

TENDER

BID NO: SCMU3-23/24-0751-HO

Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)

NAME OF COMPANY:

CSD Nr:

CRS Nr (CIDB):

CLOSING DATE: 5 April 2024

TIME: 11:00 am

Deliver to:

**EASTERN CAPE DEPARTMENT OF HEALTH: SUPPLY CHAIN MANAGEMENT OFFICE,
situated at the following address:**

**GLOBAL LIFE CENTRE, SCM UNIT, C/O PHALO AVENUE AND R63 (OPPOSITE ENGINE GARAGE), BHISHO
6001**

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THE TENDER

1.PART T1 - TENDERING PROCEDURES

PART T1.1: TENDER NOTICE AND INVITATION TO TENDER

1.1. T1.1.Tender Notice and Invitation to Tender

The Eastern Cape Department of Health invites contractors with a CIDB Grading of **CIDB 8GB** or higher in the following Class of works (**CIDB 8GB or higher**) to tender for the “**Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)**” for a **(12) Twelve-month** contract (Excluding builders holidays). The contract will be based on the JBCC Edition 6.2 of 2018 and **The Eastern Cape Department of Health** will enter a contract with the successful tenderer.

BID DOCUMENTS MAY BE OBTAINED FROM THE ECDOH & TREASURY WEB SITES AT NO COST:

There will be a compulsory briefing meeting on **6 March 2024 @ 11h00, at Cecilia Makiwane Hospital, Mdantsane, Amathole Health District, Eastern Cape Province**. Prospective bidders to meet at the parking area entrance to Family Medicine, Gatehouse B, inside the Hospital site, **11h00**.

Queries & Technical enquiries relating to the issue of these documents may be addressed in writing to Ms. T Notshe via email: thabisa.notshe@echealth.gov.za Phone: 040 608 9501

The closing time for receipt of tenders by **The Eastern Cape Department of Health** is 11:00am on **5 April 2024**. Telegraphic, telephonic, telex, facsimile, e-mail and late tenders will not be accepted. Bids must be submitted in sealed envelopes clearly marked “**TENDER: Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District) BID NO: SCMU3-23/24-0751-HO**” must be deposited in the bid/tender box of:

EASTERN CAPE DEPARTMENT OF HEALTH: SUPPLY CHAIN MANAGEMENT OFFICE,

situated at the following address:

GLOBAL LIFE CENTRE, SCM UNIT, C/O PHALO AVENUE AND R63 (OPPOSITE ENGINE GARAGE), BHISHO.

It is the responsibility of the tenderer/s to ensure that bid documents /proposals are submitted on or before closing time and the correct location as the department will not take responsibility of wrong delivery. Tenderers using courier services for delivery of their bid documents must ensure the delivery is at the correct place / location and time as the department will not be held responsible for wrong delivery. Not delivered to Departmental officials. The Department will not accept responsibility if bids received by officials are not timely deposited in the Bid Box.

Tenders may only be submitted on the tender documentation that is issued. Tenderers must be registered on the National Treasury Central Supplier Data Base and proof of registration must be submitted with the proposal (<https://secure.csd.gov.za>). Requirements for sealing, addressing, delivery, opening and assessment of tenders are stated in the Tender Data.

B. BID EVALUATION:

This bid will be evaluated in Two (2) Stages as follows:

Stage One: Compliance, responsiveness to the bid rules and conditions, thereafter they will be evaluated in terms of Price & Specific Goals

Stage Two: Price & Specific Goals in terms of the Preferential Procurement Regulations of 2022.

**PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT (PPPFA) Price & Specific Goals
POINTS WILL BE AWARDED AS FOLLOWS:**

Maximum points on Price	-	90 points
Maximum points for Specific Goals	-	10 points
Maximum points	-	100 points

C. BID SPECIFICATIONS, CONDITIONS AND RULES

The minimum specifications, bid conditions and rules are detailed in the bid document under Tender Data.

The specifications, rules, special conditions of bid, evaluation criteria, and rules for evaluation for compliance to local content and other bid conditions are detailed in the document.

Tender validity period is **90 days**.

D. TENDER SUBMISSIONS:

Bids must be submitted in sealed envelopes clearly marked: **“Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District) BID NO: SCMU3-23/24-0751-HO”** must be deposited in the tender / bid box:

EASTERN CAPE DEPARTMENT OF HEALTH: SUPPLY CHAIN MANAGEMENT OFFICE,

situated at the following address:

GLOBAL LIFE CENTRE, SCM UNIT, C/O PHALO AVENUE AND R63 (OPPOSITE ENGINE GARAGE), BHISHO.

E. ENQUIRIES WITH REGARD TO THIS ADVERT MAY BE DIRECTED TO:

Ms. T Notshe via email: thabisa.notshe@echealth.gov.za

PART T1.2: TENDER DATA

1.2. T1.2 Tender Data

The conditions of tender are the latest edition of SANS 10845-3, *Standard conditions of tender*. SANS 10845-3 makes 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 provisions of SANS 10845-3 *and* as contained in **Annexure C of Standard for Uniformity in Construction Procurement (Board Notice 423 of 2009 Government Gazette No 42622 of August 2019)**. Each item of data given below is cross-referenced to the clause in SANS 10845-3 to which it mainly applies.

Clause number	Tender Data
3.1	The Employer is the Eastern Cape Department of Health
3.2	The tender documents issued by the employer comprise the following documents: THE TENDER Part T1: Tendering procedures T1.1 - Tender notice and invitation to tender. T1.2 - Tender data Part T2: Returnable documents T2.1 - List of returnable documents T2.2 - Returnable schedules THE CONTRACT Part C1: Agreements and Contract data C1.1 - Form of offer and acceptance C1.2 - Contract data C1.3 - Dispute Resolution Mechanism Part C2: Pricing data C2.1 - Pricing Instructions C2.2 - Bills of Quantities Part C3: Scope of work C3 - Scope of work Part C4: Site information C4 - Site information
3.3	The tender documents issued by the employer comprise the documents listed on the contents page
3.4	The employer's agent is: BRINKMAN NDAYI MCALL (PTY) LTD: SUITE 1 LYNDON 114 PARK DRIVE GQEBERHA Ms. A. Swart via email: arindas@bnm.co.za Phone No. 041 5852125
3.5	The language for communications is English
3.6	The competitive negotiation procedure shall be applied.
3.7	Procurement Method: Two (2) stage procurement procedure shall be applied.
4	Tender's obligations

4.1	<p>The following tenderers who are registered with the CIDB, or are capable of being so registered prior to the evaluation of submissions, are eligible to have their tenders evaluated:</p> <p>a) contractors who have 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) of 25(7A) of the Construction Industry Development Regulations, for a CIDB CIDB 8GB or Higher class of construction work; and</p> <p>Joint ventures are eligible to submit tenders provided that:</p> <ol style="list-style-type: none"> 1. every member of the joint venture is registered with the CIDB; in GB class of works. 2. 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 CIDB 8GB or higher class of construction work or a value determined in accordance with Regulation 25 (1B) of 25(7A) of the Construction Industry Development Regulations (Three contractors registered in contractor grading designation 7 of which the lead partner must be registered in the class of work under consideration OR One grade 8 lead partner within the class of work under consideration plus any grade combination within any class of work). 3. Joint Venture Agreement. 4. Combined SBD 6.1 Specific Goals Points Claim form.
4.2	<p>The employer will compensate the tender as follows JBCC Edition 6.2 of 2018 with Government Clauses. The employer will not compensate the tenderer for any costs incurred in attending interviews or making any submissions in the office of the employer.</p>
4.3	<p>It is the responsibility of the tenderer to check the tender documents on receipt for completeness and notify the employer of any discrepancy or omission.</p>
4.4	<p>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.</p>
4.5	<p>Obtain, as necessary for submitting a tender offer, copies of the latest versions of standards, specifications, conditions of contract and other publications, which are incorporated into the tender documents by reference.</p>
4.6	<p>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.</p>
4.7	<p>The arrangements for a compulsory clarification meeting are as stated in the Tender Notice and Invitation to Tender. Tenderers must sign the attendance list in the name of the tendering entity. Addenda will be issued to and tenders will be received only from those tendering entities appearing on the attendance list. Tender documents will not be made available at the clarification meeting</p>
4.8	<p>Seek clarification <i>Request clarification of the tender documents, if necessary, by notifying the employer at least 5 (Five) working days before the closing time stated in the tender data.</i></p>
4.9	<p>Tenderers are required to state the rates and currencies in Rands. Include in the rates, prices, and the tendered total of the prices (if any), all duties, taxes which the law requires to be paid [except value added tax (VAT)], and other levies payable by the successful tenderer, that are applicable 14 days before the closing time stated in the tender data. Show the VAT payable by the employer separately as an addition to the tendered total of the prices. 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. State the rates and prices in monetary value of the contract unless otherwise instructed in the tender data.</p>
4.10	<p>Do not make any alterations or additions to the tender documents, except to comply with instructions issued by the employer or to correct errors made by the tenderer and ensure that all signatories to the tender offer initial all such alterations. Do not make erasures using masking fluid.</p>

4.11	Main tender offers are not required to be submitted together with alternative tenders.
4.12	No alternative tender offers will be considered
4.13.1	Parts of each tender offer communicated on paper shall be submitted as an original. Submit a) the parts of the tender offer communicated on paper as an original plus the number of copies stated in the tender data, with a translation of any documentation in a language other than the language of communication established in 3.5, and b) the parts communicated electronically by the employer of its agents on paper format with the tender.
4.13.2	Sign the original and all copies of the tender offer where required in terms of the tender data. State in the case of a joint venture which of the signatories is the lead partner whom the employer shall hold liable for the purpose of the tender offer. NOTE The employer holds all authorized signatories liable on behalf of the tenderer.
4.13.3	A tender security in the amount of N/A is required and shall remain valid for a period not exceeding N/A days after the closing date for tender offers. The form of the tender security shall not differ substantially from the sample provided in Annex D of SANS 10845-3.
4.13.4	The employer's details and address for delivery of tender offers and identification details that are to be shown on each tender offer package are: EASTERN CAPE DEPARTMENT OF HEALTH: SUPPLY CHAIN MANAGEMENT OFFICE, situated at the following address: GLOBAL LIFE CENTRE, SCM UNIT, C/O PHALO AVENUE AND R63 (OPPOSITE ENGINE GARAGE), BHISHO. Tender / Bid identification details: Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District) BID NO: SCMU3-23/24-0751-HO Closing time and date: As per Tender advertisement
4.13.5	The tenderer is required to submit with his tender the following compulsory certificates: 1) a copy of the CSD report showing, amongst other things, that tax matters of the service provider are in order with the South African Revenue Services. <i>In the case of a Joint Venture/Consortium/Sub-contractors each party must submit a separate CSD report showing, amongst other things, that tax matters of the service provider are in order with the South African Revenue Services.</i> 2) CIDB Grading certificate or CRS number. 3) COIDA Letter of Good standing from the Department of Labour and/or FEM
4.13.6	A two-envelope procedure will not be required.
4.13.7	Telephonic, telegraphic, telex, facsimile or e-mailed tender offers will not be accepted. The tenderer accepts that the employer does 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.
4.14	The closing time for submission of tender offers is as stated in the Tender Notice and Invitation to Tender. 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. Proof of posting shall not be accepted as proof of delivery.

	Accept that, if the employer extends the closing time stated in the tender data for any reason, the requirements of the standard conditions of tender in this part of SANS 10845 apply equally to the extended deadline.
4.15.1	The tender offer validity period is 90 days . 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. 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. Extend the period of the tender security, if any, to cover any agreed extension requested by the employer.
4.15.2	Placing of contractors under restrictions / withdrawal of tenders If any tenderer who has submitted a tender offer or a contractor who has concluded a contract has, as relevant: withdrawn such tender or quotation after the advertised closing date and time for the receipt of submissions; after having been notified of the acceptance of his tender, failed or refused to commence the contract; had their contract terminated for reasons within their control without reasonable cause; offered, promised or given a bribe in relation to the obtaining or the execution of such contract; acted in a fraudulent, collusive or anti-competitive or improper manner or in bad faith towards the Provincial Government; or, made any incorrect statement in any affidavit or declaration with regard to a preference claimed and is unable to prove to the satisfaction of the Provincial Government that the statement was made in good faith or reasonable steps were taken to confirm the correctness of the statements, such tenderer/s may be placed under restriction from tendering with the state. Procedures are outlined in the EC SCM Policy for Infrastructure procurement and Delivery Management and also on cidb Inform Practice Note #30. Excerpts of the policy can be availed on request of any interested tenderer.
4.16	Access shall be provided for the following inspections, tests and analysis: N/A
4.17	the preferred tenderer will be required to submit an approved insurer undertaking to provide the Performance Bond / Guarantee / Surety / Security to the format and/or standard
5	Employer's undertakings
5.1	The Employer will respond to requests for clarification received up to Five (5) working days before the tender closing time. If, as a result of the issuing of addenda, it is necessary to extend the closing time stated in the tender data, grant such extension and notify all respondents accordingly.
5.2	The employer shall issue addenda until Five (5) working days before tender closing time.
5.3	Tenders will be opened immediately after the closing time for tenders at 11:00am hours .
5.4	Do not disclose to tenderers, or to any 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.
5.5	Determine, after opening and before detailed evaluation, whether each tender offer that was properly received a) complies with the requirements of the standard conditions of tender in this part of SANS 10845, 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 scope of work of the tender documents, without material deviation or qualification. A material deviation or qualification is one which, in the employer's opinion, would d) detrimentally affect the scope, quality, or performance of the works, services or supply identified in the scope of work, e) significantly change the employer's or the tenderer's risks and responsibilities under the contract, or f) affect the competitive position of other tenderers presenting responsive tenders, if it were to be rectified. Reject a non-responsive tender offer, and do not allow it to be subsequently made responsive by correction or withdrawal of the non-conforming deviation or reservation.
5.6	Arithmetical errors, omission, and discrepancies

	<p>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.</p> <p>For Vat related discrepancies, National and Provincial Treasury prescripts in relation to VAT procedures apply.</p>																
5.7.1	<p>The financial offer will be reduced to a comparative basis using the Tender Assessment Schedule.</p> <p>Table F.1: Formulae for calculating the value of A</p> <table border="1"> <thead> <tr> <th>Formula</th> <th>Comparison aimed at achieving</th> <th>Option 1^a</th> <th>Option 2^a</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Highest price or discount</td> <td>$A = \left(1 + \frac{(P - P_m)}{P_m}\right)$</td> <td>$A = P/P_m$</td> </tr> <tr> <td>2</td> <td>Lowest price or percentage commission / fee</td> <td>$A = \left(1 - \frac{(P - P_m)}{P_m}\right)$</td> <td>$A = P_m/P$</td> </tr> <tr> <td colspan="4"> ^a P_m is the comparative offer of the most favourable comparative offer. P is the comparative offer of the tender offer under consideration. </td> </tr> </tbody> </table>	Formula	Comparison aimed at achieving	Option 1 ^a	Option 2 ^a	1	Highest price or discount	$A = \left(1 + \frac{(P - P_m)}{P_m}\right)$	$A = P/P_m$	2	Lowest price or percentage commission / fee	$A = \left(1 - \frac{(P - P_m)}{P_m}\right)$	$A = P_m/P$	^a P_m is the comparative offer of the most favourable comparative offer. P is the comparative offer of the tender offer under consideration.			
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5.7.2	<p>The procedure for the evaluation of responsive tenders is Method 2: Administrative compliance, Price and Preference</p> <p>Stage 1: Administrative requirements and Mandatory requirements</p> <p>Stage 2: Price and preference (90/10 system)</p>																

STAGE ONE: ADMINISTRATIVE REQUIREMENTS AND MANDATORY REQUIREMENTS

A. Bidders' proposals must meet the following minimum requirements and supporting documents must be submitted with the completed bid document in a sealed envelope in the bid box at the closing date and time. Failure to comply will automatically eliminate the bid for further consideration:

1. Bid Document (This Document must be submitted in its original format)
2. Bids which are late, incomplete, unsigned or submitted by facsimile or electronically, will not be accepted.
3. Bidder must be registered with CIDB in the correct grading and class of works as per the tender notice and requirements. It is the responsibility of the bidder to keep the status on CIDB active throughout bidding process (advert till award stage).
4. Bidders must be a legal entity.
5. Form of offer and Acceptance (fully completed and signed)
6. SBD4 must be duly completed and signed. 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, such interest must be disclosed on question 2.3.1.
7. Compulsory Enterprise Questionnaire (Completed and signed) (JV partners must complete separate Questionnaire forms and submit) (% split to be indicated for each JV partner)
8. If the offer is "Vat Inclusive", the VAT registration number of service provider must be indicated and if a service provider is not a VAT Vendor but include VAT in its prices, the successful service provider will be given 21 days to register as a VAT Vendor with SARS, after the issuing of an appointment letter. If a bidder is a VAT vendor/registered, the bidder is required to explicitly state the VAT amount. VAT vendors must include VAT at 15% in the bid offer(s).
9. Resolution to Sign (if applicable)
10. Attendance of compulsory briefing meeting
11. This tender will be awarded as a whole. All trades listed in the Bills of Quantities or Pricing schedule must be priced for (except provisional sums and allowances), failure to do so will result in increase commercial risk of the bid and may lead to elimination or passing over of the bidder.
12. The tenderer is required to submit with his tender the following compulsory certificates:
13. A copy of the CSD report showing, amongst other things, that tax matters of the service provider are in order with the South African Revenue Services. In the case of a Joint Venture/Consortium/Sub-contractors each party must submit a separate CSD report showing, amongst other things, that tax matters of the service provider are in order with the South African Revenue Services.
14. CIDB Grading certificate or CRS number.
15. COIDA Letter of Good standing from the Department of Labour and/or FEM
16. ECDOH SCM Policy applies.
17. Returnable Schedule: SBD1-Invitation to bid must be completed and signed
18. The bidder must be registered on the Central Supplier Database (CSD) before the Tender Closing Date.
19. All bidders' tax matters must be in order prior award. Bidders' tax matters will be verified through CSD.
20. Declaration of Employees of the State or other State Institutions.
21. Due Diligence In-Loco Inspection of the Bidder / or JV. As part of its due diligence obligations, the Department of Health reserves the right to do an In-Loco inspection of the offices and premises of the Bidder / or JV to verify the existence of the business ENTERPRISE as declared on the SBD1 form.
22. In the event where the In-Loco Inspections find inconsistencies and or misrepresentation in terms of what has been declared in the Bid submission, the Bidder will be notified of such inconsistencies and or misrepresentations in writing and allowed 7 (seven) days to rectify such.
23. As part of the due diligence Bid evaluation process a technical risk analysis of the Bid submission including the Bills of Quantities will be carried out by the Bid Evaluation Committee with the support of the Built Environment Professional Team, to check and

confirm whether the tender price submitted is market related and does not pose a commercial risk to the Client.

24. In the event where the Bidder that's scored the highest points and the Technical Risk Analysis outcome indicated commercial risk to the Client, the Client reserves the right to award the Bid to the second highest scorer of Bid points.
25. The Bidder who complies with the Due Diligence In-Loco Inspection evaluation criteria, may then be considered for recommendation for award.
26. In the event where the Bidder has failed to rectify the inconsistencies and or misrepresentations within the 7 (seven) day period, the Health Department shall consider the Bidder who scored the 2nd highest points to be considered for award.
27. The Department will contract with the successful bidder by signing a formal contract.
28. Wherever a brand name is specified in this document (i.e. specifications, pricing schedule, bill of quantities or anywhere), the department requires an item similar/equivalent or better.
29. Protection of personal information: Consent (POPIA)
30. The successful tenderer (after being informed) will be required to bring along an unsigned copy of the form of contract to be signed by parties (e.g. JBCC Edition 6.2 of 2018 with Government Clauses)
31. A fixed construction guarantee of 10% must be provided as security, in the event that the considered bidder fail to provide this security, the client will consider the next highest scoring bidder for consideration.

STAGE TWO: EVALUATION POINTS ON PRICE AND SPECIFIC GOALS / PPPFA OF 2022

The **90/10 preference point system** shall be applied for the purposes of this bid as per the requirements of the *Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000)* and B-BBEE/ PPPFA Regulations of 2022

Criteria	Points
POINTS ON PRICE	90
SPECIFIC GOALS	10
TOTAL	100

The 90/10 preference point system for acquisition of services, works or goods exceeding Rand value of R50 million:

(a) The following formula must be used to calculate the points for price in respect of tenders (including price quotation) with a Rand value equal to, or above R 30 000 and up to Rand value of R 50 000 000 (all applicable taxes included):

The financial offer will be scored using the following formula:

$$A = (1 - \frac{P - P_m}{P_m})$$

The value of value of W_1 is:

- 1) **90** where the financial value inclusive of VAT of all responsive tenders received have a value in **excess of R50 000 000** or
- 2) **80** where the financial value inclusive of VAT of one or more responsive tender offers have a value that **equals or is less than R 50 000 000**.

5.7.3	The procedure for the evaluation of responsive tenders is Method 2 (Administrative, price and specific goals)
5.7.4	The other approved similar approach criteria and maximum score in respect of each of the criteria are as follows: N/A
5.7.5	Each evaluation criteria will be assessed in terms of five indicators – N/A
5.7.6	The prompts for judgment and the associated scores used in the evaluation of quality shall be as follows: N/A

5.8	<p>Tender offers will only be accepted if:</p> <ol style="list-style-type: none"> a) the tenderer is registered on the Central Supplier Database (CSD) for the South African government (see https://secure.csd.gov.za/) unless it is a foreign supplier with no local registered entity b) the tenderer is in good standing with SARS according to the Central Supplier Database. Bidders must submit a CSD no. or tax status compliance pin. c) the tenderer is registered with the Construction Industry Development Board in an appropriate contractor grading designation; d) the tenderer or any of its directors/shareholders is not listed on the Register of Tender Defaulters in terms of the Prevention and Combating of Corrupt Activities Act of 2004 as a person prohibited from doing business with the public sector. e) the tenderer has not: <ol style="list-style-type: none"> 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. f) the tenderer has completed the Compulsory Declaration and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process. g) the tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process and persons in the employ of the state are permitted to submit tenders or participate in the contract.
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	<ul style="list-style-type: none"> h) Bids which are late, incomplete, unsigned or submitted by facsimile or electronically will not be accepted. i) the tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer. j) the employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the necessary competencies and resources to carry out the work safely. A letter of Good standing from the Labour Department is a compulsory mandatory requirement. k) the tender has offered a market related offer. If the offer is believed not to be market related, the department through its Supply Chain Management bid committees will attempt to negotiate the offer with identified bidder/s to a reasonable amount. Bidders are not allowed to increase their tender offers during this process. l) A Resolution of signatory form has been completed and signed by director/s or a letter bearing a letterhead of the tenderer has been attached (specific to this bid) to the bid submission; it must be duly signed by all directors and submitted the bid. Only a duly authorized official can sign the bid. m) Prospective bidders must register on CSD prior submitting bids (open tenders). Any prospective bidder found to have Tax matters not in order with SARS (verified through CSD) during the evaluation process (after being given an opportunity to rectify tax matters) will be eliminated and not be considered further in the process. Preferred bidder/s will be afforded an opportunity to rectify their tax affairs within 7 days. A bidder that fails to rectify its tax matters with SARS will be eliminated. n) NOTE: The amount reflected on the Form of Offer and Acceptance takes precedence over any other total amount indicated elsewhere in bidder's tender submission. If the Form of Offer and Acceptance has no value or figure, the bidder will be regarded as having made no offer. o) The department reserves the right not to award the bid to the most favourable tenderer, if any of the situations occur: if it is not assisting in the advancement of designated groups; risk profile of the favourable firm is too high; the bidder has been awarded a considerable number of projects by the department or provincial government; has performed unsatisfactorily in the past, etc.
	<ul style="list-style-type: none"> p) the tenderer has completed the Compulsory Enterprise Questionnaire and there are no conflicts of interest which may impact on the tenderer's ability to perform the contract in the best interests of the employer or potentially compromise the tender process and persons in the employ of the state are permitted to submit tenders or participate in the contract. q) Bids which are late, incomplete, unsigned or submitted by facsimile or electronically will not be accepted. r) the tenderer is registered and in good standing with the compensation fund or with a licensed compensation insurer. s) the employer is reasonably satisfied that the tenderer has in terms of the Construction Regulations, 2014, issued in terms of the Occupational Health and Safety Act, 1993, the necessary competencies and resources to carry out the work safely. A letter of Good standing from the Labour Department is a compulsory mandatory requirement. t) the tender has offered a market related offer. If the offer is believed not to be market related, the department through its Supply Chain Management bid committees will attempt to negotiate the offer with identified bidder/s to a reasonable amount. Bidders are not allowed to increase their tender offers during this process. u) A Resolution of signatory form has been completed and signed by director/s or a letter bearing a letterhead of the tenderer has been attached (specific to this bid) to the bid submission; it must be duly signed by all directors and submitted the bid. Only a duly authorized official can sign the bid.

