: —The design of prefabricated roof trusses, bracing, and secondary members forming part of the total timber roof construction shall be prepared by a professional structural engineer (Truss Systems Engineer) strictly in accordance with SANS Code of Practice 0160 and the superimposed loading, unless otherwise specified, is to be taken as that for inaccessible roofs.

Analysis: — From the configuration and mechanism shown on the tender drawings the Truss System Engineer shall submit, through the Contractor, to the Department detailed calculations and working drawings showing timber sizes, connections, truss dimensions, etc.

This submission must include details of both trusses and bracing as specified below:

a) TRUSSES: The analysis of the truss system is to include diagrams of the trusses with marked up members and nodes showing dimensions, positions of supports and positions and values of applied loads, which, if not specified in the tender documents, must be derived from an approved source of reference which shall be indicated in the analysis. Due account must be taken of any eccentricity particularly at supports.

   The analysis must also indicate allowable stresses, internal axial forces, moments and resulting stresses, as well as timber sizes and grades and detailed plate sizes

(b) BRACING: Bracing must be designed to withstand the forces specified in SANS Code of

Practice 0163 clauses 6 and 7.

If the bracing system incorporates trusses, the additional forces must be shown in the analysis of the trusses.

The drawings must give all the information necessary for the construction of the bracing.

An outline of the bracing system, including temporary bracing must be shown on a working drawing giving clear details of fixings and anchorages into the supporting structure at wall plate level. Interference of bracing with truss members must be taken into account. Moments caused by forces applied between node points of bracing trusses and the axial forces must be given in the bracing calculations, also sizes and fixings of the bracing system.

Submissions: — A copy of letter reference TR1 (attached at the end of this document) completed and signed by the Truss System Engineer must be submitted by the Contractor at the same time as the list of Sub-Contractors. Two sets of calculations and drawings with pertinent erection instructions for the whole roof construction as presented by the Truss System Engineer must be submitted to the Department for consideration and permission to proceed.

This in no way absolves the Contractor of his responsibilities.

Any modifications to design or drawings are to be arranged directly between the Truss System Engineer and the Department. It will be the Contractor's responsibility to ensure that information is presented to the Department in good time and no claims will be entertained in respect of any delays resulting from the late approval of drawings, etc.

Any difference in cost between the roof system initially submitted by the Contractor and the finally accepted system to meet the original design requirements will be for the account of the Contractor.

The Truss System Engineer will be required to inspect the roof structure and certify on letter reference TR2 (attached at the end of this document) that the construction is in conformity with his design, and any costs in this respect must be included in rates for the truss system.

If, in the opinion of the Department, further visits are necessary due to errors or omissions on the part of the Contractor or the Truss System Engineer the costs of these inspections will be for the account of the Contractor.

Fabrication and Storage: — Fabrication shall not commence until written permission has been given by the Department. The prefabricated roof trusses shall be manufactured, supplied and delivered to site by an approved manufacturer with all members accurately mitre cut, close butted and rigidly fixed together by approved galvanized metal spike connectors applied simultaneously to both sides of every joint by use of a mechanical press in accordance with SANS Code of Practice 0163.

Permissible deviations in fabrication of trusses are to be as specified in SANS Code of Practice 0155.
The following will not be permitted at joints: —

b) knots, splits or finger joints
c) varying member thicknesses
d) plates not fully pressed into timber
e) gaps between members exceeding 1.5mm average over the width of the mitred members.

Stress grade marks must be clearly visible on all members.

Relevant dimensions must be checked on site before fabrication. Trusses must be stored off the ground and under cover both at the factory and on site.

Erection and Bracing: — Unless otherwise instructed, erection must be carried out as described in "The Erection and Bracing of Timber Roof Trusses" published by the Truss Plate Association of South Africa and the National Timber Research Institute - CSIR.

Where the overall lengths of trusses exceed 13 m, complete braced bays are to be assembled on level ground and lifted into position suspended at maximum 3m intervals from a spreader bar. Alternatively, braced bays may be assembled in position on a minimum of two lines of temporary intermediate supports below node joints. Temporary supports must be removed before roof covering is placed.

The erector must be suitably qualified and must satisfy the Department that he can meet the specification.

Where the roof incorporates a hipped end, the construction is to commence with the hip, otherwise erection is to be commenced with a fully braced bay.

Temporary bracing must be installed as erection proceeds in accordance with the accepted design.

The Contractor must notify the Department in sufficient time in order that an inspection may be made before the roof covering is placed.

The trusses will be subject to the following tolerances: —
a) maximum out of straight — length/400
b) maximum out of vertical at any point—height/200.

Rates: **—** The Contractor is to allow in his rates for the roof trusses for the design, manufacture, supply, hoisting and fixing of the roof trusses and permanent bracing, any necessary temporary bracing, and for the costs of all inspections by the Truss System Engineer.

Purlins or battens for roof coverings have been measured elsewhere. Rates for roof trusses are also to include for the exposed rafters at eaves overhangs to be wrot all round and trimmed and splay cut as required.

INSULATION, WATERPROOFING AND DUST PROOFING MATERIAL FOR ROOFS: — shall be of an approved aluminium foil faced both sides laminated Kraft Paper and synthetic reinforced material fixed in accordance with the manufacturer's instructions, lapped 150mm at all edge, unless otherwise specified.

GYPSUM PLASTERBOARD: **—** is to be in accordance with SANS Specification 266.

GYPSUM COVED CORNICES: — are to be in accordance with SANS Specification 622.

FIBRE CEMENT SHEETS: **—** are to be in accordance with SANS Specification 685.

FIBRE CEMENT CELLULOSE SHEETS: — are to be in accordance with SANS Specification 803.

HARDBOARD: — is to be in accordance with SANS Specification 540. Tempered and un-tempered hardboard is to be conditioned in accordance with the manufacturer's instructions before fixing in position.

VENEERS: — All decorative face veneers are to be selected kiln dried of best quality of the respective timbers, free from knots, cracks, patchwork, sapwood and other defects and bonded under heat and hydraulic pressure with water-resistant synthetic resin adhesive.

Commercial veneers are to be selected rotary cut hardwood veneers and otherwise as

described above.

PLYWOOD: — is to be long grain three or five-ply type manufactured with hardwood veneers with selected face veneers as described, bonded under heat and hydraulic pressure with water-resistant synthetic resin adhesive and sanded to a smooth finish.

CHIPBOARD: — All joinery fixtures shall be manufactured from 18mm Moisture resistant V313 Melamine Faced Chipboard (Particle Board) only with 32mm worktop as specified.

BATTEN BOARDING: — is to be long grain three-ply boarding manufactured with kiln-dried South African Meranti softwood core formed of laminations not exceeding 45mm wide and faced on both sides with selected veneers as described, bonded under heat and hydraulic pressure with water-resistant synthetic resin adhesive and sanded to a smooth finish.

DECORATIVE LAMINATE LININGS: — are to be 1.2mm thick approved general purpose quality high pressure decorative melamine laminate sheeting with satin finish and of selected colours and patterns, and rates are to include for all square cutting and waste and square notching, close cut and mitred external angle intersections where required and for bonding to the timber backings with an approved adhesive in accordance with the manufacturer's instructions.

The linings are to be cut out of single sheets in obviate joints but where joints are unavoidable, the sheets are to be butted to form a tight inconspicuous joint.

NAILS AND SCREWS: **—** Mild steel nails are to be in accordance with SANS Specification 820. Mild steel and brass screws are to be round headed, countersunk, etc. as appropriate and are to be in accordance with SANS Specification 1171. Nails and screws shall be of the size, length and type appropriate to their respective uses.

PLUGS, ETC.: **—** Where items of woodwork are described as "plugged", these may be nailed to timber plugs or slips built into the structure, and where described as "plugged and screwed" these may be screwed to timber or approved patent fixing plugs.

SHOT FIXING: — Where items of woodwork are described as "shot fixed" these are to be fixed with an approved cartridge-assisted tool, and rates are to include for all nails, spikes, blanks, washers, cartridges, accessories, etc.

CARPENTRY: — Timbers are to be the best of their respective kinds, free from sap, shakes, large, loose or dead knots, wavy edges and other defects and thoroughly seasoned. Wrot surfaces are to be finished clean, smooth and free from tool marks.

Timbers shall be in as long lengths as possible.

Rates for sawn and wrot structural timbers are to include for notching, splay and birds mouth cutting, housing, halving, scarfing, cutting timbers to the required lengths, spiking and clinching and or hoisting and fixing timber in position.

CEILINGS: — are to be of the types described, fixed to timber brandering, bearers etc. as described and with panels set out so as to give even width panels not less than half a sheet wide at edges. Brandering shall be spaced at not more than 400mm c/c and fixed at right angles to sheets.

FLUSH PLASTERED CEILINGS: — are to be formed of gypsum plaster board of the thickness stated, generally in 1200mm widths and long lengths, fixed grey side down to timber brandering, bearers, etc. as described, with butted joints between the boards covered with 65mm wide strips of galvanized wire scrim fixed along both edges, including all square notches and square cutting and waste, and the ceiling finished with two coats of approved retarded hemi hydrate gypsum plaster applied in accordance with the manufacturer's instructions to a finished thickness of not less than 6mm, including pressing into scrim over joints and finished to a smooth polished surface.

TRAP DOORS:- 900 x 600 Prefabricated hinged trap door.

SUSPENDED CEILINGS BOARDS: **—** are to be of the types described or as specified – normally 6mm x 600mm x 1200mm embossed fibre cement boards - and inclusive of their component parts must be of sufficient strength to perform the function for which they are to be used, manufactured from best quality materials and conform to the requirements of the Fire Master. The exposed surfaces of all ceiling panels and supporting members are to be uniform in colour and free from surface blemishes.

Hangers are to be galvanized and are to be at maximum 1, 2mtr centres to meet the requirements of the specification, each with one end fixed to the suspension grid main bearers and the other end fitted with suitable galvanized fixing straps to the roof structure. Fixing points must be agreed to by the Department before any power shot fixings are made. Hangers must not be suspended from air-conditioning ducts.
Hangers to be provided at all four corners of recessed light fittings.

Component parts and fixings other than aluminium must be non-corrosive and able to withstand atmospheric pollution. Surfaces of aluminium which are in contact with other materials when fixed, particularly ferrous metals, are to be suitably insulated to prevent electrolytic corrosion.

All work is to be executed by specialists in accordance with the manufacturer's instructions, and to the approval of the Department.

Rates for ceilings are to include for hangers, suspension systems, ceiling panels, for constructing the ceilings in a manner suitable for carrying air conditioning diffusers and light fittings in the positions required, for setting out the ceilings to layouts approved by the Department, for all non-standard size panels, for modifications to standard suspension systems as necessary to work around any air-conditioning ducts or pipes or light fittings, for all necessary square cutting and waste, notching and fitting around projections, columns, etc.

EXPOSED TEE-SYSTEM SUSPENDED CEILINGS: — are to be of the type described with main tees and cross tees spaced at the required centres to suit the sizes of panels used, with the cross tees fitted between and notched to form a flush fit with main tees unless otherwise described. All suspended ceilings to be fitted with shadow line trimming to perimeters.

Main and cross tees shall be holed as necessary and provided with timber wedges or steel clips to prevent ceiling panels from lifting.

CONCEALED TEE-SYSTEM SUSPENDED CEILINGS: — are to be of the type described with main and cross tee section bearers spaced at the required centres and all properly fitted together at intersections.

ALUMINIUM TRIMS TO CEILINGS: — are to be of extruded aluminium of 6063-TF or equivalent quality and temper, of the sections described. Anodised trims are to be of the colour stated.

Rates are to include for all cutting, fitting at intersections, mitres, etc. and rates for items described as fixed with screws are to include for countersunk drilling and fixing with approved countersunk stainless steel screws.

INSULATION MATERIAL FOR CEILINGS: — shall be 75mm thick resin bonded glass wool / mineral wool thermal insulation blanket complying with SANS Specification 1381 of the thickness specified, delivered to the site in unopened rolls in its original factory wrappings over solid gypsum boards or styrene of 25mm thickness as specified glued to suspended ceiling tiles.

DOORS: —

Flush Doors: - Semi-solid and solid laminated flush doors are to be of approved manufacture complying with SANS Specification 545.

The doors are to be finished on both sides with the facing veneers specified and concealed on both stiles unless otherwise specified, with hardwood edge strips and where doors are required to receive a transparent finish, the edge strips are to match the facing veneers.

Doors with rebated meeting stiles are to have edge strips to the meeting stiles not less than 19mm thick.

Each door or leaf of double door, described as hung to swing, is to be fitted with necessary hardwood reinforcing blocks for bottom shoe and top centre of spring hinge.

Unless otherwise specified, all flush doors are to be interior quality, but, where exterior doors are specified, the glue used must comply with Type WBP of SANS 2304.

FRAMED, LEDGED AND BRACED BATTEN DOORS, ETC.: — Doors described as filled in with V-jointed boarding are to be filled in flush on one side with tongued and grooved vertical boarding, V-jointed on one or both sides and of the thickness stated. The boarding is to be in narrow widths, closely cramped up, rebated on outer edge and housed to grooves in stiles and rails and twice brass countersunk screwed at each intersection.

Ledges and braces and inner edges of the abutting stiles and rails are to be chamfered to form a V-joint at junction with the boarding. Braces to fall from lock to hinge side.

ENTRANCES TO SECLUSION WARDS: - Entrances to seclusion ward buildings shall be fitted with remote controlled full height 'Man Trap' Security Cubicles with bell pushes fitted to both entry and exit sides and remote unlocking / release operation enabled from security booth.

Doors to Seclusion Rooms: - Doors to seclusion rooms are to be steel lined solid core units with 100mm x 100mm viewing panel, glazed with 40mm bullet proof glass in a steel frame. Steel lining for doors is to be epoxy laminated to doors and around edges. Internal steel lining to be primed and finished with approved epoxy paint. External face of doors to be finished in veneer as per DOH standard details. Doors to be hung to open inward on special 6mm galvanized steel door frames with lugs pre welded to frame to fit every third course of brickwork. The complete unit is to be hot dip galvanized and built into surrounding 230mm solid brick walls. No welding to be done on site.

NOTE: - Above Anti–Bandit Security doors are solely supplied by "Chubb" and "Bitcon Industries" as a complete unit with all fittings and ironmongery.

DOORS TO X-RAY UNITS

Entrance doors to X-Ray rooms shall be top hung sliding door size 1830 x 2032 x 40mm, complete with heavy duty sliding door track – 'Henderson' or other approved -, 2.2mm lead insert between panels and four door stoppers. Door is to overlap door opening 100mm each side when closed.

JOINERY: — All timbers shall be in as long lengths as possible. Lengths for joinery shall be single where possible and where joints are unavoidable, they shall be made as inconspicuous as possible.

Timber for grounds, firrings, blocks, plugs, etc. shall be sound and free from defects.

All joinery work is to include for work in connecting by mortise and tenon, dovetailing, housing, flush pinning, etc. as may be by required and for all screws, nails and glueing

together and for sinking flush all exposed screws unless otherwise specified.

Wrot surfaces and edges are to be steel scraped and sandpapered before and if necessary, after fixing.

Edges are to be arras rounded unless specified to be angle rounded.

“Arras rounded” denotes that the sharp edges are slightly rounded off and that no mitring is required.

“Angle rounded” denotes rounded from 3mm to 10mm radius and is to include for housed and mitred joints.

Hardwood doors, frames, jamb and soffit linings, etc. are to be treated on all surfaces with one coat of approved sealer before building in, etc. and rates for these items must include for this. Batten doors with tongued and grooved battens are to have the tongues and grooves well sealed before assembling. The sealer used shall be compatible with the finishing coats to be applied.

Horns of door frames are to be checked and splayed back where frames are fixed projecting or flush with surface and built in.

Where doors, fanlights or sashes are described as hung to butts on steel or aluminium frames, rates are to include for supplying necessary steel, brass or stainless steel screws.

Panel work is to be secured to the grounds, etc. with screws concealed behind the mouldings or by sinking the screws and pelleting as directed.

Joinery is to be framed up, but not glued or wedged, immediately the order is given to commence work. Wherever possible, joinery shall not be placed or fabricated in position until the plaster has dried out. Reasonable tolerance shall be provided at all connections between the joinery and building carcass so that any irregularities, settlements or other movements shall be adequately compensated. All joinery shall be accurately scribed to fit the contour of any irregular surface. Should the joints of any joinery open or give, such defective work is to be taken down, refitted and redecorated or replaced by new joinery at the Contractor’s expense.

Only brass screws may be used for hardwood joinery.

The Contractor is to allow for cross-tonguing all solid wood sections unobtainable in single widths.

No joinery is to be primed until it has been inspected and approved by the Department.

All joinery liable to injury must be protected to the satisfaction of the Department. Rates must include for this temporary protection.

Rates for timber frames, mullions, transoms, linings, standards, rails, fascias, cornices, skirtings, beads, picture rails, etc. are to include for mitres, etc.

Rates for all items of timber-are to include for fixing and planting on as may be required with necessary panel pins or nails.

PARTITIONS:

These are to be of an approved system of standard construction, with an average sound rating of not less than 30 decibels taken over the whole face area.

Framing is to be natural finish anodised aluminium comprising posts at 1200mm centres unless otherwise described, with transom rails where specified, fitted between the posts, a

rail against ceiling and an aluminium standard skirting on each side at base, all neatly and securely fixed together.

Provision is to be made at the base of the partitions and in the ceiling rails and posts for electrical wiring, which will be installed under the electrical sub-contract, and the ceiling tails and end posts are to be fitted with continuous removable access plates.

Solid panelling is to be approved solid chip core panels of the thickness specified faced on both sides as described in the items.

Glazed panels are to be glazed as required, complete with all necessary natural finish anodised aluminium glazing beads and vinyl glazing strips.

Louver panels where specified are to be approved natural finish anodised aluminium adjustable louver sets each comprising head and sill weather bars and two jamb strips each fitted with louver brackets with spring loaded clips for and fitted with and including louvers as required and complete with tilt bars and operating lever handles. Where the openings are not the correct size to suit a full number of standard width louver blades, an alternate head weather bar must be provided to suit a fixed louver blade of the required width. The louver sets are to be fitted with the jamb strips positioned horizontally so that the louvers will be fixed vertically.

Partitions are to be in 1200mm modules, unless otherwise specified, except at ends where the odd lengths are to be made up by a narrow width at one end of the partition.

Ends of partitions against walls, window frames, etc. and the top edge of partitions against ceilings are to be fitted on both sides of partition with approved vinyl scribing sections fitted between the structure and the end post or top rail of the partition.

Plain openings are to have aluminium frames similar to door openings neatly fitted into the framing.
Doors are to be solid laminated flush doors complying with SANS Specification 545. The doors are to be finished on both sides with veneer as described in the items and concealed on both stiles with matching hardwood edge strips.

Where doors are described as having observation openings, these openings are to be of the sizes stated, glazed as specified with all edges bedded in approved neoprene gaskets and fixed with 10 x 25mm wrot matching hardwood rebated glazing beads mitred round and bradded to both sides.

Rates for doors are to include for all necessary additional aluminium framing to form door openings, and for hanging the doors on and including one and a half pairs of 102mm satin chrome finish brass hinges to each door.

All locks to doors in demountable partitions are to be supplied with two keys, and are to be controlled by the same master key as the mortise locks used elsewhere in the Contract when specified.

Unless otherwise specified all veneered solid panelling and doors are to be finished as follows: —

Prepare, stop with tinted stopping, apply an approved stain as necessary to achieve uniform colour appearance, and three coats of approved clear matt polyurethane finish including burnishing with steel wool between coats.

Rates for demountable partitions are to include for supplying, assembling, erecting, finishing, glazing and fixing complete between finished surfaces of concrete floors, plastered walls and ceilings, and all in accordance with the manufacturer's instructions.

DEMOUNTABLE PARTITIONS 50MM (NATURAL ANODISED).

Extruded Aluminium Sections

Supply and fit demountable “Kappa” partition system comprising anodized aluminium U-Channel fitted to suspended ceilings. Vertical split-post (mullion) to be fitted between floor and ceiling U-Channel at 1225mm c/c with angle brackets. Once framing is fixed, fit panels into place and secure with clip-on cover plates.
All aluminium sections may be anodized or powder coated in a variety of colours.

Panels

41mm thick semi solid core panels 2032 x 1200mm. The panels are made up of two outer skins of 3.2mm hardboard cladding. Lower panels to be provided with a 150mm wide solid mid-rail 850mm from the base of the panel to the centre of the mid- rail built in as part of the construction. The panels to be prepared before applying the final finish as specified.

Construction

Right angled corners to be formed with natural anodized aluminium radiused corner post fitted from floor to ceiling. Floor fixing to be angle brackets and ceiling fixing to be hidden block. The ceiling U-Channel butts up against radiused corner post.

Door Frames

Door frames to be natural anodized aluminium pre-fitted with woolpile gaskets, clipped into H-Profile at head and clipped into combination split post and cover plate at styles. The rebate on the door frame caters for standard doors of a thickness between 40mm and 44mm.

Glazing

Glazed panes to be framed with H-Profile fitted horizontally at top and bottom, butted against side of split-post and clip on cover plate combination and fixed with angle brackets. Glazing sections pre-fitted with woolpile gaskets and set into H-profiles and into post / cover plate combinations to form a neat glazing opening. Glazing beads pre-fitted with woolpile gaskets and then clipped into glazing section.

Termination

Openings for louver frames, sliding doors and windows, serving hatches and partition ends are to be lined with the aluminium termination section.

Skirtings

76mm high aluminium skirting to be glued to panels.

DRYWALL PARTITIONS:

Studs

50mm x 33.5mm x 0.5mm thick drywall galvanised steel studs are used. The studs to receive aluminium extrusions clipped onto both sides of the stud. Framing to be securely fixed to walls, floor and ceilings where necessary. Stud connectors to be used to join horizontal studs to vertical studs.

Floor Track

52mm x 25mm x0.6mm galvanised sheet steel track to be used.

Panels

12,7mm thick tapered edged gypsum plasterboard panels used and decorated in situ with panels secured to either side of framework.
Patient care areas to be 12mm Supa Wood panels in framework as specified.

Construction

Internal walls are constructed by fixing drywall studs to floor track @ 600mm c/c. Wall and ceiling junctions are formed by fixing 84mm x 19mm aluminium ceiling and wall channel to wall or ceiling. The floor track is then fixed into this; alternatively, these components may be fixed simultaneously. The studs are then fixed to floor.
The partitions, unless otherwise described are to be 75mm thick and covered both sides with 12,7mm thick tapered edged gypsum board in 1200mm widths to height specified.
The gypsum boards are screwed @ +/- 300mm c/c at all intersections to the floor and head wall tracks and vertical studs.
Using self-drilling, self-tapping, rust proofed countersunk screws, with screw heads and joints between boards and between abutting edges of boards flushed up with an approved jointing material.

Exposed Aluminium Framing
Door frames, glazing termination and ceiling and wall channels to be natural anodised aluminium. 25 x 25 x 1.5 aluminium angle stuck to external corners of partitioning. 80mm high aluminium skirting glued in position.

Glazing
Aluminium glazing section is clipped onto the flanged end of the stud around the glazing perimeter. The glazing section has a recess to accept a rectangular clip-in glazing bead which enables 3mm-8mm thick glass to be received in the system. The glass is retained with various sizes of PVC glazing gasket.

Termination
Openings for louver frames, sliding doors and windows, serving hatches and partition ends are to be lined with the aluminium termination section.

Skirting
The system is designed to accept recessed base, female, 60mm high aluminium skirting.

Sound Insulation
75mm Fibreglass Cavity Bat with a 35g glass tissue or 75mm Isotherm “Acoustisorb’ mineral wool blanket is to be installed between studding before fixing final outer panel.

All work is to be executed by a firm specialising in this type of work and all to the approval of the Department.

8. FLOOR COVERINGS, PLASTIC LININGS, ETC.

FLOOR SHEETING: — are to be of the composition, type, size and thickness specified with colour, pattern, graining, etc, consistent throughout, all to the approval of the Department.

Thermoplastic floor tiles: — are not to be used.

Fully flexible vinyl floor sheeting: — are to comply with SANS Specification 786 and is to be 2.5 mm nominal thickness.

Recessed entrance mats with brass frame at main entrance into a health facility as “Belgotex” Grimbuster or other approved. This to be positioned outside before entering.
In patient care area’s, no perforations to floor covering is to be made. Eg door stops, door barrel bolt floor keeps etc.
Where the specified sizes and/or thicknesses of floor sheeting differ from those in the SANS Specifications, such items of floor sheeting shall comply in all other respects with the relevant SANS Specifications.

SKIRTINGS, STAIR NOSINGS, EDGING STRIPS, ETC.: —are to be of the types and sizes specified and are to be of approved manufacture

CARPET TILES AND SHEETING: — are to be of the types specified and of approved colours and patterns all to approval of the Department.

LAYING: —
Vinyl Floor covering laying procedure and polishing.

Site conditions required before the layer commences an installing of a Resilient Floor covering. Some of these conditions may appear obvious, but they are not always complied with. If any of the following recommendations are ignored, it is likely that a number of problems will arise during or after installation of the flooring.

1. All building materials and equipment, e.g. sand, scaffolding, tools, etc. should be removed. (Do not allow heaps of sand, concrete, etc., to remain on the surface of the sub-floor since moisture transfer to the sub-floor takes place).

2. All resilient flooring materials require a smooth, hard, clean and level surface, not only for appearance but also for achieving a satisfactory adhesive bond and long-term durability. The Specifier and the Main Contractor shall ensure that the sub-floor is acceptable to receive the resilient flooring specified in respect of levelness, smoothness, soundness and cleanness. (The SANS Code of Practice 070/1991 as amended 1993 Section 9.3 details the requirements in this regard).
The flooring contractor shall ensure that the sub-floor is sufficiently dry prior to the installation of the flooring material. The floor should be tested by means of a Hygrometer or a Tramex. (Of the instruments available for determining moisture levels in sub-floors, the most practical and accurate is the hygrometer).

SHEETING
Ensure that the following steps are followed during the installation:

1. Trim off factory leading edge before laying sheeting.
2. Align the sheet in position that there is an opening no bigger than 1mm between adjacent sheets. For the best results, the width of a credit card is an acceptable measure.
3. Apply adhesive according to the manufacturers' specifications.
4. Roll the floor during and after installation with a 68kg roller to maximize the adhesion between the sheeting and the adhesive.
5. Complete the welding 24 hours after the installation. Groove the joins open with a suitable hand or electric groover to a width of not wider than 3mm and not deeper than 1.5mm. Weld the joins with a hot air welding gun with temperature settings of between 4-6 temperature setting and use a speed nozzle that will not burn the material or damage the coating. Use a sharp spatula and guide plate and remove the excess welding in two stages.
6. All vinyl sheeting needs to be stripped and sealed 72 hours after installation. Please ensure you use a good quality product.

2.1 **HYGROMETER**
When a hygrometer is positioned on a sub-floor surface, the reading of the relative humidity of the entrapped air space is obtained.

- A hygrometer reading of less than 70% indicates that the sub-floor is sufficiently dry for flooring to be laid upon it.
- If the hygrometer indicates a final reading of more than 70% when the initial reading of the atmosphere was less than 70% then the sub-floor is unacceptably damp and must be allowed to dry out before any flooring is installed.
- If the hygrometer indicates a final reading of more than 70% when the initial reading of the atmospheric humidity was also greater than 70%, as can occur in coastal areas, then the following applied:

1. If the final reading is significantly higher than the initial reading, then the sub-floor must be considered to be unacceptably damp.
2. If the final reading is similar to, or less than the initial reading, then the moisture content of both the atmosphere and the sub-floor are similar.

2.2 **TRAMEX CONCRETE MOISTURE ENCOUNTER (C.M.E.)**
Any reading on the C.M.E. of 60% or less indicates acceptable moisture content for the installation of any vinyl floor covering.

3. Floor Preparation – New and Existing (old) Screeds
3.1 Use of screed smoothing compounds should be avoided except for making minor repairs, however should a full skim be required, then the most common method in both instances is the use of a smoothing compound e.g. **Pavelite** in combination with **Pavelite Bonding Liquid**, mixed to the correct ratio and consistency. Only recommended products, mixed strictly in accordance with manufacturers instruction should be used. Do not use smoothing compound on power floated finishes. It is recommended that in new structures the screeding should be as specified by "Tal" using "Screedmaster", the pumped method.
A badly undulating floor may require grinding by mechanical means to improve the overall levelness. Although smoothing compounds such as **Pavelite** will improve the sub-floor it will not achieve perfection.
3.2 In cases where old vinyl floor coverings have been uplifted, leaving a bitumen adhesive residue, it is recommended that a strict procedure relating to the "Preparation of Sub Floors with Bitumen Residue", be complied with.
(This method may not constitute good flooring practice, but has proved to be successful on many occasions. No guarantee is however given or implied).

4. **Construction joints (saw cuts) and Expansion Joints**
4.1Construction joints (saw cuts) in the sub-floor should be cleaned out, and the sides of the saw cut be painted with **Pavelite Bonding Liquid** and allowed to dry. The joint should then be filled with a mixture of **Pavelite** and **Pavelite Bonding Liquid**. It is advisable to slightly overfill the joints, which when dry should be rubbed down with a carborundum stone.
4.2 Expansion joints should be filled with a suitable **Sealant** to prevent the ingress of dirt. **It is bad flooring practice to lay flooring over such a joint**. The flooring should stop at the edge of the joint and cover strips placed over the joint itself. Expansion joints and cover strips should be discussed and designed by a structural engineer.

5 Correct setting out is critical, and consideration should be given to the squareness of the area. It is safest to set out from the longest outside wall.
5.1. The recommended notching for a trowel to spread adhesive is a V notch of 1,5 x 1,5 x 1,5mm at 4,00mm centres. Consideration should however be given to the porosity of the sub-floor. Ensure the use of the recommended adhesive with the appropriate flooring. **Do not** spread the adhesive over a larger area than can be covered within the working/open time of the adhesive.
5.2 All installations must be rolled with a 68kg three sectional articulated metal floor roller on completion, within the working time of the adhesive.
5.3 Welding of sheeting is to be done only after 24 hrs after installation.
5.3. a. Trimming
While the welding rod is still warm, trim off most of the top half using a sharp spatula and spatula guide which fits over the welding rod. Carry out the final trimming using the spatula knife only, when the welding rod has cooled.
5.3.b **Glazing**
The trimmed welding rod will tend to soil more rapidly than the sheeting. It is therefore Important to glaze the surface of the trimmed welding rod.

6. After installation the flooring should be adequately protected, preventing damage caused by other trades working on the site.

7. The completed floor should not be washed or polished for a period of 72 hours after the installation in order to allow the adhesive to cure. This period will vary from one adhesive to another.
7.1 The vinyl floor covering must be cleaned with an approved water based floor Stripper, in order to achieve an acceptable standard of cleanliness for sealing. Avoid excessive use of water at all times

7.2 Foreign matter such as paint stains, tar, etc. which may not respond to the process must be removed by other means.
7.3 Three coats of a Water Based Emulsion floor dressing, shall then be applied on completely dry surface in accordance with the manufacturer's instructions, allowing one hour drying time between the first and second application of each dressing coat.

RATES: —for all floor coverings are to include for laying as described, for cleaning down backing surfaces before laying and or all square and raking cutting and waste and fitting, fair cutting at edges where no skirting occurs, protecting from injury, and for cleaning down, etc. as described, at completion.

Rates for all wall linings are to include for laying as described, cleaning down backing surfaces before laying, sizing backing surfaces if necessary to ensure proper adhesion, all square and raking cutting and waste and fitting, fair cutting at exposed edges, bending at angles and for all narrow widths and protecting from injury and cleaning down, etc. as described, at completion. Wall linings in widths not exceeding 300mm to returns, reveals and the like have not been measured separately, but have been included in the area of the general items of wall linings and rates must include or this.

Rates for skirting, stair nosing, edging strips, etc. is to include for fixing as described, cutting to lengths and fitting at intersections, mitres, ends, etc. and for cleaning down at completion.

9. IRONMONGERY

Ironmongery is to be to the approval of the Department and rates are to include for fixing screws of corresponding metal and finish and for oiling and easing as required at completion.

Where catalogue references are given, the articles are to be of the brand specified or other approved.

No two-lever mortise locks are to be used.

Mortise locks, cylinder locks, cupboard locks, etc. are to differ so that no key will pass a second lock, unless otherwise specified. Where mortise locks, cylinders, locks, etc. are specified to be "en-suite" they are to be made "en-suite" in the specified number of "suites". The "suites" are to be controlled by differing sub-master keys with a grand master key controlling all "suites", and no sub-master is to pass any lock of another "suite".

All locks are to be fitted with two keys and the locks are to be stamped with consecutive numbers and the keys to each are to be stamped to correspond with the lock.

Items of ironmongery specified as chrome plated or satin chrome finish are, unless otherwise specified, to be chromium plated or satin chrome finish on solid brass.

Items of ironmongery specified aluminium are to be natural anodised.

Where items of ironmongery are specified as fixed to pressed steel door frames, the Contractor is to ensure that the suppliers of the steel frames prepare the frames for all keeps and do all mortising and drilling required and receive all information necessary regarding ironmongery. Preparation of steel doorframes for ironmongery has been measured elsewhere.

Where tests of ironmongery are described as "plugged and screwed" these are to be screwed to patent fixing plugs of approved manufacture, and this shall include for plugging and screwing to brickwork or concrete.

Key tags are to be 40mm diameter x 3mm thick plaster of approved colour, engraved on face with the required number of letters and numerals finished in an approved colour, and the tag is to be holed for and fitted with a steel split ring and fixed to key.

Engraved plastic door signs and numeral plates are to be of 5mm thick clear plastic with square polished edges all round with an approved coloured background and sans-serif letters and numerals as described in the items, reverse engraved in the plate with splayed sides and flat reading face and finished in an approved contrasting colour. Each sign is to be twice drilled for and fixed to softwood or hardwood, unless otherwise described, with chromium plated round beaded brass screws. Unless otherwise described, the signs are to be 50mm high with 30mm high, engraved letters or numerals and are to allow a minimum margin of 25mm at both ends. All signs are to be equal to sample to be submitted to and approved by the Department.

Pictorial plastic signs are to be of 5mm thick clear plastic of the sizes stated in the items with square polished edges all round and with the silhouette described in the items applied to the back of the plate by means of the silk screen process in an approved colour and the whole back of the plate finished in an approved contrasting colour. Each sign is to be four times drilled and fixed to softwood or hardwood, unless otherwise described, with chromium plated round-headed brass screws. All signs are to be equal to sample to be submitted to and approved by the Department.

10. STRUCTURAL STEEL WORK

GENERALLY: — The fabrication, assembly and erection of structural steelwork is to be executed in accordance with SANS Specification 1200H — Structural Steelwork (a copy of which the Contractor will be required to keep on site so that it can be referred to at all times during the Contract) with the following amplifications and amendments: —

INTERPRETATIONS: — Clauses 2.1 and 2.2 refer. This preamble, together with any other supplementary preambles appearing in these Bills of Quantities shall be deemed the project specification and are the “Portion 2" referred to in Clause 2.2.

DEFINITIONS: — Clause 2.3 of SANS Specification 1200H refers. All references to the Engineer shall be deemed to mean the Department.

SUB-CONTRACTORS: —The Contractor shall either (a) have adequate satisfactory and approved experience in this type of work or (b) employ an approved specialist structural steelwork Sub-Contractor. The Contractor, in the case of (a), or the specialist Sub-Contractor, in the case of (b), shall employ at all stages of the Works both on and off site a competent Supervisor experienced in the work.

MATERIALS: — Unless otherwise shown on the drawings or hereunder, all rolled sections shall be hot rolled mild steel, and all materials shall comply with one of the following: —

a) Weldable Structural Steels to SANS 4360:
b) Hollow sections to SANS 4848 Part 2 and SANS 6323.
c) Cold rolled sections to SANS 2994.
d) Black bolts and nuts to SANS 135.
e) Precision bolts and nuts to SANS 136.
f) High-strength friction-grip bolts and nuts to SANS 1282.
g) Flat and tapered washers to SANS 1149.
h) Electrodes for welding to SANS 455.

SHOP DETAIL DRAWINGS: — The Contractor shall prepare shop detail drawings, in conformity with the details shown on the structural steelwork drawings and to show all information necessary for complete fabrication, assembly, ejection and painting. In the preparation of the shop detail drawings the Contractor is to comply with the requirements of SANS Code of Practice 0162.

The cost of preparing all necessary shop detail drawings and copies thereof is to be allowed for by the Contractor in his rates.

The Contractor shall submit two copies of his shop detail drawings to the Department for approval at least 10 days before fabrication of the member concerned is due to commence. Such approval does not imply that a complete and comprehensive check of the detail drawings has been carried out, and the Contractor shall remain responsible for ensuring that the steelwork is correctly fabricated, assembled, erected and painted.

SUBSTITUTION OF SIZES, ETC.: — No substitution of sizes or joints additional to those shown on the drawings shall be made without the prior approval of the Department. Except in cases of proven non-availability of materials specified, any additional costs involved due to substitution shall be for the Contractor's account.

FIXINGS: — The positions and manner of fixing the hangers for suspended ceiling air-conditioning ducts, pipe installations, etc. to the structural steelwork are to be approved by the Department before work on such installations commences.

FABRICATION, ASSEMBLY AND ERECTION

Welding: — shall be carried out in accordance with SANS Code of Practice 044 and the relevant recommendations of SANS Code of Practice 0162 and SANS 5135, and in any case of conflict, the SANS Codes of Practice shall be deemed as binding.

All welders employed on the Works shall be currently classified at least as grade 2 welders as defined by SANS Code of Practice 044. Should the Department so request, proof of the classification shall be produced.

Unless otherwise specified all welds are to be continuous fillet welds of 6mm leg length or not less than the thinnest plate or section being welded.

Handling, Storage and Erection: — of members is to be undertaken in such a manner to prevent overstress or damage. Should overstress or damage occur, the Department shall be informed and his instructions sought.

Storage shall be arranged such that damage to applied finishes is prevented.

All plant and equipment used in the erection of structural steelwork shall be adequate in every respect. The Contractor shall allow in his rates for all necessary temporary bracing, and for maintaining and finally removing such temporary bracing.

Fixing of Bolts, etc.: — Unless approved by the Department, no pre-drilled fixings for bolts, etc. will be permitted through hollow section members. Any hollow section member that has been drilled or punctured in any way shall be considered condemned and must be replaced to the satisfaction of the Department.

INSPECTION AND TESTING

Facility for Inspection: — The Contractor shall afford to the Department all reasonable access to inspect the steelwork at any stage of its fabrication, and shall give due notice before delivery of steelwork to the site to allow inspection and tests to be conducted if so required by the Department.

Cost of Tests: — The cost of all tests required by the Department shall be borne by the Administration, except that the costs of the following tests shall be borne by the Contractor:-
(a) Testing of welders and equipment
(b) Such tests (including load tests) as may be necessary by failure on the part of the Contractor to meet the requirements of the specification.

Procedure in the Event of Failure: — In the event of a failure of a test, the Contractor shall

either replace the defective item or prove its sufficiency by means of a load test carried out in accordance with Appendix B of Chapter 6 of the South African Standard Building Regulations. If so required by the Department the Contractor shall also demonstrate by means of tests at his own cost that all like members meet the requirements of the Specification.

PRIMING OF STRUCTURAL STEELWORK

General

(a) Painting conditions.
No painting shall be undertaken when one or more of the following conditions exist: —
(i) The atmospheric or steel temperature is below 10^0 C,
(ii) The atmospheric or steel temperature is expected to fall below 7^0 C before the paint is dry,
(iii)The atmospheric or steel temperature is high enough to cause damage to the paint film,
(iv) In fog or mist,
(v)The relative humidity is greater than 90 *%,*
(vi) Surfaces are or will be wet or damp from rain or other causes,
(vii) Surfaces are contaminated by dirt, dust, grease, oil or other matter detrimental to painting,
(viii) Wind will deposit dust onto un-dried surfaces.

(b) Extent of shop painting.
All surfaces shall be primed as described in the shop except: —
(i) Those to be encased in concrete which are to be left as prepared metal; unless otherwise specified
(ii) Contact surfaces of high strength friction-grip bolt connections which are to be left as prepared metal
(iii) Edges or faces yet to be welded which are to be left as prepared metal over sufficient width from the weld to avoid contamination of the weld or damage to the paint by the effect of welding.

(c) Paint identification, storage and preparation.
All paint shall be supplied in unopened original containers showing the manufacturer's name and trademark date of manufacture and the relevant SANS or other specification number.

No paint shall be used past its maximum life span but otherwise oldest paint shall be used first. Containers shall not be opened until required and opened containers shall be used before unopened containers

Before use, paint shall be thoroughly stirred and prepared in accordance with manufacturer's instructions.

(d) Thinning.
No paint shall be thinned except strictly in accordance with manufacturer's instructions.

(e) Dry film thickness.
Where not specifically later stated this shall be in accordance with manufacturer's instructions for spreading rates. A tolerance of approximately 10% of that thickness will be allowed.

(f) Touching-up surfaces.
Surfaces shall be protected against damage, but should this occur, then the paint shall be rubbed down over the damaged and surrounding area to a sound surface and then restored by re-applying the removed coat properly feathered in with the existing.

Upon completion of site connections, these connections shall be stripe painted with the specified primer before any further painting is carried out.

Class P1 Preparation and Priming Coat: — Unless otherwise specified, rates for structural steel-work are to include for Class P1 Preparation and Priming Coat as follows:-

(i) Surfaces are to be cleaned in accordance with SANS Code of Practice 064 to remove all rust, scale, grease, oil, etc. endeavouring to bring the surface to a bright metallic condition, and painted, unless otherwise specified, with one coat of red -oxide zinc chromate primer in accordance with SANS Specification 909 prior to despatch from the works.

(ii) Upon delivery to the site and again after erection any bared or damaged surfaces are to be made good with similar primer.

The Contractor is advised that the finishing coats of paint to be executed after the erection of the structural steelwork have been measured elsewhere.

Class P2 Preparation and Priming Coat: — Where specified, rates for structural steelwork are to include for Class P2 Preparation and Priming Coat as follows: —

(i) Surfaces shall be thoroughly cleaned by sandblasting to Swedish Standard SIS 055900 standard Sa 2½ to give minimum peak to valley profile of 50 micrometer when measured by SANS Draft Test Method No. 772.

(ii) Surfaces shall be blown thoroughly clean with compressed air and within four hours of sandblasting, one coat of "Plascon SN 162 Ironguard-4-Zinc" or other approved primer of minimum dry film thickness of 75 micrometer shall be applied by pressure pot spray system in accordance with the manufacturer's instructions in the shop.

(iii) Upon delivery to the site and again after erection, any bared or damaged surfaces are to be made good with similar primer.

The Contractor is advised that the finishing coats comprising one intermediate coat and one finishing coat of chlorinated rubber paint to be executed after the erection of the structural steelwork have been measured elsewhere.

Class P3 Preparation and Priming Coat: — Where specified, rates for structural steelwork are to include for Class P3 Preparation and Priming Coat as follows: —

(i) Surfaces shall be thoroughly cleaned by sandblasting to Swedish Standard SIS 055900 standard Sa 2½ to give maximum peak to valley profile of 50 micrometer when measured by SANS Draft Test Method No. 772.

(ii) Surfaces shall be blown thoroughly clean with compressed air and within four hours of sandblasting, one priming coat of "Epidermix 352" or other approved epoxy coal tar of minimum dry film thickness of 75 micrometer shall be applied in the shop.

(iii) Upon delivery to the site and again after erection, any bared or damaged surfaces are to be made good with similar primer.

The Contractor is advised that the finishing coat comprising a further coat of epoxy coal tar to be executed after the erection of the structural steelwork has been measured elsewhere.

MEASUREMENT AND PAYMENT: — The provisions and Clause 8 will **NOT** apply and the system of measurement which is adopted in these Bills of Quantities is the only system of measurement which will be recognised in this Contract.

RATES FOR STRUCTURAL STEELWORK: — Rates for structural steelwork are to include for all necessary cutting to lengths, splay cut ends, shaping, holing, tapping, threading, forging, turning, assembling, welding, and fixing in position.

11. METALWORK

PROPRIETARY MATERIALS: — Where proprietary materials are specified, the materials used are to be of the type, specified or other approved by the Department.

RATES: — for all metalwork, unless otherwise stated, are to include for cutting to length, shaping, turning, threading, forging, fitting, assembling, riveting, welding, welded running joints, filing smooth, also for all screws and holes and hoisting and fixing in position. All screwed work is to have full threads.

WELDING AND BRAZING: — Where items are described as welded or brazed, rates must include neat welding or brazing by experienced workmen using a recognised process and for cleaning and filing or grinding off smooth, all to approval. All welding is to be continuous unless otherwise described.

SCREW FIXINGS: — Where items are described as tap screwed, grub screwed, set screwed, etc. rates must include for the necessary screws, for drilling all components and for tapping the components where necessary to receive such screws.

PIPE MEMBERS: — All galvanized mild steel pipe members are to be "medium" pipes complying with SANS 1387. Diameters of pipes, unless otherwise stated, are normal internal diameters.

PRIMING OF STEELWORK: — All items of fabricated mild steel except where described to be galvanized, are to be cleaned in accordance with SANS Code of Practice 064 to remove all scale, rust, grease, oil, etc. endeavouring to bring the surface to a bright metallic condition, and painted, unless otherwise specified, with one coat of red-oxide zinc chromate primer in accordance with SANS Specification 909 prior to despatch from the works.

GALVANISING OF STEELWORK: — All steel surfaces described to be galvanized are to be thoroughly sand, grit or steel shot blasted to white metal in accordance with SANS Code of Practice 064 and fluxed ready for galvanising, and the completed unit is to be hot dip galvanized after fabrication in accordance with SANS Specification 763 for general applications on the relative thicknesses of metal.

The zinc coating shall be continuous and of even thickness over all surfaces entirely free of bare spots, dull, rough patches, blisters and other imperfections and shall show no signs of peeling. Where site welding has to be done, the welds are to be properly cleaned down and cold galvanized to the approval of the Department.

If requested by the Department, the manufacturer shall carry out tests to prove that the requisite mass / thickness of zinc coating is applied and that it is of uniform thickness. The tests shall be made by attaching a test piece of mild steel, approximately 250 x 25 x 6mm, by means of wire, to an article being galvanized, and subjecting the test piece to the same cleaning, fluxing and galvanising treatment as the article being galvanized, and at completion, the test piece tested by a method approved by the South African Bureau of Standards, the cost of which will be borne by the Contractor.

CHROMIUM PLATING OF STEELWORK: — All items of fabricated mild steel described to be chromium plated are to be properly de-greased, cleaned and polished perfectly smooth before plating and all in accordance with SANS Specification 728. All items are to be first nickel-plated then chromium plated to provide a bright mirror finish and all plating is to be equal to sample to be submitted for the necessary approval by the Department.

PRESSED STEEL DOOR FRAMES: — shall be manufactured from mild steel sheet 1.60mm thick for single rebated frames and 1.20mm thick for double rebated frames. Rebates shall be suitable for 42mm thick doors and fanlights.

The sections are to be accurately bent to form the profiles. Corners are to be mitred and welded and reinforced at back with 1.60mm thick steel angle sections. Transoms for

fanlights are to be let into the jambs and welded. All welds are to be solid and cleaned off flush, leaving a perfect outside finish.

Each frame is to be fitted with one pair of sturdy angle or channel section tie bars at base, welded below the frame, and where required for additional strength, cross struts of the same section are to be welded between and at right angles to the main tie bars. Each frame is also to be fitted with one 'diagonal brace as temporary support, standard 230mm long corrugated adjustable building-in lugs at jambs, three rubber shock absorbers in rebate of lock jambs of frames for single doors and one rubber shock absorber, for each leaf in the rebate of the head or transom of frames for double doors.

All frames are to be primed on all surfaces with an approved red oxide zinc chromate priming coat in accordance with SANS Specification before leaving the manufacturer's works, unless specified to be hot dip galvanized, and rates are to include for touching up where necessary with similar primer after building in.

Where frames are specified to be galvanized they are to be hot dip galvanized after manufacture in accordance with the relevant provisions of SANS Specification 763 for general applications on the relative thicknesses of metal.

Frames, unless otherwise described, are to be fitted with one and a half pairs of 100mm five-knuckle loose pin steel hinges, unless otherwise specified for each door or each leaf of double door and with one pair of 75mm five-knuckle loose pin steel hinges for each fanlight. The three-knuckle leaf of each hinge is to be welded into the frame or transom.

Where frames are described to be fitted with brass butts, the frames are to be checked out and fitted, unless otherwise specified, with one and a half pairs of 100mm double bronze washered brass butts for each door or leaf of double door, unless otherwise described, as one pair of 75mm brass butts for each fanlight, with open leaf of each butt secured to the frame or transom by means of 6mm diameter countersunk headed brass set screws screwed to and including a 3mm thick steel backing plate of suitable size welded to frame or transom and drilled and tapped to receive the set screws.

Where frames are described to be fitted with aluminium hinges the frames are to be checked out for and fitted, unless otherwise specified, with one and a half pairs of 100mm five-knuckle aluminium hinges of 6082 alloy with nylon bushes for each door or leaf of double door, unless otherwise described, and one pair of similar hinges to each fanlight, with the three-knuckle leaf of each hinge secured to the frame or transom by means of 6mm diameter countersunk headed stainless steel set screws screwed to and including a 3mm thick steel backing plate of suitable size welded to frame or transom and drilled and tapped to receive the set screws.

Where frames are to be prepared for the top centres of floor spring hinges, a 6mm thick steel backing plate of suitable size is to be welded into the back of the frame and drilled and tapped to receive the fixing screws of the top centre.

The preparation of frames or all items of ironmongery, other than butts, has been measured separately and the rates against these items are to include for all drilling, mortising, tapping for screws, etc. required for the fixing of keeps, brackets, etc. of the items of ironmongery described. Preparation of frames for locks and latches is to include, in addition to the above, for recessing and fitting the frames with and including standard keeps and adjustable striking plates to suit the types of locks and latches used and with totally enclosed mortar guards 1, 15 metre high above finished floor.

Door and fanlight sizes are given to the nearest 10mm. The building in of frames has been measured separately.

STAINLESS STEEL DOOR FRAMES:- shall be manufactured from grade 304 stainless steel sheet 1.60mm thick for single and double rebated frames to profiles as per detailed drawings. Rebates shall be suitable for 42mm thick doors and fanlights. Stainless steel

frames to be used only in Patient Treatment facilities.

PRESSED STEEL CUPBOARD DOOR FRAMES: — shall be manufactured from 1.20mm thick mild steel sheet standard sections, having rebates for 42mm thick doors, and fitted with transoms and/or mullions where required and with sill section allowing the cupboard doors to be taken down to general floor level with the floor level inside cupboards not less than 12mm above general floor level. The frames are to be 102mm wide overall.

The sections are to be accurately bent to form the profiles. Corners are to be mitred and welded and reinforced at back with 1.60mm thick steel angle sections. Transoms, mullions and sills are to be neatly fitted at intersections and welded. All welds are to be solid and cleaned off flush, leaving a perfect outside finish.

All frames are to be fitted with rubber shock absorbers to the lock jambs of single doors, and to the head, transom and sill of double doors. Each door is to be fitted with standard corrugated adjustable building in lugs at jambs.

All frames are to be primed on all surfaces with an approved red-oxide zinc chromate priming coat in accordance with SANS Specification 909 before leaving the manufacturer's works, unless specified to be hot dip galvanized, and rates are to include for touching up where necessary with similar primer after building in.

Where frames are specified to be galvanized they are to be hot dip galvanized after manufacture in accordance with the relevant provisions of SANS Specification 763 for general applications on the relative thicknesses of metal.

Frames are to be fitted with one pair of 100mm five-knuckle loose pin steel hinges for each lower door or each leaf of lower double door and with one pair of 75mm five-knuckle loose pin steel hinges for each upper door or each leaf of upper double door. The three-knuckle leaf of each hinge is to be welded into the frame or mullion. Frames for single cupboard doors shall be prepared for locks or catches as specified and the frames for double doors are to be prepared for two barrel bolts for the first closing leaf of lower doors and one barrel bolt for the first closing leaf of upper doors.

Overall sizes are given to the nearest 10mm. Building in of the frames has been measured separately.

STEEL WINDOWS AND DOORS: — shall be in accordance with SANS Specification 727 and the frames are to be provided with fixing lugs or are to be holed for screwing as required.

Industrial type windows are to be suitable for glazing from the inside and all other windows from the outside, unless otherwise described.

Side hung and vertically pivot hung sashes shall open to at least 90 degree horizontally pivot hung sashes to at least 80 degree and bottom hung sashes to 30 degree. Unless otherwise stated, hinges for side hung opening out sashes are to be of the projecting type for easy cleaning.

All opening sashes are to have polished brass furniture.

The transoms and mullions of all purpose-made windows and doors are to be equally spaced between the outer frames of the windows and doors to form openings of equal size. Where this is not the case either the width or the height of the opening is stated, unless otherwise stated, the fixed lights and sashes of all purpose-made windows are to be in one square and the sashes and doors are to open out.

Windows and doors, unless otherwise specified, shall be of "one piece" construction. Composite windows and doors are to be supplied complete with all necessary standard coupling transoms or mullions.

Stock and purpose made residential type steel windows and school type windows of residential section shall be constructed of standard 25mm steel sections and of metal not less than 3mm thick.

Stock and purpose made industrial type steel windows shall be constructed with main frames of standard 35mm steel sections and of steel not less than 3mm thick, with sashes of standard 25mm steel sections and of steel not less than 3mm thick.

“Universal” sections, where specified, shall be not less than 33mm wide (measured over one opening section only) and of metal not less than 4mm. thick, and with all sight lines maintained (whether consisting of all fixed lights, all opening sashes, or portions of both) and with all glass in the same plane.

Stock and purpose made steel doors, sidelights and fanlights, shall be constructed with the doors of “Universal” sections as before described and the sidelights and fanlights of standard residential sections as before described. Bottom openings in doors and sidelights shall be fitted with kicking plates of one thickness of 1.60mm mild steel sheet fixed with metal beads. Frames of outward opening doors shall be fitted with bottom sills of door framing section (stepped sills) and of inward opening doors with metal ties welded to frames for embedding in threshold (flush sills)

Top Hung Sashes: — are to open out on a pair of steel hinges having brass pins and washers and fitted with brass peg stay, steel peg and locking bracket.

Outward Opening Side Hung Sashes: — are to open out on a pair of steel projection hinges having brass pins and washers and fitted with brass two-point handle and brass striking plate and brass sliding stay with friction fastener.

Inward Opening Side Hung Sashes: — are to open in on a pair of steel hinges having brass pins and washers and fitted with brass single point handle and steel engaging hook and brass sliding stay with friction fastener.

Bottom Hung Sashes: — are to open in on a pair of steel hinges having brass pins and washers and fitted with steel concealed side arms with brass guides and brass spring catch for long arm or hand operation and steel catch plate.

Horizontally Pivot Hung Sashes: — are to have brass adjustable friction ring centres and fitted with brass spring catch for long arm or hand operation and steel catch plate.

Projected Out Sashes: — are to be balanced on steel concealed side arms, the top of the sash fitted with spring loaded brass shoes to slide in brass guides and fitted at bottom with brass handle and brass striking plate.

Doors: — are to be hung on one and a half pairs per leaf of steel projection hinges with brass pins and washers and fitted with mortise lock set as specified, and each lock is to be provided with two keys.

Brass concealed bolts are to be fitted at top and bottom of meeting edge of first closing leaf of double doors. Sidelights and fanlights are to be hung as described for windows.

Adjustable Louver Sets: — are to be natural anodised aluminium louver sets of approved manufacture consisting of head and sill weather strips complete with neoprene gaskets and two jamb strips each fitted with louver brackets with spring loaded clips for the specified width of glass louver blades complete with tilt bars and operating lever handles. Where openings are not of a height to suit standard width louver blades an alternate head section with static clips must be provided to take a fixed louver blade of the required width. The louver sets are to be screwed to the steel window frame with stainless steel self-tapping screws and all portions of the louver set which come in contact with the window frame are to be insulated with approved pressure sensitive PVC tape to prevent electrolytic corrosion.

Burglar Bars: — are to be standard type burglar bars formed of 20 x 5mm mild steel bars riveted at intersections and riveted at ends to the window frames. The burglar bars to the small-pane type windows are to line through with the glazing bars and windows of the horizontal-pane type or of the no-glazing bar type are to be fitted with burglar bars which are divided as for the small-pane type window.

Fly screens: — are to be standard type fly screens suitable for residential opening-out type steel windows, unless otherwise described, and are to be constructed of stove enamelled pressed steel frames fitted with 0.25mm thick mosquito-proof mesh glass-fibre gauze. The fly screens are to be clipped onto the inner face of the steel window after all painting is completed.

All steel windows and doors are to be primed on all surfaces with an approved red oxide zinc chromate priming coat in accordance with SANS Specification 909 before leaving the manufacturer's works, unless specified to be hot dip galvanized, and rates are to include for touching up where necessary with similar primer after building in.

Where steel windows and doors are specified to be galvanized they are to be hot dip galvanized in accordance with the relevant provisions of SANS Specification 763 for general applications on the relative thicknesses of metal.

Loose metal glazing beads, where specified, are to be of an approved type and size, and are to be fixed with screws set in the correct positions for the type of glazing to be used, and neatly mitred at angles.

Immediately the windows and doors have been delivered on site, they are to be thoroughly overhauled and all necessary adjustments or repairs are to be made before they are fixed in position. A further inspection is to be made after building in and any further servicing required must be carried out in order to leave windows and doors in a satisfactory condition after glazing is completed.

All glass and glazing has been measured elsewhere.

Sizes of windows and doors are given to the nearest 10mm. The building in of windows and doors has been measured separately.

STAINLESS STEEL: — is to be of the thickness and grade specified and unless otherwise stated is to be buffed to an even satin finish to the approval of the Department.

All welding to stainless steel shall be by argon arc process and where filler rods are used these are to have properties not less than those of the parent metal. All welds are to be ground off smooth and uniform and the whole buffed to an even finish all over. Stainless steel is to be cut and bent in such a manner that a minimum of welding is required.

Where bending is required, all external angles are to be arras rounded and all internal angles are to be radiused.

All stainless steel work is to be of the highest quality and executed by specialists in this type of work and to the approval of the Department.

Note that where stainless steel fittings are specified and support work or fixings with bolts, nuts, rivets, etc, are required / specified, these fixings and support work are to be of stainless steel of the same rating / grade as the equipment specified.

ALUMINIUM AND ANODISED ALUMINIUM: — is to be of the brand specified or other approved and of 6063-TF or equivalent quality and temper.

Aluminium bars and sections shall comply with the relevant clauses of SANS 1476, extruded tube and hollow sections with the relevant clauses of SANS 1474, and sheet and

strips with the relevant clauses of SANS 1470. All alloys to be anodised are to be of anodising quality.

Aluminium is to be free from flaws, hammer and die markings or other imperfections.

Anodising of aluminium is to be carried out in accordance with SANS Specification 999 by an approved process. The average anodic film thickness shall be 25 micrometer, and at no point should the anodic film thickness fall below 22 micrometer or be thicker than 30 micrometer.

Prior to anodising, all surfaces are to be de-greased and cleaned, all irregularities removed and flushed off smooth and buffed where necessary.

All anodised aluminium must be coated with a suitable “non-yellowing” methylcrylate lacquer film, approved by the Department, over the entire surface. The lacquer film must be continuous and of a uniform average thickness not less than 10 micrometer. The lacquer thickness must be determined by use of a film meter or other instrument methods as described in ASTM B244-49T. Rates for anodised aluminium must include for this protective coating.

Before the work is put in hand, samples of finish are to be submitted to the Department for approval, and all finished work is to be equal in all respects to the approved samples.

The Contractor shall provide all samples required for testing in accordance with SANS Specification 999. If required, tests on the anodic film are to be carried out at the works of the anodised to verify that the work conforms to SANS Specification 999, the cost of which will be borne by the Contractor.

The surfaces of all aluminium which are jointed to or are in contact with other materials when fixed, particularly ferrous metals, are to be suitably insulated to prevent electrolytic corrosion.

Joints in all aluminium members are to be neatly formed in an approved manner with screw heads, pins, rivets, etc. concealed so that the joints are practically invisible. Screw or bolt jointing is to be kept to a minimum and will be permitted only when welding is impracticable. Unless otherwise described, stainless steel screws or bolts are to be used for jointing and fixing aluminium work. Welded joints are to be formed by argon arc process using SANS 1476/NS6 welding rods and finished off smooth.

Welding is to be executed in such a manner as not to affect the colour of the material or the anodic coating.

Exposed heads of screws, pins, rivets, etc. in coloured anodised aluminium are to be touched up with enamel paint to match the coloured anodised finish.

No deviation may be made from the general requirements or dimensions, but improvements in the general construction and design affecting neatness, strength or durability may be introduced. If any deviation is proposed, the Contractor must submit detailed drawings showing the particular construction and form or section he proposes to use and such drawings, details and samples of fittings, etc. are to be approved by the Department before manufacture is commenced and every facility must be given for the work to be inspected during manufacture.

No work may be fixed in position until it has been inspected and approved. Anodised aluminium work must be erected as near to the end of the Contract period as possible, to minimise the danger of damage or deterioration.

All work is to be suitably protected during building operations and left in a clean and satisfactorily finished condition on completion. In particular, all anodised aluminium work must be protected against damage, and against deterioration or discolouration caused by

mortar droppings, wax, paint, etc. all to the entire satisfaction of the Department. All work so damaged, deteriorated or discoloured must be replaced at the Contractor's expense.

Rates for aluminium work are to include for necessary cutting to lengths, shaping, turning, threading, forging, fitting, assembling, riveting, welding, welded running joints, filing smooth, also for all screws and holes and hoisting and fixing in position. All screwed work is to have full threads.

ANODISED ALUMINIUM WELDED WINDOWS AND DOORS: — are to be of an approved manufacture and design.

Windows and doors are to be fabricated from Medium Universal equal leg sections, unless otherwise specified, measuring 33mm over one opening section and not less than 4mm thick through the flanges and not less than 4.75mm through the web, unless otherwise stated.

The aluminium sections are to be of approved manufacture and of 6063-TF or equivalent quality and temper and are to be anodised after manufacture to the approval of the Department. Welds are to be electrically flash butt resistance welded, properly ground and cleaned off to give a uniform appearances.

Anodising, etc. is to be carried out as before described.

All windows and doors are to be suitable for internal glazing and are to be fitted with approved anodised aluminium glazing beads of the "clip on" type. Drilling for the fixing of glazing beads is to be done to suit the thickness of the glass used.

The frames are to be perfectly flat, square, butt-welded at joints (mechanical joints will not be permitted) and all opening sashes must fit perfectly on all faces and open or close freely without binding at any point. The glazing bars must be continuous with continuous intersections (mitred intersections will not be permitted) with ends scribed and fitted to the frames with shouldered ends passed through and riveted over. The sight lines of the main frame, whether consisting of all fixed lights, all opening sashes or portions of both and the glass plane must be the same throughout each window.
Weathering on sections is to be solid extruded with the sections (screwed or riveted on strips will not be permitted) except weather bars to sills of inward opening sashes which must be welded on and not screwed or riveted except in the approved designs of built-up transoms.

No steel is to be used in the manufacture of the windows unless it is stainless steel of quality to A.I.S.I. Type 316. All fittings, butt hinges, screws, nuts, bolts, etc. are to be of high quality aluminium or other approved non-corrosive material compatible with aluminium and of sufficient strength to perform the functions for which they are used. The handles, sliding stays and peg stays are to have nylon washers, bushes and pressure pads and are to be secured to the frames with screws having riveted ends. Pop rivet fixings will not be permitted.

The transoms and mullions of all purpose-made windows and doors are to be equally spaced between the outer frames to form openings of equal size. Where this is not the case, either the width or the height of the opening is stated. Unless otherwise stated, the fixed lights and sashes of all purpose-made windows and doors are to be in one square and the sashes and doors are to open out.

Frames must be provided with suitable fixing lugs bolted on to frame with aluminium alloy bolts or are to be holed for screwing as required with lugs or holes spaced one near top, one near bottom and not more than 750mm apart intermediately each side of frame. Frames more than 900mm wide are to be provided with similar fixings to top and bottom and not more than 750mm apart.

All composite windows, doors, etc. are to be supplied with suitable and approved coupling mullions or transoms. Rectangular hollow section transoms where specified are to be

25mm x 115mm in section manufactured from 3mm thick aluminium.

The Contractor must submit drawings showing details of sections he proposes to use and these drawings are to be approved by the Department before manufacture is commenced, and when requested, specimen windows and doors complete with all fittings as well as specimen coupling mullions, transoms etc. must be submitted for approval and all windows, doors, etc. supplied must conform to the approved samples.

The manufacturer of the windows and doors must supply a dimensioned set of drawings with the windows and doors, for use on the site, including clearance and strict fixing methods and details.

Windows and doors are to be delivered to the site in suitable protective wrappings or crates and are to be stacked on end and carefully handled at all times to prevent any marking or staining of surfaces.

Immediately the windows and doors have been delivered on the site, they are to be thoroughly overhauled and all necessary adjustments or repairs are to be made before they are fixed in position. A further inspection is to be made after fixing and any further servicing required must be carried out in order to leave the windows and doors in a satisfactory condition and waterproof after glazing is completed.

Side Hung Sashes: — are to open out on a pair of aluminium hinges complete with anti-friction weatherproof bushings fixed pin and nylon washers and fitted with anodised aluminium alloy sliding stay with friction fastener and an approved anodised aluminium two point handle and striking plate.

Bottom Hung Sashes: — are to open in on a pair of aluminium hinges complete with anti-friction weatherproof bushings, fixed pin and nylon washers and fitted with concealed side arms and strong lever action spring catch and keep.

Top Hung Sashes: — are to open out on a pair of aluminium hinges complete with anti-friction weather proof bushings, fixed pin and nylon washers and fitted with anodised aluminium peg stay with cranked locking stay.

Horizontally Pivot Hung Sashes: — are to be hung on a pair of approved weatherproof brass satin-chrome finished friction pivots of the greatest possible diameter permissible and fitted at top with strong lever action spring catch for long arm or hand operation and striking plate, unless otherwise stated.

Vertically Pivot Hung Sashes: — are to be hung on free pivot cups at the head incorporating nylon bearing sleeves and lever pivots at the sill and fitted with one two-point casement handle and striking plate.

Projected Out Sashes: — are to be balanced on approved concealed side arms with stainless steel shoes and channels and fitted at bottom with one approved bow handle with catch incorporated.

Projected In Sashes: — are to be balanced on approved concealed side arms with stainless steel shoes and channels and fitted at top with strong lever action spring catch for long arm or band operation and striking plate:

Doors: — are to be side hung to open out on one and a half pairs of aluminium hinges to each leaf complete with anti-friction weatherproof bushings, fixed pin and nylon washers and fitted with lock set as specified, and each lock is to be provided with two keys. Satin chrome finish flush bolts are to be fitted at top and bottom of meeting edge of first closing leaf of double doors.

Adjustable Louver Sets: — are to be approved anodised aluminium adjustable louver sets consisting of head and all weather strips fitted with neoprene gaskets and two jamb strips

each fitted with louver brackets with spring loaded clips for the specified width of glass louver blades and complete with tilt bars and operating lever handles. Where the openings are not of height to suit standard width louver blades an alternate head section with static clips must be provided to take a fixed louver blade of the required width. The sets-sets are to be tap screwed to the window frame with stainless steel self-tapping screws.

GLAZING TO DOORS / ALUMINIUM GLAZED SCREENS

No glazing permitted to any fitting below Lock Rail (ie 1,2m high.).

Burglar Bars: — are to be standard type burglar bars formed of 20mm x 5mm aluminium bars riveted at intersections and riveted at ends to the window frame with high strength aluminium rivets. The burglar bars to the small pane type window are to line through with the glazing bars, and windows of the horizontal-pane type or of the no-glazing bar type are to be fitted with burglar bars which are divided as for the small pane type window.

All exposed surfaces of anodised aluminium are to be protected by means of an approved fabric backed adhesive tape. The Contractor shall satisfy the Department that the tape he proposes to use can be easily stripped after long exposure to sunlight, and rates are to include or the final stripping of the protective tape and cleaning dawn to approval at completion.

All work is to be protected during building against deterioration or discolouration caused by mortar droppings, wax, paint, etc. and all work so damaged is to be replaced at the Contractor's expense to the approval of the Department.

All glass and glazing has been elsewhere measured. All sashes and openings, unless otherwise stated, are to be single panes without glazing bars.

All windows and doors must be fixed into preformed openings in the structure (the building-in of windows and doors will not be pen fitted) and rates are to include for supplying necessary templates for forming the openings. Fixing in position of windows and doors has been measured separately. Sizes of windows and doors are given to the nearest 10mm.

STRONG ROOM DOORS: — must comply in all respects with SANS Specification 1015 Category 1. Each door is to be provided with two keys and the keys must be forwarded by the supplier under registered cover direct to the Department, and the supplier must clearly indicate the institutions in which the door (or doors) is being installed.

BURGLAR RESISTING SAFES: — must comply in all respects with SANS Specification 751. The safes shall be "Office Safe Category 1" as laid down in SANS Specification 751. Each safe is to be provided internally with one shelf and two lockable drawers.

Where the mass of each safe is 680kg or less, provision must be made for securing it rigidly to prevent unauthorised removal; the means of securing shall be at least equal in effectiveness to that which would be provided by four 12mm bolts. Locks shall be lever locks with a minimum of six levers. Each safe is to be provided with two keys to each lock and the keys for any safe must be forwarded by the supplier under registered cover direct to the Department, and the supplier must clearly indicate the institution in which the safe (or safes) is being installed.

ADJUSTABLE LOUVER GEAR SETS: — are to be approved natural anodised aluminium adjustable sets consisting of head and sill weather strips fitted with neoprene gaskets and two jamb strips and fitted with sets brackets with spring loaded clips for the specified glass sets blades and complete with tilt bars and operating handles. Where the openings are **not** of a height to suit standard width sets blades an alternate head section with static clips must be provided to take a fixed sets blade of the required width.

RATES: — are to include for fixing in accordance with the manufacturers instructions for screwing head and sill weather strips and jamb strips with stainless steel screws to frames (Elsewhere measured) and for oiling and easing at completion.

12. PLASTERING

MIXING
The mixing of the materials is to be done on a hard surface.
Once all materials have been mixed, they are not to be remixed with new materials added after 5 (five) hours.

MATERIALS
Stone Chippings: — are to be approved clean stone chippings of the sizes stated complying with SANS Specification 1083.

River Sand: — for floor finishes and screeds is to be clean, sharp, coarse sand free from all impurities, washed if so directed and complying with SANS Specification 1090.

Plaster Sand: — is to be clean, sharp, free from all impurities, washed if so directed and is to comply with SANS Specification 1090.

Cement: — unless otherwise specified is to be Portland cement of normal setting quality, is to comply with SANS Specification 471, and must be used fresh. Cement containing more than 15% blast furnace slag will not be permitted to be used.

Lime: — is to comply with SANS Specification 523.

Water: — is to be clean, fresh and free from injurious amounts of acids, alkalis and other organic substances.

MEASUREMENT OF CONSTITUENT PARTS OF FLOOR FINISHES, TOPPINGS, SCREEDS AND PLASTER FINISHES: — Cement, sand and stone chippings are to be measured exactly by means of gauge boxes or purpose made wheelbarrows. Part filling or heaping of normal wheelbarrows will not be permitted.

Water is to be accurately measured for each batch, to approval.

Waterproofing compounds, where specified, are to be added to the mixture in the proportions recommended by and in strict accordance with the manufacturer's instructions.

PREPARATION OF SURFACES: — Prior to the application of floor finishes, toppings, screeds, plaster finishes etc. the surfaces of the new or existing concrete, brickwork, etc. are to be thoroughly cleaned, chipped, hacked, sloshed, etc. as necessary to ensure a satisfactory bond. The Contractor will be held entirely responsible for the proper and adequate preparation of the surfaces and any work which results in failure in this regard must be made good at the Contractor's expense to the satisfaction of the Department.

FLOOR SCREEDS, ETC: — Cement screeds are to consist of one part cement and three parts sand, unless otherwise described, and are to be steel towelled, unless otherwise stated, to true smooth and even surfaces, free from tool marks to the satisfaction of the Department to receive the finishes stated in the items. It is recommended that in new structures the screeding should be as specified by "Tal" using "Screedmaster", the pumped method.

GRANOLITHIC FINISH TO CONCRETE FLOORS, ETC: — Float up to within 6mm of finished surface with layers on concrete approximately 10mm thick, composed of one part cement, two and a half parts concrete and three and a half parts granite or other approved hard stone chippings. Form finished surface with one part cement and one part fine granite chippings or other approved hard stone graded up to particle, which will pass a 6mm mesh brought to a smooth surface with a steel trowel. The floating and finishing coats are to be performed in one operation.

The granolithic work is to be carried out by experienced workmen and is to be laid in panels

V-jointed and not and not exceeding 6m^2 in area or as shown on drawings or described in the Bills of Quantities.

Thin strips if wood or other suitable materials are to be laid between panels to break contact.

Where granolith is described to be tinted, the requisite quantity of oxide of iron or other colouring materials is to be mixed with the finishing thickness.

All granolithic floors, etc. are to be covered up and protected from injury and discolouration during the progress of the work.

Rates for granolithic work are to include for cleaning down and for a coat of approved wax polish or stoep reviver well rubbed in at completion.

13. PLASTER

GENERAL

Except where otherwise described, all external plaster is to be finished with a wood float and internal plaster is to be finished with a steel trowel, unless otherwise described, all to true and even surfaces, free from tool marks and other defects to the satisfaction of the Department. No distinction has been made for brick or concrete surfaces.

CEMENT PLASTER

External cement plaster to wall is to consist on one part cement and four parts sand.

External cement plaster to ceilings is to consist of one part cement and three parts sand.

Internal cement plaster to walls is to consist of one part cement and five parts sand.

Internal cement plaster to ceilings is to consist if one part cement and three parts sand.

One coat cement plaster to walls shall not be less than 13mm or more than 16mm in thickness, and one coat cement plaster to ceilings shall not be less than 10mm or more than 13mm in thickness, unless otherwise described.

Where plaster is described as undecorated, the same type of approved sand the same brand of cement is to be used throughout to maintain a uniform colour and texture.

BARIUM PLASTER

Barium plaster shall consist of two coats plaster, the first coat 13mm thick consisting of one part cement and five parts sand, and the second coat 6mm thick consisting of one part cement and five parts Barium Sulphate. (This is to be applied only to X-Ray Room walls where holed bricks have been used).

All surfaces are to be plastered in one operation from ceiling to floor and corner-to-corner; breaks are to be made only in corners or at junctions of walls and ceilings.

CURING, PROTECTION, ETC.: — All floor finishes, paving, plaster finishes and screeds are to be properly cured to approval and all cracks, blisters and other defects which may occur are to be made good and the whole left in a satisfactory-condition at completion.

The finished surfaces are to be properly protected from damage and cleaned down at completion.

RATES: — Rates for floor finishes and screeds are to include for preparation of new or existing surfaces, dressing to falls where required, V-joints where specified, curing, protecting from damage and cleaning down at completion.

Rates for skirtings, risers, etc. are to include for internal angles at junction with floor, treads, etc. to be square or coved to not more than 50mm girth and in addition are to include for mitres, stops, etc. except where given separately in terms of the Standard System of Measuring Builders' Work.

Rates for plaster finishes are to include for preparation of new or existing surfaces, curing, protecting from damage and cleaning down at completion.

Rates for plastering are to include for internal angles to be square or coved to not exceeding 50mm girth.

Rates for rounded angles, fair edges and arrases and the like are to include for mitres, stops, etc. except where given separately in terms of the Standard System of Measuring Builders' Work.

Rates for mouldings, projecting bands, coves, weatherings and the like are to include for dubbing out.

Rates are to include for cutting back against frames and for V-joints cut where concrete abuts brickwork.

Rates generally are to include for all sundry making good and working around pipes, balusters, etc.

GENERALLY

Narrow Widths
Items described as "Extra over for narrow widths" include for all reveals, edges, soffits, treads, risers, etc. not exceeding 500mm wide, narrow widths not exceeding 500mm wide in general surfaces caused by openings or projections, all of which have been included in the areas of horizontal or vertical surfaces. No distinction has been made for finishes of differing thicknesses.

14. TILING

MATERIALS

River Sand: —is to be clean, sharp, coarse sand, free from all impurities, washed if so directed and complying with SANS Specification 1090.

Plaster Sand: — for wall backings is to be clean, sharp, free from impurities, washed if so directed and complying with SANS Specification 1090.

Cement: —unless otherwise specified, is to be Portland cement of normal setting quality complying with SANS Specification 47I and must be used fresh. Cement containing more than 15 % blast furnace slag will not be permitted to be used

Water: —is to be clean, fresh and free from injurious amounts of acids, alkalis and other organic substances.

MEASUREMENT OF CONSTITUENT PARTS OF BACKINGS, ETC.: — Cement and sand are to be measured exactly by means of gauge boxes or purpose made wheelbarrows. Part filling or heaping of normal wheelbarrows will not be permitted:

Water is to be accurately measured for each batch to approval.

Waterproofing compounds, where specified, are to be added to the mixture in the quantities recommended by and in strict accordance with the manufacturers' instructions.

PREPARATION OF SURFACES: — Prior to the application of the backing for tiles, the surfaces of the new or existing concrete, brickwork, etc. are to be thoroughly sloshed, etc. as necessary to ensure a satisfactory bond. The Contractor shall be held responsible for the proper and adequate preparation of the surfaces and any work which results in failure in this regard must be made good at the Contractor's expense to the satisfaction of the Department.

GLAZED CERAMIC WALL TILES AND FITTINGS: — shall comply with SANS Specification 22 of selected grade, free from defects and blemishes and of uniform colour.

Rates are to include for either bedding tiles on and including a solid cement mortar backing consisting of one part cement to three parts sand on brickwork or concrete, or fixed with an approved tile adhesive on and including a coat of cement plaster consisting of one part cement to five parts sand and finished to a surface to receive tiles.