	<p>v) Prospective bidders must register on CSD prior submitting bids (open tenders). Any prospective bidder found to have Tax matters not in order with SARS (verified through CSD) during the evaluation process (after being given an opportunity to rectify tax matters) will be eliminated and not be considered further in the process. Preferred bidder/s will be afforded an opportunity to rectify their tax affairs within 7 days. A bidder that fails to rectify its tax matters with SARS will be eliminated.</p> <p>w) NOTE: The amount reflected on the Form of Offer and Acceptance takes precedence over any other total amount indicated elsewhere in bidder's tender submission. If the Form of Offer and Acceptance has no value or figure, the bidder will be regarded as having made no offer.</p> <p>x) The department reserves the right not to award the bid to the most favourable tenderer, if any of the situations occur: if it is not assisting in the advancement of designated groups; risk profile of the favourable firm is too high; the bidder has been awarded a considerable number of projects by the department or provincial government; has performed unsatisfactorily in the past, etc.</p>
5.9	The number of paper copies of the signed contract to be provided by the employer is 1.
	<p>The additional conditions of tender are:</p> <ul style="list-style-type: none"> Wherever a brand name is specified in this document (i.e., specifications, pricing schedule, bill of quantities or anywhere), the department requires an item similar/equivalent or better.
T.2.1	List of returnable documents
1	<p>Documentation to demonstrate eligibility to have tenders evaluated i.e. List all documentation to demonstrate eligibility to have a submission evaluated.</p> <ul style="list-style-type: none"> Appropriate CIDB grading suitable for the works (as stated in 4.1).
2	<p>Returnable Schedules required for tender evaluation purposes.</p> <p>The tenderer must fully and appropriately complete and sign the following returnable schedules as relevant:</p> <ul style="list-style-type: none"> SBD 1, SBD 4 (Mandatory) SBD 6.1 PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022 Proposed amendments and qualifications. (Mandatory) Schedule of Proposed Subcontractors Protection of personal content: Consent POPIA (Mandatory) Valid CIDB Certificate of Tenderer (Mandatory) Valid Department of Labour COIDA Letter of Good Standing Certificate and/or FEM. (Mandatory) Proof of Specific Goals Claimed Proof of Registration on the National Treasury Central Supplier Data Base (CSD) (Mandatory) Part C1.1 Form of Offer and Acceptance (Mandatory) Part C1.2 Contract Data (Mandatory) Part C2.2 Bills of Quantities (Handwritten Priced. Not typed) (Mandatory) Compulsory enterprise questionnaire (In the case of a joint venture, separate enterprise questionnaires in respect of each partner must be completed and submitted). (Mandatory) Record of addenda issued (Only if addenda is issued) (Mandatory) Resolution for Signatory (Mandatory) Certificate of authority for joint ventures (Only where the tender/ quotation is submitted by a joint venture) (Mandatory) Proof of Registration on the National Treasury Central Supplier Data Base (CSD). A CSD Report for a contractor with valid and correct information (Mandatory)
3	<p>Other documents required for tender evaluation purposes.</p> <p>The tenderer must provide the following returnable documents:</p> <ul style="list-style-type: none"> None

4	<p>Only authorized signatories may sign the original and all copies of the tender offer where required. In the case of a ONE-PERSON CONCERN submitting a tender, this shall be clearly stated.</p> <p>In the case of a COMPANY submitting a tender, include a copy of a <u>resolution by its board of directors</u> authorizing a director or other official of the company to sign the documents on behalf of the company.</p> <p>In the case of a CLOSE CORPORATION submitting a tender, include a copy of a <u>resolution by its members</u> authorizing a member or other official of the corporation to sign the documents on each member's behalf.</p> <p>In the case of a PARTNERSHIP submitting a tender, <u>all the partners</u> shall sign the documents, unless one partner or a group of partners has been authorized to sign on behalf of each partner, in which case <u>proof of such authorization</u> shall be included in the Tender.</p> <p>In the case of a JOINT VENTURE/CONSORTIUM submitting a tender, include a <u>resolution of each company</u> of the joint venture together with a <u>resolution by its members</u> authorizing a member of the joint venture to sign the documents on behalf of the joint venture.</p> <p><u>Accept that failure to submit proof of authorization to sign the tender shall result in the tender offer being regarded as non-responsive.</u></p>
5	<p>Information and data to be completed in all respects</p> <p>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 nonresponsive.</p>
6	<p>Canvassing and obtaining of additional information by tenderers</p> <p>The Tenderer shall not make any attempt either directly or indirectly to canvass any of the Employer's officials or the Employer's agent in respect of his tender, after the opening of the tenders but prior to the Employer arriving at a decision thereon.</p> <p>The Tenderer shall not make any attempt to obtain particulars of any relevant information, other than that disclosed at the opening of tenders.</p>
7	<p>Prohibitions on awards to persons in service of the state</p> <p>The Employer is prohibited to award a tender to a person -</p> <ol style="list-style-type: none"> a) who is in the service of the state; or b) if that person is not a natural person, of which any director, manager, principal shareholder or stakeholder is a person in the service of the state; or c) a person who is an advisor or consultant contracted with the Department or municipal entity. <p>In the service of the state means to be -</p> <ol style="list-style-type: none"> a) a member of:- <ol style="list-style-type: none"> a any municipal council; b any provincial legislature; or c the National Assembly or the National Council of Provinces; d) a member of the board of directors of any municipal entity; e) an official of any Department or municipal entity; f) an employee of any national or provincial department; g) provincial public entity or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999); h) a member of the accounting authority of any national or provincial public entity; or i) an employee of Parliament or a provincial legislature. <p>In order to give effect to the above, the questionnaire for the declaration of interests in the tender of persons in service of state in part T2 of this procurement document must be completed.</p>
8	<p>Awards to close family members of persons in the service of the state</p> <p>Accept that the notes to the Employer's annual financial statements must disclose particulars of any award of more than R2000 to a person who is a spouse, child, or parent of a person in the service of the state (defined in clause 8 above), or has been in the service of the state in the previous twelve months, including -</p> <ol style="list-style-type: none"> a) the name of that person;

	<p>b) the capacity in which that person is in the service of the state; and</p> <p>c) the amount of the award.</p> <p>In order to give effect to the above, the questionnaire for the declaration of interests in the tender of persons in service of state in part T2 of this procurement document must be completed.</p>
9	<p>Respond to requests from the tenderer The employer will respond to requests for clarification up to 5 (five) working days before the tender closing time.</p>
10	<p>Opening of tender submissions Tenders will be opened immediately after the closing time for tenders</p>
11	<p>Scoring quality / functionality: Not applicable to this tender</p>
12	<p>Cancellation and re-invitation of tenders</p> <p>An organ of state may, prior to the award of the tender, cancel the tender if-</p> <p>(a) due to changed circumstances, there is no longer a need for the services, works or goods requested; or</p> <p>(b) funds are no longer available to cover the total envisaged expenditure; or</p> <p>(c) no acceptable tenders are received.</p> <p>(d) Tender validity period has expired.</p> <p>(e) Gross irregularities in the tender processes and/or tender documents.</p> <p>(f) No market related offer received (after attempts of negotiation processes)</p> <p>Where applicable, the decision to cancel the tender will be published in on the Tender Notice Board of the SCM Department and if applicable, on the CIDB website and in the Tender Bulletin or the media in which the original tender invitation as advertised.</p>
13	<p>Dispute resolution mechanism will be done through the SCM Department and thereafter the Adjudication route.</p>
14	<p>The department, when it takes action against the tenderer or person awarded the contract on a fraudulent basis, considers the provisions of Regulation 14: The remedies provided for in Preferential Procurement Regulations 2022 do not prevent an institution from instituting remedies arising from any other prescripts or contract.</p>
15	<p>Where the employer terminates the contract due to default of the contractor in whole or in part, the employer may decide to: a) Refer the breach in contract to the CIDB for investigation as a breach of the CIDB Code of Conduct in terms of the CIDB Regulations; or b) may impose a restriction penalty on the contractor in terms of Section 14 of the Preferential Procurement Regulations. The outcomes of such investigations in terms of both the CIDB Regulations and the Preferential Procurement Regulations may prohibit the contractor from doing business with the public sector for a period not exceeding 10 years.</p>

2.PART T2 - RETURNABLE DOCUMENTS

ASSESSMENT OF STAGE 1 ADMINISTRATIVE REQUIREMENTS AND MANDATORY REQUIREMENTS:

The bidder shall not proceed to the next stage of evaluation if the bidder fails to submit all the mandatory information as listed here below:

BIDDER TO INDICATE BELOW IF MANDATORY DOCUMENTS WERE SUBMITTED WITH TENDER:

16	MANDATORY DOCUMENT TO BE SUBMITTED WITH BID:	<u>YES</u>	<u>NO</u>
	SBD 1 Part of invitation to bid and terms and conditions for bidding		
	SBD 4 Declaration of interest		
	SBD 6.1 Preference points claim form in terms of the Preferential procurement regulations 2022		
	Proposed amendments and qualifications		
	Protection of personal content: Consent		
	Valid CIDB Certificate of Tenderer		
	Valid Department of Labour COIDA Letter of Good Standing Certificate and/or FEM		
	Part C1.1 Form of Offer and Acceptance (Fully signed and completed)		
	Part C1.2 Contract Data		
	Part C2.2 Bills of Quantities (Fully priced) (Handwritten Priced. Not typed)		
	Compulsory enterprise questionnaire (In the case of a joint venture, separate enterprise questionnaires in respect of each partner must be completed and submitted).		
	Record of addenda issued (Only if addenda is issued)		
	Resolution for Signatory		
	Certificate of authority for joint ventures (Only where the tender/ quotation is submitted by a joint venture)		
	Proof of Registration on the National Treasury Central Supplier Data Base (CSD) Full CSD report)		

2.1. T2.1 List of Returnable Documents

The tenderer must complete the following returnable documents:

1 Returnable Schedules required for bid/quotation evaluation purposes.

- SBD 1, SBD 4
- SBD 6.1 PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022
- Proposed amendments and qualifications.
- Schedule of Proposed Subcontractors
- Particulars of all installation subcontractors in the tender document & Schedule of materials offered
- Protection of personal content: Consent
- Valid CIDB Certificate of Tenderer
- Valid Department of Labour COIDA Letter of Good Standing Certificate and/or FEM.
- Proof of Specific Goals Claimed
- Part C1.1 Form of Offer and Acceptance
- Part C1.2 Contract Data
- Part C2.2 Bills of Quantities
- Compulsory enterprise questionnaire (In the case of a joint venture, separate enterprise questionnaires in respect of each partner must be completed and submitted).
- Record of addenda issued (Only if addenda is issued)
- Resolution for Signatory
- Certificate of authority for joint ventures (Only where the tender/ quotation is submitted by a joint venture)
- Proof of Registration on the National Treasury Central Supplier Data Base (CSD)

2 Other documents required for bid/quotation evaluation purposes.

- Nil

3 Returnable Schedules that will be incorporated into the contract

- SBD 1, SBD 4
- SBD 6.1 PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022
- Proposed amendments and qualifications.
- Schedule of Proposed Subcontractors
- Particulars of all installation subcontractors in the tender document & Schedule of materials offered
- Protection of personal content: Consent
- Valid CIDB Certificate of Tenderer
- Valid Department of Labour COIDA Letter of Good Standing Certificate and/or FEM.
- Proof of Specific Goals Claimed
- Part C1.1 Form of Offer and Acceptance
- Part C1.2 Contract Data
- Part C2.2 Bills of Quantities

2.1. SBD 1 – PART A - INVITATION TO BID

PART A INVITATION TO BID

SBD 1

CSD registered service providers (CIDB Grading of CIDB 8GB Contractor or higher) are hereby invited to bid for the services required by the Eastern Cape Department of Health					
BID NUMBER:	SCMU3-23/24-0751-HO			CLOSING DATE:	5 April 2024
				CLOSING TIME:	11:00
DESCRIPTION:	Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)				
BID RESPONSE DOCUMENTS MAY BE DEPOSITED IN THE BID BOX SITUATED AT					
EASTERN CAPE DEPARTMENT OF HEALTH: SUPPLY CHAIN MANAGEMENT OFFICE, situated at the following address: GLOBAL LIFE CENTRE, SCM UNIT, C/O PHALO AVENUE AND R63 (OPPOSITE ENGINE GARAGES), BHISHO					
BIDDING PROCEDURE ENQUIRIES MAY BE DIRECTED TO:			TECHNICAL ENQUIRIES MAY BE DIRECTED TO:		
CONTACT PERSON	Ms. T Notshe		CONTACT PERSON	Ms. T Notshe	
TELEPHONE NUMBER	040 608 9501		TELEPHONE NUMBER	040 608 9501	
E-MAIL ADDRESS	thabisa.notshe@ehealth.gov.za		E-MAIL ADDRESS	thabisa.notshe@ehealth.gov.za	
SUPPLIER INFORMATION					
NAME OF BIDDER (Entity as registered on CSD)					
POSTAL ADDRESS					
STREET ADDRESS					
TELEPHONE NUMBER	CODE		NUMBER		
CELLPHONE NUMBER					
FACSIMILE NUMBER	CODE		NUMBER		
E-MAIL ADDRESS					
VAT REGISTRATION NUMBER					
SUPPLIER COMPLIANCE STATUS	TAX COMPLIANCE SYSTEM PIN:		OR	CENTRAL SUPPLIER DATABASE No:	MAAA
An SBD 6.1 PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022 IS TO BE SUBMITTED TO CLAIM DEPARTMENTAL SPECIFIC GOAL POINTS					
a) Service providers must submit proof of its Specific Goals points claimed / status of contributor.					
b) The Specific Goals supporting documents required to verify claimed points are in line with the specified requirements include:					
<ul style="list-style-type: none"> • Historically Disadvantaged Individuals Ownership: Proof of ownership (CIPRO certificate) with id no. • Women Ownership: Ownership: Proof of ownership (CIPRO certificate) with id no. • Youth Ownership: Ownership: Proof of ownership (CIPRO certificate) with id no. • Disability Ownership: Proof of ownership (CIPRO certificate) with valid medical documentary proof. • Military Veterans Ownership: Proof of ownership (CIPRO certificate) with valid proof of veteran status. • Locality Ownership: Proof of business address (municipal account or valid lease agreement) • Updated CSD report 					

2.2. SBD 1 - PART B – TERMS AND CONDITIONS FOR BIDDING

PART B TERMS AND CONDITIONS FOR BIDDING

<p>1. BID SUBMISSION:</p> <p>1.1. BIDS MUST BE DELIVERED BY THE STIPULATED TIME TO THE CORRECT ADDRESS. LATE BIDS WILL NOT BE ACCEPTED FOR CONSIDERATION.</p> <p>1.2. ALL BIDS MUST BE SUBMITTED ON THE OFFICIAL FORMS PROVIDED–(NOT TO BE RE-TYPED) OR IN THE MANNER PRESCRIBED IN THE BID DOCUMENT.</p> <p>1.3. THIS BID IS SUBJECT TO THE PREFERENTIAL PROCUREMENT POLICY FRAMEWORK ACT, 2000 AND THE PREFERENTIAL PROCUREMENT REGULATIONS, 2022, THE GENERAL CONDITIONS OF CONTRACT (GCC) AND, IF APPLICABLE, ANY OTHER SPECIAL CONDITIONS OF CONTRACT.</p> <p>1.4. THE SUCCESSFUL BIDDER WILL BE REQUIRED TO FILL IN AND SIGN A WRITTEN CONTRACT FORM.</p>
<p>2. TAX COMPLIANCE REQUIREMENTS</p> <p>2.1 BIDDERS MUST ENSURE COMPLIANCE WITH THEIR TAX OBLIGATIONS.</p> <p>2.2 BIDDERS ARE REQUIRED TO SUBMIT THEIR UNIQUE PERSONAL IDENTIFICATION NUMBER (PIN) ISSUED BY SARS TO ENABLE THE ORGAN OF STATE TO VERIFY THE TAXPAYER'S PROFILE AND TAX STATUS.</p> <p>2.3 APPLICATION FOR TAX COMPLIANCE STATUS (TCS) PIN MAY BE MADE VIA E-FILING THROUGH THE SARS WEBSITE WWW.SARS.GOV.ZA.</p> <p>2.4 BIDDERS MAY ALSO SUBMIT A PRINTED TCS CERTIFICATE TOGETHER WITH THE BID.</p> <p>2.5 SUBMISSION OF A COIDA LETTER OF GOOD STANDING FROM DEPARTMENT OF LABOUR AND/OR FEM IS MANDATORY</p> <p>2.6 IN BIDS WHERE CONSORTIA / JOINT VENTURES / SUB-CONTRACTORS ARE INVOLVED; EACH PARTY MUST SUBMIT A SEPARATE TCS CERTIFICATE / PIN / CSD NUMBER.</p> <p>2.7 WHERE NO TCS IS AVAILABLE BUT THE BIDDER IS REGISTERED ON THE CENTRAL SUPPLIER DATABASE (CSD), A CSD NUMBER MUST BE PROVIDED.</p> <p>2.8 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.”</p>
<p>3. SPECIAL CONDITIONS OF BID</p> <p>3.1 The Eastern Cape Department of Health shall do an In-LoCo inspection of the Bidders premises, to verify the following details:</p> <p>i. The existence of the business ENTERPRISE as declared on the SBD1 form.</p> <p>ii. The existence of the resources as declared on the SBD1 forms, Pricing Schedules and relevant mandatory returnable schedules.</p> <p>3.2 In the event where the In-LoCo Inspections find inconsistencies and or misrepresentation in terms of what has been declared in the bid submission, Pricing Schedules and relevant mandatory information, the Bidder will be notified of such inconsistencies and or misrepresentations in writing and allowed 7 (seven) days to rectify such.</p> <p>3.3 The Bidder who complies with the In-LoCo Inspection evaluation criteria, may then be considered to proceed to the Evaluation Stage 2.</p> <p>3.4. In the event where the Bidder has failed to rectify the inconsistencies and or misrepresentations within the 7 (seven) day period, the Health Department shall consider the Bidder who scored the 2nd highest points to be inspected, and if compliant, recommended to proceed to the Evaluation Stage 2.</p> <p>3.5. In the event where the recommended Bidder has failed to comply with the conditions as set out in the letter of award, the client shall notify the recommended Bidder of his/her failure to comply and recommend for award the next bidder that scored the highest points. The Conditions as set out in the letter of award are as follow:</p> <p>i. Proof of having All risk, public liability and support insurances as stipulated in the contract.</p> <p>ii. Submission of a Construction Safety, Health and Environmental Plan.</p>

iii. Contract Guarantee (as selected in the tender document)

3.6. An appointment letter/acceptance letter does not constitute a contract or commencement date of a contract. The recommended Bidder is required to sign an official contract with the Department.

3.7. As part of the due diligence Bid evaluation process a technical risk analysis of the Bid submission including the Bills of Quantities will be carried out by the Bid Evaluation Committee with the support of the Built Environment Professional Team, to check and confirm whether the tender price submitted is market related and does not pose a commercial risk to the Client.

3.8. In the event where the Bidder that's scored the highest points and the Technical Risk Analysis outcome indicated commercial risk to the Client, the Client reserves the right to award the Bid to the second highest scorer of Bid points.

3.9 A fixed construction guarantee of 10% must be provided as security, in the event that the considered bidder fail to provide this security, the client will consider the next highest scoring bidder for award.

SIGNATURE OF BIDDER:

DATE:

.....

.....

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

2.3. Compulsory Enterprise Questionnaire

Compulsory Enterprise questionnaire

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

Section 1: Name of enterprise:

Section 2: VAT registration number, if any:

Section 3: CIDB registration number, if any:

Section 4: Particulars of sole proprietors and partners in partnerships

Name*	Identity number*	Personal income tax number*

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

Section 5: Particulars of companies and close corporations

Company registration number

Close corporation number

Tax reference number

Section 6: The attached SBD 4 must be completed for each tender and be attached as a tender requirement.

Section 7: The attached SBD 6.1 must be completed for each tender and be attached as a requirement.

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

- i) authorizes the Employer to obtain a tax clearance certificate from the South African Revenue Services that my / our tax matters are in order;
- ii) confirms that the 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

2.4. SBD 4

SBD 4

BIDDER'S DISCLOSURE

1. PURPOSE OF THE FORM

Any person (natural or juristic) may make an offer or offers in terms of this invitation to bid. In line with the principles of transparency, accountability, impartiality, and ethics as enshrined in the Constitution of the Republic of South Africa and further expressed in various pieces of legislation, it is required for the bidder to make this declaration in respect of the details required hereunder.

Where a person/s are listed in the Register for Tender Defaulters and / or the List of Restricted Suppliers, that person will automatically be disqualified from the bid process.

2. Bidder's declaration

2.1 Is the bidder, or any of its directors / trustees / shareholders / members / partners or any person having a controlling 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.

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:

.....

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.*

2.5. RECORD OF ADDENDA TO BID DOCUMENTS

BID DESCRIPTION	Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)		
SCMU NUMBER	SCMU3-23/24-0751-HO		
I / We confirm that the following communications received from the Department of Health before the submission of this tender offer, amending the tender documents, have been taken into account in this bid offer: (Attach additional pages if more space is required)			
Item	Date	Title or Details	No. of Pages
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Attach additional pages if more space is required.

Signed _____ Date _____

Name _____ Position _____

Tenderer _____

2.6. PROPOSED AMENDMENTS AND QUALIFICATIONS

The Tenderer should record any deviations or qualifications he may wish to make to the tender documents in this Returnable Schedule. Alternatively, a tenderer may state such deviations and qualifications in a covering letter to his tender and reference such letter in this schedule.

The Tenderer's attention is drawn to clause 5.8 of SANS 10845-3 regarding the employer's handling of material deviations and qualifications.

BID DESCRIPTION	Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)
SCMU NUMBER	SCMU3-23/24-0751-HO

Page	Clause /Item	Proposal

The undersigned, who warrants that she/ he is duly authorised to do so on behalf of the enterprise, confirms that the content of this schedule that presented by the tenderer are within my personal knowledge and are to the best of my knowledge both true and correct

Signed

Date

Name

Position

Enterprise name

2.7. RESOLUTION FOR SIGNATORY

BID DESCRIPTION	Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)
SCMU NUMBER	SCMU3-23/24-0751-HO

A. CERTIFICATE OF AUTHORITY FOR SIGNATORY

Signatory for companies shall confirm their authority hereto by attaching a duly signed and dated copy of the relevant resolution of the board of directors to this form or on company letter head.

An example is given below:

“By resolution of the board of directors passed at a meeting held on _____

Mr/Ms _____, whose signature appears below, has been duly authorised to

sign all documents in connection with the tender for Contract No. _____

and any Contract which may arise there from on behalf of (Block Capitals) _____

SIGNED ON BEHALF OF THE COMPANY: _____

IN HIS/HER CAPACITY AS: _____

DATE: _____

SIGNATURE OF SIGNATORY: _____

WITNESSES:

DIRECTOR (NAMES)		SIGNATURE	
DIRECTOR (NAMES)		SIGNATURE	
DIRECTOR (NAMES)		SIGNATURE	
DIRECTOR (NAMES)		SIGNATURE	
DIRECTOR (NAMES)		SIGNATURE	
DIRECTOR (NAMES)		SIGNATURE	

If you cannot complete this form, attach a separate sheet (in a company letter head, project specific and signed by all directors):

B. CERTIFICATE OF AUTHORITY FOR JOINT VENTURES

<p>This Returnable Schedule is to be completed by joint ventures.</p> <p>We, the undersigned, are submitting this tender offer in Joint Venture and hereby authorize Mr/Ms, authorized signatory of the company, acting in the capacity of lead partner, to sign all documents in connection with the tender offer and any contract resulting from it on our behalf.</p>		
BID DESCRIPTION	<p>Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)</p>	
SCMU NUMBER	<p>SCMU3-23/24-0751-HO</p>	
NAME OF FIRM	ADDRESS	DULY AUTHORISED SIGNATORY
<p>Lead partner: </p>		<p>Signature. Name Designation.....</p>
<p>..... .</p>		<p>Signature. Name Designation.....</p>
<p>..... .</p>		<p>Signature. Name Designation.....</p>
<p>..... .</p>		<p>Signature. Name Designation.....</p>

2.8. SCHEDULE OF PROPOSED SUBCONTRACTORS

BID DESCRIPTION	Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)
SCMU NUMBER	SCMU3-23/24-0751-HO
<p>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. This should also be declared on SBD 6.1 form.</p> <p>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.</p> <p>We confirm that all subcontractors who are or to be contracted are registered on Central Supplier Database (CSD).</p>	

No.	Name and address of proposed Subcontractor	Sub-Contractor CIDB Grading	Sub-Contractor CIDB No.	Nature, extent of work, Year completed, Value of sub-contract	Contact details: Name of person and phone No.
1					
2					
3					
4					
5					

The undersigned, who warrants that she/ he is duly authorised to do so on behalf of the enterprise, confirms that the content of this schedule that presented by the tenderer are within my personal knowledge and are to the best of my knowledge both true and correct

Signed

Date

Name

Position

Enterprise name

2.9. SBD 6.1

SBD 6.1

PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS 2022

Bid Description:	Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)
Tender No:	SCMU3-23/24-0751-HO

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).

The applicable preference point system for this tender is the 80/20 or 90/10 preference point system.

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	90
SPECIFIC GOALS	10
Total points for Price and SPECIFIC GOALS	100

1.5 Failure on the part of a tenderer to submit proof or documentation required in terms of this 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 90/10 PREFERENCE POINT SYSTEMS

A maximum of 90 points is allocated for price on the following basis:

90/10

$$Ps = 90 \left(1 - \frac{Pt - Pmin}{Pmin} \right)$$

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 90 points is allocated for price on the following basis:

90/10

$$Ps = 90 \left(1 + \frac{Pt - Pmax}{Pmax} \right)$$

Where

Ps = Points scored for price of tender under consideration

Pt = Price of tender under consideration

Pmax = Price of highest acceptable tender

4. POINTS AWARDED FOR SPECIFIC GOALS

- 4.1. In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the goals stated in table 1 below as may be supported by proof/ documentation stated in the conditions of this tender:
- 4.2. In cases where organs of state intend to use Regulation 3(2) of the Regulations, which states that, if it is unclear whether the 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 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 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 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 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 claimed (90/10 system) (To be completed by the tenderer)
Historically Disadvantaged Individuals Ownership	20% (2)	
Women Ownership	20% (2)	
Youth Ownership	20% (2)	
Disability Ownership	20% (2)	
Military Veterans Ownership	10% (1)	
Locality (Eastern Cape Contractors can claim 1 point)	10% (1)	
TOTAL	100% (10)	

Table 2: Detailed description and definition of various categories of the specific goal points that can be claimed.

No.	Detailed description and definition of various categories	Portfolio of Evidence as part of the returnables
1	<p>Historically Disadvantaged Individuals Ownership: [Historically Disadvantaged Individual (HDI). Means a South African citizen who, due to the apartheid policy that had been in place, had no franchise in national elections prior to the introduction of the Constitution of the Republic of South Africa, 1983 (Act No. 110 of 1983) or the Constitution of the Republic of South Africa, 1993 (Act No. 200 of 1993) (“The Interim Constitution”) and /or Who is a female; and/or Who has a disability]. A South African ID number is a 13-digit number which is defined by the following format: YYMMDDSSSSCAZ.</p> <ul style="list-style-type: none"> • The first 6 digits (YYMMDD) are based on your date of birth. 20 February 1992 is displayed as 920220. • The next 4 digits (SSSS) are used to define your gender. Females are assigned numbers in the range 0000-4999 and males from 5000-9999. • The next digit (C) shows if you're an SA citizen status with 0 denoting that you were born a SA citizen and 1 denoting that you're a permanent resident. 	<p>1) Proof of ownership (CIPRO certificate) with id no.</p> <hr/> <p>2) Proof of ownership (CSD report) with id no.</p> <hr/> <p>3) Certified copy of ID of all owners.</p>
2	<p>Women Ownership: A South African ID number is a 13-digit number which is defined by the following format: YYMMDDSSSSCAZ.</p> <ul style="list-style-type: none"> • The first 6 digits (YYMMDD) are based on your date of birth. 20 February 1992 is displayed as 920220. • The next 4 digits (SSSS) are used to define your gender. Females are assigned numbers in the range 0000-4999 and males from 5000-9999. 	<p>1) Proof of ownership (CIPRO certificate) with id no.</p> <hr/> <p>2) Proof of ownership (CSD report) with id no.</p> <hr/> <p>3) Certified copy of ID of all owners.</p>
3	<p>Military Veterans Ownership: According to the 2011 Military Veterans act, a military veteran is any South African who rendered military service to any of the military organisations, former statutory and liberation armies, which were involved on all sides of South Africa's liberation war from 1960 to 1993; served in the then Union Defence Force.</p>	<p>1) Proof of ownership (CIPRO certificate) with id no. with valid proof of veteran status.</p> <hr/> <p>2) Proof of ownership (CSD report) with id no. with valid proof of veteran status.</p> <hr/> <p>3) Certified copy of ID of all owners.</p>

4	Disability Ownership: The CRPD (Convention on the Rights of Persons with Disabilities) defines persons with disabilities to include those who have long term physical, mental, intellectual or sensory impairments, which in interaction with various barriers may hinder their full and effective participation in society on an equal basis.	1)Proof of ownership (CIPRO certificate) with id no. with valid medical documentary proof.
		2)Proof of ownership (CSD report) with id no. with valid medical documentary proof.
		3)Certified copy of ID of all owners.
5	Youth Ownership: Who are Youth in South Africa? The national Youth Policy defines youth as any persons between the ages of 14 and 35 years.	1)Proof of ownership (CIPRO certificate) with id no.
		2)Proof of ownership (CSD report) with id no.
		3)Certified copy of ID of all owners.
6	Locality Ownership: Proof of business address (municipal account or valid lease agreement) (Eastern Cape Contractors can claim 1 point)	1) Copy of Municipal billing account with an address in the Eastern Cape Province.
		2)Copy of a Lease Agreement with an address in the Eastern Cape Province.

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 BIDDER(S)	
SURNAME AND NAME:	.....
DATE:	.....
ADDRESS:	.....

**2.10.PROOF OF REGISTRATION ON THE NATIONAL
TREASURY CENTRAL SUPPLIER DATABASE (CSD
REPORT)**

(ATTACH HERE)

**2.11.VALID CIDB CERTIFICATE OF A TENDERER
(ATTACH HERE)**

**2.12.VALID DEPARTMENT OF LABOUR COIDA LETTER OF
GOOD STANDING CERTIFICATE AND/OR FEM
(ATTACH HERE)**

**2.13.PROOF OF SPECIFIC GOALS POINTS CLAIMED
(ATTACH HERE)**

Table 2: Detailed description and definition of various categories of the specific goal points that can be claimed.

No.	Detailed description and definition of various categories	Portfolio of Evidence as part of the returnables
1	<p>Historically Disadvantaged Individuals Ownership: [Historically Disadvantaged Individual (HDI). Means a South African citizen who, due to the apartheid policy that had been in place, had no franchise in national elections prior to the introduction of the Constitution of the Republic of South Africa, 1983 (Act No. 110 of 1983) or the Constitution of the Republic of South Africa, 1993 (Act No. 200 of 1993) (“The Interim Constitution”) and /orWho is a female; and/orWho has a disability]. A South African ID number is a 13-digit number which is defined by the following format: YMMDDSSSSCAZ.</p> <ul style="list-style-type: none"> • The first 6 digits (YMMDD) are based on your date of birth. 20 February 1992 is displayed as 920220. • The next 4 digits (SSSS) are used to define your gender. Females are assigned numbers in the range 0000-4999 and males from 5000-9999. • The next digit (C) shows if you're an SA citizen status with 0 denoting that you were born a SA citizen and 1 denoting that you're a permanent resident. 	<p>1)Proof of ownership (CIPRO certificate) with id no.</p> <hr/> <p>2)Proof of ownership (CSD report) with id no.</p> <hr/> <p>3)Certified copy of ID of all owners.</p>
2	<p>Women Ownership: A South African ID number is a 13-digit number which is defined by the following format: YMMDDSSSSCAZ.</p> <ul style="list-style-type: none"> • The first 6 digits (YMMDD) are based on your date of birth. 20 February 1992 is displayed as 920220. • The next 4 digits (SSSS) are used to define your gender. Females are assigned numbers in the range 0000-4999 and males from 5000-9999. 	<p>1)Proof of ownership (CIPRO certificate) with id no.</p> <hr/> <p>2)Proof of ownership (CSD report) with id no.</p> <hr/> <p>3)Certified copy of ID of all owners.</p>
3	<p>Military Veterans Ownership: According to the 2011 Military Veterans act, a military veteran is any South African who rendered military service to any of the military organisations, former statutory and liberation armies, which were involved on all sides of South Africa's liberation war from 1960 to 1993; served in the then Union Defence Force.</p>	<p>1)Proof of ownership (CIPRO certificate) with id no. with valid proof of veteran status.</p> <hr/> <p>2)Proof of ownership (CSD report) with id no. with valid proof of veteran status.</p> <hr/> <p>3)Certified copy of ID of all owners.</p>

4	<p>Disability Ownership: The CRPD (Convention on the Rights of Persons with Disabilities) defines persons with disabilities to include those who have long term physical, mental, intellectual or sensory impairments, which in interaction with various barriers may hinder their full and effective participation in society on an equal basis.</p>	1)Proof of ownership (CIPRO certificate) with id no. with valid medical documentary proof.
		2)Proof of ownership (CSD report) with id no. with valid medical documentary proof.
		3)Certified copy of ID of all owners.
5	<p>Youth Ownership: Who are Youth in South Africa? The national Youth Policy defines youth as any persons between the ages of 14 and 35 years.</p>	1)Proof of ownership (CIPRO certificate) with id no.
		2)Proof of ownership (CSD report) with id no.
		3)Certified copy of ID of all owners.
6	<p>Locality Ownership: Proof of business address (municipal account or valid lease agreement) (Eastern Cape Contractors can claim 1 point)</p>	1) Copy of Municipal billing account with an address in the Eastern Cape Province.
		2)Copy of a Lease Agreement with an address in the Eastern Cape Province.

2.14.PROTECTION OF PERSONAL INFORMATION: CONSENT (POPIA)

PROTECTION OF PERSONAL INFORMATION: CONSENT (POPIA)

The introduction of The Protection of Personal Information Act (POPIA) ensures the regulation of personal information through its entire life cycle of collection, transfer, storing and deletion. As part of its business activities, the Department of Health obtains and requires access to personal data from a wide range of internal and external parties, including without limitation bidders who respond to requests for proposals that are published by the Department of Health from time to time. The Department of Health confirms that it shall process the information disclosed by Bidders for the purpose of evaluating and subsequently awarding/appointing a successful Bidder.

The Department of Health hereby states that it does not and will never modify, amend, or alter any personal information submitted to it by a Bidder. Not unless directed to do so by an order of court, the Department of Health does not disclose or permit the disclosure of any personal information to any Third Party without the prior written consent of the owner of the information.

Similarly, Bidders will from time-to-time access and be seized with information of a personal nature pertaining to the Department of Health. Some of the information may because of legislative compliances be available in the public domain, whilst some is uniquely provided to bidders in pursuit of procurement or other business-related activities. In this regard, the Department of Health requires that Bidders which receive or have access to its personal information, process any such information in a manner compliant with the requirements of the POPIA.

AGREEMENT

1. The Department of Health and the Bidder (the Parties) agree and undertake that upon obtaining and having access to personal information relating to either of them, they shall always ensure that:
 - a) They process the information only for the express purpose for which it was obtained.
 - b) Information is provided only to designated and authorized personnel who require the personal information to carry out the Parties' respective obligations in terms of the Procurement processes.
 - c) They will introduce, and implement all reasonable measures ensure the protection of all personal information from unauthorized access and/or use.
 - d) They have taken appropriate measures to safeguard the security, integrity, and authenticity of all personal information in its possession or under its control.
 - e) The Parties agree that if personal information will be processed for any other purpose other than the one for which the accessing of the information was intended, explicit written consent will be obtained prior to the execution of such reason.
 - f) The Parties shall carry out regular assessments to identify all reasonably foreseeable internal and external risks to the interception of personal information in its possession or under its control and shall implement and maintain appropriate controls in mitigation of such risks.
2. The Parties agree that they will promptly return or destroy any personal data in their possession or control which belongs to the other Party once it no longer serves the purpose for which it was collected, subject to any legal retention requirements. The information will be destroyed in such a manner that it cannot be reconstructed to its original form, linking it to any individual or organization.
3. Bidder's Obligations

- a) The Bidder is required to notify the Information Officer of Department of Health, in writing as soon as possible after it becomes aware of or suspects any loss, unauthorized access or unlawful use of any of the Department of Health's personal information.
- b) The Bidder shall, at its own cost, promptly and without delay take all necessary steps to mitigate the extent of the loss or compromise of personal data.
- c) The Bidder shall be required to provide the Department of Health with details of the persons affected by the compromise and the nature and extent of the compromise, including details of the identity (if known) of the unauthorized person who may have accessed or acquired the personal data.
- d) The Bidder undertakes to co-operate with any investigation relating to security breach which is carried out by or on behalf of Department of Health.

On behalf of the Bidder:

.....
Signature

.....
Date

.....
Position

.....
Name of the Bidder

On behalf of the Client:

.....
Signature

.....
Date

.....
Position

.....
Name of Client Representative

3.THE CONTRACT

3.1. PART C1 - AGREEMENTS AND CONTRACT DATA

3.1.1. PART C1.1: FORM OF OFFER AND ACCEPTANCE

FORM OF OFFER AND ACCEPTANCE

Bid Description	Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)
SCMU number	SCMU3-23/24-0751-HO

OFFER

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

Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)

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

.....

Rand (in words);

R(in figures) (or other suitable wording)

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

.....
 Name

.....
 Capacity

for the tenderer

.....
 (Name and address of organization)

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 Agreements 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 3 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 working days of the date of such receipt notifies the employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the parties.¹

Signature

.....

Name Ms S Gede

Capacity:

Acting Head of the Eastern Cape Department of Health

for the Employer

**Eastern Cape Department of Health
Dukumbana Building, Independence Avenue
BHISHO**

(Name and address of organization)

Name and signature

of witness Date

Schedule of Deviations

1 Subject _____
Details _____

2 Subject _____
Details _____

3 Subject _____
Details _____

By the duly authorized 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 tender schedules, as well as any confirmation, clarification or changes to the terms of the offer agreed by the tenderer and the employer during this process of offer and acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender/ quotation 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.

¹ *As an alternative, the following wording may be used:*

Notwithstanding anything contained herein, this agreement comes into effect two working days after the submission by the employer of one fully completed original copy of this document including the schedule of deviations (if any), to a courier-to-counter delivery / counter-to-counter delivery / door-to-counter delivery /door-to-door delivery /courier service (delete that which is not applicable), provided that the employer notifies the tenderer of the tracking number within 24 hours of such submission. Unless the tenderer (now contractor) within seven working days of the date of such submission notifies the employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the parties

3.1.2. PART C1.2: CONTRACT DATA

The Joint Building Contracts Committee® - NPC CONTRACT DATA For use by ORGANS OF STATE and other PUBLIC SECTOR BODIES Principal Building Agreement Edition 6.2 - May 2018

A PROJECT INFORMATION

A1.0 Works [1.1]

Project name	Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)
Reference number	SCMU3-23/24-0751-HO
Works description	Refer to document C3 – Scope of Work

A2.0 Site [1.1]

Erf / stand number	Refer to document C4 – Site Information
Township / Suburb	Billie Road, Mdantsane Unit 4, Mdantsane
Site address	Refer to document C4 – Site Information
Local authority	Amathole District Municipality - Mdantsane

A3.0 Employer [1.1]

Official Name of Organ of State / Public Sector Body	Eastern Cape Department of Health
Business registration number	N/A
VAT/ number	N/A
Country	South Africa
Employer's representative: Name	Ms. S. Gede Acting Head of Department Eastern Cape Department of Health
Telephone number	040 608 9501
Physical address	EASTERN CAPE DEPARTMENT OF HEALTH: SUPPLY CHAIN MANAGEMENT OFFICE, GLOBAL LIFE CENTRE, SCM UNIT, C/O PHALO AVENUE AND R63 BHISHO.

A4.0 Principal Agent [1.1]

Name	Brinkman Ndayi Mcall (Pty) Ltd		
Legal entity of above	Brinkman Ndayi Mcall (Pty) Ltd	Contact person	Arinda Swart
Practice number		Telephone number	041-5852125
		Mobile number	
Country	South Africa	E-mail	arindas@bnm.co.za
Postal address	PO Box 12376, Centra Hill, Gqeberha	Postal Code	12376
Physical address	Suite 1 Lyndon, 114 Park Drive, Gqeberha	Postal Code	12376

A5.0 Agent [1.1]

Discipline	Architect		
Name	Brinkman Ndayi Mcall (Pty) Ltd		
Legal entity of above	Brinkman Ndayi Mcall (Pty) Ltd	Contact person	Arinda Swart
Practice number		Telephone number	041-5852125
		Mobile number	
Country	South Africa	E-mail	arindas@bnm.co.za
Postal address	PO Box 12376, Centra Hill, Gqeberha 60006	Postal Code	12376
Physical address	Suite 1 Lyndon, 114 Park Drive, Gqeberha	Postal Code	12376

A6.0 Agent [1.1]

Discipline	Quantity Surveyor		
Name	MMDP Quantity Surveyors and Project Managers		
Legal entity of above	MMDP Quantity Surveyors and Project Managers	Contact person	Keith Rennie
Practice number		Telephone number	043-7210667
		Mobile number	
Country	South Africa	E-mail	keith@mmdp.co.za
Postal address	PO Box 8370, Nahoon, East London	Postal Code	5210
Physical address	40 Drake Road, Nahoon, East London	Postal Code	5241

A7.0 Agent [1.1]

Discipline	Civil Engineer		
Name	SMEC SA (Pty) Ltd		

Legal entity of above	SMEC SA (Pty) Ltd	Contact person	Juan Kampman
Practice number		Telephone number	041 3636777
		Mobile number	
Country	South Africa	E-mail	Juan.Kampman@smec.com
Postal address	7 Mangold Street, Gqeberha	Postal Code	6045
Physical address	7 Mangold Street, Gqeberha	Postal Code	6045

A8.0 Agent [1.1]

Discipline	Structural Engineer		
Name	SMEC SA (Pty) Ltd		
Legal entity of above	SMEC SA (Pty) Ltd	Contact person	Juan Kampman
Practice number		Telephone number	041-3636777
		Mobile number	
Country	South Africa	E-mail	Juan.Kampman@smec.com
Postal address	7 Mangold Street, Gqeberha	Postal Code	6045
Physical address	7 Mangold Steet, Gqeberha	Postal Code	6045

A9.0 Agent [1.1]

Discipline	Electrical Engineer		
Name	RNA Consulting Engineers (Pty) Ltd		
Legal entity of above	RNA Consulting Engineers (Pty) Ltd	Contact person	Eric Ceba
Practice number		Telephone number	041-5812807
		Mobile number	
Country	South Africa	E-mail	ericc@rnaconsulteng.co.za
Postal address	87 Heugh Road, Walmer, Gqeberha	Postal Code	6070
Physical address	87 Heugh Road, Walmer, Gqeberha	Postal Code	6070

A10.0 Agent [1.1]

Discipline	Mechanical Engineer		
Name	RNA Consulting Engineers (Pty) Ltd		
Legal entity of above	RNA Consulting Engineers (Pty) Ltd	Contact person	Travis Warne
Practice number		Telephone number	041-5812807
		Mobile number	
Country	South Africa	E-mail	travisw@rnaconsulteng.co.za

Postal address	87 Heugh Road, Walmer, Gqeberha	Postal Code	6070
Physical address	87 Heugh Road, Walmer, Gqeberha	Postal Code	6070

A11.0 Agent [1.1]

Discipline	Occupational Health and Safety Agent		
Name	Lumcus Training & Consulting (Pty) Ltd		
Legal entity of above	Lumcus Training & Consulting (Pty) Ltd	Contact person	Elizabeth White
Practice number		Telephone number	043-54801112
		Mobile number	
Country	South Africa	E-mail	liza@lumcus.co.za
Postal address	242 Cannery Avenue, Kaysers Beach	Postal Code	5264
Physical address	242 Cannery Avenue, Kaysers Beach	Postal Code	5264

A12.0 Agent [1.1]

Discipline	External Stakeholder Manager		
Name	SMEC SA (Pty) Ltd		
Legal entity of above	SMEC SA (Pty) Ltd	Contact person	Juan Kampman
Practice number		Telephone number	041-3636777
		Mobile number	
Country	South Africa	E-mail	Juan.Kampman@smec.com
Postal address	7 Mangold Street, Gqeberha	Postal Code	6045
Physical address	7 Mangold Steet, Gqeberha	Postal Code	6045

B CONTRACT INFORMATION

B 1.0 Definitions [1.1]

Bills of quantities: System/Method of measurement	Standard System of Measuring Building Work (Seventh Edition) as amended
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B 2.0 Law, regulations, and notices [2.0]

Law applicable to the works , state country [2.1]	Republic of South Africa
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B 3.0 Offer and acceptance [3.0]

Currency applicable to this agreement [3.2]	South African Rand
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B 4.0 Documents [5.0]

The original signed agreement is to be held by the principal agent [5.2], if not, indicate by whom	Employer
Number of copies of construction information issued to the contractor at no cost [5.6]	Three (3)

Documents comprising the agreement	Page numbers
The JBCC® Principal Building Agreement, Edition 6.2 May 2018	1 to 30
The JBCC® Principal Building Agreement - Contract Data for Organs of State and other Public Sector Bodies, Edition 6.2 May 2018	1 to 18
The JBCC® General Preliminaries for use with the JBCC® Principal Building Agreement, Edition 6.2 May 2018	1 to 30

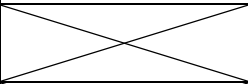
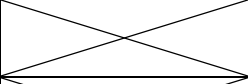
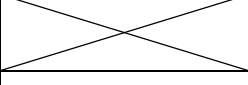
Contract drawings – description	Number	Revision	Date
As per Drawings listed C3			

B 5.0 Employer's Agents [6.0]

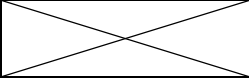
Authority is delegated to the following agents to issue contract instructions and perform duties for specific aspects of the works [6.2]
Principal Agent

Principal agent's and agents' interest or involvement in the works other than a professional interest [6.3]
None

B 6.0 Insurances [10.0]

Insurances by employer			Amount including tax	Deductible amount including tax
Yes / No:	No			
Contract works insurance:				
	New works [10.1.1] (Contract sum or amount)			
or	Works with practical completion in sections [10.2] (contract sum or amount)			
or	Works with alterations and additions [10.3] (reinstatement value of existing structures with or including new works)			
	Direct contractors [10.1.1; 10.2] where applicable, to be included in the contract works insurance			
	Free issue [10.1.1; 10.2] where applicable, to be included in the contract works insurance			
	Escalation, professional fees and reinstatement costs if not included above			
Total of the above contract works insurance amount				
Supplementary insurance [10.1.2; 10.2]				
Public liability insurance [10.1.3; 10.2]				
Removal of lateral support insurance [10.1.4; 10.2]				
Other insurances [10.1.5]				
Yes/ No?	No	If yes, description 1		
Yes/ No?	No	If yes, description 2		

and/or

Insurances by Contractor			Amount including tax	Deductible amount including tax
Yes / No:	Yes			
	New works [10.1.1] (Contract sum or amount)		N/A	N/A
or	Works with practical completion in sections [10.2] (contract sum or amount)		N/A	N/A
or	Works with alterations and additions [10.3] (reinstatement value of existing structures with or including new works)		To the minimum value of the contract sum + 10%	With a deductible not exceeding 5% of each and every claim
	Direct contractors [10.1.1; 10.2] where applicable, to be included in the contract works insurance		N/A	

	Free issue [10.1.1; 10.2] where applicable, to be included in the contract works insurance	N/A	
	Escalation, professional fees and reinstatement costs if not included above	N/A	
	Total of the above contract works insurance amount	To the minimum value of the contract sum + 10%	With a deductible not exceeding 5% of each and every claim
	Supplementary insurance [10.1.2; 10.2]	No	
	Public liability insurance [10.1.3; 10.2]	R5 million	
	Removal of lateral support insurance [10.1.4; 10.2]	No	
	Other insurances [10.1.5]		
Yes/ No?	No	If yes, description 1	
	Hi Risk Insurance [10.1.5.1]		
Yes/ No?	No	If yes, description 2	

B 7.0 Obligations of the employer [12.1]

Existing premises will be in use and occupied [12.1.2]		Yes / No?	Yes
If yes, description	Cecilia Makiwane Hospital is a working hospital and construction will take place within these premises. The Contractor will, throughout the entire period of the works, be responsible for the proper and adequate protection of property and the public and ECDOHs personnel from damage or injury resultant from the works and for the proper security of the site at all times during the course of the works. Further, the Contractor must allow for all temporary hoardings, required by the Local Authorities, National Building Regulations, OHS Act and or demanded by his own requirements. Allowance must further be made for periodic adjustment of any hoardings and for their eventual removal and for making good. All temporary fencing hoardings etc. required must be priced for in the Preliminaries of these Bills of Quantities		
Restriction of working hours [12.1.2]		Yes / No?	Yes
If yes, description	The completion of the project is urgent and work shall be executed during normal working hours i.e. 7h30 until 17h00 daily including weekends. Work required to be executed outside of these hours must be arranged with the Facilities Manager and the Chief Executive of the hospital, in advance		
Natural features and known services to be preserved by the contractor [12.1.3]		Yes / No?	No
If yes, description			
Restrictions to the site or areas that the contractor may not occupy [12.1.4]		Yes / No?	Yes
If yes, description	Work areas and restricted areas shall be defined at Site Handover		
Supply of free issue [12.1.10]		Yes / No?	No
If yes, description			

B 8.0 Nominated subcontractors [14.0]

Yes / No?	No	If yes, description of specialisation
Specialisation 1		
Specialisation 2		
Specialisation 3		
Specialisation 4		
Specialisation 5		
Specialisation 6		
Specialisation 7		
Specialisation 8		
Specialisation 9		

B 9.0 Selected subcontractors [15.0]

Yes / No?	No	If yes, description of specialisation
Specialisation 1		
Specialisation 2		
Specialisation 3		
Specialization 4		
Specialization 5		
Specialisation 6		
Specialisation 7		
Specialisation 8		
Specialisation 9		
Specialisation 10		

B 10.0 Direct contractors [16.0]

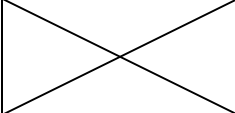
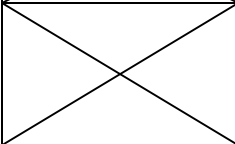
Yes / No?	No	If yes, description of extent of work
Extent of work [12.1.11]		
Extent of work [12.1.11]		
Extent of work [12.1.11]		
Extent of work [12.1.11]		
Extent of work [12.1.11]		

B 11.0 Description of sections [20.1] – REFER TO SCOPE OF WORK FOR DETAILS

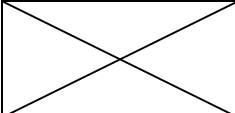
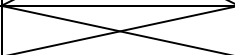
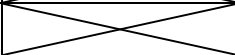
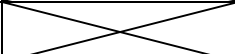
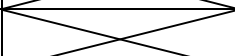
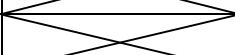
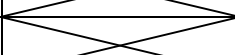
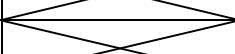
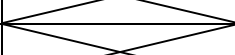
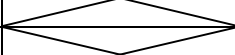
Section 1	1.1 Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works.
Section 2	N/A
Section 3	N/A
Section 4	N/A

Section 5	N/A
Section 6	N/A
Section 7	N/A

B 12.0 Possession of site [12.1.5], practical completion [19.0; 20.0] and penalty [24.0]

Practical completion for the works as a whole	Intended date of possession of the site Refer B17.0 [12.1.5; 12.2.22]	Period for inspection by the principal agent [19.3]	The date for practical completion shall be the period as indicated below from the date of possession of the site by the contractor [12.2.7; 24.1]	Penalty for late completion [24.1]
		working days	Period in months	Penalty amount per calendar day (excl. tax)
		10 Working days	12 Calendar months (Shutdown period excluded)	2.75c/R100 of Contract amount

or where **sections** are applicable N/A

Practical completion of a section of the works	Intended date of possession of the site Refer B17.0 [12.1.5; 12.2.22]	Period for inspection by the principal agent [19.3]	The date for practical completion shall be the period as indicated below from the date of possession of the site by the contractor [12.2.7; 24.1]	Penalty for late completion [24.1]
		Working days	Period in months	Penalty amount per calendar day (excl. tax)
Section 1				
Section 2				
Section 3				
Section 4				
Section 5				
Section 6				
Section 7				
Section 8				
Remainder of the				