Tiles are to have vertical and horizontal joints continuous with all joints solidly flushed up in neat white cement.

MOSAICS: — Glass or ceramic mosaics are to be of approved South African manufacture of the sizes and colours specified, fixed to paper panels for ease of handling.

Mosaics are to be bedded to a true even surface on and including a solid cement mortar backing consisting of one part cement and three parts sand on brickwork or concrete, or fixed with an approved mosaic adhesive on and including a coat of cement plaster consisting of one part cement to three parts sand finished to a surface to receive mosaics.

After setting, the paper panels are to be removed and all joints are to be solidly flushed up in neat white cement.

Samples of mosaics are to be submitted to the Department for approval before any work is put in hand.

UNGLAZED CERAMIC FLOOR TILES AND FITTINGS: — are to be unglazed acid and alkali resistant tiles and fittings of the types specified in the items, and of approved manufacture, uniform in size, shape and colour, free from cracks, twists and other defects and equal to samples to be deposited with and approved by the Department.

Floor tiles are to be laid with maximum 10mm wide joints continuous in both directions on and including a 15mm thick cement mortar bed consisting of one part cement to three parts sand, unless otherwise specified, to true levels and grades with the joints raked out and grouted up solid and flush pointed with an approved epoxy jointing compound.

Floor tiles are to be set out so as to have no long edges of tiles cut to suit room size.

RATES: — for tiles, mosaics, etc. are to include for all necessary preparation of surfaces, for laying in accordance with the manufacturer's instructions, all square cutting and waste and fitting, protecting from damage and cleaning down at completion.

Rates for tiles are also to include for laying, bedding, jointing and pointing as described and in accordance with SANS Code of Practice 0107 where applicable.

Rates for treads, risers, sills, copings, cappings, skirting etc. are to include for pointing to exposed edges and projecting soffits.

No distinction has been made for brick or concrete surfaces.

TRANSITION TRIMS:-
Aluminium Wide Tile-In Ramp splayed transition trims to be used at junction between ceramic / porcelain tiles and vinyl sheeting.

MOVEMENT JOINTS:-
Aluminium Structural Screed joints bolted to slab to be capable of total movement of minimum of 5mm either way with flexible PVC Hospital Insert.
Movement joints to be in high traffic area's as "Migua" FV35/1500 or "Kirk" ASSJ390H of approved height with hospital insert bolted to slab before screeding.
Metal movement joints in low traffic area's with hospital insert strips..

15. DRAINAGE AND PLUMBING

GENERALLY: —The Standard Preambles for other trades, with reference to Excavations, Concrete, Brickwork and Plastering, and, in particular for the full description intent and meaning of the classification for excavations, are to apply equally to this trade.

LICENSED DRAINLAYERS AND PLUMBERS: — Only licensed drain layers shall be employed on any drainage work and licensed plumbers on plumbing work.

SUBSOIL DRAINS

Unplasticised polyvinyl chloride (UPVC) slotted drainage pipes and fittings: — shall be of approved manufacture jointed in accordance with the manufacturer's instructions.

Pitch-fibre perforated or slotted drainage pipes and fittings: shall comply with SANS Specification 921 and shall be jointed in accordance with the manufacturer's instructions.

Filter fabric: — shall be non-woven, spun bonded, needle punched and continuous polyester fabric, resistant to the effects of alkalis, acids, saline solution and sunlight.

STORMWATER AND SOIL DRAIN PIPES

Reinforced concrete non-pressured pipes: shall comply, with SANS Specification 677 and must be Type SC of the class specified with spigot and socket ends with rubber insertion ring or with ogee joints with approved rubber collars. Pipes must be marked with the manufacturer's name, trade name or registered trade mark, nominal bore, class and type, date of manufacture, the letter "R" denoting reinforced and the SANS mark. Joints shall be made in accordance with SANS Code of Practice 058.

Unplasticised polyvinyl chloride (UPVC) drain and sewer pipes and fittings: — shall comply with SANS Specification 791. Joins shall be made with fittings in accordance with SANS Code of Practice 058.

CONCRETE BEDS AND ENCASEMENT TO DRAIN PIPES: — Where pipes are required to be bedded on concrete, the bed of concrete shall be Class B, a minimum of 500mm wider than the diameter of the pipe, laid to correct falls and levels with recesses formed in same for pipe joints including all necessary formwork and any additional excavation. The barrel of the pipe shall then be bedded on a thin cement mortar (1:3) bed and laid to falls. After jointing, the recesses previously formed shall be filled in with concrete Class B and the haunching or surrounding completed.

Where pipes are fixed vertically they shall be encased in concrete Class B having a minimum thickness of 150mm around the pipe and carried up to ground level and shall include for any necessary formwork.

PIPE LAYING: — All drain and sewer pipes are to be laid to a straight line to even gradients and jointed in accordance with SANS Code of Practice 058 except in the case of polyethylene or unplasticised polyvinyl chloride drain and sewer piping which is to be in accordance with SANS Code of Practice 01 12.

Before laying, each pipe shall be examined to ensure that the bore is clean and free of any foreign matter and shall be tested for soundness by striking with a wooden mallet, and any cracked or damaged pipes shall be rejected. Ends of all pipes must be clean before

jointing. Immediately after jointing a tight fitting wad or scraper shall be drawn several times through the bore of the pipe to ensure that it is left clean and free from obstructions. Whenever work is suspended, the open ends of pipes and junctions must be temporarily plugged to prevent the entrance of rubbish during construction.

GULLEY TRAPS: — Gulley trap assemblies must be of the material specified with "P" or "S" trap, jointed to drain and with hopper head with vertical and side inlets, the head fitted with 190mm diameter cast iron gulley grating complying with SANS Specification 1115 laid loose in socket. The trap, hopper head and vertical pipe shall be set on and encased in concrete Class B having a minimum thickness of 150mm at any one part, carried up 75mm above ground level as kerb, dished down to grating and finished on all exposed surfaces in 1:3 cement plaster with angles rounded, including necessary excavation and formwork.

GREASE TRAPS: — Grease trap assemblies of vitrified clay must consist of outlet junction jointed to trap with side inlet. Access openings of trap and junction shall be fitted with vitrified clay stoppers laid loose in socket of trap and set in bitumen in socket of junction. The trap and junction and vertical pipe shall be set on and encased in concrete Class B having a minimum thickness of 150mm at any one part, carried up 75mm above ground level as kerb, dished down to grating and finished, on all exposed surfaces in 1:3 cement plaster with angles rounded, including necessary excavation and formwork.

RODDING EYES: — Where pipes are carried up in ramps for rodding eyes, the head of the pipe at ground level must be fitted with an **"A.B.C."** cast iron cover and frame, complying with SANS Specification 746, jointed to pipe, the frame rebated for and including cover with raised letters "CE" cast on same, secured to frame with gun-metal screws and with the whole encased in concrete Class B having a minimum thickness of 150mm at any one part, carried up 75mm above ground Level and finished on all exposed surfaces in 1:3 cement plaster with angles rounded, including necessary excavation and formwork,

INSPECTION EYE BLOCKS: — Where inspection eye fittings are provided in pipelines, the position of these inspection eyes must be registered and demarcated with concrete Class C. block size 300 x 300 x 50mm thick finished on all exposed surfaces with 1:3 cement plaster with angles rounded and with sunk letters "I.E." formed in top and set in ground, including necessary excavation and formwork.

SURFACE WATER CHANNELS: —Concrete open surface water channels shall be formed with concrete Class B with segmental channel formed in same to the size and shape specified and finished on exposed surfaces in 1:3 cement plaster, steel towelled to a smooth even surface with all angles rounded, cast in lengths not exceeding 2m and laid to falls, including necessary excavation and formwork.

GRATINGS FOR GULLEYS AND STORMWATER DRAINS AND CAST IRON SURFACE BOXES AND MANHOLE COVERS AND FRAMES: — Cast iron or Polymer gratings for gulleys and storm water drains shall comply with SANS Specification 1115 and SANS 1882:2003 respectively.

Cast iron surface boxes and manhole covers and frames shall comply with SANS Specification 558.

All cast iron gratings, cast iron surface boxes and cast iron manhole covers and frame must be coated with approved preservative solution before leaving the manufacturer's works.

The masses stated are the combined mass of the grating and frame or the combined mass of the cover and frame.

STORM WATER SUMPS, JUNCTION BOXES, MANHOLES, INSPECTION CHAMBERS, CABLE INSPECTION CHAMBERS AND VALVE CHAMBERS: — shall be of the internal size specified and are to be constructed of one brick sides, unless otherwise specified, built in 1:3 cement mortar on a 150mm thick concrete Class C bottom and finished on top with an 85mm thick pre-cast concrete Class C cover slab, reinforced as detailed and bedded in

cement mortar. The cover slab, except to junction boxes, is to have a rebated opening formed in same, suitable for and fitted with a cast iron orating and frame, or cover and frame, of the size and mass specified with the frame bedded in cement mortar. The bottom of the sump, manhole, etc. and the exposed surfaces of the cover slab are to be finished smooth in 1:3 cement plaster with angles rounded. The internal brick surfaces are to be faceḍ with smooth facing bricks and pointed with flush joints.

Inspection chambers and manholes with an invert not exceeding 1m shall have an internal dimension of 470mm x 700mm and those exceeding 1m shall have an internal dimension of 920mm X 920mm. Where the invert of the hole exceeds 1m, a 150mm thick reinforced concrete Class C corbel slab, reinforced as detailed, with opening size 470mm x 700mm formed in same and finished smooth off the formwork, is to be built into the brick sides at a height not exceeding 1, 5 inches above the concrete bottom with the reduced manhole shaft built off the top of the corbel slab. Cast iron step irons spaced at 300mm staggered centres vertically are to be built into one side of all manholes with an invert exceeding 1m.

Where measured in number, rates for all sumps, manholes, etc. are to include for excavating to the depths required, taking precautions against collapse of sides of excavations, staging, ramming, pumping and baling to keep excavations free from water or mud, filling around and ramming and depositing and levelling spoil on site or carted away as directed. Ends of pipes are to be built through the sides of the sumps, manholes, etc. and rates are to include for this.

SOIL DRAIN MANHOLES AND INSPECTION CHAMBERS: —are to be of the internal diameter and inverts specified and are to be constructed of pre-cast reinforced concrete manhole ring sections with walls a minimum of 50mm thick, pre-cast reinforced concrete cover slabs and spacer pieces complying with SANS Specification 677. The joints for the ring sections shall be of the ogee type. The bottom shall be of concrete Class C-cast in-situ.

The placing of the concrete bottom and benching shall be carried out in three stages with the initial stage being the laying of the concrete bottom projecting 100mm beyond the external diameter of the manhole on which is laid the inspection eye pipe, branches, etc. The second stage comprises the laying of concrete within the manhole to the height of the pipes and around the perimeter of the bottom to a height of not less than 25mm above the collar of the pipe at the highest end. This annular base is to be shuttered to provide a horizontal setting for the first ring section which is to be firmly bedded in the wet concrete. The third stage comprises the laying of the benching within the initial ring section and finished in 1:3 cement plaster with all angles rounded. Thereafter, the ring sections of the required standard height are joined together to form the required depth, with all joints primed with “Bituprime” and sealed with “Bitujoint Putty”. A 125mm thick pre-cast reinforced concrete cover slab, rebated on underside to suit ring sections and with opening size 600mm x 600mm formed in same is to be bedded on top of the ring section. The shaft above the cover slab is to be constructed of either pre-cast reinforced concrete spacer units to suit the type of cast iron cover and frame specified, or one brick kerb walls faced internally with smooth facing bricks jointed with flush joints, and finished on top with an 85mm thick pre-cast concrete Class C cover stab, reinforced as detailed and bedded in cement mortar with the exposed surfaces finished smooth in 1:3 cement plaster with all angles rounded. The cover slab is to have a rebated opening formed in same suitable for and fitted with cast iron cover and frame of the size and mass specified, with the frame bedded in cement mortar.

MANHOLE COVERS AND FRAMES:- Cast iron, Concrete or Cultured Polymer covers and frames to be suitable for the area of usage.

SOAK PITS: — shall be of the lengths and widths specified and shall be a minimum of 900mm deep below the invert of the inlet pipe. A perforated pitch-fibre drainpipe, jointed to the inlet pipe and with other end capped, is to be laid level in a 19mm stone packing of a minimum thickness of 15mm below and at sites of pipe and a minimum thickness of 150mm below the top of the pipe. The remainder of the soak pit is to be filled with stone graded

from 50mm to 75mm, to a level of 50mm above the top of the pipe. The stone is to be covered with corrugated asbestos cement sheets extending 150mm beyond the walls of the soak pit all round. The trench shall be backfilled above the sheeting to a minimum depth of 300mm lightly rammed with the final 100mm of backfilling being approved topsoil from the excavations.

SEPTIC TANKS: —shall be of the internal sizes specified and are to be constructed of one brick sides built in 1:3 cement mortar on 150mm thick concrete Class C bottom laid to falls. A half brick baffle wall finished 75mm below underside of concrete cover slab and with opening size 150 x 150mm high formed in wall is to be built in 1:3 cement mortar on the concrete bottom. A 115mm thick reinforced concrete Class C cover slab, reinforced as detailed, is to be cast in-situ on removable formwork and is to have two openings formed in same, each suitable either for and fitted with 600 x 450mm x 38 kg cast iron single seal manhole cover and frame, or for the shaft of the inspection chamber built off the cover slab in one, brick walls in 1:3 cement mortar with smooth face bricks internally, finished on top with 85mm thick pre-cast concrete Class C cover slab, reinforced as detailed and rebated for and fitted with 600 X 450mm X 38-kg cast iron single seal manhole cover and frame. The bottom and sides of the septic tank are to be finished in 1:3 cement plaster, 19mm thick, with an approved waterproofing compound added, with all internal angles coved to 50mm radius. Inlet and outlet chambers attached at either end of the septic tank shall be size 600 x 450mm internally, of the depth required and each shall be constructed of one brick walls built in 1:3 cement mortar on a concrete Class C bottom 150mm thick, or where extended above the top of the septic tank cover, built off the cover and finished on top with 85mm thick pre-cast concrete Class C cover slab, reinforced as detailed and bedded in cement mortar with the exposed surfaces finished smooth in 1:3 cement plaster with angles rounded. The cover slab is to have a rebated opening formed in same suitable for and fitted with a 600 x 450mm x 38 kg cast iron single seal manhole cover and frame. Chambers shall be provided with inspection eye pipes or bends, straight or curved channel sections, benched up to sides of chambers in concrete Class C, finished in 1:3 cement plaster with all angles rounded.

The inlet and outlet of the septic tank shall be formed of cast iron square junction piece with tail-pipe extending 300mm below water level in tank, built in through end walls and jointed to channels in inlet and outlet chambers.

TESTING OF DRAINS, MANHOLES AND INSPECTION CHAMBERS: — All drains, manholes and inspection chambers with the exception of subsoil drains shall be constructed so as to be watertight. No trenches shall be backfilled or pipes encased in concrete until the drains have been tested and approved. Any drains covered by the Contractor prior to testing shall be exposed at the Contractor's expense.

The Contractor shall give at least 24 hours notice of any particular length between manholes ready for testing. The drains shall not be tested until a period of 24 hours, or such other period as may be required, has been allowed for the pipe joints to set. The Contractor shall provide all necessary testing apparatus, expanding plugs, stoppers, water and any other materials and all labour that may be required for carrying out the tests.

The whole of the drainage system shall be tested using one or more of the following tests:-

(a) **Visual test—** Each length of pipe shall be inspected for invert level grade, direction and line. Internal inspection of the bore of the pipes shall be made using mirrors and a powerful source of light. The drains must be free of invert lips and the bases of the pipes must be straight.

(b) **Air test** — All openings in the drain shall be plugged and sealed and all associated traps filled with water and air pumped into the drains until a manometric pressure of 40mm is indicated, after which, without further pumping, the pressure shall not drop below 25mm for a period of at least 30 seconds.
After the entire drainage system has been completed, all plumbing fittings installed and permanently connected up, and traps filled with water, a final air test shall be applied to the whole system.

(c) **Water test**— All openings-in the drain, except the highest one, shall be plugged and sealed and the drain filled with water so that every part of the system is tested under a head of water of not less than 1.5m and not more than 3.5m. After allowing period of 10 minutes for initial absorption, the amount of water it shall be necessary to add to maintain the water level over the next 15 minutes shall not exceed a rate of 25 litres for 100mm diameter pipe and 3,75 litres for 150mm diameter pipe for 100m of drain and an equivalent rate for larger drains. In carrying out the water test, the head of water shall be obtained by providing temporary pipes, fittings, etc. wherever necessary or by such other method as may be approved.

In cases where the maximum head of water, owing to the gradient of the drains, would be exceeded in any section, inspection eyes at suitable intervals may be provided and the drain plugged, in order not to subject the lower portion of the drain to a greater head of water than that required. Drains must be free of air before testing.

(d) **Manhole and Inspection Chamber test** — The inlet and outlet pipe hose shall be plugged and sealed and the inspection chamber filled with water. After allowing the water to stabilise due to absorption, the water level should not fall more than 5mm in *2* hours.

DEFECTS TO BE MADE GOOD: — Should the drain system fail to withstand the above tests, all defects shall be made good and the tests repeated at the Contractor's expense until the whole system is sound and passed to the satisfaction of the Department. In making good, all defective parts shall be cut out and replaced with new. No patching of pipes, joints or connections will be permitted.

SHEET METALWORK: — generally is to be lapped 75mm at ends and 150mm at angles, unless otherwise specified. Rates for sheet metalwork shall include for all labour, cutting and waste, laps, seams, welts, angles, clips, tacks, soldered dots, riveting, soldering, brazing, burning, nailing, dressing and wedging as required. All measurements are net with no allowance being made for laps, seams, welts, angles, clips and tacks or waste in cutting. Where stepped flashings are described as to flat slope, the pitch of the roof to which they apply does not exceed 40 degrees

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(a) **Galvanized sheet iron**: — shall be of an approved brand of the thickness specified after galvanising and having a galvanized coating of "Iscor Coating Designation Z450". Corroded or otherwise defective sheets shall not be used. All nailing or screwing shall be done with galvanized nails or screws.

(b) **Sheet aluminium**: — shall be of the thickness and quality specified. All nailing shall be done with aluminium alloy nails and all screwing done with stainless steel screws.

(c) **Sheet copper**: — shall be cold rolled sheet of the thickness and temper specified. Sheet copper for covering flat roofs and for valley and gutter linings, flashings, soakers, etc. shall be of dead-soft temper and for eaves gutters, rainwater pipes and other unsupported or semi self-supported work shall be of half-hard temper. All nailing shall be done with copper or copper alloy nails and all screwing done with brass screws.

(d) **Sheet lead**: — shall be best milled sheet lead of the full mass specified and of equal thickness throughout and must comply with SANS Specification 1178.

LININGS TO VALLEYS: — shall be of the material specified, lapped 200mm at ends and dressed up on to purlins or battens at sides of valleys with edges bent back to form open beads.

LININGS TO SECRET GUTTERS: — at back of chimney stacks and wall abutments and at raking intersections of walls and roofs shall be of the material specified, turned 100mm up vertical surfaces and dressed 250mm up roof slope and on to purlin or batten at edge.

SOAKERS: — to slate covered roofs shall be of galvanized sheet iron or sheet copper of 0.6mm thickness, 450mm wide to closed valleys and 250mm wide to raking intersections of roofs with vertical wall and chimney stack abutments and turned 75mm up vertical surfaces. Soakers shall be 75mm longer than the gauge of the slate roofing.

UNDER-FLASHINGS: — to all iron roofs and where specified to slate or tiled roofs shall be 0.6mm thickness galvanized sheet iron. Flashings to asbestos cement roofs shall be asbestos cement preformed units fitted in accordance with the manufacturer's instructions. Where specified, copper flashings shall be formed from sheet of 0.6mm thickness and aluminium flashings shall be formed from 1200-H4 quality sheet of 0.6mm thickness. Lead flashings, where specified, shall be formed from sheet having a mass of 24 kg/in 2.

COVER FLASHINGS: — shall be either galvanized sheet iron, copper or aluminium, as specified, of 0.6mm thickness fitted over under-flashing, stepped where required on rake and with top edge bent and wedged 25mm deep into joint of brickwork or groove formed in concrete face and flush pointed in 1:3 cement mortar.

FLASHINGS AROUND PIPES THROUGH ROOF COVERINGS

(a) Pipes through preformed sheet steel roofing shall be flashed around with 0.6mm galvanized sheet iron apron pop-riveted to top of roofing wit edges cut and dressed to profile of roofing, soldered all round and with conical sheet iron 'u' stand, riveted and soldered at joint and at base to apron. The top of the conical upstand is to be fixed around the pipe with 25mm x 3mm galvanized mild steel strap wrapped around the pipe and fixed with a galvanized steel gutter bolt.

(b) Pipes through fibre cement roofing shall be flashed around with 24 kg/in 2 lead a on dressed into corrugations, bedded in mastic and bolted to roof sheeting with galvanized steel gutter bolts and with conical lead upstand, wiped on at joint with apron, and secured around pipe with copper wire.

(c) Pipes through slate or tile roofing shall be flashed around with 24 kg/in 2 lead apron dressed to profile of slates or tiles with top edge of lead apron dressed over back edge of slate or tile under overlap of slates or tiles. A conical lead upstand, wiped on at joint with apron, is to be secured around the pipe with copper wire.

(d) Pipes through pre-printed or embossed sheet steel or aluminium roofing shall be flashed around with flexible glass-fibre reinforced waterproofing dressed to profile of roofing, pop-riveted around edges to roofing and dressed up and around pipe. The waterproof is to be finished in a colour to match that of the roofing material.

RAINWATER PIPES

GENERALLY:

Full bore outlets for flat roofs are not allowed. Where flat roofs are specified, it is preferred to have a drain along the edges into a common outlet. Where roof cover is of 'Chromodek' sheets, the preferred guttering is of the same material in the same colour in continuous lengths.

(a) **Unplasticised polyvinyl chloride (UPVC) rainwater pipes and accessories** shall comply with SANS Specification 967 and must be fixed clear of the finished wall face on stock pattern brackets in accordance with the manufacturer's instructions.

(b) **Galvanized mild steel rainwater pipes**, shall be medium quality screwed and socketed normalised welded mild steel pipes, galvanized inside and outside, and shall comply with SANS Specification 62.

Fittings for galvanized mild steel pipes shall comply with SANS Specification 509. The screwed joints must be made with lead paint and hemp or approved thread sealing tape. The pipes must be fixed clear of the finished wall face with galvanized cast iron hinged

holderbats built into walls at not exceeding 2m centres in 1:3 cement mortar.

EAVES GUTTERS

a) **Galvanized sheet iron gutters, rainwater heads, etc.** shall be formed from 0.6mm sheet and must have beaded edges with all laps riveted and soldered. Corners must be reinforced with 0.6mm X 50mm wide galvanized sheet iron strips and must be soldered across the inside of the angles.

Gutters must be laid to even falls on approved galvanized mild steel gutter brackets screwed to roof timbers at approximately 1m centres. Half round pattern gutters shall be bolted to each bracket with 6mm galvanized gutter bolt fitted close to the beaded edge. Rectangular pattern gutters shall be fixed at each bracket with galvanized mild steel long-screw with 1mm thick galvanized sheet iron spacer tube.

(b) **Fibre cement gutters and accessories** shall be of approved manufacture, not less than 6mm thick, with spigot and socket joints made in an approved mastic compound in accordance with the manufacturer's instructions. Gutters must be laid to even falls on approved aluminium alloy or stock asbestos cement brackets screwed to roof timbers at the manufacturer's recommended spacings.

(c) **Unplasticised polyvinyl chloride (UPVC) gutters and accessories** shall comply with SANS Specification 11 and must be laid to falls and fixed on brackets in accordance with the manufacturer's instructions.

SANITARY PLUMBING AND FITTINGS, WASTE, VENTILATION AND ANTI-SIPHON PIPES

(a) **Unplasticised polyvinyl chloride (UPVC) pipes and fittings** shall be of approved manufacture marked with the manufacturer's name and trade name, the nominal bore and the South African Bureau of Standards mark and shall comply with SANS Specification 967. Joints shall be made with injection moulded fittings in accordance with the manufacture's instructions and SANS Code of Practice 0112. The pipes must be fixed clear of the finished wall face with aluminium alloy holderbats fitted with plastic cushion strips with the holderbats fixed to plugs in wall.

(b) **Polypropylene pipes and fittings** shall be of approved manufacture and shall have a mechanical form of jointing. Pipes and fittings are to be fixed and jointed in accordance with the manufacturer's instructions.

(c) **Multilayed pipes** shall be of approved manufacture and shall have a mechanical form of jointing. Pipes and fittings are to be fixed and jointed in accordance with the manufacturer's instructions.

SANITARY FITTINGS: — All sanitary ware must comply with SANS 497 Specifications and be fitted with Ball-O-Cock valves in supply lines.

Wash hand basins shall be of white glazed fireclay or vitreous china of the type and size specified. Basins shall have an integral overflow to non patient treatment facilities and be fitted with 32mm chromium plated waste union with flange and grating, rubber plug on chromium plated brass chain and, where required, tap hole stopper cemented in.

WC pans shall be of white glazed fireclay or vitreous china of the type specified with 'S" or "P" trap with straight or side outlet and shall be fitted with single or double flap plastic seat as required, secured to pan with concealed brass holding down bolts. Pans shall be bedded on the concrete floors in 1:3 cement mortars. Pans in seclusion rooms and other public areas to be 'Gypsy' vandal proof – or other approved.

Glazed ceramic urinals of the bowl or stall type shall be of white glazed fireclay or vitreous china. Bowl urinals shall be fitted with 40mm chromium plated waste union, with flange and

domical grating and with spreader with flush pipe connector. Stall urinals shall be fitted with 75mm chromium plated waste union with flange and hinged domed grating and with spreader with flush pipe connector.

Flushing cisterns shall be as specified, either of white porcelain enamelled cast iron, white glazed fireclay, vitreous china or black plastic complying with SANS Specification 821, each with body and cover. Cisterns shall be a maximum of 11 litre capacity and the flushing apparatus shall be of brass, copper or other corrosion resistant metal, PVC or other approved plastic or of an approved ceramic material. All cistern lids must be able to be **screwed** down. Connections for flush pipe, inlet and overflow pipe must be provided in the body. Cisterns shall be fitted with 15mm brass ball valve with copper, PVC or polystyrene ball and with either chromium plated operating lever handle or galvanized steel pull chain and handle. A galvanized, white enamelled or chromium plated steel or copper flush pipe, of the required length, as specified, is to be jointed to the flush pipe connection on the body of the cistern and in the case of WC pans is to be fixed to the inlet of the pan with an approved patent adaptor. From the overflow connection on each cistern a 22mm copper overflow pipe, bent as required, shall be taken through wall to discharge externally, with ends splay cut and projecting 50mm beyond wall face, or where this is not possible, bent to discharge into WC pan.

Baths shall be enamelled cast iron baths of the type and size specified, holed for and fitted with chromium plated brass overflow union with grating, 40mm chromium plated brass waste union with flange and grating, rubber plug on chromium plated brass chain and fitted with adjustable cast iron feet. The fall along bottom of baths from head ends to outlets must be adequate for complete emptying.

Stainless steel sinks and drainers shall be of the types and sizes specified with exposed surfaces buffed to a satin finish and sound deadened on underside by application of an approved sound deadening coating. Splashbacks with tiling keys shall be provided at back and at ends against walls or as specified. Sink bowls are to be pressed out of single sheets with complete drainage to outlets and each bowl is to be fitted with integral built-in overflow with chromium plated brass grating and 40mm recessed waste outlets with chromium plated brass waste union with grating, rubber plug and chromium plated brass chain. Sink bowls, unless otherwise specified, are to be 450 x 355 x 140mm deep. Drainers are to be pressed out of single sheets and are to have pressed flutes to give complete drainage.

(a) For domestic use — Sinks shall comply with SANS Specification 242 and shall be manufactured from A.I.S.I. Type 430 stainless steel 0.8mm thick for units not exceeding 2,4m long and from stainless steel 1.2mm thick for units exceeding 2,4m Long. -

(b) For hospital use and laboratories — Sinks shall be manufactured from A.I.S.1. Type 304 stainless steel 0.9mm thick for units not exceeding 2.4m long and from stainless steel 1.2mm thick for units exceeding 2.4m long.

Stainless steel wash hand basins and wash troughs shall be of the types and sizes specified complying with SANS Specification 906, with exposed surfaces buffed to a satin finish and sound deadened on underside by application of an approved sound deadening coating. Each basin or wash trough in non patient treatment area's are to be fitted with integral built-in overflow with chromium plated brass grating and 40mm recessed waste outlet with chromium plated brass waste union with grating, rubber plug and chromium plated brass chain.

Stainless steel urinals shall be of the types and sizes specified complying with SANS Specification 924 and shall be manufactured from A.I.S.I. Type 304 stainless steel, 1.2mm thick, buffed to a satin finish and sound deadened at back by application of an approved sound deadening coating. The back and sides of urinals are to be made rigid by means of integral pressed ribs or by bowing. Edges at sides and top are to have plaster key. Tread plates are to be ribbed and the front edges are to be stiffened and bent to form key for floor finish. The trough shall be a minimum of 125mm wide and half round in section with all corners radiused and shall fall to ensure complete drainage to 75mm recessed outlet with

chromium plated domed hinged grating and frame.

RATES FOR SANITARY WARE: — shall include for the supply and fixing of the units as specified and for cleaning, washing and leaving in a satisfactory condition on completion.

BELOW GROUND WATER RETICULATION

Unplasticised polyvinyl chloride (UPVC) piping and fittings shall be of approved manufacture complying with SANS Specification 966. Pipes must be of the class specified and must be marked with the manufacturer's name, trade name or registered trademark, nominal diameter, class reference and the SANS mark. Pipes shall be laid and jointed in accordance with the manufacturer's instructions.

High density polyethylene (HDPE) piping shall be of approved manufacture complying with SANS Specification 533 and shall be of the class specified, laid and jointed in accordance with the manufacturer's instructions. Piping must be jointed with compression fittings with compression rings and coupling nuts.

High Density Polyethylene / Polypropylene / Multilayed piping shall be of approved manufacture, complying with SANS Specification 15875-1-2004 & 2/2003 & 1315, laid and jointed in accordance with the manufacturer's instructions.

Copper piping shall be of approved manufacture complying with SANS Specification 460 and shall be of Class 2. Pipes must be jointed with brass compression fittings with compression rings and coupling nuts complying with SANS Specification 1067 Part I Type 'A'. Copper piping must be bent, where required, with an approved bending machine.

ABOVE GROUND WATER SUPPLIES

Colour Coding Cold Water Supply the exposed piping for this non potable (recycled) water shall be colour banded Brilliant Green (B49) / Yellow Band(H10).
The other exposed piping for potable (drinkable) water shall be colour banded Brilliant Green (B49) / Blue Band(F29)

Galvanized mild steel piping for water supplies shall be medium quality screwed and socketed normalised welded mild steel pipe, galvanized inside and outside, and shall comply with SANS Specification 62.

Fittings to galvanized mild steel piping shall be steel pipe fittings complying with SANS Specification 62 or malleable cast iron fittings complying with SANS Specification 509.

Copper piping shall be of approved manufacture, complying with SANS Specification 460 and shall be of Class 2 – fixed and jointed in accordance with the manufacturer's instructions. Class 2 copper piping must be jointed with brass compression fittings with compression rings and coupling nuts complying with SANS Specification 1067 part I Type 'A'.

Polypropylene / Multilayed Piping shall be of approved manufacture, complying with SANS Specification 1315, laid and jointed in accordance with the manufacturer's instructions. This applies to hot and cold water supply within ceiling spaces also.

Stainless steel piping shall be of approved manufacture, complying with SANS Specification 4127 and shall be A.I.S.I. Type 304 L. Fittings to stainless steel piping not exceeding 50mm nominal bore shall be brass compression fittings with compression rings and coupling nuts.

Piping exceeding 50mm nominal bore shall be welded piping with 1.5mm wall thickness, unless otherwise stated, and of A.I.S.I. Type 316 stainless steel. Joints are to comprise approved A.I.S.I. Type 316 stainless steel pressed collars welded to ends of pipes and fittings with loose galvanized mild steel slip-on flanges complete with galvanized mild steel bolts, nuts and washers, and neoprene gaskets. Fittings must be A.I.S.I. Type 316

stainless steel butt weld fittings.

Phosphoric acid based fluxes must be used for all welded joints which are to be argon arc TIG welded using Type 316 filler rods, with the welds treated with suitable pickling compound.

WATER TAPS AND VALVES: — Water taps, stopcocks, ball-o-cocks and wheel valves shall be of approved manufacture complying with SANS Specification 226.

Ball valves with brass valve and copper or plastic ball float shall be of approved manufacture complying with SANS Specification 1056. Plastic floats when supplied, must comply with SANS Specification 1006.

Full Bore Teflon Seated Ball Valve shall be of approved manufacture complying with SANS Specification 664. Valves shall be clockwise closing with non-rising, cap-fitted spindles and flanked connections and of the class specified.

Pressure reducing valves shall be of approved manufacture complying with SANS Specification 198.

FIXING OF WATER PIPES: — Galvanized mild steel water piping shall be fixed, unless otherwise described, to walls or ceilings with galvanized malleable iron holderbats (school board pattern), built into walls in 1:3 cement mortar. Pipes shall be fixed to timber work with galvanized mild steel pipe clips screwed on.

Copper and stainless steel water piping shall be fixed, unless otherwise described, to walls or ceilings with brass holderbats (school board pattern) built into walls in 1:3 cement mortar. Pipes shall be fixed to timber work with brass or copper pipe clips screwed on.

Polypropylene / Multilayed Piping - shall be fixed to walls according to manufacturers recommendations.

CONCRETE THRUST AND ANCHOR BLOCKS: — shall be of the sizes required and provided where directed to anchor the water pipelines against the thrust due to hydrostatic pressure. Concrete blocks shall be cast against the undisturbed face of the excavation. Backfilling behind the thrust face of the block will not be permitted.

TESTING OF WATER MAINS: — The whole of the water reticulation shall be subjected to a hydraulic test pressure 1.5 times the maximum working pressure of the pipeline. Testing of pipelines may only commence after the installation of all anchor blocks, valves and fittings have been completed. Testing shall be carried out between installed sluice valves whenever possible. Where this is not possible the ends of the pipes shall be sealed with end caps properly held in place with temporary props.

The tests shall be carried out on lengths not exceeding 300 metres.

The pipeline shall be filled from the lowest end in order to expel the air at the upper end through special taps or through service connections, stand pipes, etc. When full the line shall be allowed to stand for 24 hours and any further accumulated air shall be expelled. The full test pressure shall then be applied and maintained for one hour, during which time the line will be examined for any leaks, movement at anchors and other defects.

Any defective work is to be taken out and replaced at the Contractor's expense and the whole retested until found satisfactory.

The Contractor shall provide all necessary testing apparatus, temporary end caps, plugs, stoppers, special taps and any other materials that may be required, and all labour for carrying out the tests.

EXCAVATIONS FOR PIPE TRENCHES: — Excavations for pipe trenches, gulley traps, manholes, inspection chambers, valve, chamber, soakpits and septic tanks shall be to the

depth and gradients shown on the drawings using sight rails and boning rods and shall include for taking precautions against collapse of sides of excavations, staging, pumping and baling to keep the excavations free from water or mud and for filling in and ramming.

The bottoms of pipe trenches are to be excavated to even falls. The barrel of the pipe, except where it is laid on a sand or concrete bed, must rest on solid ground and hand-holds of sufficient size must be cut under pipe joints to enable the jointing and filleting to be properly performed. Any excavations taken out deeper than required shall be made up to the correct grade with well rammed earth. In intermediate or hard rock excavation and where a bedding is not specified, the trench bottom must be excavated 100mm deeper than required for the grade and be backfilled with well rammed earth.

The Contractor is to notify the Department when the trenches are ready for inspection and approval. Any work put in hand before approval has been given shall, if so required, be replaced with new at the Contractor's expense.

Notwithstanding such approval of the trench bottoms, any excavations which become waterlogged or otherwise spoilt after approval, shall be cleaned out and reformed at the Contractor's expense and to the satisfaction of the Department before any piping or sand or concrete beds are laid.

Depths of excavations as approved shall be checked and recorded by a Departmental Official and the Contractor before excavations are filled in.

For the purpose of any measurement, whatever size may have been excavated, excavations are taken as follows: — Trenches not exceeding 0.75mm deep shall be taken 0.5m wider than the internal diameter of the pipe. This width shall be increased by 75mm for each successive depth of 0,75m to a maximum of 1m wider than the internal diameter of the pipe.

BACKFILLING: — No trench shall be backfilled until the Department is satisfied that the works therein have been satisfactorily completed, tested and are ready for backfilling.

The backfilling around and 300mm above the pipe is to be of approved selected material, imported if necessary, free from rock or stone, carefully packed, watered and lightly rammed equally on either side of the pipe and then filled in above this level with suitable material from the excavations, watered and compacted in layers not exceeding 300mm thick with the top 300mm consolidated to dry density of not less than 95% MOD. A.A.S.H.O. density. Topsoil from the excavation is to be set aside and used in the final layer of backfilling.
Any disturbance of or damage to the pipes during backfilling must be made good by the contractor at his own expense.

All spoil from the excavations for trenches, etc. shall be deposited and levelled on site or carted away as directed. Any subsidence or depressions below the level of the adjacent ground shall be filled in, as and when necessary, until the end of the maintenance period.

SIZES OF PIPES: The diameters stated for galvanized mild steel piping, cast iron piping, vitrified clay piping and asbestos cement pressure piping (C.I.D.) are the nominal internal diameters. The diameters stated for all other pipes are nominal external diameters.

In the case of piping and fitting which are manufactured in imperial diameters, the size nearest the metric equivalent must be used.

RATES FOR PIPES: — Rates for all pipes, gutters, channels, etc. are to include for couplings in running lengths, joints, short lengths and cutting and fixing as required. Rates for mild -steel pipes shall include for all plain sockets and nipples. Where fittings have reduced ends or branches the fittings are described as "reduced" and the largest end or branch has been stated. The Contractor may use equal fittings with reducers or bushings if he so desires, but no claim for extras in this connection will be entertained.

Rates for pipes fixed to walls, soffits of slabs, roof timbers, etc. are to include for all

brackets, holderbats, pipe clips and approved extended hangers where pipes are required to be laid to falls and for plugging and screwing or for cutting and pinning or building in tails of holderbats.

Rates for piping are to include for cleaning down at completion, and in addition, the rate for stainless steel pining is to include for polishing exposed piping, all to the approval of the Department.

RATES FOR CHASES, HOLES ETC.: — are to include for making good to approval. The term “hole” is to include for sleeves where required through concrete work.

FIRE EXTINGUISHERS: — Where specified, carbon dioxide gas type fire extinguishers shall be 2.26kg type, complying with SANS Specification 889 and fixed in position on wall brackets screwed to and including 20mm thick chamfered and oiled wrot hardwood backboard, size 450mm x 100mm screwed to plugs in wall.

Where specified, dry powder type fire extinguishers shall be of 10 litre capacity, complying with SANS Specification 810 and fixed as before described on backboard size 1000mm x 200mm.

FIRE HOSE REELS: — shall be non-swinging rotary fire hose reels, complying with SANS Specification 543, with solid side discs and 25mm waterway at bracket incorporating rotary pressure joint to hose connection at hub and fitted with 25mm screwed malleable iron ‘Sanders type A’ valve with “S” grade diaphragm, connection for supply pipe with the handwheel clearly marked in red with arrows and the words “OPEN”, “OOP”.

The reel is to be secured to the wall with and including three steel anchor bolts and fitted with 30m length of 20mm internal diameter best quality reinforced red rubber non-kinkable hose with one end fixed to wheel hub connection and the other end fitted with 20mm chromium plated gunmetal adjustable “Centorium” type nozzle with hose threaded through and including chromium plated hose guide, designed to permit the hose to run out in any direction and the nozzle supported on and including chromium plated bracket fixed to wall.

For ease of removal, a union shall be installed between the valve and the reel.

FIRE HYDRANTS: — shall be of the wheel valve pattern with instantaneous coupling outlets, size 63.5mm or 70mm as stated on the drawings. Hydrants fixed in a horizontal position shall have oblique angle outlets and those fixed in a vertical or inclined position shall have right angle outlets. The materials used in the manufacture of the hydrants shall be as laid down for the manufacture of couplings, branch pipes, etc. in SANS Specification 1128, and the various requirements of instantaneous couplings and dimensions for 70mm outlets shall comply with the requirements for Morris instantaneous pattern couplings.
The valve spindle shall have a minimum diameter of 22mm with swivelling clack at one end fitted with first quality dexine or other approved washer, bedded on to a raised seat not less than 6mm wide, and the other end shall be machined to form a square shank of 15mm minimum thickness and a length corresponding with the thickness of the boss of the handwheel, the portion protruding from the boss shall be threaded and fitted with a washer and nut to hold the handwheel firmly in place. Valve inlet shall be male screwed 80mm Whitworth pipe thread, and outlet shall be fitted with approved India-rubber coupling gasket. The internal diameter of the valve body shall be not less than 95mm in the case of 63.5mm outlets or 100mm in the case of 70mm outlets.

The valve hand wheel shall have an overall diameter of 165mm and the rim shall be of oval cross-section and shall have the words “OPEN” and “OOP” together with direction arrows embossed on the face.

All hexagonal faces shall be machined and all exposed surfaces of the valve and the wheel periphery shall be buffed and polished. Parts of the wheel not polished shall be painted two coats bright red high gloss paint.

The completed hydrant valve shall be guaranteed hydraulically tested by the manufacture to a pressure of 35 bar and shall be badged or stamped accordingly with the manufacturer’s

name or symbol and the words “TESTED 35 bar”.

16. GLAZING

MATERIALS: — Glass shall conform to the requirements of the relevant current British Standards Specification for the respective materials.

Clear glass shall be float quality glass.

Silvered glass mirror to comply with SANS Specification 1236 Class A.

Toughened safety glass 15 to be “Armourplated” float quality safety glass of the thickness specified and as manufactured by Armourplate Safety Glass (Pty) Ltd. or other approved, and glazed to sashes, etc. in strict accordance with the manufacturer’s instructions.

All toughened safety glass is to have the manufacturer’s name or motif sand-blasted in one corner of each pane

Laminated safety glass is to be float quality normal strength glass, unless otherwise stated, and of the type specified and as manufactured by Shatterprufe Safety Glass Co. (Pty) Ltd., or other approved, and glazed to sashes, etc. in strict accordance with the manufacturer’s instructions.

All laminated safety Glass is to have the manufacturer’s name or motif sand-blasted in one corner of each pane.

All glass is to be free from imperfections and is to be left in a thoroughly clean condition on completion.

No glazing is permitted in Patient Treatment area’s below 1 (one) meter.

GLAZING: — The glazing and fixing of glass in buildings shall be in accordance with SANS Code of practice 0317.

Glass panes shall have adequate glazing clearance between edges of glass and the rebates.

Putty for glazing shall comply with SANS Specification 680 type 1 for glazing in wood and type 2 for glazing in steel. Putty for glazing in natural finished wood shall be tinted to match the colour of the wood. Putty to be mixed with a hardener to allow for painting within +/- 3 days. Putty for glazing in aluminium windows shall be tinted to match the aluminium or anodised aluminium where required.
All rebates, other than those in natural finished hardwoods, are to be primed before glazing. Glass fixed with glazing beads shall be well bedded in back putty in the rebates.

Putty shall be carefully trimmed and cleaned off with front putty worked to within 3mm of the sight lines.

RATES: — Rates for glass generally shall include for preparing the rebates, etc. all putty, sprigs, clips, etc. as required and all cutting.

Rates for toughened and laminated glass shall include in addition for all necessary spacing and setting blocks in accordance with the manufacturer’s requirements.

17. PAINTING

MATERIALS: — Proprietary materials where specified are to be of the brand specified or other approved by the Department.

All primers, emulsion paints, enamels, stains, varnishes, etc. are to comply with the relevant SANS Specification.

Paints, etc. shall be suitable for application on the surfaces to which they are being applied and those used externally shall be of exterior quality or suitable for exterior use.

For any particular work the priming coat and subsequent coats of paint are to be executed with paints from the same manufacturer and in accordance with that manufacturer's instructions.

The materials are to be brought to the site in unopened containers and no adulteration will be permitted, except thinners of a quantity and quality directed by the manufacturer.

The Department shall at all times be permitted to take samples for testing purposes from open containers of any brand of paint being used on the work.

All materials, if and when required by the Department, will be subject to tests by the South African Bureau of Standards, and the cost of such tests, should the material under test not meet the requirements of this specification, shall be borne by the Contractor. Fillers and stoppings are to be suitable for use with the material being filled or stopped and to the approval of the Department.

PREPARATORY WORK: — All new and existing surfaces are to be thoroughly dry and are to be cleaned of all dust, dirt, grease, oil, rust, scale, efflorescence, fungus, loose or flaking material, etc. rubbed down, stopped, filled, knotted and sanded smooth as required in accordance with the paint manufacturer's recommendations and to the approval of the Department prior to the application of paint, etc.

Ceilings are to have nail heads, including those to cornices and cover strips, primed and stopped up as necessary and rubbed down smooth.

Asbestos cement shall be primed with an approved alkali resistant primer before the application of subsequent coats which are not, in themselves, alkali resistant.

Iron, steel and other ferrous metals shall be cleaned in accordance with SANS Code of Practice 064 to remove rust, scale, grease, oil, etc. and the surface brought to a bright metallic condition.

Galvanized iron and zinc shall be cleaned in accordance with SANS Code of Practice 062 to remove the manufacturer's temporary protective coating, white rust, etc.

Other non-ferrous metals shall be thoroughly cleaned to remove all milling oils, temporary protective coatings, etc. and the surface abraded with fine water-paper and white spirit.

Woodwork to be painted shall have all knots and resinous areas treated with an approved knotting, the surface shall then be primed and all holes, etc. stopped and rubbed down smooth,

Woodwork to be oiled, stained, varnished, etc. shall be free of all stains, pencil marks and other surface discolorations and all holes, etc. stopped with tinted stopping and rubbed down smooth.

In preparing existing glazed sashes and sash doors, all loose putty is to be removed, the rebates primed and glass re-sprigged and re-puttied as necessary before the painting is commenced.

Previously distempered or lime washed surfaces to receive any other type of paint, are to have the existing distemper or lime wash completely removed by scraping or wire brushing and the surf aces treated with an approved bonding liquid.

Where existing paint film are in good condition any flaking or bared patches are to be properly feathered into the surrounding paint and spot primed as necessary.

Where existing paint films are in poor condition and require to be removed completely, they are to be removed by means of wire brushing, paint remover, burning off, or other approved method. Paint removers shall be free of wax and caustic substances and shall preferably be of water rinseable type. When burning off paint from wood, care must be taken to avoid charring the wood.

The final state of preparatory work to existing decorated surfaces shall in all cases produce in the finished decorated surfaces a condition similar to new work.

The Contractor will be held responsible for the proper and adequate preparation of the surfaces and any work which fails to meet the manufacturer's recommendations must be made good at the Contractor's expense to the satisfaction of the Department.

APPLICATION OF PAINTS, ETC.: — Painting may be carried out by brush, roller or spray as recommended by the manufacturer and to the approval of the Department. All paints, etc. are to be applied in strict accordance with the manufacturer's instructions. Each coat of paint is to be adequately and permanently keyed onto the previous coat or surface and shall be evenly distributed and continuous and shall dry to a smooth film, free from sags, runs or other imperfections. Each coat of paint is to be of a colour distinctive from previous or succeeding coats.

All painting must be done in accordance with a colour scheme which will be provided by the Department, and rates for painting etc. are to include for all cutting in of contrasting colours and masking as required. No distinction has been made where more than one colour of the same material is required on the walls or ceiling of the same room.

Samples of colours for the final coats are to be prepared in all cases to the approval of the Department and all work must be finished to the approved colours.

Backs of wood door and similar frames an the surfaces of other new or prefixed joinery in contact with brickwork, etc. and built in as the work proceeds, shall be primed or sealed before building in to prevent moisture seeping into the wood from the mortar bedding.

Tongued and grooved and rebated edges of boards in batten doors and other such like inaccessible parts of new joinery shall, before assembly, be primed, or where the joinery is to receive a finish other than paint, be given one coat of such other finishing material.

All new external structural timbers shall be primed before the timbers are fixed in position and shall include all surfaces such as backs of fascias and barge boards.

RATES: — Rates for painting, etc. are to include for all preparatory work, and where spraying is employed, are to include or adequately masking all surrounding areas.

Where diameters of pipes are stated these are the nominal internal diameters, and rates for painting pipes are to include for painting the holderbats, hangers, clips, etc. supporting the pipes.

Rates are to include for providing all necessary dust sheets, covers, etc. taking all necessary precautions to prevent marking the surfaces of joinery, walls, floors, glass, electrical fittings, etc. All surfaces disfigured or otherwise damaged shall be completely renovated or replaced as necessary to the approval of the Department at the Contractor's own expense.

18. ROADWORK

The Contractor is referred to the preambles for "Earthworks" with particular reference to the full description, intent and meaning of the classification for excavations and the preambles for "Concrete, Formwork and Reinforcement"

The construction of the roads is to be carried out by an approved Specialist Sub-Contractor in accordance with the following specifications and all to the approval of the Department.

SUB-GRADE: — All materials placed in the sub-grade layer which is defined as being the 150mm thick layer immediately below the sub-base or the base course (where no sub-base is specified), shall conform to the following specification: —

(a) Minimum C.B.R. at 93% Mod. A.A.S.H.O. density = 10 %

(b) Maximum C.B.R. Swell = 1.5 %

(c) Maximum Plasticity Index if:
more than 30% passes the 2mm sieve = 12
less than 30% passes the 2mm sieve = 16

The sub-grade layer in cut areas shall be treated in place either to achieve a uniform standard of compaction or to break up undesirable formations of hard rock.

In the case of materials other than hard rock, treatment in place shall consist of scarifying or otherwise loosening to a depth of 150mm and re-compacting to a density of 93 % Mod. A.A.S.H.O. where directed, with the material stabilised in place before compacting.

In hard rock, treatment in place shall consist of thoroughly loosening to a depth of 450mm by rip in or blasting and then sized by rolling or knapping until the maximum dimension of any spall shall be not more than 300mm.

Compaction of the rock in the sub-grade shall be achieved by spreading and sorting by bulldozer to a reasonable uniform thickness with sufficient fine material added to fill the voids and bind the surface.

Compaction shall be achieved by means of a vibratory roller until the Department is satisfied that the mass is sufficiently dense, to provide a stable sub-grade layer.

Density tests shall be carried out at the minimum rate of one test per every 500m^2 of sub-grade area or not more than 50m apart but not less than four tests for smaller areas and shall assess the full layer thickness. The costs of such control tests shall be included in the Contractor's rate for sub-grade treatment. The Department may; at its discretion, arrange for independent check tests to be performed, but the costs of the tests in this instance will be borne by the Administration.

Processing of the material will be measured under the relevant items. An approved total weed killer shall be applied during the formation of the sub-grade. The rate of application shall be in accordance with the manufacturer's specification.

Rates shall include for the supply, delivery, spreading and stabilisation with lime, if required, and compacting and shaping to correct lines and levels.

The lime and method of mixing and watering shall be as described in the specification for stabilisation.

SUB-BASE: — All material placed in the sub-base layer, which is defined as being that layer of 150mm thickness immediately below the base course layer, shall conform to the following specification: —

	Unstabilised	Stabilised
Minimum C.B.R. at 95 % Mod. A.A.S.H.O. density	70%	50%
Minimum C.B.R. Swell	0, 5%	0, 5%

Maximum Plasticity Index	10	10
Minimum Liquid Limit	35%	35%
Maximum size of aggregate	63mm	63mm
Material passing the No. 75 micrometer sieve shall not exceed	25 %	
Minimum relative compaction in place	95 % Mod. A.A.S.H.O.	

Combined coarse and fine sand density fractions shall exceed 35 % of the soil mortar

Unless otherwise specified, the responsibility for obtaining material that conforms to the above specification rests with the Contractor who will be required to perform his own tests to prove compliance, and to submit samples to the Department before the material is delivered on site. Further control tests will be required by the Department during the placing and compaction of the material, the locations of which will be selected at random.

Should the Contractor wish to use material from the site excavations, he shall first obtain the approval of the Department. His rates shall in this case include for the selection and stockpiling.

Density tests shall be carried out at the minimum rate as specified for the sub-grade layer.

The layer shall be finished off to present a uniform texture and tightly bonded surface.

Rates shall include for the supply, delivery, spreading and stabilisation with lime, if required, and compacting and shaping to correct lines and levels.

The lime and method of mixing and watering shall be as described in the specification for stabilisation.

The finished surface shall be within 20mm of the design level. The finished width shall not be less than the design width. The average of five thickness tests at the rate of one test for every 200m^2 of surface shall not be less than 150mm and at any point not less than 130mm.

The surface finish when measured under a 3m straight edge shall have no slacks or bumps greater than 5mm.

The cost of the density control tests shall be included in the Contractor's rate for sub-base construction. The Department, at his discretion, may arrange for independent check tests to be conducted, and the costs in these instances will be borne by the Administration.

STABILISATION: — The stabilisation agent shall be slaked lime of the calcium type conforming to the requirements of SANS Specification 824.

The rate of application shall conform to the design rate and all materials to be stabilised shall be approved by the Department before processing.

The material shall be spread in a uniformly thick loose layer over the full area and thoroughly dried by scarifying or blading with a grader to ensure exposure to the air of all particles and to ensure thorough mixing to obtain a uniform grading of the material.
When the material has been approved as being ready for stabilising it shall be lightly rolled to facilitate the spreading of the lime. The lime shall be evenly applied to the surface, preferably by mechanical spreader, at the specified rate and thoroughly mixed by rotavator or disc harrow until a uniform integrated mixture of uniform colour is obtained over the full depth of the layer.

Before mixing is commenced, the Contractor shall satisfy the Department that the lime has been applied at the specified rate.

Immediately after the lime has been mixed in, water shall be added in small increments by suitable watering equipment and mixed into the layer until the required water content has been obtained which shall not exceed the Mod. A.A.S.H.O. optimum plus 2%:

The efficiency of the spreading and mixing shall be measured by Lime Determination Test according to A.S.T.M.D. Test Number 3155/1973 or the California Test Method No. 338-B July 1996. Only where the result from every 15 tests at locations selected by the Department indicate that more than 90 % of the layer has a time content exceeding 60 % of the nominal lime content will the work be accepted, provided that the coefficient of variation shall not be greater than 25%.

The test positions shall be spaced at one for every 100m^2 of surface area, but shall not be spaced, greater than 20m apart

BASE COURSE: — When the sub-grade has been prepared and approved, the base course, consisting of one of the following, shall be formed to the compacted thickness specified.

Crusher Run Base Course
Crusher-run base course shall be fresh dolerite, hard blue tillite, quartzite, fresh granite, fresh basalt or other stone which meets the following specifications.

TABLE F: CRUSHER RUN BASE COURSE: STONE SPECIFICATIONS

Sieve Size	% Passing
37.5mm	100
26.5mm	82 - 95
19.1mm	70 - 85
13.2mm	58 - 75
4.75mm	34 - 55
Sieve Size	**% Passing**
2.00mm	22 - 40
0.425mm	10 - 25
0.075mm	5 - 12

Minimum C.B.R. @ 98% Mod. A.A.S.H.O. density	80%
Maximum C.B.R. Swell	0, 5 %
Maximum Liquid Limit	25
Maximum Plasticity Index	4
Maximum Linear Shrinkage	2
Minimum Sand Equivalent Value	30
Maximum Flakiness Index	35

The soundness of the aggregate shall be such that after 5 cycles using Magnesium

Sulphate it shall not show a loss of more than 15% by weight.
The maximum Aggregate Crushing Value should not exceed 30.
The moisture content used for field compaction shall not exceed the Mod. A.A.S.H.O. optimum plus 2 %.

Natural Ground Base Course

Natural ground base course shall be approved stone which meets either of the following specifications.
Natural Gravel (Unstabilised)

Minimum C.B.R. at 98% Mod. A.A.S.H.O.	80 %
Minimum C.B.R. Swell	0.5 %
Group Index value	0
Maximum Plasticity Index	4
Maximum Liquid Limit	35
Maximum Linear Shrinkage	2
Minimum Sand Equivalent Value	30
Maximum size of particle	53mm

Material passing No. 75 micrometer sieve shall not exceed 25 %

The combined coarse sand and coarse/fine sand fraction shall not exceed 35 % of the soil mortar

Natural Gravel (Stabilised with Lime)
Lime must comply with SANS Specification 824 Minimum C. B .R.

at 98% Mod. A.A.S.H.O. density,	160	140	120
provided that the minimum C.B.R. before stabilising, at 95 % Mod. A.A.S.H.O. density	30	45	60
Maximum C.B.R. S well			0, 5%
Maximum Plasticity Index	4		
Maximum particle size	2/3 layer thickness		
Maximum percentage passing No. 75 micrometer sieve	25		
Grading Modules	1, 5		

The responsibility for obtaining suitable base course material complying with the above rests with the Contractor, unless otherwise specified, and the provisions for sub-base material in regard to tests, etc. to prove compliance with the specification shall apply to the base course.

During construction, the base course shall be evenly distributed over the sub-grade. The stone shall then be rolled with a 4 to 5 tonne roller or equal unless otherwise instructed. After a few passes of the roller the surface shall be checked for shape camber and levels and all depressions filled in. Rolling and trimming shall continue until the surface is true to required levels and falls.

Minimum density in place after compaction shall be 98% Mod. A.A.S.H.O. density.

CHIP AND SPRAY SURFACING
Binders
One of the following may be used: —
M.C. 3000 Bitumen to SANS Specification 308 (150/200 Pen.)
M.C. 800 Bitumen to SANS Specification 308 (150/200 Pen.)

RTH 45 / 50 Tar to SANS Specification 748 Spray-grade 60% emulsion where approved or specified by the Department. If emulsion is used then the specified application rates shall be increased to give the required net bitumen content.

Cover Aggregate

All Cover aggregate used in the surface treatment shall be washed 13.2mm nominal sized crusher stone in accordance with SANS Specification 647.

Aggregate Crushing Value shall not exceed 15.

Binder shall be applied after the prime coat has dried completely and all tackiness has vanished.

The binder is to be applied by means of a distributor at a rate of 1.1 litre/m2 followed immediately afterwards by the spreading of a cover aggregate of 13.2mm stone at the rate of 125m^2 / m^3. The aggregate is to be spread by means of an approved chip spreader; band spreading will only be permitted in those areas inaccessible to the spreader. The aggregate is to be rolled immediately with two passes of a pneumatic tyred roller. When the binder has set the surface shall be drag-broomed twice in each direction and then rolled again with four passes of the roller during the heat of the day or until the aggregate is firmly keyed into a tight surface.

DOUBLE SEAL COAT WITH BLACK TOP SURFACING: — The prime and first seal coat shall be applied as previously specified.

After the first seal coat has been drag-broomed and rolled as previously described, the binder shall be applied to the surface at a rate of 0.8 litre/in 2 followed immediately by the spreading of 6.7mm stone chips at the rate of 150m^2/m^3. This stone aggregate shall then be drag-broomed and rolled as previously described.

A seal spray having a net bitumen content of 0.7 litre/in^2 shall then be applied to the surface when this coat has dried completely, and shall be rolled to firmly bed any loose aggregate.

If the surface is to be opened early to traffic, it shall be covered very lightly with sand or crusher dust distributed evenly with a hessian drag and back rolled with wet wheels before opening to traffic.

SLURRY SEAL SURFACING: — The aggregate for slurry seal shall conform to the following grading: —

Sieve Size (mm)	Percentage Passing
4, 75	100
2, 36	90—100
1, 18	65—95
0, 600	42—72
0, 300	23—48
0,150	10—27
0, 075	5—12

Slurry sand shall be crusher sand with a minimum sand equivalent of 35.

Binder — Stable grade emulsion (60%)
Anionic to SANS Specification 309
Cationic to SANS Specification 548

Consistency of the slurry shall consist of 90% crusher sand, cement filler not less than 1% and net binder content of not less than 9% by weight. Water to be added as required. As a guide, approximately 300 litres of emulsion and 160 litres of water are required per cubic metre of slurry.

The slurry shall be machine mixed and wherever possible applied by means of a spreader box. The rate of application shall be 170m^2/m^3. The slurry shall be of a creamy, homogeneous mixture, free of lumps, and if the mixture shows signs of breaking before application to the surface it shall be discarded.

After the first seal has been approved by the Department, but before the application of the slurry, a fog spray comprising of a solution of 1 part emulsion to 3 parts water shall be applied at a rate of 0.8 litre/m^2 to cover the aggregate. The application of the slurry may commence when the fog spray has been applied to assist with the spread of the slurry and to smooth out squeegee marks the slurry shall, immediately after being applied and before it has broken, be smoothed by a damp hessian drag either attached to the spreader box or pulled over by hand.

After the slurry has set it shall be covered by two passes of a pneumatic-tyred roller during the heat of the day.

The permissible variation in the application of the slurry shall not vary from the specified rate by more than 10%.

PREMIX TARMACADAM SURFACING

Prime Coat
When the base course is complete and dry it shall be cleaned of all loose material and be given a prime coat of one of the following primers: —
M.C. cut-back bitumen.
Tar Primer R.T.H. 3/P.
Emulsion Primer (60%).

The rate of application of the primer shall be within the range 0.65—1.0 litre/m^2, the actual rate to be determined by test and observation on site. Where emulsion primer is used, the application rate shall be increased to give the required nett bitumen content.

Hand spraying shall be used only in those areas inaccessible to mechanical distributors. Before spraying is commenced, the surface shall be lightly watered to settle dust.

Single Coat Premix Tarmacadam
When the prime coat has dried the single coat premix wearing course, of the compacted thickness specified, shall be constructed.

The wearing course shall be Type A (Hot Mix), unless otherwise specified or approved by the Department, and shall conform to the following specification: —

TABLE G: SINGLE COAT PRE-MIX WEARING COURSE: SPECIFICATIONS

	Screen Size mm	A Hot Mix	B Hot Mix	C (Kerbs)

Aggregate Grading Per Cent Passing	26.5 19.0 13.2 9.5 6.7 4.75 2.36 1.18 0.6 0.3 0.15 0.075	100 100 80 - 100 70 - 90 - 50 - 70 35 - 50 27 - 40 19 - 30 13 - 23 8 - 16 4 - 10	- - 100 80 - 95 60 - 75 45 - 60 28 - 42 18 - 30 7 - 20 2 - 10 0 - 5 0 - 4	- - - 100 90 - 100 65 - 75 52 - 62 50 - 60 45 - 55 30 - 40 9 - 19 4 - 8
Grade Binder		60 / 70	Emulsion	60 / 70
Nominal Nett Binder Content		5.5 % +/- 0.38	4.75 % +/- 0.3	5.5 % +/- 0.3

Penetration grades to comply with SANS Specification 307.

Cut-back bitumen to comply with SANS Specification 308.

Maximum heating temperature of bitumen 170^0C.

Delivery temperature at the paver for hot mixes 130—160ºC.

For every 500m^2 of area paved the Contractor shall produce an extraction test result from a sample taken during laying operations showing grading and bitumen content of the premix carpet. The test as specified or any further tests to prove compliance with the specification shall be at the Contractor's expense.

In order that the stone and binder shall be properly mixed, this operation must be carried out in a pug-mill mixer or by hand with shovels and wheelbarrows or on metal plates, in which case the binder must be added in the correct proportions in small quantities. Mixing shall continue until the aggregate is uniformly coated with the binder. Bituminous surfacing shall not be carried out in rainy weather nor when atmospheric shade temperature is below 10^0C. Immediately after mixing, the surfacing materials must be spread and rolled on the same day. Spreading shall be done evenly over the base to ensure a consolidated thickness as specified and shall be performed by means of a mechanical spreader or by a drag spreader, or by hand, using rakes and screeds.

Where hand spreading is used, the premix must not be dumped on the base, but taken from the boards on barrows by shovel and then evenly distributed over the base. Hand raking must be reduced to a minimum to avoid segregation of aggregate. Rolling shall commence as soon as the binder has set sufficiently and, unless otherwise instructed, this shall be done with a 4 to 5 tonne roller or equal.

Places inaccessible to a roller may be compacted by means of 12kg tampers. The surface shall be rolled true to line and level without slacks or irregularities.

After three days the rolling shall be repeated during the hottest part of the day and a light application of fines may be added during the final rolling.

Premix Tarmacadam Kerb

Premix kerbs are to be Type C as specified above and constructed to give the following compacted size: —

Width at top	125mm
Width at base	230mm

Height	150mm

PRE-CAST CONCRETE PAVING BLOCKS: — shall be of the type, class and thickness specified, of approved colour and shall comply with SANS Specification 1058. Paving blocks which fail to meet these requirements must immediately be removed from the site and replaced at the Contractor's expense to the satisfaction of the Department.

Paving blocks shall be one of the following types as specified: —
Type S-A: — allows geometrical interlock between all vertical faces of adjacent blocks,
Type S-B: — allows geometrical interlock between some vertical faces of adjacent blocks.
Type S-C: — allows no geometrical interlock between vertical faces at adjacent blocks.

Paving blocks shall be one of the following classes as specified: —
Class 25: — average compression strength of at least 25 MPa.
Class 35*:* — average compression strength of at least 35 MPa.

Paving blocks are to be laid to approved patterns as specified and in accordance with the relevant clauses (excluding Clause 8) of SANS Specification 1200 MJ on and including a sand bed of the compacted thickness specified. After laying, the paving blocks are to be compacted by means of a vibrating plate compactor with the joints filled in, after compaction, by sweeping in jointing sand.

Sand for bedding shall conform to the following grading: —

Sieve size (mm)	Percentage Passing
9, 52	100
4, 75	95-100
2, 36	80-100
1, 18	50-85
0, 60	25-60
0, 30	10-30
0, 15	5-15
0,075	0-10

Sand for jointing shall pass a 1.18mm sieve and shall contain 10-50% of material that passes a 0,075mm sieve.

Spaces constituting less than 25% of a full block unit and of 25mm minimum dimension at perimeter edges of pavings against kerbs, buildings, inspection chambers, etc. are to be filled with Class B concrete trowelled to a smooth even surface to match paving blocks.

Rates for paving block pavings are to include for all straight cutting and waste, all half blocks at straight edges, filling with concrete as described, fitting, protecting from injury and cleaning down at completion.

KERBS

Generally

The kerbs are to be laid before the base course is commenced to the lines and positions as shown on the drawings. The Contractor is to allow sufficient time for the mortar bedding and joints to set and is to take all necessary precautions to maintain the line of the kerbs especially while rolling the base course and surfacing, as no claims in this connection will be considered.

Rates for kerbs are to include for necessary excavation, well consolidated bottom under kerbs and for filling and ramming to secure the kerbs in position.

Pre-cast Concrete Kerbs

Pre-cast concrete mountable kerbs as SANS Fig8 are to be of concrete Class 20 (20 MPa) and of the sizes described in the items, cast generally in 1m lengths, and finished smooth off the mould on top edge and both sides, with angles rounded, and rates are to include for all necessary formwork and moulds. The kerbs are to be bedded on and including a mat of

1:3 cement mortar, and the abutting ends of the kerbs are to be fully jointed in a similar mortar and pointed with a keyed-in joint on top edge and exposed sides.

Brick on edge kerbs
Brick on edge kerbs are to be of extra hard burnt bricks of the colour specified. The kerbs are to project 10mm above the finished tarmacadam level and are to be bedded on a mat of 1:4 cement mortar, and the abutting ends of bricks are to be fully jointed in a similar mortar and pointed with a keyed-in joint on top and exposed sides.

19. FENCING AND GATES

GENERALLY*:* — The Department shall be responsible for the initial location and exposure of all necessary boundary beacons and their indication to the Contractor at the site handover. The Contractor shall be responsible for subsequently ensuring that these beacons remain undisturbed and that the fencing is correctly aligned between boundary beacons. Should, during setting out of the further boundary beacons be uncovered or located and reasonable doubt arise regarding the correct alignment of fencing, then the Contractor shall be responsible for immediately notifying the Department, in writing, of such doubt, in order that the setting out may be checked and rectified, if necessary.

All bushes, trees, old fencing, rocks, debris, long grass and other obstructions shall be removed from the fencing line to produce a clear even strip 500mm wide on either side.

Trees, rocks or other items of horticultural or archaeological interest that are not to be removed will be indicated by the Department.

Straining Posts: - shall be erected at ends, corners and intermediately at not exceeding 30m centres with standards or intermediate posts erected between posts at not exceeding 3m centres.
Where fences are erected directly over boundaries, corner beacons shall be preserved by splaying the corner by planting two straining posts, each with one stay, 1 m from the beacon peg.
Security fences (i.e. fences with projecting overhangs if specified) shall be sited 350 mm back from the boundary line so that the end of the overhang is exactly on the boundary line.

SECURITY FENCING:

2.3m High security fencing shall consist of: -

1) Straining and Intermediate Posts (2.9mtr long).
2) Stays (2.6mtr long).
3) Welded mesh fencing (1.8mtr high).
4) Razor wire.
5) Concrete ground beam.
6) Tubular steel gate posts (when specified).

Straining and corner posts shall be 150mm ø x 3mm wall thickness steel tubing, in lengths as specified, with upper end capped and 3mm thick x 300mm x 300mm footplate welded to base. The whole shall be **hot dipped galvanized**. 80mm diameter stays x 3mm wall thickness shall be secured to posts with galvanised bolts. Straining posts to be positioned at maximum 30mtr c/c. Bottom of posts bedded in concrete to be painted with bitumen paint prior to erection. Where holes have to be drilled on site, drilling shall be cold galvanized before corrosion sets in.

Intermediate posts shall be 2.9mtr long x 100mm x 100mm square pre-stressed, precast concrete posts with top end splayed, spaced at maximum 3mtr apart. Stays for posts shall be prestressed reinforced concrete members of 75mm x 75mm x 2.6mtr long, splayed at the top end, with a 10mm ø x 50mm long galvanized steel pin attached to fit into a drilled hole in the upright and bonded to posts with approved epoxy.

Fence shall comprise of galvanized rectangular welded mesh fencing 1,80mtr high x 3.15mm ø x 25mm x 50mm rectangles fixed to 8 gauge or 3.15mm diameter – as

specified - hardened galvanized steel straining wires x 5, spaced vertically at 450mm ¢. Welded mesh shall be secured to straining wires with 2mm ø galvanized tying wire spaced at a maximum of 250mm between ties. Fencing overlap to be a minimum of 150mm.

Straining wires shall be fixed to posts with doubled strands of 2mm ø galvanized tying wire, pulled tight around posts and wound tightly around the straining wires.

Coils of 500mm ø galvanized flat wrap razor wire shall be fixed vertically above the welded mesh to a height of 450mm above the top of the welded mesh. Razor wire shall be supported on and fixed to three strands of galvanized double strand barbed wire. Barbed wire shall be fixed to the posts in the same manner as the straining wires.

Razor wire shall be fixed to the barbed wire at every intersection and laced to the concrete posts with galvanized tying wire.

A 250mm wide x 150mm minimum depth concrete ground beam of 15mpa strength shall be excavated for and cast along the entire length of the fence. Shuttering for the ground beam sides shall be provided as required. Finished level of the ground beam shall be 50mm above final ground level at the highest point, finished in a straight line both vertically and horizontally. 75mm of the welded mesh fencing and the bottom straining wire shall be embedded in this ground beam to secure the lower fence line. The top of the concrete beam shall be shaped to allow water to run off the top of the beam to prevent water collecting and standing on top of the beam.

At any change in direction of the fence line, two 150mm ø x 3mm wall thickness straining posts shall be erected with bottom ends embedded in a common concrete base with each post stayed separately.

Concrete bases for posts shall be Class B (1:3:5-19mm stone) size 400 x 400 x 500mm deep, unless otherwise specified, with tops of bases 100mm below ground level.

When required, gateposts shall be supplied in steel tubing complying with CKS 82, 150mm ø x 5mm wall thickness, in lengths as specified, with upper end capped with 1.6mm thick pressed mild steel domed cap welded on and 3mm thick x 300mm x 300mm footplate welded to base. Gateposts are to be drilled and fitted with mild steel ferrules welded into position to receive 20 mm ø mild steel hinges. Threaded 12 mm ø studs or approved stay collars are to be fixed on to the posts to locate and secure the top ends of stays. The whole shall be hot dipped galvanized. Where holes for the threading and fixing of straining wires are required, holes shall be drilled on site and cold galvanized on completion.
Stays shall have the top end flattened, bent as required, holed 12 mm ø for bolting to post and the whole hot dip galvanized.

Mild steel tubing for gate components shall comply with SANS Specification 657 Part 1. The diameters specified are the nominal external diameter of the tubing.

Straining wire: - shall be as specified, or either Type 1 galvanized wire of 3,15 mm diameter or Type 2 PVC coated galvanised wire with 3, 15 mm diameter core wire PVC coated to an overall diameter of 3,95 mm. Stainless steel straining wire when specified shall be 2,50 mm diameter A.I.S.I. Type 304 stainless steel, strained between posts and tied to same at terminal ends by turning each wire twice around the post and tying off by twisting it a minimum of three turns around the strained wire.

Binding or Tying wire: - shall be as specified, either Type 1 galvanised wire of 2 mm diameter or Type 2 PVC coated galvanised wire with 2 mm diameter core wire PVC coated to an overall diameter of 2, 80 mm.

Galvanized barbed fencing wire: - shall consist of two strands of 1, 60 mm diameter high tensile steel wire twisted together with barbs at 125 mm centres and each row of barbed wire shall be strained between posts and tied to same at ends by turning each wire around the post and tying off by twisting it a minimum of three turns around the strained wire.

Galvanising: - shall comply with SANS Specification 763 and all items of posts, stays, gate

framing, etc., described as galvanised shall be hot dipped galvanised after fabrication with Class A galvanising with all internal and external surfaces fully coated.

GATES: — Generally single gates and double gates shall be of the sizes stated and formed with mild steel tubular framing all round, covered with chain link wire mesh of the type specified laced to framing. Tubular framing to gates shall be mitred and welded at corners and, at all other intersections, the tubular framing shall be scribed and welded together with all welds ground smooth.

Preferred gate hinges are Bullet Type or through pin type hinges.

Where gates are to be hung on precast concrete posts, hinges shall be fixed to and including mild steel clamps, each formed of two 50 x 5 mm mild steel plates 200 mm long, twice holed for and bolted on opposite sides of post with two 10 mm ø x 140 mm galvanized mild steel hex-head bolts and with each plate holed to receive 20 mm ø gate hinge.

Each single gate and one leaf of each double gate shall be fitted with gate latch formed of 25 x 6 mm mild steel bracket, 550 mm girth, twice bent to U-shape with centre section 150 mm high and with ends scribed and welded to tubular stile of gate. A locking bar formed of 25 x 6 mm mild steel plate, 100 mm long, twice holed 13 mm diameter for shackle of padlock and for pad bolt, shall be welded to inside of bracket. The sliding pad bolt shall be formed of 12 mm ø mild steel rod, 220 mm long, with 25 x 6 mm mild steel flat bar 60 mm long welded on at one end and holed 13 mm diameter for shackle of padlock. The stile of the gate and the locking post or locking stile of the double gate shall be holed for and fitted with mild steel ferrule welded in to receive pad bolt. In addition, fittings to each leaf of double gate shall comprise 50 x 6 mm mild steel locking bar, 80 mm long, holed 20 mm ø for shackle of padlock and welded to locking stile of gate and drop bolt formed of 16 mm diameter mild steel rod, 575 mm girth, once bent to L-shape, fitted through and including 20 mm internal diameter mild steel sleeve welded to gate at bottom corner, with 12 mm diameter mild steel peg stay 25 mm long welded on to gate frame.

A concrete gate stop block size 230 x 230 x 230 mm deep with two 20 mm internal diameter mild steel sockets, each 75 mm long, cast into top shall be embedded in the road surface between each pair of double gates in the closed position. A similar gate stop block but with one socket shall be embedded in the road surface to each leaf of double gate in the open position.

Each single or double gate shall be fitted with an approved 51 mm brass padlock with hardened steel shackle and two keys.

Gates for 1, 20 m high fencing

Single gates shall be size 1,00 x 1,20 m high, each hung on hinges as stated above and formed of 32 mm diameter x 2 mm wall thickness mild steel tubular framing all round. Each gate shall be fitted with locking pad bolt with brass padlock.

Double gates shall be in two equal leaves with each leaf size 2.25 x 1, 20 m high, hung on hinges as stated above, formed of 38 mm diameter x 2 mm wall thickness mild steel tubular framing all round with two 38 mm diameter x 2 mm wall thickness mild steel tubular braces welded on between bottom corners and centre of top rail of each leaf. Each pair of double gates shall be fitted with locking pad-bolt, locking bars with brass padlock, drop bolts and concrete gate stop blocks as specified above.

Gates for 1, 50 m high fencing

Single gates shall be size 1, 00 x 1, 50 m high as described for gates for 1, 20 m high fencing but with each stile of gate extended 330 mm above top rail and braced between top rail and top of extension arm with 32 mm diameter x 2 mm wall thickness mild steel diagonal brace welded on and hung on hinges as stated above. Two rows of galvanised barbed wire, spaced 150 mm apart, shall be strained and tied to the extension arms.

Double gates shall be in two equal leaves with each leaf size 2, 25 x 1.50 m high with each hung on hinges as stated above, all as described for double gates for 1, 20 m high fencing but with each stile of each leaf extended 3 mm above top rail and braced between top rail and top of extension arm with 38 mm diameter x 2 mm wall thickness mild steel diagonal brace welded on. A vertical extension arm 330 mm high - formed of 38 mm diameter x 2 mm wall thickness mild steel tube - shall be welded on above centre of top rail. Two rows of galvanised barbed wire, spaced 150 mm apart, shall be strained and tied to extension arms.