Criteria to achieve practical completion not covered in the definition of practical completion
No further Criteria

B 13.0 Defects liability period [21.0]

Extended defects liability period: Refer B17.0 [21.13]	Yes / No?	Yes
If yes, description of applicable elements	All works	

B 14.0 Payments [25.0]

Date of month for issue of regular payment certificates [25.2]	30th		
Contract price adjustment / Cost fluctuations [25.3.4; 26.9.5]	Yes / No?	Yes	Base date = Tender closing date
If yes, method to calculate	CPAP calculated with Haylett formulae based on indices as provided by Stats SA		
Employer shall pay the contractor within: [25.10]	Thirty (30) calendar days		

B 15.0 Dispute resolution [30.0]

Adjudication [30.6.1; 30.10] Name of nominating body	Refer to Part C1.3 Dispute Resolution Mechanism		
Applicable rules for adjudication [30.6.2]	Adjudication in accordance with the CIDB adjudication process		
Arbitration [30.7.4; 30.10]	Yes / No?	No	
If Yes, name of nominating body			
*If No, then dispute will be referred to litigation			
Applicable rules for arbitration [30.7.5]	N/A		

B 16.0 JBCC® General Preliminaries – selections

Provisional bills of quantities [B2.2]		Yes / No?	No
Availability of construction information – is the construction information complete? [B2.3]		Yes / No?	Yes
Previous work - dimensional accuracy - details of previous contract(s) [B3.1]	N/A		
Previous work - defects - details of previous contract(s) [B3.2]	N/A		
Inspection of adjoining properties - details [B3.3]	N/A		
Handover of site in stages - specific requirements [B4.1]	Refer to B11 (Contract Data)		
Enclosure of the works - specific requirements [B4.2]	Hoarding to working areas.		
Geotechnical and other investigations - specific requirements [B4.3]	N/A		
Existing premises occupied - details [B4.5]	Working Areas will not be occupied		
Services - known - specific requirements [B4.6]	No		
Water [B8.1]	By contractor	Yes / No?	Yes
	By employer	Yes / No?	No
	By employer – metered	Yes / No?	No
Electricity [B8.2]	By contractor	Yes / No?	Yes
	By employer	Yes / No?	No
	By employer – metered	Yes / No?	No
Ablution and welfare facilities [B8.3]	By contractor	Yes / No?	Yes
	By employer	Yes / No?	No
Communication facilities - specific requirements [B8.4]	No specific requirements		
Protection of the works - specific requirements [B11.1]	No specific requirements		
Protection / isolation of existing works and works occupied in sections - specific requirements [B11.2]	No specific requirements		
Disturbance - specific requirements [B11.5]	No specific requirements		
Environmental disturbance - specific requirements [B11.6]	No specific requirements		

B 17.0 Changes made to JBCC® documentation

Reference may be made to other documents forming part of this **agreement**

1.1 Definitions

AGREEMENT: The completed Form of Offer and Acceptance, the completed **JBCC®** Principal Building Agreement and **JBCC® contract data for organs of state and other public sector bodies, the contract drawings, the priced document** and any other documents reduced to writing and signed by the authorised representatives of the **parties**

CONSTRUCTION PERIOD: The period commencing on the date of possession of the **site** by the **contractor** and ending on the date of **practical completion**

CONTRACT PERIOD: The period commencing on the date of the letter of acceptance and ending on the date of final completion

COST FLUCTUATION shall mean contract price adjustment provision (CPAP) for the adjustment of fluctuation in the cost of labour, plant, material and goods as stated in the schedule

DEFAULT INTEREST: No Clause

GUARANTEE FOR CONSTRUCTION: A security in terms of the ECDOH's Guarantee for Construction form/s, obtained by the contractor from an institution approved by the employer [CD]

CONTRACT DATA FOR ORGANS OF STATE AND OTHER PUBLIC SECTOR BODIES: The document listing the Organs of State and other Public Sector Bodies' requirements and the project specific information

INTEREST: The interest rates applicable on this contract, whether specifically indicated in the relevant clauses or not, will be the rate as determined by the Minister of Finance from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No 1 of 1999), calculated as simple interest, in respect of debts owing to the State, and will be the rate as determined by the Minister of Justice and Constitutional Development from time to time 80(1)(b) of the Public Finance Management Act, 1999 (Act No 1 of 1999), calculated as simple interest, in respect of debts owing by the State

LETTER OF ACCEPTANCE: The letter of formal acceptance of the Contractor's or Service Provider's Tender / Bid, issued and signed by the Employer

PAYMENT CERTIFICATE: A certificate issued at regular agreed intervals [CD] by the principal agent to the parties certifying the amount due and payable in terms of Clause 25.3

PRINCIPAL AGENT: The person or entity appointed by the **employer** and named in the **contract data for organs of state and other public sector bodies**. In the event of a principal agent not being appointed, then all the duties and obligations of a **principal agent** as detailed in the **agreement** shall be fulfilled by the employer's representative as named in the **contract data for organs of state and other public sector bodies**

3.0 Offer and Acceptance

Amend 3.3 to read as follows:

This **agreement** shall come into force on the date as stated on the Form of Offer and Acceptance and continue to be of force and effect until the end of the **latent defects** liability period [22.0] notwithstanding termination [29.0] or the certification of **final completion** [21.0] and final payment [25.0]

4.0 Cession and Assignment

Replace Clause 4.3 with the following:

Where a contractor cedes any right or any monies due to or to become due under this agreement as security in favour of a financial institution, the prior written consent of the employer, which consent shall not be unreasonably withheld, must be obtained

5.0 Documents

Replace Clause 5.4 with the following:

The Bills of Quantities shall not be used as a specification of material and goods or methods unless so instructed by the Principal Agent. The contractor may not use the Bills of Quantities for purpose of ordering material. All dimensions and quantities must be determined on site before ordering. In the event of discrepancy between the drawings and Bills of Quantity, the drawings shall take preference

Replace Clause 5.5 with the following:

The parties may publish or disclose on any platform only the contract scope and contract amount

6.0 Employer's Agents

Replace Clause 6.5 with the following:

Where the principal agent and/or an agent fails to act or is unable to act or ceases to be the principal agent or an agent in terms of this agreement, the employer shall appoint another principal agent and/or an agent

Add the following as 6.7:

In terms of the clauses listed hereunder, the **employer** has retained its authority and has not given a mandate to the **principal agent**. The **employer** shall sign all documents in relation to clauses 4.2, 14.1.2, 14.1.4, 14.4.1, 14.6, 23.1, 23.2, 23.3, 23.7, 23.8, 26.1, 26.7, 26.12 and 28.4

8.0 Works Risk

Replace Clause 8.4 with the following:

The **contractor** shall bear the full risk of damage to and/or destruction of the **works** by whatever cause during construction of the **works** and hereby indemnifies and holds harmless the **employer** against any such damage. The **contractor** shall take such precautions and security measures and other steps for the protection and security of the **works** as the **contractor** may deem necessary

9.0 Indemnities

9.2.7: Add the following to the end of the first sentence: "... due to no fault of the **contractor**"

9.2.9 No Clause

9.2.10 No Clause

Add the following as clause 9.3:

The employer's rights to claim damages for the contractor's omissions and actions will not be affected.

10.0 Insurances

Add the following as 10.1.5.1:

Hi risk Insurance

In the event of the project being executed in a geological area classified as a "High Risk Area", that is an area which is subject to highly unstable sub-surface conditions that might result in catastrophic ground movement evident by sinkhole or doline formation the following will apply:

10.1.5.1.1 Damage to **the works**

The contractor shall, from the date of possession of the **site** until the date of the **certificate of practical completion**, bear the full risk of and hereby indemnifies and holds harmless the **employer** against any

damage to and/or destruction of the **works** consequent upon a catastrophic ground movement as mentioned above. The **contractor** shall take such precautions and security measures and other steps for the protection of the **works** as he may deem necessary

When so instructed to do so by the **principal agent**, the **contractor** shall proceed immediately to remove and/or dispose of any debris arising from damage to or destruction of the **works** and to rebuild, restore, replace and/or repair the **works**, at the **contractor's** own costs

10.1.5.1.2 Injury to persons or loss of or damage to property

The **contractor** shall be liable for and hereby indemnifies and holds harmless the **employer** against any liability, loss, claim or proceeding arising at any time during the period of the contract whether arising in common law or by statute, consequent upon personal injuries to or the death of any person whomsoever resulting from, arising out of or caused by a catastrophic ground movement as mentioned above

The **contractor** shall be liable for and hereby indemnifies the **employer** against any and all liability, loss, claim or proceeding consequent upon loss of or damage to any moveable, or immovable property, or personal property, or property contiguous to the **site**, whether belonging to or under the control of the **employer** or any other body or person whomsoever arising out of or caused by a catastrophic ground movement, as mentioned above, which occurred during the period of the contract

10.1.5.1.3

It is the responsibility of the **contractor** to ensure that he has adequate insurance to cover his risk and liability as mentioned in 10.1.5.1.1 and 10.1.5.1.2. Without limiting the **contractor's** obligations in terms of the contract, the **contractor** shall, within twenty-one (21) **calendar days** of the date of possession of the site, but before commencement of the **works**, submit to the **employer** proof of such insurance policy, if requested to do so

10.1.5.1.4

The **employer** shall be entitled to recover any and all losses and/or damages of whatever nature suffered or incurred consequent upon the **contractor's** default of his obligations as set out in 10.1.5.1.1; 10.1.5.1.2 and 10.1.5.1.3. Such losses or damages may be recovered from the **contractor** or by deducting the same from any amounts still due under this contract or under any other contract presently or hereafter existing between the **employer** and the **contractor** and for this purpose all these contracts shall be considered one indivisible whole

11.0 Securities

Amend 11.10 to read as follows:

There shall be no lien or right of retention held by any **contractor** in respect of the works executed on **site**

12.0 Obligations of the Parties

12.1.1 No Clause

Replace Clause 12.1.5 with the following:

Give possession of the site to the contractor within ten (10) working days after approval of the Health and Safety Plan or the issue of a construction permit by the Department of Labour, if applicable, after the contractor complied with the terms of 12.2.22

12.1.6 No Clause

12.1.8 No Clause

Replace Clause 12.2.2 with the following:

The priced Bills must be submitted as part of the returnable documents. Where the priced document contains errors or discrepancies and/or prices considered by the employer or principal agent to be imbalanced or unreasonable the employer or principal agent and the contractor shall adjust such prices without any change to the contract sum

Replace Clause 12.2.5 with the following:

Effect and keep in force insurances in favour of the employer as beneficiary where the contractor is responsible for providing insurances [10.0] [CD]

Replace Clause 12.2.13 with the following:

Designate a competent person full time on site to continuously administer and control the works on site and to receive and implement notices and contract instructions on behalf of the contractor

Add the following as Clause 12.2.22:

Within fourteen (14) working days of the date of the letter of acceptance submit to the principal agent an acceptable health and safety plan, required in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993)

Add the following as Clause 12.2.23:

The contractor shall within reasonable time inform the agents regarding inspection of the works before covering / closing [B 12.0]

19.0 Practical Completion

Replace Clause 19.5 with the following:

On issue of the only or last certificate of practical completion the employer shall be entitled to possession of the works and the site. On issue of the certificate of practical completion for a section, the employer shall be entitled to possession of such section.

21.0 Defects Liability Period and Final Completion

Clause 21.0

Replace Clause 21.1 with the following:

The defects liability period for the works shall commence on the calendar day following the date of works completion and end at midnight (00:00) ninety (90) calendar days from the date of works completion [CD] or when work on the list for completion has been satisfactorily attended to [21.6], whichever is the later (if we use practical completion)

Replace Clause 21.6 with the following:

On the expiry of the ninety (90) calendar days defects liability period [21.1] for items not indicated as items with an extended liability as indicated in B14 and on receipt of the contractor's notice to the principal agent

And/or

On the expiry of the defects liability period as indicated in B14, for items indicated in B14 and on receipt of the contractor's notice to the principal agent, the principal agent shall:

- (1) inspect the works and within ten (10) working days either issue a list for final completion detailing all outstanding work or defects that must be attended to, or rectified to achieve final completion or
- (2) issue the certificate of final completion to the contractor with a copy to the employer for that part of the works where defects liability period has expired

21.6.1 Omit Clause

21.6.2 Omit Clause

Add the following as Clause 21.13:

The ninety (90) calendar days defects liability period for the works [21.1] is replaced with an extended defects liability period of three hundred and sixty-five (365) calendar days in respect of the listed applicable elements in B14

Add the following as Clause 21.14:

Penalties will be applied if the items on the completion list have not been attended to within a period of ninety (90) calendar days [21.1]. If additional defect items have being added to the list during this period, then the Principal Agent and Contractor will agree on a revised completion date. Failing in achieving the revised date will result in penalties being applied. [B12.0

23.0 Latent Defects Liability Period

22.3.2 No Clause

24.0 Penalty for Late and Non-completion

Replace Clause 24.1 with the following:

Where the contractor fails to bring the works, or a section thereof, to practical or final- completion by the applicable completion date [CD], or the revised applicable completion date, the contractor shall be liable to the employer for the penalty [CD]

Replace Clause 24.2 with the following:

Where the employer elects to levy such penalty the employer, or the principal agent on instruction from the employer, shall give notice thereof to the contractor. The principal agent shall determine the penalty due from the later of the date for practical- works-, or final- completion [CD], or the revised date for practical- works-, or final- completion, up to and including the earlier of:

Replace Clause 24.2.1 with the following:

The actual or deemed date of practical or final- completion, of the works, or a section thereof [23.7.1]

25.0 Payment

Replace Clause 25.2 with the following:

The principal agent shall issue at regular agreed intervals [CD] payment certificates, to the contractor with a copy to the employer, up to and including practical completion. Interim Payment certificates may be issued to the contractor between practical completion and the final payment certificate. A payment certificate may be for a nil or negative amount

Add the following to Clause 25.3:

25.3.12 Tax Invoice

25.5 No Clause

Replace Clause 25.6 with the following:

Materials and goods will only be certified and paid for upon providing proof of full payment to the supplier and proof of transfer of ownership from the supplier to the contractor by the contractor. Once paid, material and goods shall become the property of the employer and shall not be removed from site without the written authority of the Employer.

25.7.5 No clause.

Replace Clause 25.10 with the following:

The employer shall pay the contractor the amount stipulated in an issued payment certificate, correct in all material respects, within thirty (30) calendar days from the date of receiving the payment certificate, invoice and all other substantiating documentation for items certified in the payment certificate

25.10: Delete the words “and/or **compensatory interest**”

Replace Clauses 25.12 to 25.12.3 with the following:

Clause 25.12

The value of the works in terms of 25.1 and of the materials and goods in terms of 25.4 shall be certified in full. The value certified shall be subject to the following percentage adjustments:

25.12.1 Ninety-five per cent (95%) of such value in interim payment certificates issued up to the date of practical completion

25.12.2 Ninety-seven per cent (97%) of such value in interim payment certificates issued on the date of practical completion and up to but excluding the date of final completion

25.12.3 Ninety-nine per cent (99%) of such value in interim payment certificates issued on the date of final completion and up to but excluding the final payment certificate in terms of 26

25.12.4 One hundred per cent (100%) of such value in the final payment certificate in terms of 26 except where the amount certified is in favour of the employer. In such an event the payment reduction shall remain at the adjustment level applicable to the final payment certificate.

25.14.2: Not applicable

26.0 Adjustment of the Contract Value and Final Account

Ref Clause 6.7 [CD] – Clause 26.1

Omit Clause 26.4.3

Ref Clause 6.7 [CD] – Clause 26.7

Replace Clause 26.10 with the following:

The principal agent shall prepare the final account in consultation with the employer and issue the final account, to the contractor within sixty (60) working days of the date of practical completion

27.0 Recovery of Expense and/or Loss

Clause 27.0

Replace Clause 27.1.2 with the following:
Interest due to late payment only

Replace Clause 27.1.4 with the following:
Interest due to late payment only

27.1.5 No Clause

Replace Clause 27.5 with the following:

Where the employer decides to recover an amount due in terms of 27.2 from a construction guarantee, cash deposit or retention money held as security, the employer shall issue a written demand to the contractor before recovering the amount. Should such amount not be paid to the employer within fourteen (14) calendar days of the date-of notice by the employer, the employer may recover such an amount from the security

29.0 Termination

Clause 29.0

Add the following as Clause 29.1.4:

The contractor's estate has been sequestrated, liquidated or surrendered in terms of the insolvency laws in force within the Republic of South Africa

Add the following as Clause 29.1.5:

The contractor has engaged in corrupt or fraudulent practices in competing for or in executing the contract.

Add the following as Clause 29.1.6:

Honour his obligations in terms of Clauses 10.1.5.1.3, 11.4.1 and 12.2. sub-Clauses 5, 6, 8, 9, 10, 11, 12, 13, 15, 16, 19, 20, 22.

Replace Clause 29.7 with the following:

The employer, on notice to the contractor, may recover damages from the contractor from the date of termination including, but not limited to, additional costs incurred in the completion, consultant cost, rental of alternative accommodation, invitation of completion tenders, salaries of officials and safeguarding the site, of the remaining work [25.3.7; 27.1.3]

Replace Clause 29.9 with the following:

The employer has the right of recovery against the contractor, where applicable, [CD] from:

The payment reduction until the final payment is made;

29.14.1 No Clause

29.14.3 No Clause

29.14.4 No Clause

29.14.5 No Clause

29.14.6 No Clause

29.14.7 No Clause

29.15 No Clause

29.16 No Clause

29.17.3 No Clause

29.17.6 No Clause

29.21.5 No Clause

29.22 No Clause

29.23 No Clause

29.25.3 No Clause

29.25.4 No Clause

29.27 No Clause

30.0 Dispute Resolution

Replace Clause 30.2 with the following:

Where such disagreement is not resolved within ten (10) working days of receipt of such notice it shall be deemed to be a dispute and shall be submitted to Mediation as a first method of dispute resolution failing which the parties will resort to Litigation

30.3 to 30.7.7 No Clauses

Replace Clause 30.8 with the following:

The parties may, by agreement and at any time before Litigation, refer a dispute to mediation, in which event:

30.8.1 No Clause

Replace Clause 30.8.2 with the following:

The appointment of a mediator, the procedure, and the status of the outcome shall be agreed between the parties

Replace Clause 30.8.3 with the following:

Regardless of the outcome of a mediation the parties shall bear their own costs concerning the Mediation and equally share the costs of the mediator and related expenses.

Replace Clause 30.9 with the following:

Institution of Litigation shall be commenced, and process served within three (3) year from the date of existence of the dispute, failing which the dispute shall lapse

30.10 No Clause

30.12 No Clause

C TENDERER'S SELECTIONS

C 1.0 Security [11.0]

Guarantee for construction: Option A only	Option:	A
Option A	Fixed construction guarantee of 10% of the contract	
Guarantee for payment by employer [11.5.1; 11.10]	Not Applicable	
Advance payment, subject to a guarantee for advance payment [11.2.2; 11.3]	Not Applicable	

C 2.0 Contractor's annual holiday periods during the construction period

Year 1 contractor's annual holiday period	start date		end date	
Year 2 contractor's annual holiday period	start date		end date	
Year 3 contractor's annual holiday period	start date		end date	

C 3.0 Payment of preliminaries [25.0]

Contractor's selection: Select Option A or B	Option:	
Where the contractor does not select an option, Option A shall apply		

Payment methods

Option A	The preliminaries shall be paid in accordance with an amount prorated to the value of the works executed in the same ratio as the amount of the preliminaries to the contract sum , which contract sum shall exclude the amount of preliminaries . Contingency sum(s) and any provision for cost fluctuations shall be excluded for the calculation of the aforesaid ratio
Option B	The preliminaries shall be paid in accordance with an amount agreed by the principal agent and the contractor in terms of the priced document to identify an initial establishment charge, a time-related charge and a final dis-establishment charge. Payment of the time-related charge shall be assessed by the principal agent and adjusted from time to time as may be necessary to take into account the rate of progress of the works

Lump sum contract

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

C 4.0 Adjustment of preliminaries [26.9.4]

Contractor's selection: Select Option A or B	Option:	
---	----------------	--

Where the contractor does not select an option, Option A shall apply

Provision of particulars

The **contractor** shall provide the particulars for the purpose of the adjustment of **preliminaries** in terms of his selection. Where completion in sections is required, the **contractor** shall provide an apportionment of **preliminaries** per **section**

Option A	An allocation of the preliminaries amounts into Fixed, Value-related and Time-related amounts as defined for adjustment method Option A below, within fifteen (15) working days of the date of acceptance of the tender
Option B	A detailed breakdown of the preliminaries amounts within fifteen (15) working days of possession of the site. Such breakdown shall include, inter alia, the administrative and supervisory staff, the use of construction equipment , establishment and dis-establishment charges, insurances and guarantees, all in terms of the programme

Adjustment Methods

The amount of **preliminaries** shall be adjusted to take account of the effect which changes in time and/or value have on **preliminaries**. Such adjustment shall be based on the particulars provided by the **contractor** for this purpose in terms of Options A or B, shall preclude any further adjustment of the amount of **preliminaries** and shall apply notwithstanding the actual employment of resources by the **contractor** in the execution of the **works**

Option A	<p>The preliminaries shall be adjusted in accordance with the allocation of preliminaries amounts provided by the contractor, apportioned to sections where completion in sections is required</p> <p>Fixed - An amount which shall not be varied</p> <p>Value-related - An amount varied in proportion to the contract value as compared to the contract sum. Both the contract sum and the contract value shall exclude the amount of preliminaries, contingency sum(s) and any provision for cost fluctuations</p> <p>Time-related - An amount varied in proportion to the number of calendar days extension to the date of practical completion to which the contractor is entitled with an adjustment of the contract value [23.2; 23.3] as compared to the number of calendar days in the initial construction period [26.9.4]</p>
Option B	<p>The adjustment of preliminaries shall be based on the number of calendar days extension to the date of practical completion to which the contractor is entitled with an adjustment of the contract value [23.2; 23.3] as compared to the number of calendar days in the initial construction period [26.9.4]</p> <p>The adjustment shall take into account the resources as set out in the detailed breakdown of the preliminaries for the period of construction during which the delay occurred</p>

Failure to provide particulars within the period stated

Option A	<p>Where the allocation of preliminaries amounts for Option A is not provided, the following allocation of preliminaries amounts shall apply:</p> <p>Fixed - Ten per cent (10%) Value-related - Fifteen per cent (15%) Time-related - Seventy-five per cent (75%)</p> <p>Where the apportionment of the preliminaries per section is not provided, the categorized amounts shall be prorated to the cost of each section within the contract sum as determined by the principal agent</p>
Option B	<p>Where the detailed breakdown of preliminaries amounts for Option B is not provided, Option A shall apply</p>

Lump sum contract

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

3.1.3. JBCC GUARANTEE FOR CONSTRUCTION (PRO-FORMA)



Guarantee for Construction

For use with the JBCC® Principal Building Agreement edition /date

GUARANTOR DETAILS AND DEFINITIONS

Guarantor:

Physical Address:

Guarantor's signatory 1: Capacity

Guarantor's signatory 2: Capacity

Employer:

Contractor:

Principal Agent:

Works:

Site:

Contract Sum: Accepted amount inclusive of tax Currency

Amount in words:

Guaranteed Sum: The maximum aggregate amount Currency

Amount in words:

Guarantee for Construction: (Insert Variable or Fixed)

Expiry Date:

AGREEMENT DETAILS

Sections: Total number / not applicable Last Section

Principal Agent issues JBCC® format Recovery Statement, Interim Payment Certificates, the Final Payment Certificate, the Certificate of Practical Completion and the Certificate of Final Completion

1.0 GUARANTEE FOR CONSTRUCTION (Variable)

1.1 Where a Guarantee for Construction (Variable) in terms of the Agreement has been selected this clause 1.0 and 3.0 to 13.0 shall apply. The Guarantor's liability shall be limited to the diminishing amounts of the Guaranteed Sum as follows:-

GUARANTOR'S LIABILITY

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

Amount in words:

PERIOD OF LIABILITY

From and including the date of issue of this Guarantee for Construction and up to and including the date of issue of the Interim Payment Certificate certifying in excess of 50% of the contract sum



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

From and including the day after the date of the aforesaid Interim Payment Certificate and up to and including the date of issue of the only Certificate of Practical Completion or last Certificate of Practical Completion where there are sections

Amount in words:

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

From and including the day after the date of the applicable Certificate of Practical Completion and up to and including the date of issue of the only Certificate of Final Completion or the last Certificate of Final Completion where there are sections

Amount in words:

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

From and including the day after the date of the applicable Certificate of Final Completion and up to and including the date of issue of the Final Payment Certificate where payment is due to the Contractor, whereafter this Guarantee for Construction shall expire. Where the Final Payment Certificate reflects payment due to the Employer, this Guarantee for Construction shall expire upon payment of the full amount certified

Amount in words:

1.2 The Guarantor's liability limits set out in 1.1.1 to 1.1.4 shall apply in respect of any claim received by the Guarantor during the guarantee validity period

2.0 GUARANTEE FOR CONSTRUCTION (Fixed)

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

GUARANTOR'S LIABILITY

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

PERIOD OF LIABILITY

From and including the date of issue of this Guarantee for Construction and up to and including the date of the only Certificate of Practical Completion or the last Certificate of Practical Completion where there are sections, whereafter this Guarantee for Construction shall expire

Amount in words:

3.0 The Guarantor acknowledges that:

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

3.2 Its obligation under this Guarantee for Construction is restricted to the payment of money; and

3.3 Reference to a Recovery Statement or an Interim or Final Payment Certificate, or a Certificate(s) of Practical or Final Completion shall mean such certificate issued by the Principal Agent.

4.0 Subject to the Guarantor's maximum liability referred to in 1.0 or 2.0, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:



- 4.1 A copy of a first written demand notice issued by the Employer to the Contractor stating that payment of a sum certified by the Principal Agent in an Interim or Final Payment Certificate has not been made in terms of the Agreement and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;
- 4.2 A first written demand notice issued by the Employer to the Guarantor at the Guarantor's Physical Address with a copy to the Contractor stating that a period of seven (7) calendar days has elapsed since the issue of the first written demand notice in terms of 4.1 and that the sum certified has not been paid to date. The Employer herewith calls up this Guarantee for Construction and demands payment of the sum certified from the Guarantor; and
- 4.3 A copy of the applicable payment certificate which entitles the Employer to receive payment in terms of the Agreement of the sum certified in 4.0
- 5.0. Subject to the Guarantor's maximum liability referred to in 1.0 or 2.0, the Guarantor undertakes to pay the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand notice from the Employer to the Guarantor at the Guarantor's Physical Address calling up this Guarantee for Construction stating that:
- 5.1 The Agreement has been terminated due to the Contractor's default and that the Guarantee for Construction is called up in terms of 5.0. The demand shall enclose a copy of the notice of termination; or
- 5.2 A provisional sequestration or liquidation court order has been granted against the Contractor and that the Guarantee for Construction is called up in terms of 5.0. The demand notice shall enclose a copy of the court order.
- 6.0 The aggregate amount of payments to be made by the Guarantor in terms of 4.0 and 5.0 shall not exceed the Guarantor's maximum liability in terms of 1.0 or 2.0.
- 7.0 Where the Guarantor is a registered insurer and has made payment in terms of 5.0, the Employer shall within one hundred and eighty (180) calendar days of receipt of payment submit an expense account to the Guarantor showing how all monies received in terms of the Guarantee for Construction have been expended, or will be expended, and shall refund to the Guarantor any surplus amount. All monies refunded to the Guarantor in terms of this Guarantee for Construction shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date of payment by the Guarantor to the Employer until the date of refund.
- 8.0 Payment by the Guarantor in terms of 4.0 or 5.0 shall be made within seven (7) calendar days upon receipt of the first written demand notice to the Guarantor.
- 9.0 The Employer shall have the absolute right to arrange its affairs with the Contractor in any manner which the Employer deems fit and the Guarantor shall not have the right to claim its release from this Guarantee for Construction on account of any conduct alleged to be prejudicial to the Guarantor.
- 10.0 The Guarantor chooses the Physical Address stated above for all notices and correspondences in relation to this Guarantee.
- 11.0 This Guarantee for Construction is neither negotiable nor transferable and shall expire in terms of either 1.1.4 or 2.1, or payment in full of the Guaranteed Sum or on the Expiry Date, whichever is the earlier, whereafter no claims will be considered by the Guarantor. This original Guarantee for Construction shall be returned to the Guarantor after it has expired.
- 12.0 This Guarantee for Construction, with the required demand notices in terms of 4.0 or 5.0, shall be regarded as a liquid document for the purpose of obtaining a court order.
- 13.0 Where this Guarantee for Construction is issued in the Republic of South Africa this Guarantee for Construction shall be governed by the laws of the Republic of South Africa. A competent court in the Republic of South Africa shall have sole jurisdiction in terms of this Guarantee for Construction. Where this Guarantee for Construction is issued outside the Republic of South Africa, the laws of the guarantor who issued this Guarantee for Construction shall prevail. A competent court, in the jurisdiction in which the guarantor is domiciled shall prevail.

Signed at:

Date:

Guarantor's Signatory 1: _____

Guarantor's Signatory 2: _____

Witness: _____

Witness: _____

Guarantor's seal or stamp

3.1.4. PART C1.3: DISPUTE RESOLUTION MECHANISM

3.1.5. C1.3 CIDB ADJUDICATOR'S AGREEMENT

C1.3 CIDB ADJUDICATOR'S AGREEMENT

This agreement is made on the day of between:
 (name of company / organization) of

 (address) and
 (name of company / organization) of

 . (address) (the Parties) and (name) of

 (address) (the Adjudicator).

Disputes or differences may arise/have arisen* between the Parties under a Contract dated
 ... and known as
 and these disputes or differences shall be/have been* referred to adjudication in accordance
 with the CIDB Adjudication Procedure, (hereinafter called "the Procedure") and the Adjudicator may
 be or has been requested to act.

* Delete as necessary

IT IS NOW AGREED as follows:

- 1 The rights and obligations of the Adjudicator and the Parties shall be as set out in the Procedure.
- 2 The Adjudicator hereby accepts the appointment and agrees to conduct the adjudication in accordance with the Procedure.
- 3 The Parties bind themselves jointly and severally to pay the Adjudicator's fees and expenses in accordance with the Procedure as set out in the Contract Data.
- 4 The Parties and the Adjudicator shall at all times maintain the confidentiality of the adjudication and shall endeavour to ensure that anyone acting on their behalf or through them will do likewise, save with the consent of the other Parties which consent shall not be unreasonably refused.
- 5 The Adjudicator shall inform the Parties if he intends to destroy the documents which have been sent to him in relation to the adjudication and he shall retain documents for a further period at the request of either Party.

SIGNED by: _____
 Name: _____
 who warrants that he / she is
 duly authorized to sign for and
 on behalf of the first Party in the
 presence of

SIGNED by: _____
 Name: _____
 who warrants that he / she is
 duly authorized to sign for and
 behalf of the second Party in
 the presence of

SIGNED by: _____
 Name: _____
 the Adjudicator in the presence
 of

Witness	_____	Witness:	_____	Witness:	_____
Name:	_____	Name	_____	Name:	_____
Address:	_____	Address:	_____	Address:	_____
Date:	_____	Date:	_____	Date:	_____
	_____		_____		_____

Contract Data

1	The Adjudicator shall be paid at the hourly rate of R. in respect of all time spent upon, or in connection with, the adjudication including time spent travelling.
2	The Adjudicator shall be reimbursed in respect of all disbursements properly made including, but not restricted to: (a) Printing, reproduction and purchase of documents, drawings, maps, records and photographs. (b) Telegrams, telex, faxes, and telephone calls. € Postage and similar delivery charges. (d) Travelling, hotel expenses and other similar disbursements. € Room charges. (f) Charges for legal or technical advice obtained in accordance with the Procedure.
3	The Adjudicator shall be paid an appointment fee of R. This fee shall become payable in equal amounts by each Party within days of the appointment of the Adjudicator, subject to an Invoice being provided. This fee will be deducted from the final statement of any sums which shall become payable under item 1 and/or item 2 of the Contract Data. If the final statement is less than the appointment fee the balance shall be refunded to the Parties.
4	The Adjudicator is/is not* currently registered for VAT.
5	Where the Adjudicator is registered for VAT it shall be charged additionally in accordance with the rates current at the date of invoice.
6	All payments, other than the appointment fee (item 3) shall become due in 30 days after receipt of invoice, thereafter interest shall be payable at 5% per annum above the Reserve Bank base rate for every day the amount remains outstanding.

* Delete as necessary

4.PART C2 - PRICING DATA

4.1. PART C2.1: PRICING INSTRUCTIONS

C2.1 Pricing Instructions

- 1 The Bills of Quantities have been drawn up in accordance with the Standard System of Measuring Building Work as amended) published and issued by the Association of South African Quantity Surveyors (Seventh Edition), 2015. Where applicable the:
 - a) Civil engineering work has been drawn up in accordance with the provisions of the latest edition of SABS 1200 Standardised Specifications for Civil Engineering Works.
 - b) Mechanical work has been drawn up in accordance with the provisions of the latest edition of SABS 1200 Standardised Specifications for Mechanical Engineering Works.
 - c) Electrical work has been drawn up in accordance with the provisions of the latest edition of SABS 1200 Standardised Specifications for Electrical Engineering Works.
- 2 The agreement is based on the JBCC Edition 6.2 of 2018 with Government Clauses, prepared by the Joint Building Contracts Committee, The additions, deletions and alterations to the JBCC Principal Building Agreement as well as the contract specific variables are as stated in the Contract Data. Only the headings and clause numbers for which allowance must be made in the Bills of Quantities are recited.
- 3 Preliminary and General requirements are based on the [preliminaries for the use of JBCC Edition 6.2– May 2018](#). Only the headings and clause numbers for which allowance must be made in the Bills of Quantities are recited.
- 4 It will be assumed that prices included in the Bills of Quantities are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for tenders. (Refer to www.stanza.org.za or www.iso.org for information on standards).
- 5 The drawings listed in the Scope of Works used for the setting up of these Bills of Quantities are kept by the Principal Agent or Engineer and can be viewed at any time during office hours up until the completion of the works.
- 6 Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted but only if approved by the Principal Agent.
- 7 The bills of quantities forms part of and must be read and priced in conjunction with all the other documents forming part of the contract document, The Standard Conditions of Tender, Conditions of Contract, Specifications, Drawings, The document “Construction Works: Specifications: General Specification (PW371-A) Edition 2.0” is obtainable on the Department’s website (<http://www.publicworks.gov.za/> under “Consultants Guidelines”), and shall be read in conjunction with the **bills of quantities** / lump sum document and be referred to for the full descriptions of work to be done and materials to be used The document “Construction Works: Specifications: Particular Specification (PW371-B) Edition 2.0” is issued together with the drawings and shall be read in conjunction with the drawings and the **bills of quantities** / lump sum document
- 8 Where any item is not relevant to this specific contract, such item is marked N/A (signifying “not applicable”)
- 9 The Contract Data and the standard form of contract referenced therein must be studied for the full extent and meaning of each and every clause set out in Section 1 (Preliminaries) of the Bills of Quantities

- 10 The Bills of Quantities is not intended for the ordering of materials. Any ordering of materials, based on the Bills of Quantities, is at the Contractor's risk.
- 11 The amount of the Preliminaries to be included in each monthly payment certificate shall be assessed as an amount prorated to the value of the work duly executed in the same ratio as the preliminaries bears to the total of prices excluding any contingency sum, the amount for the Preliminaries and any amount in respect of contract price adjustment provided for in the contract.
- 12 Where the initial contract period is extended, the monthly charge shall be calculated on the basis as set out in 11 but taking into account the revised period for completing the works.
- 13 The amount or items of the Preliminaries shall be adjusted to take account of the theoretical financial effect which changes in time or value (or both) have on this section. Such adjustments shall be based on adjustments in the following categories as recorded in the Bills of Quantities:
 - a) an amount which is not to be varied, namely Fixed (F)
 - b) an amount which is to be varied in proportion to the contract value, namely Value Related (V); and
 - c) an amount which is to be varied in proportion to the contract period as compared to the initial construction period excluding revisions to the construction period for which no adjustment to the contractor is not entitled to in terms of the contract, namely Time Related (T).
- 14 Where no provision is made in the Bills of Quantities to indicate which of the three categories in 13 apply or where no selection is made, the adjustments shall be based on the following breakdown:
 - a) 10 percent is Fixed
 - b) 15 percent is Value Related
 - c) 75 percent is Time Related
- 15 The adjustment of the Preliminaries shall apply notwithstanding the actual employment of resources in the execution of the works. The contract value used for the adjustment of the Preliminaries shall exclude any contingency sum, the amount for the Preliminaries and any amount in respect of contract price adjustment provided for in the contract. Adjustments in respect of any staged or sectional completion shall be prorated to the value of each section.
- 16 The tender price must include 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.
17. The Contractor shall adhere to "The national minimum wage determined by the Minister in accordance with the National Minimum Wage Act (NMWA)", and yearly pronounced increases for duration of contract.
18. Voting day / Election day 2024 will be a statutory public holiday and contractor must make provision in his bid. No further claims will be entertained in this regard.

4.2. PART C2.2 – BILLS OF QUANTITIES

Item No		Quantity	Amount
	<p><u>SECTION No. 1: PRELIMINARIES</u></p> <p><u>BILL No 1: PRELIMINARIES</u></p> <p><u>BUILDING AGREEMENT AND PRELIMINARIES</u></p> <p>The JBCC Principal Building Agreement (Edition 6.2 - May 2018) prepared by the Joint Building Contracts Committee shall be the applicable building agreement, amended as hereinafter described</p> <p>The JBCC Principal Building Agreement contract data form an integral part of this agreement</p> <p>The JBCC General Preliminaries (May 2018) published by the Joint Building Contracts Committee for use with the JBCC Principal Building Agreement (Edition 6.2 - May 2018) shall be deemed to be incorporated in these bills of quantities, amended as hereinafter described</p> <p>The contractor is deemed to have referred to the above mentioned documents for the full intent and meaning of each clause</p> <p>The clauses in the above mentioned documents are hereinafter referred to by clause number and heading only</p> <p>Where any item is not relevant to this agreement such item is marked N/A signifying "not applicable"</p> <p>Where standard clauses or alternatives are not entirely applicable to this agreement such amendments, modifications, corrections or supplements as will apply are given under each relevant clause heading and such amendments, modifications, corrections or supplements shall take precedence notwithstanding anything to the contrary contained in the above mentioned documents</p> <p><u>PREAMBLES FOR TRADES</u></p> <p>The General Preambles for Trades 2017 published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said General Preambles will be entertained</p> <p>Supplementary preambles and/or specifications are incorporated in these bills of quantities to satisfy the requirements of this project. Such supplementary preambles and/or specifications shall take precedence over the provisions of the General Preambles</p> <p>The contractor's prices for all items throughout these bills of quantities shall take account of and include where applicable for all of the obligations, requirements and specifications given in the General Preambles and in any supplementary preambles and/or specifications</p> <p>If any discrepancy in any of the documents forming part of the contract is found, then the contract data and or amendments within the special conditions of contract and herein shall prevail in cases of conflict between any of the documents</p>		
	Carried to Collection	R	
	Section No. 1 PRELIMINARIES Bill No. 1 PRELIMINARIES		

STRUCTURE OF THIS PRELIMINARIES BILL

Section A : A recital of the headings of the individual clauses in the aforementioned **JBCC** Principal Building Agreement

Section B : A recital of the headings of the individual clauses in the aforementioned **JBCC** General Preliminaries

Section C : Any special clauses to meet the particular circumstances of the project

PRICING OF PRELIMINARIES

Contractors are required to price all individual items in the preliminary and general section of the bill of quantities and should not lump the items into a single sum or amount. This fully priced schedule must be included as part of the priced bill of quantities returnable with tender submission

In the event that the contractor, due to causes of his own making, fails to achieve the targets set out in his construction programme and his performance is not in accordance with the contract, payment of the time related Preliminaries will be paid in proportion to the value of the monthly progress payment and not in accordance with the projected cash flow for this item. The principal agent shall review the status quo and revert to paying the contractor in accordance with the contract once the contractor has demonstrated improvement of their performance and the principal agent is satisfied that the contractor is performing diligently

Similarly the full amount of the fixed portion of the Preliminaries will be paid only once the successful contractor has fully complied with deliverables under this section

Should the **contractor** select Option A in the **contract data** for the adjustment of **preliminaries**, the amounts entered against the relevant items in these **preliminaries** are to be divided into one or more of the three categories provided namely fixed (F), value related (V) and time related (T)

SECTION A: PRINCIPAL BUILDING AGREEMENT

Interpretation (A1-A7)

1 Clause 1.0 - Definitions and interpretation

Pricing of bills of quantities

The **contractor** is to allow opposite each item for all costs in connection therewith. All prices to include, unless otherwise stated, for all materials, fabrication, conveyance and delivery, unloading, storing, unpacking, hoisting, labour, setting, fitting and fixing in position, cutting and waste (except where to be measured in accordance with the standard system of measurement), patterns, models and templates, plant, temporary works, returning of packaging, duties, taxes (other than Value Added Tax), imposts, establishment charges, overheads, profit and all other obligations arising out of this **agreement**. Value Added Tax (VAT) is to be separately stated on the summary page of these **bills of quantities**

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Items left unpriced will be deemed to be covered in prices against other items throughout these bills of quantities and no claim for any extras arising out of the contractor's omission to price any item will be entertained

Prices for all construction equipment, temporary works, services and other items shall include for the supply, maintenance, operating cost and subsequent removal and making good as necessary

Contractors are reminded that some of the works are to be undertaken under restrictive site conditions, over steep terrain, in dense vegetation, protected environments etc.

In addition to the usual rates priced for standard measured items in the bills of quantities, contractors shall provide for all additional plant, labour, equipment, temporary works, temporary access ways and any additional supervision, transport, security, special plant and equipment to navigate restrictive site conditions and all things necessary for the completion of the works within this bills of quantities. The rates or amounts tendered for these items shall also include for the contractors management, attendance, profit, costs for removal and reinstatement of the ground conditions, vegetation, etc. in the state and condition prior to the works being undertaken

In addition to the usual rates priced for compliance with law and regulation in relation to inspections, warranties, guarantees, tests, analysis, commissioning and all things necessary for compliance, the contractor is expected to include in the rates, prices and the tendered total of the prices for all inspections, warranties, guarantees, tests, analysis, commissioning and all things necessary for compliance, payable by the contractor

Such items include but are not limited to: - Electrical Compliance Certificate - Plumbing Compliance Certificate - Structural Steel Compliance Certificate - Lightning Certificate - Soil Protection Certificate - Concrete test results and cube certificates - Compaction Test results and certificates - Waterproofing guarantee certificates - TR1 and TR2 prefabricated roof truss certificates - Roof covering certificate - 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 - Any other requirement as per the latest National Building Regulation

Contractors are reminded and hereby given the opportunity to allow for and price all costs related to the abnormal working conditions referred to herein as no claims for additional costs will be entertained for any omission on the part of contractor

Clause 3.9 amended to read 'The priced document shall not be used as a specification for material and goods and the quantities should not be used for procurement purposes

All procurement of material will be based on actual site measurements and not on drawings, specifications or the bill of quantities

Abbreviated descriptions

The items in these **bills of quantities** utilise abbreviated descriptions. It is the intention that the abbreviated descriptions be fully described when read with the applicable measuring system and the relevant preambles and/or specifications. However, should the full intent and meaning of any description not be clear, the **contractor** shall, before submission of his tender, call for a written directive from the **principal agent**, failing which it shall be assumed that the **contractor** has allowed in his pricing for materials and workmanship in terms of international best practice

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Legal status of contractor

If the **contractor** constitutes a joint venture, consortium or other unincorporated grouping of two or more persons then:

1. These persons are deemed to be jointly and severally liable to the **employer** for the performance of this **agreement**
2. These persons shall notify the **employer** of their leader who has assigned authority to bind the **contractor** and each of these persons
3. The **contractor** shall not alter its composition or legal status without the prior written consent of the **employer**

F:..... V:..... T:.....

Item

2 **Clause 2.0 - Law, regulations and notices**

F:..... V:..... T:.....

Item

3 **Clause 3.0 - Offer and acceptance**

F:..... V:..... T:.....

Item

4 **Clause 4.0 - Cession and assignment**

F:..... V:..... T:.....

Item

5 **Clause 5.0 - Documents**

Value Added Tax

Provision is made in the summary page of these **bills of quantities** for the inclusion of Value Added Tax (VAT)

Priced document as specification

Clause 5.4 is deemed to be deleted

The **principal agent** shall decide which portion of the **priced document** may be used as a specification of **materials and goods** or methods, if any

Electronic issue of drawings

Some drawings for this project will be issued electronically and the **contractor** shall be deemed to have received such drawings on the date that such drawings have been dispatched electronically [5.6]

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F:..... V:..... T:.....

6 Clause 6.0 - Employer's agents

Delegated authority

The authority of the **principal agent** to issue **contract instructions** [17.1] and perform duties for specific aspects of the **works** is delegated to **agents** as follows [6.2]. This does not preclude the **principal agent** from issuing such **contract instructions**:

1. Architect

1.1 Duties [6.2] :

The architect is responsible for the architectural design, functional design and quality inspection of the **works**

1.2 **Contract instructions** [6.2; 17.1] :

1.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the **agreement** other than in the **JBCC** Principal Building Agreement

1.2.2 Alteration to design, standards or quantity of the **works** provided that such **contract instructions** shall not substantially change the scope of the **works**

1.2.3 The **site** [13.0]

1.2.4 Compliance with the **law**, regulations and bylaws [2.1]

1.2.5 Provision and testing of samples of **materials and goods** and/or of finishes and assemblies of elements of the **works**

1.2.6 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]

1.2.7 Removal or re-execution of work

1.2.8 Removal or substitution of any **materials and goods**

1.2.9 Protection of the **works**

1.2.10 Making good physical loss and repairing damage to the **works** [23.2.2]

1.2.11 Rectification of **defects** [21.2]

1.2.12 A **list for practical completion** specifying outstanding or defective work to be rectified to achieve **practical completion**, a **list for completion** and a **list for final completion** specifying outstanding or defective work to be rectified to achieve **final completion**

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1.2.13 Expenditure of **budgetary allowances, prime cost amounts and provisional sums**

1.2.14 Appointment of a **subcontractor** [14.0; 15.0]

1.2.15 Work by **direct contractors** [16.0]

1.2.16 On suspension or termination, protection of the **works**, removal of **construction equipment** and surplus **materials and goods** [29.0]

2. Quantity surveyor

2.1 Duties [6.2] :

The quantity surveyor is responsible for all measurements, valuations, financial assessments and all other quantity surveying and cost control functions of the **works**

2.2 **Contract instructions** [6.2; 17.1] :

2.2.1 No **contract instructions** delegated to the quantity surveyor

3. Civil and structural engineer

3.1 Duties [6.2] :

The civil and structural engineer is responsible for all aspects of civil and structural engineering design and quality inspection of the **works**

3.2 **Contract instructions** [6.2; 17.1] :

3.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the **agreement** other than in the **JBCC** Principal Building Agreement

3.2.2 Alteration to design, standards or quantity of the **works** provided that such **contract instructions** shall not substantially change the scope of the **works**

3.2.3 The **site** [13.0]

3.2.4 Compliance with the **law**, regulations and bylaws [2.1]

3.2.5 Provision and testing of samples of **materials and goods** and/or of finishes and assemblies of elements of the **works**

3.2.6 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]

3.2.7 Removal or re-execution of work

3.2.8 Removal or substitution of any **materials and goods**

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- 3.2.9 Protection of the **works**
- 3.2.10 Making good physical loss and repairing damage to the **works** [23.2.2]
- 3.2.11 Rectification of **defects** [21.2]
- 3.2.12 A **list for practical completion** specifying outstanding or defective work to be rectified to achieve **practical completion**, a **list for completion** and a **list for final completion** specifying outstanding or defective work to be rectified to achieve **final completion**
- 3.2.13 Expenditure of **budgetary allowances, prime cost amounts** and **provisional sums**

4. Mechanical engineer

4.1 Duties [6.2] :

The mechanical engineer is responsible for all aspects of mechanical engineering design and quality inspection of the **works** and, where appointed by the **employer** for quantity surveying services in respect of the mechanical installations, for all measurements, valuations, financial assessments and all other quantity surveying and cost control functions

4.2 **Contract instructions** [6.2; 17.1] :

- 4.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the **agreement** other than in the **JBCC** Principal Building Agreement
- 4.2.2 Alteration to design, standards or quantity of the **works** provided that such **contract instructions** shall not substantially change the scope of the **works**
- 4.2.3 Compliance with the **law**, regulations and bylaws [2.1]
- 4.2.4 Provision and testing of samples of **materials and goods** and/or of finishes and assemblies of elements of the **works**
- 4.2.5 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]
- 4.2.6 Removal or re-execution of work
- 4.2.7 Removal or substitution of any **materials and goods**
- 4.2.8 Protection of the **works**
- 4.2.9 Making good physical loss and repairing damage to the **works** [23.2.2]
- 4.2.10 Rectification of **defects** [21.2]

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4.2.11 A **list for practical completion** specifying outstanding or defective work to be rectified to achieve **practical completion**, a **list for completion** and a **list for final completion** specifying outstanding or defective work to be rectified to achieve **final completion**

4.2.12 Expenditure of **budgetary allowances, prime cost amounts and provisional sums**

5. Electrical/Electronics engineer

5.1 Duties [6.2] :

The electrical engineer is responsible for all aspects of electrical and electronics engineering design and quality inspection of the **works** and, where appointed by the **employer** for quantity surveying services in respect of the electrical installations, for all measurements, valuations, financial assessments and all other quantity surveying and cost control functions

5.2 **Contract instructions** [6.2; 17.1] :

5.2.1 Rectification of discrepancies, errors in description or quantity or omission of items in the **agreement** other than in the **JBCC** Principal Building Agreement

5.2.2 Alteration to design, standards or quantity of the **works** provided that such **contract instructions** shall not substantially change the scope of the **works**

5.2.3 Compliance with the **law**, regulations and bylaws [2.1]

5.2.4 Provision and testing of samples of **materials and goods** and/or of finishes and assemblies of elements of the **works**

5.2.5 Opening up of work for inspection, removal or re-execution [23.2.4; 26.4.2]

5.2.6 Removal or re-execution of work

5.2.7 Removal or substitution of any **materials and goods**

5.2.8 Protection of the **works**

5.2.9 Making good physical loss and repairing damage to the **works** [23.2.2]

5.2.10 Rectification of **defects** [21.2]

5.2.11 A **list for practical completion** specifying outstanding or defective work to be rectified to achieve **practical completion**, a **list for completion** and a **list for final completion** specifying outstanding or defective work to be rectified to achieve **final completion**

5.2.12 Expenditure of **budgetary allowances, prime cost amounts and provisional sums**

6. Health and safety consultant

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6.1 Duties [6.2] :

The health and safety consultant is responsible for all aspects of health and safety of the **works**. Without derogating from the generality thereof, the health and safety consultant will perform the following specific functions and duties in respect of the health and safety aspects of the **works**. He shall:

- 6.1.1 Act as the **employer's agent** in terms of the Construction Regulations issued in terms of the Occupational Health and Safety Act, 1993 as amended
- 6.1.2 Prepare and update the health and safety specification for the **works**
- 6.1.3 Agree with the **contractor** the health and safety plan for the **works**
- 6.1.4 Carry out regular audits to ensure adherence to the safety plan and compliance with the act and regulations
- 6.1.5 Stop the execution of the **works** where the agreed specification or plan is not adhered to

F:..... V:..... T:.....

Item

7 Clause 7.0 - Design responsibility

F:..... V:..... T:.....