Gates for 3, 00 m high fencing
Single gates shall be size 1,00 x 1,50 m high, hung on hinges as stated above and formed of 38 mm diameter x 2 mm wall thickness mild steel tubular framing all round with 38 mm diameter x 2 mm wall thickness mild steel horizontal centre rail. Each gate shall be fitted with locking pad bolt with brass padlock.
Chain link wire mesh fencing shall be carried over and above the top of the gate as previously described for fencing.
Double gates shall be in two equal leaves with each leaf size 2, 25.x 3, 00 m high, each hung each hung on hinges as stated above, and formed of 51 mm diameter x 2 mm wall thickness mild steel tubular framing all round with two 51 mm diameter x 2 mm wall thickness mild steel tubular braces welded on between bottom corners and centre of top rail of each leaf. Each pair of double gates shall be fitted with locking pad bolt, locking bars with brass padlock, drop bolts and gate stop blocks.

Gates for 1, 8 m high security fencing:
Single gates shall be size 1,00 x 1,80 m high, hung on hinges as stated above and formed of 38 mm diameter x 2 mm wall thickness mild steel tubular framing all round with 38 mm diameter x 2 mm wall thickness mild steel horizontal centre rail. Each gate shall be fitted with locking pad bolt with brass padlock.
Single gates shall be hung on mild steel tubular gate posts with cranked overhang when specified and the galvanised barbed wire overhang shall be carried over above the gate as previously described.
Double gates shall be in two equal leaves with each leaf size 2, 25 x 1, 80 m high, each hung on hinges as stated above and formed of 51 mm diameter x 2 mm wall thickness mild steel tubular framing all round with two 51 mm diameter x 2 mm wall thickness mild steel tubular braces welded on between bottom corners and centre of top rail of each leaf. The stiles of each gate shall be extended 450 mm high above the top rail and braced between top rail and top of extension arm with 51 mm diameter x 2 mm wall thickness mild steel diagonal brace welded on. A vertical extension arm 450 mm high formed of 51 mm diameter x 2 mm wall thickness mild steel tube shall be welded on above centre of top rail. Three rows of galvanised barbed wire, spaced 150 mm apart, shall be strained and tied to extension arm. Each pair of double gates shall be fitted with locking pad bolt, locking bars with brass padlock, drop bolts and gate stop blocks.
Double gates shall be hung on posts without cranked overhang but with the posts extended 450 mm high above top of chain link wire mesh fencing to receive continuation of barbed wire and razor wire.

Gates for 2, 40 m high security fencing
Single gates shall be of size 1, 00 x 2, 00 m high, all as described for gates for 1, 80 m high security fencing.
Chain link wire mesh fencing shall be carried over above the top of the gate to an overall height of 2, 40 m with the razor wire carried across between the gateposts.
Double sates shall be in two equal leaves, with each leaf 2, 25 x 2, 40 m high, all as described for double gates in 1, 80 m high security fencing.
Double gates shall be hung on posts without cranked overhang but with the posts extended 450 mm high above top of chain link wire mesh fencing to receive continuation of razor wire.

SUBMISSIONS FOR PREFABRICATED TIMBER ROOF TRUSSES

Letter Ref. TR 1

I / We hereby undertake to be responsible for the design of the total timber roof construction and will satisfy myself / ourselves that the fabrication and erection is in accordance with my / our design.

Project: _____

_____

Part(s):

_____

_____

NAME OF FIRM:

_____

SIGNATURE: _____ QUALIFICATION:

_____

DATE: _____

Letter Ref. TR 2

I / We am/are satisfied that the fabrication and erection of the total roof construction has been completed in conformity with my / our design.

Project: _____

_____

Part(s):

_____

_____

NAME OF FIRM:

_____

SIGNATURE: _____ QUALIFICATION:

_____

DATE: _____

SUPPLEMENTARY PREAMBLES

The following Supplementary Preambles are to be read in conjunction with the "Standard Preambles to all Trades" included here before and are to apply to this Contract.

Where these "Supplementary Preambles" are at variance with the "Standard Preambles to all Trades" referred to above, such variances are to take precedence and are to apply to this Contract.

1. ALTERATIONS

All Notes, Preambles, etc. applicable for the various trades in the Bills of Quantities, will apply equally to the trades in this Bill.
Tenderers are advised to visit the site and satisfy themselves as to the nature and extent of the work to be done, and also to examine the condition of the existing building.

Tenderers are advised that all materials from the pulling down (except where described to be re-used or handed over to the Department) will become the property of the Contractor, and all these materials, together with all rubbish and debris, must be immediately carted away, and the site left clean and unencumbered. Materials, etc. which are described to be handed over to the Department are to be carefully dismantled where necessary, and neatly stacked where directed on site. Items described as removed shall be removed from site.

Credit for the value of the materials from the pulling down may be allowed for on the Final Summary page.

Prior to the removal of any timbers from the site, they are to be inspected by the Government Entomologist as laid down in Section 32 of the Government Forest and Veld Conservation Act of 1941 (Act 13 of 1941) as amended. If any of the timbers are infested with wood destroying agencies, they are to be disposed of in the manner prescribed by the Government Entomologist.

The Contractor is to give ample notice to the Department and Local Authorities regarding any disconnections necessary prior to the removal or interruption of electric light or telephone cables, water and sanitary services, etc.

Tenderers are advised that adjacent sections of this building will be occupied during the building operations, and the Contractor is required to carry out the work with as little noise, dust and disturbance as possible. Undisturbed access is to be given to patients, staff and visitors.

The Contractor is advised to check all dimensions affecting the existing building as he will be held solely responsible for all new work being of the correct size. All sizes stated are approximate and under no circumstances will claims be entertained should actual sizes of existing items on site vary marginally from the sizes stated in this document.

The Contractor will be held solely responsible for any damage to persons, property, and equipment and for the safety of the structure throughout the whole of the Contract, and must make good at his own expense any damage that may occur.

The Contractor must obey the instructions of the Department in carrying out any portion of the work which in his opinion requires expediting, and the Contractor shall give priority to such work as and when directed.

In taking down and removing existing work, the utmost care is to be observed to avoid any structural or other damage to the remaining portions of the building. The Contractor must also protect all work not removed, such as walls, floors, doors, windows or joinery, loose and fixed fittings and electrical equipment, appliances, etc. from damage during the progress on the works and provide all necessary materials in so doing.

Special care is to be taken not to interfere with any electric light, bell, power or telephone wires and fittings that may be encountered on site. New work to the existing electrical, air-conditioning, gas and telephone installations, etc. is included elsewhere in this document.

The Contractor must take the exigencies of the Hospital Service into consideration. Liaison is to be carried out through the offices of the Regional Engineer, with referrals to the Director: Physical Facilities Management for a final decision. No instructions may be received by the Contractor from the Hospital Authorities and all instructions are to be given by the Chief Department in writing before they are put in hand.

2. CONCRETE, FORM WORK AND REINFORCEMENT

Cement is to comply with:

SANS ENV 197 (1 to 2)
SANS ENV 413 (1 to 2)
SANS ENV 196 (1 to 7)
SANS ENV 196 (21)

as applicable, and replaces the following SANS Specifications in the Standard Preambles:

SANS 471 Portland cement (ordinary, rapid hardening and sulphate resisting)
SANS 626 Portland blast furnace cement.
SANS 831 Portland cement 15 (ordinary and rapid hardening)

3. MASONRY

Masonry is to comply with SANS Code of Practice 0249 and 0164 as applicable.

4. ROOF COVERINGS, ETC.

The installation of roof coverings and side claddings is to comply with SANS Code of Practice 0237 as applicable.

5. CARPENTRY AND JOINERY

Note:

All timber must be treated in terms of SANS Code of Practice 05 for GYMNOSPERMAE including all SA Pine species and ANGIOSPERMAE including all Eucalyptus species but excluding laminated timber.

It is now a compulsory requirement to use only treated timber in buildings. The treatment shall comply with SANS 457, 753, 754 or 1288 as relevant.

Reference must also be made to the appropriate Standard Preambles and SANS requirements for items not covered by these joinery preambles, etc. i.e. ironmongery, aluminium, glazing, paintwork, etc.

Where items are described as “plugged and screwed”, they are to include for plugging and screwing to new or existing brickwork or concrete, with heads of screws sunk and pelleted.

Sawn softwood timber: General, Stress Graded, Industrial, Brandering and Battens is to comply with SANS 1783 Parts 1 to 4 as applicable.

All hardwood is to be dark red Meranti, even in grain and colour selected for “Standard and Better” quality, from Malaysia, with a minimum density of 550 kg per cubic metre at moisture content of 12%, and is to comply with SANS 1099 as applicable.

Hardboard is, unless otherwise described; to be 3mm un-tempered hardboard for floor units and 6mm tempered hardboard for wall units.

Melamine faced moisture resistant V313 chipboard can be used when specified.

Materials generally are to comply with the following specifications and requirements as applicable:

TABLE H: CARPENTRY AND JOINERY: SANS SPECIFICATIONS

MATERIAL	SANS SPECIFICATION	GRADE OR CLASS
Softwood structural timber	1783	Parts 1, 2, 3, 4
Softwood engineering timber	1783	Parts 1, 2, 3, 4
Softwood studs for timber frames in building	1783	Parts 1, 2, 3, 4
Softwood brandering and battens	1783	Parts 1, 2, 3, 4
Softwood joinery timber	1783	Parts 1, 2, 3, 4
Softwood flooring boards	629	Flooring Grade
Hardwood joinery timber	1099	Heavy flooring board
Hardwood strip flooring	281	Knotty grade
Wooden ceiling and panelling boards	1039	As specified
Laminated timber (glulam)	1460	As specified
Gypsum, plasterboard	266	As specified
Wood fibreboard	540	As specified
Wood wool panels (cement bonded)	637	As specified
Fibre cement sheets: profiled and flat	685	As specified
Fibre cement boards	803	As specified
Plywood and composite board Particle Board: Highly Moisture resistant exterior and flooring type Interior Type	929 EN 312 EN 312	 Parts 1 to 7
Decorative laminates	SANS ISO 4586 and SANS 1405	High Pressure
Decorative Melamine Faced Boards	1763	
Wooden Doors (flush)	545	
Materials for thermal insulation of buildings	1381	As applicable
Mild steel nails	820	
Metal screws for wood	1171	
Creosote	538	As specified
Timber roof trusses	0243	SANS Code of Practice

6. CEILINGS AND PARTITIONS

Refer to Joinery Fittings regarding specifications and requirements of materials.

7. IRONMONGERY

Materials

i) Locks are to comply with SANS 4 as applicable
ii) Door closers are to comply with SANS 1510 as applicable
iii) Symbolic safety signs are to comply with SANS 1186 as applicable

All ironmongery, unless otherwise described, is fixed to timber.

Sheet steel furniture to comply with SANS 757 as applicable

8. METALWORK

Rates are to include for cutting to lengths, splay cut ends, shaping, holing, tapping, threading, forging, turning, fitting, assembling, welding, filing smooth, preparation, priming coats, hoisting, temporary bracing and fixing in position.

Towel rails are to be tubular Satin Chrome mild steel to diameters - minimum 19mm - and lengths as specified in matched Satin Chrome end pieces. End pieces to be either flat or bracket type - according to requirements, application and specification - plugged and screwed into walls with Chromed Brass screws.

Electro-plating is to comply with SANS ISO 1456 as applicable.

Curtain tracks to be "Forwin" Hospital Curtain Tracks as "Kirton" (Pty) Ltd. - or other approved -, including 15 wheeled runners per metre, hangers, brackets, stopped ends, etc. Hangers are to be suspended from roof timbers or concrete slab over – **not off the ceiling grid**. Allowance is to be made for necessary bends and curving as per plan supplied.
Curtains to be provided as (Chintz fabric (#155CZ) woven with 100% polyester yarn)

SHELVING FOR PHARMACIES: - Shall be epoxy coated steel shelving, either fixed to epoxy coated wall bands or free standing units as specified.

SHELVING FOR CSSD STERILE STORE: - Shall be slatted grade 304 stainless steel wall bands or free standing units as specified.

Aluminium Windows and Doors

NOTE:

Glazed aluminium alloy windows and sliding doors for external use are to comply with SANS 1651 as applicable.

All items must conform to and carry the Certification Seal of the AAAMSA and no items which are not so certified will be accepted on site.

The work is to be cleated and framed.

All visible surfaces are to have a 25 micron anodised finish as specified.

Anodised coatings on aluminium are to comply with SANS 999 as applicable.

Rates are to include for setting up and building in as well as for isolation material between the aluminium surfaces and adjacent surfaces of a differing material.

All visible surfaces are to be covered with a temporary protective tape, later to be removed.

Float glass for glazing is to comply with SANS CKS 55 and SANS 952 as applicable.

Safety and security glazing materials for buildings is to comply with SANS 1263(1) unless otherwise described. All panes are to be marked so as to be visible. Laminated safety glass is to carry a written five year guarantee.

Windows and doors are to be watertight.

Silicon pointing to windows and doors is covered elsewhere.

9. PLASTERING

Rates for new plaster, screeds, etc. to existing surfaces are to include for all preparatory work and forming a key.

Removal of paint and/or varnish as well as the roughening of the existing face brick surfaces both externally and internally to receive new plaster has been measured separately.

Plaster and screeds, etc. in patches is generally of an isolated nature and to existing surfaces. Portion of the work may be in narrow widths.
Where alterations are to be done to the existing structure, the new plaster, etc. has been measured to a point 300mm beyond the line of the alteration on the existing structure.

10. TILING

Ceramic Wall and Floor Tiles are to comply with SANS 1449 as applicable.

11. PLUMBING AND DRAINAGE

Water Supply and Drainage for Buildings is to comply with SANS Code of Practice 0252 as applicable.

Water Supply and Distribution System Components is to comply with SANS 1808 as applicable.

Electrical Water Heater:

Storage Heaters to comply with SANS 151.
Instantaneous Heaters to comply with SANS 1356 and IEC 335 (2-35).

12. GLAZING

Glass is to comply with SANS Specification 952.

Glass for glazing is to comply with SANS Specification CKS 55.

Safety and security materials are to comply with SANS Specification 1263 as specified.

Laminated safety glass is to carry a written five year guarantee.

ANNEXURE 2

GENERAL ELECTRICAL SPECIFICATIONS

GENERAL ELECTRICAL SPECIFICATION

(ALL IN CONTRACTS)

1. CONDUIT AND CONDUIT ACCESSORIES

1.1 Conduit

Conduit shall be of steel galvanised internally and externally, either solid drawn, or welded and not less than 20 mm diameter, with all rough edges removed. All tube ends removed. All tube ends are to be reamed. With screwed conduit one threaded end is to be fitted with a coupling and the other end is to be protected against damage.

UPVC conduit may only be used if permitted by the Head : Works and only in those areas which he may specify. In this case this conduit shall be according to SABS 950.

Conduit accessories, which are secured to the conduit by means of lugs, screws or setscrews, are not acceptable.

General requirements of conduiting to SABS IEC 60614 (1).

Metal conduits shall be fully in accordance with SABS 1065 PART I.

1.2 Conduit Accessories

All conduit accessories shall be galvanised both internally and externally and comply with SABS 1065 – PART II.

All screwed conduit fittings shall be of malleable cast iron.

Where fittings are fitted with covers, the covers shall be of galvanised pressed steel secured with brass screws.

1.3 Flexible Conduit

Flexible conduit shall be of the plastic covered metal type complete with brass connectors to the approval of the Head : Works.

2. INSTALLATION OF CONDUIT

2.1 General

Except where cables are specified for certain circuits, the installation(s) shall be tubed throughout in steel conduit. Split conduit is not permitted. All conduits shall, wherever possible, or unless otherwise specified or agreed, be concealed in the structural work.

Except where agreed or otherwise specified or indicated on the drawings, all conduit to points shall run via the ceiling and floor slabs or roof space. In damp situations and where exposed to the weather, the conduits shall be so installed as to avoid, as far as possible, the condensation of moisture within them. All running joints are to be painted with an approved metal primer.

Mechanical and Electrical continuity must be maintained throughout the installation. Each length of conduit and every conduit fitting must be inspected for defects and all sharp edges or burrs must be removed before it is installed. All joints are to be tightly fitted together.

Running joints with long threads, where used, are to be fitted with a lock nut and the running thread shall not be longer in length than a coupling and lock unit.

In conduits smaller than 32 mm elbows and normal bends are not to be used but conduits are to be set to the required angles.

Flexible connections between conduit and appliance or other equipment shall be by means of flexible tubing (see Par 1.3).

No wiring shall be drawn into conduits until the conduits have been installed.

Where more than one socket outlet is connected on a circuit, the conduit shall be looped from the one outlet box to the following outlet box.

All switch-boxes, socket outlet boxes and any other purpose made metal box including distribution board trays shall be suitable treated against corrosion before installation with “Rustodian” or other approved metal primer.

All conduits shall be securely fixed into chases, and all flush switch and socket outlet boxes must be firmly embedded in cement mortar.

The Contractor shall make himself familiar with the positions of all fittings, such as blackboards, pinning boards, cupboards, shelving, worktops, etc, before commencing the conduit installation. The position of switches and socket outlets as indicated on the drawings are approximate only. The Contractor must verify that the final position of these will not be covered by the installation of the fittings referred to above, or come midway between the junction of any dados and upper wall finishes.

No extras will be entertained for moving switches or socket outlets as a result of the Contractor’s failure to verify the final positions of the fittings or type of wall finish.

2.2 **In Roof Spaces**

The conduit in roof spaces shall be installed parallel or at right angles to the roof truss members and shall be secured at centers not exceeding 1,2 m by means of galvanised saddles nailed to the timbers with galvanised clout nails. Crampets will not be allowed.

Crossing of conduits is to be avoided wherever possible. Where unavoidable, one conduit must be neatly set over the other. Where a number of conduits have to run back to the distribution board or switchboard, they shall run parallel to the distribution board or switchboard, and at saddle distance to each other wherever possible.

Conduit runs from distribution boards shall terminate in fabricated sheet steel draw boxes installed in the roof above the distribution boards. Each draw box shall be fabricated from 1,6 mm galvanised sheet steel with welded corners and suitably treated against corrosion with “Rustodian” or other approved primer and finished in aluminium paint.

Each draw box is to be fitted with slip-on lid with a 13 mm skirt. The box shall be 75 mm deep, shall be rectangular in shape and the size of conduits entering or leaving the box. Conduits shall be fixed to the box by means of couplings and brass male bushes or lock nuts and brass bush-nuts.

Conduit droppers shall be neatly cut into timber wall plates and set to face the right direction. All sets must be uniform. Conduits may be set at angles only where droppers or ceiling points are within 230 mm of roof members.

No conduits are to be run over the top of gangplanks or trapdoors.

Draw-in boxes with metal covers shall be provided where required and shall be installed near the gangplanks, if any. All inspection conduit fittings in open roof spaces shall face upwards to facilitate wiring and to permit easy inspection. Three-way conduit boxes shall be used for tee-off purposed in open roof spaces. Inspection tees are not to be used except where otherwise agreed or specified.

All conduits extended into a roof space with a roof clearance of more than 900 mm shall be set onto the beam and extended into the roof for a distance where there is sufficient clearance. Under flat roofs or where there is less than 900 mm clearance, the conduit shall be installed as specified for tubing in concrete slabs, right angle bends should be kept to a minimum and the shortest route taken.

Where false ceilings occur they shall be tubed as called for in the detailed specification. Conduits in restricted spaces and run as for concrete slabs must however, be installed in a neat and orderly manner.

Conduits to ceiling points for all types of fittings must be firmly supported and shall terminate in a back entry conduit box. The conduit box shall be taken through to the face of the ceiling and finish flush. Where the ceiling brandering interferes with the installation of the ceiling point specified, the Contractor must trim the brandering to allow the conduit box to be taken through to the face of the ceiling as specified. Luminaires must be bonded to the conduit box by means of metal threaded screws.

2.3 **In Concrete Slabs**

In order not to delay building operations, the Contractor must ensure that all conduits and conduit fittings, which are to be cast in concrete, are laid in good time. The Contractor shall have a competent Electrical Artisan standing by during casting of concrete, etc, to ensure that the conduit boxes are not damaged during casting of concrete.

Draw boxes, expansion joints boxes and round conduit boxes are to be provided where necessary.

Deep type conduit boxes shall be used for side entering conduits and normal shallow boxes may be used for back entry conduits. No elbows, bends or sharp sets will be allowed in concrete slabs except in cases of conduits of 40 mm diameter or when larger sweeping bends will be permitted.

Common drawn and/or inspection boxes shall be used where there is more than one circuit involved. They shall be installed in lavatories, storerooms, or other inconspicuous places. Covers shall be of hardboard neatly finished to match the finished ceiling or wall surface, and shall be fitted parallel to the wall or ceiling.

All boxes, etc. are to be securely fixed to the shuttering to prevent displacement when concrete is cast. All conduits must be laid off the deck, supported and secured at regular intervals and installed as close as possible to the neutral axis of concrete beams and slabs.

Expansion joints shall be shown on layout drawings and shall consist of a metal box in which one conduit is fixed and the other capable of movement with the building's expansion and contraction. Earth continuity of these joints shall be maintained by means of stranded copper conductors bonded to the conduits in the box as shown on the drawing.

Earth conductors and clamps buried in concrete are not permitted.

Conduits must be spaced sufficiently apart to allow for proper concreting. All joints shall be painted with an approved metal primer after completion of the tubing installation, prior to the concreting. All exposed parts of the conduit installation shall be suitably, protected against corrosion at the discretion of the Head : Works.

Before any concrete slab is cast, all conduit droppers to switchboards shall be neatly spaced and rigidly fixed.

2.4 Surface Work

All conduit must be plumbed and leveled and only straight lengths shall be used.

In cases where doorframes are out of plumb, or fittings, beams etc, are out of level, the conduit shall be run parallel with the doorframes, fittings, beams etc.

No threads shall be visible when the conduit installation is complete, except on running couplings.

Running couplings shall only be used where unavoidable and shall be fitted with a sliced coupling as a lock nut.

No inspection or normal bends are to be used on surface work, except with the approval of the Works Inspector and where conduits of 32 mm diameter or larger are used. Conduits shall be set uniformly and inspection couplings shall be used where necessary.

Fittings, tees, boxes, couplings, etc, are to be cut into the surface to allow the conduit to fit flush against the surface or alternatively spacer bar saddles may be used. Conduit is to be bedded into any irregularities to avoid gaps between the surface and the conduit.

Double sets, where used, shall be parallel with no twists and shall be as short as possible. All conduits, which terminate at metal trays, boxes, industrial switches and plugs shall do so by means of couplings and male bushes. No couplings will be permitted in droppers of lengths less than 3.6 m.

Where crossings of conduits is unavoidable, purpose made metal boxes shall be used. The length of the box is to be 8 times the diameter of the largest conduit, the width one and half times the sum of the diameter of al the conduits, and the depth one and half times the diameter of the largest conduit with a minimum depth of 50 mm. The box shall be fitted with a neatly fitting cover and the finish shall be in keeping with the general layout.

Where a number of conduits are to be installed in parallel they shall be evenly spaced and grouped under one purpose made saddle. Conduit spacing shall not exceed 10 mm. The purpose made saddle shall be made of 25 x 2 mm galvanised steel strip or other approved material, formed to suit the curvature of the various conduits and shall be drilled and fixed by means of screws between. Saddles shall be spaced at intervals not exceeding 1.8 m, except for conduit droppers, which shall be saddled centrally between ceiling and accessory box. All saddles are to be secured to the wall by means of black japan or brass rounded head screws. Distribution boards, draw boxes, industrial switches and plugs, etc, shall be neatly recessed into the surface of plastered walls to avoid double sets or alternatively spacer bar saddles may be used. On face brick walls the conduit shall be tightly set into the switch or plug.

In situations where there are not ceilings, the conduits are to be run along the wall plates and tie beams.

No wiring is to be carried out until the tubing has been inspected and approved.

Where spacer bar saddles are used, these shall be installed at centers of 1 m for horizontal and 1.5 m for vertical runs.

All conduits shall be painted with an approved enamel paint to match the background colour.

2.5 Future Extensions

In roof spaces with a minimum clearance of 900 mm, switch and plug drips for future use are to be set 300 mm in the correct direction and shall be threaded and fitted with plugged couplings. Where the roof over a slab is to be removed for future expansions, conduits for future use are to terminate 40 mm above tie beams and shall be threaded and fitted with plugged couplings.

Where future extensions are to be below slabs, all switch, socket outlet and other conduit droppers are to terminate 130 mm below slabs or beams with conduit ends threaded and fitted with plugged couplings.

Where provision is made for future extensions to a concrete slab, all conduits required for future use are to project 130 mm from the slab. Conduit projections are to be painted with an approved anti-corrosive paint and must be fitted with plugged couplings.

All switch, plug and other outlet boxes required for future use shall be fitted with approved blank cover plates.

Unused lighting outlet boxes are to be fitted with round hardboard or plastic covers with brass cover screws, which shall fit flat on the finished ceiling.

2.6 Fixing of Conduits

Conduits shall be fixed to switch and socket outlet boxes by means of couplings and brass male bushes or lock nuts and brass bush nuts. Couplings and male bushes to be used on all surface work.

2.7 Chases and Building Work

Except where otherwise specified conduits, switch boxes, plug boxes and distribution boards are to be built into the brick walls by the Contractor. It will, however, remain the responsibility of the Contractor to ensure that the above-mentioned boxes and distribution boards are correctly built in and are firmly bedded and cemented into the walls, plumb and square.

The Contractor shall, unless otherwise specified, do all necessary chasing and cutting of bricks. All electrical materials (e.g. conduits up to 40 mm for UG cables, conduits, conduit boxes, distribution boards etc) must be supplied by the Contractor who must arrange to have these on site, and positioned when required for the building work. A competent Electrical Artisan must be in attendance and ensure that the conduits etc are correctly installed and positioned.

The Contractor is to ensure that tubing installed in chases is securely nailed and covered by a layer of 5:1 mixture of coarse sand and cement, finished flush with brickwork and that switch and plug boxes finish flush with the finished wall surface.

The Contractor is to ensue that below distribution boards connected by means of under-ground cables, a 230 mm wide by 115 mm deep cavity in the wall from the cable pipe to the distribution board is to be provided by the Contractor, or alternatively, cable sleeves as specified.

3. PLUGGING OF WALLS

Only approved plastic plugs shall be used to secure conduit or equipment up to 5kg mass. The use of round-headed screws only will be permitted.

Heavier equipment shall be secured by means of approved expansion bolts.

Wood plugs and any plugs in the joints in brick walls are not permitted.

4. FIXING TO CONCRETE CEILINGS

Ceilings mounted equipment other than luminaires shall be secured to concrete ceilings by means of expansion bolts, shot bolts or “Robot” tools bolts or as expressly specified for the service.

5. WIRING

5.1 PVC Insulated Single Core Medium Voltage Conductor

The conductor is to be of high conductivity copper wire insulated with Polyvinyl Chloride. The cable shall be finished in the required colours and shall be in accordance with SABS 1507 and 1574.

Circuit wiring shall be of the Loop-in system and no wiring joints in the conduit or conduit fittings will be permitted. Not more than two conductors of a kind will be allowed at any outlet point. the end strands of cables, whether single or looped which have to be connected to terminals of switched, plugs, lamp-holders, fittings and distribution boards, etc, are to be tightly twisted together. Cutting away of wire strands of any cable will not be allowed. Only one circuit in any one conduit will be permitted unless otherwise specified.

Conductor sizes shall be as follows except where otherwise specified:

Lighting circuits	1,5 mm²	
Bells circuits	1,5 mm²	
Clock circuits	1,5 mm²	
Incinerator circuits	2,5 mm²	
Ironing circuits	2,5 mm²	with 2,5 mm² insulated earth wire
Plug circuits	4,0 mm²	with 2,5 mm² insulated earth wire
Geyser circuits	4,0 mm²	with 2,5 mm² insulated earth wire
Heater circuits	4,0 mm²	with 2,5 mm² insulated earth wire
Stove	10 mm²	with 6,0 mm² insulated earth wire
Motor circuits		
Up to 4kW single phase	4,0 mm²	with 2,5 mm² insulated earth wire
Up to 11kW three phase	4,0 mm²	with 2,5 mm² insulated earth wire

To avoid deformation of PVC insulated cables at temperatures in excess of 57° C, they shall not be brought directly on to the terminals of appliances such as electric heaters, or any other electrical appliances or apparatus (including luminaires) which have a temperature in excess of 57° C. They shall terminate in a suitable terminal box as near to the appliance or fittings as possible and connect up from thereon, with heat resistant conductor.

6. MOUNTING AND POSITIONING OF LUMINAIRES

Luminaires and installation to comply with SABS 1464 Parts 1 to 22 and IEC 598-1 and IEC 60598 as applicable.

The contractor shall, in the case of board and acoustic tile ceilings (i.e. as opposed to concrete slabs), ensure that the luminaires are symmetrically positioned with regard to the ceiling pattern.

The layout of the luminaires as indicated on the drawings shall be adhered to as far as possible. The exact positions must be confirmed on site with the Head : Works.

Except where otherwise specified, pendant luminaires are to be mounted with the bottom of the fittings 2,5 m above finished floor level, mounted on either metal discs or wood blocks.

Under no circumstances shall cover strips be cut to accommodate wood blocks. Wood blocks must be neatly slotted to fit over cover strips and are to be secured by a minimum of two screws, which shall penetrate at least 25 mm into solid wood. Ceiling cover strips shall be neatly cut to accommodate fluorescent luminaires.

Where ceilings are raked, all incandescent luminaires are to be mounted on shaped leveling wood blocks securely fixed to the ceiling. Batten holders shall be secured to woodblocks by suitable brass screws. Fluorescent luminaires are to be mounted direct on raked ceiling without leveling blocks.

Fluorescent luminaires to be mounted on concrete ceilings shall be screwed to the outlet boxes and additionally supported by means of 50 x 6 mm expansion bolts. The bolts are to be ¾ of the length of luminaires apart.

Where a number of luminaires are installed end to end, outlet points must be provided after every second luminaire unless otherwise indicated on the drawing.

The luminaires are to be joined together by means of 20 mm conduit nipples, lock nuts and male brass bushes, and the wiring led through the channels of the luminaires. The Contractor shall ensure that all such rows are correctly lined up and that the rows are parallel with the relevant building line.

The luminaires are to be jointed together by means of 20 mm conduit nipples, lock nuts and male brass bushes, and the wiring led through the channels of the luminaires. The Contractor shall ensure that all such rows are correctly lined up and that the rows are parallel with the relevant building line.

Incandescent luminaires are to be screwed directly to outlet boxes in concrete slabs and in board ceilings. In board ceilings the conduit box and the conduit shall be secured to the timberwork of the ceiling in such a manner that it shall support any incandescent luminaire, which is designed to be fixed to a normal conduit box.

Fluorescent luminaires shall be secured to board ceilings by means of the conduit box and 6 mm bolts passing through the boards and brandering.

7. BATTEN HOLDERS

B.C. batten holders shall be of brass or moulded plastic reinforced type complete with shade ring. The batten holders shall comply with SABS IEC 60238 and SABS IEC 61184. All lamp holders are to have brass terminals with screw type connection.

8. LAMP HOLDERS

Edison screw lamp holders	:	SABS IEC 60238
Bayonet lamp holders	:	SABS IEC 61184
Lamp holders for tubular fluorescent lamps	:	SABS IEC 60400

B.C. screwed lamp holders shall be of brass 20 mm E.T. complete with shade ring and shall comply with SABS IEC 60238 and SABS IEC 61184 with screw type connection terminals.

9. SWITCHES AND SOCKET OUTLETS

Switches SABS IEC 60669 as applicable and socket outlets SABS IEC 60884 as applicable shall be of the most modern manufacture and bear the SABS mark.

Flush switch and plug cover plates shall, unless otherwise specified, be of anodized aluminium of thickness not less than 0,9 mm, satin or other approved finish as directed and otherwise to be fully in accordance with SABS IEC 1084 for cover plates and SABS 1085 for wall boxes.

10. POSITIONS OF SWITCHES AND SOCKET OUTLETS

Except where otherwise specified, lighting switches and socket outlets are to be installed 1,4 m above finished floor level.

All mounting heights specified are to be measured from finished floor level to the bottom of the outlet box.

Where the lower portion of the wall consists of face brickwork and the upper portion of plastered finish, switches and socket outlets are to be mounted in the plastered surface, provided that the lower edge of the plasterwork does not exceed a height of 1,5 m above finished floor level in which case the switches or socket outlets are to be installed in the face brick dado.

Where socket outlet and switch boxes have been installed with fixing lugs below finished wall surface, only approved distance pieces required to compensate for the recess shall be used. The lengths of distance pieces are not to exceed 15 mm.

Unless otherwise approved, light switches adjacent to doors are to be installed at the lock side of the door. Where the lock position is not indicated on the drawings, its position shall be ascertained before the switch box is installed. Switches are to be installed 150 mm from the reveal, or centrally if there is a fitting near the door.

All switch and socket outlet boxes shall be installed plumb, and built into the wall with a 1:1 mixture of cement and sand.

Industrial type switches and socket outlets shall be neatly recessed into the surface of plastered walls to avoid sets or alternatively spacer bar saddles may be used.

Deep type boxes may be used where switches or socket outlets are back to back, but where one side only is to be utilized at the time and the other is for future use, the side for future use shall be suitably covered with a metal cover plate.

11. LOW TENSION SWITCHBOARDS

Low Voltage switch gear and control gear to comply with SABS 1473 and SABS IEC 60947 and SABS 60349.

Where switchboards are to be installed in switch rooms or switch cupboards, the Contractor must ensure that the boards are manufactured to suit the dimensions of the rooms or cupboards.

Low tension switchboards shall be specified in detail for each service, but shall generally conform to the following:

They are to be of strong and rigid construction, with suitable angle, channel or folded steel framework. They are to be flush fronted and totally enclosed with sheet steel panels suitably formed at the edges and reinforced to prevent distortion. Unless otherwise directed, all front panels must be at least 2 mm thick and all other panels at least 1.6 mm thick. Panels are to be secured to the framework with studs and chromium plated dome nuts (self-tapping and similar screws are not permitted).

Switches, etc, are to be mounted on metal frames within the boards to give flush front panels. Equipment of normally surface mounted types such as energy meters, time switches and contractors, are to be mounted on inner metal trays behind hinged front panels. In the case of supply authority meters the hinged front panels must have transparent inserts.

All metal work of the boards must be thoroughly degreased, primed with PA 10 self etching primer and finished with one coat of undercoat and two coats of electrical orange high gloss enamel, unless otherwise specified.

All accessible current carrying parts, bus-bars, connecting strips, collector bars, etc, are to be adequately insulated in phase colours and suitably braced to withstand projected fault currents.

Connecting strips and collector bars must be of sufficient cross sectional area to carry full rated current of the switches served, irrespective of the fuse of trip rating.

The complete distribution board including bus-bars must be suitably constructed to withstand fault currents specified.

Connections to bus-bars are to be made by means of lugs suitably bolted and locked with high tensile bolts and connections to lugs must be effected by means of a crimping tools.

Incoming and outgoing bus-bar studs, where required, must be suitably insulated where they pass through panels of the board, and firmly supported within the board.

Where applicable, incoming and outgoing collector bars for cables in parallel must so arrange that the multiple cable ends can be connected to the bars with reasonably short tails which do not have to cross.
Cable supports must be placed at suitable heights having regard to the bending radius of the cables concerned and convenience in making off.

Wall-mounting and floor-standing back to wall type boards must be provided with full easy access to all equipment and wiring without any necessity of disconnecting or removing of any of the equipment mounted in the board.

Clear visible indication of all switch positions must be provided and the switches must be clearly labeled as directed by the Head : Works.

The details of construction proposed, and the Head : Works must approve all equipment of switchboards: Works before manufacture is commenced.

12. DISTRIBUTION BOARDS

12.1 Approval

The Head : Works must approve the details of construction proposed and all equipment within distribution boards: Works before manufacture is commenced.

12.2 Flush Mounting Distribution Boards

These shall be generally manufactured in accordance with SABS 1765. The board shall consist of two panels fitted side by side with common bonding tray and attached to a common architrave. One panel shall accommodate all single phase MCB's and the second panel shall accommodate the main isolator, main bus-bars and the triple pole MCB's. Chassis shall be of rigid channel section rust proofed steel with clip-on trays for the single pole MCB's. The main isolator is to be mounted at the bottom of the second panel with the triple pole circuit breakers above.

12.3 Surface Mounting Distribution Boards

These shall be generally manufactured in accordance with SABS 1765, with two panels as for flush boards.

12.4 **Single Phase Distribution Boards**

Single Phased boards shall be generally constructed as three phase boards except they shall have a single panel. Single phase boards shall be mounted with the bottom of the architrave 1,5 m above finished floor level unless specifically directed otherwise.

12.5 **Distribution Board – In Roof Spaces**

Where distribution boards are installed below a roof space, a minimum of 2 x 20 mm and 1 x 25 mm spare conduits are to be run from the distribution board into the roof space.

13. **METER BOXES**

The meter box shall be mounted with the top 1,7 m above finished ground level. Surface mounted meter boxes shall be secured by at least 4 x 10 mm expansion bolts.

Service cables entering the meter box shall be protected by means of a suitably sized galvanised pipe extended 450 mm below the ground surface and securely saddled to the wall and bonded to the meter box.

14. **CONNECTIONS TO OUTLETS**

14.1 **General**

Where connectors are used to connect to the wiring of luminaires and other appliances, the connectors shall comply with SABS Specification 1239.

14.2 **Connection to Stoves**

14.2.1 **General**

The connection to an electric stove, unless otherwise specified shall consist of 2 x 10 mm² conductors and a 6 mm² insulated earth wire in 25 mm conduit. The stove shall be controlled by a 60 Amp micro gap switch of approved make and the connection shall be by means of a 45 Amp 3 pin stove plug of the “Cape Town” type. Cable ends, which are to be connected to the stove, shall be equipment with suitable soldered or crimped lugs. The connection between the stove plug and stove shall be by means of flexible conduit.

Except for high school domestic science unit kitchens (see Clause 14.2.2), the conduit shall be chased into the wall and fitted with a switchbox for housing the micro gap switch and a 25 mm circular conduit box over which the stove plug will be mounted. The stove plug shall be fitted with an adaptor plate and shall be screwed directly to the conduit box by means of round head metal screws. The plug outlet shall face downward.

The stove plug and switch shall be mounted 430 mm and 1,4 m respectively above finished floor level unless otherwise specified or indicated on the drawings.

14.2.2 **Stove Connections in High School Domestic Science Unit Kitchens**

Connections to stoves in High School Domestic Science Unit Kitchens, where the stoves are situated in front of a fitting, shall be generally as specified in Clause 14.2.1 except that the 25 mm diameter conduit shall be run in the floor slab, from the distribution board to a position to the right of the stove. A pedestal, which is complete with a 45 Amp 3 pin "Cape Town" type cooker plug, mounted on the back, shall be fitted over the conduit and securely bolted to the floor by means of expansion bolts. The plug circuit, which passes through the pedestal, is to be on a separate circuit.

14.3 **Connections to Hot-water Cylinders**

The connections to hot-water cylinders not exceeding 3kW loading shall consist of 2 x 4 mm² PVC conductors and 1 x 2,5 mm² earth wire in a 20 mm diameter conduit from the distribution board. The conduits shall be chased in the wall and shall terminate at the side of the cylinder in a box over which is to be mounted a double pole isolator with pilot light.

The final connection between the isolator and cylinder shall be by means of silicone heat resistant conductors in 20 mm diameter flexible conduit.

Connections to roof mounted hot-water cylinders shall generally be as specified above with an isolator with pilot light mounted adjacent.

14.4 **Connections to Power Points**

Connections to electric motors and fixed apparatus to vibration shall, unless otherwise specified or indicated on the drawings, have final connections consisting of conduit and flexible tubing or reinforced hose in accordance with Clause 1.3 of this specification and PVC cables and earth wire of the required size.

An isolator shall protect all fixed apparatus and where necessary a starter fitted with a no-volt coil and overload protection adjacent to such apparatus.

Power points for connection of fixed apparatus to be installed by others, shall terminate in an approved type wall mounted switch unless otherwise specified.

The minimum conductor size for all power points shall be 4 mm² unless otherwise specified.

14.5 **Underground Service Connection**

This clause refers to underground service connections not provided by the Supply Authority.

The service cable and earth wire to be connected at the supply point in accordance with Clause 15.8 of this specification, and unless otherwise specified, shall be aid 600 mm below ground level throughout and otherwise fully in accordance with Clause 15 and all applicable sub-clauses thereof. Cable entries to meter boxes shall be in accordance with Clause 13 and other entries shall be by pipe or duct as directed.

14.6 Connections to Outbuildings

Connections to outbuildings shall be made by means of underground cable only, laid in accordance with Clause 15 and all applicable sub-clauses.

Where the cable is run from the roof space of the main building, it shall be enclosed in suitably sized galvanised pipe built into the wall or run surface as directed. Surface run pipes shall be securely saddled at 1,8 m centers. Where the cable connects to the conduit in the roof space, a suitable joint box shall be provided or alternatively the cable may be taken through the roof space, a suitable joint box shall be provided or alternatively the cable may be taken through the roof space with fixings at regular intervals, and down to the main board. At the outbuildings, the cable shall be enclosed in a suitably sized galvanised sleeve pipe built into the wall or run surface and terminated in the distribution board tray.

14.7 Connection and Mounting of Cable Fed Street/Site Lighting

Street/site lights shall in all cases, except where otherwise specified, be fed by underground cable. Unless otherwise directed, a suitable terminal board shall be provided in the base of the lighting pole for the connection of the incoming and outgoing cables, the feeds from the terminal board to the fitting shall be as specified.

“Surfix” cable and compression glands shall be installed between terminal board and cross arm/bracket mounted luminaires. The terminal board shall also accommodate a miniature circuit-breaker in the phase connection to the fitting. Poles intended for mounting directly in ground are to be provided with a 300 x 300 mm base plate.

15. UNDERGROUND CABLES

1000 volt PVC SWA and 110 Volt PILCA cable and accessories shall be in accordance with the relevant SABS specifications to SABS 1507.

The storage, transportation, handling and laying of underground cables shall be according to the manufacturer's requirements and the Contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to cables during such operation. All cable pipes and ducts entering buildings are to be sealed against the ingress of vermin, water, etc.

15.1 Trenching

Cables, unless otherwise specifically directed, shall be laid at a depth of 600 mm below ground level. Trenches shall not be less than 300 mm wide for one to three cables, and the width shall be increased where more than three cables are to be laid together so that the cables may be placed at least 75 mm throughout the run.

The Contractor shall take all necessary precautions to prevent trenching work being in any way a hazard to the public and to safeguard all structures, roads, sewer works, or other property from risk of subsidence and damage.

15.2 **Cable Joints**

Joints in underground cable runs will not be permitted unless unavoidable and at the discretion of the Head : Works. Where cable joints are unavoidable, the cable jointer is to work efficiently and cleanly and so that each end of the cables to be joined may have a minimum of 0,9 m of slack disposed in a loop without stress. Back-filling under joints must be firmly tamped to prevent any subsequent settling.

15.3 **Bedding**

In trenches made in intermediate, hard rock, or boulder material, the cables shall be laid on a 75 mm thick bed of earth and be covered with a 150 mm layer of earth before the trench is filled in. The Contractor to supply all earth required for trench filling.

15.4 **Laying**

Cables shall be removed from the cable drum in such a way that no twisting, tension or mechanical damage is caused, and must be adequately supported at short 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 the drawing in of the cables.

15.5 **Back Filling**

Back filling after bedding (see Clause 15.3) 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 a required.

Back filling of cable trenches must not be commenced until after the cable trenches and laid cable(s) have been inspected by the Head : Works. Where a Contractor fails to observe this requirement he may, at the discretion of the Head : Works, be required to re-open such cable trenches for inspection at his own expense.

15.6 **Protection of Cables**

Where so directed by the Head : Works, concrete or other warning covers shall be placed over cables above the top bedding layer. Cable pipes when directed are to be installed at road and other crossings.

15.7 **Marking of Cables**

Cable marking tape is to be supplied by the Contractor and is to be laid 150 mm below ground over a cable run and as may be directed by the Head : Works to give early indication of underground cable runs.

15.8 **Joints and Termination of Cables**

Joints in underground cables and terminations shall be made by means of “Scotch Cast” or other approved epoxy-resin pressure type jointing kits. Low tension PVC cables are to be made off with sealing glands and materials designed for this purpose, which must be of approved make.

15.9 **Sealing of Paper Insulated Cable Ends**

Where cables are cut and not immediately made off, the ends must be sealed without delay. If cables are cut and the ends not immediately made off or sealed, the cable may be rejected and the Contractor will be required to replace it at his own expense.

15.10 **Earth Wires**

Except where specifically directed otherwise, earth continuity conductors are to be run with all underground cables constituting part of a low tension distribution system. Such earth continuity conductors shall be bare copper wire of a cross sectional area in accordance with the Code of Practice 0142 but shall not be less than 4 mm² nor more than 70 mm². The earth continuity conductor is to be bonded to the cable armouring, and to the lead sheath if any, at each termination, as well as to the local earth bard. The earth wire must be secured to the cable at 1,8 m centers.

15.11 **Opening Up of Existing Cables**

Where it is necessary to expose existing buried cables for any purpose, or to excavate in the vicinity of existing buried cables, pipes, etc, every care is to be exercised and only labourers experienced in such work, and duly warned by the Contractor, shall be employed thereon.

15.12 **Definitions for Classifying of Excavation**

(a) Soft Excavation – shall be excavation in material that can be efficiently removed by a back-acting excavator of flywheel power approximately 0,10kW per millimeter of tinned-bucket width, without the assistance of pneumatic tools such as paving breakers, or that can be efficiently loaded without prior ripping or stockpiling by a rubber tyred front-end loader approximately 15T mass and a flywheel power of approximately 100kW.

(b) Intermediate Excavation – shall be excavation in material that requires a back-acting excavator of flywheel power exceeding 0,10kW per millimeter of tinned-bucket width and the assistance of pneumatic tools prior to removal by equipment equivalent to that specified in (a) above.

(c) Hard Rock Excavation – shall be excavation in material that cannot be efficiently removed without blasting or without wedging and splitting prior to removal.

(d) Class A Boulder Excavation – shall be excavation in materials containing more than 40% by volume of boulders of sizes between 0,03 cubic meter and 20 cubic meter in a matrix of softer material or smaller boulders.

Note: (1) Excavation of solid boulders or lumps of size exceeding 20 cubic meter will be classified as hard rock excavation.

(2) Excavation of fissured or fractured rock will not be classed as boulder excavation but as hard rock intermediate excavation according to the nature of the material.

(e) Class B Boulder Excavation – shall be excavation of boulders only in a material containing 40% or less by volume of boulders of size between 0,03 cubic meter and 20 cubic meter in a matrix of softer material or smaller boulders.

Note: Those boulders that required individual drilling and blasting in order to be loaded by a back-acting excavator as specified in (a) above, or by a track type front-end loader, will each be separately classed as Class B Boulder Excavation.

16. EARTHING

16.1 Main Earthing

The type of main earthing shall be as required by the Supply Authority, if other than the Head : Works and in any case as directed by the Head : Works who may require additional earthing to meet test standards.

Where required, an earth mat is to be provided, the minimum size, unless otherwise specified, being constructed from copper straps 950 x 25 x 3 mm at 230 mm centers and braced at all intersections. Alternatively or additionally earth rods or trench earths may be required, as the Head : Works may direct, and installed according to his instructions.

All earth electrodes and connections thereto must be approved “in-situ” by the Head : Works before back-filling.

The electrical installation shall not be earthed by means of the lightning arrester earth electrode, if such is included in the installation, but may be bonded thereto.

16.2 Earthing in Installations

The installation shall be effectively earthed in accordance with the relevant sections of the Code of Practice 0142 and the requirements of the Supply Authority.

All hot and cold water and waste pipes are to be effectively bonded by means of 12 x 1,5 mm solid copper tape (perforated tape or wire will not be permitted), clamped by means of brass bolts and nuts. Bonding tapes exceeding 75 mm in length must be fixed to the wall by means of No. 6 x 20 mm brass screws and plastic plugs not exceeding 150 mm centers. Main earth copper tapes where installed less than 2,5 m from ground level, must be run in 20 mm diameter conduit securely saddled to the wall.

Gutters and down pipes are to be bonded by means of 6 mm round headed brass bolts, with nuts and washers. Self-tapping screws are not permitted.

Connections from the earth bar or terminal on the main board must be made to a visible cold water main, the incoming service conductor, if any, and the earth mat or plate (where such is required) by means of either 12 x 1,5 mm solid copper tape or bare 25 mm² copper wire, or such larger conductor as the Head : Works may direct. From each distribution board separate earth conductors are to be taken to the main earth bar or terminal on the main board. Each conductor shall consist to stranded copper conductors drawn into the conduit together with the distribution board feeders. The size of the earth conductors to be in accordance with the requirements of the Code of Practice 0142 or as specified.

Earthing clips shall be made of not less than 0,9 mm thick copper strips not less than 12 mm wide. They are to be complete with 25 x 7,7 mm brass bolts, washers and nuts and must be constructed so that the clips will fit firmly to the conduit without any additional packing.

Adjustable earth clips are not permitted.

17. EXISTING BUILDINGS

17.1 Occupied Buildings

Where work is to be carried out in occupied buildings the Contractor must arrange to carry out the installation with as little interruption to services and discomfort to the occupants as possible.

17.2 Temporary Connections

Temporary connections shall be provided where necessary for continuity of services, and as directed by the Head : Works. The contractor must ensure that such connections are both electrically safe and free from physical hazard.

17.3 Old Materials

Unless otherwise specified all existing materials removed by the Contractor shall remain the property of the Head : Works and are to be handed to the Head : Works.

17.4 Making Good

Any damage which may be done to the plaster work, floors, ceilings, wood and paint work, furniture and other equipment in the building, etc, during the progress of the electrical installation shall be repaired and made good by the Contractor to the satisfaction of the Head : Works.

18. COMPLETION

18.1 Balancing of Load

The Contractor is required to balance the load as equally as possible over multi-phase supplies.

18.2 Tests

The installation shall be tested by the Contractor as the service progresses or as required by the Head : Works and upon completion, for earth continuity and insulation. The final test before the taking over of the installation shall be made in the presence of the Head : Works.

The mandatory “Certificate of Compliance” shall be issued by the Contractor to the Supply Authority, with a copy to the Head : Works prior to first delivery being taken.

18.3 **Labelling**

All circuits and apparatus on switchboards shall be suitably correctly labeled by means of engraved plastic labels (white lettering on black), which are to be either bolted or screwed to the equipment panel, or fitted in channeling provided below the switch gear.

Sub-circuits are to be numbered and a legend detailing the circuits is to be framed and fitted to the door of the distribution board.

All other equipment is to be individually labeled to indicate the function.

All switchboards are to be fitted with a label on which the designation of the board is clearly indicated.

A separate engraved label depicting the origin and cable/conductor size shall be fixed below the main switch.

18.4 **Finishes**

Covers for all boxes, expansion boxes, etc, shall be finished to match the paint work of the ceiling or wall surface or as specified.

18.5 **Site Drawing**

On all completed new work or where specifically called for in the Tender Document, the Contractor shall, on completion of the works, submit to the Head : Works, a marked up site plan indicating the exact underground cable reticulation.

19. **POWER DUCTING FOR SCHOOL SCIENCE LABORATORIES**

The ducting shall be “Ductline 3” supplied by Messrs. Lascon Lighting, 102 Malbourne Road, P.O. Box 2479, Durban 4000: Telephone 031-2075081 or other approved.

20. **SPEAKER AND MICROPHONE OUTLETS**

Speaker and microphone outlets are to conform to the following details:

1. Speaker outlet – To have one flat and one round pin.

2. Microphone outlet – To have one round pin only.

Both female and male parts to be supplied and installed by the Contractor.

21. **BELLS AND BUZZERS**

21.1 **Bells**

Bells for schools and hostels shall be 220 Volt AC or 24 Volt DC as specified for the service. They are to be of robust construction encased in a sturdy cast metal weather-proof case. They are to operate on the frequency of the supply. They shall have an adjustable stabilizing spring, gold-silver contact points and 150 mm gongs.

21.2 **Doorbells, Buzzers and Bell Transformers**

These will be as specified for each service.

21.3 **Bell Pushes**

Except where otherwise specified, bell pushes shall be of the flush type suitable for mounting in a standard 100 x 50 mm box. They shall be clearly marked as a bell push and shall be fitted with satin finished anodized aluminium cover plates.

22. **SIGNAL TIMERS**

22.1 **Primary Schools**

The timer shall be designed to automatically signal the start and finish of school periods by the switching of a bell circuit and is to comply with the following specification:

1. The mechanism may be synchronous motor or quartz movement driven with a 24 hour dial or digital time read-out suitable for operation on a 220V 50Hz supply and is to be provided with a spring or battery reserve of a least 24 (twenty four) hours.

2. The unit is preferably to have minute to minute timing for a 24 (twenty four) hour period although 5 (five) minute intervals are acceptable, and is to be provided with Weekend lockout. Signal periods shall be adjustable from 5 – 45 seconds.

3. The unit shall be housed in a metal or plastic case with detachable front cover suitable for wall mounting.

4. Timers with punch tape programming are not acceptable.

22.2 **High Schools and Colleges**

Timers for these institutions shall generally be as for Primary Schools but are to have at least 3 (three) separate programmes and be fitted with three push buttons for independent manual operations for testing of each programme, plus an on/off switch for each programme, which does not affect the running of the clock.

23. **CLOCKS**

Electric clocks shall be of the quartz electronic battery operated type, with a dial of 250 mm diameter. The dial shall be white, with distinctive minute markings and chapters shall be black Arabic figures. Time adjustment shall be simple. Where mains operated electronic clocks are specified, these shall be of the synchronous self starting type, suitable for a 200 – 250 V 50 Hz AC supply

24. **TIME SWITCHES**

The time switch shall consist of a single pole switch with silver to silver or other approved contacts operated by a quartz movement with a 24 hour reserve.

A suitable 24 hour, night and day dial, with hour indicator and two adjustable strikers, one OFF and one ON must be provided. The whole mechanism is to be totally enclosed in a dust proof case.

The current rating shall be required and the switch is to be suitable for operation on 220 volt 50 Hertz AC supply. Time switches used for under floor heating are to be fitted with weekend cut-out.

25. **MOULDED CASE CIRCUIT BREAKERS (INCLUDING MINIATURE)**

Circuit breakers shall be of the size and type as directed and specified for the service. They shall comply with SABS Specification 156 and SABS IEC 60947-2.

26. **SWITCHES: ON-LOAD FAULT MAKING (CIRCUIT BREAKER TYPE) WITHOUT TRIPS**

The switches shall be triple pole, hand operated, panel mounting air break type, having continuous current rating as specified and suitable for operation of 380 – 440 Volt 50 Hz AC system.

The contacts are to be of silver alloy and the switch mechanism shall be of the quick-make, quick-break type.

27. **SWITCHBOARD EQUIPMENT**

Switchboard equipment such as switches, circuit breakers, etc, shall be as directed and specified in the detail specification for the service.

Circuit breaker equipment of SABS IEC 60934.

28. **FUSE-SWITCH UNITS (WITH HRC FUSES)**

The fuse-switch unit is to be of the double pole, or triple pole or triple pole with neutral link type, and of the required current rating, as specified for the service and must be in accordance with BS EN 60947-3.

The fuse links must be fully isolated when the switch is in the open position, and interlocks must be provided to prevent the switch being operated with the cover open.

The fuse links shall comply with SABS Specification 172 and SABS IEC 60269-1 to 4.

29. **BUS-BAR COPPER**

Bus-bar copper must be fully in accordance with Tables A1 and A2 of SABS 1473-2 and SABS IEC 60439-2.

30. **SPECIFICATION COMPLIANCE**

The complete installation shall comply with the requirements of this specification. Should any differences or contradictions exist between this Specification and the detailed requirements for a specific installation, then the detailed requirements shall take precedence.

LIGHTNING PROTECTION INSTALLATION

GENERAL SPECIFICATION

1. SATISFACTORY INSTALLATION

The whole of the installation shall be carried out in accordance with:

(a) The latest S.A.B.S. Code of Practice for the Protection of Structures against Lightning - S.A.B.S. 03 ; SABS IEC 61024 (1) , 61024 (1 -1); SABS IEC 61312 (1) ; SABS IEC 61662 & NRS 042.

(b) The KwaZulu-Natal Department of Works General Electrical Specification.

(c) The Municipal By-Laws and any other special requirements as deemed necessary by the Local Supply Authority;

(d) Local Fire Regulations.

2. S.A.B.S. APPROVED DRAWINGS

SABS Approved drawings are not required for this project.

3. TEST ON COMPLETION

Upon completion of the lightning protection system, the following tests shall be witnessed by an appointed representative of the Employer. The results shall be recorded on suitable test certificates which must be signed by both the Contractor and the Employers representative. A sketch must be included on each test certificate indicating the positions of each earth electrode in relation to some permanent reference point. It must also indicate the positions at which tests were carried out, the type of test and the results of these tests.

3.1 Earth Resistance Test

The Earth Resistance Test shall involve measuring the resistance to earth of each rod-type electrode, or group of rod-type electrodes, or trench earth which would normally be connected to one down-conductor or earth terminal. This test must be made with the electrodes completely disconnected from any part of the structure or lightning protection system.

3.2 Electrical Continuity Tests

(a) **External Down-Conductors**

Electrical continuity between the lower ends of external down-conductors which must all be disconnected from the earthing system during the test shall not exceed 1 (one) ohm.

(b) Metallic Services

Electrical continuity between any metallic structures of services (e.g. rainwater pipes) which form an integral part of the lightning protection system shall not exceed 1 (one) ohm. These tests should be carried out with all other components of the lightning protection system disconnected from the component being tested.

4. DESCRIPTION OF MATERIAL

4.1 Air Terminals and Down-conductors

All conductors must be in accordance with the requirements of BSS 1474 or American Standards Specification 6063. All aluminium conductors shall have a cross-section area of not less than 30 mm^2 (domestic dwelling only) or 50 mm^2 for all other applications. The dimensions of flat section conductors to be 20 mm x 3 mm. Where conductors are mounted in stand-off guides, the cross-section area of the conductor must be not less than 70 mm^2 to give adequate mechanical strength.

4.2 Conductor Guides

The conductor must be mounted in aluminium alloy guides conforming with the material specification given in 4.1 above. The guides must allow for free longitudinal movement of the conductor to cater for expansion and contraction of the system caused by temperature variation. The minimum thickness of any part of the guide shall not be less than 3 mm. The guides must be securely attached to the structure using two stainless steel screws and plugs, the use of plated screws is not permitted.

The conductor system shall be supported in guides so that an air gap exists at all times between the aluminium and the surface of the structure, the guides being seated upon plastic or other similar insulating material. Should conductors be installed directly upon the surface of concrete or cement plaster, an insulating strip is to be installed over its whole length to prevent contact between the two surfaces. Guides shall be installed to support the conductor at intervals not exceeding 1,2 metres horizontally or 1,5 metres vertically.

N.B.: No part of an aluminium conductor system must be allowed to come into direct contact with concrete or cement plaster as this may cause the aluminium to corrode.

4.3 Expansion Loops

Where conductors are installed horizontally without deviation from a straight line over long distances, expansion loops must be provided at distances not exceeding 30 metres. These expansion loops must have a cross-sectional area which is at least equal to that of the conductor.

4.4 Protection of Down-conductors

Where external down-conductors are installed in areas which are readily accessible to the public, the lower ends of the conductors shall be enclosed in a semi-rigid insulating material. In the case of a circular section conductor this shall comprise a 2 metre length of 20 mm diameter P.V.C. conduit. This conduit shall be securely attached to the wall by means of galvanized steel saddles fixed with stainless steel screws and plugs, spaced at intervals not exceeding 1 m. Where a flat section conductor is used this shall be covered by a similar length of 25 mm P.V.C. conduit. The lower end of the conduit shall be positioned as close as practicable to ground level, i.e. immediately above an aluminium to copper joint. The ends of the conduit shall not be sealed.

4.5 Earthing Electrodes

Earthing electrodes must consist of either copper-clad steel rods not less than 12 mm in diameter and having a minimum copper thickness of 0,20 mm driven into the ground, or a 50 mm^2 (35 mm^2 for domestic dwellings) bare copper conductor buried in a trench, or a combination thereof. Where copper clad steel electrodes are used they must have a suitable bond between the steel core and copper exterior to prevent moisture ingress between the two metals. Where it is necessary to extend earth rods, an electrolytically compatible corrosion resistant, coupling device, which prevents ingress or moisture into the joint shall be used. The copper conductor below the down-conductor joint shall be covered by a semi-rigid P.V.C. conduit for a distance of approximately 200 mm above ground and 400 mm below ground.

4.6 Joints Above Ground

Circular section aluminium conductors shall be jointed by aluminium ferrules or lugs which are securely crimped into place. Aluminium lugs must be bolted together using 10 mm diameter aluminium bolts and washers. The material specification for these components must conform with that laid down in paragraph 4.1. Alternatively heavily tinned copper lugs and ferrules may be used. The lugs should be joined together by means of 10 mm diameter copper, brass or bronze bolts and washers. Care should be taken to inhibit corrosion where dissimilar metals are used by thoroughly cleaning the surfaces of the metal before assembly and subsequently sealing the joint with an inert tenacious compound or tape.

Flat section aluminium conductors shall be joined by double riveting, using aluminium rivets which comply with the material specification laid down in 4.1. Alternatively 2 x 6 mm diameter stainless steel bolts, nuts and washers may be used. Fold over type bends will not be permitted.

Down-conductors are to be terminated approximately 200 mm above finished ground level. Circular section aluminium is to be jointed to a 50 mm^2 (35 mm^2 in the case of domestic dwellings) stranded copper conductor by securely crimping in place two heavily tinned lugs and bolting these together using 10 mm diameter copper, brass or bronze nuts, bolts and washers.

N.B. : Under no circumstances shall aluminium conductors be buried in the ground.

4.7 Joints Below Ground

A joint in the stranded copper conductor which forms part of the earthing system must be made by using a crimped copper ferrule clamping (not lugs) using two copper line taps of suitable dimensions, or exothermic welding. The copper earth conductor must be joined to an earth rod by either clamping, using a standard earth rod clamp or copper line tap or by exothermic welding. Joints which are made between dissimilar metals (i.e. copper conductor to galvanized steel water main), must be thoroughly cleaned before assembly. They shall be rendered watertight using waterproof adhesive tape on a suitable compound for a minimum distance of 200 mm in all directions from the joint.

4.8 Bonds

Where it is necessary to bond the aluminium conductor to any other metallic surface, this must be done by bolting or riveting. When attaching aluminium to a dissimilar metal the joints are to be thoroughly cleaned and sealed to prevent corrosion.

5. GENERAL INSTALLATION PROCEDURE

5.1 Air Terminals for Non-metallic Pitched Roofs

Aluminium conductors are to be installed along all ridges of roofs and projections such as dormer windows, etc., terminating at the ends with conductors running downwards over the surface of the roof and the eaves. Non-metallic chimneys must be protected by means of a finial of sufficient length to cover the chimney within a 45° angle struck downwards from its point. Alternatively it should have a conductor installed in the form of a closed loop upon the upper surface. The conductors are to follow the outer contour of the stack and must be bonded at a convenient point to the nearest component of the air terminal system.

N.B. : This bond may run in a horizontal or downward direction, but under no circumstances must any part of it run above horizontal.

Conductors may be dead-ended (i.e. have one end free and unbonded), providing that the length of such a conductor does not exceed 10 metres and that the unbonded end is either at the same level or higher than the bonded end. This technique may be used where ridge conductors are installed over dormer windows, etc.

In all cases where metallic gutters have been installed along the eaves of a pitched roof, these must be bonded to the air terminal system. Where metallic gutters do not exist, however, a conductor must be installed over the surface of the roof at eaves level to which the remainder of the air terminal system is to be bonded, with the following exceptions :

(a) Where the maximum distance from the ground level to the eaves of the building is less than 4 metres and the pitch of the roof is more than 1 in 2 (27° from the horizontal).

(b) Where the maximum distances from ground level to the eaves is less then 7 metres and the pitch of the roof is more than 1 in 1,5 (34° from the horizontal).

(c) Where the distance from the ground level to the eaves is more than 7 metres and the pitch of the roof is more than 1 in 1 (i.e. the included angle at the apex of the roof is less than 90°).

Under these circumstances eaves conductors need not be installed.

Any non-metallic objects which protrude above the general roof lines, such as Cape Dutch gable ends, must be protected as described above with a suitable air terminal system. Any metallic objects which protrude above the general roof line, such as hot water expansion pipes must be bonded as directly as possible to the nearest eaves conductor, gutter or other part of the lightning system.

N.B. : These bonding conductors must run in a horizontal or preferably a downward direction, from the vent pipe, etc., to the lightning protection system.

5.2 Air Terminals for Metallic Pitched Roofs

Buildings with roofs covered with electrically continuous metal sheets do not require separate air terminals but must be earthed via down conductors generally as described in 5.6 and 5.7. Any non-metallic objects projecting above the general roof line must be separately protected as described in 5.1 and bonded to the metal roof covering.

5.3 Air Terminals for Non-metallic flat or Mono-pitched Roofs

For flat or mono pitched roofs of non-metallic construction the air terminal system must consist of aluminium alloy conductors installed around the outer perimeter of each section of the roof structure. These conductors must be installed on top of parapet walls if these exist. Lift motor rooms, tank rooms, penthouses, etc., which protrude above the general roof line must have air terminal conductors installed around the outer perimeter of each roof slab or parapet wall. Any metallic objects which protrude above the roof line, such as expansion pipes, signs, flag poles, handrails, etc., must be bonded directly to the nearest component of the lightning protection system as described in 5.1.

N.B. : It is not permissible for the ends of conductors to be bonded directly to the perimeter air terminal system if the latter is installed upon a parapet wall having a height exceeding 500 mm above roof slab level. In these circumstances the conductors are to be bonded directly to the down conductors.

5.4 Air Terminals for Metallic flat or Mono Pitched Roofs

Metallic flat or mono pitched roofs do not require separate air terminal conductors, providing that there is electrical continuity between the metallic roofing sheets, (see 5.2). A metallic roof surrounded by a non-metallic parapet wall shall have conductors installed at the top of the parapet wall and these must be bonded to the metallic roof at intervals not exceeding 20 metres. If the parapet wall is clad with metal over its upper surface or a handrail is installed which affords good electrical continuity, separate air terminal conductors need not be installed. Under these circumstances the metal handrail or cladding must be bonded to the metal roof covering at intervals not exceeding 20 metres.

All non-metallic covering such as slates, tiles, asbestos cement sheeting, etc., supported by a steel structure being electrically continuous throughout may be treated as being of a complete metal construction. In these circumstances no separate air terminal system need be installed providing the steel roof structure is bonded to earth at intervals given in 5.5.

5.5 Down Conductors for Non-metallic Structures

Down conductors must be installed at regular intervals around structures and to run as directly as possible between the air terminal and earthing system. They must, where practicable, be positioned at the external corners of the structure. The maximum separating distance between down conductors around the perimeter of the structure must not exceed 30 metres. In the case of very tall buildings having a slender base (i.e. chimney stacks, water towers, etc.), a minimum of two down conductors must be installed.

The lower ends of down conductors are to be terminated and bonded to the earthing system approximately 200 mm above finished ground level. Under no circumstances must aluminium conductors be buried underground. Test joints must be provided between the down conductors and earthing system. Down conductors must run vertically between the air terminal and earthing systems. Where this is impracticable, their course may be deviated to run at any angle up to and including horizontal.

Where it is necessary to run conductors horizontally over the upper surface of a structural protrusion, such as an exposed concrete slab, the conductor may run down vertically over the edge of the slab and return to the main structure, so that the distance between the upper and lower conductors exceeds one third of the length of the horizontal run. Looped down conductors are not permitted. Down conductors must not run over the underside of large overhangs which are less than 6 metres above ground level, or other areas where people are likely to be present during a thunderstorm.

External or internal metallic rainwater pipes may be used as down conductors providing these are of substantial section and are jointed by screwing one length into another or welding. Thin gauge galvanized steel pipes whose sections are held together by friction, rivets or screws must not form part of a lightning protection system.

5.6 Down conductors for reinforced concrete framed structures

The steel reinforcement of this type of structure may be used in place of down conductors. Where the reinforcing system is used, the air terminal system must be bonded to it at a maximum of 30 metre intervals using steel clamps. This bond may be achieved by clamping, with a steel clamp, a steel conductor to a selected reinforcing bar, the opposite end of this conductor must terminate at a corrosion resistant metallic terminal such as Grade 316 stainless steel.

The reinforcing system of prefabricated concrete buildings must not be used unless special provision is made for bonding the various prefabricated sections together.

The terminals should be mounted flush with the face of the concrete. An aluminium alloy bond must then be taken from the air terminal system and be connected to the stainless steel terminal by means of a heavily tinned crimp lug for circular section aluminium, or a suitable bi-metallic joint in the case of flat section aluminium. A similar system must be used to bond the reinforcing system at ground level to the earthing system at points directly below the air terminal bonds. Here copper conductors must be used as the external bonding material.

Under no circumstances must copper, or other non-ferrous material be allowed to come into contact with steel reinforcing bars, as this may cause severe corrosion and subsequent structural damage. The lightning protection system must not be bonded to any part of the structure which is electrically isolated from the remainder of the building, i.e. cantilevered sections. In these circumstances, or where it is otherwise impracticable to use the reinforcing system, external down conductors must be installed as described in 5.5.

5.7 Down conductors for steel framed structures

Where the framework of a building is constructed of structural steel columns, these may be used in place of down conductors providing the separating distance between them does not exceed 30 metres. The upper ends of the columns must be bonded to the air terminal systems and the lower ends to the earthing system.

5.8 Earthing by means of vertically installed rod type electrodes

Rod-type electrodes must be driven into the ground at a position directly below each down connector. The maximum earthing resistance of each electrode or number of electrodes bonded to any one down conductor shall not exceed N X 30 ohms, where N equals the total number of down conductors which are bonded to a common air terminal system, or 200 ohms whichever is the lower value.

The minimum horizontal separating distance between rod-type electrodes bonded together must not be less than their installed depth. The upper ends of installed rod-type electrodes are to be terminated approximately 500 mm below finished surface level. A 50 mm^2 copper bonding conductor must be installed to run between each earthing electrode system and the lower ends of the adjacent down conductors. A joint is to be made between each of these bonding conductors and the down conductors at a position approximately 200 mm above finished ground level. These bonding conductors must be installed in P.V.C. conduit securely affixed to the wall (see 3.4). The length of this P.V.C. conduit must be approximately 600 mm and must be installed so that approximately 200 mm protrudes above ground level, the remainder being buried into the soil.

5.9 Earthing by means of metallic water mains

Where two or three down conductors are installed the water mains may serve as an earth terminal for one of these. Where three of more down conductors are installed the water mains may serve as an earth terminal for two of these. Regardless of whether the water mains are used as an earth terminal or not, the incoming metal water pipe must be bonded to the lightning protection earthing system underground.

5.10 Earthing by means of trench type electrodes

Where the soil conditions prevent the satisfactory installation of rod-type electrodes, a trench earth system must be installed. This method is to comprise a 50 mm^2 stranded copper conductor installed horizontally into a trench at a depth of 500 mm below finished ground level. The conductor is to follow the general outline of the structure to be protected and be installed 1 metre away from the outside walls. Where the building stands on rocky ground, the trench earth may be attached to the lower part of the wall in areas where rock protrudes through the soil. The conductor must, however, be buried wherever possible as described above.

Each down conductor must be bonded to the trench earth system as directly as possible by means of a copper conductor.

Trench earth systems must have a maximum earth resistance of 30 ohms. An isolated length of trench earth mat must be bonded to the down conductor system in such a way as to reduce the length of dead-ends to the minimum.

Should trench earths be installed beneath pathways where people are likely to be present during a thunderstorm, a plastic, bitumastic or ceramic pipe must be installed having a length similar to the width of the pathway and the trench earth conductor run inside it.

N.B. : The maximum useful length of a dead-ended trench earth is 80 metres.

ANNEXURE 3

MECHANICAL SPECIFICATIONS

PW 327

DEPARTMENT OF PUBLIC WORKS

STANDARD SPECIFICATION

FOR

AIR CONDITIONING AND

VENTILATION INSTALLATIONS

STS 1
1998

ISSUE XII

AC.PWD.XII

STANDARD SPECIFICATION

FOR

AIR CONDITIONING AND VENTILATION INSTALLATIONS

CONTENTS

SECTION	DESCRIPTION	PAGE
1.0	General Requirements	1.1
2.0	Maintenance and Servicing	2.1
3.0	Technical Requirements - General	3.1
4.0	Technical Requirements - Equipment and Materials	4.1

SECTION 1

CONTENTS

CLAUSE	DESCRIPTION	PAGE
1.0	General Requirements	1.1
1.1.0	Notice	1.1
1.2.0	Standard Measures	1.1
1.3.0	Materials and Workmanship	1.1
1.4.0	Drawings	1.2
1.5.0	Site Conditions	1.3
1.6.0	Deviations from Tender Documents	1.3
1.7.0	Programming of Work	1.4
1.8.0	Manufacturer's Ratings	1.4
1.9.0	Notices	1.4
1.10.0	Guarantee	1.4
1.11.0	Lubrication	1.4
1.12.0	Commissioning and Testing	1.4
1.13.0	Performance Tolerance	1.7
1.14.0	Test Certificates	1.7
1.15.0	Application for Installation	1.7
1.16.0	Power, Water and Drain Connections	1.7
1.17.0	Quality of Materials	1.7
1.18.0	Service Access	1.8
1.19.0	Standard Specifications	1.8
1.20.0	Montreal Protocol	1.8

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.

1.3.2 The entire installation shall be in accordance with the following:

a) The National Building Regulations and Building Standards Act No. 103 of 1977 as amended in 1984 and all amendments thereafter.

b) The latest revision of SABS 0400: The Applications of the National Building Regulations, as amended.

c) SABS Code of Practice for the Wiring of Premises No. 0142 of 1981, as amended.

d) The Machinery and Occupational Health and Safety Act No. 85 of 1993.

e) Any other relevant by-laws of local or other authorities.

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 sepia 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 it's 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.

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.

SECTION 2

CONTENTS

CLAUSE	DESCRIPTION	PAGE
2.0	Maintenance and Servicing	2.1
2.1.0	General	2.1
2.2.0	Maintenance Instruction of Owner's Staff	2.1
2.3.0	Spare Parts and Agencies	2.1
2.4.0	Tools	2.2
2.5.0	Operating, Maintenance Instructions, Wiring and Control Diagrams	2.2

STANDARD SPECIFICATION

FOR

AIR CONDITIONING AND VENTILATION INSTALLATIONS

SECTION 2

2.0 MAINTENANCE AND SERVICING

2.1.0 GENERAL

2.1.1 Unless otherwise specified in the Supplementary Specification, the Contractor shall be responsible for all maintenance and servicing of the installation for the full 12-month guarantee period. During this period, the Contractor shall make good any defect due to inferior materials or workmanship and maintain all plant and equipment in perfect operating condition.

2.1.2 The Contractor shall be entirely responsible for carrying out regular inspections at intervals not greater than 1 month, unless otherwise specified, and for full servicing of all components of the installation in accordance with the manufacturer's instructions. For this purpose, the Contractor shall prepare a detailed inspection and service report in the form a checklist and log sheet showing all functions to be carried out at each inspection and service. Copies of these service reports shall be regularly submitted to the Department after each service.

The Contractor shall also maintain a plant logbook on site in which he shall record, sign and date all work carried out at each inspection as well as log all temperatures and pressure readings etc.

2.1.3 The Contractor shall allow for all expendable materials necessary for servicing such as lubricating oils, grease, refrigerant and cleaning materials.

Replacement filters, if required, will be provided by and at the expense of the Department.

2.2.0 MAINTENANCE INSTRUCTION OF OWNER'S STAFF

2.2.1 Tenderers shall make proper allowance in their tender price for instruction of the Department's staff in the maintenance, repair and adjustment of all the equipment. Allowance must be made for the proper hands-on tuition of the owner's personnel at the appropriate time to enable them to take over operational duties.

2.3.0 SPARE PARTS AND AGENCIES

2.3.1 Where Tenderers offer plant embodying units of manufacture other than those of their principals and for which they are not accredited South African agents, and for which they do not stock spare parts, they should state in the tender the name of the accredited South African agents from whom spare parts for such units are obtainable.

2.3.2 In all cases, Tenderers should furnish an undertaking from agents to the effect that they are prepared to carry the necessary stock of spare parts for their particular units

2.3.3 Tenderers are also required to furnish the same undertakings as regards the spares for units manufactured by their own principals.

2.3.4 During adjudication of tenders, consideration may be given not only to the cost of the plant offered, but also to the cost of the spares.

2.4.0 TOOLS

2.4.1 All special tool required, i.e. tools specially designed for the particular equipment offered, must be supplied and listed in the tender offer and included in the unit price. In the case of a number of identical items of plant being supplied it will only be necessary to supply two sets of tools covering all units, and not one set for each unit.

2.4.2 It is the responsibility of the Contractor to ensure that all tools are handed over to the Department on completion of the contract, in brand new condition. No damaged tools will be accepted, and the contract will not be considered complete until such tools are satisfactorily received. Tools handed over shall be suitably mounted on a wallboard or supplied in a high quality metal box or other container as may be agreed to by the Department.

2.5.0 OPERATING, MAINTENANCE INSTRUCTIONS, WIRING AND CONTROL DIAGRAMS

2.5.1 The Contractor shall prepare and supply comprehensive manuals for the successful operation and maintenance of the installation. A draft of the manual shall be submitted to the Department after commissioning, for approval. The draft shall then be corrected, if required, and THREE sets of the manual shall be submitted before first acceptance of the plant will be considered.

2.5.2 Manuals shall be prepared in the same language as the contract document unless otherwise required by the Department. These manuals shall be bound in hard file covers with clear titles and indices and shall contain the following information as a minimum, in the sections indicated:

SECTION 1: System Description

A comprehensive description of the system, including schematic diagrams.