Item

Insurances and securities (A8-A11)

8 Clause 8.0 - **Works** risk

F:..... V:..... T:.....

Item

9 Clause 9.0 - Indemnities

F:..... V:..... T:.....

Item

10 Clause 10.0 - Insurances

Clause 10.1.1 - Contracts Works Insurance

'the contractor shall be responsible for effecting and maintaining the contract works insurance for the full duration of the contract period. The insured amount for the full scope of works shall be 120% of the contract amount

- Clause 10.1.2 - Supplementary Insurance
- Clause 10.1.3 - Public Liability Insurance
- Clause 10.1.4 - Removal of Lateral Support Insurance - N/A
- Clause 10.1.5 - Other Insurances - N/A

F:..... V:..... T:.....

Item

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11 Clause 11.0 - **Securities**

Clause 11.1 - Guarantee for construction

F:..... V:..... T:.....

The contractor shall provide to the employer a **guarantee for construction** within fifteen (15) working days of acceptance of the contractor's tender

Clause 11.5 - Guarantee for payment

The employer shall not provide to the contractor a **guarantee for payment**. The contractor shall waive his lien or right of continuing possession of the works [11.10]

Extension of waiver of lien

The **contractor** shall ensure that a waiver of lien is included in all subcontracts and that the **works** executed on the **site** are kept free of all liens and other encumbrances at all times [11.10]

F:..... V:..... T:.....

Execution (A12 - A17)

12 Clause 12.0 - Obligations of the **parties**

Office accommodation

The **contractor** shall provide, maintain and remove on **practical completion** air conditioned office accommodation with suitable tables and chairs for meetings to be held on the **site**. Such offices shall be kept clean and fit for use at all times [12.2.18]

Notice board

The **contractor** shall erect in a position approved by the **principal agent**, maintain and remove on **practical completion** a notice board recommended by the South African Institute of Architects and as approved by the **principal agent** listing the names and logos of the **employer**, the **contractor** and the professional consultants. No subcontractor or supplier notice boards may be erected unless permission is granted by the **principal agent** for such notice boards to be erected [12.2.18]

Statutory and other notices

The **contractor** shall submit and/or comply with all statutory and other notices that may be required by any local or other authority in order not to cause any delay to the commencement of the **works** by the **contractor**. The **contractor** shall pay all deposits or fees in this regard

It is, however, specifically recorded that the **employer** shall be responsible for the timeous approval of building plans by any local or other authorities and the payment of any fees or charges related thereto

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20	<p>Clause 20.0 - Completion in sections</p> <p>F:..... V:..... T:.....</p>	Item
21	<p>Clause 21.0 - Defects liability period and final completion</p> <p>A 2.5% retention shall apply. The maintenance period shall be 12 months.</p> <p>F:..... V:..... T:.....</p>	Item
22	<p>Clause 22.0 - Latent defects liability period</p> <p>F:..... V:..... T:.....</p>	Item
23	<p>Clause 23.0 - Revision of the date for practical completion</p> <p>Adverse weather conditions</p> <p>The contract duration includes a monthly allowance of 3 working days for adverse weather conditions [23.1.1] during which rainfall exceeds 10mm per day. These days shall be reflected on the critical path of the construction programme. Where the programmed delays for adverse weather conditions exceed the actual delays incurred the date for practical completion will not be adjusted. Where the actual delays incurred for adverse weather conditions exceed the programmed delays and such delays have impacted on the critical path of the construction programme, the date for practical completion will be adjusted should the requirements of Clause 23.0 be satisfied</p> <p>Substitution of materials and goods</p> <p>The removal or substitution of any materials and goods which do not conform to the specification or the contract drawings shall not constitute grounds for the extension of the construction period nor for the adjustment of the contract value [17.1.8; 23.1 & 2]</p> <p>F:..... V:..... T:.....</p>	Item
24	<p>Clause 24.0 - Penalty for late or non-completion</p> <p>F:..... V:..... T:.....</p> <p>Payment (A25 - A27)</p>	Item
25	<p>Clause 25.0 - Payment</p>	
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Prices submitted

Where prices are submitted by the **contractor** or **subcontractor** during the progress of the **works** in respect of **contract instructions** or in regard to a claim under the terms of this **agreement** and notwithstanding the fact that such prices may be used in an interim **payment certificate**, there is to be no presumption of acceptance. Should the **principal agent** wish to accept any such prices prior to the issue of the **certificate of final completion**, it shall be in writing

Clause 25 amended to read 'The employer shall pay to the contractor the amount certified in interim payment certificate within thirty (30) calendar days of the date of issue of the payment certificate or the contractors tax invoice whichever is the later date'

Materials and goods stored off site shall not be included in the amount authorised for payment unless the requirements for an Advanced Payment Guarantee are met

F:..... V:..... T:.....

Item

26 Clause 26.0 - Adjustment of the **contract value** and **final account**

Fluctuations in costs

All fluctuations in costs, with the exception of fluctuations in the rate of Value Added Tax, shall be for the account of the **contractor** [26.9.5]

Tenant installation/user requirements delayed

There is a possibility that certain works related to tenant installation/user requirements may have to be delayed and may consequently not be executed prior to **practical completion**

Should the **contractor** be instructed to do so he shall execute this work under the conditions pertaining to this **agreement** on the basis that a separate amount for **preliminaries** appurtenant to this work (if applicable) is agreed to between the **contractor** and the **principal agent** and on condition that instruction to proceed with such work is given to him within a period of three (3) calendar months after the date of **practical completion** of the **works**

The contractor shall not receive any mark-up for overheads and profit on any omission of tenant installation work or tenant installation work by others. Claims of loss of profit shall not be considered

The **employer** reserves the right to omit such work without compensation to the **contractor** for loss of profit or any other loss which the **contractor** may suffer as a result of such omission

Cost of claims

All costs incurred by the **contractor** in the preparation of claims shall be borne by the **contractor**. This provision shall not preclude an adjudicator or an arbitrator appointed in terms of this **agreement** [30.6 & 7] from making a determination on costs

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Claims from subcontractors

The **contractor** shall review, assess and adjudicate any claims received by him from any **subcontractor** and thereafter submit same to the **principal agent** with a recommendation in order to assist the **principal agent** in adjudicating the claim [26.6]

F:..... V:..... T:.....

Item

27 Clause 27.0 - Recovery of expense and/or loss

F:..... V:..... T:.....

Item

Suspension and termination (A28 - A29)

28 Clause 28.0 - Suspension by the **contractor**

F:..... V:..... T:.....

Item

29 Clause 29.0 - Termination

F:..... V:..... T:.....

Item

Dispute resolution (A30)

30 Clause 30.0 - Dispute resolution

F:..... V:..... T:.....

Item

31 **Agreement**

The required information of the **parties** and the amount of the **contract sum** shall be inserted in the **agreement** for signature of the **agreement** by the **parties**

F:..... V:..... T:.....

Item

32 **Contract data**

Tenderer's selections

Before submission of his tender the **contractor** is to complete the tenderer's selections in the **contract data**

F:..... V:..... T:.....

Item

SECTION B: GENERAL PRELIMINARIES

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Definitions and interpretation (B1)

33 Clause 1.1 - Definitions
F:..... V:..... T:.....

Item

34 Clause 1.2 - Interpretation
F:..... V:..... T:.....

Item

Documents (B2)

35 Clause 2.1 - Checking of documents
F:..... V:..... T:.....

Item

36 Clause 2.2 - Provisional **bills of quantities** Yes

Multiple procurement

These **bills of quantities** are in multiple procurement format ie the "wet trades" - plumbing and drainage - are provisionally measured and the subsequent trades are **budgetary allowances** and **provisional sums**. **A portion of the works are also measured in SMME Packages as a separate Section.**

F:..... V:..... T:.....

Item

37 Clause 2.3 - Availability of **construction information**

F:..... V:..... T:.....

Item

38 Clause 2.4 - Ordering of **materials and goods**

F:..... V:..... T:.....

Item

Previous work and adjoining properties (B3)

39 Clause 3.1 - Previous work - dimensional accuracy

F:..... V:..... T:.....

Item

40 Clause 3.2 - Previous work - **defects**

F:..... V:..... T:.....

Item

41 Clause 3.3 - Inspection of adjoining properties

F:..... V:..... T:.....

Item

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The site (B4)

42 Clause 4.1 - Handover of **site** in stages
F:..... V:..... T:..... Item

43 Clause 4.2 - Enclosure of the **works**
Hoarding will be required to isolate areas; this hoarding has been allowed for in the bills of quantities
F:..... V:..... T:..... Item

44 Clause 4.3 - Geotechnical and other investigations
F:..... V:..... T:..... Item

45 Clause 4.4 - Encroachments
The contractor shall notify the principal agent if any encroachments of adjoining foundations, buildings, structures, pavements, boundaries, etc. exist in order that the necessary arrangements may be made for the rectification of any such encroachment
F:..... V:..... T:..... Item

46 Clause 4.5 - Existing premises occupied
The existing buildings will not be occupied and will be hoarded off as agreed with the Hospital to work on
F:..... V:..... T:..... Item

47 Clause 4.6 - Services - known
F:..... V:..... T:..... Item

Management of contract (B5)

48 Clause 5.1 - Management of the **works**
F:..... V:..... T:..... Item

49 Clause 5.2 - Progress meetings
F:..... V:..... T:..... Item

50 Clause 5.3 - Technical meetings
F:..... V:..... T:..... Item

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Samples, shop drawings and manufacturer's instructions (B6)

51	Clause 6.1 - Samples of materials F:..... V:..... T:.....	Item
52	Clause 6.2 - Workmanship samples F:..... V:..... T:.....	Item
53	Clause 6.3 - Shop drawings F:..... V:..... T:.....	Item
54	Clause 6.4 - Compliance with manufacturer's instructions F:..... V:..... T:.....	Item

Deposits and fees (B7)

55	Clause 7.1 - Deposits and fees F:..... V:..... T:.....	Item
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Temporary services (B8)

56	Clause 8.1 - Water F:..... V:..... T:.....	Item
57	Clause 8.2 - Electricity F:..... V:..... T:.....	Item
58	Clause 8.3 - Ablution and welfare facilities Clause 8.3 - Ablution and welfare facilities in compliance to the provisions of the Construction Regulations 2014 issued in terms of the Occupational Health and Safety Act, 1993 as amended: Section (30): Sub-section (1)(a) - Shower facilities after consultation with the employees or the employees representatives, or at least one shower facility for every 15 persons; Sub-section (1)(b) - at least one sanitary facility for each sex and for every 30 workers; Sub-section (1)(c) - changing facilities for each sex and Sub-section (1)(d) - sheltered eating areas F:..... V:..... T:.....	Item
59	Clause 8.4 - Communication facilities F:..... V:..... T:.....	Item

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Prime cost amounts (B9)			
60	Clause 9.1 - prime cost amounts F:..... V:..... T:.....	Item	
Attendance on subcontractors (B10)			
61	Clause 10.1 - General attendance F:..... V:..... T:.....	Item	
62	Clause 10.2 - Special attendance F:..... V:..... T:.....	Item	
General (B11)			
63	Clause 11.1 - Protection of the works F:..... V:..... T:.....	Item	
64	Clause 11.2 - Protection/isolation of existing works and works occupied in sections F:..... V:..... T:.....	Item	
65	Clause 11.3 - Security of the works The contractor shall be briefed on the restrictions of movement, servitudes, access control, buildings in use, security requirements and security clearances, working hours, etc. and the employers control at all times. The contractor shall not extend his operations into any restricted or undefined areas Work shall be carried out during normal working hours. Any extended times or approval or overtime work shall be considered and approved by the PA. The contractor shall comply with the employers rules for the control of delivery of materials and goods into the site and for the removal of such items from the site The Contractor will be responsible for ensuring the security and protection of all material, hand tools, power tools, plant, equipment, machinery, etc. stored on the site The Contractor will be required to make arrangements with the Employer, through the Principal Agent, for the use of and reimbursement for the security measures currently in force and operational on the site F:..... V:..... T:.....	Item	
66	Clause 11.4 - Notice before covering work F:..... V:..... T:.....	Item	
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67	<p>Clause 11.5 - Disturbance</p> <p>Disturbance</p> <p>All work is to be carried out in such a manner as to cause no unacceptable or unreasonable dust, noise, vibrations, nuisance, inconvenience, annoyance and the like to the public, others, other properties and traffic in so far as they exceed the permissible limitations set by government legislation or by the local authority. Any delays, stoppages and the like arising from or in order to comply with the above will not constitute grounds for an adjustment to the construction period or contract value whatsoever</p> <p>F:..... V:..... T:.....</p>	Item	
68	<p>Clause 11.6 - Environmental disturbance</p> <p>Controlling all forms of pollution</p> <p>The contractor shall be responsible for and take all precautions in controlling by whatever means necessary all forms of pollution emanating from the site during the construction period due inter alia to noise, artificial light, wind-blown sand, dust, deposits of mud, etc.</p> <p>The contractor is to ensure that all roads which border the site and are used by the contractor during the execution of the works are kept clean and free of any dirt or debris caused by the execution of the works</p> <p>F:..... V:..... T:.....</p>	Item	
69	<p>Clause 11.7 - Works cleaning and clearing</p> <p>F:..... V:..... T:.....</p>	Item	
70	<p>Clause 11.8 - Vermin</p> <p>F:..... V:..... T:.....</p>	Item	
71	<p>Clause 11.9 - Overhand work</p> <p>F:..... V:..... T:.....</p>	Item	
72	<p>Clause 11.10 - Tenant installations</p> <p>F:..... V:..... T:.....</p>	Item	
73	<p>Clause 11.11 - Advertising</p> <p>F:..... V:..... T:.....</p>	Item	
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SECTION C: SPECIFIC PRELIMINARIES

74 Warranties for materials and workmanship

Where warranties for materials and/or workmanship are called for, the **contractor** shall obtain a written warranty, addressed to the **employer**, from the entity supplying the materials and/or executing the work and shall deliver same to the **principal agent** on **final completion** of the contract

The warranty shall state that workmanship, materials and installation are warranted for a specific period from the date of **practical completion** and that any **defects** that may arise during the specified period shall be made good at the expense of the entity supplying the materials and/or doing the work, upon written **notice** to do so

The warranty will not be enforced if the work is damaged by **defects** in the execution of the **works**, in which case the responsibility for replacement shall rest entirely with the **contractor**

F:..... V:..... T:.....

Item

75 Overtime

Should overtime be required to be worked for any reason whatsoever, the cost of such overtime is to be borne by the **contractor** unless the **principal agent** has specifically authorised, prior to execution thereof, that costs for such overtime are to be borne by the **employer**

F:..... V:..... T:.....

Item

76 Cooperation of the **contractor** for cost management

It is specifically agreed that the **contractor** accepts the obligation of assisting the **principal agent** in implementing proper cost management. The **contractor** will be advised by the **principal agent** of all cost management procedures which will be implemented to ensure that the **contract value** does not exceed the budget

F:..... V:..... T:.....

Item

77 Health and safety

Without limiting the generality of the provisions of clause 2.0, the contractor's attention is drawn to the provisions of the Construction Regulations issued in terms of the Occupational Health and Safety Act, 1993 as amended. It is specifically stated that the employer shall prepare a documented health and safety specification for the works and that the employer shall ensure that the contractor has made provision for the cost of health and safety measures during the execution of the works. The contractor shall price the Pricing schedule for Health, Safety and Environment as per the pricing schedule included in Bill No. 2 as part of the Preliminaries Section.

Provision for pricing of the Occupational Health and Safety Act, Construction Regulations and Health and Safety Specification is made under this clause and under Bill No. 2 and it is explicitly pointed out that all requirements of the aforementioned are deemed to be priced hereunder and no additional claims in this regard shall be entertained.

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The **contractor** shall:

1. Comply with the health and safety specification for the **works**
2. Prepare and agree with the health and safety consultant the health and safety plan for the **works**
3. Cooperate with the health and safety consultant in all respects
4. Manage the compliance of all subcontractors with the regulations and with the health and safety plan and specification
5. Conform to the conditions contained in the **employer's** health and safety specification

F:..... V:..... T:.....

Item

78 Reporting by the Contractor

The **Contractor** is required to complete a **CONTRACTOR MONTHLY REPORT** which is to be submitted together with the **Contractor's** payment claim

Payment of the **Contractor** is conditional on this information being accurate and timeously provided

Payment shall be subject to the **Contractor** giving the **Employer** a tax invoice for the amount due.

The **Contractor** is to take note of the following requirements -

At the bottom of the **CONTRACTOR MONTHLY REPORT**, the **Site Agent, Clerk of Works, CLO** or **Contractor** must sign the document as proof that the people indicated have worked the number of days

F:..... V:..... T:.....

Item

79 Administration

The **Contractor** must allow for **all costs** (including any profit or attendance) associated with the administration, appointment, training and/or payment of the CLO, Built Environment Interns, Training of Local Labour, Students **as applicable** and included in this tender document (refer **PROVISIONAL SUMS** section). No additional claims in this regard shall be entertained

F:..... V:..... T:.....

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80	<p>Advertising rights</p> <p>The employer may elect to contract with advertising agencies for the erection of advertising hoardings, banners, wraps or the like for the duration of the contract. The contractor shall not prevent such an arrangement and will assist in the facilitation of same. The position and type of advertising structure to be agreed with the principal agent so as not to hinder the contractor in meeting his obligations under this agreement</p> <p>F:..... V:..... T:.....</p>	Item	
81	<p>Confidentiality</p> <p>The contractor undertakes to maintain in confidence any and all information regarding this project and shall obtain appropriate similar undertakings from all subcontractors and suppliers. Such information shall not be used in any way except in connection with the execution of the works</p> <p>No information regarding this project shall be published or disclosed without the prior written consent of the employer</p> <p>F:..... V:..... T:.....</p>	Item	
82	<p>Media releases</p> <p>All rights of publication of articles in the media, together with any advertising relating thereto or in any way connected with this project, shall vest with the employer</p> <p>The contractor together with his subcontractors shall not, without the prior written consent of the employer, cause any statement or advertisement connected with this project to be printed, screened or aired by the media</p> <p>F:..... V:..... T:.....</p>	Item	
83	<p>Socio-Economic Deliverables</p> <p>The Tenderer must allow for all costs (including any profit or attendance) associated with the administration, appointment, training and/or payment of the CLO, Built Environment Interns, Training of Local Labour, Students as applicable and included in this tender document (refer PROVISIONAL SUMS section). No additional claims in this regard shall be entertained</p> <p>F:..... V:..... T:.....</p>	Item	
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84 SMME Contractors as Sub-Contractors to the Principal Contractor

The Tenderer must allow for all costs applicable that they may feel will be associated with the successful integration, development of and completion of **SMME Sub-contractors'** work to the approval of the Principal Agent on this project. Approximately **30%** of the building work needs to be allocated to SMME Sub-contractors (refer **SMME PACKAGES** section). Contractors will be required to supply verified monthly statements/schedules (verified by their auditors) indicating the % achieved for that month. A cumulative schedule also needs to be maintained for each month that has passed. The Tenderer must also note that some SMME Packages as specified in the **SMME PACKAGES** section may consist of various smaller SMME sub-contractors within each specified package (split per link), the cost for this must be included in this item.

Any additional costs that the Tenderer may deem applicable due to the use of **30%** of SMME Sub-contractors, should be allowed for in this item (Preliminaries, OHS, Profit and Attendance, etc.), as no claim for any additional costs attributable to the incorporation and development of SMME Sub-contractors on this project will be entertained after the tenders are submitted.

F:..... V:..... T:.....

Item

85 SMME Monitoring

Provision for pricing for the employment, on a full time basis for the duration of the contract, SMME Mentor. All costs associated with the completion of the SMME Monitoring duties, provision of office facilities and tools of trade are deemed to be priced hereunder. No additional claims in this regard shall be entertained. The above is in strict accordance with the Specification for the Employment of SMME Sub-contractors and all costs should be included in this item for the employment for Monitoring

F:..... V:..... T:.....

Item

SUMMARY OF CATEGORIES

Category : Fixed R.....

Category : Value R.....

Category : Time R.....

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Item No		Quantity	Rate	Amount
	<p><u>SECTION No. 1: PRELIMINARIES</u></p> <p><u>BILL NO. 2 HEALTH AND SAFETY</u></p> <p><u>MODEL PREAMBLES</u></p> <p>The tenderer is referred to the "Model Preambles for Trades 2008" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates.</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p>Supplementary preambles and/or specifications are incorporated in these bills of quantities to satisfy the requirements of this project. Such supplementary preambles and/or specifications shall take precedence over the provisions of the General Preambles.</p> <p>The contractor's prices for all items throughout these bills of quantities shall take account of and include where applicable for all of the obligations, requirements and specifications given in the General Preambles and in any supplementary preambles and/or specifications.</p> <p>Prior to pricing the principal contractor must familiarize him/herself with the Occupational Health and Safety Act No. 85 Of 1993, Construction Regulations 2014, other relevant Regulations and Standards as well as project specific Health & Safety specifications including any latest amendments.</p> <p>The items in this Bill do not contain quantities hence the Contractor must insert his own quantities based on his individual requirements to comply with the Health and Safety obligations and demands of the Occupational Health and Safety Act No. 85 of 1993, Construction Regulations 2014, other relevant Regulations and Standards as well as project specific Health & Safety Specifications.</p> <p>The costs included herein must incorporate Community Liaison Officer (CLO).</p> <p><u>OCCUPATIONAL HEALTH AND SAFETY</u></p>			
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General:

- | | | | | |
|----|--|------|--|--|
| 1 | One full time Construction Health and Safety Officer or Manager (CHSO/M) | | | |
| | Full time attendance on site of a SACPCMP-registered CHSO/M from the start of construction until the end of project handover and provisions of telecommunications. | Item | | |
| 2 | Provision for Health and Safety Management Plans and File inclusive of COVID -19 aligned with project specifications | Item | | |
| 3 | Allow for the necessary Workman's Compensation Fund or approved Insurer contributions for the duration of the project with and including renewals | Item | | |
| 4 | Medical certificates of fitness. | | | |
| | Medical examination of all employees and certification of fitness for Pre-employment is required. | | | |
| | Medical examination of all employees and certification of fitness for Exit-employment is required. | | | |
| | Allow for annual medicals for employees if the project duration is more than 12 months. | Item | | |
| 5 | Emergency Equipment based on the risk exposure and emergency rescue (stretchers, neck brace, first aid kits, fire fighting equipment) | Item | | |
| 6 | Competent inspectors for equipment such as scaffolding inspectors and lifting machine inspector, etc. | Item | | |
| 7 | Mandatory training such as risk assessments, legal liability/OHS Act, awareness, first aid incident investigation | Item | | |
| 8 | Allow for the implementation and maintenance of project-specific H &S Plan & file including implementation of and handling ACM as per Asbestos Abatement Regulations 2020 as per H&S Specification | Item | | |
| | <u>Provide, supply and maintenance for each worker the following SANS approved personal protective equipment & clothing as per the site-specific risk assessments:</u> | | | |
| 9 | Hard hats (High density polyethylene with 6 point lining) | Item | | |
| 10 | Overall/work suits (100% Cotton) | Item | | |

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11	The following PPE to be worn at all times during the handling of ACM as per Asbestos Abatement Regulations 2020 <ul style="list-style-type: none"> • Disposable overall • Eye protection • FF3 - Particulate masks • Gloves 	Item	
12	Reflective vests with visible marking of contractor and proof of induction	Item	
13	Safety boots/shoes (Steel-toe)	Item	
14	Ear Plugs/Muffs	Item	
15	Dust Mask FFP2	Item	
16	Safety goggles	Item	
17	Safety gloves	Item	
18	Respirators	Item	
19	Safety harness	Item	
20	Permit board	Item	
21	Barricading and hoarding for fall arrest, SANS approved safety netting (orange colour with minimum of 1,2 meters high)	Item	
22	Personal fall arrest and rescue equipment with and including lifelines and associated equipment	Item	
23	Temporary handrails, toe boards other than for access to scaffolding	Item	
24	Construction information, warning signage, posters	Item	
25	Allow for fire extinguishers and fire fighting equipment	Item	
26	Safe lifting equipment for lifting and lowering pipes, lifting tackles and slings	Item	
27	Allow for provision of telecommunication facilities for the appointed OHS officer	Item	
28	Provide for appointment of responsible and competent person/s to manage and supervise the works and administer and enforce health and safety on site	Item	
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29 Allow for provision of Basic medical Preparedness and Response equipment & at least Level 2 First Aider/s

Item

Environmental:

30 Dust control measure for the prevention of dust nuisance

Item

31 Provision for spill kits, drip trays

Item

32 Housekeeping – provide for the waste bins, safe collection and disposal of waste material from site by an approved method

Item

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Item No		Quantity	Rate	Amount
	<p><u>SECTION No. 2: BUILDING WORKS</u></p> <p><u>BILL No. 1: ALTERATIONS (PROVISIONAL)</u></p> <p>The Tenderer is referred to the relevant Clauses in the separate Supplementary Preambles hereunder and Department of Public Works PW371 document and SANS 2001 Series documents</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p>All work described in this bill is to be executed in/on existing buildings and prices shall allow for this</p> <p><u>General</u></p> <p>Descriptions that include the text "... take out/up/off/down and remove" shall indicate that the Tenderer shall allow that these items/materials shall become his property and shall be removed from site, or dumped at a site of disposal that the Tenderer has identified.</p> <p>Descriptions that include the text "..... make good" shall indicate that the Tenderer shall allow for all associated costs of repairing disturbed finishes, costs of disconnecting/removing the items/materials and preparatory work to receive new items/materials.</p> <p>Descriptions that include the text "..... carefully take out/up/remove" shall indicate that the Tenderer shall allow for all possible care in the removal process and temporarily storage processes, as these items/materials will be re-used elsewhere.</p> <p>All costs associated with the above will be deemed to be included in the Tenderer's prices.</p> <p>The Contractor shall carry out the whole of the works with as little mess and noise as possible and with a minimum of 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.</p> <p>Making good of finishes shall include making good of the brick and/or concrete surfaces onto which the new finishes are applied, where necessary</p>			
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The Contractor will be required to take dimensions when fitting new items/elements to existing structures/frames, etc. as there may be some minor adjustments required and it shall be deemed that all prices shall include such minor adjustment work.