SECTION 2: Commissioning Data

The results of all checks and measurements as recorded during the commissioning period, shall be compiled in such a manner that every check and measurement is clearly defined.

SECTION 3: Operating Instructions

1. Plant running checklist and frequency of servicing.
2. Safety precautions to be taken.
3. Manual and automatic operation.
4. Operator's duties.
5. Lubricating oils and service instructions.
6. Pre-start checklist for each system.
7. Starting and stopping procedures.

SECTION 4: Mechanical Equipment

1. Description of all major items of equipment with the make, model number, names, addresses and telephone numbers of the Supplier, Manufacturer or their Agents.

2. Design capacities of all equipment including selection parameters, selection curves, capacity tables, etc.

3. Manufacturer's brochures and pamphlets.

4. Schedule of spares with part numbers recommended to be held in stock by the Department.

SECTION 5: Maintenance Instructions

1. Schedule of maintenance particulars, frequency of service and replacements.

2. Troubleshooting guide.

3. Part number of all replacement items and spares.

4. Capacity curves of pumps, fans and compressors.

5. Serial number of main items of equipment.

SECTION 6: Electrical Equipment

1. Schedule of equipment indicating manufacturer, type, model number, capacity and address and telephone number of supplier.

2. Maintenance instructions.

3. Manufacturer's brochures and pamphlets.

4. Complete "as-built" circuit diagrams and diagrammatic representation of inter-connections of electrical equipment.

SECTION 7: Instrumentation and Control

1. Description of each control system.

2. Schedule of control equipment indicating make, type, model number, rating, capacity and name, address and telephone number of supplier.

3. Maintenance instructions.

4. Manufacturer's brochures and pamphlets.

SECTION 8: Drawings

1. Paper prints (reduced if so desired) of all "as-built" mechanical and electrical Contractor's drawings.

2. Wiring diagrams, framed behind glass shall be mounted adjacent to each relevant control panel.

SECTION 3

CONTENTS

CLAUSE	DESCRIPTION	PAGE
3.0	Technical Requirements - General	3.1
3.1.0	Erection of Equipment	3.1
3.2.0	Equipment Plinths	3.1
3.3.0	Holding Down Bolts and Bolts for Equipment	3.1
3.4.0	Bedplates	3.2
3.5.0	Coupling Shaft and Vee-belt Guards	3.2
3.6.0	Couplings	3.2
3.7.0	Mechanical Drives	3.3
3.8.0	Packing of Equipment	3.4
3.9.0	Alignment of Equipment	3.4
3.10.0	Assembly of Components	3.5
3.11.0	Welding	3.5
3.12.0	Galvanising	3.6
3.13.0	Painting	3.7
3.14.0	Bearings	3.8
3.15.0	Noise and Vibration Control	3.9
3.16.0	Electrical Equipment and Installation	3.17
3.17.0	Selection of Equipment	3.18

STANDARD SPECIFICATION

FOR

AIR CONDITIONING AND VENTILATION INSTALLATIONS

SECTION 3

3.0 TECHNICAL REQUIREMENTS - GENERAL

3.1.0 ERECTION OF EQUIPMENT

3.1.1 Tenderers shall allow for a complete installation, including the provision of mobile cranes, air compressors, lifting tackle, measuring equipment, precision levels, and all other special or regular tools and equipment that may be needed to complete the entire installation in accordance with the specification, and to the satisfaction, of the Department.

3.1.2 The Contractor will be responsible for any damage caused to buildings, equipment, etc. during the course of the erection of his equipment.

3.2.0 EQUIPMENT PLINTHS

3.2.1 Plinths as specified hereunder shall not be confused with any form of inertia or anti-vibration base. Unless otherwise specified in the Supplementary Specification, equipment plinths shall form part of the air conditioning and ventilation contract.

3.2.2 Plinths shall be provided for all mechanical and electrical equipment. Plinths cast on concrete surfaces shall protrude at least 100mm above floor levels and depending on the position of the vibration mountings, shall be at least 300mm wider or longer than the inertia bases mounted on top. (Where applicable)

3.2.3 Plinths for equipment which do not need inertia bases or plinths for inertia bases with recessed vibration mountings, shall be of the same size as the equipment or bases mounted on top. Plinths shall consist of 1,6mm thick channel or angle iron formers with 10mm thick reinforcing bars located at 150mm pitch in each direction and filled with concrete. The top surface of the concrete shall be floated to an even and smooth finish to allow for not less than 25mm and not more than 50mm of suitable cement or epoxy grout under the equipment base frame. A 25mm 45º chamfer shall finish off all grout corners.

3.2.4 Plinths as specified above shall also be provided for field assembled plenum chambers and other equipment.

3.2.5 Where cooling towers are on the same floor level as condenser water pumps, the towers shall be mounted on concrete or masonry walls high enough to ensure a flooded suction at all times.

3.3.0 HOLDING DOWN BOLTS AND BOLTS FOR EQUIPMENT

3.3.1 The Contractor shall be responsible for the supply of all necessary holding down bolts for the machines supplied by him. He shall also supply all bolts necessary for assembling all the equipment supplied by him.

3.3.2 Holding down bolts shall preferably be cast into concrete bases when the bases are being cast. All bolts shall, in this instance, be provided with galvanised sheet metal sleeves approximately three times the diameter of the bolt, and projecting a minimum of four-bolt diameters below the surface of the concrete. This sleeve must be kept free of concrete until the final grouting takes place.

3.3.3 Under exceptional circumstances, the provision of suitably sized pockets for the holding down bolts will be permitted.

3.3.4 Where galvanised bolts are called for, they shall be fully galvanised all over. No re-cutting of threads will be permitted after galvanising. All nuts must run freely on the threads.

3.4.0 BEDPLATES

3.4.1 All bedplates shall be of fabricated mild steel with surfaces on which the pump, motor, gearbox, fan etc. is mounted.

3.4.2 All bedplates shall be stress relieved after welding but before machining. Each bedplate shall be provided with approximately eight horizontal jacking screws with locknuts for each unit mounted thereon to assist in aligning the pumps and motors, etc.

3.4.3 All bedplates shall be thoroughly cleaned, prepared and painted with one coat of Anodite red oxide primer to finishing coats being applied.

3.4.4 It will not be necessary to dowel equipment in place, provided the jacking screws specified above are fixed and locked.

3.5.0 COUPLING SHAFT AND VEE-BELT GUARDS

3.5.1 All couplings, vee-belts, shafts and moving parts and components shall be fitted with adequate guards which comply in all respects with the Machinery and Occupational Health and Safety Act. They shall be fabricated from sheet and flattened expanded metal, and be so arranged that the couplings or belts are completely visible through the guard.

3.5.2 All guards shall be painted as specified.

3.5.3 Guards for fluid couplings shall be so constructed as to completely enshroud the coupling, and completely contain 110% of the full volume of oil contained in the coupling. In the event of an oil discharge, no oil must be thrown about or leak onto the floor.

3.6.0 COUPLINGS

3.6.1 High speed (Above 750 r/min)

Couplings between motors and driven equipment shall be Fenaflex tyre type couplings or approved, and shall comply with the following requirements:

i) They should be designed and selected for severe duty and 24 hours per day operation. In no case shall a "service factor" of less than 25% above that given in the Fenner Catalogue be used.

ii) All tyre couplings must be fitted with taper lock bushes.

iii) All couplings shall be of synthetic oil resisting rubber.

3.6.2 Low speed (Below 750 r/min)

These couplings shall in general be of a flexible type, which shall be approved by the Department.

Couplings shall in all cases be designed and selected for severe duty and 24 hours per day operation. In no cases shall a "service factor" of less than 25% above that given in the maker's catalogue be used.

Where possible, all couplings shall be fitted with taper lock bushes.

3.6.3 Hydraulic Couplings

These shall be of the Crofts, Voith or Vulcan Sinclair manufacture or as approved.

Where possible, couplings shall be fitted with taper lock brushes for both input and output shafts.

All couplings shall be adequately rated for the full power and torque rating of the motor to which they are coupled, plus 15% safety margin.

All fluid couplings must be offered with a temperature safety device, which will safely release the oil in the event of the coupling overheating.

3.7.0 MECHANICAL DRIVES

3.7.1 Vee-belt drives

Where used vee-belts shall be standard sections and lengths conforming to the latest edition of CKS 332 - 1972, "Specifications for industrial vee-belts".

Belt drives shall be designed and selected assuming direct on line starting of a squirrel cage motor and heavy duty operation for 24 hours per day. Design and selection shall be in accordance with the Fenner Power Transmission design manual or equivalent. Design shall be based on at least 2 starts per hour for all air conditioning applications. The power rating of the drive shall be based on full rating of the drive motor.

Pulleys shall be fitted with taper lock bushes. No pulley shall have a diameter smaller than that recommended by the belt manufacturer with minimum diameter being 100mm, and no non-standard pulley will be accepted.

No drive above 1kW rating shall have less than two belts.

Pulley size and centre distance shall be designed to ensure a belt contact arc over the smaller pulley of not less than 120º.

Pulleys shall be manufactured from close-grained cast iron with grooves matching belt sections and properly machined with smooth edges and wear surfaces.

Inward and outward adjustment of the drive motor and pulley combination shall be possible with proper locking mechanisms to enable correct belt tensioning and ease of replacement of belts.

All belt tensions shall be checked within 24 hours of first delivery and again one week later and adjusted as necessary.

Belt speeds exceeding 15 m/s and speed ratios greater than 7:1 are not acceptable.

3.7.2 Chain Drives

To facilitate maintenance, spares inter-changeability and standardisation, chains where selected, shall be standard stock roller type precision drive chains of reputable manufacture.

The axial and angular alignment of wheels and chains shall be carefully checked to very close tolerances to ensure maximum life and trouble free operation.

The amount of adjustment possible to take up chain wear shall be not less than 2 pitches or 2 percent elongation above nominal chain length, whichever is the greater. Chains shall be lubricated in accordance with manufacturer's recommendations.

3.8.0 PACKING OF EQUIPMENT

3.8.1 All base plates and steel work shall be suitably packed with steel packs to ensure that they are true to level, line and grade. The thickness of packing shall be such as to allow for not less than 25mm, and not more than 50mm of grout under all base plates or steel work. Packings shall be of suitable size to support the base plates and one pack must be situated immediately on each side of each holding down bolt as well as in such other positions as may be directed by the Department in order to adequately support the base plates and its superimposed load.

3.8.2 All packs shall be as near as possible to the exact height in one thick piece. Thinner shims may be used for final adjustments, but large piles of thin shims will not be accepted. All packs must be of parallel shims. Taper packs or wedges will not be accepted. Packs must be bedded on a flat and smooth area on the surface of the concrete foundation. Packs resting on rough concrete will be rejected.

3.8.3 After final levelling and lining up, it is essential that all packs are tight. Loose packs will be rejected.

3.8.4 No shims will be permitted between a machine base and plate and the machine's feet except as mentioned hereinafter.

3.9.0 ALIGNMENT OF EQUIPMENT

3.9.1 Bedplates

Where equipment is delivered completely assembled on a bedplate, these items of equipment shall be removed from the bedplate prior to installation. The bedplates shall first be installed, levelled, lined up and packed to ensure that there is no twist or distortion therein. The machines shall then be installed on their bedplates and the final alignment carefully checked and adjusted until it is to the entire satisfaction of the Department.

Minor corrections to the alignment of machines may be carried out using thin shims between the machinery feet and the machined surface of the bedplate. This applies particularly to electric motors. A maximum level error of 20 seconds of arc, or as decided by the Department, will be allowed.

3.9.2 Couplings

The alignment of all couplings must be carefully checked for both the parallelism and eccentricity of their shafts. Alignment must be carried out to the maker's tolerance and to the entire satisfaction of the Department.

In any event, a misalignment of more than 0,05mm will not be permitted for either parallel or eccentric misalignment as measured at the periphery of the couplings. It is essential that a dial micrometer is used to set the final alignment, which must be witnessed by the Department.

3.9.3 Vee-belts and chain drives

The alignment of vee-belt drives and chain drives shall be carried out with a precision steel straight edge in the case of short centre drives, or by means of a nylon line in the case of long centre drives. The Contractor must ensure that all belts and chains are correctly tensioned in accordance with the maker's instructions.

3.9.4 Gearboxes

All gearboxes shall be carefully checked for level and twist. No twist in the gearbox casing will be permitted. After final levelling and bolting down, the gear teeth shall be marked with Engineer's blue, and the meshing and bearing of the teeth checked and corrected to the satisfaction of the Department.

3.10.0 ASSEMBLY OF COMPONENTS

3.10.1 It is essential that all mating components such as couplings, taper lock bushes, machined faces, etc., be thoroughly cleaned with a suitable solvent before assembly. All surfaces must be free from burrs or irregularities, which may prevent the correct mating of the surfaces.

3.10.2 A molybdenum-disulphide lubricant similar or equivalent to Mobil-grease Super shall be used on the threads of all bolts and between the mating surfaces of all parts closely fitted together, such as shafts and couplings, keys and base plates. PTFE tape shall be used in all screwed pipe connections.

3.11.0 WELDING

3.11.1 Welding shall be carried out in accordance with the current edition of SABS 044 Parts I to VII where applicable.

3.11.2 All welded filler or butt joints shall be free from porosity, cavities and entrapped slag. Joints shall be ground smooth, if required for aesthetic reasons only, without effecting weld strength.

3.11.3 The joints in the weld run, where welding has been recommended, shall be as smooth as possible and shall show no pronounced hump or crater in the weld surface.

3.11.4 The profile of the weld shall be uniform, of approximately equal leg length and free from overlap at the toe of the weld. Unless otherwise specified the surface shall be either flat or slightly convex in the case of fillet welds and with reinforcement of not more than 3mm in the case of butt welds.

The weld face shall be uniform in appearance throughout its length.

3.11.5 Filler metal electrodes shall be of an approved type for the material being used and shall be kept in a dry condition. All electrodes shall conform to SABS 455.

3.11.6 Only welders in possession of a valid approved competence certificate shall be employed.

3.11.7 All welds must show proper fusion.

3.11.8 Where welding is contemplated in pipework systems, Tenderers shall allow for the removal and testing by an approved body of 5% of the welded joints in the system. These will be removed at random as indicated by the Department and tested. Should faulty welding be discovered, all other joints shall be X-ray tested by the SABS or an approved body, all at the expense of the Contractor.

3.12.0 GALVANISING

3.12.1 Unless otherwise specified in the Supplementary Specification the following items shall always be galvanised:

Fabricated mild steel sections exposed to the weather.

Steel grilles and louvres exposed to the weather.

3.12.2 Where hot dip galvanising is called for, items to be galvanised shall be entirely pre-fabricated and then dismantled in sections for galvanising. No cutting of threads or welding will be accepted after galvanising.

3.12.3 All hot dip galvanising shall be carried out in accordance with SABS 934 and SABS 763 where applicable, including preparation for galvanising.

3.12.4 Mild steel plate and sections shall be of good commercial quality, or higher grades, best suited for galvanising. The materials shall be free from slag or coarse laminations, fine fissures and rolled-in impurities.

3.12.5 Castings shall be sound, dense and clean, and free from distortion, porosity, carbon and slag enclosures, blowholes, and other injurious conditions.

3.12.6 Welding flux shall be chipped away and all welds wire brushed before galvanising.

3.12.7 The surface to be galvanised shall be free from paint, oil, grease and similar impurities.

3.12.8 All exposed surfaces including welds shall be thoroughly sand blasted prior to galvanising.

3.12.9 The Department reserves the right to inspect all steel components before galvanising, and shall have the right to reject or ask for remedial treatment of any material which is considered to be unsuitable. This applies particularly to welds.

3.12.10 The galvanising coating shall be smooth, adherent, continuous and free from black spots or flux stains.

3.12.11 Globular extra-heavy deposits of zinc, which interfere with the intended use of the material, will not be acceptable. Excessively protuberant lumps and nodules shall be removed by hot wiping or by the skilful application of mechanical means, however there shall remain a sufficient minimum thickness of unbroken zinc coating. Flaws on small parts and working surfaces shall be repaired only by stripping and re-dipping.

3.12.12 Repairs to galvanised coatings will not be accepted. Items damaged will need to be re-galvanised.

3.12.13 Coating thickness shall be as per table 1 of SABS 763 unless otherwise specified in the supplementary specification.

3.12.14 The SABS requirement for uniformity shall apply.

3.12.15 Galvanised surfaces specified with paint finishing shall not be passivated.

3.13.0 PAINTING

3.13.1 The entire installation, other than aluminium or stainless steel pipe cladding, shall be painted, unless otherwise specified in the Supplementary Specification.

3.13.2 Painted items shall include plantroom floors, equipment plinths and bases.

3.13.3 Before any painting is applied, the surfaces shall be prepared according to SABS 064, Code for Preparation of Steel Surfaces for Painting. All surfaces shall be moisture free, clean and properly prepared.

3.13.4 During painting, the Contractor shall ensure that all the necessary fire prevention and fire-fighting precautions have been taken.

3.13.5 Name plates, labels and notices on equipment shall not be painted.

3.13.6 Items which do not require painting such as diffusers and grilles, shall only be installed after the paintwork on the plant, ceiling or walls have been completed.

3.13.7 Painted surfaces on proprietary manufactured items shall be adequately protected. Equipment on which the paintwork has been damaged during installation shall be repainted before first delivery of the plant will be considered.

3.13.8 Unless otherwise specified in the Supplementary Specification the installation shall be painted in accordance with SABS colour coding where applicable. Colour code bands and arrow indicators shall be as per SABS 0140 of 1978, and the basic colour shall cover the full length and circumference of pipes and ducts.

3.13.9 Plastered surfaces inside plenums shall be painted with a suitable alkali resistant primer to SABS 1414-1987 followed by a universal undercoat with a final coat of high gloss enamel paint to SABS 630, Grade I. The colour of the final coat shall be white.

3.13.10 Lagged and plastered ductwork and plastered surfaces outside plenums shall be painted with a suitable alkali resistant primer to SABS 1414 of 1987 followed by one undercoat to SABS 681, type II and one coat high gloss enamel paint to SABS 630, Grade 1 or PVA exterior type emulsion paint to SABS 634 of 1974 as top coat.

3.13.11 Ferrous casings of cooling towers, evaporative condensers and sprayed coils including galvanised iron casings, sumps, fans and ductwork connected to outlets of cooling towers or evaporative condensers, shall be internally painted with two coats of epoxy-tar paint to SABS 801, type II.

Angle iron framework shall be similarly painted with epoxy paint before side covers are fitted. All steel surfaces shall be cleaned and painted with a wash primer or zinc chromate primer (un-galvanised iron) before the epoxy paint is supplied.

3.13.12 Exposed and unlagged galvanised piping shall be painted with one coat wash primer (self etch primer) to SABS 723 followed by one undercoat to SABS 681, type II and one coat gloss enamel paint to SABS 630, Grade 1 as top coat.

3.13.13 Unlagged black piping, flat iron, angle iron, rods, etc, for supports, brackets, frames, duct stiffeners, etc, shall be painted on all sides with a zinc chromate primer to SABS 679 type 1, followed by one coat universal undercoat and one finishing coat of enamel paint to SABS 630 Grade 1.

3.13.14 Where specified in the supplementary specification, aluminium shall be painted with a wash primer to SABS 723 followed by a zinc chromate primer to SABS 679, type I and one coat universal undercoat to SABS 681-1972 type II and one final coat of enamel paint to SABS 630, Grade 1.

3.13.15 Where specified in the supplementary specification, steel surfaces shall be cleaned and then treated with the hot phosphate process to a minimum weight of 1,6 g/m? coating followed by two coats of backing enamel to SABS 783 type I.

3.13.16 All galvanised surfaces requiring painting other than those covered in 3.13.17 below shall be thoroughly degreased. In case a detergent is used, the surface shall be well rinsed and dried. It shall then be painted with one coat wash primer (self etch primer) to SABS 723. When dry, the surface shall be painted with one undercoat to SABS 681 type II and one coat universal undercoat and one coat high gloss enamel paint to SABS 630 Grade 1 as top coat.

3.13.17 All galvanised surfaces inside air handling plenums and external within 50km of the coast, or as specified in the supplementary specification, shall be cleaned with a galvanised iron cleaner until a water break free surface is achieved. After drying one primer coat of "Galvo-Grip" or approved paint shall be applied followed by one coat of universal undercoat paint. A final coat of gloss enamel to SABS 630, Grade I shall then be applied.

3.13.18 For air handling units the entire air-conditioning unit casings, including galvanised iron eliminators, sumps, drip pans, fans etc., shall be painted internally with two coats of epoxy-tar paint to SABS 801, type II. The white rust preventative compound on galvanised iron shall be removed as specified above before the paint is applied. Angle iron framework shall be similarly painted with epoxy paint before side covers are fitted.

3.13.19 Exposed piping with canvas covered insulation shall be painted two coats of bitumen aluminium paint to SABS 802 followed by the colour coding basic colour as per table 1.

3.14.0 BEARINGS

3.14.1 Anti-friction

Anti-friction bearings shall include all bearings, which provide rolling contact between one or more sets of hardened steel balls or rollers and hardened steel rings or raceways.

Anti-friction bearings shall be of approved manufacture and available throughout South Africa.

To facilitate maintenance, spares interchangeability and standardisation, anti-friction bearings of standard design and manufacture shall be employed. All anti-friction bearings shall be provided with greasing facilities in accordance with manufacturer's requirements.

3.14.2 Bushed Bearings

Only where specifically stated in the Supplementary Specification and in the case of low velocities and light loads in moisture free conditions will bushed bearings be accepted. All bushed bearings shall be made of an approved bearing metal composition, which has good anti-friction qualities and is capable of withstanding severe usage in the specific application.

All bushed bearings shall be provided with lubrication facilities to ensure adequate lubrication and shall be properly grooved to distribute the lubricant uniformly over the bearing surfaces. Grooves shall not be cut into the journal, but always into the surrounding bush. The edges of all chambers and grooves shall be rounded to avoid sharp corners and to facilitate the introduction of the oil or grease between the journal and the bearing metal.

3.14.3.1 Self-lubricating or oilless bearings

Self-lubricating or oilless bearings shall only be used on application of light and low velocities in moisture free and low humidity conditions and where access to bearings is difficult and likely to be neglected during servicing.

The type of bearing metal composition used shall have frictional and wear resistant properties akin to those of grease lubricated bushed bearings.

3.15.0 NOISE AND VIBRATION CONTROL

3.15.1 General Unless otherwise specified in the Supplementary Specification the design, manufacture and installation of all the mechanical and electrical equipment shall be such as to ensure compliance with the relevant sections of SABS 0103 of 1983 "The Measurement and Rating of Environmental Noise with Respect to Annoyance and Speech Communications", as amended.

Any installation where the measured residual sound level exceeds the maximum desired residual sound level as per SABS 0103 shall be rectified to comply with SABS 0103 at the Contractor's own expense.

In all plantroom applications where airborne noise cannot be limited or comply with the set standards, provision shall be made for acoustical treatment of the equipment involved or, alternatively, total enclosure thereof with acoustical panelling to comply with requirements laid down in this specification.

Such provisions shall be included in the tender price and no claims for payment to comply with this requirement will be entertained.

3.15.2 Vibration Isolation

Proper provisions shall be made in the foundations and mountings of all equipment capable of transmitting vibration forces to its environment, whether local or remote, (As is the case with pipes) for vibration isolation.

The following table of recommended isolation efficiencies for critical areas applicable to heavy mass concrete floor slabs serves as a guide only:

CRITICAL AREAS			TRANSMISSIBILITY	ISOLATION EFFICIENCY
1.		Centrifugal compressors and chillers	0,5%	99,5%
2.	a)	Centrifugal fans larger than 15kW		
	b)	Reciprocating compressors larger than 40kW		
	c)	Pumps larger than 4kW	1%	99%
3.	a)	Axial flow fans larger than 20kW		
	b)	Centrifugal fans up to 15k W		
	c)	Reciprocating compressors up to 40kW		
	d)	Pumps up to 4kW		
	e)	Unit air conditioners		
	f)	Fan coil units	3%	97%
4.	a)	Axial flow fans up to 20kW		
	b)	Air handling units	4%	96%
5.	a)	Pipes		
	b)	Electrical connections, conduit cabling etc.	8%	92%
6.		Boilers, steam and central heating, larger than 20kW		4 to 7 Hz

The following table of recommended isolation efficiencies for general areas applicable to heavy mass concrete floor slabs serves as a guide only:

CRITICAL AREAS			TRANSMISSIBILITY	ISOLATION EFFICIENCY
1.	Centrifugal compressors and chillers		5%	95%
2.	a)	Centrifugal fans larger than 15kW		
	b)	Reciprocating compressors larger than 40kW		
	c)	Pumps larger than 4kW	8%	92%
3.	a)	Axial flow fans larger than 20kW		
	b)	Centrifugal fans up to 15k W		
	c)	Reciprocating compressors up to 40kW		
	d)	Pumps up to 4kW		
	e)	Unit air conditioners		
	f)	Fan coil units	10%	90%
4.	a)	Axial flow fans up to 20kW		
	b)	Air handling units	15%	85%
5.	a)	Pipes		
	b)	Electrical connections, conduit cabling etc.	20%	80%
6.	Boilers, steam and central heating, larger than 20kW			8 to 15 Hz

Selection of vibration isolation equipment and in particular, mountings for equipment and machines, shall be done with due regard to the forcing frequency of the driven machinery and the mounted natural resonant frequency of the machine.

In the case of installation of equipment on upper floors, suspended floors, roofs etc. it is of prime importance that floor stiffness, floor, deflection and natural frequency of the floor be taken in to consideration to ensure that resonant conditions cannot occur.

Driven machinery and isolator deflections shall be carefully selected in these applications.

Equipment selection schedules shall be submitted to the Department for approval and shall contain full details regarding the forcing frequency, the natural mounting frequency, the static deflection and all other relevant information to evaluate vibration isolation equipment.

Should added mass inertia blocks be required to comply with these vibration isolation requirements, proper provision shall be made at tender stage for the provision of such.

3.15.3 Damping

Where static deflections in excess of 8mm are indicated, steel springs shall be employed incorporating acoustic sound pads in series with the spring.

The horizontal stiffness of the springs shall not exceed that in the vertical, in particular for systems mounted at vertical frequencies below 5Hz.

Low frequency mounts shall incorporate rubber snubbers to accommodate extreme horizontal or vertical motions such as can occur near resonance during start up.

The snubbers shall however not be relied upon to provide the necessary horizontal stability of the machine in normal operational conditions.

Spring layouts and inertia blocks shall be employed to avoid this situation.
For static deflections below 8mm, rubber in sheer mounts may be used provided the frequency is above 6Hz.

For small static deflections less than 4mm and particularly for high-speed machines and general acoustic isolation, ribbed rubber neoprene composite pads may be employed subject to the specified requirements.

No equipment shall be installed in critical areas without correct and approved vibration isolation.

Sufficient stability and damping shall be incorporated in the mountings to minimise the movement of the machine during start up or changes in the operating conditions.

The selection of mounts shall take proper cognisance of unequal distribution of the mounting weight of equipment and rotational and/or pressure forces acting thereon.

3.15.4 Refrigeration Chillers

3.15.4.1 Indoor Units

Indoor units shall be carefully selected with due regard to vibration transmission to pipework and the surrounding structure and airborne noise transmitted to the plantroom. Where the airborne noise inside the plantroom exceeds the limits laid down, provisions shall be made in the tender for the total enclosure of the chiller with acoustic panelling to ensure acceptable noise levels.

Spring mounting of compressors only on the basic chiller framework as supplied ex factory will not be sufficient. In addition, (unless otherwise specified in the supplementary specification) the complete chiller unit shall be installed on spring mountings of the correct deflection characteristic.

For critical areas, the standard spring mounting of the chillers will not be sufficient. In addition, inertia mass will be required with the chiller unit as a whole mounted on correctly selected spring mounts. Deflection in excess of 40mm can be expected.

Indoor air cooled chillers shall in all cases be fitted with centrifugal fans for the condenser section. The complete unit with fan/s, ducting grilles etc. shall comply with the requirements laid down in this specification.

3.15.4.2 Outdoor Chillers

Where outdoor type air-cooled chillers are specified in critical areas, in addition to the laid down requirements, condenser-cooling fans shall be of the centrifugal type and provided with attenuation.

Centrifugal fans and attenuation shall be provided where necessary to meet the laid down noise criteria for other areas.

Acoustic panelling to the chiller housing shall similarly be provided for equipment where necessary to comply with the laid down criteria.

SABS 0103 has reference.

3.15.5 Cooling Towers

3.15.5.1 Indoor Applications

Anti-vibration requirements and noise transmission to surrounding areas shall comply with requirements as laid down (unless otherwise specified in the supplementary specification). No

cooling tower shall be installed indoors unless it is mounted on anti-vibration spring mountings and should it be necessary, the required inertia mass.

3.15.5.2 Outdoor Applications

Cooling towers installed outdoors shall similarly comply with the laid down noise criteria for this application, particular care being paid to the selection of the fans and where applicable, the pumps for critical areas.

3.15.5.3 Cooling Tower Fans

Centrifugal fans shall generally be required for indoor application of cooling towers and for outdoor applications in critical areas.

In critical areas it will possibly be required that proper attenuation be applied to air inlets and air discharge of cooling towers and, where so specified in the supplementary specification, the total cooling tower shall be installed inside acoustic panelling to prevent noise breakout.

Alternatively ejector type cooling towers may be offered, subject to the requirements of this specification.

3.15.6 Pumps

All pumps with their motors shall be mounted on a baseframe, which shall be installed on concrete plinths.

In addition it is required that pumps installed indoors and in critical areas shall be installed on anti-vibration mountings with inertia mass bases with mountings selected for correct static deflection.

Bases for pumps in non-critical areas shall be installed on rubber in sheer mounts as a minimum, depending on the pump selection and locality of the pump.

Where required in the supplementary specification, pumps shall be totally enclosed in acoustic panelling to reduce noise breakout to the immediate vicinity and surrounding areas.

3.15.7 Fans

3.15.7.1 Centrifugal Fans

No centrifugal fan shall be selected in a class range other than Class 1 or 2 and the rotating speed of the fan at duty point shall not exceed 1 440 r/min.

Centrifugal fans in critical areas and fans above 7,5kW shall in all cases be mounted together with the drive motor on anti-vibration mountings together with the correct inertia mass.

3.15.7.2 Propeller Fans

Propeller fans shall comply with the criteria already laid down and shall be carefully selected for the highest possible efficiency with due regard for the noise criteria.

Propeller fans in excess of 0,5kW and of rotational speed higher than 800 r/min shall, in addition to the requirements already laid down, be mounted on correctly selected and installed anti-vibration mountings to reduce possible vibration transmission to surrounding structures.

3.15.7.3 Axial Flow Fans

Axial flow fans shall be selected for the highest possible efficiency and comply with the noise criteria specified. In critical areas no fan shall be installed without attenuators on inlet and outlet sides.

In addition it will be required that the fan as a whole be mounted on anti-vibration mountings and where specified in the supplementary specification, it may be required for the fan to be enclosed in acoustic panelling.

No axial flow fan may be installed without anti-vibration mountings to match the fan characteristics and in critical areas it may be required for the axial fan to be provided with inertia mass to match.

Fan rotational speeds specified in the supplementary specification shall not be exceeded.

3.15.7.4 General

No fan may be directly connected to ducting either on the inlet or outlet sides, approved flexible connections shall be provided between the fan and the ducting distributing the air.

Where fan noise characteristics cannot meet the requirements of this specification such fans shall be replaced or other approved steps taken by the contractor at his own expense until the installation meets the requirements.

3.15.8 Air Handling Units

3.15.8.1 General Application

Air handling units shall comply with the requirements already laid down for noise vibration and noise criteria.

In the case of built-up air handling units, the fan and motor unit shall be mounted on anti-vibration mountings and in the case of critical areas, be provided with additional inertia mass to comply.

In the case of packaged factory-built units, it shall be necessary to mount the fan and motor unit on anti-vibration mountings internally to the unit and in addition, it will be required for the air handling unit as a whole to be mounted on anti-vibration mountings of the correct static deflection characteristic.

In critical areas, it will be necessary to provide additional inertia mass for the fan and motor combination in addition to the above.

Where necessary to comply with the noise criteria laid down, air handling units shall be provided with internal acoustic panelling to match the fan characteristic and to comply with the noise criteria laid down.

3.15.8.2 Hospital Applications

In hospital applications, the noise criteria already laid down for critical areas and as per SABS 0103 shall apply and the general requirements set out above.

However, no internal insulation or acoustic panelling will be permitted and all noise reduction required shall be done external to the air path.

3.15.9 Piping

3.15.9.1 General

Under no circumstances may any piping be directly connected to noise generating equipment such as pumps, chillers, cooling towers etc.

Connections to such equipment shall be made with correctly selected flexible rubber type connectors of the spherical type.

In critical areas double spherical rubber type isolators immediately adjacent to the noise generating machine will be required.

3.15.9.2 Pipe Penetrations Through Walls

Under no circumstances will pipe penetrations through walls be permitted where the pipe comes in direct contact with the surrounding wall or structure.

At such penetrations it is required that a sleeve of 25mm thick soft neoprene, or other approved material, be provided around the piping at the penetration and, where plastering is applied, plastering shall be cut back to the outer edge of this sleeve.

Rubber links similar to the LINK-SEAL bolted type are preferred.

3.15.9.3 Pipe Supports

In all critical applications and within the first ten metres of all equipment, it is required that pipe supports shall be of the flexible type, correctly selected for the application and with the correct static deflection.

Depending on the application spring mounting will in all probability be required.

Any other areas and applications at risk of noise or vibration transmission to the surrounding structure similarly require pipe mountings isolated from the structure.

Pipe supports fixed to sensitive building elements will not be permitted.

3.15.9.4 Refrigerant Piping

Refrigerant piping in critical applications shall similarly be supported on anti-vibration mountings and in addition, delivery and suction piping at compressors and air handling units shall be provided with at least two braided flexible connections installed at 90? to each other and in close proximity of each other.

3.15.10 Sound Attenuators

Where required, in order to comply with the noise and vibration criteria already laid down, or where specified in the supplementary specification, sound attenuators shall be provided for ventilation, air conditioning and all other plant (Duct mounted and/or as applicable).

Primary sound attenuators shall be installed near or in the plantroom.

The attenuators selected shall match the specific fan or plant characteristics to ensure the correct insertion loss to meet the sound criteria laid down.

Unless otherwise specified, sound attenuators shall be installed with flexible connections at the inlet and outlet connections.

The sound attenuators shall in addition be selected to produce the minimum pressure loss across the attenuator coupled to the least re-generated noise level produced by the flow through the attenuator.

Unless otherwise specified, air path sound attenuators shall be manufactured from galvanised sheet steel with the sound absorption material moisture repellent and erosion resistant up to 20 m/s air speed, and preferably flange connected.

Wherever possible attenuators shall be proprietary type supplied by the same manufacturer as the plant manufacturer to ensure complete compatibility.

Where not clearly indicated on the drawings, attenuators shall in all cases be provided at points where supply and return air ducting leaves the plantroom and shall be installed to prevent noise breakout from the plantroom via the ductwork.

Where specified in the supplementary specification and indicated on the drawings, additional cross talk attenuators shall be installed in the air conditioning or ventilation ductwork.

The internal free area of sound absorbers shall be not less than the cross sectional area of the connecting duct as indicated on the drawings.

Field fabricated type sound absorbers shall be made as follows:-

All sides of rectangular ducting shall be double walled with the inner walls perforated with 10mm holes at 25mm centres. The space between the two sidewalls shall be divided into 3 unequal sections by means of 25mm thick cement fibre panel strips and filled with glass wool. The lining thickness shall be at least 80mm.

Circular ducts shall be lined as specified above except that the lining thickness shall not be less than 100mm.

3.15.11 Air-Borne Noise

Selection and installation of all items such as grilles, diffusers, dampers, jet outlets, nozzle outlets, transformation pieces, takeoffs, etc. shall be carried out in such a manner to ensure compliance with the noise criteria laid down in this specification. Items shall be carefully selected to reduce generated noise levels to accepted levels and with minimum air pressure loss.

Items such as dampers, volume control items etc, shall be carefully selected with due consideration for noise regeneration in all possible positions of such dampers or items to ensure compliance in all positions.

All duct penetrations through walls and structures shall be provided with a 25mm thick soft neoprene or similar approved material sleeve surround to ensure that no direct contact between the duct and wall occurs. For plastered walls the plastering shall be cut back to the outer edge of this sleeve.

3.15.12 Room Units

Where room units such as air conditioners, fan coil units, VAV outlets or induction units are used, it is essential that the acoustical characteristics of such units are considered during selection and that they are installed to ensure compliance with the noise criteria laid down.

The sound pressure level from these machines shall be within the set criteria throughout the frequency range.

3.15.13 Noise to the Exterior

Where specified in the supplementary specification, additional measures shall be taken to prevent or reduce noise breakout to the exterior from the plantrooms.

In critical areas it is essential that all possible steps be taken and be allowed for at tender stage to ensure compliance with the requirements laid down.

No allowance shall be made for screening or attenuation with distance in calculating requirements.

3.15.14 Electrical Connections

In critical areas no conduit or armoured cabling may be connected directly to equipment. Flexible connections shall be used in these applications.

In other applications cabling shall be connected to equipment with long radius bends. No sharp corners or bends in cabling may be used.

Electrical connections shall not impede anti-vibration mountings and shall not convey vibrations or sound to the structure or building elements.

In critical areas cabling, trunking etc. shall be supported in a manner to ensure no vibrations are conveyed to the structure. Supporting from sensitive elements of the structure will not be permitted.

Where floating floors, acoustical separating elements etc. are used in a structure, flexible connections, conduit etc. shall be used at all crossover points.

3.15.15 Testing

When called upon to do so by the Department, the Contractor shall provide at his expense, all necessary equipment required to ascertain compliance with noise and vibration elimination in the installation.

The instruments provided shall be calibrated by an approved Authority and shall be capable of measuring sound and vibration levels integrated over a period of time.

The instrument to measure sound pressure levels must be capable of reading sound levels in dBA as well as the sound level at the international octave band centre frequencies of 31,5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1000 Hz, 2000 Hz, 4000 Hz and 8000 Hz as a minimum.

The instrument to measure vibration levels shall be calibrated in nano m/s over the integration period.

In the event of such tests indicating insufficient provision for eliminating airborne noise and vibration transmission, the Contractor shall at his expense rectify the installation as necessary and the tests shall again be executed until satisfactory results are obtained.

Final approval of the noise and vibration levels shall be at the sole discretion of the Department.

3.16.0 ELECTRICAL EQUIPMENT AND INSTALLATION

3.16.1 Unless otherwise stated in the Supplementary Specification tenderers must allow in their price for the complete electrical installation and wiring.

3.16.2 All electrical equipment and wiring shall be in accordance with the current issue of the Department's Standard Specification for Electrical Equipment and Installation for Mechanical Services. Copies can be obtained from the Department, Private Bag X65, PRETORIA, 0001.

3.16.3 Power terminal points will be as specified in the Supplementary Specification.

3.16.4 Ammeters and pilot lights shall be provided for electric heaters, one of each for each step of heating.

3.16.5 All compressor motors over 5kW shall be provided with an approved electronic type motor protection unit in addition to the protection called for in the Standard Specification for Electrical Equipment and Installation for Mechanical Services.

3.16.6 Clause 1.2.1 (a) of the Standard Electrical Specification shall read "The South African Bureau of Standards Code of Practice for the Wiring of Premises as amended".

3.16.7 In conventional field assembled plants lighting wired from the air conditioning control panel shall be provided for the filter chamber, coil chamber and fan chamber and shall comprise of bulkhead fittings permanently fixed to the walls or ceiling and earthed directly to the main earthing bar of the switchboard by means of a 4mm² bare copper earth continuity conductor, in addition to being earthed by means of the continuity of the conduit as specified in the Standard Electrical Specification.

3.16.8 The fault level of the air conditioning distribution board shall be as specified in the Supplementary Specification.

3.16.9 In the case of small wiring direct from busbars, e.g. voltmeter supply, suitable protection fuses shall be mounted directly onto the busbars.

3.16.10 The possibility of inadvertent contact with live terminals shall be avoided at all cost. All apparatus and wiring behind readily accessible hinged doors or panels shall be protected against finger contact by means of insulating panels (Perspex or similar approved material) or other approved method. Busbar mounted voltmeter fuses shall be mounted on insulated back plates to afford complete safety from hand contact with busbars or other conductors in the immediate vicinity.

3.17.0 SELECTION OF EQUIPMENT

3.17.1 All equipment shall be selected with due regard to the installation site conditions, particularly with respect to;

- altitude
- ambient temperatures
- atmospheric conditions

3.17.2 Equipment shall at all times be selected to operate within the limits recommended by the particular manufacturer.

3.17.3 Where equipment will be required to operate at conditions deviating from the manufacturer's standard selection tables, re-rating shall be done strictly in accordance with the manufacturer's methods.

SECTION 4

CONTENTS

CLAUSE	DESCRIPTION	PAGE
4.0	Technical Requirements - Equipment and Materials	4.1
4.1.0	Room Type Air Conditioners	4.1
4.2.0	Fans	4.4
4.3.0	Electrical Heaters	4.7
4.4.0	Air Filters	4.7
4.5.0	Cooling and Heating Coils	4.10
4.6.0	Heat Pumps	4.11
4.7.0	Self-contained Air Conditioning Units	4.13
4.8.0	Field Assembled Air Handling Units and Plenums	4.13
4.9.0	Air Handling Units	4.15
4.10.0	Fan Filter Units	4.15
4.11.0	Room Type Fan Coil Air Handling Units	4.16
4.12.0	Induction Units	4.17
4.13.0	Evaporative Cooling Units	4.17
4.14.0	Room Type Air Conditioners - Water Cooled	4.18
4.15.0	Reciprocating Refrigerant Compressors	4.19
4.16.0	Reciprocating Compressor Water Chillers	4.20
4.17.0	Centrifugal Compressor Water Chillers	4.20
4.18.0	Screw Compressor Water Chillers	4.21
4.19.0	Scroll Compressor Water Chillers	4.23
4.20.0	Air Cooled Condensers	4.24
4.21.0	Evaporative Condensers	4.25
4.22.0	Water Cooled Condensers	4.26
4.23.0	Cooling Towers	4.27
4.24.0	Closed Circuit Cooling Towers	4.28
4.25.0	Dry Coolers	4.28
4.26.0	Closed Circuit, Secondary Circuits	4.29
4.27.0	Computer Room Air Conditioning Units	4.30
4.28.0	Air Cooled Condensing Units	4.33
4.29.0	Refrigerant Circuits	4.33
4.30.0	Water Circuits and Accessories	4.35
4.31.0	Installation of Pipework and Ductwork	4.42

CLAUSE	DESCRIPTION	PAGE
4.32.0	Pumps	4.42
4.33.0	Humidifiers	4.44
4.34.0	Water Treatment	4.45
4.35.0	Fire Dampers	4.47
4.36.0	Ductwork	4.47
4.37.0	Air Outlets and Dampers	4.49
4.38.0	Insulation	4.50
4.39.0	Automatic Control System	4.55
4.40.0	Thermostats and Hygrostats	4.60

STANDARD SPECIFICATION

FOR

AIR CONDITIONING AND VENTILATION INSTALLATIONS

SECTION 4

4.0 TECHNICAL REQUIREMENTS - EQUIPMENT AND MATERIALS

4.1.0 ROOM TYPE AIR CONDITIONERS - AIR COOLED

4.1.1 General

4.1.1.1 Room type air conditioners shall be completely self-contained units of the direct expansion unitary or split type design, air-cooled.

4.1.1.2 The air conditioners shall generally be in accordance with SABS 1125-1977 with sound levels not exceeding the values specified in the Supplementary Specification and/or this Standard Specification as applicable.

4.1.1.3 Room air side shall be equipped with a suitable and easily accessible filter, two speed fan, adjustable directional air discharge grille, adjustable outside our intake damper, control thermostat, electric heating elements (if not specified as reverse cycle heating) (where applicable), drain pan and drain piping, cooling coil, controls and control panel and complete wiring, including interlocking with outdoor unit.

4.1.1.4 The outdoor unit shall contain the matching compressor unit, air-cooled condenser, condenser fan within a waterproof painted and corrosion protected casing.

4.1.1.5 The indoor/outdoor units shall be interconnected with refrigerant piping (separately insulated suction and delivery piping for reverse cycle units), electric wiring and interlocking control cabling.

Where visible and/or exposed to the weather or possible mechanical damage refrigerant piping and cabling shall be run inside galvanised sheet steel trunking, neatly erected and painted as specified.

4.1.1.6 Where applicable provision shall be made in the unit design to re-evaporate condensate from the condenser.

Provision shall however be made in all cases for the drainage of excessive condensate to the nearest building drain by means of copper or uPVC tubing (refer to Supplementary Specification) not less than 18mm diameter.

For reverse cycle heating units, including split type units, a proper drippan with drainage piping as above shall be provided for the outdoor units where dripping can create unacceptable conditions.

Where drainage piping is required to be installed flush mounted, positioning and chasing shall be done in good time to meet construction programmes.

Drainage to points other than a proper building drain shall comply with SABS 0400.

4.1.1.7 All panels shall be neat fitting with hardwearing exposed surfaces of baked enamel or equal finish of approved colour.

4.1.1.8 Electrical interlocking shall be provided to ensure that;

a) compressor cannot run without both indoor and outdoor fans running,

b) electric heating elements can only be switched on if the indoor fan is running,

c) it shall not be possible to switch cooling and heating on simultaneously.

4.1.1.9 Unless otherwise specified in the Supplementary Specification room type air conditioners in the cooling mode shall be rated at 35ºC ambient dry bulb air temperature on to the condenser, 27ºC dry bulb and 19ºC wet bulb air entering conditions to evaporator, all at sea level with the cooling capacities specified at these conditions. For reverse cycle heating the rating shall be based on 7ºC ambient dry bulb and 6ºC wet bulb air on to the outdoor coil with 21ºC dry bulb air on to the indoor coil.

4.1.1.10 Unless otherwise detailed on the drawings or in the Supplementary Specification units installed through a wall shall be installed with a subframe built in to the wall (hardwood or steel) and neat finishing architraves inside and outside. The external architrave shall be of aluminium angle and shall be mitred at corners and shall cover the subframe and opening completely. The architrave and subframe surround shall be sealed with clear silicone sealant.

4.1.2 Coastal Applications

For coastal applications special considerations and requirements are called for namely;

4.1.2.1 All steel parts exposed to the atmosphere or to ambient air (including outdoor unit air path) shall be either hot-dip galvanised or electroplated to SABS 728 of 1970 before painting.

4.1.2.2 Outdoor unit coil shall be constructed of copper to copper tubing and fins.

4.1.2.3 Electric terminals and connections shall be corrosion protected with non-hardening mastic or equal coating.

4.1.2.4 The complete compressor unit shall be sprayed with a continuous skin of PA 10 plastic film, or equal.

4.1.2.5 Fan motors, fan scroll and internal fan wheels shall similarly be sprayed with a PA 10 plastic film or equal.

4.1.3 Window Type Units

4.1.3.1 Window type room air conditioners shall be suitable for mounting in window frames or wall openings and shall be completely self-contained.

4.1.3.2 The units shall be made up in two parts namely the chassis or cabinet and the main body. The cabinet shall be mounted in the window frame or wall. The main body shall slide in/out on self-locating guides and guide strips to facilitate maintenance.

4.1.3.3 Where a unit is installed beyond normal reach the controls shall be installed remote at eye level.

Unless otherwise specified in the Supplementary Specification all wiring between the unit and the remote control shall be installed in flush conduit and draw-boxes.

4.1.4 Console Type Units

4.1.4.1 Console units shall be completely self-contained and shall be mounted above skirting height for cleaning purposes.

4.1.4.2 Units with a two-part construction allowing the cabinet to be built in to the wall with the main body to slide in or out is preferred.

4.1.4.3 Matching weather tight air intake and exhaust louvred panels of anodised aluminium with horizontal blades shall be provided and installed with each unit.

Depending on size, detail and wall thickness the louvre shall form part of the cabinet or shall be fixed to the subframe.

4.1.4.4 Units shall be supplied with the manufacturer's standard 2 kW electric heating element thermostatically controlled.

Reverse cycle units shall only be supplied if called for in the Supplementary Specification.

4.1.5 Split Type Units

4.1.5.1 Split type units shall consist of a direct expansion indoor fan coil unit and a separate (remote) externally located air-cooled condensing unit.

4.1.5.2 The indoor fan coil unit shall be floor-mounted, wall mounted, under-ceiling mounted, ceiling cassette mounted or above ceiling ducted type as specified.

4.1.5.3 Above ceiling units shall be properly insulated, particularly where exposed to high roof or lighting heat loads.

4.1.5.4 Remote controls shall be wired in conduit and mounted at eye level in the positions indicated on the drawings.

4.1.5.5 All conduit and draw boxes shall be installed flush in the walls or partitions.

Surface mounted wiring in trunking or the like will only be accepted if specified as such.

No joints will be allowed in the control wiring.

4.1.5.6 Suction lines shall be insulated as specified. Suction and delivering lines may not be insulated grouped together as for a single line. Vapour barrier integrity will be critical to prevent dripping.

4.1.5.7 Gas piping (insulated as specified) and wiring shall be installed in galvanised steel trunking throughout for protection, painted as specified where exposed or visible.

4.1.5.8 Outdoor units shall be installed on raised plinths or where wall mounted on unistrut or approved galvanised steel brackets, properly braced and fixed.

4.1.5.9 Refrigerant piping shall be sized and fitted with the necessary oil traps strictly in accordance with the manufacturer's requirements.

4.2.0 FANS

4.2.1 General

4.2.1.1 Fan duties are specified in the Supplementary Specification.

Where no pressure requirements are indicated Tenderers shall estimate the fan static pressure requirements for the system layout and equipment as offered by them and tender accordingly.

4.2.1.2 Fans shall be selected to operate at or as near to maximum efficiency as possible.

4.2.1.3 Flexible connections shall be fitted between fan inlet/discharge and ducting or equipment as appropriate. Flanges are required with flexible connections.

4.2.1.4 Fans shall be fitted with manufacturer's nameplates permanently fixed to the casing in a prominent position clearly indicating manufacturer, model number, maximum operating speed, maximum power absorbed, size and serial number for larger fans.

4.2.1.5 Air in/outlets not connected to ducting or equipment shall be properly protected with removable screens as per SABS 0400.

4.2.1.6 Indicating arrows for both direction of rotation and direction of airflow shall be provided on fan casings.

4.2.1.7 Fans for special applications such as corrosive gas, explosive atmospheres etc. shall be specified as such in the Supplementary Specification.

4.2.1.8 Fans for proprietary and package units although not specifically covered in this specification shall however comply with the general requirements of this specification.

4.2.2 Centrifugal Fans

4.2.2.1 Centrifugal fans shall be of the forward or backward curved, multi-vane type with single or double inlet and arrangement as specified in the Supplementary Specification.

4.2.2.2 Fan performance shall be based on tests carried out in accordance with BS 848 : Part 1 or Part 3 (as applicable) and as amended.

4.2.2.3 The fan casing shall be of the volute type manufactured from sheet steel with lock forming or continuously welded seams, suitably reinforced and adequately supported by means of a steel superstructure.

4.2.2.4 Fan wheel and shaft assembly shall be statically and dynamically balanced to ISO 1940 - 1973 within grade G6,3.

4.2.2.5 Fan drives shall be by means of standard V-belt and grooved pulley configuration. Drive motors mounted on the fan casings are not acceptable.

4.2.2.6 Larger fans shall be manufactured with split casings in sections to permit installation through available openings in new and existing buildings.

4.2.2.7 Shaft bearings shall be grease lubricated, self-aligning ball or roller bearings in accordance with the fan manufacturer's standard practice. For bearings located in the air stream, precautions shall be taken to prevent loss of lubricant.

4.2.2.8 Shafts shall be fully machined steel shafting conforming to BS 970 grade 070M20.

4.2.2.9 A drain socket with plug shall be provided at the lowest point in the fan casing (except if discharge is at lowest point).

4.2.2.10 Fans used in variable volume applications shall have stable characteristics throughout the operating range.

4.2.2.11 All fans shall be tested in the factory and checked for vibration to ISO 2372, smooth running, mechanical interference. Bearings shall be checked using a shock impulse meter.

All measurements and observations made during this test run shall be recorded and made available to the Department on request.

4.2.2.12 Fan motors in the air stream in draw-through applications with spray coolers or sprayed coils shall be TEFC and protected to IP44 or better.

4.2.2.13 Shafts for variable inlet vane control shall be supported by pre-lubricated sealed bearings.

Both sets of variable inlet vanes on double inlet fans shall be controlled simultaneously and equally.

Variable inlet vanes shall automatically be in the closed position during starting-up until the pre-selected fan speed is reached.

4.2.2.14 Casing access panels shall be fitted to fans 630mm and larger and all fans used in draw-through applications with spray coolers or sprayed coils.

4.2.3 Axial Flow Fans

4.2.3.1 Axial flow fans shall be of the aerofoil type with non-overloading characteristic with peak power requirements occurring in normal operating pressure range and motor rating exceeding this requirement.

4.2.3.2 Axial fans shall be selected for the highest possible efficiency with the lowest possible blade tip speed.

4.2.3.3 Only fans of a make approved by the Department will be acceptable.

4.2.3.4 The complete fan unit shall be statically and dynamically balanced in accordance with ISO 1940 - 1973 within grade G6,3.

4.2.3.5 Fan performance shall be based on tests carried out in accordance with BS 848 : Part 1 as amended.

4.2.3.6 Fan casings shall be manufactured from reinforced mild steel with predrilled flanges at both ends.

4.2.3.7 Casing access panels shall be provided where specified in the Supplementary Specification.

4.2.3.8 Fan motors shall be totally enclosed squirrel cage induction type with protection to IP 55 unless for a special application as set out in the Supplementary Specification.

4.2.3.9 Motor connections shall be in a external weather proof terminal box forming part of the casing. (Except for flameproof and special applications.)

4.2.3.10 Fans fitted at the inlet of a system shall be provided with bell-mouth entries.

4.2.3.11 Axial fans shall be resiliently mounted.

4.2.3.12 Single-phase fan motors shall only be provided where specifically specified in the Supplementary Specification.

4.2.3.13 Impeller hubs and blades shall be die cast aluminium alloy assembled with high tensile steel bolts and nuts except for special applications where material requirements will be as set out in the Supplementary Specification.

4.2.4 Propeller Fans

4.2.4.1 Propeller fans shall be suitable for mounting with or without mounting plate (diaphragm) as specified in the Supplementary Specification.

4.2.4.2 Mounting plates (diaphragm) where required shall be of pressed steel or reinforced laminated fibreglass with integral bell mouth orifice.

4.2.4.3 Impellers shall be of heavy gauge contoured pressed steel blades or reinforced polypropylene or fibreglass ultra-violet stabilised, mounted on cast aluminium or steel hubs.

4.2.4.4 Fan motors shall be three-phase totally enclosed squirrel cage induction type with protection to IP44 unless otherwise specified.

4.2.4.5 Fans shall be resiliently mounted.

4.2.4.6 Balancing and testing shall be as set out in clauses 4.2.3.4 and 4.2.3.5 above.

4.2.4.7 Motor and impeller protection screens shall be fitted as applicable.

4.2.4.8 Fans on exterior walls shall be fitted with weather tight galvanised louvre shutters and where specified with wall cowls.

4.2.5 Window/Wall Extract Fans

4.2.5.1 Window/wall type fans shall be fitted with automatic shutters.

4.2.5.2 Fans shall be fitted with finger protection guards.

4.2.5.3 Where specified, speed control shall be provided.

4.2.5.4 Where remote control is specified wiring between fan, control point and power supply point shall be flush mounted with conduit and draw boxes.

4.2.6 Roof Extract Fans

4.2.6.1 Roof extract fans shall be the mixed flow or propeller type as specified in the Supplementary Specification with non-overloading characteristic.

4.2.6.2 Where specified, units shall be suitable for upstand or curb mounting complete with weather skirt and flashing as required.

4.2.6.3 Vertical discharge fans shall be fitted with shutters to prevent rain ingress.

4.2.6.4 Roof extract units shall be suitable for mounting on any form of roof with pitch varying from horizontal to 45 degrees.

4.2.6.5 Roof extract units shall be manufactured from corrosion resistant materials and painted as specified.

4.2.6.6 Fans shall be directly driven by totally enclosed airstream rated motors protected to IP44 or as specified.

4.2.6.7 Fan performance shall be based on tests carried out in accordance with BS 848 : Part 1 (as amended).

4.2.6.8 Impeller shall be statically and dynamically balanced.

4.3.0 ELECTRICAL HEATERS

4.3.1 Heaters shall comply with the current issue of the Department's Standard Specification for Electrical Equipment and Installation for Mechanical Services and SABS 0173 as applicable.

4.3.2 Heaters built in to ductwork shall be provided with fibrecement panelling downstream of the heater bank as protection for the insulation in close proximity to the heater bank.

4.3.3 Heaters shall be so constructed and installed that routine maintenance, repair or replacement can be undertaken without disassembly of connected ducting or air handling plants.

4.3.4 The heater element for each step of heating shall be strung across the entire face of the coil or duct opening to prevent stratification and bypassing when operating at reduced capacity.

4.3.5 Ventilation and other openings in the external enclosure shall be so protected that contact with live terminals or parts is rendered impossible without the use of tools.

4.4.0 AIR FILTERS

4.4.1 General

4.4.1.1 Filters of the type, size and quantity as specified in the Supplementary Specification shall be provided.

4.4.1.2 Filter efficiency and arrestance shall be in accordance with ASHRAE Test Standard 52-76.

4.4.1.3 Filters and filter holding frames shall be of approved manufacture with standardised dimensions to enable replacement with equivalent filters of all recognised manufacturers.

4.4.1.4 Construction and manufacture of all components shall be such that under no circumstances any un-filtered air can by-pass filters or filter banks.

4.4.1.5 Sufficient space shall be allowed in front or behind filters, as applicable, to enable inspection and servicing.

4.4.1.6 Proper access doors shall be fitted to filter service areas.

4.4.1.7 Filters installed close to exposed air inlets shall be weather protected with weather louvres and a wire mesh screen.

4.4.1.8 Tubes for the measuring of the pressure drop across each filter bank shall be fitted as standard to enable connecting a manometer or other instrument as specified.

4.4.1.9 All filters and filter banks, including two-stage high efficiency and final filters shall be fitted with inclined pressure differential manometer gauges, clearly marked with filters clean (green) and filters dirty (red) indicators of a permanent type.

A separate manometer shall be fitted for each filter stage.

4.4.1.10 Fan and system selection shall allow for expected final filter resistance to ensure a supply air quantity in excess of 90% of design air quantity immediately prior to filter replacement.

4.4.1.11 Unless otherwise specified in the Supplementary Specification only dry media filters are required.

4.4.1.12 Where specified, pressure monitoring across a filter bank or banks shall be fitted for alarm purposes using differential pressure switches to activate the warning alarm or indicator required.

4.4.1.13 Where air filters of the washable type are specified in the Supplementary Specification a suitable filter wash tank and stand complete with a drying rack shall be provided in each plant room.

The wash tank and stand shall be manufactured from galvanised steel and epoxy powder coated.

The wash tank shall be connected to mains water and a suitable overflow and drain piped to the building drain fitted.

The drying rack shall hold at least 20 filters.

4.4.1.14 Where washable filters are specified one complete set of spare filters shall be provided.

4.4.2 Panel Filters

4.4.2.1 Panel filters shall be of the pleated type and not less than 50mm thick.

4.4.2.2 The filter shall be washable or disposable as specified.

4.4.2.3 Synthetic media shall be used bounded together with galvanised wire for reinforcing and bonded in the frame ensuring no air bypass.

4.4.2.4 The frame shall be galvanised steel or a distortion and corrosion free moulding.

4.4.2.5 Initial synthetic dust arrestance shall be not less than 70% with dust holding capacity needed in excess of 300g per square metre nominal face area.

4.4.2.6 Initial dust spot efficiency shall be not less than 20%.

4.4.2.7 Nominal filter face velocity shall not exceed 1,5m/s with initial clean filter resistance 60Pa or less and recommended resistance at specified arrestance not more than 250Pa.

4.4.3 Pad Type Panel Filters

4.4.3.1 Pad type panel filters shall make use of disposable replacement media of thickness as specified, but generally not less than 25mm thick.

4.4.3.2 Disposable media supplied and the filter in general shall comply with 4.4.2 above, unless otherwise specified.

4.4.3.3 The media shall be held in galvanised steel frames with galvanised steel screen supports on both sides. The downstream screen shall be fixed in the frame with the upstream screen removable.

4.4.4 Extended Surface Intermediate Efficiency Filters

4.4.4.1 Filter media shall be self-supporting, leak-free and stable under all airflow conditions.

4.4.4.2 Front frames shall be of aluminium, galvanised steel or reinforced high-density hard polyurethane foam with a continuous foam rubber gasket.

4.4.4.3 "Slide-in" type of arrangements will not be accepted for filters in this class.

4.4.4.4 Filter depths less than 150mm will not be accepted.

4.4.4.5 Galvanised protection screens shall be fitted to match the airflow arrangement.

4.4.4.6 Initial synthetic dust arrestance shall be not less than 85% with dust holding capacity not less than 1 500g per square metre nominal face area.

4.4.4.7 Nominal filter face velocity shall not exceed 2,5m/s with initial clean filter resistance 60Pa or less and recommended resistance at specified arrestance not more than 250Pa.

4.4.5 High Efficiency Particulate Air Filters (HEPA)

4.4.5.1 Filter media shall be self-supporting leak-free and stable under all airflow conditions.

4.4.5.2 The media shall be bonded in to a pressed and sealed particle board housing.

4.4.5.3 Unless otherwise specified in the Supplementary Specification filters shall be provided with silicone filled channel seals.

4.4.5.4 "Slide-in" type of arrangements will not be accepted for filters in this class.

4.4.5.5 Filters shall be arranged in two or three stage configuration with the primary filters complying with clauses 4.4.1 to 4.4.4 above as specified in the Supplementary Specification.

4.4.5.6 Filter depths less than 300mm will not be accepted and effective filter media surface area shall exceed 50m? per square metre nominal face area.

4.4.5.7 Each filter shall be individually tested in the factory for leakage with a DOP aerosol and supplied to site in completely sealed protection containers.

4.4.5.8 Corrugated media separators shall be of aluminium or kraft paper.

4.4.5.9 Filter efficiency shall be not less than 99,9% when tested with 0,3 micrometer Dioctylphthalate smoke.

4.4.5.10 Dust holding capacity shall not be less than 2 000g per square metre nominal face area.

4.4.5.11 Nominal filter face velocity shall not exceed 1,5m/s with initial clean filter resistance to be 250Pa or less and final resistance not to exceed 500Pa.

4.4.5.12 Pressure monitoring across the HEPA filters is required with warning light and/or alarm as specified.

4.4.6 Filter Holding Frames

4.4.6.1 Filter holding frames shall be the manufacturer's standard product installed and used in accordance with his recommendations.

4.4.6.2 Holding frames shall be manufactured from at least 16 gauge galvanised or epoxy powder coated steel.

4.4.6.3 Holding frames may be bolted or riveted together and shall be suitably reinforced in larger arrangements to withstand all possible operating conditions.

4.4.6.4 Fasteners shall be positive sealing type that clip in and a minimum of four fasteners per filter is required.

4.4.6.5 Fasteners shall match the particular filter, filter arrangement and frame.

4.5.0 COOLING AND HEATING COILS

4.5.1 General

4.5.1.1 Cooling coils shall be suitable for direct expansion air to refrigerant heat transfer or air to chilled water heat transfer as specified in the Supplementary Specification.

4.5.1.2 Heating coils shall be of the hot water to air heat transfer type.

4.5.1.3 Coils shall be of the extended surface type, constructed of seamless copper tubes with mechanically bonded aluminium or copper fins.

For coastal installations and all spray coil applications copper to copper construction is required.

4.5.1.4 Coils shall be designed and constructed for a test pressure of 1 400kPa or the system working pressure times 1,5, whichever is the greatest.

4.5.1.4 Coil face velocity shall be low enough to ensure that no water is carried over in the air stream, generally not more than 2,5m/s.

Where moisture carry-over may be a problem proper eliminators shall be fitted downstream of the coil.

4.5.1.6 Coil casings shall be flanged and constructed of 1,6mm or thicker sheet steel hot dip galvanised after manufacture.

4.5.1.7 Water coils shall be provided with air vent and drain connections. Drain connections and coil circuitry shall be such that the coil can be completely drained of water if necessary.

4.5.1.8 Tubes shall be silver soldered to headers.

4.5.1.9 All coils subject to mechanical damage shall be properly protected with galvanised sheetmetal covers over the entire coil face area. Covers shall only be removed when commissioning commences.

4.5.2 Direct Expansion Coils

4.5.2.1 Direct expansion coils shall be circuited for the most economic balance between heat transfer, refrigerant pressure drop and proper oil return.

4.5.2.2 The suction header shall be constructed to ensure complete oil drainage from the coil.

4.5.2.3 Liquid and vapour distributors on multi-circuit coils shall ensure uniform refrigerant distribution between circuits.

4.5.3 Heating Coils

4.5.3.1 Heating coils shall conform to the same requirements as cooling coils.

4.5.3.2 Steam heating coils shall be slightly tilted to ensure proper condensate drainage from the coil.

4.5.3.3 Steam coils shall be fitted with proper vacuum breakers.

4.5.4 Spray Coils

4.5.4.1 Where spray coils are specified a full-face area eliminator section shall be provided downstream of the coil section.

4.5.4.2 Eliminators shall be manufactured from uPVC or moulded fibreglass with a minimum of three directional changes to the air path and eliminator baffle spacing not exceeding 30mm.

4.5.4.3 Water distribution over the coil shall be by means of plastic, bronze or gunmetal nozzles of the centrifugal non-clog type spaced to ensure complete spray coverage over the entire coil face area.

4.5.4.4 A sump manufactured from stainless steel 430 shall be provided to collect spray run-off. The sump shall be provided with a brass float valve connected to the water mains and overflow and drain piped to the nearest building drain point.

4.5.4.5 A removable strainer manufactured from brass or stainless steel shall be fitted to the pump suction connection. The strainer perforations shall be small enough to protect the nozzle and pump impeller clearances.

4.5.4.6 A water bleed line shall be fitted to the pump discharge and piped to the building drain point via an open turndish for visibility. A manual throttling valve shall be fitted to this line.

4.5.4.7 Pump installation shall be such as to ensure a flooded pump suction arrangement.

4.5.5 Drain Pan

4.5.5.1 Drain pans to collect water condensing on the coil shall be provided under all cooling/ dehumidifying coils.

4.5.5.2 The pan shall be constructed from galvanised sheet steel or copper (1,6mm thick or thicker). Fibreglass moulded or uPVC welded drippans are acceptable.

4.5.5.3 The pan bottom shall slope from all sides towards the drain point.

4.5.5.4 The pan shall be fitted with a screwed drain connection 20mm or larger depending on coil size and application.

The drain connection shall be fitted with a manometric trap matching fan pressure but not less than 50mm water depth.

4.5.5.5 Coils shall be arranged so that all condensate water is collected with no air bypassing the coil.

4.5.5.6 Pans at risk of "sweating" on the outside and causing water dripping or collecting outside the pan where it cannot be properly drained away, shall be insulated.

4.5.5.7 The drain from the drippan shall be piped to the nearest building or plantroom drain with 20mm galvanised steelpipe (or copper) or larger.

4.5.5.8 Damming up of water or puddles of water anywhere in the air-handling unit will not be accepted.

4.6.0 HEAT PUMPS

4.6.1 Heat pumps shall be of the air-to-water, water-to-water or air-to-air type or as specified in the Supplementary Specification.

4.6.2 Refrigerant to water heat exchangers shall be corrosion resistant and suitable for use with the local water at high temperature and flow velocities.

4.6.3 Shell and tube condensers are preferred for air to water applications.

4.6.4 Heat pumps shall be completely self-contained units with stainless steel or epoxy powder coated casings and cladding, suitable for permanent outdoor use where required.

4.6.5 Condenser and condenser piping circuits shall be properly insulated.

4.6.6 A condensate drippan of stainless steel 430 shall be fitted and piped to the nearest building drain, allowing for defrost cycles.

4.6.7 Heat pumps shall be selected for a maximum compressor running operation of 20 hours per day.

4.6.8 Reverse cycle automatically controlled defrost shall be provided as standard. Defrost shall be demand controlled and not timer controlled.

4.6.9 The heat pump shall be suitable for operating with ambient wet bulb temperatures as low as -10ºC and as high as 35ºC.

4.6.10 Heat pumps for domestic hot water shall heat the water to 60ºC (or as specified). Condensing and evaporation temperatures shall be selected to ensure correct functioning with water inlet temperature as low as 9ºC and as high as 50ºC. Heat pumps not capable of heating inlet water at 50ºC will not be accepted.

4.6.11 Heat pumps with a coefficient of performance (COP) of less than 3,0 at ambient wet bulb temperature of 15ºC with secondary circuit inlet temperature 20ºC or less will not be acceptable.

4.6.12 Each heat pump shall be fitted with a control and a fault indication panel to provide status indication on fault occurrence and operation mode.

4.6.13 A flow switch shall be fitted to the water or air secondary circuit and the heat pump control interlocked with the flow switch.

4.6.14 Heat pumps for domestic hot water shall be fitted with head pressure control set at ensuring constant 60ºC water supply temperature at all possible water inlet temperatures and flows.

4.6.15 Compressors shall be well known products of an approved manufacturer.

Motor windings shall be suitable for the temperatures experienced in heat pump applications, particularly hermetically sealed units.

Operating pressures and temperatures shall comply with the manufacturer's recommendations.

4.6.16 Provision shall be made in the refrigerant circuits for liquid collection during periods of not being in use.

4.6.17 The compressor shall be interlocked with the evaporator fan/s and the flow switch to prevent operation unless these elements are functional.

4.6.18 Each refrigerant circuit shall be fitted with a sight glass, replaceable filter drier, manual liquid shut-off valve, high- and low-pressure switches and pressure gauges.

4.6.19 Controls shall be fitted to prevent compressor short cycling on low demand.

4.6.20 Crankcase heaters shall be fitted where application and unit size warrants the use thereof.

4.6.21 Where a standby heater is required with a heat pump application the standby heater shall be switched on automatically on heat pump failure.

4.6.22 Suction- and discharge pressure gauges shall be provided on the instrument panel.

4.6.23 Noise levels shall comply with clause 3.15.0.

4.6.24 Easily detachable/ openable panels of rigid construction giving access to all working parts of the unit shall be provided.

4.7.0 SELF-CONTAINED AIR CONDITIONING UNITS

4.7.1 Each unit shall be complete with fan/s, direct expansion cooling coil, compressor unit, condenser (if not remote), expansion valve, refrigerant tubing and accessories, air filters, return air grille and/or mixing plenum control panel and control thermostat.

4.7.2 Units shall be totally indoor type or totally outdoor type as specified in the Supplementary Specification.

4.7.3 Condensers shall be air or water-cooled.

Air cooled condensers may be remote (split) type with interconnecting refrigerant piping or built in to the unit with ducted air in- and outlets.

Water cooled condensers may be remote evaporative cooling type or built in to the unit with water connections for connection to remote closed circuit or open cooling towers, as specified.

4.7.4 Where specified in the Supplementary Specification units shall be reverse cycle heating type.

4.7.5 Indoor units shall be suitable either for the attachment of ductwork or fitted with a discharge air plenum with adjustable directional air louvres (Automatic sweep acceptable) as specified. Return air shall similarly be ducted or through unit mounted return air grille as specified.

4.7.6 Outdoor units shall be suitable for ducted supply and return air with a proper mixing plenum, dampers and filter arrangement as indicated on the drawings.

4.7.7 The cabinet and drippan shall be of rigid galvanised sheet steel and angle iron construction epoxy powder coated. Units installed outdoors shall be totally waterproof.

Units installed in visible locations indoors shall have a neat well-finished appearance.

4.7.8 Easily detachable panels giving free access to all components shall be provided.

4.7.9 The total interior of the cabinet shall be insulated with neoprene or sonic liner faced fibreglass at least 25mm thick (or other approved method of insulation).

4.7.10 Compressors shall be of the hermetically sealed or semi-sealed, reciprocating or rotary type.

4.7.11 Remote on/off control and sensing shall be provided where specified, and fitted in the position indicated on the drawings.

4.7.12 Indoor air supply fans shall be of the centrifugal type.

4.7.13 Outdoor fans (condenser fans) shall be of the centrifugal or axial flow type for ducted condenser air applications and propeller fans for free flow applications.

4.7.14 General arrangement and configuration required shall be indicated on the drawings.

4.8.0 FIELD ASSEMBLED AIR HANDLING UNITS AND PLENUMS

4.8.1 Field assembled plants shall consist of plenum chambers built to accommodate equipment such as dampers, filters, cooling- and heating coils, heating elements, fans, drain pan etc., as specified in the Supplementary Specification and/or drawings.

4.8.2 Plenum walls and roof shall consist of prefabricated precision metal clad insulated panels (double skin) with the metal skin permanently bonded to the insulation with heat polymerising adhesive.

4.8.3 Panel sections shall clip together or joined by means of male/female insertions with a non-hardening butyl rubber base sealant. Joints shall be sealed with a clear silicone sealant.

4.8.4 Panel insulation thickness shall be not less than 50mm based on polystyrene or 40mm based on polyurethane.

4.8.5 Panel finish shall generally be galvanised steel on the inside of the plenum and chromadek on the exterior. (Painted exterior panels acceptable.)

4.8.6 Panels for ventilating plants without heating or cooling can be single skin and uninsulated (where not exposed to heat sources) suitably reinforced to ensure a proper installation.

4.8.7 Floors for plenums shall be one of the following:

i) Granolithic screed with steel trowelled finish, or

ii) Panel constructed as for walls (galvanised finish both sides) reinforced on top with 5mm thick aluminium checker plating, or

iii) As specified in the Supplementary Specification. Floors shall be waterproof and laid with a fall to the drain points.

4.8.8 Openings for doors, ducts, dampers etc. shall be pre-cut and neatly framed with angle iron steel and finished to match the exterior wall finish.

4.8.9 The entire plenum section shall be completely airtight and suitably reinforced to withstand all possible pressure differentials across the walls and roof sections.

4.8.10 Access doors shall be provided to all plenum sections. Doors shall be of the hinged double skin insulated type, 1600mm high and 600mm wide. Doors shall close airtight with sufficient cam lever type locking devices and a profiled durable rubber seal.

4.8.11 Detachable sections shall be provided for the removal or replacement of components such as fans, motors etc.

4.8.12 Standard factory fabricated modular central station air handling units may be offered as an alternative to field assembled units where such units match the general requirements set out above and the space requirements.

4.8.13 Doors giving access to electric heater banks shall be provided with safety micro switches to isolate all heater banks when these doors are opened.

The following notice shall be painted on these access doors in clear red lettering at least 50mm high;

"DANGER - ELECTRICAL HEATERS

GEVAAR - ELEKTRIESE VERWARMERS"

4.8.14 Coils, heaters, dampers etc. requirements shall comply with the relevant sections of this Specification.

4.8.15 Other factory made plenum designs will be considered subject to approval by the Department.

4.9.0 AIR HANDLING UNITS

4.9.1 Units and components shall generally comply with the relevant sections of this Specification.

4.9.2 Units shall be of the horizontal or vertical floor mounted type, draw-through or blow-through as specified in the Supplementary Specification.

4.9.3 For Operating theatres, Intensive care units, Burns units, Premature birth nurseries and the like only air handling units with blow through filter arrangements are acceptable.

4.9.4 Unit casings shall be heavy gauge galvanised sheet steel, suitably braced and stiffened to ensure a rigid non-vibrating structure.

4.9.5 Easily removable access panels shall be provided to facilitate servicing and repairs to items like fans, cooling and heating coils etc., and such panels shall be complete with suitable gaskets to ensure air tight fittings.

4.9.6 Solid double skinned access doors of the hinged type sealing air tight with proper hardware and profiled rubber seals shall be provided.

4.9.7 Doors giving access to electric heater banks shall be fitted with safety micro switches isolating the electricity supply to the heaters when such doors are opened. These access doors must be clearly marked in 50mm high red letters.
"DANGER - ELECTRICAL HEATERS

GEVAAR - ELEKTRIESE VERWARMERS"

4.9.8 The unit casing, together with removable panels, shall be internally insulated with 25mm thick polythene/neoprene coated glass fibre.

4.9.9 For Operating theatres, Intensive care units, Burns units, Delivery rooms, Premature birth nurseries and the like, the insulation shall be sheetmetal covered (Double skinned).

4.9.10 Where insulation is not sheet metal covered - i.e. it is not maintained between two sheets of metal, it shall be secured by means of a suitable adhesive as well as metal fasteners, spaced regularly at intervals not exceeding 0,3m.

4.10.0 FAN FILTER UNITS

4.10.1 Fan filter units shall be used to supply filtered air (usually outdoor air) for ventilation purposes as specified.

4.10.2 Filter requirements shall be as set out in the Supplementary Specification and in accordance with the relevant sections of clause 4.4.0.

4.10.3 Units shall be configured as indicated on the drawings.

4.10.4 Centrifugal fans only may be used in the units.

4.10.5 Casings shall be of galvanised sheet steel at least 1,25mm thick suitably reinforced and painted as specified.

4.10.6 Unless otherwise specified wall sleeves and weather louvres matching the fan filter unit shall be provided to form a complete installation.

4.10.7 Unit air supply shall be variable as specified by means of variable motor speed control and not damper control.

4.11.0 ROOM TYPE FAN COIL AIR HANDLING UNITS

4.11.1 Fan coil units shall be of the arrangement as indicated on the drawings i.e. concealed or exposed, floor mounted or ceiling mounted.

4.11.2 Each unit shall be complete with cabinet matching the application, chilled water cooling coil, hot water heating coil or electric element heater (as specified), fan, filter, drain pan, drain piping and controls.

4.11.3 Cabinets for exposed units shall be manufactured from 1,25mm thick sheet steel internally lined with glass fibre at least 12mm thick for insulation and acoustic purposes.

A baked enamel finish to exposed surfaces shall be provided.

Removable panels shall be provided to allow access for servicing of all components.

4.11.4 Units hidden from sight in bulkheads or ceilings shall be fabricated from 1,25mm galvanised sheet steel, internally lined with glass fibre at least 12mm thick for insulation and acoustic purposes.

Motor and fan assembly shall be easily accessible for servicing.

Where called for collars for supply and return ducting shall be fitted.

Filters shall be accessible for cleaning or replacing.

4.11.5 Supply and return air grille shall be as specified.

4.11.6 Cooling and heating coils, and heating elements shall comply with the relevant sections of this Specification.

4.11.7 Fans shall be centrifugal type, statically and dynamically balance and directly connected to the drive motor.

Fan wheels and housings shall be galvanised steel.

4.11.8 Fan motors shall be of the shaded pole or permanent split phase capacitor type with built-in thermal overload protection.

4.11.9 Drain pans shall be removable for cleaning purposes and shall be insulated to prevent condensation on the outer surfaces, and generally as per clause 4.5.5. The drain pan shall project under the entire length and width of the cooling coil including uninsulated portions of chilled water piping and valves.

4.11.10 Fan and unit on/off switch and controls shall be mounted on the unit or remote flush mounted as specified.

4.11.11 Fan control shall be by means of an on/off switch combined with speed selection options. A minimum of three speed selections shall be possible.

4.11.12 Cooling/heating control shall be by means of a thermostat and shall be on/off or proportional as specified.

4.11.13 Filters shall be easily accessible for cleaning and shall be of the cleanable type.

4.11.14 Outside air inlet openings with collars, sleeves, louvres and manual dampers shall be provided where specified.

4.12.0 INDUCTION UNITS

4.12.1 Except where otherwise specified in the Supplementary Specification the cabinets for induction units, with suitable discharge and return air grilles, will form part of the Building Contract.

4.12.2 Each unit shall be complete with air plenum, air balancing damper, ejector nozzles, cooling coil assembly, lint screen, drain pan and the necessary air and water connections.

4.12.3 The air plenum shall be constructed of cold rolled steel suitably rustproofed, or aluminium. All internal areas shall be acoustically and thermally insulated with fibreglass or equal. A primary air-balancing damper arranged for independent manual adjustment of the primary air volume shall be provided.

4.12.4 Ejector nozzles shall be heat resistant (65ºC) and shall be designed for minimum noise generation and good flow characteristics. Nozzle pressure shall be such that the mean sound pressure levels of the units do not exceed the specified level.

4.12.5 Lint screens shall be of fine mesh, properly supported and readily removable for servicing.

4.12.6 Ducting and pipe work within the cabinets shall be properly supported.

4.13.0 EVAPORATIVE COOLING UNITS

4.13.1 Direct Evaporative Cooling Units

4.13.1.1 Evaporative cooling units shall be of the type and configuration indicated on the drawings and in the Supplementary Specification.

4.13.1.2 Unit casing shall be manufactured from galvanised sheet steel panels and galvanised angle iron framework bolted together.

4.13.1.3 Interior wet surfaces shall be epoxy coated against corrosion.

4.13.1.4 Exterior surfaces shall similarly be epoxy coated and then painted as specified.

4.13.1.5 Sufficient access doors and removable panels shall be provided to ensure access to all components.

4.13.1.6 Internal wiring shall be terminated in a weathertight junction box mounted on the outside of the unit.

4.13.1.7 Units shall be complete with fan/s, evaporative media (or nozzles), recirculating spray pumps, pump suction strainer, drain valve and overflow, automatic fill and level control, adjustable bleed valve, internal piping, sump and headers (or nozzles).

4.13.1.8 The unit shall have a saturation efficiency of not less than 80%, excluding pump and fan energy.

4.13.1.9 Evaporative media shall be of cross-fluted, self-cleaning design with a maximum face velocity of 3,8 m/s.

4.13.1.10 The media for rigid-media coolers shall be constructed of cellulose paper impregnated with insoluble anti-rot salts and rigidifying saturants.

4.13.1.11 Wetted pad type coolers may use fibrous fill of resilient material with a maximum nominal face velocity of 1,5 m/s, subject to approval by the Department.

4.13.1.12 Media shall be readily accessible for servicing and replacement.

4.13.1.13 The recirculating pump shall be of the centrifugal submersible type, corrosion proof and fitted with overload protection.

4.13.1.14 The fan shall be a centrifugal fan of corrosion proof materials.

4.13.1.15 Provision shall be made in all cases for the drainage and overflow to be piped to the nearest building drain by means of copper or uPVC tubing (Refer to Supplementary Specification) not less than 18 mm diameter.

4.13.1.16 Controls shall be as specified in the Supplementary Specification.

4.13.2 Two Stage Evaporative Cooling units

4.13.2.1 Two stage evaporative cooling units shall generally comply with 4.13.1 above and shall consist of a primary and secondary air stream, with the primary air dry cooled (sensible cooling) by a first stage cooling coil and second stage evaporative cooling.

4.13.2.2 The first stage coil shall be manufactured from copper tubing with aluminium or copper fins as specified in the Supplementary Specification and generally in accordance with clause 4.5.0.

4.13.2.3 Evaporative media shall be of crossfluted self-cleaning design with maximum face velocity of 3,5m/s.

The media shall be manufactured from special cellulose paper impregnated with insoluble anti-rot salts and rigidifying saturants and not less than 300mm deep.

4.13.2.4 Water distribution piping shall be uPVC of class 4 or higher grade.

4.13.2.5 Fans for secondary air shall be as specified in the Supplementary Specification suitable for ducted or direct flow as required, with sealed bearings and IP54 or better in draw-through configuration.

4.13.2.6 Primary air fan shall be a centrifugal fan of corrosion proof materials.

4.13.2.7 Unless otherwise specified in the Supplementary Specification three step control will be required, i.e. first step no cooling with ventilation only, second step cooling as evaporative cooler only and third step as full two stage cooling unit, all controlled from a room sensor with the necessary controller.

4.14.0 ROOM TYPE AIR CONDITIONERS – WATER-COOLED

4.14.1 Room type water-cooled air conditioners shall generally comply with clause 4.1.0 and shall be of the direct expansion unitary design type with a water-cooled condenser for remote heat rejection.

4.14.1 Electrical interlocking shall be provided to ensure that:

a) compressor cannot run without the indoor fan running and cooling water flowing. A flow switch shall be fitted in the water circuit of each individual unit to this end,

b) electric heating elements can only be switched on if the indoor fan is running,

c) it shall not be possible to switch on cooling and heating simultaneously.

4.14.3 Unit configuration and arrangement required shall be indicated on the drawings.

4.14.4 Units shall be completely self-contained and with isolating valves to connect condenser cooling water.

4.14.5 Units shall be fitted with hot water heating coils or electric heating elements as specified.

4.14.6 The water-cooled condenser shall be of the co-axial tube-in-tube type copper water path.

4.14.7 Water regulating valves for automatic head pressure control shall be fitted where specified.

4.15.0 RECIPROCATING REFRIGERANT COMPRESSORS

4.15.1 Reciprocating compressors shall be either of the open-, semi-hermetic- or hermetic type.

4.15.2 Compressors in the larger cooling capacity ranges shall be equipped with positive pressure lubrication systems.

4.15.3 Compressors shall be operated within the selection and speed ranges recommended by the manufacturer.

4.15.4 Provision shall be made to prevent excessive accumulation of liquid refrigerant in crank- cases during off-cycles.

Larger units shall be factory fitted with crankcase heaters as standard.

4.15.5 Compressors having nominal cooling capacities of 35 kW and larger shall be equipped with built-in capacity controlled steps (Depending on number of cylinders) of unloading cylinders.

4.15.6 Compressors with nominal cooling capacity exceeding 7 kW must start unloaded.

4.15.7 Open type compressors shall be directly coupled to the drive motor by means of flexible couplings.

Compressor and motor shall be mounted on a single robust bedplate of fabricated steel construction.

4.15.8 Multiple compressors connected to the same refrigerant circuit shall have the piping arranged to return oil equal to all compressors and balance lines shall be installed to equalise pressure differences between compressors.

The compressors must all operate at the same suction pressure.

4.15.9 Operating and safety controls shall be provided for each unit in a control panel forming an integral part of the unit or in a separate control panel/switchboard, as specified.

The following controls and instruments shall be provided as a minimum;

a) Suction and discharge pressure gauges with isolating valves,

b) Oil pressure gauge and low oil pressure safety switch on compressors with positive pressure oil feed,

c) High- and low refrigerant pressure safety switches,

d) Positive action timer controlled circuit for pump-down and to prevent short cycling,

e) Sight glass indicating oil level in crankcase.

4.15.10 Units of 7 kW and larger shall be fitted with a suction strainer and an oil filter with replaceable element and safety by-pass.

4.15.11 Initial charge of oil and refrigerant shall be provided.

4.15.12 Internal motor over-temperature protection shall be fitted to hermetically and semi-hermitically sealed units together with external over-current protection.

4.15.13 Serviceable compressors shall be equipped with shut-off valves on the suction and discharge sides.

4.15.14 Compressor and components of 40kg or heavier shall be fitted with lifting lugs.

4.15.15 Tenders for compressors of a manufacture not adequately backed by South African suppliers carrying sufficient stock of the complete line of spare parts, which are subject to replacement, will not be considered.

4.16.0 RECIPROCATING COMPRESSOR WATER CHILLERS

4.16.1 The compressors shall generally be in accordance with clause 4.15.0.

4.16.2 Each water chiller shall be complete with one or more compressor and motor units, water cooler (evaporator), condenser, expansion valves, refrigerant piping circuits, controls and control panel.

4.16.3 The condenser shall be air-cooled or water cooled as specified.

4.16.4 The water chiller shall be a complete packaged unit with all components mounted on a sturdy steel framework with cladding, panels etc. to match the application.

4.16.5 Air-cooled chillers installed indoors shall be fitted with centrifugal or axial flow condenser fans.

4.16.6 The water cooler (evaporator) shall be of the shell-and-tube design with seamless copper tubing expanded into steel tube plating, each individually replaceable.

Tubes shall be accessible from either side of the shell for tube replacement and cleaning purposes.

Corrosion proof internal baffling shall be provided.

4.16.7 Chillers smaller than 30kW cooling capacity may be provided with copper to copper, tube-in-tube evaporators.

4.16.8 Waterside working pressure rating for the water cooler and condenser (where water-cooled) shall be not less than 1000 kPa.

4.16.9 Evaporators shall be factory insulated.

4.16.10 Step control shall be provided matching compressor/cylinder configuration.

4.16.11 Each evaporator unit shall be provided with a chilled water low temperature safety switch.

4.16.12 Compressor control shall be interlocked with a flow-switch in the chilled water circuit (with delay timer) to prevent the unit operating with no water flow.

4.16.13 Multiple compressor and refrigerant circuit units shall be provided with automatic controls for lead/lag switching and operating time balancing of compressor running hours.

4.16.14 Units shall be selected with fouling factors as required in the Supplementary Specification.

4.17.0 CENTRIFUGAL COMPRESSOR WATER CHILLERS

4.17.1 Centrifugal compressor chillers shall be of the packaged type complete with built-up water cooler and condenser, centrifugal compressor, capacity control system, lubrication system, purge system, all interconnecting piping, controls and all other auxiliaries required for the proper and safe operation of the unit.

4.17.2 Rotor assemblies shall be statically and dynamically balanced and shall be free from vibration at all operating conditions, also during acceleration from rest and deceleration from operating speed to rest.

Operating speed shall be well below the first critical speed.

4.17.3 Each compressor unit shall be equipped with a forced lubrication system complete with oil pump, reservoir, oil heater, oil cooler, filter, level indicator etc. which shall provide positive lubrication of all moving parts under all operating conditions, including start-up and shut-down operations.

4.17.4 Units operating below atmospheric pressure shall be provided with a motor driven purge pump or compressor complete with the necessary accessories for the automatic separation of non-condensible gasses and the return to the evaporator of reclaimed refrigerant.

4.17.5 Each unit shall be provided with a control panel or cabinet containing the main switch, circuit breakers, refrigerant pressure gauges, high and low pressure and low temperature cut-out safety switches, a differential oil pressure safety switch and all other accessories required for the proper and safe operation of the unit.

4.17.6 Units operating above atmospheric pressure shall be provided with a separate compressor operated transfer unit and storage tank to permit removal and isolation of the full refrigerant charge allowing internal inspection of the evaporator, condenser and compressor.

The transfer unit shall be complete with all necessary controls for manual operation including all piping and valves.

4.17.7 The chiller shall be capable of starting and operating at part load.

4.17.8 Stable capacity control through a range of 10% to 100% of full load by means of variable inlet vanes shall be provided.

4.17.9 Thermometers shall be provided as permanent equipment on all compressor and gearbox bearings to indicate the prevailing bearing or lubricant temperatures.

4.17.10 The water cooler (evaporator) shall generally be of the shell and tube type as specified for the reciprocating compressor water chillers.

4.17.11 Condensers shall be of the water-cooled shell and tube type.

4.17.12 Evaporators shall be provided with charging connections, relief devices and sufficient eliminator area to prevent liquid refrigerant carry-over.

4.17.13 Operating and safety controls shall be provided on the control panel or cabinet supplied with each unit. The following instrumentation shall be provided as a minimum;

a) Microcomputer control system,

b) Suction and discharge refrigerant pressure gauges,

c) Oil pressure gauge, (or LED readout)

d) Oil temperature gauge, (or LED readout)

e) Low chilled water temperature safety switch,

f) Low oil pressure safety switch,

g) Low- and high refrigerant pressure safety switches,

h) Bearing high temperature safety switch (manual reset),

i) Motor winding high-temperature safety switch (manual reset),

j) Necessary relays and time delays, including motor overload protection,

k) Ammeter. (3-phases)

4.17.18 Each compressor shall be driven by a squirrel cage induction type electric motor. The motors of hermetic units shall have insulation suitable for the service. It shall be either refrigerant gas cooled or water-cooled and shall be provided with a moisture indicator.

4.17.19 Waterside working pressure rating for water cooler and condenser shall be not less than 1000 kPa.

4.17.20 Units shall be selected with fouling factors as required in the Supplementary Specification.

4.17.21 Initial charge of oil and refrigerant shall be provided.

4.17.22 The water chiller shall be a complete packaged unit with all components mounted on a sturdy steel framework with cladding, panels etc. to match the application.

4.17.23 Evaporators shall be factory insulated.

4.17.24 Compressor control shall be interlocked with a flow switch (with delay timer) in the chilled water circuit to prevent the unit operating with no water flow.

4.17.25 Mechanical means shall be provided to prevent loss of efficiency and impeller damage due to liquid carry-over.

4.17.26 Condenser tubes shall be protected against direct impingement of high velocity compressor discharge gas.

4.17.27 Initial charge of oil and refrigerant shall be provided.

4.18.0 SCREW COMPRESSOR WATER CHILLERS

4.18.1 Screw compressor chillers shall be of the serviceable hermetic compressor, direct drive packaged type complete with screw compressor, water cooler, condenser, capacity control, lubrication system, all interconnecting piping, control panel and all other auxiliaries required for the proper and safe operation of the unit.

4.18.2 Motor and rotor assemblies shall be statically and dynamically balanced and shall be free from vibration at all operating conditions.

4.18.3 Capacity control shall be by means of a hydraulic slide valve on a continuous basis or equal.

4.18.4 Bearing elements shall be pressure lubricated.

4.18.5 Low oil circulation rate shall be provided by means of an efficient oil separator forming an integral part of the compressor assembly.

4.18.6 The drive motor shall be refrigerant cooled.

4.18.7 Oil circulation system shall be complete with separator, compressor oil injection, oil filter, solenoid valves, flow switch, oil cooler, etc.

4.18.8 The water cooler (evaporator) shall be of the shell and tube type as specified for the reciprocating compressor water chillers.

4.18.9 The condenser shall be a water-cooled shell and tube condenser.

4.18.10 Water side working pressure rating for water cooler and condenser shall be not less than 1000 kPa.

4.18.11 The water chiller shall be a complete packaged unit with all components mounted on a sturdy steel framework with cladding, panels etc. to match the application.

4.18.12 Evaporators shall be factory insulated.

4.18.13 Each evaporator shall be provided with a low temperature safety switch.

4.18.14 Compressor control shall be interlocked with a flow switch in the chilled water circuit (with delay timer) to prevent the unit operating with no water flow.

4.18.15 Units shall be selected with fouling factors as required in the Supplementary Specification.

4.18.16 Each unit shall be provided with a control panel or cabinet containing the main switch, circuit breakers, refrigerant pressure gauges, high and low pressure and low temperature cut-out safety switches, low oil pressure safety switch and all other accessories required for the proper and safe operation of the unit.

4.18.17 The drive motor shall drive the male rotor assembly directly and shall be of the squirrel cage induction type.

4.18.18 Operating and safety controls shall be provided on the control panel or cabinet supplied with each unit. The following instrumentation shall be provided as a minimum;

a) Microcomputer control system,

b) Suction and discharge refrigerant pressure gauges,

c) Oil pressure gauge (or LED readout),

d) Oil temperature gauge (or LED readout),

e) Low chilled water temperature safety switch,

f) Low oil pressure safety switch,

g) Low- and high refrigerant pressure safety switches,

h) Bearing high temperature safety switch (manual reset),

i) Motor winding high-temperature safety switch (manual reset),

j) Necessary relays and time delays, including motor overload protection,

k) Ammeter (or digital readout), 3 phases.

4.18.19 Initial charge of oil and refrigerant shall be provided.

4.19.0 SCROLL COMPRESSOR WATER CHILLERS

4.19.1 Scroll type compressor water chillers and components shall generally comply with the requirements set out for reciprocating compressor chillers.

4.19.2 The chiller shall be air-cooled, air cooled remote condenser or water cooled as specified.

4.19.3 The unit shall be free of liquid refrigerant and oil slugging.

4.19.3 Lubrication shall be by means of mechanical oil pump, complete with oil heater.

4.19.4 Evaporators and water-cooled condensers shall be shell and tube design.

4.19.5 The water chiller shall be a complete packaged unit with all components mounted on a sturdy steel framework with cladding, panels etc. to match the application.

4.19.6 Each chiller shall be complete with one or more compressor and motor units, water cooler (evaporator), condenser, expansion valves, refrigerant piping circuits, controls and control panel.

4.19.7 Evaporators shall be factory insulated.

4.19.8 Each evaporator unit shall be provided with a chilled water low temperature safety switch.

4.19.9 Compressor control shall be interlocked with a flow switch (with delay timer) in the chilled water circuit to prevent the unit operating with no water flow.

4.19.10 Operating control shall include for anti-recycling timing between compressor starts and capacity steps and low pressure starting.

4.19.11 Multiple compressor and refrigerant circuit units shall be provided with automatic controls for lead/lag switching and operating time balancing of compressor running hours.

4.20.0 AIR-COOLED CONDENSERS

4.20.1 Air-cooled condensers shall be complete factory assembled packaged units consisting of refrigerant condensing coils, framework, casing, fan/s and fan motor/s.

4.20.2 For coastal applications condensers shall be manufactured in accordance with clause 4.1.2.

4.20.3 Units shall be arranged for horizontal or vertical airflow as indicated on the drawings.

4.20.4 Units with ducted air discharge shall be fitted with centrifugal or axial flow fans.

4.20.5 Wiring shall be terminated in a weathertight junction box mounted in an accessible position on the unit.

4.20.6 Head pressure control with fan cycling and/or fan speed control shall be fitted as standard equipment.

Idle fans shall not be driven backwards by air short-circuiting.

4.20.7 Condenser casings shall be constructed of galvanised steel, stainless steel or aluminium and painted. All steel parts shall be adequately protected against corrosion. Access panel doors shall be provided for repairs and maintenance.

4.20.8 Condensing coils shall be of seamless copper tubing with copper or aluminium fins depending on the application.

Inlet headers shall be designed for uniform gas distribution through all individual circuits.

Headers shall be arranged to prevent trapping of oil. The coil face velocity shall not exceed 3m/s.

4.20.9 Units for outdoor use must be suitably weather proofed. Fan blades shall be of aluminium or of steel having a corrosion resistant coating, including fan shafts.

4.20.10 Air intake and discharge openings shall be screened to protect coils and fins.

4.20.11 Heat rejection capacity and coil sizing shall be selected to ensure subcooling of refrigerant.

4.20.12 Interlocks for fans shall be provided between the indoor and outdoor units.

4.21.0 EVAPORATIVE CONDENSERS

4.21.1 Evaporative condensers shall be factory assembled sectional units, complete with fan/s, refrigerant condensing coil/s, spray nozzles and water distribution system, recirculating spray pump, eliminators, pan section and casing.

4.21.2 Heat rejection capacity and condenser section shall be selected for refrigerant subcooling.

4.21.3 Water level control shall be automatic with a quick-fill bypass valve and drain valve fitted to the sump.

4.21.4 Unless otherwise specified in the Supplementary Specification the unit shall be of the counter-flow blow-through arrangement type with centrifugal fan/s.

4.21.5 All steel sections shall be manufactured from galvanised steel with edges protected against corrosion.

4.21.6 Casings shall be rigidly manufactured from galvanised sheet steel, aluminium or re-enforced moulded glass fibre. Glass fibre units used outdoors shall be ultra-violet resistant.

Access to all internal parts shall be provided by means of easily removable panel/s or watertight doors fitted with quick opening catches. Suitable handles or holding bars shall be fitted to removable panels and doors.

4.21.7 Fan wheels and housings shall be of hot dip galvanised steel or corrosion protected to the Department's approval.

4.21.8 All moving parts shall be protected with removable screens and panels, hot dip galvanised after manufacture.

4.21.9 Effective eliminator sections, corrosion proof shall be provided to prevent water carry-over.

4.21.10 Refrigerant inlet and outlet headers shall be arranged to ensure proper refrigerant distribution and complete drainage of any oil present.

4.21.11 The heat transfer coil shall be of heavy class seamless steel tubing to SABS 62, hot dip galvanised after manufacture. (Copper for coastal and high corrosion applications).

4.21.12 The pan section shall be manufactured of heavy gauge hot dip galvanised steel.

Standard pan accessories shall include access doors, easily removable corrosion proof strainer for the pump suction, drain valve, overflow and large bore adjustable make-up ball valve.

The perforations of the strainer shall be smaller than the bore of the spray nozzles.

4.21.13 Automatic water treatment for corrosion protection with bleed control shall be fitted as standard equipment.

4.21.13 Re-circulating spray water shall be uniformly distributed over the condensing coil ensuring complete wetting of the coil at all times.

Spray nozzles shall be of the non-clogging type. Nozzles and branch piping shall be easily removable for cleaning and flushing purposes.

4.21.15 Evaporative condensers with ducted discharge shall be provided with access panels in the ducting, large enough to ensure proper access to nozzles and headers and to enable removal of eliminator sections for repairs or replacement.

4.21.16 The re-circulating pump shall be of the centrifugal type matching the system flow and pressure requirements.
A pressure gauge shall be fitted to the pump discharge.

The pump shall be installed in such a manner that it will drain completely when the sump is drained.

4.21.17 Units for outdoor use shall be completely weatherproof including all electric components.

4.21.18 Units shall be assembled with compatible galvanised or polymer and cadmium coated fasteners.

4.21.19 Where specified in the Supplementary Specification protection against pan freezing shall be built in.

4.21.20 Head pressure control by means of modulating damper control matching heat rejection and system load shall be provided.

4.21.21 The unit shall be painted as set out in clause 3.13.11.

4.21.22 Drain and overflow connections shall be piped to the nearest building drain point or gully.

4.21.23 Interlocks for fans and pumps shall be provided between the indoor and outdoor units linked in the system as specified.

4.21.24 Wiring shall be terminated in a weathertight junction box on the unit.

4.22.0 WATER COOLED CONDENSERS

4.22.1 Water-cooled condensers smaller than 30 kW heat rejection may be copper, tube-in-tube type.

4.22.2 Water cooled condensers larger than 30 kW heat rejection shall be of the shell-and-tube design with seamless copper tubing expanded in to steel tube plating, each individually replaceable.

Tubes shall be accessible form either side of the shell for tube replacement and cleaning purposes.

4.22.3 Water-cooled condensers shall be fitted with the manufacturer's standard head pressure control.

4.22.4 Steel shells shall be welded to the tube plates.

4.22.5 Safety pressure relief valves shall be fitted.

4.22.6 Waterside shall be designed for a working pressure of 1000 kPa, refrigerant side to match the system.

4.22.7 Sub-cooling of refrigerant shall be built in as standard.

4.22.8 Mechanical means shall be provided in each condenser to avoid direct impingement of high velocity compressor discharge gas on the tubes.

4.22.9 The water velocity inside condenser tubes shall not exceed 3m/sec and the tube diameter shall not be less than 13mm I.D. Each condenser shall be provided with a main liquid stop valve.

4.22.10 A plastic resin coating or equal for corrosion protection shall be applied after fabrication to the waterside of all steel tube plates within each condenser.

4.22.11 Tube supports, correctly spaced shall be provided between the end plates.

4.22.12 End covers shall be of cast iron or welded steel with integral baffled circuiting to suit the pass arrangements.

4.22.13 End covers shall be provided with proper gaskets and shall be easily removable for periodic cleaning.

4.22.14 Water and refrigerant pipe connections shall be sized according to the duty and shall be flanged.

4.22.15 The unit shall be painted as set out in clause 3.13.11.

4.23.0 COOLING TOWERS

4.23.1 Cooling towers shall be factory assembled units, rigidly constructed of galvanised sheet steel, stainless steel, aluminium or moulded fibre glass suitably reinforced with galvanised steel angle iron.

Units shall be complete with fan/s, spray nozzles, water distribution system, eliminators, pan section and casing.

4.23.2 Water level control shall be automatic with a quick-fill bypass valve and drain valve fitted to the sump.

4.23.3 Unless otherwise specified in the Supplementary Specification the unit shall be of the counter-flow blow-through arrangement type with centrifugal fans.

4.23.4 All steel sections shall be manufactured from galvanised steel with edges protected against corrosion.

4.23.5 Access to all internal parts shall be provided by means of easily removable panel or watertight doors fitted with quick opening catches. Suitable handles or holding bars shall be fitted to removable panels and doors.

4.23.6 Fan wheels and housings shall be of hot dip galvanised steel or corrosion protected to the Department's approval.

4.23.7 All moving parts shall be protected with removable screens and panels, hot dip galvanised after manufacture.

4.23.8 Effective eliminator sections, corrosion proof shall be provided to prevent water carry-over.

4.23.9 The pan section shall be manufactured of heavy gauge hot dip galvanised steel.

Standard pan accessories shall include access doors, easily removable corrosion proof strainer for the pump suction, drain valve, overflow and large bore adjustable make-up ball valve.

The perforations of the strainer shall be smaller than the bore of the spray nozzles.

4.23.10 Automatic water treatment for corrosion protection with bleed control shall be fitted as standard equipment.

4.23.10 Recirculating spray water shall be uniformly distributed over the heat transfer surfaces ensuring complete wetting of the wet deck areas at all times.

Spray nozzles shall be of the non-clogging type. Nozzles and branch piping shall be easily removable for cleaning and flushing purposes.

4.23.12 Cooling towers with ducted discharge shall be provided with access panels in the ducting, large enough to ensure proper access to nozzles and headers and to enable removal of eliminator sections for repairs or replacement.

4.23.13 A pressure gauge shall be fitted to the nozzle inlet piping from the pump.

4.23.14 Units for outdoor use shall be completely weatherproof including all electric components.

4.23.15 Units shall be assembled with compatible galvanised or polymer and cadmium coated fasteners.

4.23.16 Where specified in the Supplementary Specification protection against pan freezing shall be built in.

4.23.17 Where specified modulating damper control matching heat rejection and system load shall be provided.

4.23.18 All steel surface shall be painted as specified in Clause 3.13.11.

4.23.19 Cooling towers with forced draught propeller or axial flow fans are not acceptable.

4.23.20 Units with multiple fan sections shall be internally baffled to permit independent operation of the individual fan sections.

4.23.21 The wet deck shall consist of heavy hot dip galvanised steel, PVC or other plastic material impervious to rot or biological attack or decay encased in removable hot dip galvanised steel panels or sections.

The wet deck surface shall be properly degreased.

4.23.22 Eliminators shall be manufactured from hot dip galvanised steel, stainless steel or moulded fibre glass UV stabilised where exposed to the sun with a minimum of three directional changes to the air path.

Plate spacing shall not exceed 30mm centre to centre.

4.23.23 Drain and overflow connections shall be piped to the nearest building drain point or gully.

4.23.24 Cooling tower and circulating pump levels shall be arranged to ensure a flooded pump suction with NPSH complying with the manufacturer's requirements.

4.23.25 Piping system and cooling tower shall be arranged to prevent the sump flooding when circulating pumps are stopped.

4.23.26 Interlocks for fans and pumps shall be provided between the indoor and outdoor units linked in the system, as specified.

4.23.27 Wiring shall be terminated in a weather tight junction box on the unit.

4.24.0 CLOSED CIRCUIT COOLING TOWERS

4.24.1 Closed circuit cooling towers shall generally comply with clauses 4.22.0 and 4.23.0 as applicable.

The heat exchanger shall however be water/fluid to water and not refrigerant to water.

4.24.2 Each tower shall be served by two circulating pumps, one for the closed circuit to be cooled and one forming an integral part of the cooling tower for the spray circuit.

4.24.3 The closed circuit shall be fitted with the necessary air release valves, expansion tank with make-up, overflow and drain connections and provision for slug-dosing of the closed circuit against corrosion.

4.25.0 DRY COOLERS

4.25.1 Dry coolers shall be factory assembled closed circuit water to air coolers, complete with heat exchanger, fan/s, screens and controls.

4.25.2 Heat rejection shall be based on ambient air to water or ambient air to glycol water solution where specified in the Supplementary Specification.

4.25.3 Drycooler selection shall be based on specified ambient dry bulb temperature and maximum circuit heat rejection.

4.25.4 Drycoolers shall be factory assembled, tested, commissioned and guaranteed.

4.25.5 Drycooler and circulating pumps shall be interlocked with the chiller/condenser with timer controlled delay starting of approximately 60 seconds (Adjustable 30 - 120 seconds).

4.25.6 The drycoolers shall be of the vertical or horizontal type with slow speed multiple fans of the direct drive type with horizontal or vertical air discharge as indicated on the drawing, suitable for permanent outdoor use.

4.25.7 The drycooler heat exchanger shall be constructed of copper tubing with aluminium fins (copper fins for coastal applications). Design water pressure shall be not less than 1400 kPa.

4.25.8 The casing shall be constructed of corrosion resistant steel, aluminium or stainless steel panels suitable for permanent outdoor application.

If not stainless steel the casing shall be epoxy powder coated finish.

4.25.9 All sections of the casing shall be completely self-draining with no water collecting areas.

4.25.10 Support framework shall be hot dip galvanised after manufacture and epoxy powder coated.

4.25.11 The fans shall be direct drive type fitted with rigid protection screens on the discharge side and coils/fins similarly protected.

Fans and fan motor shall have permanently sealed and lubricated ball or roller bearings, designed and manufactured for continuous heavy duty application.

The drycoolers shall operate at minimum noise level with maximum fan speeds not exceeding 1000r/min.

Fan blades shall be of aluminium or corrosion protected steel including shaft.

4.25.12 Tube headers shall be fitted with automatic air vent valves and drain valves as well as suitable in/out water connections.

4.25.13 Solid state fan speed control and fan cycling control on multiple fan units is required to maintain a near constant water temperature.

4.25.14 Off-cycle fans shall be protected against windmilling.

4.25.15 Coil face air velocity shall not exceed 3m/s.

4.25.16 The drycooler shall be mounted on a sturdy base frame and concrete plinth.

4.25.17 Internal wiring shall be terminated in a weather tight junction bore mounted on the unit baseframe.

4.26.0 CLOSED CIRCUIT, SECONDARY CIRCUITS

4.26.1 Proper provision shall be made in closed circuit secondary cooling circuits on the pump suction manifold for sampling and charging the circuit with glycol and corrosion inhibitor as required.

4.26.2 Systems shall be charged initially with a concentration by mass of non-corrosive glycol ethylene suitable for the application, where specified.

4.26.3 Systems shall also be charged with a recognised corrosion inhibitor chemical treatment of a reputable and recognised firm. This inhibitor shall match the corrosion characteristics of the site water, the glycol ethylene (where specified) and the piping system, including heat exchanger materials.

It will also be expected of the Contractor during the 12-month maintenance guarantee period to sample the closed circuits, correct the concentration and inhibitor content as necessary and file a report on the state thereof with the maintenance report.

4.27.0 COMPUTER ROOM AIR CONDITIONING UNITS

4.27.1 Computer room type air conditioning units shall be of the remote air cooled, water/glycol cooled or chilled water cooled type as specified in the Supplementary Specification.

4.27.2 Down-flow or up-flow cabinet units shall be provided as indicated in the Supplementary Specification.

4.27.3 The units shall be of the free standing type suitable for mounting on a suspended computer type floor.

All units shall run continuously, capacity to be based on parallel redundancy.

Each unit shall be complete with compressor/s, water/glycol cooled or air cooled condenser and evaporator coils or chilled water coils, fan/s, electric heaters, filters, humidifier, refrigerant circuit and built-in controls with alarms and switchboard.

4.27.4 The units shall operate on 100% recirculating air and shall be near sensible coolers only. Air coil off temperature shall be maintained at set point temperature for normal operation, but the temperature shall be automatically adjusted for dehumidification when required with automatic reheat to maintain room temperature.

4.27.5 All components shall be selected for continuous year round operation with maximum life expectancy.

4.27.6 Each unit shall be installed on a specially manufactured steel structure to the supplier's requirements and not directly on the floor structure. This steel support shall be properly earthed to the unit but shall be insulated from the floor matrix and the special floor earth.

This floor stand shall have adjustable legs for height setting to match the final surrounding floor level and shall be complete with vibration isolation pads.

4.27.7 Cabinets shall consist of a rigid corrosion resistant framework onto which components and exterior panels are fitted. The exterior panels shall be provided with pressure tight, non-perishable rubber seals. All hinges shall be invisible and all panels easily removable for service access. Exterior panels shall be insulated with 25mm thick closed cell foam insulation or equal.

4.27.8 The coil drippan shall be of stainless steel 430 and shall be insulated. Drainage piping shall be provided.

4.27.9 An adjustable air by-pass is required to enable exact air balancing on site where direct driven fans are tendered. Air discharge opening sizes and positions to be arranged with Principal Contractor on site, to be cut into floor panels.

4.27.10 Service access shall be possible to all components and a secondary screening panel is required for live electrical terminals etc.

4.27.11 Cabinet colour shall be approved by the Department prior to ordering but shall generally match the computer equipment.

4.27.12 Refrigerant units larger than 15 kW nominal cooling capacity shall have multiple independent refrigerant circuits with separate compressors, evaporators etc.

4.27.13 Compressors shall be of the hermetic or semi-hermetic serviceable type with suction gas cooled motor and shall be mounted on anti-vibration and noise isolators.

4.27.14 Each compressor unit shall be complete with built-in overloads, oil sight glass, manual reset high pressure switch, pump down low pressure switch, reversible oil pumps for forced feed lubrication, pumpdown control and service valves. Units with compressor crankcase heaters and suction line accumulators in lieu of pump down control will also be considered.

4.27.15 Each compressor unit shall be complete with suction line strainer-dehydrator, hot gas muffler, moisture indicator, sight glass, thermal expansion valve and cooling coil (evaporator). The cooling coil shall be at least four rows deep.

4.27.16 The design shall ensure quiet operation, with fan impellers statically and dynamically balanced, and running on self aligned sealed-for-life bearings. Each fan shall be driven by it's own motor.

4.27.17 Fan motors shall be of the heavy duty, drip proof or totally enclosed type, specially selected for quiet operation and reliability. Overload protection shall be provided.

4.27.18 For belt driven units the motors shall be mounted on adjustable slide bases. A minimum of two belts, each capable of transmitting the full power requirements shall be provided.

4.27.19 Even air distribution over the coil face is essential.

4.27.20 Condenser circuits shall be equipped with head pressure control, factory fitted.

4.27.21 Disposable panel filters with pleated surfaces shall be provided. Filter efficiency shall be not less than 95% arrestance generally as per clause 4.4.0.

4.27.22 Filters shall form an integral part with the fan coil unit and shall fit into self-centring frames with soft rubber seals. An external manometer shall be mounted on each filter bank clearly marked to indicate filter replacement resistance.

4.27.23 The filters shall be serviceable from either side of the unit without a ladder or platform.

4.27.24 A filter resistance switch with adjustable range shall be provided and wired for remote indication/monitoring as part of control and alarm system, with terminals to suit.

4.27.25 Each unit shall be fitted with the manufacturer's standard heater/ reheater (electrical).

The element pack is to be arranged to give an efficient heat transfer to the air, easy accessibility for maintenance and to allow expansion of the elements without distortion.

4.27.26 Each unit shall be provided with a complete microprocessor type environmental control system that may be programmed at the unit for the various parameters with local visual display of operating modes and visual indication of alarm conditions.

4.27.27 Local monitoring and programming as well as L.E.D. numerical displays on a visible monitor panel on the front of the unit of the following functions are required;

a) Current room temperature, ºC

b) Temperature setpoint, adjustable 18ºC - 30ºC

c) Temperature sensitivity, adjustable 1ºC - 5ºC

d) Humidity setpoint, 40% - 60% relative humidity

e) Humidity sensitivity, adjustable 1% - 10% r.h.

4.27.28 The following normal operating modes shall be indicated as coloured L.E.D. status displays on the monitor panel;

a) Heating

b) Cooling

c) Humidification

d) Dehumidification

4.27.29 The control system shall monitor unit operation and activate an audible and visual L.E.D. display on the unit monitor panel of the following alarms;

a) High room temperature

b) Low room temperature

c) High room humidity

d) Low room humidity

e) High compressor head pressure (for each compressor, where applicable).

f) Filter resistance high

g) Reduced or loss of air flow

h) Humidifier alarm

4.27.30 A silence button shall be provided for the audible alarm but alarm displays shall remain until the alarm condition is corrected.

A manual compressor sequence switch shall be provided to enable changing of the lead/lag sequence for multiple compressor units.

4.27.31 Proportional dehumidification control is required with reheating to maintain room conditions.

4.27.32 A battery back-up system is required to maintain unit set points in the event of a power interruption.

4.27.33 Where specified in the Supplementary Specification the control system shall be suitable for interfacing with a remote monitoring microprocessor. It shall also be possible to set or adjust all operating and alarm parameters for each individual unit from this remote microprocessor.

4.27.34 Stop/start push buttons as well as lamp test buttons shall be provided.

4.27.35 Terminals shall be provided for N.O. or N.C. dry contact interlocking with fire protection systems to enable switching off of the unit in the event of a fire.

4.27.36 Interlocking for stopping/starting and control purposes shall be provided between indoor and outdoor units where applicable.

4.28.0 AIR COOLED CONDENSING UNITS

4.28.1 Air-cooled condensing units shall be factory produced and tested units complete with compressor/s, fan/s, condenser/s and casing.

4.28.2 Compressor, condenser and unit casing shall generally comply with clauses 4.15.0, 4.19.0 and 4.20.0 as applicable.

4.28.3 Outdoor units shall be suitable for permanent outdoor use and fully weatherproof.

4.29.0 REFRIGERANT CIRCUITS

4.29.1 Refrigerant tubing shall generally be in accordance with SABS 1453: 1988: Copper tubes for medical gas and vacuum services with preferred sizes in accordance with SABS: 460 class 2 and shall be de-oxidised and dehydrated.

4.29.2 The tubing shall be seamless cold drawn copper tubing with soldered copper capillary fittings.

4.29.3 Piping/tubes, up to and including 10 mm diameter, may be jointed with the flaring method.

Other pipeline joints, shall be silver soldered or other approved hard solder. All soldered joints, on factory supplied equipment, shall be carefully checked before commissioning and remade if found damaged in transit. Silver solders shall be in accordance with SABS 23: 1973 and revisions.

4.29.4 Pipe sizing shall be as specified in the supplementary specification. Pipe size selections shall however be such as to produce moderately low velocities whilst, nevertheless, ensuring;

a) proper oil return to the compressor and minimising lubricating oil being trapped in the system.

b) practical lines without excessive pressure drops and with proper feed to evaporators.

c) prevent liquid refrigerant from entering the compressor during operation and at shutdown.

4.29.5 All plant room piping shall be thoroughly cleaned and painted with a heat resistant clear lacquer.

4.29.6 Piping shall be supported (unless otherwise indicated on the drawings) as follows:

Pipe Size(mm)	Max. distance between supports in meters
10 (and smaller)	0,6
10 – 18	1,0
22	1,5
28 – 35	2,0
42	2,5
54	2,75
67	3,0

4.29.7 Refrigerant piping shall be arranged so that normal inspection and servicing of the compressor and other equipment is not hindered. Locations where copper tubing will be exposed to mechanical damage shall be avoided.

4.29.8 Flexible metal vibration absorbers shall be fitted at compressor discharge and suction connections. Absorbers shall be installed at right angles to the direction of vibration. Hangers and supports where piping penetrates through walls shall be designed to prevent transmission of vibration to the building.

4.29.9 A hot gas muffler shall be installed as close to the compressor as possible in a position to prevent oil trapping.

4.29.10 Flash gas at the expansion valve shall be prevented. On systems with large pressure drops due to line friction or static head, liquid line subcooling shall be accomplished by the use of either liquid-suction heat exchangers, or subcooling sections in evaporative, air, or water-cooled condensers.

4.29.11 Subcooling coils in evaporative and air-cooled condensers shall be in accordance with clause 4.5.0. Receivers shall be provided in the liquid line between the condensing and subcooling coils.

4.29.12 Liquid-suction heat exchangers shall be of either the shell-and-tube or the tube-in-tube type. Liquid-suction heat exchangers shall not be used in systems using R-22 as refrigerant. A valved liquid bypass shall be provided around the heat exchanger.

4.29.13 Coils with more than one inlet or coils in which the individual circuits are not evenly loaded due to surface or air quantity variations shall be provided with separate expansion valves.

4.29.14 For evaporative or air cooled condensers each compressor circuit shall be equipped with a receiver with safety valve, isolating valves and purge cock, capable of holding the full volume of refrigerant in that circuit. Receivers shall be shaded from the sun.

Receivers with pressure/volume rating qualifying as pressure vessels in terms of the Regulations of the Machinery and Occupational Health and Safety Act shall comply with all requirements of the Act and Regulations and shall be fitted with safety valves, purge cock, isolating valves, manufacturer's plates etc. as required by the Regulations.

4.29.15 For water-cooled condensers where the condensers are not of sufficient capacity to hold the full refrigerant charge, a receiver shall be installed in each circuit to hold the balance of refrigerant.

4.29.16 The liquid piping from the condenser to the receiver shall allow free drainage of the liquid. The condenser to receiver piping shall be as short as possible and shall be pitched towards the receiver with a minimum slope of 20mm per metre.

4.29.17 Oil separators shall be used in systems where it is impossible to prevent substantial absorption of refrigerant in the crankcase oil during normal operation or during shutdown periods. Oil separators shall be insulated to prevent it form acting as a refrigerant condenser. Provision shall be made to prevent drainage of condensed refrigerant into the crankcase.

4.29.18 A quality refrigerant drier shall be provided in the liquid line on all systems. Dryers shall be of the side inlet replaceable element type. Dryers shall be installed with a three-valve bypass for servicing and to allow partial flow on open compressor systems in order to reduce pressure drop. All the refrigerant shall flow through the drier on hermetic compressor systems. A reliable moisture indicator shall be provided for positive indication when the drier cartridge should be replaced.

4.29.19 A quality strainer shall be provided on all systems in the liquid line. A suction strainer shall also be provided unless the compressor is equipped with a built-in suction strainer. Combined filter-dryers are also acceptable. Strainers shall be adequately sized to assure adequate foreign material storage capacity without causing excessive pressure drop.

4.29.20 Sight glasses of double port seal cap type shall be installed in a vertical section of the liquid line after the receiver or condenser (if no receiver is used) to check the refrigerant charge and before the expansion valve to check the state of the refrigerant. Moisture indicators installed directly in the liquid line serving the dual purpose of liquid line sight glass and moisture indicator are also acceptable.

4.29.21 A refrigerant charging connection shall be provided between the receiver or shell and tube condenser and the refrigerant drier, in the liquid line. Before charging the system with refrigerant the circuit shall be tested as specified.

4.29.22 Solenoid valves shall have opening stems to continue operation of the system in case of solenoid coil failure.

4.29.23 All pipes, vessels etc. operating below ambient dew point shall be insulated and a vapour barrier provided.

4.30.0 WATER CIRCUITS AND ACCESSORIES

4.30.1 Piping

4.30.1.1 Piping layouts and circuits shall be laid out as shown on the drawings, including schematic drawings issued with the service.

4.30.1.2 Unless otherwise specified open circuit condenser cooling water piping shall be heavy class steel piping to SABS 62: 1971, amended and galvanised to SABS 763 : 1988 for type B articles, heavy duty.

4.30.1.3 Unless otherwise specified closed circuit condenser water piping, primary and secondary chilled water piping and closed circuit hot water piping for heating circuits shall be medium class black piping to SABS 62 : 1971, painted or coated as specified prior to insulation where applicable.

4.30.1.4 Where specified in the Supplementary Specification chilled water piping and condenser water piping up to size 50mm diameter may be copper piping.

Where specified in the Supplementary Specification condenser water piping may be uPVC not less than class 6 or as specified.

4.30.1.5 Pipe connections from main circuits to unitary equipment such as fan coils, humidifiers etc. shall be annealed copper class 2 to SABS 460 : 1985, as amended.

4.30.1.6 Fittings and accessories larger than 50mm nominal bore size shall be flanged with standard flanges to SABS 1123.

Compressed mineral fibre joint rings shall be used for flanged joint packings.

4.30.1.7 Fittings and accessories smaller than 50mm nominal bore may use screwed connections.

Screwed fittings shall be of malleable cast iron to SABS 509 : 1975, amended. Ordinary light type or black iron fittings shall not be used.

Screw thread shall be to BS21 of ISO R7.

PTFE sealing tape or other approved sealing compound shall be used on screwed connections.

4.30.1.8 Welding to galvanised piping or fittings will not be permitted.

Where welding for whatever purpose is unavoidable the complete section shall be hot dip galvanised after manufacture.

Cold galvanising will not be accepted.

4.30.1.9 Full radius bends and sweep fittings must be used wherever possible. Elbows may only be used under exceptional conditions and only with written permission of the Department.

Where it is necessary to reduce pipes in size, reducing sockets only shall be used and not bushes.

In horizontal runs of piping, where there is only a slight fall eccentric fittings are to be used.

4.30.1.10 Pressure relief valves shall be of Spirax or approved manufacture and shall be installed in the positions indicated on the drawings.

Pressure relief valve drains shall be taken to a suitable safe discharge point.

4.30.1.11 Where pipes pass through walls etc., sleeve pipes must be provided by the Contractor. Sleeve pipes should be made in such a manner that they will not foul against any piping due to the natural expansions and contraction of the piping.

4.30.1.12 All pipelines must be provided with 15mm drain cocks at all low points in the system so that the pipework can be drained of liquid without dismantling.

Sufficient drain points must be provided to drain the system completely.

4.30.1.13 Provision shall be made by tenderers in their tender price to have one in every twenty welded joints cut-out for inspection and testing and for making good afterwards.

Should any of the test welds prove unsatisfactory the Contractor will be called upon to have all welds on the installation X-rayed and examined, at his own expense, by an approved Inspection Authority.

The Contractor will then be required to submit written test and inspection reports by the Inspection Authority before the installation will be considered for acceptance.

4.30.1.14 Horizontal pipes shall be installed with a slope of a least 1 in 500 to allow venting of air to the expansion tank wherever possible. Air pockets shall be avoided. High points shall be provided with automatic air vent valves or air bottles. Air vents or bottles shall be designed for at least 1,5 times the working pressure of the system.

4.30.1.15 Piping in plant rooms shall be so arranged that normal inspection and servicing of equipment is not obstructed.

All pipes must be neatly fitted and shall be run in such a manner as to prevent the formation of air locks.

On all circuits, screwed unions or flanged joints are to be provided to allow for the easy dismantling of pipes. Unions or flanges must be provided at all Tee-offs and adjacent to all valves. Pipes up to 50mm nominal size may use unions but pipes larger than 50mm must be flanged. On straight or continuous runs of pipe, unions or flanges shall be provided at intervals not exceeding 20 metres.

4.30.1.16 Pipes which are not dimensioned on drawings shall be sized as follows:-

a) The velocity shall not exceed 3m/s.

b) The friction rate shall not exceed 140 kPa per 100m length.

The pressure drop through all circuits shall be approximately the same. If this cannot be achieved by pipe sizing alone due to excessive resultant velocities, throttling or balancing type valves shall be provided where required.

4.30.1.17 Pipe supports and the positions of anchors shall be such as to allow for movement due to pipe expansion and contraction or expansion joints in the building structure as applicable. Expansion joints, where required, shall be of the bellows type manufactured from stainless steel or may be of the Viking Johnson pipe coupling or equal where moderate expansion movements are to be accommodated. Expansion joints shall be rated at not less than 1,5 times the maximum working pressure in the system. Expansion joints in hot water piping shall be suitable for water temperatures up to 120ºC.

4.30.1.18 Pipe hangers shall be of the spring, roller, chain or rod type. The maximum spacing of hangers and the minimum diameter of hanger rods shall be as follows:-

Nominal Pipe Size mm	Maximum Span m	Minimum Rod Diameter mm
25	2,2	10
40	2,8	10
50	3,1	10
80	3,7	14
90	4,0	14
100	4,3	16
125	4,9	16
150	5,2	20
200	5,8	22
250	6,7	22
300	7,0	22

4.30.1.19 High compression type thermal insulation such as hard wood timber of the same diameter as the required insulation shall be provided between hangers and chilled and hot water pipes.

4.30.2 Strainers

4.30.2.1 Water strainers shall be of the pot or angle type. Strainers shall be designed for not less than 1 000 kPa or 1,5 times the maximum system working pressure whichever is the greatest. Strainer screens shall be of bronze, monel metal or stainless steel and shall have the following maximum perforation sizes:-

Strainer Size mm	Perforation Size mm
2 – 50	0,8
65 – 150	1,6
200 – 300	3,2
over 300	6,4

4.30.2.2 The effective free area of the screen shall in all cases be not less than 3 times the cross sectional area of the inlet opening.

4.30.2.3 Strainers shall be installed in accessible positions where the strainers can be easily removed and cleaned.

4.30.3 Pressure Gauges and Thermometers

4.30.3.1 Pressure gauges shall be of the "Bourdon" type to BS 1780 with at least a 100mm dial and calibrated in kPa with the maximum range not exceeding 1,5 times the system working pressure. Forged brass or gunmetal gauge cocks must be fitted with each pressure gauge.

4.30.3.2 Thermometers shall be of the replaceable glass type with bronze casings, fitted into pockets for removal without draining the system. The thermometers shall be calibrated in ?C and the scale length shall be at least 170mm. Pockets shall be of brass, filled with oil and shall be installed vertically.

On pipes smaller than 50mm diameter, pipe sizes must be increased locally to install the sockets.

4.30.4 Air Release Valves

4.30.4.1 Automatic air release valves shall be provided where shown on the drawings, but shall in addition also be fitted to piping at all high points and other places where air may accumulate. As these points depend on the installation of the system, full responsibility for fitting these valves rests with the Contractor.

4.30.4.2 Valves shall be of the inverted float type similar or equal to Honeywell, Braukmann or Spirax. They shall have either integral shut-off valves or be preceded by a lock shield valve.

4.30.4.3 Connections to the service pipe shall be made at the highest point to ensure complete venting. Valves shall be mounted with the inlet connection exactly vertical.

4.30.5 Drain Cocks

4.30.5.1 Drain cocks shall be of copper alloy and be of the screw down pattern type to BS2879 : 1957, Type A. They shall be fitted to all low points in the installation to ensure full draining of the system.

4.30.6 Valves and Non-Return Valves

4.30.6.1 Isolating valves, unless otherwise specified in the Supplementary Specification shall be Saunders Type A or Type KB diaphragm valves or equal fitted with suitable diaphragms and rated for at least 1 000 kPa working pressure and the system temperature.

Diaphragm valves shall be provided with hand wheels. Valves of 80mm and larger which are installed higher than 2 500mm above floor level, shall be provided with chainwheels and chains.

4.30.6.2 Where isolating valves of the gate type are specified it shall be of the type with solid or flexible wedges in accordance with SABS 664 and SABS 776. Valves of 80mm nominal bore and smaller shall be of bronze or gunmetal.

In lieu of gate valves, other types of valves may also be offered provided that bodies, temperature and pressure ratings are generally as specified for gate valves and that the fluid pressure drop for wide open valves does not exceed that of 40 diameters of pipe of the same size.

4.30.6.3 Diaphragm type valves and gate valves shall not be used for balancing or throttling purposes.

4.30.6.4 Unless otherwise specified in the Supplementary Specification balancing valves shall be similar or equal to the STA-T shut-off/balancing valves. Valves shall be provided with drain cocks with hose connections and two pressure cocks across each valve to enable measuring the flow rate. A differential pressure gauge to measure the pressure drop across all the valves in the system and a flow chart for each valve size used shall be provided by the Contractor at first handover.

4.30.6.5 Throttling valves shall be either plug, globe, angle or "Y" valves. Provision shall be made to prevent opening and closing of throttling valves by unauthorised persons once they are set.

4.30.6.6 Check valves shall be of the swing or lift type with seats of neoprene, gunmetal or stainless steel, discs of bronze, gunmetal or stainless steel and bronze or cast iron bodies, suitably rated for system pressure and temperatures.

4.30.7 General

4.30.7.1 Flexible connections shall be provided at all chiller and pump connections and where indicated on the drawings. These shall be of nylon reinforced moulded neoprene rubber with metal flanges at both ends. Metal reinforcing will not be accepted.

The flexible connections shall be of spherical or double spherical construction as per clause 3.15.0.

The flexible connections shall be installed strictly in accordance with the manufacturer's recommendations and shall be suitable for the system working pressures and temperatures.

4.30.7.2 Pressure gauges, thermometers and shut-off valves shall be provided in the following positions in each condenser water pipe circuit:

a) A pressure gauge, thermometer and shut-off valve before and after each condenser and self-contained air conditioning unit.

b) A shut-off valve at the in- and outlet of each cooling tower.

c) A strainer shall be provided at the suction side of each pump.

d) A pressure gauge before and after each strainer and at each pump discharge for pump units.

e) A shut-off valve before each strainer and at each pump discharge for pump units.

4.30.7.3 Pressure gauges, thermometers, unions and shut-off valves shall be provided at the inlet and outlet of chilled water and central heating coils.

4.30.7.4 Strainers shall be provided upstream of coils and control valves.

4.30.8 Expansion Tanks

4.30.8.1 Expansion tanks shall be fitted to all closed circuit piping installations. The tank capacities shall be as specified in the Supplementary Specification but generally not less than 50 litres water capacity.

4.30.8.2 The tank shall be manufactured form at least 2mm galvanised sheet steel or be hot dip galvanised after manufacture. The minimum water level in the tank shall be kept at approximately 300mm from the bottom by means of a 20mm nominal size ball valve. A stopcock shall be provided in the make-up water line upstream of the ball valve.

The tank shall be provided with a separate quick filling connection, overflow, drain and a bolt-down lid with an air vent.

4.30.8.3 The expansion tank shall be installed at least 1 200mm above the highest point of the relevant water system.

4.30.9 Copper Piping

4.30.9.1 Where specified in the Supplementary Specification copper piping may be used for chilled water and/ or condenser water piping.

4.30.9.2 All piping shall be the best quality copper pipe of approved make, free from any defects. The sizes shall be indicated on the main drawings and no pipe of a smaller size than 15mm shall be used.

4.30.9.3 All piping shall comply with SABS 460 – 1985 as amended, either half hard Class 1, 2 or 3 piping as specified in the Supplementary Specification.

All piping shall be suitable for a working pressure of not less than 1 300kPa.

4.30.9.4 In general, Class 1 and 2 piping shall be used inside buildings while only Class 3 piping shall be used for underground services.

4.30.9.5 All fittings shall be of the best quality and shall and shall be correctly matched to the size of piping to which they are connected.

4.30.9.6 Capillary type copper bends, elbows, tees, reducers, etc. are preferred wherever possible. These must be silver soldered using hard solders complying with SABS 23 – 1992 as amended. The use of soft tin-lead is not permissible.

4.30.9.7 Where it is necessary to provide dismantled connections in the pipework use may be made of brass "Flarex "or "Conex" type fittings.

4.3.9.8 "Conex" type fittings will not be permitted for use with Class 1 piping or in underground use.

4.3.9.9 Brass fittings must be made from a grade of brass or gunmetal, which will not be subject to dezincification.

4.30.9.10 Full radius bend and sweep fittings must be used wherever possible. Elbows may only be used under exceptional conditions and only with the express permission of the Department.

4.30.9.11 Where it is necessary to reduce pipes in size, reducing sockets and fittings only shall be used and not bushes.
In horizontal runs of piping, where there is only a slight fall, eccentric reducing fittings are to be used to prevent air locks.

4.30.9.12 Where practical copper pipes, particularly in sizes up to 28mm shall be bent or set around corners or obstacles. Where pipes are bent or set proper bending springs or pipe bends shall be used. No flattening of pipes at bends or sets will be permitted.

4.30.9.13 On all circuits, screwed "Flarex" or "Conex" unions o flanged joints are to be provided to allow for easy dismantling of pipes. Unions or flanges must be provided at all major tee offs and adjacent to all valves. Pipes up to 50mm may use unions but pipes above 50mm must be flanged. On straight or continuous runs of pipes, unions or flanges shall be provided at intervals not exceeding 20 meters.

4.30.9.14 Horizontal copper piping shall be supported unless otherwise indicated on the relevant drawings, as follows:

DIAMETER	MAXIMUM SUPPORT SPACING METERS
15mm	1,8
22 – 28mm	2,4
34 – 54mm	3,0
76 – 108mm	3,6

"Unistrut " copper piping shall be supported unless otherwise indicated on the drawings or in the specification. Pipe support hanger bolts and "U-bolts" shall in all cases be provided with lock nuts, which shall be brass or galvanised and must be arranged so as to cause no electrolytic corrosion of the copper pipe.
Where small bare copper pipes are chased in to brickwork or floors, they shall be first wrapped with suitable mineral fibre or glass fibre tape approximately 6mm thick.

4.30.10 uPVC Piping

4.30.10.1 Where applicable in the Supplementary Specification uPVC piping may be used for condenser water, above or below ground.

4.30.10.2 The class of piping to be used shall be as specified, but not less than class 6.

4.30.10.3 Piping, fittings and joints shall generally comply with SABS 956 – 1976 as amended.

4.30.10.4 Piping handling and installation shall generally be in accordance with Code of Practice SABS 0112 – 1992 as amended.

4.30.10.5 Only pipes and fittings bearing the SABS mark will be acceptable.

4.30.10.6 All horizontal pipework shall be adequately supported at intervals not exceeding those given in the table below which applies for ambient and water temperatures not exceeding 35ºC. For higher temperatures continuous support shall be provided.

Nominal pipe diameter (mm)

10	1,25	20	25	30	40	50	60	75	100	150	200

Maximum distance between supports (m)

0,25	0,30	0,30	0,35	0,35	0,45	0,45	0,50	0,60	0,90	1,0	1,0

It is essential that where metal holder bats or other types of support are used that all rough edges that may damage the pipe surfaces are removed prior to installation. Pipes must be free to slide axially in the pipe supports to accommodate expansion and contraction.
Where pipes pass through walls or floors, suitable non-metallic sleeves must be provided to allow freedom of axial movement. Unistrut pipe supports and hangers shall be used throughout unless otherwise indicated on the drawings or in the specification. Pipe support hangers and “U-bolts”, hall in all cases be provided with locknuts, which shall be securely locked. All brackets and pipe clamps shall be suitably galvanised, hot dipped to SABS 763 – 1977.
For vertical piping the above spacing may be doubled.
Expansion loops or telescopic expansion units shall be fitted in straight runs of pipe at intervals of not more than 50 meters, Pipes must be suitably anchored at appropriate places to ensure that expansion takes place in the desired direction so that it can be correctly taken up by the expansion devices, Anchors must be so designed as to render damage to or crushing of the pipe impossible.

Installation of expansion units on site must be done with due regard t the season and average ambient temperature prevailing when assembly takes place.

4.30.11 Testing of Piping Installations

4.30.11.1 Testing of the installation is to be carried out by the Contractor at his own expense in the presence of the Department's Representative. The following actions shall be carried out:

a) After the flushing and cleaning of the pipelines, all lines shall be completely filled with cold water and bled of all air.

b) The pipe system shall then be subjected to a test pressure of 1,5 times the working pressure by means of a test pump. This pressure shall be maintained for a minimum of 60 minutes.

c) Any leaks apparent during the test shall be made good and the test repeated until no further leaks exist.

d) Items not capable of withstanding this test pressure shall be isolated from the pipe system.

4.31.0 INSTALLATION OF PIPEWORK AND DUCTWORK

4.31.1 Pipework and ductwork shall be installed in accordance with the service drawings issued with the Supplementary Specification.

4.31.2 The tender drawings are schematic and do not purport to show exact positions of pipes or ducts or specific details of construction of the latter. All final dimensions must be checked on site before preparation of manufacturing drawings and the fabrication of ducting and piping.

4.31.3 Where beams, stanchions or other obstructions interfere with the straight running of pipes or ducts, suitable offsets shall be provided or alternatively changes in the section of the particular duct made, all in accordance with good engineering practice.

4.31.4 Sufficient offsets or alternatively expansion bellows shall be allowed in piping installations to allow for expansion and contraction.

4.31.5 It is required that tenderers make themselves conversant with all the drawings of the particular building in order to determine the number of such offsets or changes in section and the positions in which they will be required.

Due allowance shall be made in the tender price for such offsets and changes required.

A complete set of drawings of the building may be inspected at the office of the Regional Representative of the Department.

4.32.0 PUMPS

4.32.1 Pumps shall be of the centrifugal type with non-overloading characteristics and volute casings.

Pumps shall be selected for the maximum possible efficiency at the required duty point.

4.32.2 Pumps requiring an input power of less than 4,0 kW may be end suction pumps, close coupled to flange mounted motors.

4.32.3 Pumps requiring an input power of more than 4,0 kW may be end suction or horizontally split casing pumps mounted on a common baseplate with the drive motor with their shafts coupled with an approved flexible coupling.

4.32.4 Unless otherwise specified in the Supplementary Specification pump speed shall not exceed1 500 r/min.

No pump shall be operated at a speed exceeding the maximum recommended by the manufacturer.

4.32.5 Pumps shall be selected to handle the specified water flow quantities at the required total system resistance.

Pump pressure and flow characteristics shall be selected to match the total system requirements under all control conditions.

4.32.6 The Contractor shall ensure that the minimum Nett Positive Suction Head as required by the pump manufacturer is maintained throughout the required operating pressure and flow range at the pumped fluid temperature.

4.32.7 Renewable casing wearing rings shall be fitted on all pumps with discharge diameters of 80mm and larger and with delivery pressures in excess of 175 kPa. Wearing rings shall be manufactured of bronze, chromium steel, nickel steel or an alloy suitable for the particular application.

4.32.8 Impellers shall be manufactured of bronze and shall be statically and dynamically balanced. Impellers of pumps having 40mm diameter and larger discharge connections, shall be fully enclosed and hydraulically balanced.

4.32.9 Pumps shall be provided with mechanical seals matching the duty, fluid and temperature requirements.

4.32.10 Pump casing design pressure shall match the total system working pressure or be 1,5 times the discharge pressure, whichever is the greater.

Pump casings shall be of close-grained cast iron.

4.32.11 Suction and discharge connections shall be flanged with machined flanges corresponding to the pressure rating of the casing.

4.32.12 Bearings shall be grease lubricated ball and roller bearings selected for long duty life and to accommodate radial and axial loads.

Grease gun lubrication shall be provided. The grease gun nipples shall be of an approved type and shall comply with BS 1486 and be of the hexagonal "hookon" type 11 or 21.

4.32.13 A galvanised sheet metal drip tray with drain connection shall be provided underneath each pump. Drain connections shall be piped to the nearest drain or gully.

In coastal applications the driptray shall be of stainless steel.

4.32.14 Pump shafts shall be of EN57 stainless steel with stainless steel mechanical seal holders.

4.32.15 Pumps with stuffing box type shaft seals will only be considered if:

a) The shaft is fitted with a replaceable stainless steel wearing sleeve,

b) A lantern ring is fitted,

c) A minimum of 4 standard packing rings can be fitted, and

d) Bronze thrust bushes are provided.

4.32.16 Drive motors shall be selected with at least 15% more power than the maximum pump requirements.

4.32.17 Pumps for water temperatures in excess of 90ºC shall be provided with water-cooled bearings and seals.

4.32.18 All pump casings shall be provided with plugged drain and vent trappings.

In addition pumps of 4,0 kW or larger input power shall be provided with plugged tappings for suction and delivery pressure gauges and a filling point.

Tappings or internal drilling shall be provided for gland and bearing cooling water where necessary.

4.32.19 Pumps of design different from that specified above offered as integral parts of factory made equipment, will also be considered.

4.33.0 HUMIDIFIERS

4.33.1 Humidifiers shall be of the electrical electrode steam generating self-contained type with electronic controls.

Pan type or water spray type humidifiers will not be acceptable unless specifically called for in the Supplementary Specification.

4.33.2 Humidifiers shall be suitable for the water of the particular application with controls fully adjustable to match local requirements.

4.33.3 Generator bottles shall be fully replaceable on electrode wear.
Units with openable, cleanable generator bottles and replaceable electrodes are preferred.

4.33.4 Steam injection shall not be in the air handler or upstream of the fan, filters, coils, etc., but downstream thereof.
Steam distribution shall be over the full width of the duct with stainless steel distribution pipework. The pipework shall be so arranged that condensate is returned to the humidifier and does not end up in the duct.

4.33.5 The humidifier shall be selected for discharging the steam directly into the supply air duct against the operating static pressure. Steam shall be discharged as uniformly as possible into the air stream and the installation of the distribution manifold shall comply with the following:-

a) The manifold shall be installed across the widest dimension of the duct in the centre.

b) The manifold length shall not be less than 85% of the widest duct dimension.

c) Two or more distribution manifolds shall be installed where the duct dimension exceeds 800mm.

d) Where the distribution manifold may restrict the airflow in small ducts, the duct shall be enlarged at the point where the manifold must be installed.

e) A distance of at least 3m shall be provided between the distribution manifold and any downstream temperature controller.

f) A distance of at least 2m shall be provided between the distribution manifold and the first air outlet in the duct system.

g) The distribution manifold shall not be installed vertically downward from the humidifier.

4.33.6 A high limit duct humidity controller shall be provided to limit the output capacity or stop the humidifier when the humidity in the duct exceeds 90%. The humidity-sensing element shall be not less than 3m downstream of the distribution manifold.

4.33.7 The maximum output capacity of the humidifier shall be manually adjustable and limited to correspond with the specified maximum demand of the system.

4.33.8 Humidifiers shall be inter-locked with the relevant supply air fans to shut water and electrical supplies off when the particular fan is not running.

4.33.9 Humidifiers shall be connected to the available water supply point. A suitable stop valve shall be provided in the supply water connection. Wastewater from the humidifiers shall be discharged into an open tundish and connected with a 32mm nominal pipe to the nearest drain. Supply and drain piping shall be of galvanised steel.

4.33.10 Humidifiers shall be equipped with fail safe safety controls for low water level or interrupted water supplies.

4.33.11 The humidifier shall be electronically controlled with a minimum of three steps, proportional control is however preferred.

The humidifier shall be complete with its own integral controls in a lockable panel.

The electrodes must have built-in overcurrent protection and the unit must have an adjustable automatic control for draining and filling.

4.33.12 Humidifying control shall be through the use of a controlled water level.

4.33.13 A high-level safety switch shall be provided to prevent overflow.

4.33.14 Each humidifier shall be provided with an ammeter or demand indicator, indicating LED lights for water level and drain cycle and an alarm for the cylinder to be changed.

4.33.15 Access to all components for servicing shall be arranged by panel casing design and construction.

4.34.0 WATER TREATMENT

4.34.1 General

4.34.1.1 Water treatment shall be provided for all cooling towers, open and closed circuit type as well as evaporative condensers.

4.34.1.2 Water treatment and water quality control shall be provided to match the specific application and local site and water conditions.

4.34.1.3 Water treatment for evaporative cooling units shall be provided only where specifically called for in the Supplementary Specification.

4.34.2 Water Softener

4.34.2.1 Water softeners shall be installed in the make-up lines to evaporative condensers and cooling towers.

4.34.2.2 Where capacities are not specifically specified the softener shall have sufficient capacity to ensure that the make-up demand is met under all operating conditions and that the softener will be capable of operating for at least 48 hours without regeneration.

4.34.2.3 The softener shall function automatically and must be of the base exchange type, manufactured from corrosion resistant materials.

4.34.2.4 The softener and dosing plant (where specified) shall be of the same manufacture and provided by the same supplier.

4.34.2.5 The resin bed exchange rate must not be higher than 45kg/m^3 during regeneration and the softened water shall not contain more than 10mg/ litre of total dissolved solids as $CaCO_3$.

4.34.2.6 The softener shall be complete with a Kent or equal flow recording meter, control wiring, brine tank etc. and a bypass valve arrangement.

4.34.2.7 Each water softener shall be equipped with a time control mechanism to automatically control the time lapse between regeneration cycles for any period between 24 hours and 7 days. Alternatively the regeneration cycle may be controlled volumetrically by means of a meter in the soft water outlet pipeline.

4.34.2.8 Each softener shall be equipped with an automatic diaphragm valve, salt solution tank, salt storage compartment, salt solution ball valve and the necessary connections for draw-off and refilling of salt solutions.

4.34.2.9 The brine tank shall hold at least one week's brine for summer conditions, and shall be manufactured from PVC, Polypropylene or similar material.

4.34.2.10 Drainage pipework must be piped to the nearest drainpipe.

4.34.2.11 The softener shall be installed to match the existing site water pressure. If the water pressure is too high a pressure-reducing valve similar and equal to Glenfield & Kennedy or approved shall be installed. If the water pressure is too low a booster pump of sufficient capacity shall be installed.

4.34.3 Water Dosing Plant

4.34.3.1 Unless otherwise specified cooling tower/condenser water circuits shall be provided with automatic dosing plant including bleed control.

4.34.3.2 Where capacities are not specified the dosing plant shall have sufficient capacity for the application and local water quality.

4.34.3.3 Each evaporative condenser or cooling tower circuit must be provided with it's own independent dosing plant and bleed control.

The dosing system must be complete with all necessary chemicals, controls, valves and appliances.

4.34.3.4 The system shall comprise an automatic bleed-off valve controlled by an electronic measuring cell from the water conductivity and automatic measuring type dosing pump/s. The electronic measuring cell must continually measure the water conductivity and control the bleed-off valve and dosing pump/s accordingly.

4.34.3.5 The pre-set values of the water conductivity (TDS) must be adjustable. The TDS shall be controlled in the range of 600-800mg/ litre.

4.34.3.6 The water treatment shall ensure that:

a) Scale forming and corrosion are prevented,

b) Algae and microbiological growth is controlled,

c) Sediment is controlled with low water consumption.

4.34.3.7 Chemicals provided shall be well known products, and approved dilution tanks as reservoirs for the metering pumps must be provided.

4.34.3.8 Sufficient chemicals and salt must be provided at first hand over for three months use.

4.34.3.9 When the plant is in effective operation, water samples shall be drawn after the softener and from the condenser sump. The samples must be analysed by a recognised laboratory suitably equipped and the report submitted to the Regional Office.

4.34.3.10 Service calls with water analysis and recognised corrosion tests must be carried out every three months during the maintenance period and reports sent to the Regional Office.

4.34.3.11 The chemicals used shall be stable over at least a 12-month period and shall not break down and cause clogging of the dosing apparatus.

4.34.3.12 Isolating valves shall be provided to allow all components of the water treatment plant to be removed for maintenance without affecting the operating of the cooling plant.

4.34.3.13 The water treatment plant shall be electrically interconnected with the recirculating water pump so that it cannot operate unless the pump is running.

4.35.0 FIRE DAMPERS

4.35.1 Combination fire/smoke control dampers complying with SABS 193 and NFPA 90A are required in the positions indicated on the main drawings.

4.35.2 The dampers shall be UL (underwriters Laboratories) or SABS certified with proven low leakage in the closed position.

4.35.3 Dampers shall be actuated by fusible link, electrical solenoid or pneumatic means as specified in the Supplementary Specification.

4.35.4 Fire dampers shall be flanged both sides and access panels shall be provided in the ducting at each fire damper on the upstream side.

4.35.5 Each fire damper shall be clearly marked as per clause 4 of SABS 193.

4.35.6 Fire dampers shall have at least a 2-hour resistance rating when tested in accordance with SABS 193.

4.35.7 Insulating fire dampers shall be fitted where indicated on the drawings.

4.35.8 The open or closed status of the damper shall be clearly indicated outside the casing for inspection purposes.

4.35.9 Dampers shall be sized so that the nominal free air area when in the open position is not less than the connected duct free air area.

4.35.10 Dampers shall be installed so as to form part of a continuous barrier to passage of fire when in a closed position. Where a fire damper cannot be fitted immediately adjacent to the firewall, the section of ducting between damper and wall shall be of at least the same metal thickness and fire rating as the damper casing.

4.35.11 Dampers shall be self-supporting in case of duct destruction due to heat. Care shall be exercised that the frame be set so that the closing device will be accessible.

4.35.12 Suitable hand openings with tightly fitted covers shall be provided to make dampers accessible for inspection and maintenance.

4.36.0 DUCTWORK

4.36.1 Sheetmetal Ductwork

4.36.1.1 Sheetmetal ductwork shall be manufactured in accordance with SABS 1238 : 1979 as amended and installed, balanced and tested as set out in SABS 0173 : 1980, as amended.

4.36.1.2 Ductwork layouts, dimensions etc. shall be as indicated on the drawings issued with the Supplementary Specification.

4.36.1.3 Where changes in duct sizes indicated are necessitated on site, duct sizes shall be determined using equivalent diameters (hydraulic diameter) and not cross-sectional area.

4.36.1.4 Aspect ratios in excess of 4:1 shall be avoided in rectangular ductwork. Internal duct dimensions of less than 200mm in rectangular ducting will not be acceptable in low and medium velocity ductwork.

4.36.1.5 Adjustable opposed blade dampers, duct splitters and turning vanes shall be provided where shown on the drawings.

4.36.1.6 Unless otherwise specified ductwork shall be manufactured of galvanised sheet steel.

4.36.1.7 Ductwork shall be painted as specified.

4.36.1.8 Flexible joints shall be provided between all fans, airhandlers, vibration inducing equipment, etc. and ducting.

Flexible joints exposed to weather shall be provided with protecting galvanised sheet steel cover strips.

Flexible connections shall be made of fireproof fabric reinforced airtight material attached both sides with approved galvanised steel collars or frames.

4.36.1.9 Ductwork connected to equipment such as cooling towers, evaporative condensers. plenum chambers etc. shall be provided with flanged removable sections to allow for removal and access to eliminators etc.

4.36.2 Flexible Ductwork

4.36.2.1 Where indicated on the main drawings ductwork shall be connected to mixing boxes and integrally mounted ceiling diffusers by means of flexible ducting.

4.36.2.2 Flexible ducting shall consist of aluminium foil faced glass fibre fabric mechanically interlocked by a corrosion resistant metal spiral helix on the outside of the fabric.

4.36.2.3 Flexible ducting shall comply with local fire codes, NFPA Bulletin 90A and SABS 0400 fire resistance requirements.

4.36.2.4 Flexible ducts connected to diffusers or mixing boxes shall, unless otherwise shown or approved, not exceed 1,5m in length nor have more than the equivalent of two 90-degree bends. Bends shall be of the maximum possible radius without flattening or distorting the flexible ducting.

4.36.2.5 Flexible ducting shall be supported with sufficient and correct brackets that will ensure maintenance of shape.

4.36.2.6 Flexible ducting shall be externally insulated where insulation of ductwork is called for in the Supplementary Specification.

4.36.3 PVC Ductwork

4.36.3.1 PVC ductwork where called for in the Supplementary Specification shall be of unplastisised polyvinyl chloride (uPVC) manufactured and installed in accordance with specification DW151 "Specification for Plastics Ductwork" of the "Heating and Ventilating Contractor's Association" and/or SMACNA - "Thermoplastic Duct Construction Manual".

4.36.3.2 The class of ducting used shall be as specified.

4.36.3.3 Proper provision shall be made for expansion and contraction of the ductwork.

4.36.3.4 Flexible connections shall be made of plasticised polyvinyl chloride (PVC).

4.36.3.5 Duct joints shall be welded flanges or male/female socket type welded all-round.

All welded joints and seams shall be tested by high frequency spark test at 40kV.

4.36.4 Testing

4.36.4.1 Unless otherwise specified the total ductwork installation shall be tested for leakage as per SABS 0173.

4.36.4.2 Leakage rates in excess of 5% of the required air flow quantity in any section of ductwork or in excess of the SABS permissible leakage, whichever is the smaller, will not be accepted.

4.37.0 AIR OUTLETS AND DAMPERS

4.37.1 Grilles

4.37.1.1 Supply and return air grilles shall be provided as indicated on the drawings.

Each grille shall be selected in accordance with the manufacturer's recommendations to be capable of passing the specified air quantity without creating excessive resistance, noise or local draughts.

4.37.1.2 Grilles shall be manufactured of stamped, extruded or rolled aluminium or steel sections, finished as specified and mounted in a neat frame.

4.37.1.2 Supply air grilles shall be provided with double deflection aerofoil vanes adjustable from the front of the grille.

Vanes shall be spaced at not more than 20mm centres.

4.37.1.4 Exhaust and return air grilles in the same installation shall be similar in general appearance and construction to the supply air grilles but with a single set of fixed vanes.