Viewing of the site

Before submitting his tender, the Contractor shall visit the site and satisfy himself 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.

Removal and disposal of harmful material

Tenderers are to note that some of the buildings to be altered, may contain harmful materials/elements:

The items that are measured in this section are described, where applicable, as "asbestos". However, it is the Tenderers' responsibility to assess and decide whether the items identified are all harmful asbestos materials/elements.

Should the Tenderers be of the opinion that the items listed are identified as possible harmful materials/elements and disposal thereof, the onus will be on them to assess the latter on site and define/establish and prices the respective items accordingly. It will be deemed that Tenderers' prices received have fully taken the above requirements into consideration and priced accordingly to allow for the correct procedure of removal and disposal thereof to a designated dumping site in terms of the latest legislation applicable.

No extra cost will be entertained should the Contractor establish at a later stage that some materials/elements are harmful and their pricing did not include for the additional cost applicable due to legislative requirements relating to removal and disposal thereof.

CLEANING/PLASTERING OF EXISTING FACED BRICKWORK SURFACES

Where descriptions refer to "..... clean existing facebrick walls and prepare to receive new plaster", Tenderers shall allow for the cleaning off of all fungal matter by whatever means and water pressure cleaning the areas to prepare it for new plaster.

Generally, the joints' depth of the existing faced brickwork is approximately 6 - 10mm; the type of existing faced brickwork is not described and Tenderers must acquaint themselves with the nature of this work, prior to submitting tenders.

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1	Clean existing facebrick walls by pressure cleaning to remove all algae, discolourations, dirt, etc.	m2	10
<u>REMOVAL OF EXISTING WORK</u>			
<u>Comprehensive Asbestos Plan</u>			
2	Comprehensive asbestos plan		Item
3	Pre-production sampling		Item
4	Clearance sampling: To state area is clear and safe for normal occupation		Item
5	Clearance Report: To state area is clear and safe for normal occupation		Item
<u>Breaking up/taking down/lifting up and removing:</u>			
6	100mm Thick concrete surface beds inside existing buildings, etc.	m2	391
<u>Excavate for and remove fill under surface bed to be demolished (elsewhere measured):</u>			
7	Filling inside existing building	m3	156
<u>Break down and remove existing brickwork or blockwork, etc.:</u>			
8	Half brick wall	m2	705
9	One brick wall	m2	221
<u>Break out and remove existing brickwork for new openings:</u>			
10	Form new opening in half brick wall size, 913 x 2032mm high, including new lintol and preparing opening to receive door (elsewhere measured)	No	12
11	Form new opening in half brick wall size, 1500 x 1200mm high, including new lintol and preparing opening to receive viewing panel (elsewhere measured)	No	2
12	Form new opening in one brick wall size, 900 x 2032mm high, including new lintol and preparing opening to receive door (elsewhere measured)	No	1
13	Form new opening in one brick wall size, 913 x 2032mm high, including new lintol and preparing opening to receive door (elsewhere measured)	No	2

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14	Form new opening in one brick wall size, 1500 x 1200mm high, including new lintol and preparing opening to receive viewing panel (elsewhere measured)	No	3	
15	Form new opening in one brick wall size, 1200 x 1335mm high, including new lintol and preparing opening to receive viewing panel (elsewhere measured)	No	1	
16	Form new opening in one brick wall size, 1800 x 1195mm high, including new lintol and preparing opening to receive viewing panel (elsewhere measured)	No	2	
17	Form new opening in one brick wall size, 1915 x 2094mm high, including new lintol and preparing opening to receive door (elsewhere measured)	No	1	
<u>Take out/up/off/down and remove existing doors, door frames/linings and windows including preparing opening to receive a new door/window (elsewhere measured)</u>				
18	Timber door size 813 x 2032mm high with steel lining and prepare for new lining (elsewhere measured)	No	1	
19	Timber door size 900 x 2032mm high with steel lining and prepare for new lining (elsewhere measured)	No	89	
20	Timber door size 900 x 2032mm high with steel lining and prepare for new aluminium door (elsewhere measured)	No	7	
21	Timber double door size 1613 x 2032mm high with steel lining and prepare for new lining and door (elsewhere measured)	No	1	
22	Timber double door size 1613 x 2032mm high with steel lining and prepare for new aluminium door (elsewhere measured)	No	6	
23	Timber double door size 1740 x 2032mm high with steel lining and prepare for new aluminium door (elsewhere measured)	No	1	
24	Steel window, including burglar proofing, size 700 x 1953mm high from one brick wall	No	12	
25	Steel window, including burglar proofing size 3050 x 600mm high from one brick wall	No	10	
26	Steel window, including burglar proofing size 3926 x 600mm high from one brick wall	No	1	
27	Trellidoor steel gate size 1500 x 2100mm high from 110mm brick wall and make good finishes disturbed	No	2	
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28	Steel gate size 1600 x 2400mm high from 110mm brick wall and make good finishes disturbed	No	1		
29	Steel gate size 2100 x 2400mm high from 110mm brick wall and make good finishes disturbed	No	2		
<u>Take up/down and remove existing roofs, floors, panelling, ceilings, partitions, etc.:</u>					
<u>All removal of structural roof members to be done strictly in accordance with the Engineers instructions. Temporary bracing and support requirements to be checked by the Engineer prior to commencing with the work</u>					
30	Acoustic sound panels complete with timber bracing, etc.	m2	24		
31	Suspended fibre cement ceilings complete with cornices, timber bandering, etc.	m2	1 660		
32	Steel roof covering fixed to structural timber roof trusses taking care not to damage roof timbers and preparing area to receive new roof sheeting (elsewhere measured)	m2	2 714		
33	Steel roof covering fixed to structural steel roof members to receive new roof sheeting (elsewhere measured)	m2	41		
34	Sheet iron ridge capping	m	62		
35	Insulation blanket approximately 100mm thick between roof members	m2	2 714		
36	Sheet iron sidewall or barge flashing	m	350		
<u>Take up and remove existing floor sheeting complete with adhesive from screed and prepare screed to receive new finish (elsewhere measured):</u>					
37	Vinyl floor sheeting	m2	583		
<u>Take up/hack up and remove existing floor tiles/sheeting complete with screed under and prepare concrete surface bed for new screed (elsewhere measured):</u>					
38	Vinyl tiles	m2	1 490		
<u>Hack up/off and remove existing external plaster and wall finishes including preparing wall surfaces for new plaster or tiles (elsewhere measured):</u>					
39	On walls generally	m2	61		
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	<u>Hack up/off and remove existing internal plaster and wall finishes including preparing wall surfaces for new plaster or tiles (elsewhere measured):</u>				
40	On walls generally	m2	222		
	<u>Hack up/off and remove existing wall tiles complete with mortar bed or backing, including preparing wall surfaces for new plaster/paint and/or tiles (elsewhere measured):</u>				
41	White glazed tiles to walls	m2	3		
	<u>Take out/off and remove existing sundry items, including making good to all screw/bolt holes, etc.:</u>				
42	Overhead privacy curtain track assembly three times fixed to fibre cement ceiling and twice plugged and screwed to brick wall	m	20		
43	X-ray viewing panel size 1500 x 600mm high	No	9		
44	Stainless steel table with sink unit 1800 x 1000 x 1000mm high	No	1		
45	Pinning board approximate size 1100 x 1100mm high	No	11		
46	Pinning board approximate size 1200 x 1000mm high	No	3		
47	Pinning board approximate size 1800 x 1200mm high	No	1		
48	Pinning board approximate size 2000 x 1500mm high	No	1		
49	Projection screen retractable 1900mm wide	No	1		
50	Curtain track assembly twice plugged and screwed to brick wall size 4400mm long	No	17		
51	Audiology listening chamber complete with acoustic dampening walls and roof size 2840 x 2860 x 2250mm high complete	No	1		
	<u>Take out and remove sundry joinery work, including making good to all screw/bolt holes to floors and walls, etc.:</u>				
52	Coat rack timber 2000mm long from brick wall	No	1		
53	Key box wall mounted steel, 400 X 540mm high	No	2		
54	TV bracket 1000 x 420 x 750mm high bolted to brickwork	No	2		
55	Floor and wall mounted steel shelve with splash back size 1150 x 530 x 980mm high	No	3		
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56	Wall mounted steel and glass cupboard size 1000 x 185 x 880mm high	No	4		
57	Wall mounted steel shelving unit size 1800 x 310mm deep	No	1		
58	Wall mounted timber shelving unit size 1390 x 360mm deep	No	2		
59	Floor and wall mounted steel three tier shelving unit size 1900 x 250 x 850mm high	No	2		
60	Floor and wall mounted steel three tier shelving unit size 2800 x 250 x 850mm high	No	1		
61	Floor mounted timber display unit with double glazed doors size 1700 x 130 x 850mm high	No	3		
62	Floor mounted timber display unit with double glazed doors size 1000 x 120 x 850mm high	No	3		
63	Floor mounted timber display unit with double glazed doors size 1630 x 450 x 1250mm high	No	1		
64	Floor mounted timber display unit with double glazed doors size 1140 x 640 x 710mm high	No	2		
65	Floor mounted timber cupboard size 850 x 520 x 530mm high	No	11		
66	Floor mounted timber cupboard size 1800 x 820 x 2590mm high	No	1		
67	Floor mounted timber cupboard size 3200 x 650 x 950mm high	No	1		
68	Floor mounted timber cupboard size 4340 x 600 x 900mm high	No	1		
69	Wall mounted timber observation panel with shutter and rail size 1200 x 1060mm high	No	1		
70	Wall mounted timber countertop 1060 x 500mm deep	No	1		
71	Wall mounted timber countertop 1500 x 500mm deep	No	1		
72	Wall mounted timber countertop 2460 x 550mm deep	No	1		
73	Triangular steel bracket assembly for countertops (elsewhere removed size 400 x 400mm twice bolted	No	4		
74	Wall mounted timber countertop 3800 x 550mm deep	No	1		
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75	Wall mounted timber countertop 2500 x 900 x 730mm high on and including one brick wall	No	2
76	Timber slated seating including steel framing bolted to brickwork at 1m centres four times bolted to floor including wall mounting timber backing bolted to brickwork	m	38
77	Floor and wall mounted L-shaped cupboard unit (3000mm total girth) size 320 x 2800mm high	No	1
78	Floor and wall mounted L-shaped cupboard unit (3200mm total girth) size 600 x 900mm high	No	1
79	Floor and wall mounted L-shaped cupboard unit (3200mm total girth) size 600 x 900mm high on steel support bolted to floor	No	15
80	Floor and wall mounted L-shaped cupboard unit (4000mm total girth) size 350 x 2100mm high	No	1
81	Floor mounted timber tender box 450 x 450 x 450mm high	No	1
82	Wall mounted timber pigeon type storage unit size 1200 x 200 x 300mm high	No	15
83	Steel cupboard size 7670 x 480 x 2100mm high	No	2
<u>Take/break out existing glazing from steel window pane, clean out opening of all loose rust, putty, etc. and prime opening to receive new glazing (approximate sizes indicated) (elsewhere measured):</u>			
84	Pane size 257 x 162mm high	No	16
85	Pane size 280 x 214mm high	No	16
86	Pane size 310 x 95mm high	No	16
87	Pane size 452 x 245mm high	No	119
88	Pane size 451 x 311mm high	No	16
89	Pane size 451 x 420mm high	No	16
90	Pane size 421 x 520mm high	No	119
91	Pane size 452 x 257mm high	No	135
92	Pane size 490 x 1130mm high	No	89

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93	Pane size 544 x 777mm high	No	16
94	Pane size 545 x 1121mm high	No	208
	<u>Take out and remove piping, sanitary fittings, etc. including disconnecting piping from fittings and making good floor and wall finishes (making good tiling and paintwork elsewhere measured):</u>		
95	Drying rack fitted with twelve bolts from brick wall	No	8
96	Paper towel dispenser from brick wall	No	21
97	Soap dispenser from brick wall	No	24
98	Towel rail complete with two end brackets	No	20
99	Wash hand basin size 560 x 410mm wide including taps, traps, etc.	No	46
100	Combination bedpan and washup sink unit size 1980 x 700 x 1000mm high including all fittings, brackets etc.	No	5
101	Floor mounted WC pan with wall hung cistern	No	10
	<u>SERVICING OF WINDOWS, ETC.</u>		
	<u>Sundry repairs to existing steel windows:</u>		
102	Allow for servicing catch mechanism and stay to opening sections of window	No	135
	<u>Sundry repairs to existing (tenderer to note high level windows approximately 4m above finished floor level) steel windows to the satisfaction of the Architect:</u>		
103	Cutting out rusted sections of steel window frame (RFX7) and preparing for replacement (elsewhere measured)	m	491
	<u>GENERAL WALL CRACK REPAIRS</u>		
	<u>Preparation</u>		
	Remove all deleterious (weak) plaster to expose brick surface.		
	Surfaces to be prepared by brushing to remove loose plaster.		
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Crack repairs

Thoroughly pre-wet the surface and apply SikaTop-Armatec - 110 EpeCem or other approved cementitious epoxy resin primer strictly in accordance with the manufacturer's specification and recommendations.

Restore original plaster using Sika Rep LW or other approved non-sag mortar repair strictly in accordance with the manufacturer's specification and recommendations.

104	Break out and remove 30mm wide x 15mm thick deleterious (weak) plaster, including preparing surfaces to receive concrete repair compounds	m	25
105	Plaster repair comprising 60mm wide Sika ArmaTec - 110 EcoCem or other approved primer and 30mm wide x 15mm thick Sika Rep LW or other approved repair mortar finished flush with the surface of the wall on previously prepared area (elsewhere measured)	m	25

OPENINGS THROUGH EXISTING PANEL WALLS, ETC.

Forming opening through 50mm GO-panel (50mm Polystyrene core walls with 0.5mm Chromodek finish to both sides) for pipes, vents etc. including silicone sealant to both sides (pipes, vents, etc. elsewhere measured)

106	Opening for 15mm diameter water supply pipe (pipe elsewhere measured)	No	64
107	Opening for 22mm diameter water supply pipe (pipe elsewhere measured)	No	4
108	Opening for 40/50mm diameter waste pipe (pipe elsewhere measured)	No	64
109	Opening for 110mm diameter waste pipe (pipe elsewhere measured)	No	9

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Dewatering of excavations

The Contractor shall allow for removing seepage and other water from subterranean sources from the excavations by pumping, bailing or otherwise.

Accurate records of all such dewatering shall be kept to determine the total volume of water so removed and a clear distinction shall be made between water from subterranean sources and other water.

Density testing on filling

Rates for filling, etc. shall include for all density and soil type testing to prove that the specified compaction is achieved.

When additional testing is done on instruction of the principal agent and these tests are successful, they will be paid for additionally.

Imported fill

"Filling and bedding to trenches etc. to be in compliance with SABS 1200 DB and LB respectively".

EXCAVATION, FILLING, ETC. OTHER THAN BULK

Excavation in earth not exceeding 2m deep:

1	Trenches	m3	60
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Extra over trench and hole excavations in earth for excavation in:

2	Soft rock	m3	3
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3	Hard rock	m3	1
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Extra over all excavations for carting off site to a location to be identified by the Contractor:

4	Surplus material from excavations	m3	88
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Risk of collapse of excavations:

5	Sides of trench and hole excavations not exceeding 1,5m deep	m2	114
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Keeping excavations free of water:

6	Keeping excavations free of all water other than subterranean water		Item
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Compaction of surfaces:

7 Compaction of ground surface under floors, etc. including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to a minimum of 90% Mod AASHTO dry density

m2 243

Earth filling supplied by the Contractor under surface beds or rafts:

8 G5 Material in accordance with SANS 1200DM in 150mm layers compacted to a minimum of 98% Mod AASHTO dry density

m3 156

Prescribed density tests on filling:

9 Modified AASHTO density test

No 10

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	<p><u>SECTION No. 2: BUILDING WORKS</u></p> <p><u>BILL No. 3: CONCRETE, FORMWORK & REINFORCEMENT</u></p> <p>The Tenderer is referred to the relevant Clauses in the separate Supplementary Preambles hereunder and Department of Public Works PW371 document and SANS 2001 Series documents</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary products in descriptions</u></p> <p>Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted</p> <p><u>Concrete</u></p> <p>All concrete work to be carried out in accordance with SABS 1200G</p> <p><u>Cost of tests</u></p> <p>The costs of making, storing and testing of concrete test cubes as required under clause 7 'Tests' of SABS 1200G shall include the cost of providing cube moulds necessary for the purpose, for testing costs and for submitting reports on the tests to the Principal Agent. The testing shall be undertaken by an independent firm or institution nominated by the Contractor to the approval of the Principal Agent (test cubes are measured separately)</p> <p><u>Formwork</u></p> <p>Description of formwork shall be deemed to include use and waste only (except where described as "left in" or "permanent"), for fitting together in the required forms, wedging, plumbing and fixing to true angles and surfaces as necessary to ensure easy release during stripping and for reconditioning as necessary before re-use</p> <p>The vertical strutting shall be carried down to such construction as is sufficiently strong to afford the required support without damage and shall remain in position until the newly constructed work is able to support itself</p>				
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Formwork to soffits of solid slabs, etc. shall be deemed to be slabs not exceeding 250mm thick unless otherwise described

Formwork to sides of bases, pile caps, ground beams, etc. will only be measured where it is prescribed by the Engineer for design reasons. Formwork necessitated by irregularity or collapse of excavated faces will not be measured and the cost thereof shall be deemed to be included in the allowance for taking the risk of collapse of the sides of the excavations, provision for which is made in "Earthworks"

Degree of accuracy: Accuracy II as SABS 1200G

Permissible deviations:

Flatness of plain surface - 5mm

Abrupt changes in a continuous surface - 5mm

Reinforcement

Reinforcement to include 30MPa concrete cover blocks to ensure correct cover to reinforcing

REINFORCED CONCRETE

25MPa/19mm Concrete:

1	Surface beds	m3	27
2	Surface beds including thickening inside existing buildings	m3	30

CONCRETE TESTS

Test blocks:

3	Making and testing 150 x 150 x 150mm concrete test cube (Provisional) (Only test cubes that have passed will be reimbursed)	No	9
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CONCRETE SUNDRIES

Smooth power floated finish to top surfaces of concrete:

4	Surface beds, slabs, etc.	m2	379
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STEEL REINFORCEMENT (PROVISIONAL)

Mild steel reinforcement to structural concrete work:

5	8mm Diameter bars	t	0.10
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High tensile steel reinforcement to structural concrete work:				
6	12mm Diameter bars	t	0.20	
Fabric reinforcement:				
7	Type 311 fabric reinforcement cut and bent to fit and lapped to existing reinforcement in concrete surface beds inside existing buildings, etc.	m2	379	
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	<u>BILL No. 4: WATERPROOFING</u>				
	The Tenderer is referred to the relevant Clauses in the separate Supplementary Preambles hereunder and Department of Public Works PW371 document and SANS 2001 Series documents				
	<u>SUPPLEMENTARY PREAMBLES</u>				
	<u>Proprietary products in descriptions</u>				
	Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted				
	<u>DAMPPROOFING OF WALLS AND FLOORS</u>				
	<u>One layer of 250 micron green polyethylene waterproof sheeting (SANS 952-1985 type C) sealed at laps with PVC self-adhesive tape:</u>				
1	Under surface beds	m2	92		
2	Under surface beds lapped to existing waterproofing inside existing buildings	m2	287		
	<u>One layer of 375 micron embossed polyethylene dampproof course (SANS 952-1985 type B):</u>				
3	In walls, under cills, etc.	m2	29		
	<u>JOINT SEALANTS, ETC.</u>				
	<u>Approved polysulphide sealing compound including backing cord, bond breaker, primer, etc.:</u>				
4	10 x 10mm In vertical expansion joint between brick surfaces including raking out joint filler as necessary	m	313		
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	<p><u>SECTION No. 2: BUILDING WORKS</u></p> <p><u>BILL No. 5: ROOF COVERINGS, ETC.</u></p> <p>The Tenderer is referred to the relevant Clauses in the separate Supplementary Preambles hereunder and Department of Public Works PW371 document and SANS 2001 Series documents</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary products in descriptions:</u></p> <p>Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted</p> <p><u>Fixing</u></p> <p>Fixing shall be done according to SABS 1200HB with minimum 225mm end laps</p> <p><u>Pricing</u></p> <p>Prices for roof covering and cladding are to include for all necessary drive screws, hook bolts, clips, sheet bolts, nuts, washers, etc., for drilling holes for screws and bolts including removing all swarf from the sheeting and all right angle cutting and waste</p> <p><u>PROFILED METAL SHEETING AND ACCESSORIES</u></p> <p>Safintra 410 concealed fix roofing sheeting must be installed by an approved Roofing Contractor in strict accordance with the manufacturer's instructions. A ten year guarantee on thickness, workmanship, material and water tightness is required by the Principal Agent (to be supplied by Safal Group/Safintra)</p> <p>The contractor shall include for all raking, cutting and waste when pricing this bill section</p> <p><u>0.55mm Thick Saflok 410 concealed fix profile roofing Colorplus AZ200 or other approved interlocking aluminium-zinc roof sheeting and all required concealed fixing accessories, fixed to timber purlins (elsewhere measured) at approximately 1200mm centres, in accordance with the manufacturer's instructions:</u></p>				
1	Roof covering with pitch not exceeding 25 degrees	m2	2 712		
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2	Extra over roof covering for cranking to 33 degree angle	m	49	
	<u>0.55mm Thick Saflok 410 concealed fix profile roofing Colorplus AZ200 or other approved interlocking aluminium-zinc roof sheeting and all required concealed fixing accessories, fixed to structural steel members at approximately 1200mm centres, in accordance with the manufacturer's instructions:</u>			
3	Side cladding	m2	41	
	<u>0.8mm Thick Concealed Fix flashings and closures, etc. finished to same finish as roof sheeting, including fixing to interlocking roofing on steel and/or timber roof trusses:</u>			
4	Ridge capping to suit roof profile	m	62	
5	Broad flute closers	m	150	
6	Barge flashing 660mm girth	m	350	
7	Head wall flashing 462mm girth	m	26	
8	Counter flashing 185mm girth	m	329	
9	Cover flashing 462mm girth	m	355	
10	Drip flashing 231mm girth	m	26	
	<u>RAINWATER DISPOSAL</u>			
	<u>0.6mm Thick seamless aluminium gutters and rainwater pipes prepainted with double coated polymer silicone baked enamel to Marble White colour, including fixing with heavy duty brackets in accordance with the manufacturer's instructions:</u>			
11	150 x 125mm Ogee eaves gutter	m	134	
12	Extra over gutter for stopped end	No	36	
13	Extra over gutter for outlet to suit 100 x 75mm rainwater pipe	No	18	
14	100 x 75mm Rainwater pipe	m	54	
15	Extra over rainwater pipe for bend or shoe	No	18	
16	Extra over rainwater pipe for eaves offset to 300mm projection	No	18	
	<u>ROOF INSULATION</u>			
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Lambdaboard or other approved laminated polyisocyanurate core board with a minimum core density of 34kg/m³, minimum thickness of 100mm; in widths of 1,220mm with a 4.17 (Km²/W) R-Value. Finish shall be White Mineral and Mineral Natural laminated on each side. Lambdaboard to be installed above roof timbers and in conjunction with Roof covering and in accordance with manufactures specification:

17 Insulation laid over roof timbers and fixed concurrent with roof covering

m2

2 712

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The connector plates shall be of such size as will ensure that the joints so made will adequately withstand the forces exerted on the joints

In coastal areas connector plates in buildings without ceilings shall be painted with two coats of epoxy tar complying with SABS Specification 801 Type 2, or rust neutralising paint

Timber members built into brickwork to be given two coats of carbolineum and wrapped in plastic

Approval of pre-fabricated roofing systems, whether measured as an alternative or not, shall be subject to the following requirements:

(a) The Manufacturer of the pre-fabricated trusses shall hold a certificate of competence issued by the Institute for Timber Construction

(b) A polyester print, size A1 having a minimum thickness of 0,5mm, shall be submitted by the Contractor to the Regional Representative at an early stage for approval by the Directorate: Structural Engineering Services

(c) The drawings shall be signed by a Registered Professional Engineer whose name appears on the Departmental panel for structural work

(d) In the case of systems buildings, approval shall be given with submission of the contract drawings on acceptance of the tender

The following minimum information shall be shown on the drawings:

- (a) Details of the roof system with the position of the rafters and purlins indicated thereon as well as typical elevations
- (b) Bracing as recommended by the Institute for Timber Construction
- (c) Sizes and grading of the timber components
- (d) Truss sizes, e.g. height of ridge or angle of pitch
- (e) Plate sizes for every construction point (Code numbers only are deemed insufficient)
- (f) Separate connection details for hip, valley and jack rafters
- (g) Maximum spacing for purlins and bracing to ceilings shall be according to specifications

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(h) The type of roof covering as well as the design load. Over and above the supervision undertaken by the Representative/Agent, the Truss Fabricator or his Design Engineer shall inspect the completed roof structure and issue a certificate of confirmation to the Department that:

"The roof structure(s) has (have) been erected in accordance with the Design Engineer's drawings, as accepted by the Department, and the relevant details given in the manual "THE ERECTION AND BRACING OF TIMBER ROOF TRUSSES" issued by the National Timber Research Institute and the Institute for Timber Construction"

The prefabricated timber roof trusses shall be designed by a Registered Professional Engineer and shall be in accordance with SABS 0160 and 0163, as well as the additional requirements of PW 371, clause 8.10. The wind loading shall be as determined in terms of Clause 5.5 of SABS 0160. The applicable terrain category shall be taken as Category 2.

All prices shall be deemed to include the cost of the Registered Professional Engineer and the issuing of a certificate on completion, certifying the workmanship, erection and materials meeting the stated requirements.