4.37.1.5 Supply air grilles shall be provided with opposed blade volume control dampers adjustable from the front of the grille.

Return air grilles shall be provided with opposed blade dampers for volume control only where called for on the drawings. Dampers shall be adjustable from the front of the grille.

4.37.1.6 Grilles shall in all cases be selected with free air passage areas not less than that indicated on the drawings.

4.37.2 Weather Louvres

4.37.2.1 Weather louvres shall be manufactured of extruded aluminium sections or ferrous metal hot dip galvanised after manufacture, as specified.

4.37.2.2 Weather louvres shall be constructed with drip edges to blades and rigid frame to enable building in.

4.37.2.3 Weather louvres shall be finished in natural anodised aluminium, powder coated or painted is specified.

4.37.2.4 Weather louvres shall be watertight even with nominal air velocity up to 3,0m/s.

4.37.2.5 Weather louvres shall be fitted with 12mm opening size galvanised expanded metal or wire mesh screen.

4.37.2.6 Top and bottom blades shall be fitted flush with the frame and smooth without grooves, channels or recess where dirt or water can collect.

4.37.3 Diffusers

4.37.3.1 Diffusers shall be square, round or rectangular with faceplates matching the ceiling grid as specified, manufactured from pressed or spun steel or aluminium sheet metal.

4.37.3.2 Each diffuser shall be selected in accordance with the manufacturer's recommendations to be capable of passing the specified air quantity without creating excessive resistance, noise or local draughts.

4.37.3.3 Each diffuser shall be provided with an opposed blade volume control damper. Dampers shall be selected and installed so as not to disturb the supply air distribution pattern or induction ratio of the diffuser.

4.37.3.4 Diffuser cores shall be removable for cleaning and access purposes.

4.37.4 Variable Volume Outlets

4.37.4.1 Variable volume outlets with controls and reheaters shall be provided where indicated on the drawings.

4.37.4.2 Only well-catalogued and proven products will be considered.

4.37.4.3 Minimum air volume shall be factory set and site checked for each outlet.

4.37.4.4 Outlets shall be selected and installed to ensure that no dumping or coning of supply air streams occur, particularly at low air flow rates.

4.37.4.5 Variable volume control shall be achieved with pneumatic or electric drives as specified. Low noise levels during operation is essential.

4.37.4.6 Reheaters shall be protected against overheat and shall be switched with an adequately rated and reliable microswitch.

4.37.4.7 Easy access to all parts possibly requiring servicing or setting shall be provided.

4.37.5 Dampers

4.37.5.1 Dampers for positive volume control purposes shall be manual, pneumatic or electric actuator driven as specified and provided where indicated on the drawings.

4.37.5.2 Damper blades, links and damper frames shall be of rigid construction galvanised steel generally as per SABS 1238, and of the opposed blade type.

4.37.5.3 Manually adjusted dampers shall be provided with adjusting levers in accessible positions with provision for positive locking in any position from fully open to fully closed.

4.37.5.4 Dampers shall be of the link or gear type as specified.

4.37.5.5 Dampers creating unacceptable vibrations and noise levels will be rejected and will need to be replaced at the Contractor's expense.

4.38.0 INSULATION

4.38.1 General

4.38.1.1 Insulation shall in all instances be applied by specialist contractors and be of the highest standard. Any section not installed to the approval of the Department shall be re-done at the Contractor's expense.

4.38.1.2 Prior to insulation being fitted, all pressure testing shall be completed satisfactorily.

4.38.1.3 Insulation, cladding and vapour barriers shall be painted as specified.

4.38.1.4 All items of plant likely to operate at temperatures below the surrounding ambient dew point shall be insulated and provided with a vapour barrier.

4.38.2 Ductwork

4.38.2.1 All air ducts carrying heated or cooled air, except where specifically excluded in the Supplementary Specification shall be thermally insulated.

4.38.2.2 Ductwork shall be internally or externally insulated as specified. If no mention is made in the Supplementary Specification, internal insulation shall be offered unless circular ducts are indicated on the drawings. These shall be externally insulated in all instances.

4.38.2.3 Ducts for ventilating plants supplying heating only shall be insulated except within the heated space.

4.38.2.4 Internal duct insulation shall consist of not less than 25mm thick neoprene or flexible fabric faced fibreglass which shall be secured to the duct by means of suitable adhesive in addition to metal fasteners similar or equal to Gripnail or Duradyne Weldpins, generally in accordance with SABS 1238 - 1979. Flexible fabric face insulation shall be similar or equal to Eurosonic.

4.38.2.5 External insulation shall generally be in accordance with SABS 0173 - 1980.

4.38.2.6 Fibreglass density shall be a minimum of 24kg/m^3 for internal insulation and external insulation in unexposed areas. For external insulation in exposed areas such as plantrooms, service trenches and service ducts, the minimum density shall be 48kg/m^3.

Thermal conductivity in both instances shall not exceed 0,037 W/mºK.

4.38.2.7 In unexposed areas such as roof spaces, etc., external insulation shall be protected with a neoprene or aluminium foil cover. These shall be strapped at intervals not exceeding 500mm with nylon straps and buckle clips or similar approved method.

4.38.2.8 All air conditioning ductwork externally insulated shall be provided with a continuous vapour barrier, sealed with adhesive aluminium tape or equal.
The vapour barrier shall comply with the flammability requirements for sealing membranes as per SABS 1238 - 1979.

4.38.2.9 Particular care shall be taken with insulation at ductwork joints to ensure maximum possible insulation of duct surfaces, special reference shall be made to clauses 4.8.3 to 4.8.7 of SABS 1238.

4.38.2.10 External insulation in exposed areas shall comprise 40mm thick fibreglass to cover all flanges, joints, etc. It shall be externally clad with a galvanised sheetmetal skin over a vapour barrier and painted to specification.

Horizontal surfaces and joints in the sheet metal cladding shall be such that they shed water.

Alternatively, the outer metal skin may be substituted with 25mm mesh wire netting, stapled to the insulation and then covered with a 10mm layer of hard setting plaster trowelled to a smooth even finish. The plaster shall be coated with one coat liquid polymer such as "Foster Sealer" or "Decadex", followed by a reinforced fibreglass scrim, fixed with a suitable adhesive, and a second coat of liquid polymer. The duct shall then be painted as specified.

The method employed shall be as set out in the Supplementary Specification.

4.38.2.11 Flexible ducting shall be proprietary made complete with insulation at least 40mm thick fibreglass equivalent and an acceptable fire retardant outer layer.

Where flexible-ducting joins on to sheet metal ducting the joints shall be sealed with foil backed adhesive tape.

4.38.3 Insulation of Hot Water Piping and Fittings

4.38.3.1 All hot water piping shall be insulated with pre-formed insulation matching pipe size and specified thickness, painted and colour coded as specified.

4.38.3.2 The insulating materials shall comprise pre-formed glass fibre rigid or mineral wool sections of long fine fibres, bonded with a temperature resistant binder. The thermal conductivity shall not exceed 0,038 W/mºK, and the density shall not be less than 80kg/m^3. The sections shall be rot-proof, odourless, non-hygroscopic and non-combustible.

Minimum thickness shall be in accordance with the table below:

Pipe diameter (mm)	15-25	32-50	65-80	100 and larger
Glass fibre insulation thickness (mm)	20	25	40	50

4.38.3.3 Insulation shall be held in position by aluminium, galvanised steel, stainless steel or nylon straps. These straps are to be located at butt joints between lengths of insulation and at 300mm centres over the length of the insulation.

4.38.3.4 Insulation to bends on unexposed pipework (e.g. in roofspaces etc.) may be formed from mitred and trimmed sections, cut to ensure that a good contact with the surface to be insulated is made, alternatively moulded trowelled insulation may be applied.

4.38.3.5 To ensure maximum continuity of insulation, adjoining sections shall be firmly butted together and sealed with a self-adhesive tape at least 50mm wide. At valves, fittings and pipeline equipment the insulation shall be taped together in a similar fashion. Open ends of rigid sections shall be sealed off with a suitable mastic.

4.38.3.6 All piping, hot water valves and fittings shall be clean, dry and free of grease, loose rust and scale before any insulation is applied.

Where specified piping shall be painted prior to application of insulation.

4.38.3.7 Where hangers and/or supports occur along the run of the insulated pipes, a segmental section of hardwood approximately 70mm long shall be inserted, the outer diameter being identical to that of the insulated pipe and the ends thereof butted to the insulation. The insulation finish shall be continued over the hardwood insert and the finish shall be protected by means of sheet metal hoops under the bracket, against movement of the pipe and/or hanger.

Alternatively for pipes of diameter 80mm or less the pipes may be supported over the insulation with approved non-crushing hoop type hangers. Supports compressing the insulation will not be accepted.

4.38.3.8 All pipes exposed to the weather or where the insulation is likely to be damaged or where visible inside buildings and plantrooms, are to be provided with a covering of galvanised sheetmetal over the insulation, adequately secured. Sheetmetal thickness shall be not less than 0,5mm for pipe sizes up to 100mm diameter and not less than 0,8mm for larger pipe sizes.

The sheetmetal covering shall be held in position with 10mm wide stainless steel metal bands spaced to ensure a neat and firm finish at intervals not exceeding 500mm. Longitudinal overlap joints shall be arranged to be in one line at 10 o'clock or 2 o'clock and to be water shedding.

4.38.3.9 Flanged joints shall be separately covered by pre-formed insulation flange boxes (muff covers) held in position by removable metal bands and finished similarly to the lagging on piping.

The flange boxes shall be capable of removal without damage to any other portion of the insulation.

4.38.3.10 Hot water pipes exposed to the weather shall be insulated and clad in such a manner that no moisture or rainwater may penetrate the insulation.

Support brackets, hangers, etc. shall be external to the insulation and cladding and no cut-outs will be permitted.

4.38.3.11 All bends on indoor pipework are to be insulated with moulded plastic lagging (see below) of same or better insulation property than the sectional insulation, trowelled to a smooth finish to the same diameter as the sectional insulation and then neatly bound with an approved tape and painted, or alternatively insulated with mitred sections.

4.38.3.11 Lobster back weatherproof galvanised sheet steel bends with segmented glass fibre lagging must be used where pipework is exposed to the weather.

Alternatively, bends may be insulated with plastered hard setting moulded plastic asbestos lagging strengthened with galvanised wire netting and trowelled to a smooth finish of the same diameter as the sheet metal covering. The insulation shall be finished with 4 coats silicated soda and then neatly bound with an approved tape and painted as specified.

4.38.3.13 Pipes to be chased into brickwork shall be wrapped with suitable mineral fibre or glass fibre tape approximately 6mm thick.

4.38.3.14 Pipe insulation not covered with sheetmetal cladding shall be covered with canvas having at least a 50mm overlap at joints. Overlaps shall be sealed down with a suitable adhesive.

4.38.3.15 Hot water valves and fittings shall be insulated similarly.

4.38.3.16 Unless otherwise specified in the Supplementary Specification expanded high density polyethylene material may only be used where the pipework is entirely under cover and protected, e.g. roof spaces, etc. and only on pipes up to 50mm diameter. It shall not be used in plantrooms or where at risk of physical damage.

The material shall be of expanded cross-linked polyethylene, with SABS certified self- extinguishing properties similar and equal to "Thermaflex" type QE40.

The thermal conductivity of the material shall not exceed 0,038 W/mºK. Nominal insulation thickness shall be 20mm.

Straight sections shall be applied in 2 metre lengths where possible and closed by means of the zipper. Tees and elbows shall be insulated employing pre-formed sections. Alternatively mitred cut sections shall be employed, taped together with HDPE tape to ensure a sealed fit. Joints in straight lengths or between fittings and straight lengths shall be taped for a minimum of 40mm on either side of the joint, employing HDPE tape.

4.38.4 Insulation of Chilled Water Piping and Fittings

4.38.4.1 Chilled water and refrigerant suction piping shall generally be insulated as set out above with the specified material, material thickness and vapour barrier, painted and colour coded as specified.

4.38.4.2 All chilled water and refrigerant suction piping shall be insulated in a workmanlike manner to modern practice.

4.38.4.3 Insulation shall be sectional resin bonded glass fibre with density not less than 95kg/m^3. The insulation thickness shall be not less than 25mm for pipe sizes up to 40mm diameter and not less than 40mm thick for larger diameter pipes and shall be provided with a factory applied canvas finish.

4.38.4.4 All circumferential joints to the insulation shall receive one application of "Foster Foamseal 30-45" or equivalent to the full thickness of the insulation during erection to prevent lateral penetration of moisture along the pipe when in service.

At all points where the vapour barrier is broken due to cutouts, the insulation shall be sealed as above, during erection.

4.38.4.5 Bends shall be insulated with 12mm or 27mm thick asbestos plastic insulation compound, covered by a 13mm thick layer of asbestos hard setting compound, trowelled to a neat smooth and symmetrical finish. Two coats of Decadex or equal shall be applied as vapour barrier prior to painting as specified.

4.38.4.6 Concealed and exposed chilled water piping and refrigerant suction lines, valves and fittings, shall be covered over the insulation with an aluminium foil/kraft paper vapour barrier with 50mm overlap at joints, sealed with a suitable adhesive, with no further cladding.

4.38.4.7 Concealed piping and fittings shall be vapour sealed over the insulation without any further cladding, but colour coded as specified.

4.38.4.8 Exposed chilled water piping and refrigerant suction lines, in plantrooms, and in areas where pipes are likely to be damaged or where exposed to the weather, shall be covered over the vapour barrier specified above with a 10mm thick layer of W.R. 700 Armour plaster or equal, trowelled to a smooth and even finish. When dry the plastered surface shall be painted as specified. Valves and fittings shall be plastered or wrapped in non-sweating "Denso" or equal tape where plaster is not possible and where diameters are 32mm or less.

As an alternative to the plaster finish 0,9mm galvanised sheet metal or 1mm thick aluminium sheeting as a cladding may be provided over the vapour barrier specified. Valves and fittings shall be plastered as specified above. Galvanised sheet metal shall be painted as specified. No painting is required on aluminium coverings, except colour coding as specified.

4.38.4.9 As an alternative vapour barrier to the aluminium foil/kraft paper vapour barrier specified above the plaster cover to the insulation shall be painted when dry with Decadex LPL sealer or equal followed by two high build brush coats of Decadex Firecheck Copolymer liquid plastic or equal. The surface shall be reinforced by embedding a layer of open weave fibre-glass membrane in the Firecheck.

4.38.4.10 Refrigerant suction lines may alternatively be insulated by means of "Thermaflex"Type 40 QE cross-linked polyethylene foam tube insulation, neoprene rubber foam with quick zip fastener, or equal. The insulation material shall meet the following minimum requirements:

Temperature range	:	-80ºC to +120mºC
Thermal conductivity	:	0,038 W/mºK at 0ºC
Thickness	:	10mm
Density	:	35kg/m^3
Odour properties	:	Neutral
Cellular structure	:	Totally closed
Fire properties	:	Self-extinguishing to SABS

The insulation shall be applied to form a continuous and homogeneous vapour barrier over bends, supports, etc.

Where these pipes are run in areas exposed to sunlight, they shall be installed inside suitable galvanised mild steel trunking or other approved method of covering.

4.38.4.11 When completed the installation shall ensure a complete vapour barrier and any signs of sweating or dripping shall cause the installation to be rejected.

4.38.5 Steam Piping

4.38.5.1 Steam piping shall generally be insulated as specified for hot water systems.

4.38.5.2 Pre-formed fibreglass or mineral wool sections of density not less than 96kg shall be used.

4.38.5.3 Thickness shall be as set out below:

Pipe diameter (mm)	15	20	25	32	40	50	65	80 and larger
Insulation thickness (mm)	25	25	25	40	40	40	40	50

4.38.5.4 Surface temperatures shall not exceed 40ºC when in use. Unless otherwise specified in the Supplementary Specification, condensate pipes shall not be insulated.

4.38.6 Shell and Tube Water Coolers

4.38.6.1 These shall be insulated with 25mm thickness fibreglass slabs fastened to the cooler by means of mechanical fasteners. Covering shall be as for exposed chilled water piping with a homogeneous vapour barrier.

4.38.6.2 Cutouts and penetrations shall be sealed with a vapour barrier.

4.38.6.3 Factory insulated equipment shall be acceptable provided this is to the approval of the Department.

4.39.0 AUTOMATIC CONTROL SYSTEMS

4.39.1 General

4.39.1.1 Unless otherwise specified in the Supplementary Specification controls shall be electric or electronic or a combination thereof.

Controls shall be analogue or direct digital as specified in the Supplementary Specification.

4.39.1.2 The performance of sensors, controllers and outputs shall be such that stability is ensured under all operating conditions.

4.39.1.3 Provision shall be made on controllers to enable adjusting control loop stability such as adjustable proportional bands, adjustable reset rates etc.

4.39.1.4 Closed loop control systems are required generally with one or more of the following control actions;

a) Two-position action, maximum/minimum or on/off.

The differential shall be adjustable.

a) Floating action with the controller moving the controlled device to it's open or closed position with a neutral zone between the two positions allowing the controlled device to stop at any position whenever the controlled variable is within the differential of the controller.

Whenever the controlled variable gets outside the differential of the controller, the controller shall move the controlled device in the proper direction.

b) Proportional action where the controlled device is positioned proportionally in response to slight changes in the controlled variable.

The throttling range shall be adjustable to suit the application. Controllers with excessive droop or steady-state error will be rejected.

d) Proportional plus integral control and proportional-integral-derivative controls shall be provided on sensitive installations and where specified in the Supplementary Specification.

4.39.2 Controllers

4.39.2.1 Controllers shall be designed for minimum time lag around the control loop.

4.39.2.2 Adjustments shall be made to the various control modes of each controller to obtain maximum regulation quality. Systematic trial methods or adjustment shall be avoided as far as possible. Recommendations of the controller manufacturer shall be carefully followed or alternatively adjustments shall be made based on the ultimate sensitivity calculated method.

4.39.2.3 Non-adjustable controllers or controllers with inadequate adjustment facility will not be accepted.

4.39.2.4 Provision shall be made to prevent noise signal disturbances in the control loop. Where noise cannot be eliminated completely by means of filtering or averaging noise out of the signal or by shielding control wires against stray voltages, etc., proportional plus reset controllers shall be used.

4.39.2.5 Controllers and all control items shall be housed in a separate cubicle in the electrical control panel/switchboard.

4.39.2.6 Controllers shall be of the indicating type with the value of the controlled variable clearly indicated on a suitable scale.

4.39.2.7 Direct digital controllers shall make use of a microprocessor or computer to implement control algorithms on one or more multiple control loops as required.

Pre-programmed control routines shall be stored in permanent programmable read only memory unless otherwise specified.

User programmable controllers shall only be provided where specified in the Supplementary Specification.

4.39.2.8 Where intelligent programmable controllers are specified it shall comply with the following as a minimum;

- ? flexible direct digital control
- ? touch screen with pre-programmed control applications ensuring ease of commissioning and operation
- ? simple interrogation and setting of control parameters through the touch screen with graphical LCD display
- ? real-time feature enabling continued operation even after a power failure
- ? graphics software package with easily programmed special applications
- ? proportional plus integral plus derivative control actions that can be individually set to match application
- ? full monitoring and logged data capacity combined with graphical display of stored data
- ? providing full alarm monitoring
- ? interfacing with building management system must be possible with standard interface facility for remote computer configuration

4.39.3 Control of Single Centrifugal Water Chillers

4.39.3.1 Unitary equipment such as centrifugal chillers shall be provided with it's own built-in control and safety systems, generally as supplied standard by the manufacturer.

4.39.3.2 Interlocks and interfacing with the system shall be provided as specified in the Supplementary Specification.

4.39.3.3 The following interlocks and safety controls shall however be provided as a minimum;

- ? anti-freeze protection to evaporator
- ? the compressor shall not run unless the chilled water pump, condenser water pump and cooling tower fans are running (water cooled)
- ? the capacity regulating vanes shall remain closed until the motor is connected across the full line voltage
- ? the capacity regulating vanes shall close, or at least in the limit, remain constant when the motor load exceeds full load. The motor overload control shall override the chilled water temperature control.

4.39.3.4 For off-season operation a manual demand-limit-control shall be fitted. This demand-limit-control shall override the automatic capacity control to limit current drawn by the chiller during off-season operation. This control shall be able to limit the motor current to a maximum of 50% of full load current.

4.39.3.5 Leaving chilled water temperature shall be controlled to within ± 1ºC of the specified temperature by suction vane positioning in the compressor intake.

4.39.3.6 On starting of the chilled water pump, local manually or remote automatically all chiller controls shall be energised and function automatically.

4.39.3.7 When cooling of the chilled water is required, the condenser water pump, cooling tower fans (or condenser fans if air-cooled) and compressor shall start automatically and in sequence.

4.39.3.8 All centrifugal chillers shall be provided with microprocessor unit control modules with serial interface for remote monitoring and/or control by a building management system.

Demand limiting control shall be possible from the remote building management system.

The microprocessor unit control modules shall generally provide the following as a minimum;

- liquid crystal display with LED back lighting
- entry section to enter setpoint changes, cancel inputs, set day and time
- print section with standard printer port to permit hard copy printouts, with separate printer, of operating data for unit and history of fault shutdowns. (Printer by others)
- program section to program functions such as cut-outs, unloading, anti-recycle timer, etc.

The following displays are required;

- - water temperature in/out
- - cut out settings;
  water temperature
  ambient temperature
  suction temperature
- pressures for each system;
  suction
  delivery
- anti-recycle timer setting for each compressor
- day, date and time
- daily stop/start times
- automatic or manual lead/lag control (where applicable)
- fault shut downs
- number of unloading step
- percent full load motor current

4.39.4 Control of Reciprocating Water Chillers

4.39.4.1 On starting of the chilled water pump, local manually or remote automatically all chiller controls shall be energised and function automatically.

4.39.4.2 Leaving chilled water temperature shall be controlled to within ± 1ºC of the specified temperature by unloading of cylinders and/or switching compressors on or off as necessary.

4.39.4.3 Compressors shall be automatically stopped/started and loaded or unloaded in steps and in sequence in accordance with the return chilled water temperature.

4.39.4.4 Interlocks and interfacing with the system shall be provided as specified in the Supplementary Specification.

4.39.4.5 The following interlocks and safety controls shall however be provided as a minimum;

- the compressor shall not run unless the chilled water pump, condenser water pump and cooling tower fans are running (water cooled)
- anti-freeze protection to evaporator
- compressors shall always start unloaded.

4.39.4.6 All chillers larger than 150kW cooling capacity (and where specified in the Supplementary Specification) shall be provided with microprocessor unit control modules with serial interface for remote monitoring and/or control by a building management system.

Clause 4.39.3.8 above shall generally apply.

4.39.4.7 On multiple circuit chillers compressor starting/stopping shall be in sequence and on units larger than 100kW cooling capacity (and where specified in the Supplementary Specification) automatic lead/lag control for equalising compressor running hours is required.

4.39.5 Control of Screw Compressor Water Chillers

4.39.5.1 Screw compressor water chillers shall generally be controlled as specified for centrifugal water chillers.

4.39.5.2 Clause 4.39.3.8 above shall generally apply.

4.39.6 Control of Airhandling Unit Equipped with Chilled Water Coil and Hot Water Coil or Electric Elements for Heating

4.39.6.1 Both heating and cooling shall be controlled by a single room or return air sensor and controller as specified.

4.39.6.2 A control range of approximately 15ºC – 30ºC is required with a dead zone of approximately 0,5ºC between cooling off and heating on and vice versa.

4.39.6.3 The controls shall maintain the specified temperature ± 1ºC by controlling the control valves on the cooling and heating coils. (or heating elements)

4.39.6.4 Electric heaters shall be controlled in steps as specified in the Supplementary Specification, with contactors.

4.39.6.5 The control circuit shall be interlocked with the supply air fan and shall only be in operation if the fan is running.

4.39.6.6 Where three-way valves are used it shall be in the full by-pass position when the system is off.

4.39.6.7 Three-way valves shall be fitted with balancing valves in the by-pass leg with the valve adjusted to ensure that the flow resistance across the by-pass leg shall equal the coil resistance at full flow.

4.39.6.8 The following interlocks shall be provided for electric heaters where used;

- ? heater shall not be on unless the fan is on
- ? a fire protection high temperature thermostat shall be provided in the supply air duct to stop the fan if the air temperature exceeds 50ºC and to switch all heaters off
- ? a pressure switch or flap type mercury switch shall be fitted in the supply air duct to ensure that the heaters cannot be on unless air flow is established
- ? provision to ensure that heating and cooling cannot be on simultaneously.

4.39.7 Control of Air Handling Unit Equipped with Direct Expansion Cooling Coil and Electric Elements for Heating

4.39.7.1 Both heating and cooling shall be controlled by a single room or return air sensor and controller as specified, generally as per 4.39.6 above.

4.39.7.2 In the cooling mode step control matching the refrigerant side with on/off, unloading/loading of compressors shall be provided.

4.39.7.3 Compressor interlocks preventing operation unless heat rejection equipment is functioning shall be provided.

4.39.8 Condensing Pressure Control

4.39.8.1 Cooling towers, evaporative condensers and air-cooled condensers shall be provided with head pressure control to maintain condensing temperatures within the limits recommended by the compressor manufacturer.

4.39.8.2 Aerofoil dampers with proportional control shall be used on cooling towers and evaporative condensers to match cooling capacity with system heat rejection whilst saving on fan energy.

4.39.8.3 Other methods of condensing pressure control, such as variable fan speed and fan cycling will only be considered if the head pressure can be controlled within the limits recommended by the compressor manufacturer.

4.39.9 Control Valves and Actuators

4.39.9.1 Control valves shall be the reversible globe type, either single, two or three ported or angle type as required, suitable for a working pressure of 900 kPa or 1? times the operating pressure of the system, whichever is the greatest, for the specified fluid and fluid temperature to be controlled.

4.39.9.2 Single ported control valves with port sizes larger than 25mm in diameter shall, whenever possible, be installed so that flow tends to open the valve.

4.39.9.3 The design and materials of the valve and its operating motor shall be such that leakage of fluid from the stem seal cannot cause corrosion, freezing or overheating of any working part. Valves of 40mm and smaller, shall have cast bronze bodies with screw ends.

4.39.9.4 Valves between 50 and 80mm shall be of cast bronze, cast steel or cast iron with screwed or flanged connections. Valves of 100mm and larger, shall be of cast steel or cast iron with flanged connections. Valve trim (valve plug, seat rings, valve stem guide bushings, valve guide bushings, valve stem and internal stuffing box parts), shall be of austentic stainless steel or other hard facing materials suitable for the fluid to be controlled.

4.39.9.5 All control valves shall be provided with readily visible position indicators.

4.39.9.6 Electric actuators shall be of either the electric solenoid operated type or electric motor operated type.

4.39.9.7 Electric motor type actuators shall be of the shaded pole or capacity induction type capable of stopping at any point in the cycle or rotating in any direction. Provision shall be made for manual operation.

4.39.9.8 Electric actuators shall be installed in positions where they will not be subjected to any damp conditions due to condensation or overheating.

4.39.9.9 Actuator and valve and damper combinations shall be selected to suit the particular duty.

All valves and actuators on a installation shall be of the same manufacturer.

4.39.9.10 Control valves with their actuators shall be installed in readily accessible positions for maintenance purposes and where position indicators are clearly visible.

4.39.9.11 Where fail safe controls are specified, actuators shall be provided with spring return to either the open or closed position or alternatively solenoid valves shall be added for this purpose. Solenoid valves shall fail either to the open or closed position as required by the system.

4.39.9.12 Damper actuators shall be selected to suit the specified control requirements and with sufficient torque output to drive the dampers smoothly without straining or overloading.

4.39.9.13 Damper actuators shall be mounted in accessible positions for maintenance and setting purposes.

4.39.9.14 Linkages between actuators and dampers shall be adjustable.

4.39.9.15 Thermostatic expansion valves shall be of the gas charged type with external superheat adjustment and solder joint or flanged pipe connections. On coils where the refrigerant pressure drop through the coils exceeds 15 kPa, the expansion valve shall be provided with an external equaliser to the suction line at a point beyond the remote bulb. Valves shall be able to move from fully open to fully closed on not more than 3ºC change in superheat. The superheat setting shall be between 4 and 8ºC and shall be as recommended by the coil manufacturer.

4.40.0 THERMOSTATS AND HYGROSTATS

4.40.1 Thermostats and hygrostats or alternatively temperature and humidity transmitters in occupied areas, shall be provided where indicated on the drawings and shall be installed against the wall at a height of approximately 1,5 metres from the floor. Units mounted against outside walls, shall be provided with insulated bases.

4.40.2 Temperature sensing primary elements shall be either bimetal strips, sealed bellows or resistance wires.

4.40.3 Humidity sensing primary elements shall be either human hair, leather, plastic or of the hygroscopic resistance type.

4.40.4 Duct, pipe and tank thermostats shall be of the capillary remote bulb immersion type. Alternatively, thermostats controlling air temperatures may have fast response coiled sensing elements.

4.40.5 Sensing elements in piping and tanks shall be installed in oil filled separable immersion wells, screwed into the pipe or tank. Immersion wells shall be of copper or brass. Small diameter pipes shall be enlarged at points where sensing elements are installed. Sensing elements in ducts shall be located where they will respond to a representative temperature within the duct.

4.40.6 Thermostats and hygrostats mounted out of doors shall be provided with splash proof enclosures.

4.40.7 Capillary type thermostats shall be installed at a height of approximately 1,5 metres above floor level in easily accessible positions for adjustment and maintenance purposes. Thermostats

mounted against insulated ducts or pipes, shall be mounted on stand-off brackets. Capillary tubing shall be neatly installed and coiled where necessary and shall be protected against possible damage.

4.40.8 Fire protection and overheat thermostats shall be of the rigid stem insertion type.

4.40.9 Thermometers shall be provided in piping, ducts and tanks at the location of all control thermostats (not at limit or safety thermostats). Thermostats having built in thermometers, are also acceptable.

4.40.10 Thermostats and hygrostats shall not be installed in positions where they are subjected to direct sunlight. Thermostats near electric heater elements or other hot surfaces, shall be shielded against radiation.

4.40.11 Thermostats and hygrostats shall be protected against dust, dirt, corrosive fumes, chemicals and moisture.

4.40.12 Unless otherwise specified in the Supplementary Specification, all thermostats and hygrostats shall be of the relay-operated type.

4.40.13 Electric control relays shall be mounted inside the electrical switchboards.

4.40.14 Relays shall be suitable for the supply voltage required and shall have a contact rating well in excess of the load.

GREYS HOSPITAL: DOCTORS & NURSES RESIDENCE RENOVATIONS VENTILATION & HOT WATER INSTALLATION

TECHNICAL SPECIFICATIONS

I N D E X

Table of Contents

1. GENERAL CONDITIONS OF CONTRACT 2
2. SCOPE OF THE WORKS 2
3. DESIGN PARAMETERS 5
4. SITE LOCATION 5
5. GENERAL REQUIREMENTS 5
6. VISIT TO SITE 6
7. PROVISIONAL, PRIME COST & CONTINGENCY AMOUNTS 6
8. PROGRAMMING AND GUARANTEE 7
9. MATERIAL AND WORKMANSHIP 7
10. REFERENCE SPECIFICATIONS AND STANDARDS 7
11. PLANT LAYOUT 9
12. ORDERING OF EQUIPMENT 9
13. ALTERNATIVE EQUIPMENT 9
14. DRAWINGS 9
15. VARIATIONS 11
16. EXISTING SERVICES & EQUIPMENT 11
17. NEW HOT WATER EQUIPMENT 12
18. INSPECTIONS & TESTING 23
19. COMMISSIONING AND HANDING OVER 25
20. TRAINING 26
21. OPERATING AND MAINTENANCE MANUAL 26
22. MAINTENANCE DURING THE GUARANTEE PERIOD 27
23. STATUTORY AND REGULATORY REQUIREMENTS 27
24. ARRANGEMENTS WITH THE SUPPLY AUTHORITY 28
25. NOISE AND VIBRATION CONTROL 28
26. PAINTING 29
27. CODING, LABELLING AND NOTICES 30
28. DRAWINGS 32

1. GENERAL CONDITIONS OF CONTRACT

1.1 This contract forms part of the Renovations and Upgrade to the Doctors and Nurses Accommodation project at Greys Hospital in Pietermaritzburg Completion Contract This specification provides the requirements for supply, delivery installation, testing commissioning, handover, guarantee and maintenance of equipment for ventilation and hot water systems at the Doctors and Nurses Quarters. Refer to details of scope below.

1.2 This specification is to be read in conjunction with all the drawings, the bill of quantities and all schedules which form part of this tender document. The complete installation shall comply with the requirements of this document.

1.3 Tenderers shall note that the site is on an existing hospital premises that is currently operational. Furthermore, the Doctors and Nurses Quarters are currently occupied, therefore the work shall be carried out with minimum disturbance to the operation of the Doctors and Nurses Quarters, and the greater hospital complex. The Tenderer shall undertake all risk and safety measures to ensure the safety of the occupants, staff and visitors to the hospital.

1.4 Tenderers are advised to consult the decanting plan which will inform the overall construction programme.

2. SCOPE OF THE WORKS

2.1 The Scope of Works detailed below is separated into Nurses: Block A, Nurses Block B and Doctors, in line with the contract programme.

2.2 This contract shall cover the ventilation and hot water installations for Nurses: Block A, Nurses Block B and Doctors.

2.3 The scope, as detailed below, includes the contract engineering, project management, supply, installation, completion, testing, commissioning, hand-over, guarantee and maintenance of the following overview. The details of the equipment and the work required are indicated on the attached Tender drawings and in the bill of quantities which form part of this tender document:

2.4 Doctors

a) Existing Steam line

- Steam line to be isolated at isolating valve outside hospital kitchen.
- Steam supply and return lines outside kitchen to be disconnected and blanked off. Terminated steam lines to remain in situ i.e. must not be removed.

b) Existing Equipment in Hot Water Plantroom

- Two (2) existing 1.8 kL Hot Water Tanks to be decommissioned, disconnected, removed, and handed over to Greys Hospital Maintenance Department. *This has been completed under the previous contractor's works.*
- One (1) existing 2.5 kL Hot Water Tank to be retained; plate heat exchanger to be disconnected, removed and handed over to Greys Hospital Maintenance Department.
- All associated pipework (Hot water, cold water and steam), valves and fittings inside plantroom to be disconnected, removed and handed over to Greys Hospital Maintenance Department.

Dosing plant to be disconnected, removed and handed over to Greys Hospital Maintenance Department.

c) New Hot Water Equipment & pipework

- One (1) new 3 kL Hot Water Tank (that has been supplied and is on site in the plantroom) to be installed and connected in parallel with existing 2.5 kl Hot Water Tank. Tanks to be connected to heatpumps.
- Three (3) new heatpumps that are on site and are partially installed to be connected in parallel and installed externally adjacent to plantroom.
- Three (3) new heatpump circulation pumps to have their installation completed in plantroom and connected as per schematic.
- Two (2) new hot water return circulating pumps (run / standby) to be installed in plantroom and connected as per schematic.
- One (1) heatpump, one (1) heatpump circulation pump and one (1) hot water return pump to be connected to essential supply. All other equipment to be connected to normal supply.
- Hot water tanks to be supplied with Municipal water supply, with PRV to control operating pressure. Cold water supply from domestic cold-water tanks on roof to be connected to tanks on manual bypass as backup when Municipal water is switched off.
- Hot water supply from tanks tie into existing hot water supply to building.
- Existing hot water return from building to tie into hot water return to tanks, via circulation pumps.
- A three-phase power supply shall be supplied (by others) to electrical control panel (included in this contract) in the plantroom. electrical control panel to be supplied, delivered and installed complete with all switchgear, contactors, circuit breakers, fuses, warning lights & alarms, over/under current protection, phase rotation protection, toggle switches, isolators; all electrical & control wiring.

d) Existing Hot Water Plantroom

- Remove existing weather louvres and install new louvres
- Install extract fan

The items listed below will form part of the **main contractor's** scope or works:

- Strip and repaint internal plantroom walls and soffit
- Service Tilly garage doors
- Upgrade lighting
- Replace fire detectors
- Confirm the existence of floor drains; jet if necessary.

2.5 Nurses: Block A

a) Mechanical Ventilation

- Supply, deliver, install, commission, test, and hand over of 10 (10) new wall or window mounted extract fans.
- Supply, deliver, install, commission, test, and hand over of two (2) new plate-mounted extract fans.
- Supply, deliver and install suitable isolators for fans above. Isolators to be wired to power supply at distribution board. On/Off switched to be placed approximately 125mm from floor level, or similar easy-to-reach height.
- Supply, deliver and install fifteen (15) door grilles.
- Welding Shut of ten (10) windows adjacent to plate fans in ablution facilities.

2.6 Nurses: Block B

a) Mechanical Ventilation

- Supply, deliver, install, commission, test, and hand over ten (10) new wall/window mounted extract fans.
- Supply, deliver, install, commission, test, and hand over of 1 (one) new plate-mounted extract fans.
- Supply, deliver and install suitable isolators for fans above. Isolators to be wired to power supply at distribution board. ON/Off switch to be mounted at a suitable height viz 125mm above floor level.
- Supply, deliver and install thirteen (13) door grilles.
- Welding Shut of twelve (12) windows adjacent to existing plate fans in ablution facilities.

b) Existing Hot Water Equipment

- Existing 5kL Hot Water Tank to be decommissioned, disconnected, removed, and handed over to Greys Hospital Maintenance Department.
- Existing 5.5kL Hot Water Tank to be retained. Plate heat exchanger to be disconnected, removed and handed over to Greys Hospital Maintenance Department.
- All associated pipework (Hot water, cold water and steam), valves and fittings inside plantroom to be disconnected, removed and handed over to Greys Hospital Maintenance Department.
- Dosing plant to be disconnected, removed and handed over to Greys Hospital Maintenance Department
- 5.5kL tank to be connected closest to plantroom Door

c) New Hot Water Equipment & pipework

- One (1) new 6kL Hot Water Tank (That is currently on site) to be installed and connected in parallel with existing 5.5kl Hot Water Tank. Hot Water Tanks to be connected to new heatpumps.This tank to be placed furthest into the plantroom.
- Three (3) new heatpumps to be connected in parallel and installed externally adjacent to plantroom. One heat pump is currently on-site.
- Three (3) new heatpump circulation pumps to be installed in plantroom and connected as per schematic.
- Two (2) new hot water return circulating pumps (run / standby) to be installed in plantroom and connected as per schematic.
- One (1) heatpump, one (1) heatpump circulation pump and one (1) hot water return pump to be connected to essential supply. All other equipment to be connected to normal supply.
- Hot water tanks to be supplied with Municipal water supply, with PRV to control operating pressure. Cold water supply from domestic cold-water tanks on roof to be connected to tanks on manual bypass, as backup when Municipal water is switched off.
- Hot water supply from tanks tie into existing hot water supply to building.
- Existing hot water return from building to tie into hot water return to tanks, via circulation pumps.
- A three phase power supply shall be supplied (by others) to the electrical control panel (included in this contract) in the plantroom. Electrical control panel to be supplied, delivered and installed complete with all switchgear, contactors, circuit breakers, fuses, warning lights & alarms, over/under current protection, phase rotation protection, toggle switches, isolators; all electrical & control wiring.

d) Existing Hot Water Plantroom

- Remove existing weather louvres and install new louvres
- Install extract fan

The items listed below will form part of the **main contractor's** scope or works:

- Strip and repaint internal plantroom walls and soffit
- Service Tilly garage doors
- Upgrade lighting
- Replace fire detectors
- Confirm the existence of floor drains; jet if necessary.

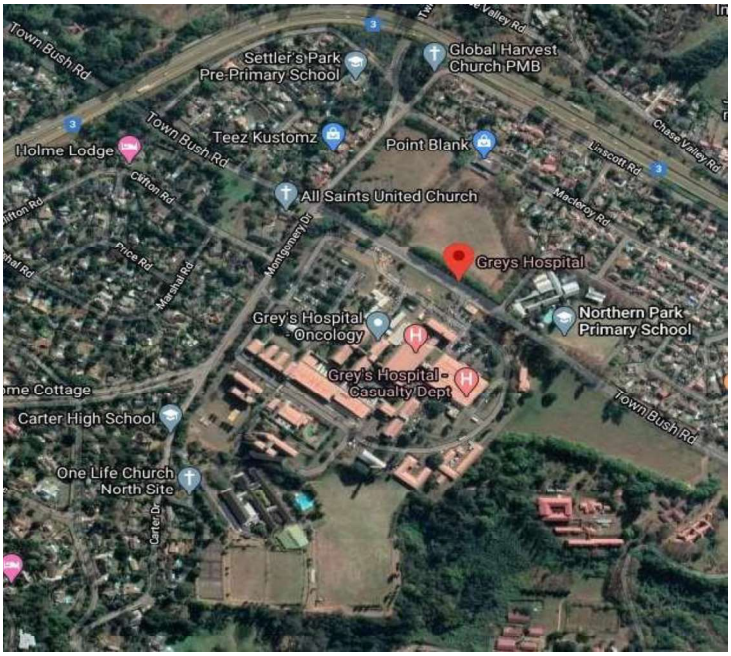
3. DESIGN PARAMETERS

3.1. The equipment offered shall be capable of continuous operation under the following design parameters apply:

- Altitude: 596 m
- Barometric Pressure: 930mbar
- Summer: 32.2°C db; 22.7°C wb
- Winter: 5 °C db

4. SITE LOCATION

- Municipality: Umgungundlovu District Municipality
- Street Address: 201 Townbush Road, Pietermaritzburg, KZN, 3201
- Postal Address: Private Bag X9001, Pietermaritzburg, 3200
- Cadastral Description: 30.36378417, -29.579613
- Existing Infrastructure: Brick and mortar multi-storey buildings
- Existing Services: All municipal services are available
- Zoning: Government



5. GENERAL REQUIREMENTS

5.1 A requirement of this tender and contract is that the tenderer must visit and thoroughly inspect the site prior to submitting a tender. This visit and inspection must also incorporate the use of the tender drawings. The tenderer is responsible for all aspects of the project and must ensure that all details, building structure, programme and everything associated with the works are known prior to submitting a tender.

5.2 The contractor for this particular contract will be a domestic sub-contractor to the main contractor.

5.3 The tenderer is required to, and must be prepared to, work together with the entire professional team, including but not limited to the Principal Agent, the Architect, the Mechanical Engineer, to ensure a satisfactory completion of this scope of works, and a high standard of engineering and installation

5.4 The tender is in the form of a bill of quantities. The tenderers must price and complete all the items in the bill of quantities. Failure to complete and price all the items may result in the disqualification of the tenderer's offer.

5.5 This installation shall be suitable in all respects for operation under the atmospheric conditions and electricity supply as outlined in the schedules. The onus is on the tenderer to ascertain any other local conditions or peculiarities which might affect the working of the plant, and no allowance in price or standards of materials or workmanship will be made for any ignorance on the part of the tenderer in this respect. This applies to the nature and construction of the building.

5.6 All materials and workmanship supplied under this contract shall be of the highest quality. Installation work shall be done in accordance with the best modern engineering practice, and where installations are required for medical and/or advanced research proposes, reliability and accuracy in operation are the major requirements. The Engineer shall have the right to reject and demand satisfactory replacement at the Contractor's cost, or any part of it, which in his opinion, does not conform to the highest standards of material and workmanship. The installation shall be required to run for long continuous periods, and it is essential that all installations shall be capable of operating continuously and satisfactorily over such periods.

6. VISIT TO SITE

6.1 There will be a compulsory site inspection.

6.2 Tenderers must familiarize themselves with local site conditions such as access area available on site, type of ground, space available for on-site fabrication, existing plantrooms, storage, transport, loading and unloading facilities, scaffolding, tackles and tools needed, as no claims by the Contractor, which may arise from ignorance of the site conditions, will not be considered.

7. PROVISIONAL, PRIME COST & CONTINGENCY AMOUNTS

7.1 No provisional amounts, PC sums or contingencies have been listed in the Bills.

8. PROGRAMMING AND GUARANTEE

8.1 Programming

Before commencing the work, the Contractor shall submit a written construction programme in collaboration with the main contract programme to the Engineer for information purposes.

The Engineer shall have the right to alter the programme mutually agreed upon if, in his opinion, circumstances so dictate, and any such alteration or deviation shall in no case be deemed a basis for claims for extra work or cost by the Contractor.

The work must be executed in strict accordance with the agreed program of completion of the works between the Employer and Main Building Contract.

8.2 Guarantee

The 12 months guarantee period will only commence once Works Completion has been awarded.

9. MATERIAL AND WORKMANSHIP

9.1 The contract works shall be executed in accordance with the specified standards and level of workmanship, to the satisfaction of the Engineer.

9.2 All materials shall be of the quality specified and the Contractor shall, upon request of the Engineer, furnish him with proof to his satisfaction that the materials are of the specified quality.

9.3 All materials and equipment used for the installations shall be new, unused and undamaged.

9.4 The Contractor shall, if requested by the engineer, provide samples of material and equipment for approval. If judged necessary by the Engineer, such samples may only be returned after the completion of the installation, in order to ensure that the quality of the installed product is the same as that of the approved sample.

10. REFERENCE SPECIFICATIONS AND STANDARDS

10.1 The Installations shall be designed, erected, commissioned and maintained in compliance with the following appropriate regulations, and as specified in the Standard Technical Specification. In addition the contractor shall exempt the employer from all losses, costs or expenditures which may arise as a result of the contractor's negligence to comply with the requirements of the regulations enumerated in this clause.

10.2 It shall be assumed that the Contractor is conversant with the abovementioned requirements. Should any requirement, bye-law or regulation, which contradicts the requirements of this Document, apply or become applicable during erection of the Installation, such requirements, bye- law or regulation shall overrule this Document and the Contractor shall immediately inform the Engineer of such a contradiction. Under no circumstances shall the Contractor carry out any variations to the Installations in terms of such contradictions without obtaining the written permission to do so from the Engineer It shall be the responsibility of the Contractor to make the necessary arrangements, at his own cost, with any Statutory Authority, and to

supply the labour, equipment and means to inspect, test, commission and hand over the installation.

10.3 The latest revision of any Specification referred to in this specification, will be applicable.

10.4 Where a specification or standard is not specifically referred to, it will be assumed that the relevant SABS, ISO, BSS, DIN or equivalent American standard, listed in order of preference will apply.

10.5 The SI ("Le Systeme International d' Unites") – Metric System of Units will apply. Refer to SANS – M33A: The International Metric System: Guide to the use of the SI in South Africa.

10.6 The Contractor shall supply and install all notices and warning signs that are required by the appropriate laws or regulations and/or by these Documents.

10.7 The entire new installation shall be carried out in accordance with the following:

- The Application of the National Building Regulations SANS 10400 (including all SANS addenda).
- The South African Bureau of Standards Code of Practice for wiring of Premises SANS 10142.
- The Occupational Health and Safety Act No 85 of 1993.
- The Standard Specification for the Air-conditioning and Ventilation Services for the Provincial Administration of the Republic of South Africa, as amended, issued by the Chief Director: Work of Kwa-Zulu Natal Provincial Administration.
- The General Electrical Specification for the Provincial Administration of the Republic of South Africa Part 2E.
- Refrigeration Systems including Plants associated with Air-conditioning Systems SANS 10147.
- Room air-conditioners and heat pump SANS 1125.
- Non-ducted air conditioners heat pumps testing and rating performance SANS 5151.
- SANS-10252-1: 2018 Water supply and drainage for buildings Part 1: Water supply installations for buildings,
- SANS-10254: 2018 The installation, maintenance, replacement and repair of fixed electric storage water heating systems
- SANS 1352:2012 The installation, maintenance, replacement and repair of domestic air source water heating heat pump systems
- Municipal by-laws and any special requirements of the Supply Activities of the area or district concerned.
- Municipal Fire Regulations.
- Corrosion protection of steel structures by protective paint SANS 12944.
- Hot-dip galvanising, coating of iron and steel
- Department of Health Policy: Mechanical Installations
- IUSS Health Facility Guides: Building engineering services

11. PLANT LAYOUT

11.1 All plant and equipment specified herein shall comply in capacity / duty and general layout with the details given in the specification and drawings. Should the contractor offer equipment at variance with these requirements, full details and calculations and the supporting reasons therefore shall be given. The Contractor must ensure that his plant selection is suitable for the plant room dimensions.

11.2 The general plant layout may be altered or modified to suit the contractor's equipment, but a sketch showing the intended layout submitted to the Engineer before the tender is awarded. Dimensions shown on the drawings are sufficiently accurate for tendering purposes, but before construction of the plant is commenced, these dimensions together with all structural members, existing systems, existing equipment, etc., must be verified on site and the plant constructed accordingly.

11.3 If the contractor requires alterations to the structure these must be described timeously so as not to effect the construction programme. Minor structural alterations which might facilitate the work can be arranged with the Engineer and/or Architect as the work progresses, but no claims will be entertained for alterations without approval and site instructions.

12. ORDERING OF EQUIPMENT

12.1 Equipment submittals shall be submitted to the Engineer to be signed off by before ordering of equipment.

13. ALTERNATIVE EQUIPMENT

13.1 The words "other approved", are implied wherever specific descriptions of equipment is provided. In the case of specific product names being provided in schedules, implies that such equipment was selected for design purposes only. Tenderers may offer alternative equipment with the understanding that such alternative offers are "similar" and “equal to" the selected equipment (in quality and performance) on which the design was based. The engineer shall reserve the right, on behalf of the client, to decide whether such equipment is acceptable or not. Subject to a tender being accepted with such alternatives, approval must be obtained from to the engineer for such alternatives prior to the contractor placing orders for the equipment.

14. DRAWINGS

14.1 Engineers Drawings

14.1.1 The Engineer’s Tender drawings are not manufacturing drawings and the dimensions given are only sufficient for tendering purposes or to enable the contractor to complete manufacturing drawings. It is the responsibility of the contractor to verify all dimensions. The contractor will be furnished, on request, with the Engineer’s drawings available in this document.

14.1.2 Electronic drawings in DWG for the project are supplied by the engineer. These drawings are to indicate the general arrangement only, and are to be used only for tender purposes. The successful contractor is required to check details and measurements on site and to compare and check these with the engineer’s drawings. The engineer’s drawings are to be used as “base” drawings and are to be modified and corrected by the contractor as required for the final installation.

14.2 Contractor's drawings

14.2.1 The contractor shall produce and make available for scrutiny one (1) hard copy as well as an electronic copy of each detailed workshop drawing. The contractor shall allow the Engineer one (1) week for drawing checking. After a marked-up copy with all the Engineer's comments has been returned, the contractor shall update the original, which shall then be submitted to the Engineer for final checking. At this time the Engineer will give permission for the Contractor to proceed with the installation.

14.2.2 Four (4) copies as well as an electronic copy of the workshop drawing shall be issued to the Engineer for distribution. Drawings shall be accompanied by a drawing register. All revisions to drawings must include the revision number as well as the detail of the revision highlighted by a revision cloud in the appropriate place.

14.2.3 The workshop drawing shall include:

- Builder's Work Drawings
- Mechanical Drawings – These are all Workshop and Equipment Layout Drawings required for the manufacture and erection of the installations.
- Instrumentation Drawings, such as
  - Schematic Control Diagrams.
  - General Arrangement Drawing of Control Board.

- Electrical Power Drawings, such as:
  - General Arrangement Drawing of Switchboard.
  - Circuit Diagrams and interconnecting diagram giving cable schedules with numbers and sizes corresponding with the circuit diagrams and interconnection diagram.

14.2.4 Unless otherwise specified, cable routes shall be superimposed on the Mechanical Layout Drawings, showing the runs and fixing details.

14.2.5 The contractor shall provide the Engineer with working drawings of all items of equipment, with a detail technical specification of the equipment, for approval, before placing an order for the equipment.

14.2.6 The Contractor shall arrange for a full set of white prints of installation drawings to be kept on the site showing the progress of all work in connection with this Contract. Such prints shall be kept up-to-date.

14.2.7 Any work done by the contractor without an approved signed drawing, will be at the risk of the contractor.

14.2.8 The Contractor shall update all drawings ("as built drawings") once the installation has been completed. Three (3) sets of paper prints and one (1) electronic set shall be supplied to the Engineer as part of the O & M Manual.

15. VARIATIONS

15.1 If a variation becomes necessary, the engineer shall notify the contractor in writing, setting out the scope and nature of the proposed variation. The contractor shall then determine what cost variation, if any, is involved, giving due consideration to any material already prepared, or work already done, which would require alterations. Variation in cost shall be in accordance with rates set out in the contract, where these are applicable. A price breakdown is to accompany the variation quotation submitted.

15.2 Within seven (7) days of receipt of the engineer's request for variation, the Contractor shall inform him of the price adjustment attributable to the proposed variation. If the Contractor should fail to notify the engineers within seven (7) days that there will be a cost increment associated with the proposed variation, it will be assumed, in default, that no cost variation is applicable. If it is decided that the work shall proceed, the engineer shall then issue a variation order to the Contractor, authorizing him to carry out the variation. Works may not proceed without an approved variation order.

15.3 If the carrying out of any variation instructed by the engineer would, in the opinion of the Contractor, prevent him from fulfilling any of his obligations under the contract, including the timely completion of the Contract, he shall notify the engineer in writing without delay, and shall submit computations or other evidence in support of his opinion. The engineer should then decide whether or not the variation is to be carried out. If the engineers confirm his instructions to carry out the variation, the Contractor shall be held relieved of his obligation under the contract in so far as they are affected by the required variation. The engineers decision as to the validity of the Contractors claim is however final.

16. EXISTING SERVICES & EQUIPMENT

16.1 Existing Services:

The Doctors and Nurses Quarters form part of the Greys Hospital complex which is an existing facility. As such, it is served by a number of existing services sewer reticulation, hot and cold water reticulation, fire reticulation and steam reticulation. The water supply is from Municipal mains. The steam supply is from the hospital's boiler. The following reticulation is to be retained at the Doctors and Nurses Quarters: sewer reticulation, hot and cold water reticulation and fire reticulation The contractor is required to confirm the following by means of pressure and flow tests, where applicable.

a. That the municipal water pressure is sufficient to supply the buildings with domestic water and fire water.
b. That the existing hot and cold water and fire reticulation in the building is in good condition and is capable of supplying the buildings with domestic water and fire water at the required pressure.
c. That the existing sewer reticulation is in good condition, that there are no blockages and that it is capable of servicing the buildings.
d. That the new 5.5Kl hot water storage tank installed in the Nurses Accommodation in 2020 is in good condition, able to be incorporated into the new hot water system for the building
e. That the new hot water storage tank installed in the Doctors' Accommodation in 2019 is in good condition, and can be incorporated into the new hot water system for the building.
f. That the new hot water storage tank on-site in the Doctors' Accommodation plantroom in 2022 is in good condition, and can be incorporated into the new hot water system for the building
g. That the new 3000L hot water storage tank supplied under the previous contractor is in good

condition and can be incorporated into the new hot water system for the building.

h. The steam lines (supply and return) to both the Doctors and Nurses Quarters are to be isolated, terminated and blanked off at the isolating valve outside the main hospital kitchen. The section of terminated steam lines to remain in-situ i.e. it must not be removed.

16.2 Existing Equipment:

16.2.1 *Doctors Quarters: Hot Water Plantroom*

a. Two existing 1.8 kL Hot Water Tanks are to be decommissioned, disconnected, removed and handed over to Greys Hospital Maintenance Department. This has been completed under the previous contractor and the university.
b. The existing 2.5 kL Hot Water Tank is to be retained, but the plate heat exchanger is to be disconnected, removed and handed over to Greys Hospital Maintenance Department.
c. The dosing plant to be disconnected, removed and handed over to Greys Hospital Maintenance Department.
d. All associated pipework (Hot water, cold water and steam), valves and fittings inside plantroom are to be disconnected, removed and handed over to Greys Hospital Maintenance Department.
e. An existing 3000 kL Hot water tank is partially installed in the plantroom
f. An exisiting additional Hot water tank has been installed in the plantroom and is to be incorporated in the plantroom only if required
g. 3 of 38 Kw new HeatPumps are currently located in the Doctors Quarters Outdoor Plantroom, and are partially installed
h. 3 of Grundfos Pumps are located in the Doctors Quarters Plantroom, and are partially installed, their installation is to be completed
i. 2 of Reticulation Pumps are located in the store room and are to be installed into the system at the Doctors' Quarters.

16.2.2 *Nurses Quarters: Hot Water Plantroom*

a. The existing 5kL Hot Water Tank is to be decommissioned, disconnected, removed and handed over to Greys Hospital Maintenance Department.
b. The existing 5.5kL Hot Water Tank to be retained; but the plate heat exchanger is to be disconnected, removed and handed over to Greys Hospital maintenance Department
c. All associated pipework (Hot water, cold water and steam), valves and fittings inside the plantroom are to be disconnected, removed and handed over to Greys Hospital Maintenance Department.

17. NEW HOT WATER EQUIPMENT

17.1 Hot Water Vessels

17.1.1 Complete installation, testing and commissioning of SA BOILER hot water storage vessels (or other approved), for the new hot water systems at Doctors Quarters.

17.1.2 Hot Water Vessel Schedule – Doctors:

Reference	*Location*	*Description*	*Capacity*	*Comments*
Hot Water Tank 02	Doctors HW Plantroom	SA Boiler Vertical Vessel	3 000 litres	Excluding electric element Vessel has been supplied under the prevous contractor

17.1.3 Hot Water Vessel Schedule – Nurses:

Reference	*Location*	*Description*	*Capacity*	*Comments*
Hot Water Tank 02	Nurses HW Plantroom	SA Boiler Horizontal Vessel	6 000 litres	Excluding electric element Vessel has been supplied under the previous contractor

17.1.4 Vessels to be supplied EXCLUDING electrical element.

17.1.5 Vessel dimensions to suit plantroom dimensions.

17.1.6 Vessels to be manufactured according to ASMEVIII div 1 and SANS 347:2012 Standards.

17.1.7 Dish Ends and shell to be constructed with S355JR (300WA) Steel. Shell thickness to be 6mm,

17.1.8 All seams to be internally and externally welded.

17.1.9 Manhole size 400NB required for ease of maintenance

17.1.10 Vessel to maintain an operating pressure of 600kPa, and withstand a testing pressure of 900kPa.

17.1.11 Vessel to be internally treated with a two-pack epoxy coating and externally treated with weatherproof epoxy paint.

17.1.12 Vessel to be insulated with 50mm Isover Glasswool 80 kg/m3 and cladded with 0.8mm glavanised steel cladding.

17.1.13 All ports to be flanged setup.

17.1.14 All pipework interconnection between tanks and heat pumps to be fitted with lagging and cladding.

17.1.15 Vessel to be supplied and fitted complete with safety valve, pressure gauge, thermometer, sacrificial anode and HP sensor.

17.1.16 Vessels shall have a data plate fixed permanently and containing the following information, as a minimum:

- Name of Manufacturer
- Country of Manufacture
- Year of Manufacture
- Manufacturer's serial number

- Capacity
- Minimum & maximum Design Temperature
- Design Pressure in Pa
- Unique mark of approved Inspection Authority, as applicable
- Hazard Category in accordance with SANS 347

17.2 Heat Pumps

17.2.1 Complete supply, delivery, installation, testing and commissioning of Thermowise air-to-water heatpumps (or other approved), for the new hot water systems at Doctors Quarters and Nurses Quarters. Contractor to note that 'Condition' of the equipment. Where stated that the heatpumps have been *supplied under the previous contractor* and are on site, having been only supplied and delivered they are to be rigged in place if needed, and installed, tested and commissoned. If stated they or are *on site and are partially installed*, they are to have installation completed and testing and commissioning. If condition is stated as *'not supplied'* the equipment is to be completly supplied, delivered, installed and commissioned by the contractor

17.2.2 Heatpump Schedule – Doctors:

Reference	*Location*	*Description*	*Model no.*	*Heating Capacity*	*Condition*
HP-01	Outside Doctors HW Plantroom	Air to water heatpump	Thermowise TKRS-380E/SN2-M	38 kW	On-site and partially installed
HP-02	Outside Doctors HW Plantroom	Air to water heatpump	Thermowise TKRS-380E/SN2-M	38 kW	On-site and partially installed
HP-03	Outside Doctors HW Plantroom	Air to water heatpump	Thermowise TKRS-380E/SN2-M	38 kW	On-site and partially installed

17.2.3 Heatpump Schedule – Nurses:

Reference	*Location*	*Description*	*Model no.*	*Heating Capacity*	*Condition*
HP-01	Outside Nurses HW Plantroom	Air to water heatpump	Thermowise TKRS-800E/SN2-M	80 kW	Supplied under the previous contractor- not installed
HP-02	Outside Nurses HW Plantroom	Air to water heatpump	Thermowise TKRS-800E/SN2-M	80 kW	Not Supplied
HP-03	Outside Nurses HW Plantroom	Air to water heatpump	Thermowise TKRS-800E/SN2-M	80 kW	Not supplied

17.2.4 Heatpumps to be connected to hot water vessels in plantrooms. Heatpumps to be connected as per drawings.

17.2.5 Heatpumps to be sized to heat reservoir water to a temperature of between 60°C, with minimum ambient temperature of 5°C.

17.2.6 Heatpumps to be supplied and installed complete with automatic defrost cycle, all safety features, thermostats, controls and connection to main control panel, with maximum noise level of 70dB(A), fittings, insulation, cladding, bends, tees, and necessary accessories as specified.

17.2.7 In each case, one (1) heatpump shall be wired to essential power while the remaining two (2) heatpumps shall be wired to normal power

17.2.8 Heatpumps to be factory-assembled units housed in a sturdy weatherproof casing constructed from rust-proofed mild steel panels coated with a baked enamel finish.

17.2.9 Heatpumps shall have a maximum noise level of 70 dB(A) at normal operation measured horizontally 1m away and 1m above ground.

17.2.10 The heat exchanger shall be constructed with copper tubes mechanically bonded to aluminum fins to form a cross fin coil. The aluminum fins shall be covered by anti-corrosion resin film.

17.2.11 The refrigerant shall be R410A or other approved with 0 Ozone depleting agent.

17.2.12 All necessary safety devices shall be provided to ensure the safety operation of the system.

17.2.13 Heatpumps to be installed externally adjacent to hot water plantroom, on anti-vibration mountings on concrete plinths.

17.3 Circulating Pumps

17.3.1 Complete supply, delivery, installation, testing and commissioning of Grundfos circulating pumps (or other approved), for the new hot water systems at Doctors Quarters and Nurses Quarters. Contractor to note

17.3.2 Circulating Pump Schedule – Doctors:

Reference	*Location*	*Description*	*Make & Model no.*	*Duty*	*Run / Standby*	*Condition*
HPCP-01	Doctors HW Plantroom	Heatpump circulating pump	Grundfos CR 10-2	10 m^3/hr @ 27m	Run	On-site and partially installed
HPCP-02	Doctors HW Plantroom	Heatpump circulating pump	Grundfos CR 10-2	10 m^3/hr @ 27m	Run	On-site and partially installed
HPCP-03	Doctors HW Plantroom	Heatpump circulating pump	Grundfos CR 10-2	10 m^3/hr @ 27m	Run	On-site and partially installed
HWRP-01	Doctors HW Plantroom	Hot Water return pump	Grundfos UPS 25-60-180	30 l/min @ 3.5m	Run	*Supplied by Previous contractor*
HWRP-02	Doctors HW Plantroom	Hot Water return pump	Grundfos UPS 25-60-180	30 l/min @ 3.5m	Standby	*Supplied by Previous contractor*

17.3.3 Circulating Pump Schedule – Nurses:

Reference	*Location*	*Description*	*Make & Model no.*	*Duty*	*Run / Standby*	
HPCP-01	Nurses HW Plantroom	Heatpump circulating pump	Grundfos CR 15-2	17 m^3/hr @ 22m	Run	*Supplied by Previous contractor*
HPCP-02	Nurses HW Plantroom	Heatpump circulating pump	Grundfos CR 15-2	17 m^3/hr @ 22m	Run	*Supplied by Previous contractor*
HPCP-03	Nurses HW Plantroom	Heatpump circulating pump	Grundfos CR 15-2	17 m^3/hr @ 22m	Run	*Supplied by Previous contractor*
HWRP-01	Nurses HW Plantroom	Hot Water return pump	Grundfos UPS 25-60-180	30 l/min @ 3.5m	Run	Not supplied

HWRP-02	Nurses HW Plantroom	Hot Water return pump	Grundfos UPS 25-60-180	30 l/min @ 3.5m	Standby or essential	Not supplied

17.3.4 Return Hot water circulating pumps to be wall-mounted in plantrooms

17.3.5 Heatpump circulating pumps to be mounted on concrete plinths in plantrooms.

17.4 Electrical panels

17.4.1 Complete wall-mounted electrical Panel is required in each Hot water Plantroom as described in the BOQ, Power supply by others is to be provided at a panel. The panel is to be connected to the heat pumps, circulating pumps and extract fans

The successful contractor is to check and verify the details.

Panel to include ammeter, volt meter, time and by-pass switches, stepped control, low water cut-outs and relays for elements to "kick-in" when Heat Pumps or circulating pumps are "down" and temperature below 40°C.

17.4.2 Panel/Panels to allow for normal and essential electricity supply

17.4.3 All wiring drawings and diagrams are to include an exact and corrected schedule of equipment to be fitted into the panels. Detailed drawings of the construction & dimensions of the electrical panels are also to be included with all drawings.

17.4.4 All electrical drawings are to be submitted to the consultant prior to commencing with manufacture. A certificate of compliance is to be included for each electrical panel.

17.5 Copper Piping & fittings

17.5.1 All pipework shall be Copper 460/1.

17.5.2 Piping shall include for tie-ins to existing cold water mains, existing hot water supply to building, existing hot water return from building and piping between hot water vessels and heatpumps.

17.5.3 Hangers to be of Zinc Electroplated Mild steel construction with EPDM rubber lining.

17.5.4 Hangers and supports where piping penetrates through walls shall be designed to prevent transmission of vibration to the building.

17.5.5 Supports must be installed near to joints and fittings.

17.5.6 Pipe supports shall be installed at the following centre to centre distances.

Copper size	Horizontal Pipe	Vertical Pipe
12 mm	1.0 m	1.2 m
15 mm	1.2 m	1.5 m
22 mm	1.5 m	1.8 m

28 mm	1.9 m	2.1 m
35 mm	2.1 m	2.4 m
42 mm	2.4 m	2.7 m
54 mm	2.4 m	3.0 m
66 mm	2.4 m	3.0 m
76 mm	2.5 m	3.0 m

17.5.7 The contractor shall be responsible for the drilling of the holes and creating openings for pipework to pass through walls, then making good of the building to the plaster and paint.

17.5.8 Sleeves through outside walls, slabs and piping through roofs and windows must be sealed off watertight.

17.5.9 Pipe fittings shall be of copper capillary soldered type pipe fittings.

17.6 Insulation of pipes and pipe fitings

17.6.1 All pipe work shall be pressure tested prior to fitting of any insulation.

17.6.2 All hot water pipes, valves and fittings shall be insulated with lagging and cladding.

17.6.3 Insulation to be with "Thermaflex" or "K-Flex" foam insulation, or other approved.

17.6.4 Insulation thickness to be 25mm for pipe diameters from 12 to 65mm, and 38mm thickness for pipe diameters exceeding 65mm.

17.6.5 Cladding to be 0.5mm thick galvanised sheet metal, fixed with galvanised steel bands and clips. No pop rivets to be used.

17.6.6 All piping shall be labelled to specifications herein. Neat direction arrows (at maximum 2 meter intervals) shall indicate the direction of water flow.

17.6.7 All piping, pipe fittings, etc. shall be thoroughly cleaned from rust, oil, grease, etc., before any insulation material is applied.

17.6.8 The insulation material shall meet the following minimum requirements:

- Temperature range : -80°C + 120°C
- R-value : 0.8 m^2.K/W
- Thickness : 15 mm
- Density : 35kg/m3
- Odour Properties : Neutral
- Cellular Structure : Totally closed
- Fire Properties : Self-extinguishing

17.7 Pipe Valves, Gauges & Fittings

17.7.1 **Valves** shall be in accordance with the relevant SANS standard specifications for the particular application.

17.7.2 Valves shall conform to the following material specifications:

- Bronze: BS 1400 – LG-2-C
- Cast iron: BS 1452 – LG 14

17.7.3 The castings shall be of uniform thickness and free of scale blowholes and defects and the top of internal working surfaces shall be machined.

17.7.4 All wearing components shall be manufactured of non-corrosive materials and replaceable. Where possible, valves shall be of same manufacture.

17.7.5 All valves and fittings shall be installed in a way that allows easy removal without cutting into pipework.

17.7.6 Valve bodies shall be of copper alloy for valves up to 50mm diameter, and of cast iron and steel for those over 50mm diameter.

17.7.7 Valve mating flanges shall correspond to valve pressure rating and valve flange diameter

17.7.8 Handwheels for valves shall be of a suitable diameter to allow tight closure by hand with the application of reasonable force without additional leverage and without damage to stem, seat and disc. Handwheel operated valves shall close clockwise. Seating surfaces shall be machined and finished to ensure tightness against leakage for service specified and shall seat

freely. All screwed valves shall be so designed that when the screwed connections are properly made, no interference with, nor damage to the working parts of the valve, can occur.

17.7.9 **Pressure relief valves** shall be of the totally enclosed spring loaded type with padlock and easing lever. The outlet shall be piped to the visible position where discharge will not cause damage or injury.

17.7.10 **Balancing valves** shall be fitted where necessary, whether specified or not, and shall be manufactured from cast iron and bronze with stainless steel moving parts. Balancing valves up to 63mm diameter shall have screwed connections. Larger valves shall have flanged connections. All valves shall be supplied with pressure tappings for pressure drop measurements. The function of the balancing valves is for balancing the water flow and for use as shut-off valves. Balancing valves shall be of the type Frese ALPHA valves as manufactured by FRESE, or any other approved, type for sizes up to 65mm diameter.

17.7.11 **Isolating Ball Valves** shall be used as general purpose isolating valves on all pipelines up to and including 50 mm in diameter. Ball valves shall be of the full way type manufactured from brass and equipped with plastic coated mild steel level handle with screwed connections to SANS 1056 (SABS 1056, Part 3) and pressure tested to 2000 kPa. The valves shall be able to handle water temperatures from 2°C to 100°C.

17.7.12 **Butterfly isolating valves** shall be used on pipe sizes above 50 mm. The valves shall conform to BS 5155 PN 16 and to American Standard MSS SP 67 and API 609. The valves shall be designed to fit between flanges drilled to the BS 10 Table D. The valve body shall be cast iron BS 1452 grade 220. The liner shall be high nitrile rubber moulded to the valve body to form a resilient seal. The inner shall be lapped over into the body recess to provide a self-sealing joint with mating pipe flanges. The disk shall be manufactured from spheroidal graphite iron to SANS 936/937 grade SG42 with a nylon coating. The shaft shall be Grade 431 stainless steel to BS970 Parts 1 to 4. The primary and secondary shaft seals shall be integral with the body liner. The replaceable tertiary O-rings shall be shaft mounted. The valve shall be manually operated and closed using a trigger lever which will incorporate a spring loader trigger enabling the disk to be set in a number of intermediate positions from fully opened to fully closed. The valve shall be finished in a protective red oxide primer followed by a green protective coating. The valves shall be able to handle water temperatures from 2°C to 100°C.

17.7.13 **Gate Valves** shall be of the full way type manufactured from cast iron for larger valves and brass or gunmetal castings for smaller valves. Gate valves shall have rising stems and split or solid wedge gates and shall have back seats to facilitate re-packing under pressure, and shall be drop right closing. Copper alloy gate valves shall comply with BS 1952. Cast iron gate valves shall be to SANS 664, BS 1218 or BS 3464.

17.7.14 **Globe valves** shall conform to BS 2060, or equivalent, and shall have characterized plug discs. The discs shall be free to rotate, readily removable from the valve stem and renewable. Valves shall permit control of flow rate from full flow to complete shut-off and suitable for re-packing of stem gland under pressure.

17.7.15 **Water pressure gauges** shall be the circular dial type and shall have a diameter of not less than 80mm. Each water pressure gauge shall be attached to a pipe with a syphon tube and gauge cock, complete with insulation on a tube.

17.7.16 **Thermometers** shall be of the stem type suitable for measuring temperatures of liquid in tanks or pipes and shall be installed in brass pockets. All thermometers shall be installed upright, and be visible from obvious positions. Thermometers shall be manufactured by Messrs

Marshalltown or other approved. Thermometers shall have the following range for hot water applications: 0-200°C (Calibrated in 1°C max).

17.7.17 **Thermometer pockets** shall not be installed in a pipe with a diameter of less than 50mm. If the pipe in which the pocket is to be installed, is less than 50mm in diameter, the part in which it is to be installed shall be increased in diameter to 50mm. Thermometer pockets shall be filled with oil and the thermometer shall be screwed onto the pocket. Pockets shall be not less than 50mm long complete with insulation.

17.7.18 **Manual air vents** shall be provided generally to vent all systems during filling and normal operation. Automatic air vents shall be used at all points in the systems, where air will accumulate continuously. Where specified, all vents, manual or automatically shall be piped to a common collection point and shall enter into a tundish. The tundish shall then be piped with a galvanized pipe to the nearest drain. In the case of manual air vents a shut-off valve shall be installed in the pipe leading to the tundish at a height of not more than 1800mm from the floor, otherwise air vents shall be equipped on a reinforced neoprene overflow u-tube pipe in order to prevent any water staining piping.

17.7.19 **Strainers** shall be installed to ensure that all foreign matter is continuously removed from the system. Strainers shall be of at least the same nominal bore as the pipeline in which they are fitted. The filter medium shall be removable for cleaning purposes. Bolted end covers shall incorporate drain plug for blow down purposes. Strainers shall be of the pot or angle type. Strainers of 50mm bore and smaller shall be taper-screwed and shall have bronze, gunmetal or ductile iron bodies. Strainers of 65mm bore and larger, shall be flanged and shall have cast iron bodies to BS 1452 GR 14, ductile iron to BS 2789 or cast steel to BS 1504 – 161A.

17.7.20 Screen shall be bronze or stainless steel, with perforation as follows:

Strainer Size	*Perforation*
20-50mm	0,74mm
65-150mm	1,50mm
200-300mm	3mm

17.7.21 The open area of each screen shall be at least three times the area of the inlet pipe. Strainers shall not be fitted in suction pipes feeding pumps unless ample static head (200kPa minimum)

is available in such suction pipes at the position of the strainers.

17.7.22 **Drain Cocks** shall be of the screw and/bolted down tapered plugs plug type. Plugs shall be tapered and ground into the body to form a tight seal under pressure. They shall be suitable for hose connection at outlet.

17.8 Extraction Systems

17.8.1 The general installation requirements for the extraction systems is covered in this section

17.8.2 Mechanical extraction is required in the Nurses' communal kitchens, ablutions, laundries and certain store rooms, and in the Nurses and Doctors hot water plantrooms, in order to achieve the required air change rate and address challenges with moisture.

17.8.3 Ventilation Schedule – Nurses Block A:

Reference	*Location*	*Description*	*Make & Model no.*	*Duty*	*Quantity*
EF-01	Block A	Wall/window mounted extract fan	Vortice Vario ARI LLs 150/6	97.2 l/s EXTRACT	5
EF-03	Block A	Wall/window mounted extract fan	Vortice Vario ARI LLs 300/12	320 l/s EXTRACT	5
EF-04	Block A	Plate-mounted extract fan	HYDOR HPA 350/4 CFP-350/4	760 l/s-EXTRACT	2

17.8.4 Ventilation Schedule – Nurses Block B:

Reference	*Location*	*Description*	*Make & Model no.*	*Duty*	*Quantity*
EF-01	Block B	Wall/window mounted extract fan	Vortice Vario ARI LLs 150/06	97.2 l/s EXTRACT	5
EF-02	Block B	Wall/window mounted extract fan	Vortice Vario ARI LLs 230/09	188l/s EXTRACT	5
EF-03	Block B	Wall/window mounted extract fan	Vortice Vario ARI LLs 300/12	320 L/S EXTRACT	0
EF-04	NURSES HW PLANTROOM	Plate-mounted extract fan	HYDOR HPA 350/4 CFP-350/4	720 L/S EXTRACT	1

17.8.5 Ventilation Schedule – Doctors:

Reference	*Location*	*Description*	*Make & Model no.*	*Duty*	*Quantity*
EF-04	Doctors HW plantroom	Plate-mounted extract fan	HYDOR HPA 350/4 CFP-350/4	720 L/S EXTRACT	1

17.8.6 Wall/Window-mounted extract fans shall be installed in the communal kitchens and store rooms. These fans will be controlled via the light switch.

17.8.7 Plate-mounted extract fans shall be installed in the hot water plantroom. These fans will be controlled via timers.

17.8.8 Window/wall mounted fans will be installed in the communal laundry rooms . These fans will be controlled via timers or On/Off switches.

17.8.9 The Nurses' rooms do not require mechanical ventilation as they are naturally ventilated through openable glazed windows in external walls.

17.8.10 The Doctors dwellings do not require mechanical ventilation as they are naturally ventilated through openable glazed windows in external walls.

17.8.11 A plate-mounted extract fan will also be installed in the Hot Water Plantroom at the Doctors Quarters And the Nurses Quarters

17.8.12 The contractor shall supply and install all extract fans in the positions as shown on the drawings, and all necessary equipment to ensure the necessary operation of the extraction systems.

17.8.13 All plate-mounted fans shall be encased in weather-proof housings and shall be fitted with terminal boxes, etc., suitable for such operation. The casings shall be of hot-dip galvanized mild steel and shall incorporate access panels and external lubrications using nylon tubes and grease nipples on the casings are to be fitted where applicable.

17.8.14 Weather-proof external terminal boxes shall be provided on the casings of fans fitted with standard casings that enclose the impeller and the motor completely. The motor shall be wired into the external terminal box through flexible terminal weather-proof conduit.

17.8.15 Fan capacities are specified in the Schedule of Information. All fans shall be selected to handle at least the quantity of air specified against the relevant system static pressure.

17.8.16 An electrical isolator shall be provided within one meter of the fan. The connections to the fans and isolators form part of this contract.

17.8.17 Complete units shall be statically and dynamically balanced.

17.8.18 Doors shall be fitted with door grilles, in positions as shown on the drawings.

17.8.19 The works includes all builders work (openings in walls for fans, openings in doors for door grilles and fitting of door grilles)

17.8.20 Noise levels caused by the extract fans shall not exceed 40dBA. The above noise level shall be measured at various positions in the spaces at a height of 1,2m above floor level and not less than 1,0m from walls.

18. INSPECTIONS & TESTING

18.1 Inspection

18.1.1 The Engineer shall have the authority to inspect and examine, at any time, any part of the Contract Works, or any materials intended for use in or on the Contract Works, either on the site or at any factory, workshop or other place where such parts or materials are being constructed or manufactured. Supervision shall comprise such periodic visits as the Engineer may consider necessary to inspect the Contract Works for conformity with the Contract documentation and to provide clarification and further information as necessary.

18.1.2 The Contractor shall not be liable for the cost of inspecting materials at the place of manufacture, construction or storage nor be responsible for any travelling or accommodation costs arising out of the execution of such inspection, etc.

18.2 Testing

18.2.1 The Contractor shall supply all test equipment, test facilities and everything necessary, at his cost, to perform these tests. The minimum testing and commissioning equipment that is required, is as follows:

a. Pitot tube and manometer.
b. Hot wire anemometer.
c. Crane type manometer for balancing valves.
d. Thermometer for insertion into pipe and duct pockets alongside temperature detectors.
e. Sling psychrometer.
f. Revolution counter suitable for measuring fan and motor shaft rotation.
g. Megger equipment.
h. Clamp on ammeter.Voltmeter.
i. Power factor meter.
j. Ohmmeter suitable for continuity testing.
k. Neon type ON/OFF test lamp.
l. Maximum indicating ammeter suitable for measuring peak motor starting currents.
m. Vacuum pump.
n. Thermo couple – electronic or calibrated micrometer gauge.

18.2.2 The contractor shall record all measurements taken during testing and shall do the necessary adjustments until the Engineer is satisfied with the results.

18.2.3 The Engineer shall be notified one (1) week in advance of any tests so that he may witness such tests.

18.2.4 Unless otherwise specified, the contractor will be required to perform the following tests:

18.3 Electrical Switchboards

18.3.1 A simulated functional test in the factory to ensure the correct operation of equipment, controls, interlocks and measuring circuits.

18.3.2 A 2,5 kV pressure test in the factory

18.4 Water Pipes

18.4.1 Pressure testing will be conducted on all water pipework.

18.4.2 All pipes shall be pressure tested at 1,5 times the maximum working pressure (900 kPa) at the lowest point in the system (Operating water pressure to be at 600 kPa).

18.4.3 The Contractor is to ensure that the internal pipework is clean before testing.

18.4.4 All instrumentation or other equipment which could be damaged during the pressure test, shall be removed from the pipe systems. The system shall be filled with water and all high points shall be vented at least 24 hours before the test.

18.4.5 The duration of the pressure test shall be 24 hours, after which no water leaks shall be visible and no pressure drop shall occur after corrections have been made for changes in ambient temperature during the test period.

18.4.6 Pressure tests shall be completed in sections, which adhere to the schedule as specified in this specification, prior to insulating or covering piping. If leaks are found, welded connections shall be cut out and re-welded and screwed joints shall be dismantled, cleaned and reconnected. Rectified piping shall be retested.

18.5 Pressure Vessels

18.6 Refer to the requirements set out in the Occupational Health and Safety Act of 1993. Refrigerant Piping

18.6.1 Refrigerant pipes and equipment shall be tested in terms of SABS 10147 - 2014: Code of Practice for Refrigeration and Air Conditioning Installations.

18.6.2 Equipment which has been factory tested and refrigerant charged, as well as any other equipment which could be damaged or cause personal injury by imposed pressure test, shall either be isolated or removed from the system

18.6.3 Refrigerant pipes and equipment shall be tested under vacuum at a pressure of 0,68kPa absolute, maintained for a period of one hour with the vacuum pump uncoupled. Any leaks under these conditions are not acceptable.

18.6.4 The pressure test shall be applied in two stages, before any joints are insulated or piping covered. The test gas shall be dry nitrogen. The first stage shall be at 69 kPa with every joint checked with a thick soap or colour indication solution. The test pressure and ambient temperature is to be recorded to which the system is exposed.

18.6.5 The second stage shall be tested at pressure not less than the lower of the system design operating pressure or the protecting pressure relief device with 10% increments above 690 kPa. The final pressure shall be maintained for 24 hours with the system pressure and ambient temperature recorded. Should any leaks be found, then the joints shall be removed, thoroughly cleaned and re-installed as a new joint. Joints repaired by calking, re-melting or back welding shall not be acceptable. After the necessary repairs have been done, the system shall be re-tested.

18.6.6 Following a successful pressure test, each system shall be relieved and evacuated to an absolute pressure of 300 micrometers. The ambient temperature is to be higher than 2˚C during a vacuum test. Once the desired vacuum is reached, the vacuum shall be closed and stand for 1 hour. Should the pressure rise over 500 micrometers after 1 hour, the system shall be evacuated down to 300 micrometers and left for 1 hour. The system shall not be charged until a vacuum of at least 500 micrometers is maintained for 1 hour without a vacuum line. Should any leaks occur, they are to be repaired with vacuum procedure redone.

19. COMMISSIONING AND HANDING OVER

19.1 The Contractor shall inform the Engineer within (4) weeks of his appointment, what time allocation has been allowed for commissioning purposes. This must be reflected on the Critical Path Schedule to be submitted by the Contractor.

19.2 After physical completion of the erection phase of the installations, the Engineer will issue a Defects List certifying that commissioning can proceed. Items which would not influence the commissioning process could, at the discretion of the Engineer, be attended to during commissioning stage.

19.3 The Commissioning of the entire installation shall be carried out timeously. The workshop

drawings, to be produced by the Contractor, are to be perused and approved, in principal, by the Contractor's Commissioning Engineer who is to confirm that the installation as indicated can be commissioned.

19.4 The commissioning of the installation shall be in terms of the following codes, or any other code approved by the Engineer:

(a) Refrigeration Systems:
- CIBSE: Commissioning Code: Series R: Refrigeration Systems.
- SANS 10147: 2014 Refrigerating systems, including plants associated with air-conditioning systems

(b) Control System:
- CIBSE: Commissioning Code: Series C: Automatic Controls.

(c) Water Distribution Systems:
- CIBSE: Commissioning Code: Series W: Water Distribution Systems.

19.5 The Contractor shall submit the Commissioning program to the Engineer, at least four (4) weeks prior to the commencement of commissioning.

19.6 The power connections to the various installed equipment must be energized to facilitate commissioning of the installation.

19.7 After commissioning the Engineer will issue a second Defects List (the Commissioning Defects List). All outstanding work will be recorded on this list.

19.8 After completion of all outstanding items and receipt of all manuals and drawings as recorded on the Commissioning Defects List, the Engineer will issue a works completion Certificate. This certificate will accompany a certificate of acceptance by the Client's representative.

19.9 The one year maintenance and guarantee period will commence on the date of the works completion Certificate.

20. TRAINING

20.1 The Contractor shall provide a suitably qualified and trained person to train the Employer's staff in the correct operation and maintenance of the hot water installations and ventilation installations. The Contractor shall allow for this person to be full time on site as called for in the maintenance contract conditions.

21. OPERATING AND MAINTENANCE MANUAL

21.1 The contractor shall, at his cost, prepare and supply Operating & Maintenance manuals for the successful operation and maintenance of the installation.

21.2 Six weeks prior to the commencement of commissioning, the contractor shall supply a draft of the manual to the Engineer for approval. Two weeks after commissioning, the Contractor shall supply four (4) additional manuals and one (1) electronic manual scanned on a disk, which have been updated and included all commissioning data and "record" drawings.

21.3 These manuals shall contain the following information:

INDEX OF CONTENTS

SECTION 1: SYSTEM DESCRIPTION

- A comprehensive description of the installation.

SECTION 2: OPERATING INSTRUCTIONS

- Starting and stopping instructions.
- Pre-start checks.
- Equipment running checks.

SECTION 3: MECHANICAL EQUIPMENT

The following information shall be provided in full for each item of equipment:

- General information: Description, Make, Model Number, Name and Address of Supplier, Manufacturer, etc.
- Design information: Design Data Sheet containing all design and selection parameters, calculations, selection curves, etc.
- Settings and values recorded during commissioning.
- Manufacturer's Brochures and Pamphlets.
- Maintenance Data and Schedules
- Maintenance programme showing the lapse of time between services and the description of the service required of each part, lubrication requirements, etc.
- Schedule of Spares.

22. MAINTENANCE DURING THE GUARANTEE PERIOD

22.1 Guarantee

22.1.1 The contractor shall guarantee the materials, equipment and labour performed on the complete hot water and ventilation installations, as described in this document, for a period of twelve calendar months, commencing on the date of the Clients Certificate of Acceptance.

22.1.2 The guarantee shall include the free of charge replacement of any defective components of the installed equipment during this period.

22.2 Maintenance

22.2.1 During the guarantee period, the Contractor shall be fully responsible for complete maintenance of the installations as per the equipment manufacturer's requirements. This maintenance shall commence on the date when the Engineers Certificate and the Clients Certificate of Acceptance is issued and shall expire one calendar year later.

22.2.2 Maintenance of the installation shall mean the regular servicing, lubrication, repairing, cleaning and adjustment of all the installed equipment, as well as the free of charge replacement of any defective components of the new installed equipment during the guarantee period.

22.2.3 As part of the final hand over, the contractor is to submit all maintenance log-sheets for the maintenance carried out during the 12 Maintenance Period.

23. STATUTORY AND REGULATORY REQUIREMENTS

23.1 The installations shall be designed, erected, commissioned and maintained in compliance with the following appropriate regulations as specified in the Standard and Technical Specification.

23.2 In addition, the contractor shall exempt the Employer from all losses, costs or expenditures which may arise as a result of the Contractor's negligence to comply with the requirements of the regulations enumerated in this Clause.

23.3 It shall be assumed that the Contractor is conversant with the abovementioned requirements. Should any requirement, by-law or regulation, which contradicts the requirements of this Document, apply or become applicable during erection of the installation, such requirements, bye-law or regulation shall overrule this document and the contractor shall immediately inform the Engineer of such a contradiction.

23.4 Under the circumstances shall the Contractor carry out any variations to the installations in terms of such contradictions without obtaining the written permission to do so from the Engineer.

24. ARRANGEMENTS WITH THE SUPPLY AUTHORITY

24.1 It shall be the responsibility of the Contractor to make the necessary arrangements at his own cost with any Statutory Authority and to supply the labour, equipment and means to inspect, test, commission and to hand over the installation.

24.2 The Contractor shall supply and install all notices and warning signs that are required by the appropriate laws or regulations and/or by these documents.

25. NOISE AND VIBRATION CONTROL

25.1 The plant shall be as noise and vibration free as possible.

25.2 The Contractor shall take special care in this respect and must allow for all the items necessary to ensure that the sound levels as specified in the specification are not exceeded as a result of the noise and vibration created by the installations

25.3 All equipment creating vibrations shall be installed on vibration damping mountings to prevent transmission of vibrations to the surrounding structure. The method of installation and the number of mountings required shall be strictly in accordance with the manufacturer's instructions. Mechanical equipment, piping, etc. shall be mounted on or suspended from approved and specified foundations or supports. Floor mounted equipment shall be erected on a 100mm high reinforced concrete base or as detailed on the drawings. Where vibration isolation equipment is used, the bases shall be extended to support the isolation system.

25.4 All steel parts shall be hot-dip galvanized, and bolts shall be cadmium plated and all springs shall be cadmium plated and NEOPRENE - coated.

25.5 All noise and vibration control equipment must be clearly shown on the Contractor's drawings which are to be submitted for approval.

25.6 Noise levels specified below may be amended in the supplementary specification if a specific part of the contract works so requires. This shall not however relieve the Contractor of the responsibility of meeting the requirements of the above clauses as far as the remainder of the contract work is concerned.

25.7 The Contractor shall submit noise estimating sheets for all systems as well the insertion loss ratings of sound attenuators for approval before ordering. Failure to do so may result in additional costs to the Contractor if noise levels in any area should exceed the specified limits.

25.8 If the noise levels exceed the values specified above, the Contractor shall be responsible to carry out all the necessary rectifications at his own expense.

25.9 Double deflection "Neoprene"-in-Shear Mountings

Double deflection NEOPRENE- in shear mountings shall have a minimum static deflection of 10mm. The mountings shall each consist of a steel top plate and base plate completely embedded in coded NEOPRENE for easy identification of rated load capacity. The mountings shall be molded with a non- skid ribbed construction on the top plate and base plate. All mountings shall be equipped with bolt holes in the base plate and tapped holes in the top plate so that may be bolted to the floor and the equipment.

25.10 Steel Spring Mountings

Steel spring vibration mountings shall consist of cast telescopic housing containing one or more steel springs of 50mm minimum diameter as the isolation medium. They shall have built-in leveling bolts, resilient inserts to act as guides for the upper and lower housings and shall incorporate 6mm thick ribbed NEOPRENE - acoustical pads bonded to the top and bottom. All mountings shall have bolt holes in the base plate. Horizontal and vertical spring constants shall be equal to ensure mounting stability. All mountings shall have an additional 50% capacity beyond the rated load. Mountings used on equipment likely to undergo mass changes (i.e. cooling towers or boilers when being drained) shall incorporate a resilient vertical limit stop to prevent spring extension. A minimum clearance of 12mm shall be maintained between the steel springs and the limit stop housings, and around the restraining bolts so as not to interfere with normal spring performance.

25.11 Steel Spring Hangers

Steel spring hangers shall consist of a steel spring in combination with a NEOPRENE-inshear element. The minimum total deflection shall be 32mm.

25.12 Double Deflection "NEOPRENE"-in-Shear Hangers

25.13 Double deflection NEOPRENE-in-shear hangers shall have a minimum static deflection of 10mm. The elements shall be of molded 'neoprene' and shall be coded for easy identification of rated load capacity.

25.14 Flexible Connectors located in Pipework

Flexible connectors shall be of molded neoprene, nylon reinforced construction. The connectors shall be of the "twin-sphere" type as detailed on the drawings. Flexible connectors shall be located in the following positions: 1. Pump connections 2. Chiller connections 3. Cooling Tower connections The connectors shall be oil, weather and ozone resistant. They shall be complete with loose flanges and able to be installed without gaskets. The connectors shall have a rated working pressure and temperature suitable for the operating conditions. Connectors shall be installed having axial alignment with the connecting flanges, and shall not be bent, stretched, compressed or subject to torsional forces. They shall, at all times, be installed in accordance with the manufacturer's instructions.

26. PAINTING

26.1 Unless otherwise specified, the contractor shall be responsible for the painting of the complete Installation.

26.2 The contractor shall be responsible for the painting of all pipework and pipe supports in

accordance with this specification.

26.3 The colours and colour coding shall be to the details and specification as issued by the engineer, the architect and / or the client. The colour schedule is to be determined and finalized prior to commencing with the painting.

26.4 All surfaces to be painted shall be clean and dry and shall be free from oil or grease. The cleaning and preparation of surfaces, the application and type of undercoats and paints, shall be in accordance with the prescriptions and specifications, applicable to the specific material and surface, of an approved paint manufacturer and of this section of the specification which shall take priority. All steel surfaces shall be prepared according to SABS 064 Code for Preparation of Steel Surfaces for Painting.

26.5 During painting, the contractor shall ensure that all the necessary fire prevention and firefighting precautions have been taken.

26.6 Name plates, labels and notices on equipment shall not be painted.

26.7 The Contractor shall adequately protect the painted surfaces of all equipment which have been pre-painted in the factory, since such equipment will have to be repainted “in total” if the Engineer is not satisfied with the paint surfaces during the final inspection.

26.8 All galvanized surfaces shall be thoroughly degreased. In the case where detergent is used, the surface shall be well rinsed and dried. It shall then be painted with one coat of wash primer (self-etch primer) to SABS 723. When dry, the surface shall be painted with one undercoat to SABS 681, Type 11 and one coat high gloss enamel paint to SABS 630m, Grade 1 as top coat. Exposed and unlagged galvanised piping shall be painted with one coat wash primer (selfetch primer) to SABS 723 followed by one undercoat to SABS 681, Type 11 and one coat high gloss enamel paint to SABS 630, Grade 1 as top coat. Un-lagged black piping, flat iron, angle iron, rods etc. for supports, brackets, frames, duct stiffeners etc., shall be painted on all sides with a zinc chromate primer to SABS 679 type 1, followed by two coats of enamel paint to SABS 630, Grade 1. Only a very high standard of painting and finish is required for this project.

27. CODING, LABELLING AND NOTICES

27.1 General

27.1.1 The Contractor shall supply and install all coding, labelling and notices as required under this Clause.

27.1.2 The wording shall be in English.

27.1.3 To reduce the possibility of incorrect labels and/or notices, the Contractor shall submit a schedule of labels and notices to the principal agent for approval. Costs to rectify inscriptions, resulting from the failure by the Contractor to obtain approval, will be for his account.

27.2 Coding

27.2.1 Codes and numbers for wiring shall be CRITCHLEY IZ-type, or other approved, Cable Marker interlocking endless expanding markers, as supplied by CABLE ACCESSORIES (PTY) LTD. CRITCHLEY C-type, or other approved, Cable Markers shall only be used with the approval of the Engineer where wires and piping have already been terminated.

27.2.2 Lettering shall be marked in black on a white background.

27.2.3 Provide and install the following coding:

- Numbering of both ends of power and control conductors in switchboards.
- Numbering of both ends of field cables.
- Numbering of both ends of individual field conductors within cables of control circuits only, where such conductors are not uniquely identified by means of insulation colour codes.

27.3 Labelling

27.3.1 Labelling shall be CRITCHLEY UNILABEL, or other approved, Cable Marker, as supplied by CABLE ACCESSORIES, or engraved “IVORENE” or “TRAFOLITE” labels.

27.3.2 Black letters on a white background shall be used.

27.3.3 Labels shall be fixed with screws or acceptably glued to all equipment.

27.3.4 All mechanical, electrical and instrumentation equipment shall be identified by means of an equipment code. Minimum height of letters: 10mm.

28. DRAWINGS

The following Tender drawings form part of the specifications:

28.1 Doctors – Hot water

Drawing Number	Description	Revision
DOH.1-T-DOC/HW-01	DOCTORS - Hot water: lower ground floor plan	0
DOC.1-T-DOC/HW-02	DOCTORS - Hot water Schematic	0

28.2 Nurses – Hot water

Drawing Number	Description	Revision
DOH.1-T-NUR/HW-01	NURSES - Hot water: lower ground floor plan	0
DOH.1-T-NUR/HW-02	NURSES Hot water schematic	0

28.3 Nurses – Ventilation

Drawing Number	Description	Revision
DOH.1-T-NUR/HVAC-01	HVAC: Ground Floor Plan	0
DOH.1-T-NUR/HVAC-02	HVAC: Typical Floor Plan (1st to 4th)	0

GREYS HOSPITAL: DOCTORS & NURSES RESIDENCE RENOVATIONS

VENTILATION & HOT WATER INSTALLATION

SCHEDULE OF INFORMATION FOR EQUIPMENT OFFERED BY TENDERER

The Tenderer shall complete the schedules of information below for the equipment to be offered in the contract. This information shall be completed and submitted together with tender documents at tender closure.
Equipment shall be deemed to comply with the Specification.

1. Hot Water Vessel Schedule – Doctors:

Reference	*Make*	*Model*	*Description*	*Capacity*
Hot Water Tank 02	*n/a*	*n/a*	*On-site*	*n/a*

2. Hot Water Vessel Schedule – Nurses:

Reference	*Make*	*Model no.*	*Description*	*Capacity*
Hot Water Tank 02	*n/a*	*n/a*	*On site*	*n/a*

3. Heatpump Schedule – Doctors:

Reference	*Make*	*Model no.*	*Description*	*Heating Capacity*
HP-01, 02,			*One heat pump on-site and not installed, two to be supplied delivered and installed*	

4. Heatpump Schedule – Nurses:

Reference	*Make*	*Model no.*	*Description*	*Heating Capacity*
HP-01, 02, 03	*n/a*	*n/a*	*On-site*	*n/a*

1.1 Circulating Pump Schedule – Doctors:

Reference	*Make*	*Model no.*	*Description*		*Duty*
HPCP-01, 02, 03	n/a	n/a	n/a	On site, partially installed	n/a
HWRP-01, 02	n/a	n/a	n/a	On Site, not installed	n/a

5. Circulating Pump Schedule – Nurses:

Reference	*Make*	*Model no.*	*Description*	*Duty*
HPCP-01, 02, 03	*n/a*	*n/a*	*On-site*	*n/a*
HWRP-01, 02	*n/a*	*n/a*	*n/a*	*n/a*

6. Ventilation Schedule – Nurses Block A:

Reference	*Make*	*Model no.*	*Description*	*Duty*	*Quantity*
EF-01					
EF-03					
EF-04					

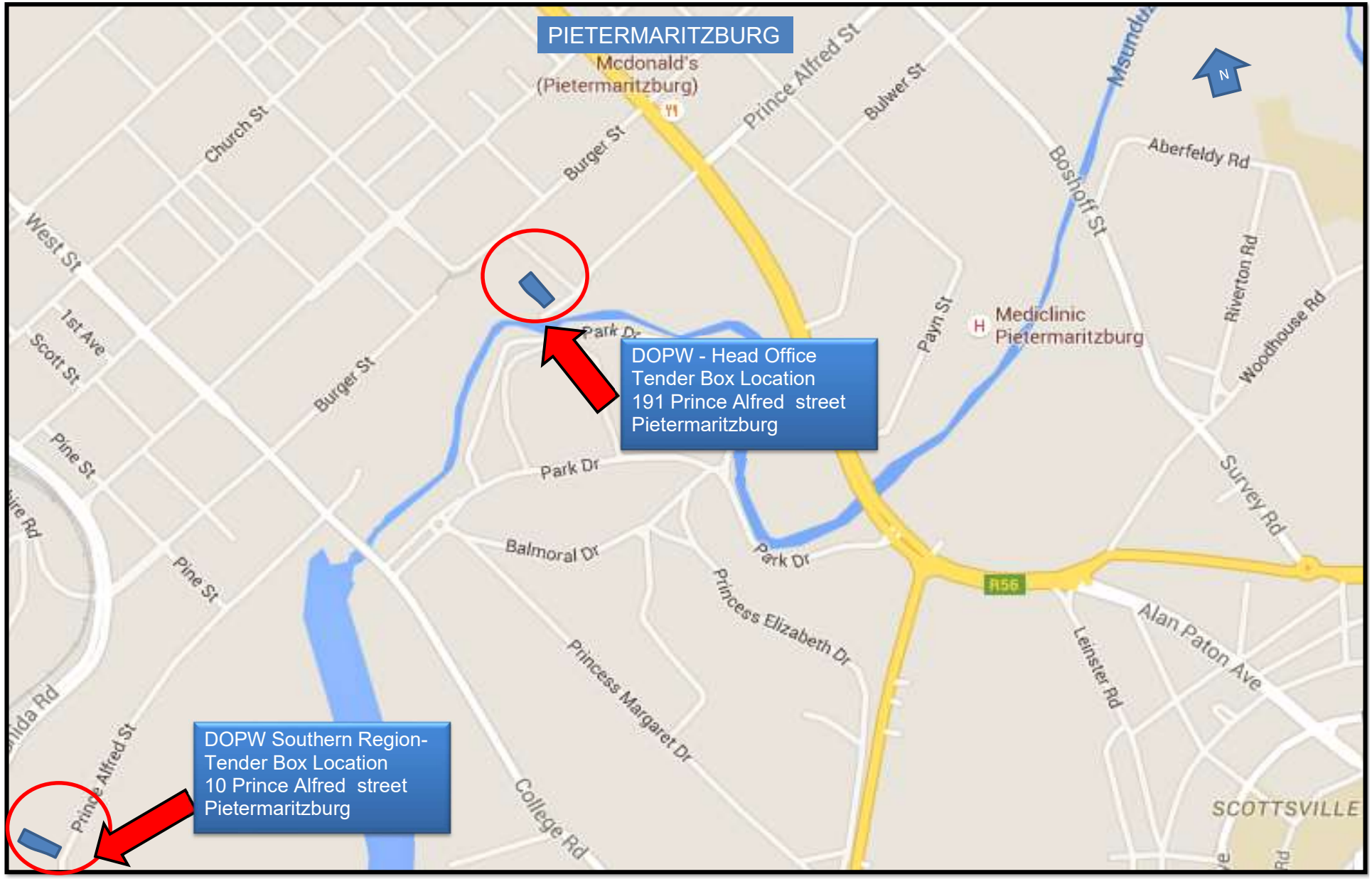
7. Ventilation Schedule – Nurses Block B:

Reference	*Make*	*Model no.*	*Description*	*Duty*	*Quantity*
EF-01					
EF-02					
EF-03					
EF-04					

8. Ventilation Schedule – Doctors:

Reference	*Make*	*Model no.*	*Description*	*Duty*	*Quantity*

EF-04					


PIETERMARITZBURG
Mcdonald's
(Pietermaritzburg)
Church St
Burger St
Prince Alfred St
Bulwer St
Msunduzi
N
Aberfeldy Rd
Boshoff St
West St
1st Ave
Scott St
Burger St
Payn St
Mediclinic
Pietermaritzburg
Riverton Rd
Woodhouse Rd
DOPW - Head Office
Tender Box Location
191 Prince Alfred street
Pietermaritzburg
Park Dr
Pine St
Survey Rd
Balmoral Dr
Park Dr
R56
Princess Elizabeth Dr
Alan Paton Ave
Leinster Rd
Princess Margaret Dr
DOPW Southern Region-
Tender Box Location
10 Prince Alfred street
Pietermaritzburg
College Rd
SCOTTSVILLE

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Annexure 5

Joint Venture Agreement

(March 2004)

(First Edition of CIDB document 1017)

1. **PREAMBLE**

This agreement is made and entered into by and between

_____

_____

_____

of the first part and

_____

_____

_____

of the second part and

_____

_____

_____

of the third part.

(allow for additional parties as necessary).

Whereas the foregoing parties have resolved to form a Joint Venture under the title of

_____

_____

_____

for the exclusive purposes of securing and/or executing the Contract to be awarded by

(name of Employer)

to the KZN Department of Public Works in respect of the following project:

for *(brief description of Contract)*

DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT

Now it is hereby agreed as follows :

2. DEFINITIONS AND INTERPRETATION

2.1 Definitions

The following words and expressions shall have the meanings indicated, except where the context otherwise requires. Defined terms and words are, in general, signified in the text of the Agreement by the use of capital initial letters, but the absence of such letters does not necessarily signify that a term, or word, is not defined.

'Agreement' means the agreement between the Members of the Joint Venture and includes this model form of agreement together with the Preamble, Specific Provisions, if any, Schedules 'A', 'B' and 'C' and any relevant Documents prepared prior to the signing of the Agreement and appended thereto.

'Contract' means the contract with the Employer for the supply of the Deliverables, for the purposes of securing and executing which, the Joint Venture has been formed.

'Deliverables' means the works and/or services, equipment, materials, goods, etc. to be furnished by the Joint Venture to the Employer in terms of the Contract.

'Document' means any written, drawn, typed, printed, or photographic material, which relates to the Agreement.

'Employer' means the person, or body, which is to award the Contract and will employ the Joint Venture if it is awarded the Contract.

'Joint Venture' means the joint venture formed by the Members in accordance with the Agreement.

'Management Committee' means the body established in terms of the Agreement to manage all aspects of the work of the Joint Venture in securing and executing the Contract and in meeting the provisions for the Agreement.

'Member' means a person, or body which, being a party to the Agreement, is a member of the Joint Venture.

'Member's Interest' means the proportion expressed as a percentage, which the total monetary value of all resources provided and contributions made by a Member towards the execution by the Joint Venture of the Contract bears to the total of such values by all Members and, unless otherwise indicated in the Agreement, represents the extent to which the Member participates in the fortunes of the Joint Venture.

'Representative' means the person representing a Member on the Management Committee.

'Schedules' means Schedules 'A', 'B' and 'C' which set out general, financial and other information relating to the Members and the obligations, duties, rights, risks and benefits arising from their participation in the Joint Venture.

'Specific Provisions' means the variations, if any, required to this standard form of agreement for the specific purposes of the Agreement.

2.2 Interpretation

Unless inconsistent with the context, an expression in the Agreement which denotes:

- any gender shall include the other genders
- a natural person shall include a juristic person and vice versa
- the singular shall include the plural and vice versa

2.3 Headings

The headings to clauses of the Agreement shall not be considered part thereof, nor shall the words they contain be taken into account in the interpretation of any clause.

2.4 Law

The Agreement shall be construed in accordance with and governed by the laws of the Republic of South Africa and the English language versions shall prevail.

2.5 Language

English shall be exclusively used by the Members in the preparation of Documents unless otherwise indicated.

2.6 Conflict between Agreement and Contract

Should any provision of the Agreement be in conflict with the terms of the Contract, the Agreement shall be amended to the approval of the Management Committee so as to eliminate the conflict.

3. JOINT VENTURE GENERAL

3.1 Establishment and Purpose

The Joint Venture established by the Members in terms of the Agreement is an unincorporated association with the exclusive purposes of securing and executing the Contract for the benefit of the Members.

3.2 Termination

The operation of the Joint Venture and the validity of the Agreement shall terminate if and when it becomes evident that the Joint Venture will not be awarded the Contract, or, if the Joint Venture secures the Contract, when all obligations and rights of the Joint Venture and the Members in connection with the Contract and the Agreement have ceased and/or been satisfactorily discharged.

Unless otherwise decided by the Management Committee, the Agreement shall not terminate if a Member changes its name, or is taken over by, or merged with, another body.

This agreement will terminate when any one of the Members resigns, are liquidated or opts out of this agreement and the Joint Venture will be in breach of contract with the Employer and their contract could be cancelled.

3.3 Exclusivity

Unless otherwise agreed by the Management Committee, or provided for in the Contract no Member shall engage in any activity related to the Contract other than as a Member of the Joint Venture and Members shall ensure that their subsidiaries and other bodies over which they have control comply with this requirement.

3.4 Participation of Members

Except as may otherwise be stipulated in the Agreement, each Member shall be responsible for all costs incurred by it prior to the date of inception of the Agreement.

Subsequent to the date of inception of the Agreement, each Member shall, participate in the operations, risks, responsibilities and fortunes of the Joint Venture including, inter alia, the provision of funding, sureties, guarantees, insurances, human and other resources and participation in profits and losses to the extents indicated in the Schedules. Participation in any aspect not covered in the Schedules shall, if an agreement cannot be reached between the Members, be to the same extents as indicated by the Members Interests.

3.5 Management

The affairs of the Joint Venture shall be directed and controlled by the Management Committee, as set out in Section 4 hereof.

3.6 Confidentiality

All matters relating to the Agreement and the Contract shall be treated by the Members as confidential and no such matter shall be disclosed to any third party without the prior written approval of the Management Committee.

No Member shall be party to the dissemination of publicity relating to the Contract, or the Agreement, without the prior written approval of the Management Committee and the Employer.

3.7 Assignment

No Member shall cede, assign, or in any other way make over any of its rights, or obligations, under the Agreement without the prior written consent of the Management Committee.

3.8 Subcontracting

No Member shall subcontract any obligation, work or duty for which it is, itself, responsible in terms of the Agreement without the prior written consent of the Management Committee.

3.9 Variations to Agreement

No variation, modification, or waiver of any part of the Agreement shall be of any force, or effect, unless unanimously agreed by the Members and reduced to writing.

3.10 Liability

Each Member warrants that it will indemnify the other Members against all legal liabilities arising out of, or in connection with the performance of its obligations under the Agreement.

It is acknowledged by the Members that they may be held jointly and severally liable in respect of claims against the Joint Venture by the Employer or third parties.

4. MANAGEMENT OF JOINT VENTURE

4.1 General

The affairs of the Joint Venture shall be directed, controlled and managed by the Management Committee, which, within the terms of the Agreement and the Contract, shall have full authority to bind the Members in all matters relating to the affairs of the Joint Venture.

Communication between the Joint Venture and the Employer, or third parties, relating to the Contract shall be conducted exclusively by the Management Committee, or by such person as it may delegate to perform this function.

The Management Committee shall have the power to appoint a project manager and/or such other persons as it may see fit to appoint for the purpose of executing the Contract and may delegate such of its powers, responsibilities and duties as it may consider necessary, or desirable, to persons or bodies appointed or seconded for this purpose.

Such administrative functions as are necessary to ensure the effective operation of the Management Committee shall be performed by its chairman.

4.2 Management Committee

4.2.1 *Composition*

The Management Committee shall, unless otherwise agreed by all the Members, consist of one Representative of each Member and each Member shall be obliged, at all times, to maintain a Representative on the Management Committee.

Each member shall, not later than three working days after the signing of the Agreement, appoint its Representative and notify the other Members of the name and contact details of the Representative. Such Representative shall have the power to bind the Member that he represents in all matters relating to the execution of the Contract and the performance of the Agreement.

A Member shall be entitled, after giving the other Members not less than three working days written notice of his intention to do so, appoint, remove and/or replace, an alternate who shall, at any meeting of the Management Committee from which the Representative whom he represents is absent, be vested with all rights and powers and subjected to all the obligations of the absent Representative.

The chairman of the Management Committee shall be the Representative of the Member which has the largest Member's Interest. If two, or more, Members have the same, largest Member's Interest, the chairmanship shall rotate between the Representatives of such Members at three monthly intervals, the order of rotation to be determined by ballot.

Notwithstanding the foregoing, the chairmanship of the Management Committee may be determined, or changed, at any time by unanimous decision of the Management Committee.

No remuneration shall be paid by the Joint Venture to Representatives or their alternates for serving on the Management

4.2.2 *Meetings*

Meetings of the Management Committee shall take place at such times and places as the Management Committee may determine, provided that the chairman shall convene a meeting of the Management Committee to be held not later than ten working days after he has been requested, in writing, by a Member to do so. Not less than five working days written notice of any meeting of the Management Committee shall be given to all Representatives and their alternates.

The Management Committee may permit, or invite, persons other than Representatives or alternates to attend any of its meetings, but such persons shall not have voting rights.

4.2.3 *Decisions*

Each Representative shall have one vote on the Management Committee and where, in terms of this clause, a casting vote is required, this shall be exercised by the chairman.

All decisions of the Management Committee shall, desirably, be unanimous. Accordingly, if unanimity cannot, initially, be achieved in regard to a decision, the meeting at which that decision is sought shall be adjourned for a period of 48 hours to enable Representatives to consult with their principals. If, on resumption of the adjourned meeting, unanimity can still not be achieved, the decision, provided it is not one requiring unanimity of the Members, shall be taken by majority vote and, in the event of a tie, the chairman shall exercise a casting vote.

A Member not satisfied with a majority decision of the Management Committee may declare a dispute, to be dealt with in terms of Clause 8 hereof, but the majority decision shall, nevertheless, be implemented with immediate effect.

Decisions of the Management Committee, whether taken at a meeting, or otherwise, shall be recorded in written minutes, which shall be distributed by the chairman to reach the Representatives not later than five working days after those decisions were taken. Such minutes shall be deemed to have been affirmed by the Representatives unless written notice of dissent is received by the chairman not later than three working days after receipt of the minutes by the Representative.

4.2.4 Powers and duties

The functions, responsibilities and powers of the Management Committee shall include, inter alia, those listed below:

4.2.4.1 Formulating overall policy in regard to the achievement of the objectives of the Joint Venture.

4.2.4.2 Managing the day to day affairs of the Joint Venture.

4.2.4.3 Monitoring, directing and co-ordinating the activities of the Members to ensure that the objectives of the Joint Venture are achieved and that the obligations and responsibilities of the individual Members are met.

4.2.4.4 Monitoring and controlling the financial affairs of the Joint Venture and ensuring that proper books of account and financial records relating to affairs of the Joint Venture are maintained in an approved form and submitted to the Management Committee for approval at regular intervals, which shall not be longer than one month.

4.2.4.5 Determining the necessity for and the details of any changes in the duties and responsibilities of Members provided that any resulting changes in Members' Interests shall be unanimously approved by the Members.

4.2.4.6 Determining the terms and conditions of employment of personnel and the emoluments applicable to staff seconded to the Joint Venture by the Members.

4.2.4.7 Controlling and approving the appointment of all subcontractors.

4.2.4.8 Procuring, after the completion of the Contract and the release of all bonds, guarantees and sureties given in respect of the performances of the Joint Venture and the Members, the preparation and auditing of a final set of accounts, on the basis of which the final profits, or losses, attributable to the individual Members shall be determined and any necessary adjustments effected.

5 RESOURCES OF JOINT VENTURE

The resources to be utilised by the Joint Venture in securing and executing the Contract shall, insofar as these are to be provided directly by the Members, be as set out in the Schedules and may, from time to time, be amended by decision of the Management Committee, provided that the Member's Interests are not, except with the unanimous approval of the Members, affected thereby.

Similarly, specific areas of responsibility of the Members for the performance of work and the provision of facilities shall be as set out in the Schedules and may, from time to time, be amended by decision of the Management Committee, provided that the Members' Interest are not, except with the unanimous approval of the Members, affected thereby.

5.1 Schedule 'A' (General)

Schedule 'A' shall contain general information relating to the Joint Venture including, inter alia, the following :

1. The Employer's name and address.
2. A brief description of the Contract and the Deliverables.
3. The name, physical address, communications addresses and domicilium citandi et executandi of each Member and of the Joint Venture.
4. The Members' Interests.
5. A statement indicating whether, or not, Specific Provisions apply to the Agreement.
6. A schedule of insurance policies which must be taken out by the Joint Venture and by the individual Members.
7. A Schedule of sureties, indemnities and guarantees that must be furnished by the Joint Venture and by the individual Members.
8. Details of the persons, who, in the event of failure by the Members to reach agreement on the appointments of mediator and arbitrator, will nominate appointees to these positions in terms of Clauses 8.2 and 8.3.

5.2 Schedule 'B' (Financial)

Schedule 'B' shall contain information regarding the financial affairs of the Joint Venture including, inter alia, the following :

1. The working capital required by the Joint Venture and the extent to which and manner whereby this will be provided and/or guaranteed by the individual Members from time to time.
2. The banking accounts that are to be opened in the name of the Joint Venture and the manner in which these are to be operated.
3. The rates of interest that will be applicable to amounts by which Members are in debit, or credit, to the Joint Venture.
4. The names of the auditors and others, if any, who will provide auditing and accounting services to the Joint Venture.
5. The intervals at which interim financial accounts and forecasts will be prepared for approval by the Management Committee.
6. Insofar as not covered in Schedule 'C', the basis on which contributions of various types by the Members towards the work of the Joint Venture in securing, executing, managing and satisfactorily completing the Contract, will be valued.
7. The basis on which profits and/or surplus cash will, if available from time to time, be distributed to Members.
8. The basis upon which losses, if any, are to be apportioned to Members.

5.3 Schedule 'C' (Contributions by Members)

Schedule 'C' shall set out the contributions of various types, other than cash, that will be made by the individual Members towards the work and obligations of the Joint Venture and shall, as far as possible, indicate the monetary values to be placed on such contributions, which may include, inter alia, the following :

1. Staff seconded to the Joint Venture.
2. Work carried out and services provided to, or on behalf of, the Joint Venture.
3. Plant, equipment, facilities etc. made available for use by the Joint Venture.
4. Materials and goods supplied to, or on behalf of, the Joint Venture.
5. Licences, sureties, guarantees and indemnities furnished to, or on behalf of, the Joint Venture.
6. Joint Venture Disclosure form required for the Contract.

6. BREACH OF AGREEMENT

If a Member breaches any material provision of the Agreement, or delays or fails to fulfil its obligations in whole, or in part, and does not remedy the situation within fourteen calendar days of receipt of notice from the Management Committee, or another Member, to do so, the other Members shall have the right, without prejudice to any other rights arising from the default, to summarily terminate the Agreement and re-assign the defaulting Member's rights and obligations in the Joint Venture as they see fit and withhold any moneys due to the defaulting member by the Joint Venture.

Each Member shall indemnify the other Members against all losses, costs and claims which may arise against them in the event of the Agreement being terminated as a result of breach of the Agreement by the said Member.

7. INSOLVENCY OF MEMBER

Should a Member be placed in liquidation, or under judicial management, whether provisionally or finally, or propose any compromise with its creditors, the other Members shall be entitled to proceed in terms of Clause 6, as if the Member had breached the Agreement.

8. DISPUTES

8.1 Settlement

The Members shall negotiate in good faith and make every effort to settle any dispute, or claim, that may arise out of, or relate to, the Agreement.

If agreement cannot be reached, an aggrieved Member shall, if he intends to proceed further in terms of Clause 8.2 hereof, advise all other Members in writing that negotiations have failed and that he intends to refer the matter to mediation in terms of Clause 8.2.

8.2 Mediation

Not earlier than ten working days after having advised the other Members, in terms of Clause 8.1, that negotiations in regard to a dispute have failed, an aggrieved Member may require that the dispute be referred, without legal representation, to mediation by a single mediator.

The mediator shall be selected by agreement between the Members, or, failing such agreement, by the person named for this purpose in Schedule 'A'. The costs of the mediation shall be borne equally by all Members.

The mediator shall convene a hearing of the Members and may hold separate discussions with any Member and shall assist the Members in reaching a mutually acceptable settlement of their differences through means of reconciliation, interpretation, clarification, suggestion and advice. The Members shall record such agreement in writing and thereafter they shall be bound by such agreement.

The mediator is authorised to end the mediation process whenever in his opinion further efforts at mediation would not contribute to a resolution of the dispute between the Members.

8.3 Arbitration

Where a dispute or claim is not resolved by mediation, it shall be referred to arbitration by a single arbitrator to be selected by agreement between the Members or, failing agreement, to be nominated by the person named for this purpose in Schedule 'A'.

The Member requiring referral to arbitration shall notify the other Members, in writing, thereof, not later than thirty calendar days after the mediator has expressed his opinion, failing which the mediator's opinion shall be deemed to have been accepted by all Members and shall be put into effect.

Arbitration shall be conducted in accordance with the provisions of the Arbitration Act No. 42 of 1965, as amended, and in accordance with such procedure as may be agreed by the Members or, failing such agreement, in accordance with the rules for the Conduct of Arbitrations published by the Association of Arbitrators and current at the date that the arbitrator is appointed.

The decisions of the arbitrator shall be final and binding on the Members, shall be carried into immediate effect and, if necessary, be made an order of any court of competent jurisdiction.

9. DOMICILIUM

The Members choose domicilium citandi et executandi for all purposes of and in connection with the Agreement as stated in Schedule 'A'. A Member shall be entitled to change his domicilium from time to time, but such change shall be effective only on receipt of written notice of the change by all other Members.

Member No. 1

Thus done and signed at _____ this _____ day of _____20___

For and on behalf of_____*[Company]*

by *[name]* _____ who warrants his authority to do so.

_____

As witnesses 1. _____ As witnesses 2. _____

Member No. 2

Thus done and signed at _____ this _____ day of _____20___

For and on behalf of_____*[Company]*

by *[name]* _____ who warrants his authority to do so.

_____

As witnesses 1. _____ As witnesses 2. _____

Member No. 3

Thus done and signed at _____ this _____ day of _____20___

For and on behalf of_____*[Company]*

by *[name]* _____ who warrants his authority to do so.

_____

As witnesses 1. _____ As witnesses 2. _____

[Allow for additional parties as necessary].

REFERENCE NR	053651
Revision	2
Date	May 2025

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Occupational Health and Safety Specification

(OHSE SPEC)

Project Name : **DOH: GREY'S HOSPITAL: RENOVATIONS AND UGRADE TO NURSES AND DOCTORS COMPLETION CONTRACT**

WIMS no. : 053651

Client OHS Representative : H.S Masikane

Region : Southern Region

District : Pietermaritzburg

TABLE OF CONTENTS

1. Introduction

2. Definitions

3. Scope of application

3.1. Site description

3.2. Summary of Scope of work

3.3. Project team

4. Contractual Issues

5. Administrative Requirements

5.1. Notification of Construction Work

5.2 *Application for working permit*

6. Appointment of Safety Officers

7. Covid-19 Site Management Safety Requirements

8. Annexures

i. *Annexure A – Structure of the detailed OHSE Plan*

ii. *Annexure B – Client Specific Legal Requirements*

iii. *Annexure C – OHS Declaration for Tenders*

iv. *Annexure D - Baseline Risk Assessment*

v. *Costing Template (BOQ*

1. Introduction

The *KwaZulu Natal Department of Public Works* is deemed as the "**Client"** in terms of the definitions of Construction Regulations of 2014 as published in *Government Gazette No. 37305*.The Construction Regulations of 2014 under *CR(5)(1)* stipulates that that the client must prepare a suitable, sufficiently documented and coherent site specific Occupational Health and Safety Specification for the intended construction work based on the baseline risk assessment.

The purpose of this Occupational Health and Safety Specification document (which hereinafter will be referred to as OHSE Spec) is to provide designers and the successful tenderer with essential OHS information to ensure effective safety management during the design and construction phase of the project.

This OHSE Spec forms an integral part of the contract between the Client and the Principal Contractor, so as to ensure compliance with the Occupational Health and Safety Act, Act 85 of 1993 and its applicable regulations and must serve as the basis for the Principal Contractor to develop his/her Project Safety, Health and Environmental Management Plan. As with any other plan for it to be implemented and managed effectively it requires the allocation of sufficient funds to achieve the objectives set out in the plan. In line with this requirement Construction Regulation 5(1)(g) requires the Client to ensure that the Principal Contractor has made adequate provisions for the cost of Health and Safety Measures in their tenders.

It must be noted that this OHSE Spec as much as it is detailed it is not exhaustive and the onus is on the Principal Contractors to ensure that they comply with Section 8 of the OHS Act, Act 85 of 1993 which states that "*Every Employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees*." this means that Principal Contractors as they are employers in their own right must at all times ensure continuous assessments are done for continued provision and maintenance of a healthy and safe working environment.

2. Definitions

For the purpose of the OHSE Spec, the abbreviations or definitions given hereunder shall apply and the reference to on gender will also apply to the other gender.

"CR" refers to the Construction Regulations 2014

"Agent (*Pr.CHSA***)"** means a competent person who acts as a representative for a Client in terms of regulation (5)5.

"Client" means Department of Public Works

"Competent person" means a person who-

(a) Has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable, qualifications, specific for that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualifications Framework Act, 2000 (Act No.67 of 2000), those qualifications and that training must be regarded as the required qualifications and training; and

(b) Is familiar with the OHS Act, Act 85 of 1993 and with the applicable regulations made under the Act;

"Construction Manager (*Site Agent***)"** means a competent person responsible for the management of the physical construction processes and the coordination, administration and management of resources on a construction site;

"Construction Site" means a work place where construction work is being performed;

"Construction Supervisor" means a competent person responsible for supervising construction activities on a construction site;

"Construction Vehicle" means a vehicle used as a means of conveyance for transporting persons or material, or persons and material, on and off the construction site for the purposes of performing construction work;

"Construction work" means any work in connection with –

(a) The construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure; or
(b) the construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving of earth, clearing of land, the making of excavation, piling, or any similar civil engineering structure or type of work;

"Construction Work Permit" means a document issued in terms of regulation 3 of the Construction Regulations 2014;

"Contractor" means an employer who performs construction work;

"Demolition Work" means a method to dismantle, wreck, break, pull down or knock down of a structure or part thereof by way of manual labour, machinery, or the use of explosives;

"Fall Protection Plan" means a documented plan, which includes and provides for-

(a) All risks relating to working from a fall risk position, considering the nature of work undertaken;
(b) The procedures and methods to be applied in order to eliminate the risk of falling; and
(c) A rescue plan and procedures;

"Health and Safety File" means a file, or other record containing the information in writing required by these Regulations;

"Health and Safety Plan" means a site, activity or project specific documented plan in accordance with the client's health and safety specification;

"Health and Safety Specification" means a site, activity or project specific document prepared by the client pertaining to all health and safety requirements related to construction work;

"Medical Certificate of Fitness" means a certificate contemplated in regulation 7(8) of Construction Regulations 2014;

"Principal Contractor" means an employer appointed by the client to perform construction work;

"Safety Officer" – a person deemed competent by SACPCMP under the relevant category of registration.

"Professional Engineer or Professional Certificated Engineer" means a person holding registration as either a Professional Engineer or Professional Certificated Engineer in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000);

3. Scope of Application

This OHSE Specification document stipulates the minimum Occupational Health, Safety, and Environmental requirements that the tenderer need to address in his/her OHSE Plan. This Specification also addresses legal compliance, hazard identification, risk assessment, risk control, and the promotion of a Health and Safety culture amongst those working on the project.

This Specification also makes provision for the protection of persons other than employees. **T**his OHSE Spec is exclusively applicable to the following project pending any change of scope which may necessitate changes to the OHSE Specification;

NAME OF THE INSTITUTION: DOH – GREY'S HOSPITAL – RENOVATION AND UPGRADE TO NURSES AND DOCTORS ACCOMODATION.

This OHSE Specification further seeks to achieve the following**;**

a) To provide Principal Contractors with the Structure of the Detailed OHSE Plans they will have to prepare and submit for this project. ***See Annexure A***

b) Provide the overarching framework within which the Principal Contractor is required to demonstrate compliance with certain requirements for occupational health and safety established by the Occupational Health and Safety Act, Act 85 of 1993, all applicable regulations and Client Specific Requirements. ***See Annexure B***

c) To bring to the attention of the Bidding Principal Contractors that they need to make an undertaking that the costs for executing the project includes the costs of complying with the OHS Act, Act 85 of 1993, all applicable regulations including Client Specific requirements. Such undertaking is made by appending signatures on the OHS Declaration for Tenders. ***See Annexure C***

d) Ensure that the Principal Agent as the Professional Service Provider appointed by the Department to manage the project on its behalf in terms of the Conditions of Contract applicable to this project ensures that the contents of this document and the attached Baseline Risk Assessment are taken into consideration during design by all professions appointed and that the OHSE Specification is incorporated into the tender documents. ***See Annexure D***

3.1. Site description

The site is located Pietermaritzburg – Grey's Hospital.

3.2. Summary of Scope of work

Renovation and upgrade to Nurses and Doctors' accommodation.

The Project Team is as follows:

Initials and Surname	Organisation	Discipline	Tel	Email
Priven Chowthee	DOH	Project Leader		Priven.Chowthee@kznhealth.gov.za
Gelly Masikane	DOPW	Client Health and Safety Representative	0711007366	gelly.masikane@kznworks.gov.za

4. Contractual Issues

Acceptance by the Principal Contractor of the contract with KZN DOPW shall constitute acknowledgement that the Principal Contractor has familiarised him/herself with the contents of the OHSE Spec and that he/she will comply with all its obligations in respect thereof.

Due to fact that this document is based on legislative requirements, the Client requires that all Contractors comply with the requirements of this document and all other relevant legislative requirements not covered by this document.

The Client or its duly appointed Construction H&S Agent reserves the right to stop any Principal Contractor or Sub-Contractors from working whenever Safety, Health or Environmental requirements are being violated as required by regulation 5(1)(q). Any resultant costs of such work stoppages will be for the relevant Contractor's account.

The requirements as specified by the Client in this document must not be deemed to be exhaustive and the Client reserves the right to make changes as and when the Client deems fit to address issue of OHSE Compliance.

The Client will not entertain any claim of any nature whatsoever which arises as a result of costs incurred or delays being experienced due to the Contractor not complying with the requirements of this document and/or any other applicable legislative requirements imposed on the Contractor.

5. Administrative Requirements

5.1. Notification of Construction Work

The successful tenderer must at least within 07 working days before commencing with construction work notify the Provincial Director in writing using **Annexure "2**". A copy of the notification once stamped by a DoL Official must be submitted to the client prior to commencing with construction work.

5.2. Application for a Construction Work Permit

Should the submitted tender meet the following criteria then the tenderers must ensure that they attach a certified copy of the SACPCMP Certificate or Proof of Registration for a Construction Manager/ Safety Officer together with their OHSE Plans. The criterion is as follows;

(a) Construction work will exceed 180 days;

(b) Will involve more than 1800 persons days of construction work; or

(c) The works contract is of the value equal to or exceeding thirteen million rand or CIDB level 6

The application for the Construction Work Permit Number as contemplated above shall be the responsibility of the client depending on the submission of all relevant documentation from the successful tenderer.

After the Provincial Director of Labour has issued a Construction Work Permit, the Client's or its duly appointed Construction H&S Agent will issue a letter advising the Project Leader and the Principal Agent to arrange the site hand-over meeting as all legislative requirements would have been complied with including a copy of the construction permit to work

6. Appointment of a Part time / Fulltime Safety Officer

a) The Principal Contractors will have to appoint a competent Part Time Construction H&S Officer who must be present on site at least 2 days per week.

b) Further to the abovementioned appointment, should the Client or its Representative having considered the risks present and lack of compliance to the Occupational Health and Safety Act, Act 85 of 1993 and its applicable Regulations the Client or its Representative may issue an instruction that a Full Time Construction Health and Safety Officer must be appointed, such a requirement will have to be met.

7.1. Appointment of a COVID-19 compliance officer

The Principal Contractors will have to appoint a COVID-19 compliance officer to oversee the implementation of the COVID-19 site management plan and conduct daily inspection of the work areas.

7.2. Onsite Record keeping and management requirements

Every employer (contractor) has an obligation to assist government in enabling contact tracing in the workplace. These obligation include the following measure:

- Contractors are advice to observe confidentiality of employee's details and medical results at all times.
- A register containing the details of employees, visitors and service providers that enter the site in a particular day to be kept in a secured environment only accessible to authorised personnel.
- The following details should be contained in the register, date, time (of entry and departure), name, surname, identity number, residential address, mobile number and next of kin details.
- All employees, service providers, sub-contractors, visitors and consultants must sign the register with the above details on entering the site.
- Adequately trained health and safety personnel, to perform daily workplace COVID-19 symptom screening.
- Provide compulsory medical screening equipment
- Provide prescribed personal protective equipment (PPE) to all employees onsite.
- All personnel and visitor entering the site must be temperature screened with a laser temperature scanner and records must be kept of the site register. If the temperature is above 37.3 C or more, advice the individual to stay at home, self-isolate, and observe the symptoms. They should also telephone the nearest health facility or the COVI-19 centre; provide them details of their recent travel and symptom.

8. Annexure A

Structure of the Detailed OHSE Plan

A detailed OHSE Plan is to be submitted by the successful tenderer as per section 8 above. The following are the minimum standard legal documentation that must form part of the OHSE Plan based on the risks attached in executing this project **–**

NAME OF THE INSTITUTION: DOH – GREY'S HOSPITAL – RENOVATION AND UPGRADE TO NURSES AND DOCTORS ACCOMODATION.

1. The notification to commence with construction work made to the Provincial Director of Labour using Annexure 2. (*Filled in only to be submitted on approval of the Safety Plan*)
2. Letter of Good Standing with Compensation Commissioner or Compensation insurer
3. The Contractor's Health, Safety & Environmental Policy, signed by the chief executive officer, which outlines the Contractor's OHSE compliance objectives and how they will be achieved.
4. Pre-Construction risk assessment *(Site specific)* and method statement of priority Risk as per the Risk Profile.
5. Relevant checklists and registers.
6. Site specific OHSE Organogram
7. Preliminary Induction Program
8. Environmental Management Plan
9. Public Safety Management Plan
10. Proof of competency for the following legal appointees;
    - *10.1. Construction Manager – (Detailed CV reflecting qualification, relevant experience and references from previous clients)*
    - *10.2. Construction Work Supervisor – (Detailed CV reflecting qualification, relevant experience and references from previous clients)*
    - *10.3. Construction H&S Officer – SACPCMP proof of registration*
    - *10.4. Risk Assessor – SAMTRAC or equivalent*
    - *10.5. Accident Investigator - SAMTRAC or equivalent*
    - *10.6. Fall Protection Planner – SAQA US 229994*
    - *10.7. Demolition work inspector – (Detailed CV reflecting qualification, relevant experience and references from previous clients)*
    - *10.8. Electrician – wireman's licence*

Legal appointments to be appointed	
Prior Site Handover	**After Site Handover on commencement with Construction work**
• Construction Manager • Construction Work Supervisor • Assistant Construction Work Supervisor (where applicable) • Construction H&S Officer • Risk Assessor • Fall protection Planner • COVID-19 compliance officer	• Scaffold Erectors • Scaffold Inspectors • First Aiders • Emergency co-ordinator • Fire Marshalls • Fire team members • Portable Electrical tool inspector • Hand tools inspector • Housekeeping inspector • Stacking and storage inspector • Construction Vehicle and mobile plant inspector • Traffic Controller (Flagman) • Temporary electrical installation inspector • Flammable liquids Storage Inspector • Hazardous substance storage inspector • Ladder inspector • Health and safety representatives • Accident investigator

Annexure B

Client Specific Requirements

Items	Client Specific Requirements
Site Office location	• The location of the site office should be in an area that will not require visitors to pass through or enter area where construction work is active and will not require the re-location of the office as the project progresses.
COVID-19 Site Management Plan	• Construction projects operating during the Coronavirus (COVID-19) pandemic ensure they are protecting their workforce and minimizing the risk of spread of infection. • Access control to site - All personnel and visitor entering the site must be temperature screened with a laser temperature scanner and records must be kept of the site register • Medical screening of employees and visitors to site. • The sanitization of work areas, transport for workers, facilities on site. • On site record keeping - All employees, service providers, sub-contractors, visitors and consultants must sign the register with the above details on entering the site.
Medical Certificates	• In compliance with the requirements of the Construction Regulations 2014 section 7(8) the Contractor must ensure that all of his employee's onsite have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.
Appointment of a full - time safety officer	• The Principal Contractors will have to appoint a competent full - Time Construction H&S Officer for this project.
Extreme weather conditions	• If the weather condition poses a threat to the health & safety of employees be it extreme heat, cold, lighting or any adverse weather condition appropriate safety measures have to be taken.
Change to scope of work	• Should there be changes to the original scope of work, the Principal Agent must inform appointed Construction Health and Safety Agent to effect changes to the OHSE Specification.
Safety Plan Submission	• The successful Tenderer must submit a copy of the detailed OHSE Plan for approval and keep the original for onsite use during construction. The principal Contractor will not be allowed to start site establishment before his/her SHE Plan has been approved in writing.
Bylaws	• The Principal Contractor must incorporate any aspects of the Local Municipal bylaws which affect the, Safety and Environmental wellbeing of the employees and the public into his/her OHSE Plan and ensure compliance to such bylaws.

Risk assessment for construction work	• To comply with CR(9) and to also address environmental issues • To also include exposure to hazardous gases *See the attached baseline risk assessment to be considered by both the designer and the principal contractor.*
Fall protection	• To comply with CR (10), • Edge protection and protection of floor openings need to be of such a manner as to properly protect employees from falling off elevated positions or falling into floor openings
Structures	• To comply with CR (11)
Scaffolding	• To comply with CR(16) and the following; • Scaffolding Inspectors and Scaffolding Erectors must be different individuals. • Scaffold Harness must be used on Scaffolding, normal Harnesses may not be used on scaffolding • Sufficient Scaffolding material e.g., tags, trapdoors etc. need to be on site as determined by the activities on site • Scaffold bases may not be supported by materials such as bricks and chipboard. Suitable material needs to be used as per SANS 10085
Construction vehicles and mobile plant	• To comply with CR (23) and the following;
Electrical installations and machinery on construction sites	• To comply with **CR (24)**
Use and temporary storage of flammable liquids on construction sites	• To comply with **CR (25)**
Housekeeping and general safeguarding on construction sites	• To comply with CR (27) and the following; • Contractor to designate areas for placing refuse and rubble prior to being removed from site • Contractor must implement a daily task site clean-up for all activities these should cover work areas, stairways, walkways etc. to free of any construction debris obstruction. • Refuse to be separated for recycling purposes • Hazardous materials such as asbestos may not be included in general rubble and need to be disposed of as per applicable legislative requirements

Stacking and storage on construction sites	• To comply with CR (28)
Fire precautions on construction sites	• To comply with CR (29) and the following; • No smoking may be permitted on site except in designated smoking areas
Construction employees' facilities	• To comply with CR (30) and the following; • Gender signs to be placed at appropriate locations • All welfare facilities to be kept in a hygienic condition at all times • Employees to be trained in good hygiene practices
Public Safety & Signage	• The Principal Contractor engaged in construction work must ensure that each person working on or visiting a site, and the general public in the vicinity of the construction site, shall be made aware of the dangers likely to arise from onsite activities and the precautions to be observed to avoid or minimise those dangers. • Appropriate signage shall be posted at conspicuous points within and around the perimeter of the site. The steps to comply with this requirement must be outlined in the OHSE Plan. • The public or visitors may only be permitted on site if they go through an appropriate health and safety induction detailing hazards and risks they may be exposed to and what measures are in place to control these hazards and risks • The entire project site must be secured against unauthorized access and provided with appropriate warning signage. Where roadways or walkways must be encroached or closed due to work, adequate barriers shall be installed to safely redirect the flow of vehicles and pedestrians and protect them from construction activities. • Whenever it is necessary to maintain public use of work areas (such as sidewalks, ramps, entrances to buildings, corridors, or stairways), the public shall be protected with appropriate guardrails, barricades, temporary fences, overhead protection, or temporary partitions and hoarding. The public must also be adequately protected from any work created hazards, such as excavations. Appropriate warnings, signs, warning lights and instructional safety signs shall be conspicuously posted and placed where necessary. • The public must also be protected from falling debris and objects from the project site. Overhead protection shall be provided that will fully protect the public and be capable of withstanding the maximum forces that could be applied from potential falling objects. Special attention shall also be given to developing adequate means to protect against wind-blown debris and construction-related materials.

On Site Health and Safety Training & Induction	• The Principal Contractor shall ensure that all site personnel and visitors undergo a risk-specific health & safety induction training session before starting work or being permitted to enter the site. A record of attendance shall be kept in the health & safety file. • The Principal Contractor shall ensure that, on site periodic toolbox talks take place at least once per week. These talks should deal with risks relevant to the construction work at hand. A record of attendance shall be kept in the health & safety file. The above should also cover all sub-contractors that are onsite. • All Contractors have to comply with this minimum requirement. Environmental issues to be included in toolbox talks where required.
General Record Keeping	• The Principal Contractor and all Sub Contractors must keep and maintain Health and Safety records to demonstrate compliance with this Specification, The OHS Act 85/1993; and with the Construction Regulations of 2014. The Principal Contractor shall ensure that all records of incidents/accidents, training, inspections; audits, etc. are kept in a health & safety file held in the site office, which must be present on site at all times. • The Principal Contractor must ensure that every Sub Contractor opens its own health & safety file, maintains the file and makes it available on request.
Health & Safety Audits, Monitoring and reporting	• The Client or its duly appointed Agent shall conduct monthly health & safety audits. The Principal Contractor is obligated to conduct similar audits on all Sub Contractors appointed by them at least once a month. Detailed audit reports must be presented and discussed at all levels of project management meetings and a copy of such audit will be provided to the Client or its duly appointed Agent within 7 working days of such audit. Copies of the Client's audit reports shall be kept in the Principal Contractors Health & Safety File.
Emergency Procedures	• The Principal Contractor shall submit a detailed Emergency Plan for approval by the Client prior to commencement on site. The plan shall detail the response procedure including the following key elements: 1. List of key competent personnel; 2. Details of emergency services; 3. Actions or steps to be taken in the event of the specific types of emergencies; 4. Information on hazardous material/situations.
First Aid Boxes and First Aid Equipment	• The appointed First Aider(s) to be in possession of a valid first aid training certificate Level 2. Valid certificates are to be kept in the Site Safety File. All Sub Contractors with more than 5 employees shall supply their own first aid box, except if otherwise agreed upon between Principal and Sub- Contractor in writing.
Accident / Incident Reporting and Investigation	• Injuries are to be categorised into Near miss, first aid, LTI, fatal etc. Fatal accidents to be reported in addition to applicable legislative requirements to the Client or its duly appointed Agent with immediate

	effect. The Principal Contractor must stipulate in its construction phase OHSE Plan how it will handle each of these categories. When reporting injuries to the Client, these categories shall be used. The Principal Contractor shall investigate all injuries, with a report being forwarded to the Client immediately. All Sub- Contractors have to report on the abovementioned categories of injuries to the Principal Contractor at least monthly. All categories of incidents/accidents must be in the Statistics Section of the Monthly Audit Reports, submitted to the Client or it's duly appointed Agent.
Hazards and Potential Situations	• The Principal Contractor shall immediately notify other Sub Contractors as well as the Client of any hazardous or potentially hazardous situations that may arise during performance of construction activities. • Should a hazardous situation require work stoppages, the work must be stopped and corrective steps taken such as the issue of Written Safe Work Procedures and the issue of Personal Protective Equipment.
Personal Protective Equipment (PPE) and Clothing	• The Principal Contractor must ensure that all workers are issued with the required PPE as required by the risks associated with the activities they perform .The minimum PPE to be worn on site will be Safety Shoes/Boots, Hard Hats, Overalls and reflective vests. No Visitors may enter the site without Safety Shoes/Boots and Hard hats. The Principal Contractor and all Sub Contractors shall make provision and keep adequate quantities of SABS approved PPE on site at all times. All employees issued with PPE to be trained in correct use, records of training and issue to be kept in the Site SHE File .Procedure to be in place to deal with: • 1 Lost or stolen PPE; • 2 Worn out or damaged PPE replacement. • 3. Employees not utilising PPE as required • The above procedure applies to Principal Contractors and their appointed Sub- Contractors, as they are all employers in their own right.
Permits	1) The Principal Contractor shall prepare and issue the required written permits relating to but not limited to the following: • Hot Work • Roof Work; and • Electrical work (both temporary and permanent) 2) The Principal Contractor must ensure that where permits are required that they are properly implemented and adhered to.
Speed Restrictions and Protections	Unless otherwise stipulated, the maximum speed limit on sites must be limited to 10 km/h. 1) Vehicle movement routes on site must be clearly indicated where

	applicable. 2) Signage to ensure the safe movement of vehicles on site, as well as to ensure the health and safety of all employees and visitors on site, must be displayed in strategic locations.
Hazardous Chemical Substances (HCS)	1) To comply with Hazardous Chemical Substances Regulations as published in Government Notice No. R. 1179 dated 25 August 1995. 2) In addition to the abovementioned, Material Safety Data Sheets must be kept on site for all materials, which may contain hazardous chemical substances
Fire Extinguishers and Fire Fighting Equipment	1) The Principal Contractor and Sub-Contractors must allow for and provide adequate provision of regularly serviced temporary fire fighting equipment located at strategic points on site, specific for the classes of fire likely to occur. 2) The appropriate notices and signs must be allowed for and be erected as required 3) Contractors may not utilize fire protection equipment belonging to the Client without prior consent
Ladders and Ladder Work	1) The Principal Contractor must allow for and ensure that all ladders are inspected at least monthly, are in a good safe working order, are the correct height for the task, extend at least 1m above the landing, are fastened and secured and are placed at a safe angle. 2) Records of inspections must be kept in a register on site.
General Machinery	To comply with Driven Machinery Regulations as published in Government Notice No. R. 1010 dated 18 July 2003
Portable Electrical Tools and Hand Tools	1) The Principal Contractor shall ensure that all electrical tools, electrical distribution boards, extension leads, and plugs are kept in a safe working order. 2.) The Principal Contractor shall ensure that all portable electrical Equipment, is clearly numbered, inspected by a Competent appointed person and records of such inspections to be kept on record in an appropriate register on the site SHE file 3) The Principal Contractor shall allow for and ensure the following in relation to hand Tools: That a "Competent Person" undertakes routine inspections and records are kept on site. That only authorized trained persons use the tools. That safe working procedures apply. That PPE is provided and used.
High Voltage Electrical Equipment Installations and Equipment	1) All Employees must be made aware of the presence and location of High Voltage Equipment such as underground cables and overhead lines, and ensure that the necessary precautionary steps are taken where work has to be executed in the vicinity of such

	equipment. 2) Precautionary measures such as Isolation and Lock-Out of electrical systems or the use of electrically isolated tools must be used.
Adequate Lighting	All Contractors must allow for and ensure that adequate lighting is provided to allow for work to be carried out safely.
Transportation of Workers	1) In addition to CR 23 the following will apply The Principal Contractor and Sub-Contractors shall not: • Transport persons together with goods or tools unless there is an appropriate area or section of the vehicle in which to store such goods. • Transport persons on the back of trucks except if a proper canopy (properly covering the sides and top) has been provided with suitable seating areas. • Permit workers to stand or sit on the edge of the transporting vehicle. • Transport workers in LDVs unless they are closed/covered and have the correct number of seats for the passengers • No driver may transport more than six people on the back of a 1 Ton LDV and more than four passengers on the back of a ½ Ton LDV. 2) The driver of any LDV may not permit more than two passengers to occupy the cab of any LDV. 3) Drivers of such vehicles must have a valid driver's license for the code of vehicle being driven by them. 4) No servicing of vehicles will be permitted on a Construction Site. No Vehicles or machinery leaking oil will be permitted on site due to the risk posed to the environment. 5) Any oil or diesel spilled on site must be cleaned up as per accepted environmental practice.
Driving Regulation	**In the event that Earth Moving Machinery is present on site the following must be adhered to:** • Drivers of vehicles must be instructed to avoid parking behind earth moving machinery in order to ensure that their vehicles are visible to the operators of earth moving machinery. • Right of way must be afforded to earth moving machinery at all times. • Vehicles must only be permitted to park, where possible, in designated areas
Occupational Hygiene	1) Occupational exposure is a major problem and all Contractors must ensure that proper health and hygiene measures are put in place to prevent exposure to these hazards. 2) All Contractors must prevent inhalation, ingestion and absorption of any harmful chemical or biological agents 3) Water to be utilized for drinking purposes may only be drawn from taps designated for drinking water purposes. Fire hydrants and fire hose reels may not be utilized for drinking water purposes.

Environmental Management	• The Principal Contractor and Sub-Contractors must comply with the requirements of NEMA Act. • The Principal Contractor must develop a waste management plan, implement and maintained it onsite • Cement mixing to be done at a predetermined location on site which must include a solid, slab, and bunded edges to prevent runoff • Contaminated run off water from the site must be treated such as to ensure that it does not pose a risk to the environment • Any material which may have a harmful effect when disposed of by normal means must be disposed of in an appropriate manner to eliminate its harmful effect on the environment after disposal. • The Principal Contractor must allow for and ensure that adequate procedures are implemented and maintained to ensure that waste generated is placed in suitable receptacles and removed from the site promptly. • Plans to deal with spillages must be in place and maintained. • No waste materials (liquid or solid) may be disposed of in drains. • No burning of waste material may take place on site as such material being burned may result in pollution of the air or give off toxic vapours which could be harmful to the health of employees or any other person present on site.
Alcohol and other Drugs	• No alcohol and other drugs will be allowed on site without the express permission of the Principal Contractor • No person may be under the influence of alcohol or any other drugs while on the construction site. • Any person on the construction site who is on prescription drugs must inform his/her Employer accordingly and the Employer shall in turn report this to the Principal Contractor immediately. • Any person on the construction site who is suffering from any illness/condition that may have a negative effect on his/her safety performance must report this to his/her Employer, who in turn must report this to the Principal Contractor forthwith. • Any person on the construction site who is suspected of being under the influence of alcohol or other drugs must be removed from site immediately and be instructed to report back the next day for a preliminary inquiry. A full disciplinary procedure must be followed by the Contractor concerned and a copy of the disciplinary action must be forwarded to the Principal Contractor for his records.

Annexure C

CONTRACTOR'S SAFETY, HEALTH AND ENVIRONMENTAL DECLARATION FOR TENDERS

INTRODUCTION

In terms of *Construction Regulation 5(1)(h)* of the *Construction Regulations of February 2014* a Contractor may only be appointed to perform construction work if the Client is satisfied that the Contractor has the necessary competencies and resources to carry out the work safely in accordance with the *Occupational Health and Safety Act, Act 85 of 1993* and the Construction Regulations of February 2014. In line with this requirement the Contractor is required to read through this document carefully, sign it and submit it with his/her Tender.

DECLARATION

1. I the undersigned hereby declare and confirm that I am fully conversant with the Occupational Health and Safety Act, Act 85 of 1993, the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specification attached in the tender document.

2. I hereby declare that my company and its employees has the necessary competency and resources to safely carry out the construction work under this contract in compliance with the Occupational Health and Safety Act, Act 85 of 1993,the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specification.

3. I hereby confirm that adequate provisions has been made in my tender to cover the cost of all Safety, Health and Environmental duties and responsibilities imposed on me by the Occupational Health and Safety Act, Act 85 of 1993, the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specification.

4. I confirm that I may not commence with any part of construction work under the contract until my Construction Safety, Health and Environmental Plan has been approved in writing by the Client.

5. I hereby confirm that copies of the following documentation will be kept on site for viewing and inspection purposes for the duration of the construction work:

    a) Client's Construction Safety, Health and Environmental Specification
    b) Approved Construction Safety, Health and Environmental Plan
    c) Occupational Health and Safety Act, Act 85 of 1993, and
    d) Construction Regulations of February 2014.

6. I agree that my failure to complete and execute this declaration to the satisfaction of the Client will mean that I am unable to comply with the requirements of the Occupational Health and Safety Act, Act 85 of 1993 and Construction Regulations 2014, and accept that my tender will be rejected.

Signature:……. Date:……..

Annexure D

Summary of a Designers Risk Reports
Structural & Architect

The Department of Public Works – KwaZulu Natal (DPW) was appointed by the Department of Health – KwaZulu Natal (DOH) in July 2019 to undertake Renovation and Upgrade to Nurses and Doctors' Accommodation at Grey's Hospital to bring them to habitable standards from their current poor condition.

The Grey's Hospital Nurses' accommodation is intended to house nursing students from the Grey's Hospital Nursing College while the Doctors' accommodation is intended to house medical doctors that work in Grey's Hospital. The works will also include renovations to the Grey's Hospital Squash Courts.

The renovations and upgrades of the facilities comprises two stages, a condition assessment of the existing facilities and recommendations for upgrades and/or renovations.

Annexure D

Baseline Risk Assessment

Please note that this is a Baseline Risk Assessment and not a detailed Risk Assessment.

Activities as listed below may not be in the sequence preferred by the Contractor or may be conducted at the same time

(Covid -19 Baseline Risk Assessment)

Project:	DEPARETMENT OF HEALTH:GREY'S HOSPITAL: RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMODATION:

REF N0	CHSM/RA 2/0OOOOO	**RISK ASSESSOR**		REVISION		**DATE**	

LIKELIHOOD		**CONSEQUENCE**		**RISK VALUE= LIKELIHOOD X CONSEQUENCE**	**RISK RANKING**	
Rare	**1**	**Insignificant**	**1**		**0-5**	**1**
Unlikely	**2**	**Minor**	**2**		**6-10**	**2**
Possible	**3**	**Moderate**	**3**		**11-16**	**3**
Likely	**4**	**Major**	**4**		**17-20**	**4**
Almost certain	**5**	**Severe**	**5**		**21-25**	**5**

MAIN ACTIVITY	**Site Establishment and Site demarcation**

REF NO	**SUB ACTIVITY**	**HAZARDS SHE**	**HEALTH RISK**	**ENVIRO ENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL MEASURE**	**RESIDUAL RISK**	**Risk Prioritisation Number**

	Demarcation and location of an access for construction activities	Struck by tools, cuts, wrist twisting, weather conditions, faulty tools, hands caught between areas, etc	Permanent wrist pains, heat stroke, permanent back strains	Land Pollution from poor housekeeping	poor housekeeping; place old fencing away from public to avoid injuries	**5x3=15:3**	Signage for public awareness to avoid injuries, PPE, drink lots of fluid, tool box training	4x2=10	**2**
	Vehicles entering & exiting a construction site,	Incompetent drivers, noise, Poor traffic control eg. Flag man , no clear safety signage's	Death or physical injuries from vehicles colliding with other vehicles, employees nocked / run-over by construction	Land pollution from petrol and oil leaks & spillages from construction vehicles	Exposed to intermittent noise levels & dust inhalation generated by construction vehicles entering & exiting site; etc	**3x4=12:3**	Safe systems of work, training , PPE, Competent Drivers, Good Housekeeping Practises, Supervision.	2x2=4	**1**
	Off-loading material/ equipment	Caught between , bumo against, sharp edges, hazardous substances, excessive enviro temps	Cuts, bruising, muscular strain, heat stroke etc	Fuel spillage	None	**4x3=12:3**		2x2=4	**1**
	Moving machineries on site	Incompetent operator, faulty machinery, incompetent driver run over workers onsite	Death, injuries	Land pollution from faulty machinery eg leakage of fuel/ diesel, poor housekeeping	None	**3x5=15:3**	Service Machinery, competent Operator , workers to wear visible/ reflector vest, Proper Supervision, flag man etc	**2x4=8**	**2**

	Placement or allocation of site office & Construction Facilities *(i.e. toilets, changing areas, sheltered eating area, etc.)* on site	Incorrect lifting, faulty lifting machinery or equipment, lifting heavy equipment, tripping, workers bump into each other, heat exhaustion, sharp edges	Permanent back injuries, heat stroke	None	None	4x4=8:2	Service lifting equipment, training, drinking lots of fluid, Correct PPE, competent machinery operator, Load testing	3x2=6	2
Main Activity	**GREY'S HOSPITAL: RENOVATIONS AND UPGGRADE TO NURSES AND DOCTORS ACCOMODATION.**								
REF NO	**SUB ACTIVITY**	**HAZARDS SHE**	**HEALTH RISK**	**ENVIRONMENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL MEASURE**	**RESIDUAL RISK**	**Risk Prioritisation Number**
	Installation of scaffolding props	Poor Posture, straining of arms, incorrect lifting, excessive weather, struck by tools, falling objects etc	Back injuries, heat stroke, fractures, fatigues, etc	None	None	4x4=12:3	Training, PPE, Safe Systems of work, supervision of the job, drink lots of fluid etc	3x3=9	2
	Removal of defected waterproofing.	Struck by falling objects , caught between surface, unsafe lifting position , sharp edges	Cuts, abrasions , bruising ,back strain , death	None	None	4x4=12:3	Training, PPE, Safe Systems of work, supervision of the job, drink lots of fluid etc	3x3=9	2

	Replace waterproofing.	Struck by falling objects , caught between surface, unsafe lifting position , sharp edges	Cuts, abrasions , bruising ,back strain , death	None	None	4x4=12:3	Training, PPE, Safe Systems of work, supervision of the job, drink lots of fluid etc	3x3=9	2
	Removal of existing and installing new door frames	Bumping against objects, dust, bruises. Hearing loss	Permanent back pain, heat exhaustion, inhalation of dust, abrasion	None	Noise, dust	4x4=16:3	Training, PPE, Barricading.	2x3=6	2
	Removal of debris from walls	Struck by, bumping against, , dust, excessive weather etc	Backstrain, dust inhalation, heat exhaustion etc	None	None	3x2=6:2	Training, PPE,Supervision, safe system of work, appropriate signages, etc	2x1=2	1
	Removal of existing floor tiles	Bumping against objects, dust, bruises. Hearing loss	Permanent back pain, heat exhaustion, inhalation of dust, abrasion	None	Noise, dust	4x4=16:3	Training, PPE, Barricading.	2x3=6	2
	New floor surface bed	Dust, noise, bump against, contact with hazardous substances	Abrasions, lung infections	Cement spillages	None	3x4=12:3	Training, PPE, Proper Supervision, safe systems of work	2x2=4	1
	Lay new tiles	sharp edges, dust, etc	back injuries, abrasions, cuts, skin irritation etc	Incorrect disposal of cement.	None	4x4=16:3	correct PPE, good housekeeping, proper supervision, etc	3x3=9	2

	Fit new skirting	Rough surfaces, hazardous substances, flying particles, cuts.	Abrasion, back pain, heat stroke, injuries.	None	None	3x5=15: 3	Training, use of PPE	2x4=8	2
	Internal and external wall finishes.	Rough surfaces, hazardous substances, flying particles, cuts.	Abrasion, back pain, heat stroke, injuries.	None	None	3x5=15: 3	Training, use of PPE	2x4=8	2
	Re painting of walls	Untrained worker, weather conditions, dust, inhalation of paint fumes	Skin irritation, lung infection.	Environmental degradation	None	1x2=2:1	PPE, Training, supervision etc	1x1=1	1
	Removal existing windows	Struck by tools, hands caught between areas, Flying particles	cuts, abrasions, dust inhalation, fractures	None	None	**4x3=12:3**	Training, PPE, safe systems of work and supervision	**3x3=9**	**2**
	Install new aluminium windows windows	Rough surfaces, hazardous substances, flying particles, cuts.	Abrasion, back pain, heat stroke, injuries.	None	None	3x5=15: 3	Training, use of PPE and supervision	2x4=8	2

	Fitting of hanger, frame panels	Bumps, sharp edges, hazardous dust and substances	Muscular strains, dust inhalations, cuts and abrasions	None	None	3x5=15: 3	Training, use of PPE and supervision	2x4=8	2
	Securing ceiling panels	Falls, hazardous dust, bumps, sharp edges,	Muscular strains, dust inhalations, skin absorption of hazardous substances, cuts and abrasions	None	None	3x5=15: 3	Training, use of PPE and supervision	2x4=8	2
	Fitting new ceiling	Bumps, sharp edges, hazardous dust and substances	Injuries, cuts and bruises	None	None	2x4=8:2	Training; safe systems of work, proper supervision, etc	2x2=4	1
	Chiselling	Struck by tools, hands caught between areas, Flying particles	cuts, abrasions, dust inhalation, fractures	None	None	**4x3=12:3**	Training, PPE, safe systems of work and supervision	**3x3=9**	**2**

	Fitting of new bathroom fixtures,toilet and basin	Noise, untrained worker, dust, sharp edges, bumping against, falls, etc	Muscular strain, lung infection due to dust inhalation, noise induced hearing loss, cuts, abrasions etc	None	None	3x3=9:2	Training, fall protection plan, PPE, Proper Supervision, Safe systems of work	3x2=6	2
	Soldering of pipes	Hazardous substance, heated surface, flammable substance, noise, sharp edges etc	Inhalation of hazardous vapour, burns, body strain, noise induced hearing etc	None	None	3x4=12:3	Training, PPE, safe systems of work and proper supervision, Fire Protection system	2x2=4	1
Main Activity	**REMOVAL AND DISPOSAL OF DAMAGED ASBESTOS IN LAUNDRY**								
REF NO	**SUB ACTIVITY**	**HAZARDS SHE**	**HEALTH RISK**	**ENVIRO MENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL MEASURE**	**RESIDUAL RISK**	**Risk Prioritisation Number**
	Implementation of precautionary steps to prevent dust becoming airborne such as dampening down, placing of containment sheets below roof sheeting , warning signage, ppe etc	Falling through fragile material, persons being struck by falling objects, hands being caught between surfaces etc	Inhalation of respirable asbestos particles, inhalation of moulds, bacteria or others similar contaminanats,Cuts , abrasions, fractures etc from galling etc	Release of asbestos contaminated dust into the surrounding environment	Inhalation of air contaminated with respirable asbestos, moulds etc dust	**4x5=20**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**3x3=9**	**2**

	Removal of roof Sheets	Falling through fragile material, persons being struck by falling objects, hands being caught between surfaces etc	Inhalation of respirable asbestos particles, inhalation of moulds, bacteria or others similar contaminanats,Cuts , abrasions, fractures etc from galling etc	Release of asbestos contaminated dust into the surrounding environment	Inhalation of air contaminated with respirable asbestos, moulds etc dust	**4x5=20**	Fall Protection Plan. Documented method statement for removal of sheets, Damping procedures, Warning signage, Placing and securing PVC sheeting below roof structure to contain dust released, correct lifting of sheets, placing in approved skips, cleaning up etc. Obtaining Asbestos Disposal certificate etc.	**3x3=9**	**2**
	Stripping of fixtures	Struck by tools, falls, tripping	Cuts, abrasions, fractures	Littering from poor housekeeping	fixtures being removed falling on public, noise	**3x3=9**	Risk Assessment Training to employees; Safe & proper use of hand tools; Wearing required PPE, practise of proper manual lifting of material.	**2x2= 4**	**1**
	Use of hand tools	Struck by hand tools, tripping,	Abrasions, burns, hand injuries, eye injuries, back injury, heat exhaustion	none	none	**3x3=9**	Training, PPE, safe systems of work and proper supervision, Fire Protection system	**2x2= 4**	**1**

	Removing of rubble, machine and labour	Tripping, struck by, bumping against,, machine colliding with vehicles &People	Back strain, heat exhaustion, bruising,, cuts, abrasions, death	Spilling of oil, diesel, petrol	Noise, dust, collisions, death	**3x3=9**	Training, PPE, safe systems of work and proper supervision, Fire Protection system	**2x2= 4**	**1**
Main Activity	**ADDITIONAL WORK - (CIVIL WORK)**								
REF NO	**SUB ACTIVITY**	**HAZARDS SHE**	**HEALTH RISK**	**ENVIRO MENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL MEASURE**	**RESIDUAL RISK**	**Risk Prioritisation Number**
	Demolition of existing shower and convert to new.	Falls, Hazardous dust, Bumps, Sharp edges, Struck by falling objects.	Muscular strains, Cuts and abrasions	None	None	**3x3=9**	Safe systems of work, training, PPE, Good Housekeeping Practises, Supervision; etc	**1x2=2**	**1**
	Installation of new washing lines.	Cuts & abrasion Trips & falls Dust etc.	Back strain Dust inhalation etc.	None	None	**3x3=9**	Medical Fitness Certificates, Competent Management, Competent Supervision, safe systems of work. Training, PPE,	**1x2=2**	**1**

	Replacing of leaking pipes.	Cuts & abrasion Trips & falls Dust etc.	Back strain Dust inhalation etc.	None	None	**3x3=9**	Medical Fitness Certificates, Competent Management, Competent Supervision, safe systems of work. Training, PPE,	**1x2=2**	**1**
	Resealing of expansion joints of slab.	Struck by Items Hands Caught in between areas Falling objects Sharp edges Noise, Dust, etc	Muscular Strain Dermatitis Heat exhaustion Lung infection	None	None	**3x3=9**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**1x2=2**	**1**
	Repairs to cracks on concrete floor.	Struck by Items Hands Caught in between areas Falling objects Sharp edges Noise, Dust, etc	Muscular Strain Dermatitis Heat exhaustion Lung infection	None	None	**3x3=9**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**1x2=2**	**1**

	Plastering	Abrasive surfaces, Poor working posture, Hot climatic conditions, Falls Cement Dust, HCS etc.	Abrasions, Muscular strain, Heat exhaustion, Dermatitis, Lung infection, Fracture and Death etc.	Discarding of unused cement-contamination of natural resources	None	**3x4=12**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**3x2=6**	**2**
	Shower walls to e tiled.	1.Manual handling Dust, Flying particles, Sharp objects, Tripping etc.	Dust inhalation Eye injuries Fractures etc.	None	None	**3x3=9**	HIRA, Competent Management, Competent Supervision, safe systems of work, Medical Fitness Certificates, continuous housekeeping signage and barricading, training. PPE etc.	**2x3=6**	**2**
	Replacement of worn out squash court walls.	Manual handling. Cuts & abrasion Trips & falls Dust etc.	Back strain Dust inhalation; etc.	None	None	**3x3=9**	Medical Fitness Certificates, Competent Management, Competent Supervision, safe systems of work. Training, PPE,	**2x3=6**	**2**

	Repair / replace spalling of concrete.	Abrasive surfaces, Poor working posture, Hot climatic conditions, Falls Cement Dust, HCS etc.	Abrasions, Muscular strain, Heat exhaustion, Dermatitis, Lung infection, Fracture and Death etc.	None	None	**3x3=9**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2x3=6**	**2**
	Removal of granolithic cladding on the exterior walls.	Abrasive surfaces, Poor working posture, Hot climatic conditions, Falls Cement Dust, HCS etc.	Abrasions, Muscular strain, Heat exhaustion, Dermatitis, Lung infection, Fracture and Death etc.	None	None	**3x3=9**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**2x3=6**	**2**
	Repairs settled storm water drains.	Manual handling, Struck by falling items. Sharp edges, Poor working posture, Tripping. etc.	Muscular strain, Bruising Fractures, Cuts Abrasion, Lower back strain, Fractures, grazing etc.	None	None	**4x5=20**	HIRA ,Competent Supervision and Management, Insulated tools ,Lock out, testing and tagging , permit issue, PPE etc.	**2x3=6**	**2**

	Replacement of missing storm water drain metal grating.	Manual handling, Struck by falling items. Sharp edges, Poor working posture, Tripping. etc.	Muscular strain, Bruising Fractures, Cuts Abrasion, Lower back strain, Fractures, grazing etc.	None	None	**4x5=20**	HIRA ,Competent Supervision and Management, Insulated tools ,Lock out, testing and tagging , permit issue, PPE etc.	**2x3=6**	**2**

Main Activity	**Electrical work**								
REF NO	**SUB-ACTIVITY**	**HAZARD SHE**	**HEALTH RISK**	**ENVIRONMENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL MEASURE**	**RESIDUAL RISK**	**RISK PRIORITISATION NUMBER**
	Trenching	Striking a live cable when trenching, disruption of electrical supply to other areas	Serious injuries eg burns due to Electrocution, death	None	None	4x5=20:4	Conduct risk assessment, use of cable tracers to trace existing cables before work commence, PPE, proper supervision	3x4=12	**3**
	Chasing of conduits into walls	Electrocution, falling, struck by flying objects, noise, dust	Serious injuries eg burns due to Electrocution, death, loss of hearing due to noise, lung infection due to dust inhalation, loss of sight due to flying particles got into	None	None	5x4=20:4	Risk assessment, use safe ladders where required, fall protection plan in place and communicated a competent fall protection developer, safety signs in place, training, PPE	3x3=9	2

			eyes etc						
	Connection/ disconnection	Incorrect wiring, faulty tools	Electrocution, burns	None	None	3x5-15:3	Training, PPE, safe systems of work, Proof of valid Electrical certificate	2x410	2
	Installation of lighting protection	Incorrect wiring, faulty tools	Electrocution, burns	None	None	3x5-15:3	Training, PPE, safe systems of work, Proof of valid Electrical certificate	2x410	2
	Working with existing electrical reticulation.	Electrocution	Burns, injuries, death	None	None	3x5=15:3	Training, PPE, safe systems of work, Proof of valid Electric certificate	2x4=8	**2**
	Fitting of plug boxes, distribution boards etc	Incorrect bending, bump against ares, noise, electricity etc	Electrocution, burns, loss of hearing	None	None	**2x3=6:2**	Training, PPE, safe systems of work, ensure that no live electricity	**2x2=4**	**1**
	Overhead work	Working at height, falling, dropping of objects, poor posture etc	Back injuries, death	None	None	**4x5=20:4**	Safe scaffolding erected by competent person, safe ladders, ppe, training, Safe Systems	**3x4=12**	**3**
	Replacement of three – pin socket outlets.	Noise Dust Electricity Bumping against Struck by flying items Entanglement Moving parts	Noise induced hearing loss. Dust inhalation Electrocution Cuts and abrasions	None	none	**4x5=20**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates,	**3x3=9**	**2**

		etc.					continuous housekeeping signage, training. PPE etc		
	Replacement of stoves isolators.	Noise Dust Electricity Bumping against Struck by flying items Entanglement Moving parts etc.	Noise induced hearing loss. Dust inhalation Electrocution Cuts and abrasions	None	none	**4x5=20**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**3x3=9**	**2**
	Supply points for the extractor fans and emergency exit and illuminated exit.	Electricity, Sharp edges, Physical Exertion, Poor working posture, Elevated work, etc.	Electrocution, death, Cuts, Muscular strain, Lower back strain, Fractures, death etc.	None	None	**4x5=20**	HIRA ,Competent Supervision and Management, Insulated tools ,Lock out, testing and tagging , permit issue, PPE etc.	**2x3=6**	**2**
Main Activity	**Mechanical Work**								
REF NO	**SUB-ACTIVITY**	**HAZARD SHE**	**HEALTH RISK**	**ENVIRONMENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL MEASURE**	**RESIDUAL RISK**	**RISK PRIORITISATION NUMBER**
	Installing of units at higher level	Falling from height, lifting of heavy units,	Back injuries, serious injuries, etc	None	None	4x4=16:3	Training, safe systems of work, risk assessment, use safe ladders and or	3x3=9	2

		dropping of objects, poor posture, wrong tools, incorrect bending etc					safe scaffolding, PPE, safety signs, supervision of work		
	Welding	Faulty welding machine, flying sparks, noise, etc	Electrocution, loss of sight due to flying sparks got into eyes, loss of hearing etc	None	None	4x4=16:3	Training, Tools checklist register, keep serviced fire extinguisher close to welding machine, PPE, supervision	2x3=6	2
	Disassembly and assembly of equipment	Physical exertion, bump against, caught between, etc	Serious injuries	None	None	2x2=4:1	Training, proper PPE, safe systems of work, supervision of work , etc	2x1=2	1

MAIN ACTIVITY	**Fire Water supply and Reticulation**								
REF NO	**SUB-ACTIVITY**	**HAZARD SHE**	**HEALTH RISK**	**ENVIRONMENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL MEASURE**	**RESIDUAL RISK**	**RISK PRIORITISATION NUMBER**
	Drilling	Entanglement, struck by flying objects, electricity, hazardous substance dust , noise	Drilling	None	None	**4x3=12:3**	Training, PPE, safe systems of work and supervision	**3x3=9**	**2**

	Fire water supply installation	Struck by tools, hands caught between areas, Flying particles	Fire extinguishers installation	None	None	3x3=9:2	Training, fall protection plan, PPE, Proper Supervision, Safe systems of work	3x2=6	2

MAIN ACTIVITY	**Hot Water Installation**								
REF NO	**SUB-ACTIVITY**	**HAZARD SHE**	**HEALTH RISK**	**ENVIRONMENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL MEASURE**	**RESIDUAL RISK**	**RISK PRIORITISATION NUMBER**
	Isolating and disconnection of steam supply	Entanglement, struck by flying objects, electricity, hazardous substance dust , noise	Drilling	None	None	**4x3=12:3**	Training, PPE, safe systems of work and supervision	**3x3=9**	**2**
	Decommissioning and removal of three existing calorifiers	Struck by tools, hands caught between areas, Flying particles	Fire extinguishers installation	None	None	3x3=9:2	Training, fall protection plan, PPE, Proper Supervision, Safe systems of work	3x2=6	2
	Supply, installation and commissioning of new hot water storage tanks	Struck by falling objects , caught between surface, unsafe lifting position , sharp edges	Cuts, abrasions , bruising ,back strain , death	None	None	4x4=12:3	Training, PPE, Safe Systems of work, supervision of the job, drink lots of fluid etc	3x3=9	2

	Removal of sections of corroded copper piping	Bumping against objects, dust, bruises. Hearing loss	Permanent back pain, heat exhaustion, inhalation of dust, abrasion	None	Noise, dust	4x4=16:3	Training, PPE, Barricading.	2x3=6	2
	Removal of sections of corroded steel piping	Struck by, bumping against, , dust, excessive weather etc	Backstrain, dust inhalation, heat exhaustion etc	None	None	3x2=6:2	Training, PPE,Supervision, safe system of work, appropriate signages, etc	2x1=2	1
	Deep cleaning of existing sectional domestic cold water storage tanks	Struck by falling objects , caught between surface, unsafe lifting position , sharp edges	Cuts, abrasions , bruising ,back strain , death	None	None	4x4=12:3	Training, PPE, Safe Systems of work, supervision of the job, drink lots of fluid etc	3x3=9	2

MAIN ACTIVITY	**Hot Water Plant Rooms**								
REF NO	**SUB-ACTIVITY**	**HAZARD SHE**	**HEALTH RISK**	**ENVIRONMENTAL RISK**	**PUBLIC RISK**	**PURE RISK**	**RECOMMENDED RISK CONTROL MEASURE**	**RESIDUAL RISK**	**RISK PRIORITISATION NUMBER**
	Strip and repaint internal plant room walls	Entanglement, struck by flying objects, electricity, hazardous substance dust , noise	Drilling	None	None	**4x3=12:3**	Training, PPE, safe systems of work and supervision	**3x3=9**	**2**

	Remove existing weather louvres	Struck by tools, hands caught between areas, Flying particles	Fire extinguishers installation	None	None	3x3=9:2	Training, fall protection plan, PPE, Proper Supervision, Safe systems of work	3x2=6	2
	Service Tilly garage doors	Struck by falling objects , caught between surface, unsafe lifting position , sharp edges	Cuts, abrasions , bruising ,back strain , death	None	None	4x4=12:3	Training, PPE, Safe Systems of work, supervision of the job, drink lots of fluid etc	3x3=9	2
	Install extractor fans	Bumping against objects, dust, bruises. Hearing loss	Permanent back pain, heat exhaustion, inhalation of dust, abrasion	None	Noise, dust	4x4=16:3	Training, PPE, Barricading.	2x3=6	2
	Upgrade lighting	Struck by falling objects , caught between surface, unsafe lifting position , sharp edges	Cuts, abrasions , bruising ,back strain , death	None	None	4x4=12:3	Training, PPE, Safe Systems of work, supervision of the job, drink lots of fluid etc	3x3=9	2
	Replace fire detectors	Bumping against objects, dust, bruises. Hearing loss	Permanent back pain, heat exhaustion, inhalation of dust, abrasion	None	Noise, dust	4x4=16:3	Training, PPE, Barricading.	2x3=6	2

MAIN ACTIVITY	RENOVATION OF THE EXISTING SQUASH COURT							
REF NO	SUB-ACTIVITY	HAZARD SHE	HEALTH RISK	ENVIRONMENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK
	Excavation	Poor posture, Bumps, sharp edges etc	Muscular strains, dust inhalation, cuts and abrasions	None	None	**4x3=12:3**	Training, PPE, safe systems of work and supervision	**3x3=9**
	Setting of the area	Struck by vehicle, vehicle colliding with other vehicles, Impact hazard, Caught between parts, falling	Back strain, heat exhaustion, abrasions, fractures, death	None	None	4x3=12:3	Training, PPE, drink lots of fluid, Safe systems of work, proper supervision of work, etc	3x2=6
	Sub basing compaction	Striking against area, sharp edge, hazardous substance	Cuts &abrasions, inhalation of dust, dermatitis	Cement spillage	None	4x4=12:3	Training, PPE, drink lots of fluid, Safe systems of work, proper supervision of work, etc	3x2=6
	Concrete pouring	Poor posture, Bumps, sharp edges etc	Muscular strains, dust inhalation, cuts and abrasions	None	None	3x3=9:2	Training, fall protection plan, PPE, Proper Supervision, Safe systems of work	3x2=6

GENERAL SITE ACTIVITIES

Activity	Risk to safety	Risk to Health	Risk to Environment	Risk to Public Safety	Control Measures
Drilling	Entanglement, struck by flying objects, electricity, hazardous substance dust , noise	Electrocution, dust inhalation, noise induced hearing loss, muscle strain, foreign objects in eyes	Contamination of natural resources (spillages)	dust , noise	Safe systems of work ,Training, PPE, barricading, Supervision etc.
Sanding	Grazing, wrist strain, bumping	Dust inhalation, dust in eyes, minor abrasions	none	dust nuisance	Safe systems of work ,PPE, Housekeeping, barricading, Supervision etc.
Painting	Bumping against, wrist strain	Inhalation of vapours, paint in eyes , minor abrasions	Contamination of natural resources (spillages)	None	Safe systems of work ,PPE, ventilation of area, good housekeeping
Grinding	Electrocution, entanglement,, tripping hazards, struck by flying materials etc	Noise induced hearing loss, cuts, loss of limbs, electrocution	none	Noise, dust etc	Safe systems of work ,Wet cutting, barricading, temporary guarding, signage Supervision ,etc.
Breaking of concrete	Struck by flying particles, impact hazards, vibration, electrocution etc	Noise induced hearing loss ,dust inhalation , particles in eye, electrocution , etc	None	Noise, dust etc	Safe Systems of work , barricading, temporary guarding, signage Supervision etc
Excavation work	Hidden services ,bumping against , uncomfortable working position etc	Back strain , dust inhalation, cuts and abrasions	None	None	Safe systems of work , supervision , PPE , Barricading etc.
Cement Mixing	Struck by ,sharp edges, poor working position , hazardous substances	Inhalation of cement dust, back strain , dermatitis	Contamination of natural resources (spillages)	Noise, dust	Safe Systems of work ,PPE, Housekeeping, barricading, bunding, Supervision etc.
General brickwork	Abrasive surfaces, hazardous substances , straining of muscles	Cut and abrasions, crushing injuries etc	None	dust	Safe systems of work, barricading, signages PPE, Supervision etc.

Activity	Risk to safety	Risk to Health	Risk to Environment	Risk to Public Safety	Control Measures
Compaction of soil	Struck by tools, flammable substances , flying materials	Back strain, heat exhaustion, bruising, dust inhalation, burns	Contamination of resources with fuel	Noise	Safe systems of work, barricading, signage , PPE, Supervision etc.
Loading and unloading by hand	Bumping against edges , Hands caught between , Sharp edges, muscle strain	Back strain, exhaustion, bruising, hand injuries,	None	None	Safe systems of work, PPE, Training in correct lifting procedures , Supervision etc.
Ladder use	Incorrect positioning, overreach , Overhead hazards , dropping of tools from ladder , Falls	Broken bones , death,	None	None	Safe systems of work , PPE usage, Supervision etc.
Extension cords	Electricity , tripping hazards	Electrocution , fractures etc	none	None	Safe systems of work, PPE, Supervision etc.
Hand tools	Tripping, struck by, bumping against, abrasions, sharp edges, caught between surfaces, flying metal particles etc	Cuts ,Bruising ,Foreign material in eyes	none	None	Safe systems of work, PPE, Supervision etc.
Installation of signage's	Bumping against edges , Hands caught between , Sharp edges, muscle strain	Back strain, exhaustion, bruising, hand injuries	None	None	Safe systems of work, PPE, Training in correct lifting procedures , Supervision etc.

COVID-19 BASELINE RISK ASSESSMENT The COVID-19 hazard identification and risk assessment aims to determine the level of risk exposure on site and for contractors to implement the control measures.			
ACTIVITY / IDENTIFIED POTENTIAL AREA OF EXPOSURE COVID-19	**HAZARDS SHE**	**HEALTH RISK**	**RECOMMENDED RISK CONTROL MEASURE**
Exposure of employees entering the workplace with CV19	1.Transmitting the virus on to other employees, causing illness and possible death 2.Exposure at site access point (security control)	1.Respiratory infection that can lead to fatality's 2. Fever, cough, fatigue	1. Symptomatic individuals will not be allowed entry. 2.Hygiene requirements (handwashing etc.) and symptoms of 3. CV19 included with Induction. 4.CV19 Information posters placed in accessible locations in the workplace 5.All employees and visitors, to receive induction training 6.Adequately train identified personnel to perform regular COVID-19 screenings 7. Provide compulsory medical screening equipment and keep documented record of screenings and should an employee be tested positive, then such an
Display symptoms within the workplace	1.Transmitting the virus on to other employees, causing illness and possible death 2. Enhancing the possibility of spreading the Covid 19 pandemic	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1. Worker removed to a designated area at least 2 metres away from other people. 2. The individual will be sent home and advised to follow Governmental guidance. 3. Workplace decontaminated following accepted standards. 4.Relevant PPE to be issued All employees to receive awareness training on COVID-19 and personal hygiene (Toolbox talks) 5.Adequately train identified personnel to perform regular COVID-19 screenings 6.compulsory medical screening equipment and keep documented record of screenings
Contaminated workplace	Workers catching CV19 due to	1.fever, dry cough	1.cleaning equipment and facilities frequently.

	contaminated surfaces, causing illness and possible death	2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	2.Hand sanitisers to be been placed in readily accessible locations. Extra hygiene requirements enforced. 3.PPE to be issued Clean and disinfect objects that are regularly touched
Overcrowded work areas	Workers catching CV19 due to working closely with infected colleagues, causing illness and possible death	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1. Social Distancing policy implemented. All work areas and activities been revaluated for the possibility of implementing social distancing (no handshaking, deferring large meetings etc.) 2.Relevant PPE to be issued Clean and disinfect objects that are regularly touched 3.CV19 Information posters placed in accessible locations in the workplace 4.Employees and visitors, to receive induction training 5.Employees to receive awareness training on COVID-19 and personal hygiene (Toolbox talks) 6.Adequately train identified personnel to perform regular COVID-19 screenings
Use of handtools or equipment onsite	Workers catching CV19 due to working closely with infected colleagues, causing illness and possible death	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1. Daily disinfecting of all work surfaces, construction work vehicles, portable working tools and equipment prior to resuming construction work. 2. Hand sanitisers to be been placed in readily accessible locations. 3. A formal training program implemented to cover risks, symptoms and control measures. 4.All employees to receive awareness training on COVID-19 and personal hygiene (Toolbox talks)
Transportation of workers to workplace	Workers catching CV19 due to sitting closely with infected colleagues, causing illness	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea	1. Adhere to general travel ban by SA Government no over crowding in the transport 70% load capacity 2. Social Distancing policy implemented. All work areas and activities been revaluated for the possibility of implementing social distancing (no handshaking, deferring large meetings etc.)

	and possible death	conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	3.Relevant PPE to be issued Clean and disinfect objects that are regularly touched 4.CV19 Information posters placed in accessible locations in the workplace 5.All employees and visitors, to receive induction training
Change rooms and dinning facility	A worker catches CV19 because a colleague continues working despite being unwell, causing further spread of disease and possible death	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1.decontamination of all facility regularly and provide hygiene requirements (handwashing etc.) and 2.CV19 Information posters placed in accessible locations in the workplace 3.Relevant PPE to be issued Clean and disinfect objects that are regularly touched 4. Provision of hand sanitisers, paper towel, soap and water for employee's onsite. 5. Hand sanitizers should be strategically placed at entrances and common areas. 6. Dining facilities and change rooms onsite be arranged to allow for half a meter physical distancing.
First Aid Training	Workers exposed to CV19 due to providing First Aid in the workplace or during CPR	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1.Proper training of First Aid staff 2.Use of correct equipment while giving First Aid 3.Maintaining proper mannequin hygiene 4.Relevant PPE to be issued Clean and disinfect objects that are regularly touched

SAMPLE OHS BILL OF QUANTITIES TO BE RETURNED WITH SHE PLAN SUBMISSION

HEALTH AND SAFETY IMPLEMENTATION AND MANAGEMENT COSTING

The Contractor must complete this sample sheet and submit with his SHE Plan. Items may be added or removed as required by the Contractor.

ITEM	DESCRIPTION	UNIT	QUAN-TITY	MONTHS (Indicative)	RATE	AMOUNT (a)x(b)
1	**MEDICALS**					
1.1	Pre-employment medical	Nr.				
1.2	Psychological medical for working at heights	Nr.				
1.3	Psychological medical for working motorized equipment & construction machinery	Nr.				
1.4	Routine medical as per requirement of job activities	Nr.				
1.5	Re-medicals - yearly	Nr.				
	OTHER ITEMS					
	TOTAL					
2	**PERSONAL AND GENERAL PROTECTIVE EQUIPMENT**					
2.1	Overalls Blue					
2.2	Hard Hats					
2.3	Safety Boots/Shoes. Steel toecap Gumboots					
2.4	Gloves					
2.5	Hearing Protection					
2.6	Eye Protection					
2.7	Reflective vests					
2.8	Orange Star Netting - 1.2m High	m				
2.9	Orange Plastic road cones	Nr.				
2.10	Dust masks	Nr.				
	OTHER ITEMS					
	TOTAL					
3	**FIRE FIGHTING**					
3.1	Fire extinguishers - 4.5Kg	Nr.				

3.2	Training	Nr.				
3.3	Other - Drip trays	Nr.				
	OTHER ITEMS					
	TOTAL					
4	**HEALTH AND SAFETY PERSONNEL**					
4.1	Full Time Safety Officer	Nr.				
4.2	Fire Watchers	Nr.				
4.3	First aiders	Nr.				
4.4	Construction Phase SHE Plan					
	OTHER ITEMS					
	TOTAL					
5	**FACILITIES**					
5.1	Provision of ablution facilities	Nr.				
5.2	Service and maintenance of ablution facilities	Nr.				
5.3	Provision of eating areas	Nr.				
5.4	Cleaning of Lay down and other storage areas	Nr.				
5.5	Wash hand basin	Nr.				
5.6	Hot and Cold running water	Nr.				
	OTHER ITEMS					
	TOTAL					
6	**FALL PREVENTION / PROTECTION**					
6.1	Safety harnesses with double lanyards	Nr.				
6.2	Lanyard extenders	Nr.				
6.3	Scaffold hooks	Nr.				
6.4	Lifelines and vertical fall arrest systems	Nr.				
6.5	Scaffolding – material, erection and inspection (Estimate for project)	Nr.				
6.6	Temporary hand railing material and kick flats	Nr.				
6.7	Chin Straps/Toolbags/Wrist straps	Nr.				
	OTHER ITEMS	Item				

	TOTAL					
7	**VEHICLE / MOBILE EQUIPMENT UPGRADE FOR USE ON SITE**					
7.1	Rotating orange light	Nr.				
7.2	Flag as per procedure	Nr.				
7.3	Fire extinguisher - 4.5Kg	Nr.				
7.4	First aid box	Nr.				
7.5	Reflector tape	m				
7.6	Danger Tape	Rolls				
7.7	Signage	Nr.				
7.8	Directional control Signage	N/r				
	OTHER ITEMS					
	TOTAL					
9	**INSURANCES**					
9.1	COID cover for the project	Nr.				
9.2	Liability insurances	Nr.				
	TOTAL					
10	**FIRST AID**					
10.1	First aid boxes	Nr.				
10.2	Rescue equipment and stretchers	Nr.				
10.3	Replenishment of boxes and other supplies	Nr.				
	OTHER ITEMS					
	TOTAL					
11	**TRAINING**					

11.1	SHE Representative	Nr.				
11.2	Supervisor A2	Nr.				
11.3	First Aid Level 1	Nr.				
11.4	Fire Fighting	Nr.				
11.5	Legal Liability	Nr.				
11.6	Scaffold Inspector					
11.7	Scaffold Erector					
11.8	Basic Working at Heights					
	OTHER ITEMS					
	TOTAL					
12	**SIGNAGE**					
12.1	All signage as required by law: regulatory, warning and information	Nr				
	OTHER ITEMS					
	TOTAL					
13	**ELECTRICAL**					
13.1	Locks required for lockouts	Nr.				
13.2 13.3 13.4 13.5	Tags Permit books Callipers Key safes	Nr. Nr Nr Nr				
	OTHER ITEMS					
	TOTAL					
14	**PLANT & SCAFFOLDING**					
14.3	Scaffolding and related items eg Tags, Signage etc					
	OTHER ITEMS					
15	**COVID 19 MANAGEMENT REQUIREMENTS**					
15.1	Cloth Masks (2 per employee)	**Nr**				
15.2	Disposable Masks (Visitors and temp replacement for lost cloth	**Nr**				

	masks etc)					
15.3	Face shields (First Aiders only)	**Nr**				
15.4	Additional Cleaning staff to maintain hygiene standards	**Nr**				
15.5	Non- Contact Temperature scanners (2x per site entrance)	**Nr**				
15.6	Spray Bottles (1 and 5l)	**Nr**				
15.7	Sanitiser (70% alcohol based)	**Qty**				
15.8	Sanitising fluids(eg Jik)	**Qty**				
15.9	Wiping materials eg Cloths, “Wipes”	**Qty**				
15.10	Disposal of contaminated materials eg wipes, rags etc					
15.11	Covid signage , posters, checklists etc					
15.12	Covid training (First Aiders,Covid Manager, Compliance officer etc					
15.2	Site Sanitisation on Covid positive diagnosis					
	OTHER ITEMS					
	TOTAL					

HEALTH AND SAFETY IMPLEMENTATION COSTING

Contractor to give a breakdown of his Health and Safety costs on this sheet.

ITEM	DESCRIPTION	UNIT	QUAN-TITY	MONTHS (Indicative)	RATE	AMOUNT
			(a)		(b)	(a) x (b)
1	**MEDICALS**					
1.1	Pre-employment medical	Nr.	-			
1.2	Re-medicals - yearly	Nr.	-			
	TOTAL					
2	**PERSONAL PROTECTIVE EQUIPMENT**					
2.1	Overalls	Nr.				
2.2	Hard Hats	Nr.				
2.3	Safety boots/shoes	Nr.				
2.4	Gloves	Nr.				
2.5	Gumboots steel toe cap	Nr.				
2.6	Safety glasses	Nr.				
2.7	Reflector Bibs	Nr.				
2.8	Barricading Material	M				
2.9	Dust masks	Box 20				
	TOTAL					
3	**FIRE FIGHTING**					
3.1	Fire extinguishers - 4.5Kg	Nr.				
3.2	Surveys - Annual Service	Nr.				
	TOTAL					
4	**HEALTH AND SAFETY PERSONNEL**					
4.1	Safety Manager	Nr.				
4.2	Safety Officer	Nr.				
4.3	Construction Phase Safety, Health, Environmental and Waste Management Plan	Nr.				
	TOTAL					
5	**FACILITIES**					
5.1	Provision of ablution facilities	Nr.				
5.2	Service and maintenance of ablution facilities	Nr.				
5.3	Provision of eating areas	Nr.				
5.4	Cleaning of Lay down and other storage areas	Nr.				
5.5	Wash hand basin	Nr.				
5.6	Hot and Cold running water	Nr.				
5.7	Degreasing & Toilet soap	Nr.				
	TOTAL					
6	**FALL PREVENTION / PROTECTION**					
6.1	Safety harnesses with double lanyards	Nr.				
6.2	Safety harnesses with Scaffold hooks	Nr.				
6.3	Lifelines and vertical fall arrest systems	Nr.				
6.4	Scaffolding – material, erection and inspection (Estimate for project)	Nr.				
6.5	Temporary hand railing material and kick flats	Nr.				
6.6	Chin Straps	Nr.				
	TOTAL					
7	**FIRST AID**					
7.1	Replenishment of boxes and other supplies	Nr				
	TOTAL					

8	**TRAINING**					
8.1	SHE Representative	Nr.				
8.2	First Aid Level 1	Nr.				
8.3	Fire Fighting	Nr.				
	TOTAL					
9	**SIGNAGE**					
9.1	All Signage as required by Law, regulatory, warning and information	Nr.				
9.2	Posters for awareness	Nr.				
	TOTAL					
10	**ELECTRICAL**					
10.1	Replacement of Locks required for lockouts	Nr.				
10.2	Replacement of tags	Nr.				
10.3	Replacement for Permit books	Nr.				
10.4	Replacement of Callipers	Nr.				
	TOTAL					
11	**OTHERS (Project Specific)**					
11.1		Nr.				
	TOTAL					
GRAND TOTAL TO BE CARRIED TO THE PRELIMINARIES AND GENERAL IN BILL OF QUANTITIES						

WAIVER OF CONTRACTOR'S LIEN

DEFINITIONS

Contractor:	_____
Employer:	Head: Public Works (KZN Department of Public Works: Province of KwaZulu-Natal)
Agreement:	GCC FOR CONSTRUCTION WORKS - SECOND EDITION 2010
Works (description):	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**
Site:	Southern Region: Umgungundlovu District Municipality: Msunduzi Local Municipality: Ward Nr. 25

AGREEMENT

The Contractor waives, in favour of the Employer, any lien or right of retention that is or may be held in respect of the Works to be executed on the Site

Thus done and signed at _____ on _____
[Date]

_____ _____
Name of signatory Capacity of signatory

_____ _____
As witness For and on behalf of the contractor who by signature hereof warrants authorisation hereto

SCOPE OF WORKS IN RESPECT OF WORK RELATING TO THE EXTENDEND PUBLIC WORKS PROGRAMME (EPWP)			
Project title:	**DEPARTMENT OF HEALTH: GREYS HOSPITAL : RENOVATIONS AND UPGRADE TO NURSES AND DOCTORS ACCOMMODATION COMPLETION CONTRACT**		
Project Code:	**053651**	EPWP NO:	**N/A**

Introductory notes:

1. The works, or parts of the works will be constructed using labour-intensive methods only in terms of this specification. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letters **LI** are not necessarily an exhaustive list of all the activities which must be done by hand, and this clause does not over-ride any of the requirements in the generic labour intensive specification in the Scope of Works.
2. Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment.

DESCRIPTION OF THE WORKS

Employer's objectives

The employer's objectives are to deliver public infrastructure using labour-intensive methods in accordance with EPWP Guidelines.

Labour-intensive works

Labour-intensive works comprise the activities described in the Labour-Intensive Specification. Labour-intensive works shall be constructed/maintained using local workers who are temporarily employed in terms of the scope of work.

LABOUR-INTENSIVE COMPETENCIES OF SUPERVISORY AND MANAGEMENT STAFF

Contractors shall only engage supervisory and management staff in labour-intensive works that have completed the skills programme including Foremen/ Supervisors at NQF level 4 "National Certificate: Supervision of Civil Engineering Construction Processes" and Site Agent/ Manager at NQF level 5 "Manage Labour-Intensive Construction Processes" or equivalent QCTO qualifications (See Appendix C). at NQF outlined in Table 1. (See GUIDELINES FOR THE IMPLEMENTATION OF LABOUR-INTENSIVE INFRASTRUCTURE PROJECTS UNDER THE EXPANDED PUBLIC WORKS PROGRAMME (EPWP) -THIRD EDITION 2015)

Emerging contractors shall have personally completed, or be registered on a skills programme for the NQF level 2 unit standard. All other site supervisory staff in the employ of emerging contractors must have completed, or be registered on a skills programme for the NQF level 2 unit standards or NQF level 4 unit standards. Table 1: Skills programme for supervisory and management staff.

Table 1: Skills programme for supervisory and management staff

Personnel	NQF level	Unit standard titles	Skills programme description
Team leader / supervisor	2	Apply Labour-Intensive Construction Systems and Techniques to Work Activities	This unit standard must be completed, and
		Use Labour-Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	any one of these 3 unit standards
		Use Labour-Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	

		Use Labour-Intensive Construction Methods to Construct, Repair and Maintain structures	
Personnel	**NQF level**	**Unit standard titles**	**Skills programme description**
Foreman/supervisor	4	Implement Labour-Intensive Construction Systems and Techniques	This unit standard must be completed, and
		Use Labour-Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	any one of these 3 unit standards
		Use Labour-Intensive Construction Methods to Construct and Maintain Water an Sanitation Services	
		Use Labour-Intensive Construction Methods to Construct, Repair and Maintain structures	
Site Agent /Manager (i.e. the contractor's most senior representative that is resident on the site)	5	Manage Labour-Intensive Construction Processes	Skills Programme against this single unit standard
Details of these skills programmes may be obtained from the CETA ETQA manager (e-mail :gerard@ceta.co.za , tel: 011-265 5900)			

EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR-INTENSIVE WORKS

1.1 Requirements for the sourcing and engagement of labour.

1.1.1 Unskilled and semi-skilled labour required for the execution of all labour-intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour.

1.1.2 The rate of pay set for the SPWP per task or per day will be an acceptable rate determined by the Department of Labour.

1.1.3 Tasks established by the contractor must be such that:

a) the average worker completes 5 tasks per week in 40 hours or less; and
b) the weakest worker completes 5 tasks per week in 55 hours or less.

1.1.4 The contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of 1.1.3.

1.1.5 The Contractor shall, through all available community structures, inform the local community of the labour-intensive works and the employment opportunities presented thereby. Preference must be given to people with previous practical experience in construction and / or who come from households:

a) where the head of the household has less than a primary school education;
b) that have less than one full time person earning an income;
c) where subsistence-agriculture is the source of income.
d) that who are not in receipt of any social security pension income

1.1.6 The Contractor shall endeavour to ensure that the expenditure on the employment of unskilled and semi-skilled workers is in the following proportions:

a) 60% women;
b) 55% youth who are between the ages of 18 and 35; and
c) 2% on persons with disabilities.

1.2 Specific provisions pertaining to SANS 1914-5

1.2.1 Definitions

Targeted labour: Unemployed persons who are employed as local labour on the project.

1.2.2 Contract participation goals

1.2.2.1 There is no specified contract participation goal for the contract. The contract participation goal shall be measured in the performance of the contract to enable the employment provided to targeted labour to be quantified.

1.2.2.2 The wages and allowances used to calculate the contract participation goal shall, with respect to both time-rated and task rated workers, comprise all wages paid and any training allowance paid in respect of agreed training programmes.

1.2.3 Terms and conditions for the engagement of targeted labour
Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.

1.2.4 Terms and conditions for the engagement of targeted labour
Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.

1.2.5 Variations to SANS 1914-5

1.2.5.1 The definition for net amount shall be amended as follows:
Financial value of the contract upon completion, exclusive of any value added tax or sales tax which the law requires the employer to pay the contractor.

1.2.5.2 The schedule referred to in 5.2 shall in addition reflect the status of targeted labour as women, youth and persons with disabilities and the number of days of formal training provided to targeted labour.

1.3 Training of targeted labour

1.3.1 The contractor shall provide all the necessary on-the-job training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the contract in a manner that does not compromise worker health and safety.

1.3.2 The cost of the formal training of targeted labour, will be funded by the local office of the Department of Labour. This training will take place as close to the project site as practically possible. The contractor must access this training by informing the relevant regional office of the Department of Labour in writing, within 14 days of being awarded the contract, of the likely number of persons that will undergo training and when such training is required. The Employer and the Department of Public Works (Fax: 012 3258625/ EPWP Unit, Private Bag X65, Pretoria 0001) must be furnished with a copy of this request.

1.3.3 The contractor shall do nothing to dissuade targeted labour from participating in training programmes and shall take all reasonable steps to ensure that each beneficiary is provided with two days of formal training for every 22 days worked.

1.3.4 An allowance equal to 100% of the task rate or daily rate shall be paid by the contractor to workers who attend formal training, in terms of the above.

1.3.5 Proof of compliance with the above requirements must be provided by the Contractor to the Employer prior to submission of the final payment certificate.

GENERIC LABOUR-INTENSIVE SPECIFICATION

1 Scope

This specification establishes general requirements for activities which are to be executed by hand involving the following:

a) trenches having a depth of less than 1.5 metres
b) storm water drainage
c) low-volume roads and sidewalks

2 Precedence

Where this specification is in conflict with any other standard or specification referred to in the Scope of Works to this Contract, the requirements of this specification shall prevail.

3 Hand excavateable material

Hand excavateable material is material:

a) Granular materials:

i) whose consistency when profiled may in terms of table 1 be classified as very loose, loose, medium dense, or dense; or

ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 15 blows of a dynamic cone penetrometer is required to penetrate 100mm;

b) Cohesive materials:

i) whose consistency when profiled may in terms of table 1 be classified as very soft, soft, firm, stiff and stiff / very stiff; or

ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 8 blows of a dynamic cone penetrometer is required to penetrate 100mm;

Note: 1) A boulder, a cobble and gravel is material with a particle size greater than 200mm, between 60 and 200mm.

2) A dynamic cone penetrometer is an instrument used to measure the in-situ shear resistance of a soil comprising a drop weight of approximately 10 kg which falls through a height of 400mm and drives a cone having a maximum diameter of 20mm (cone angle of. 60 degrees with respect to the horizontal) into the material being used.

Table 2: Consistency of materials when profiled

GRANULAR MATERIALS		COHESIVE MATERIALS	
CONSISTENCY	**DESCRIPTION**	**CONSISTENCY**	**DESCRIPTION**
Very loose	Crumbles very easily when scraped with a geological pick.	Very soft	Geological pick head can easily be pushed in as far as the shaft of the handle.

Loose	Small resistance to penetration by sharp end of a geological pick.	Soft	Easily dented by thumb; sharp end of a geological pick can be pushed in 30-40 mm; can be moulded by fingers with some pressure.
Medium dense	Considerable resistance to penetration by sharp end of a geological pick.	Firm	Indented by thumb with effort; sharp end of geological pick can be pushed in upto 10 mm; very difficult to mould with fingers; can just be penetrated with an ordinary hand spade.
Dense	Very high resistance to penetration by the sharp end of a geological pick; requires many blows for excavation.	stiff	Can be indented by thumb-nail; slight indentation produced by pushing geological pick point into soil; cannot be moulded by fingers.
Very dense	High resistance to repeated blows of a geological pick.	Very stiff	Indented by thumb-nail' with difficulty; slight indentation produced by blow of a geological pick point.

4 Trench excavation

All hand excavateable material in trenches having a depth of less than 1,5 metres shall be excavated by hand.

5 Compaction of backfilling to trenches (areas not subject to traffic)

Backfilling to trenches shall be placed in layers of thickness (before compaction) not exceeding 100mm. Each layer shall be compacted using hand stampers

a) to 90% Proctor density;
b) such that in excess of 5 blows of a dynamic cone penetrometer (DCP) is required to penetrate 100 mm of the backfill, provided that backfill does not comprise more than 10% gravel of size less than 10mm and contains no isolated boulders, or
c) such that the density of the compacted trench backfill is not less than that of the surrounding undisturbed soil when tested comparatively with a DCP.

6 Excavation

All hand excavateable material including topsoil classified as hand excavateable shall be excavated by hand. Harder material may be loosened by mechanical means prior to excavation by hand.

The excavation of any material which presents the possibility of danger or injury to workers shall not be excavated by hand.

7 Clearing and grubbing

Grass and small bushes shall be cleared by hand.

8 Shaping

All shaping shall be undertaken by hand.

9 Loading

All loading shall be done by hand, regardless of the method of haulage.

10 Haul

Excavation material shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150 m.

11 Offloading

All material, however transported, is to be off-loaded by hand, unless tipper-trucks are utilised for haulage.

12 Spreading

All material shall be spread by hand.

13 Compaction

Small areas may be compacted by hand provided that the specified compaction is achieved.

14 Grassing

All grassing shall be undertaking by sprigging, sodding, or seeding by hand.

15 Stone pitching and rubble concrete masonry

All stone required for stone pitching and rubble concrete masonry, whether grouted or dry, must be collected, loaded, off loaded and placed by hand.

Sand and stone shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150m.

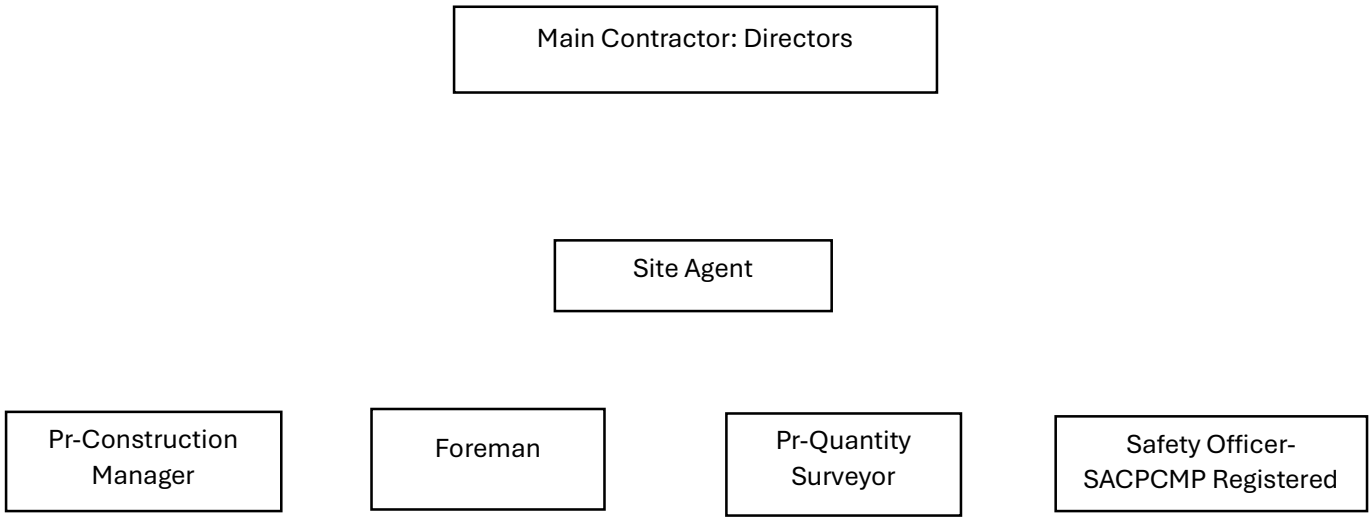
Grout shall be mixed and placed by hand.

16 Manufactured Elements

Elements manufactured or designed by the Contractor, such as manhole rings and cover slabs, precast concrete planks and pipes, masonry units and edge beams shall not individually, have a mass of more than 320kg. In addition, the items shall be large enough so that four workers can conveniently and simultaneously acquire a proper handhold on them.

SERVICE DESCRIPTION: UPGRADES AND RENOVATION TO NURSE'S AND DOCTOR'S ACCOMMODATION (COMPLETION CONTRACT)

PROJECT SPECIFIC ORGANOGRAM (ANNEXURE 10)



Proforma Reference Letters for Previous Projects (Annexure 11)

To be Completed by reference and returned

Project **Name** Completed …….....Value: R….....

Client **Name**…….....Year: ….....

		Comments
Please verify that information provided by the respondent in Part A above is correct Comment alongside if necessary	☐ No ☐ Yes	
Please score **and** comment on the **attributes listed** below	Score out of 10	
Overall Project Planning by Contractor		
Ordering of **Materials** and Long Lead **Materials**		
Submission and Compliance with Construction programme		
Application for resources to project		
Site Management and Reporting		
Contractual acumen		
Administration of Subcontractors (Nominated, Selected, Domestic)		
Payment of Subcontractors and Suppliers		
Management of OHS and safety on site by the contractor		
Quality of workmanship and Quality Assurance Testing		
Total Score (Sum of all scores)		

Referee name:..... Referee signature…….....

Designation:…….....

Date:……..... Business entity /Client Stamp:

Tel:…….....

ANNEXURE 12

PPROJECT BRIEF AND DECANTING PLAN

health
Department:
Health
PROVINCE OF KWAZULU-NATAL

DIRECTORATE

Physical Address: Townhill Hospital, Pietermaritzburg, 3201
Postal Address: Private Bag X9051, Pietermaritzburg, 3200
Tel: 033 940 2610 Email: temitope.sokoya@kznhealth.gov.za
www.kznhealth.gov.za

INFRASTRUCTURE DEVELOPMENT
Planning

PROJECT BRIEF

GREY'S HOSPITAL: RENOVATION AND UPGRADE TO NURSES AND DOCTOR'S ACCOMMODATION

Drafted by: **MR TEMITOPE SOKOYA** Architect: Planning Signed: Date: 07/06/2019	Accepted by: ~~MS M DE GOEDE~~ MRS. A. HESKETH Director: Infrastructure Planning (ACTING) 7 JUNE 2019
Version: (13)- MAY 2019	Final Version:
Recommended by: **MRS GUGU MASONDO** Director: Programme Delivery and Real Estate Signed: Date: 10/06/2019	Approved by: **MR B. GCABA** Chief Director: Infrastructure Development Signed: Date: 11/6/2019

1. PROJECT ORGANISATION

Project Team comprises:	
Project Sponsor:	**MR B G GCABA**
Project Control Group:	**INFRASTRUCTURE DEVELOPMENT**
Project Manager/Leader:	**MR. Priven Chowthee**
Team Members:	Mr. TemiTope Sokoya –Architect Mr. R. Potsane – Quantity Surveyor Mr. M. Myeza – Electrical Engineer Mr. S. Cele – Mechanical Engineer Ms. S. Ncgobo – Occupational Health & Safety Ms. Y. Thambiran – Quality Assurance Mrs. N.M. Zuma-Mkhonza- Umgungundlovu District Manager Mr A.D. Cardoso - eThekwini District Engineer Dr K Bilenge : CEO - Grey's Hospital CEO
Challenge Members:	National Department of Health

2. PROJECT INTRODUCTION

Project Background:

1. Grey's Hospital is a referral hospital offering tertiary services located in Pietermaritzburg, which falls in the Umgungundlovu health district. Grey's Hospital offers tertiary services to the Western half of KwaZulu-Natal – this includes 5 health districts with a total population of 4.5 million.

2. The Grey's Hospital Nursing accommodation is a 2 wings building with 8 floors on the left wing and 9 floors on the right wing while the Doctor's accommodation, also a 2 wing building, is a 6 floors building on the right wing at the East side of the hospital.

3. The Nursing and Doctor's accommodation at Grey's Hospital is in poor condition and students have made several complaints. Then, UKZN renovated floors 5th - 7th of east wings of the nurse's accommodation for their nursing students. Subsequently to that, other students are complaining about the nursing accommodation and this could lead to protest.

4. Due to the sensitivity of the project, the Department of Health (DoH) has declared the project urgent and hence renovating / upgrading Nurses accommodations on the Ground floor, 1st, 2nd, 3rd and 4th floors of both wings and Doctor's accommodation on the Ground floor, 1st, 2nd, 3rd, 4th, 5th, 6th and Squash court at Grey's Hospital as well as toilets, kitchenette, social areas and passages. This is to bring the condition of Nurses and Doctor's accommodation to habitable standard from its current poor condition.

5. The majority of these Nurses and Doctor's accommodation are in poor condition. Floors, walls, ceilings, windows, doors, built-in cupboards to rooms, kitchenette, passages and toilets are in bad condition. Also, there are problems with electrical, mechanical and plumbing installations in all the rooms, kitchenette and toilets at Grey's Hospital.

6. In addition, due to poor condition of rooms, some of the rooms are un-occupied. Toilets and kitchenettes also pose health risk to users.

7. The KwaZulu-Natal Department of Health's Policy Document for the Design of Structural Installations dated January 2013, require that:
   Codes and Specifications for Structural Installations: The complete installation must conform to the following:
   - National Building Regulations and Government Gazette No 31084 of the 30th May 2008 and the SANS 10400: (Ex SABS 0400: 1990) Code of Practise for the Application of the National Building Regulations

Project Objectives:

The objective of the project is to upgrade and renovate Nurses accommodation Building to habitable condition as stipulated on this project brief and to comply with National Building Regulation of SAN 10400.

Project Outcomes:

The expected outcome of the project is for Grey's Hospital to provide habitable student nursing accommodation which complies with current norms and standards.

Success Criteria:

The successful completion of the project will be measured as follows:

a) Scope - Adherence to DOH's specifications and requirements;
b) Time - Project completed as per Project Implementation Plan,
c) Cost - All expenditure remains within the allocated budget

The success will be measured by the building occupancy increasing and no further protest action being experienced.

3. PROJECT DEFINITION

The Site	
Land owner	Provincial Government of KwaZulu-Natal
Street address (or directions)	Townbush Road Pietermaritzburg 3200
Postal address	Private Bag X9001, Pietermaritzburg 3200
Cadastral description	30.36378417 | -29.579613
Telephone number	27 (0) 33 897 3000
Addington Hospital CEO	Dr K Bilenge
Zoning	Government
Planning restrictions	N/A
Existing infrastructure	Brick and Mortar multi-storey building
Existing Services	All services are available, however they are generally not in good working order

Scope:

The scope is to completely refurbish ground, 1st, 2nd, 3rd and 4th floors rooms of both wings of nurses accommodation and ground, 1st, 2nd, 3rd, 4th, 5th, 6th, of doctor's accommodations as well as Squash court at Grey's Hospital. This will include the renovation of toilets, kitchenette, social areas and passages. This is to bring the condition of Nurses accommodation to habitable standard from its current poor condition. Electrical installations will be replaced in all areas.

The following details the scope per element:

BEDROOMS:

FLOORS AND SKIRTING

- Remove all existing vinyl flooring, carpeting and skirting and prepare surface for tiling.
- Install new Granito Gres Everest HD full bodied porcelain 300mm x 300mm or equally approved. Tiles to be uniform in size, shape and colour, free from cracks, twists and other defects.
- **Skirting:** Remove all skirting prior to commencing floor work and install new skirting to match floor tile.
- **Showers Cubicles:** Remove all existing tiling & shower trays and prepare the surface for new waterproofing. Install new waterproofing to specialists detail & specification. Install new shower trays to match existing and re-tile Cubicle floor with 300mm x 300mm Non-slip full bodied porcelain tiles.
- **Suspended Timber floors:** All floor areas in the two squash courts to be inspected for damage to floor boards and structure. Damaged floors to be replaced to match existing and installed by specialist.
- **Parquet flooring:** Existing parquet flooring to be sanded, loose blocks fixed & floor re-sealed.

WALLS

- Clean facebrick walls.

- Ex plastered walls to be repaired where necessary.
- Repaint walls.
- Remove all existing wall tiling and prepare the surface for new waterproofing. Install new waterproofing to specialists detail & specification. Install new 150mm X 150mm white Wall tile. Tiles to be uniform in size, shape and colour, free from cracks, twists and other defects.

CEILINGS

- Replace all damaged ceiling. 'Pelican Systems' or equal approved fibredek vinyl clad shell white ceiling tiles size 1200 x 600 x 6mm thick, laid on 24mm wide Pre-painted exposed gridlock tee suspension system including all necessary hangers, grids locking type end clips.
- **Painted concrete soffits & plasterboard:** Damaged plastered soffits & plasterboard to be made good before painting.
- Remove acoustic suspended ceilings and replace with suspended ceiling where necessary.

DOORS

- All timber doors to be inspected. Remove and replace damaged doors.
- Repaint existing doors where necessary.
- Service existing door ironmongery. Replace where damaged to match existing.
- Replace damaged / missing door handles. All broken or missing ironmongery to be replaced to match existing.
- All steel door frames to be inspected and surfaces sanded & prepared for paint.
- Remove and replace existing damaged duct doors. All duct covers / doors to be inspected. Damaged doors and ironmongery to be replaced with new to match existing. Painted surfaces to be sanded & surface prepared

for paint.

- Varnish existing timber glazed double doors. All aluminium doors & frames to be inspected, serviced, repaired or replaced to match existing.

WINDOWS

- Replace all damaged and missing glazing with new to comply with SANS 10400 Part N.
- All steel window frames to be inspected. Rusted frames to be replaced with new to match existing. Painted surfaces to be sanded & surface prepared for paint.
- **Ironmongery** - All broken or missing ironmongery to be replaced to match existing.
- All aluminium windows to be inspected, serviced, repaired or replaced to match existing

JOINERY FITTINGS

- Re-varnish existing joinery fittings
- Replace damaged / missing joinery fittings
- Allowance for new wooden worktops to existing timber desk in bedrooms.
- Replace / repair damaged doors, drawers, shelving, etc.

PLUMBING AND DRAINAGE

- Clean existing wash hand basins, sinks, wc's etc., where necessary.
- Remove and replace wash hand basins and wc cisterns, etc., where necessary to match existing.
- Remove and replace damaged / missing taps, mixers, traps, etc.

ELECTRICAL

- Test all plugs sockets
- Install double 3 pin plug sockets to rooms to electrical engineer's spec.
- Replace damaged / missing plug sockets
- Replace damaged / missing light switches
- Install 60A isolators and 3 pin plug sockets to kitchen and laundry areas
- Install bulbs in light fittings
- Power supply conduits, cables, etc. for kitchen and laundry equipment extraction
- Inspect all db boards and replace where necessary.
- Provide access control to security gates and turnstiles.

MECHANICAL

- Install extraction to bathrooms and kitchens.

KITCHENS

- Altering existing tiled concrete worktop and make good existing finishes to match what UKZN has done

BATHROOMS

- Removal of bath tubs and conversion to shower cubicle

- Demolish existing shower and convert to new wc

PASSAGES

- Install security gates including turnstiles at passage entrance / exits.

BALUSTRADES

- All aluminium balustrades to be inspected for defects and all missing sections of balustrades to be replaced to match existing. All loose balustrade to be securely fixed.

GENERAL

- **Joinery:** Inspect all built in Joinery & repair where necessary to match existing.
- **Varnish:** Refer to detailed Dulux (or similar approved) paint spec.
- **Reception Counters:** Manufacture and install new reception counter as per architect's drawings.
- **Tiling Cover Strips:** Replace missing cover strips to match existing or re-fix loose ones.

LAUNDRY

- **Ironing board:** Possible asbestos to be tested. If positive test results for asbestos. To be removed and disposed of by specialist and replaced with laminated hardwood boards.
- **Washing Lines:** Install new washing lines. Re-screed floor to fall min 1:100 gradient towards existing floor drain channel & tile to spec.
- **Appliances:** Existing appliances in laundries to be removed and replaced with new industrial type washing machines & tumble dryers for each floor. Appliances to be coin operated

- **Signage:** Replace all damaged or missing room and emergency signage with new signage to match existing.

ROOF ACCESS

- New gate required to match existing gate. New burglar guards required to block off the side of the stairs (above balustrade)
- Install new aluminium self-closing trap door to comply with fire regulations.

ROOF SHEETING

- All roof areas to be inspected for damage by roofing specialist. Roofs with damage to be repaired by roofing specialist.

ROOF SLAB

- All concrete roofs to be cleaned and inspected for leaks. New waterproofing to be installed where required to match existing by specialist to manufacturer's specifications.

KITCHEN APPLIANCES

- Install new fridges and freezers in kitchen to client's specification.

SQUASH COURT

- Squash court walls and floors to be inspected and replaced where damaged.
- Squash court ceiling to be inspected and replaced where damaged

Conditional Assessment:

1. The nurses and doctor's accommodation are in poor condition and considered not habitable. This is due to general wear and tear, age of the building and water ingress. The following are specifically noted:
2. Rooms currently have wet and dirty carpets.
3. Cupboards are mostly damaged and cupboard doors loosely hanging.
4. Tables tops have been ripped off and drawers missing.
5. Room ceiling have stalactites and paints are peeling off
6. Toilet wc's, baths, showers and whb are unusable.
7. Toilet floors are in poor condition
8. Toilet wall tiles are dirty and some tiles either cracked or missing.
9. Toilet taps and drains are not working properly.
10. Toilet slab soffit has stalactites and paints peeling off.
11. There are exposed DB boards and services in the passage.
12. Kitchen sinks are not usable.
13. Kitchen floors and wall are in poor condition. Paints are dirty and peeling off.
14. Floors and walls to lift lobbies are dirty and in poor condition.





Existing façade of Grey's hospital Doctor and Nurse's accommodation





Existing condition of rooms, passage, toilets and services.





Existing condition of ceiling, wc's, tiling, shower and services

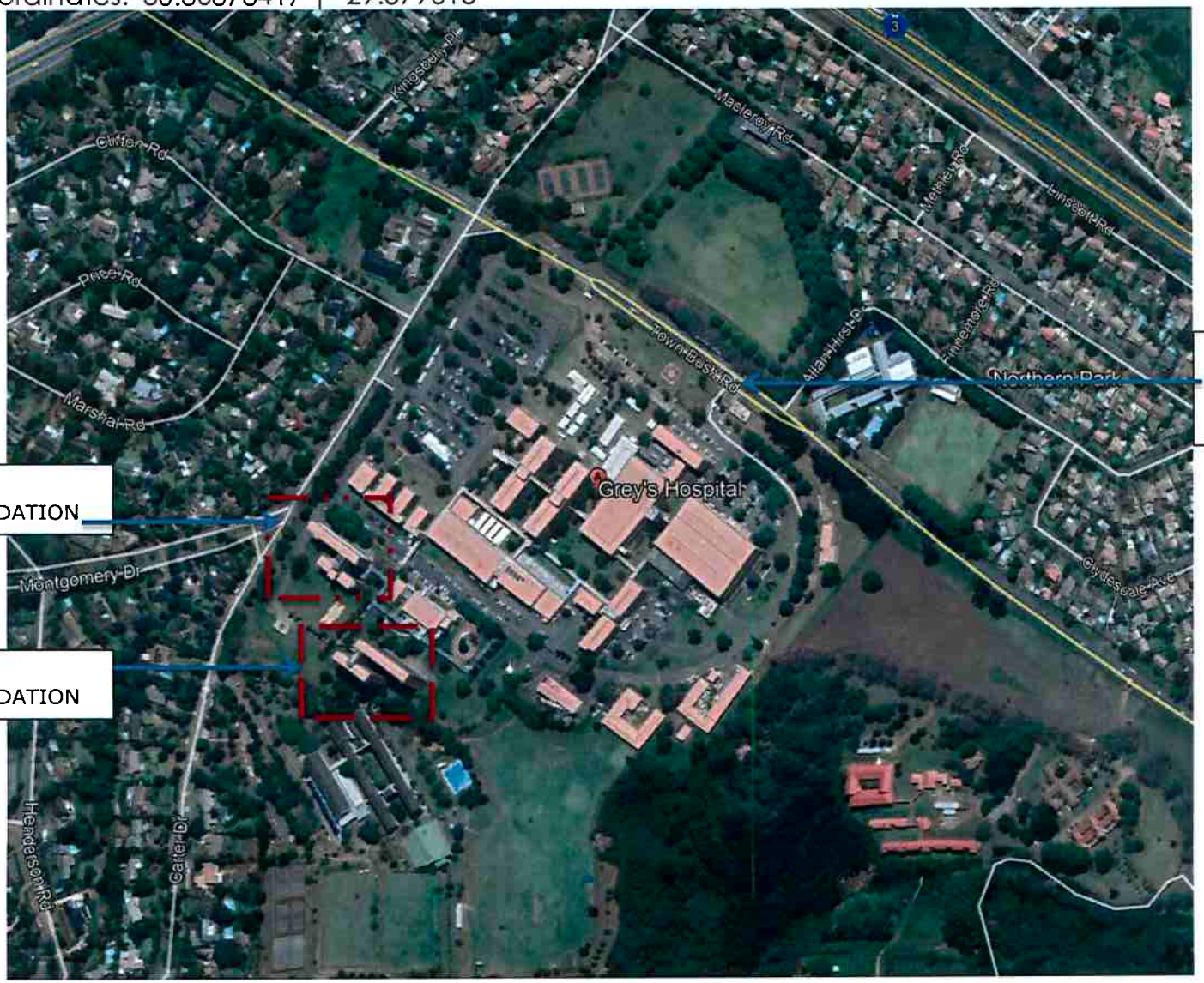




Existing condition of Toilets, lobby and shower.

The Site

Site coordinates: 30.36378417 | -29.579613



Methodology:	
Recommended procurement strategy	Through Department of Public works (KZN - DoPW). Departement of Public works to appoint multi-disciplinary team with all relevant consultants and contractor. The multi-disciplinary team must also have a principal agent (PA)
Recommended construction methods	Conventional construction to match existing
Special recommendations	All recommendations through DoPW. DoPW must also confirm if they are able to deliver within the time line otherwise DoH will withdraw project if DoPW default.
Deliverables:	- Completed and fully functional Nursing Accommodation Building. - 12 months maintenance and warranty as part of the construction package. - Provide all Certificate of Compliances. - Provide Nursing Accommodation Building as-built drawings. - Provide original equipment manufacturers' manuals. - Close-out report.
Dependencies and Associated Initiatives:	The project is not dependant on any other initiatives
Constraints:	Project is constrained by students already accommodating nurses and doctors accommodations. For nurse's accommodation, students will be decanted to the left wing to allow for upgrade and renovation of the right wing. Students will then be moved to right wing to allow for upgrade and renovation of the left wing. For the doctor's accommodation, students will be decanted to the 5th and 6th floors to allow for renovation of ground, 1st, 2nd, 3rd and 4th floors. Students will then be decanted to ground, 1st, 2nd, 3rd and 4th floors to allow for renovation of the 5th and 6th floors.
Financial *Resources:* *Time:* *Other:*	• Limited budget. • Industry capacity. • Limited timeframe allocated for the project.

4. STATUTORY REQUIREMENTS

Legislation	- SANS 10400, Code of Practise for the application of the National Building Regulations. - All other applicable legislation.
Norms	- IUSS guidelines: Internal wall Finishes in health facilities guides
Standards	- National Building Regulations and Building Standards Act, 1977.
Policies	- KZN Department of Health: Policy Document for the Design of Structural Installation, Rev. 7, January 2013.
Other requirements	- Municipal consultation

5. STATUTORY PERMISSIONS

Statutory Permission	Authority
Land Acquisition	Existing site – not required
Environmental Impact	Existing site – not required
Planning and Development Act	Existing site – not required
Access to Provincial Roads	Existing site – not required

6. STAKEHOLDERS AND COMMUNITY ENGAGEMENT

Stakeholder	Authority	Contact Person
Department of Health Infrastructure Development	Client Department	Name: Mr. Priven Chowthee Quantity Surveyor: Programme Delivery and Real Estate Tel : 033 940 2581 Mobile : 078 384 0292 Email : Priven.Chowthee@kznhealth.gov.za

Department of Clinical Services, Grey's Hospital	Nursing Manager	Name: Mrs KT McKenzie Director: Nursing department Mobile : 083 256 4026 Email : MCKENZIEKT.Mckenzie@kznhealth.gov.za
Department of Health- Umgungundlovu Health District	User/Client	Name: Mrs N.M. Zuma-Mkhonza Director: District Manager 171 Hoosen Haffajee (former Berg) Street, Pietermartizburg Tel : (033) 897 1000 Email : Zuma.May@kznhealth.gov.za

7. PROJECT PLANS

7.1. Project Overview

IDMS stage	Major Phases:	Milestones	Tasks	Responsibility	Timeframe (estimated)
	Planning	Brief	Engagement meetings	KZN-DOH	07 June 2019
			Brief sign off	KZN-DOH	07 June 2019
	Design	Design approved	Sketch plans	KZN-DOH	07 June 2019
			Approved budget and development	KZN-DOH	07 June 2019
	Documentation	Tender submission	Tender documents	KZN-DOH	31 July 2019
			Approved budget and development	KZN-DOH	31 July 2019
	Tender	Award	Advertise	KZN-DOH	14 August 2019
			Adjudicate	KZN-DOH	20 August 2019
			Award	KZN-DOH	26 August 2019
	Construction	Practical Completion	Site Hand over	CONTRACTOR	01 September 2019

			Practical Completion	CONTRACTOR	01 September 2020
			Retention	CONTRACTOR	31 September 2020
			Works completion (GCC- same as PC)	CONTRACTOR	31 October 2020
	Close out		Final Completion	CONTRACTOR	31 March 2021
			Final Account	CONTRACTOR	01 May 2021
			Close-out report	CONTRACTOR	29 June 2021

7.2. Project Budget Breakdown

Budget			
Funding source	**Health Facility Revitalization Grant (HFRG)**		
			Explanatory Notes
AIP approved project cost	**R**	**10,000,000**	AIP allocated budget
Estimated Construction cost	R	**8,000,000**	
Estimated Fees cost	R	**2,000,000**	DoPW to appoint all consultant
Contingency	R	**500,000**	5%
Estimated escalation	R	**0.00**	Fix contract (Estimated 12 months)
Total cost	**R**	**10,500,000**	
MTEF allocation	Construction		
2019/20	**R**	**2,000,000**	Assuming contractor will be on site by 1st of September 2019
2020/21	**R**	**8,500,000**	

7.3. Project Communication Plan

The following plan is a guideline

ITEM	ELEMENTS
Strategies	In order to ensure good communication, frequent engagement will take place throughout the project life cycle. The engagements include: • Stakeholder engagement meetings • Planning meetings • Update meetings • Report back meetings • Site meetings **No media communication except by DOH Communication**
Methodologies	Communication will be done though the following methods: • Meetings • Minutes • Telecommunication • E-mails • Reports • Letters • Feedback information
Delivery	Communication will be delivered through: • Telecommunication • E-mails • Postal services • Internal registry services
Personnel	Communication will be between KZN-DOH Infrastructure Development (DOH ID)and:- • Mr Priven Chowthee – Project Leader / Quantity Surveyor • Mrs N. M. Zuma-Mkhonza – Umgungundlovu District Manager • Dr K. Bilenge: CEO – Grey's Hospital

ITEM	ELEMENTS
	Communication is expected to take place between: • KZN-DOH and Contractor/s • KZN-DOH and Relevant consultants

7.4 Project Communication Plan

The following plan is a guideline

Communication Type	Objective of communication	Medium	Frequency	Audience
Project Team Meeting	Design improvements and update	Face to Face	Monthly	Project Leader KZN DOH
Bid Specification Committee	To evaluate the quality of the Bid Document	Meeting	Once	KZN - DoPW Project Leader KZN DOH
Compulsory site meeting	To brief the Contractor the site conditions and tender procedures	Site meeting	Once	KZN - DoPW Project Leader KZN DOH
Bid Evaluation Committee	To approve the advertising of the project, to recommend the highest scoring bidder and to approve extension of times	Meeting	Weekly	KZN - DoPW Project Leader KZN DOH
Bid Award Committee	To approve the advertising of the project, award the highest scoring bidder.	Meeting	weekly	KZN - DoPW Project Leader KZN DOH
Site Hand Over	Hand site to contractor	Meeting	Once	KZN - DoPW Project Leader KZN DOH

Progress meetings	To evaluate the progress on site	Site meeting	Every week	KZN - DoPW Project Leader KZN DOH
First delivery Meeting	To hand over the site back to the Client	Site meeting	Once	KZN - DoPW Project Leader KZN DOH
Ad Hoc	General updating or interventions	Meeting to be determined	As when required	All stake holders

8. PROJECT MANAGEMENT

The following Project Management plan is a guideline.

ITEM	ELEMENTS	
Needs Assessment/Analysis:	• Can this project be undertaken utilising only in-house skills?	• **No.** **Project to be implemented through Department of Public Works (DoPW)**
	• Why does this project need an Implementing Agent	• **Insufficient in-house resources**
	• Why does this project need a consultant	• **Project requires input from professional consultants.**
	• Are there other ways/options to undertake project work?	• **Not at this time**
Project Brief:	• The project brief is required to manage the implementation of the project to successful completion within time, cost and to the required specification and to manage **all** project associated risks for minimum impact.	
Consultancy Brief:	• There will be no Consultant Team	
Evaluation and	• The project may not proceed to any stage until DOH is satisfied with the current stage	

Engagement:	(wherever that is) of the project; • DOH will follow the IDMS principals for approval and evaluation

9. PROJECT RISK MANAGEMENT

Informed decision-making is critical to the success of any project. Crucial to this success is the identification of risks and how they will be managed. The following risks have been identified prior to the projects start. These risks are not all inclusive and will be reviewed as the project progresses.

Risk Log

Risk	Owner (Initials)	Probability (low/med/high)	Consequence (L/M/H)	Actions
Inexperienced Contractor appointed	DoH	High	High	DoH to ensure at the adjudication that contractors that qualify meet all the requirements to deliver on the project and are of the right CIDB rating.
Delay in approval of IDMS Stage Reports	DoH	Medium	High	To monitor the milestone set out in the brief and have all stakeholders informed at all stages of the project.
Disruption to Users	DoH	High	Low	Careful and clear communication with the end User on where and when such inconvenience shall be caused must be given.

Projected cashflow for current year

MONTH	FEES	CONSTRUCTION
APRIL, 2019	R 0.00	R 0.00
MAY, 2019	R 0.00	R 0.00
JUNE, 2019	R 0.00	R 0.00
JULY, 2019	R 0.00	R 0.00
AUGUST, 2019	R 0.00	R 0.00
SEPTEMBER, 2019	R 0.00	R 500,000.00
OCTOBER, 2019	R 0.00	R 500,000.00
NOVEMBER, 2019	R 0.00	R 500,000.00
DECEMBER, 2019	R 0.00	R 500,000.00
JANUARY, 2020	R 0.00	R 500,000.00
FEBRUARY, 2020	R 0.00	R 500,000.00
MARCH, 2020	R 0.00	R 500,000.00
APRIL, 2020	R 0.00	R 500,000.00
MAY, 2020	R 0.00	R 500,000.00
JUNE, 2020	R 0.00	R 2,000,000.00
JULY, 2020	R 0.00	R 1,000,000.00
AUGUST, 2020	R 0.00	R 1,000,000.00
SEPTEMBER, 2020	R 0.00	R 1,000,000.00
	R 0.00	R 500,000.00