Fixing

All nailing of timber roof trusses, purlins, etc. shall be done with galvanised nails. In coastal areas, copper, aluminium or stainless steel nails shall be used

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

Where items are described as "bolted" the bolts have been measured elsewhere

STRUCTURAL ROOF TIMBERS

Replacement structural timbers to existing trusses bolted in position (bolts elsewhere measured)

Sawn softwood:

1	38 x 114mm Posts and webbing in single lengths not exceeding 2,4m	m	338
2	38 x 152mm Rafters in single lengths exceeding 6,6m (Provisional)	m	260

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3	38 x 228mm Rafters in single lengths exceeding 6,6m (Provisional)	m	260	
4	76 x 152mm Beams in single lengths exceeding 2,4 and not exceeding 3,9m	m	87	
5	76 x 152mm Beams in single lengths exceeding 6,6m	m	136	
	<u>Sundries</u>			
6	Double sided bulldog connector plate	No	416	
	<u>GENERAL ROOF TIMBERS</u>			
	<u>Sawn softwood:</u>			
7	38 x 50mm Sub-frame plugged and screwed to wall	m	239	
8	50 x 76mm Subframe components for fixing fascia (elsewhere measured)	m	79	
	<u>EAVES, VERGES, ETC.</u>			
	<u>Pressed fibre cement:</u>			
9	10 x 300mm Fascia fixed vertically to timber subframe (elsewhere measured) with brass screws, including H-profile PVC joint strips, caps, etc.	m	134	
	<u>SOLID FLUSH DOORS</u>			
	<u>Solid core laminated doors with 4mm composite board crossbanding for and including 0,8mm thick Linewood Formica or other approved high pressure laminated surface to both sides of door, including 18mm thick Beachwood edge strips all round with slightly round angles, hung to steel door linings:</u>			
10	40mm Thick door size 813 x 2032mm high, including 100mm undercut to door	No	4	
11	40mm Thick purpose made heavy duty sliding door, size 870 x 2040mm high (sliding gear elsewhere measured) as per DT16 in door schedule	No	3	
12	40mm Thick door size 913 x 2032mm high	No	61	
13	Extra over above for forming rectangular cut out size 450 x 250mm high, complete with framing around cut out and supply and securely fit Trox Type AGS-T anodised aluminium louvre	No	7	
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14	Extra over above for rectangular opening for glazing (elsewhere measured) size 450 x 350mm high, rebated all round for timber glazing beads (elsewhere measured)	No	2	
15	40mm Thick door size 1013 x 2032mm high	No	1	
16	Extra over above for forming rectangular cut out size 450 x 250mm high, complete with framing around cut out and supply and securely fit Trox Type AGS-T anodised aluminium louvre	No	1	
17	40mm Thick double door in two equal leaves with rounded stiles, overall size 1613 x 2032mm high	No	2	
18	40mm Thick double door in two equal leaves with rounded stiles, overall size 1720 x 2032mm high	No	4	
19	40mm Thick double door in two equal leaves with rounded stiles, overall size 1800 x 2032mm high	No	2	
20	40mm Thick bi-fold-a-side door in five equal leaves with and including all necessary lock and hinge blocks, rails, etc. as per manufacturer's specification, leaves with cut-out for glazing size 515 x 1068mm high (glazing elsewhere measured) and timber panel insert size 515 x 513mm high, overall size 3640 x 2035mm high as per DT15a in door schedule	No	1	
21	40mm Thick bi-fold-a-side door in six equal leaves with and including all necessary lock and hinge blocks, rails, etc. as per manufacturer's specification, leaves with cut-out for glazing size 469 x 1068mm high (glazing elsewhere measured) and timber panel insert size 469 x 513mm high, overall size 4085 x 2035mm high as per DT15 in door schedule	No	1	
22	40mm Thick bi-fold-a-side door with fanlight section comprising of seven equal fixed pane sections divided with six vertical mullions and separated from door with one horizontal transome, each pane size 1500 x 339mm high, door in fourteen equal leaves with and including all necessary lock and hinge blocks, rails, etc. as per manufacturer's specification, leaves with cut-out for glazing size 541 x 1068mm high (all glazing elsewhere measured) and timber panel insert size 541 x 513mm high, overall size 10635 x 2475mm high as per DT15b in door schedule	No	1	
<u>ACOUSTIC DOORS</u>				
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	<u>Varikust VK62G 43 dB or similar approved acoustic door:</u>				
23	Acoustic door and frame including 200 x 900mm high acoustic safety glass viewing panel, installed in accordance with the manufacturer's instructions as DT14 in the door schedule	No	1		
	<u>SEMI SOLID FLUSH DOORS</u>				
	<u>Semi solid doors with 4mm composite board crossbanding suitable for and including 0.8mm thick Linewood Formica or other approved high pressure laminated surface to both sides of door, including 18mm thick Beachwood edge strips all round with slightly round angles, hung to timber/steel door linings:</u>				
24	40mm Thick door size 913 x 2023mm high	No	5		
	<u>FRAMES, ETC.</u>				
	<u>Wrot Meranti:</u>				
25	69 x 107mm Rebated frame plugged to wall	m	42		
	<u>BEADS, ARCHITRAVES, ETC.</u>				
	<u>Wrot Meranti:</u>				
26	10 x 15mm Glazing bead planted on	m	108		
	<u>BUMP RAILS, ETC.</u>				
	<u>Max-on-top Avonite wrapped supawood bump rail:</u>				
27	16 x 250mm Twice angle rounded bumprail, covered with 10mm thick high pressure laminate fixed on natural anodized adjustable aluminium brackets, twice plugged to wall at 1000mm centres and intervals, 900mm high from floor	m	282		
	<u>JOINERY FITTINGS (PROVISIONAL)</u>				
	References in the descriptions refer to the respective joinery details on the Architect's Joinery Drawings (refer to attached drawings) appended to these Tender Documents				
	Additionally all prices for doors, drawers, etc. are deemed to include for all ironmongery, etc. as depicted on the Architect's Joinery Drawings indicated above				
	<u>Cupboard Connection or other approved joinery assemblies</u>				
	<u>Wet Areas</u>				
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1. Carcasses

- 1.1. 16mm Thick Bisonboard V313 with melamine on both faces in colour to match doors on exposed sides.
- 1.2. 16mm Thick Bisonboard V313 with white melamine finished on both faces to internal and concealed sides.
- 1.3. Carcasses are to be fitted with powder-coated adjusters so that the cabinets do not come into contact with the floor.
- 1.4. 3.2mm Masonite backs.
- 1.5. Shelves to be 16mm thick Bisonboard V313 with white melamine finished on both faces and all edges.
- 1.6. All exposed edges to be 2mm PVC impact edging.
- 1.7. Hinges: Brass piano hinges with chrome screws. Sides of carcass only to extend by 16mm to be flush with outer face of doors and drawers

2. Drawers

- 2.1. 16mm Thick fronts with Bisonboard V313 substrate with melamine on both faces. Edging will be 2mm thick PVC impact edging and must be applied by a continuous hot melt high pressure edging machine. Colour to schedule.
- 2.2. Carcasses same as 2.1. above.
- 2.3. Runners: Metal with nylon runner Hettich type with 30kg load capacity.

3. Wall Units

- 3.1. 16mm Thick Bisonboard V313 with melamine on both faces in colour to match doors on exposed sides.
- 3.2. 16mm Thick Bisonboard V313 with white melamine finished on both faces to internal and concealed sides.
- 3.3. 3.2mm Masonite back.
- 3.4. Shelves to be 16mm thick Bisonboard V313 with white melamine finished on both faces and edges.
- 3.6. All exposed edges to be 2mm PVC impact edging.
- 3.7. Hinges: Chrome plated piano hinges with chrome screws. Sides of carcass to extend by 16mm to be flush with outer face of doors and drawers

4. Doors

- 4.1. 16mm Thick with Bisonboard V313 core with melamine on both faces. Edging will be 2mm thick PVC and must be applied by a continuous hot melt high pressure edging machine

5. Counter Tops

- 5.1. Type A: Max-On-Top standard HPL on 32mm thick substrate boarding
- 5.2. Type B: Fenix NTM 1.2mm Matched colour single sided on 32mm thick substrate boarding

6. Kickplates:

- 6.1. Type A: Max-On-Top standard HPL on 32mm thick substrate boarding - colour tbc.
- 6.2. Type B: Fenix NTM 1.2mm Matched colour single sided

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on 32mm thick substrate boarding

7. Handles: 288mm Brushed mild steel bar handle. Handles to approved sample

Dry Areas

1. Carcasses

- 1.1. 16mm Thick Bisonboard (chipboard) with melamine on both faces in colour to match doors on exposed sides.
- 1.2. 16mm Thick Bisonboard (chipboard) with white melamine finished on both faces to internal and concealed sides.
- 1.3. Carcasses are to be fitted with powder-coated adjusters so that the cabinets do not come into contact with the floor.
- 1.4. 3.2mm Masonite backs.
- 1.5. Shelves to be 16mm thick Bisonboard (chipboard) with white melamine finished on both faces and all edges.
- 1.6. All exposed edges to be 2mm PVC impact edging.
- 1.7. Hinges: Steel chrome plated piano hinges with chrome screws. Sides of carcass only to extend by 16mm to be flush with outer face of doors and drawers. See detail

2. Drawers

- 2.1. 16mm Thick fronts with Bisonboard (chipboard) core with melamine on both faces. Edging will be 2mm thick PVC and must be applied by a continuous hot melt high pressure edging machine. Colour to schedule.
- 2.2. Carcasses same as 2.1. above.
- 2.3. Runners: Metal with nylon runner Hettich type with 30kg load capacity.

3. Wall Units

- 3.1. 16mm Thick Bisonboard (chipboard) with melamine on both faces in colour to match doors on exposed sides.
- 3.2. 16mm Thick Bisonboard (chipboard) with white melamine finished on both faces to internal and concealed sides.
- 3.3. 3.2mm Masonite back.
- 3.4. Shelves to be 16mm thick Bisonboard (chipboard) with white melamine finished on both faces and edges.
- 3.6. All exposed edges to be 2mm PVC impact edging.
- 3.7. Hinges: Brass piano hinges with chrome screws. Sides of carcass to extend by 16mm to be flush with outer face of doors and drawers.

4. Doors

- 4.1. 16mm Thick with Bisonboard (chipboard) core with melamine on both faces. Edging will be 2mm thick PVC and must be applied by a continuous hot melt high pressure edging machine. Colour to schedule.

5. Counter Tops

- 5.1. Type A: Max-On-Top standard HPL on 32mm thick substrate boarding - colour to be confirmed.

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5.2. Type B: Fenix NTM 1.2mm Matched colour single sided on 32mm thick substrate boarding - colour to be confirmed.

6. Kickplates:

6.1. Type A: Max-On-Top standard HPL on 32mm thick substrate boarding - colour to be confirmed.

6.2. Type B: Fenix NTM 1.2mm Matched colour single sided on 32mm thick substrate boarding - colour to be confirmed.

7. Handles: 288mm brushed mild steel bar handle. Handles to approved sample

The references in the descriptions below are to the respective joinery details on the Architect's drawing number 3235-JD

Boardroom (room 01):

28	32mm Thick x 450mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B7	m	4.87
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Staff Entrance Lobby (room 02):

29	32mm Thick x 600mm wide Max-on-top HPL worktop counter top supported on and including purpose made steel angle brackets fixed to wall and 870mm high x 80mm diameter steel leg as per detail JD A2	m	2.04
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30	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 800mm long as per detail JD A2	m	2.04
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Records room (room 4):

31	32mm Thick x 600mm wide Max-on-top HPL worktop counter top supported on and including purpose made steel angle brackets fixed to wall and 870mm high x 80mm diameter steel leg as per detail JD A2	m	1.80
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32	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 800mm long as per detail JD A2	m	1.80
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<u>Reception (room 5):</u>				
33	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 2190mm long, and including floor mounted bearer as per detail JD A1	m	3.23	
34	Provide the sum of R 50,000.00 (Fifty Thousand Rand) for specialised reception joinery installation complete		Item	
<u>Main Waiting Area (room 6):</u>				
35	Timber bench formed of 69 x 32mm hardwood slats with rounded ends and fixed with self tapping screws counter-sunk to and including 25 x 25 x 2mm thick galvanised mild steel frame including welding, mitring and all powder coated, at maximum 800mm centres, bench 585mm wide and 450mm high as per detail JD C10	m	6.78	
<u>Clerk (room 9):</u>				
36	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 2190mm long, and including floor mounted bearer as per detail JD A1	m	3.17	
37	32mm Thick x 600mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B1	m	2.41	
38	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 800mm long as per detail JD B1	m	2.41	
39	32mm Thick x 700mm wide Max-on-top HPL worktop counter top supported with wall bearer and 710mm high x 80mm diameter steel legs, overall size 1500 x 700 x 760mm high with and including 400 x 550 x 590mm four drawer mobile pedestal as per detail JD B6	No	1	
<u>Office (room 10):</u>				
40	32mm Thick x 600mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	3.16	
41	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	3.16	
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42	32mm Thick x 700mm wide Max-on-top HPL worktop counter top supported with wall bearer and 710mm high x 80mm diameter steel legs, overall size 1800 x 700 x 760mm high with and including 400 x 550 x 590mm four drawer mobile pedestal as per detail JD B6	No	1	
<u>Staff Toilets (room 11):</u>				
43	32mm Thick x 600mm wide Rustenburg granite worktop counter top, with and including cut-out for sink/basin (elsewhere measured), wall mounted with and including steel angle brackets and floor mounted with 870mm high x 80mm diameter steel legs, unit 900mm high as per detail JD C4 and JD C5	m	1.00	
<u>Unit Manager (room 12):</u>				
44	32mm Thick x 600mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	3.12	
45	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	3.12	
46	32mm Thick x 700mm wide Max-on-top HPL worktop counter top supported with wall bearer and 710mm high x 80mm diameter steel legs, overall size 1500 x 700 x 760mm high with and including 400 x 550 x 590mm four drawer mobile pedestal as per detail JD B6	No	1	
<u>Tea Lounge (room 13):</u>				
47	32mm Thick x 600mm wide Rustenburg granite worktop counter top, with and including cut-out for sink/basin (elsewhere measured), wall mounted with and including steel angle brackets and floor mounted with 870mm high x 80mm diameter steel legs, unit 900mm high as per detail JD C1 and JD C2	m	1.81	
48	Wall mounted open cupboard formed of 16mm Max-on-top faced boarding, overall 300mm wide x 648mm high, including all required bearers, etc. as per detail JD C2	m	1.81	
<u>Group Therapy 1 (room 17):</u>				
49	32mm Thick x 450mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B7	m	2.70	
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<u>Consulting 1 (room 18):</u>				
50	32mm Thick x 600mm wide Max-on-top HPL worktop counter top with and including cut-out for sink (elsewhere measured) over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	2.39	
51	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	2.39	
52	32mm Thick x 700mm wide Max-on-top HPL worktop counter top supported with wall bearer and 710mm high x 80mm diameter steel legs, overall size 1200 x 700 x 760mm high with and including 400 x 550 x 590mm four drawer mobile pedestal as per detail JD B6	No	1	
<u>Consulting 2 (room 19):</u>				
53	32mm Thick x 600mm wide Max-on-top HPL worktop counter top with and including cut-out for sink (elsewhere measured) over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	2.90	
54	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	2.90	
55	32mm Thick x 700mm wide Max-on-top HPL worktop counter top supported with wall bearer and 710mm high x 80mm diameter steel legs, overall size 1200 x 700 x 760mm high with and including 400 x 550 x 590mm four drawer mobile pedestal as per detail JD B6	No	1	
<u>Interview (room 20):</u>				
56	32mm Thick x 600mm wide Formica postform worktop colour as per Architect, supported on 32mm melamine faced boarding and with and including four 44 x 32mm hardwood bearers, as per detail JD B13	m	2.28	
<u>Consulting 3 (room 22):</u>				
57	32mm Thick x 600mm wide Max-on-top HPL worktop counter top with and including cut-out for sink (elsewhere measured) over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	2.90	
58	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	2.90	
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<u>Store (room 27):</u>					
59	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 2190mm long, and including floor mounted bearer as per detail JD A1	m	4.99		
<u>Office 1 (room 28):</u>					
60	32mm Thick x 600mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	2.78		
61	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	2.78		
62	32mm Thick x 700mm wide Max-on-top HPL worktop counter top supported with wall bearer and 710mm high x 80mm diameter steel legs, overall size 1600 x 700 x 760mm high with and including 400 x 550 x 590mm four drawer mobile pedestal as per detail JD B6	No	1		
<u>Office 2 (room 30):</u>					
63	32mm Thick x 600mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	2.78		
64	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	2.78		
<u>Consulting Room 1 (room 31):</u>					
65	32mm Thick x 600mm wide Max-on-top HPL worktop counter top with and including cut-out sink (elsewhere measured) over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	4.32		
66	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	4.32		
67	32mm Thick x 700mm wide Max-on-top HPL worktop counter top supported with wall bearer and 710mm high x 80mm diameter steel legs, overall size 1800 x 700 x 760mm high with and including 400 x 550 x 590mm four drawer mobile pedestal as per detail JD B6	No	1		
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<u>Consulting Room 2 (room 32):</u>				
68	32mm Thick x 600mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	2.78	
69	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	2.78	
<u>Office 1 (room 34):</u>				
70	32mm Thick x 600mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	1.00	
71	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	1.00	
<u>Office 2 (room 35):</u>				
72	32mm Thick x 600mm wide Max-on-top HPL worktop counter top with and including cut-out sink (elsewhere measured) over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	2.78	
73	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	2.78	
<u>Store (room 36):</u>				
74	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 2190mm long, and including floor mounted bearer as per detail JD A1	m	4.32	
<u>Kitchen (room 37):</u>				
75	32mm Thick x 600mm wide Rustenburg granite worktop counter top, with and including cut-out for sink/basin (elsewhere measured), wall mounted with and including steel angle brackets and floor mounted with 870mm high x 80mm diameter steel legs, unit 900mm high as per detail JD C1 and JD C2	m	3.52	
76	Wall mounted open cupboard formed of 16mm Max-on-top faced boarding, overall 300mm wide x 648mm high, including all required bearers, etc. as per detail JD C2	m	3.52	
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<u>Consulting Room 2 (room 39):</u>				
77	32mm Thick x 600mm wide Max-on-top HPL worktop counter top with and including cut-out sink (elsewhere measured) over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	2.78	
78	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	2.78	
79	Floor mounted cupboard formed of 16mm melamine faced boarding with 94 x 32mm hardwood floor bearers, unit 600mm wide and 2257mm high as per detail JD A5	m	1.67	
<u>Store (room 40):</u>				
80	Floor and wall mounted four tier shelving with 69 x 22mm hardwood support battens and consisting of 22mm thick laminated timber shelves all varnished, unit 450mm wide and 2102mm high as per detail JD A3	m	7.95	
<u>Consulting Room 1 (room 41):</u>				
81	32mm Thick x 600mm wide Max-on-top HPL worktop counter top with and including cut-out sink (elsewhere measured) over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	4.32	
82	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	4.32	
<u>Storage (room 42):</u>				
83	Floor and wall mounted four tier shelving with 69 x 22mm hardwood support battens and consisting of 22mm thick laminated timber shelves all varnished, unit 450mm wide and 2102mm high as per detail JD A3	m	17.56	
<u>Wheelchair Store room (room 43):</u>				
84	Ryco Racking or similar approved, 4 tier medium duty steel racking system with steel shelves unit 900mm wide x 2160mm high as per detail JD A4	m	14.90	
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<u>Communal Family Lounge (room 44):</u>				
85	32mm Thick x 600mm wide Rustenburg granite worktop counter top, with and including cut-out for sink/basin (elsewhere measured), wall mounted with and including steel angle brackets and floor mounted with 870mm high x 80mm diameter steel legs, unit 900mm high as per detail JD C1 and JD C2	m	2.83	
86	Wall mounted open cupboard formed of 16mm Max-on-top faced boarding, overall 300mm wide x 648mm high, including all required bearers, etc. as per detail JD C2	m	2.83	
87	32mm Thick x 600mm wide Rustenburg granite worktop counter top, with and including cut-out for sink/basin (elsewhere measured), wall mounted with and including steel angle brackets and floor mounted with 870mm high x 80mm diameter steel legs, unit 900mm high as per detail JD C4 and JD C5	m	1.61	
<u>Store (room 47):</u>				
88	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 2190mm long, and including floor mounted bearer as per detail JD A1	m	5.04	
<u>Office (room 48):</u>				
89	32mm Thick x 600mm wide Max-on-top HPL worktop, wall mounted with and including 44 x 44mm hardwood support rail and top mounted to front with and including 32 x 32mm hardwood rail, colour as per Architect, overall unit size 600mm wide x 760mm high as per detail JD B4	m	3.18	
90	32mm Thick x 600mm wide Max-on-top HPL worktop, with and including three drawer unit, including all bearers, etc. finished with Max-on-top HPL faced boarding, colour per Architect, assembly size overall 600 x 600 x 760mm high as per JD B3	No	3	
<u>Assisted Devices Receiving (room 49):</u>				
91	Ryco Racking or similar approved, 4 tier medium duty steel racking system with steel shelves unit 900mm wide x 2160mm high as per detail JD A4	m	7.60	
92	Floor mounted four tier shelving with 69 x 22mm hardwood support battens and consisting of 22mm thick laminated timber shelves all varnished, unit 900mm wide and 2102mm high as per detail JD A6	m	6.60	
Carried to Collection				
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93	Floor and wall mounted four tier shelving with 69 x 22mm hardwood support battens and consisting of 22mm thick laminated timber shelves all varnished, unit 900mm wide and 2102mm high as per detail JD A3	m	6.60	
94	Wall mounted white epoxy coated adjustable steel shelving brackets with slots cut in for hanging of aid devices with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 800mm long similar to detail JD C3	m	5.19	
<u>Sewing Room (room 50):</u>				
95	Floor mounted cupboard formed of 16mm melamine faced boarding with 94 x 32mm hardwood floor bearers, unit 600mm wide and 2257mm high as per detail JD A5	m	1.80	
96	32mm Thick x 600mm wide Max-on-top HPL worktop, wall mounted with and including 44 x 44mm hardwood support rail and top mounted to front with and including 32 x 32mm hardwood rail, colour as per Architect, overall unit size 600mm wide x 760mm high as per detail JD B4	m	2.40	
97	32mm Thick x 600mm wide Max-on-top HPL worktop counter top over floor mounted unit 760mm high including bearers, finished with 16mm Max-on-top HPL faced boarding, unit 600mm wide and 760mm high as per detail JD B5	m	1.61	
98	32mm Thick x 600mm wide Max-on-top HPL worktop, with and including three drawer unit, including all bearers, etc. finished with Max-on-top HPL faced boarding, colour per Architect, assembly size overall 600 x 600 x 760mm high as per JD B3	No	2	
<u>O & P Consulting Room (room 51):</u>				
99	32mm Thick x 600mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B1	m	5.88	
100	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 800mm long as per detail JD B1	m	5.88	
<u>Audiology Consultation Room (room 52):</u>				
101	32mm Thick x 450mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	3.79	
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102	32mm Thick x 600mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	5.88	
103	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	9.67	
104	32mm Thick x 900mm wide Max-on-top HPL worktop counter top supported with wall bearer and 710mm high x 80mm diameter steel legs, overall size 1800 x 700 x 760mm high with and including 400 x 550 x 590mm four drawer mobile pedestal as per detail JD B6	No	1	
<u>Booth (room 53):</u>				
105	Two 32mm thick x 350mm wide Formica postform worktops colour as per Architect, supported on hardwood brackets either side of brick wall (elsewhere measured) overall 760mm high, as per detail JD B14	m	1.76	
<u>Store (room 54):</u>				
106	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 2190mm long, and including floor mounted bearer as per detail JD A1	m	3.18	
<u>Passage (room 64):</u>				
107	Floor mounted cupboard formed of 16mm melamine faced boarding with 94 x 32mm hardwood floor bearers, unit 600mm wide and 2257mm high as per detail JD A5	m	5.29	
<u>Store (room 66):</u>				
108	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 2190mm long, and including floor mounted bearer as per detail JD A1	m	4.62	
<u>Office 1 (room 67):</u>				
109	32mm Thick x 600mm wide Max-on-top HPL worktop, wall mounted with and including 44 x 44mm hardwood support rail and top mounted to front with and including 32 x 32mm hardwood rail, colour as per Architect, overall unit size 600mm wide x 760mm high as per detail JD B4	m	5.14	
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110	32mm Thick x 600mm wide Max-on-top HPL worktop, with and including three drawer unit, including all bearers, etc. finished with Max-on-top HPL faced boarding, colour per Architect, assembly size overall 600 x 600 x 760mm high as per JD B3	No	2		
	<u>Consulting 1 (room 68):</u>				
111	Steel wall mounted rack fixed to wall with 50 x 30 x 3mm galvanised mild steel angle brackets, including welding, mitring and fixed to wall with and including 100 x 120 x 5mm thick base plate and 100 x 100 x 5mm thick base plate each with M10 diameter masonry bolts, rack filled with and including 50 x 50mm aperture welded wire mesh, welded to frame along perimeter, all steel powder coated, assembly 900mm wide and 900mm high as per detail JD D1	m	3.88		
112	32mm Thick x 600mm wide Max-on-top HPL worktop counter top supported with wall bearer and 710mm high x 80mm diameter steel legs, overall size 1500 x 700 x 760mm high with and including 400 x 550 x 590mm four drawer mobile pedestal as per detail JD B6	No	1		
	<u>Consulting 2 (room 69):</u>				
113	Steel wall mounted rack fixed to wall with 50 x 30 x 3mm galvanised mild steel angle brackets, including welding, mitring and fixed to wall with and including 100 x 120 x 5mm thick base plate and 100 x 100 x 5mm thick base plate each with M10 diameter masonry bolts, rack filled with and including 50 x 50mm aperture welded wire mesh, welded to frame along perimeter, all steel powder coated, assembly 900mm wide and 900mm high as per detail JD D1	m	3.82		
114	32mm Thick x 600mm wide Max-on-top HPL worktop counter top supported with wall bearer and 710mm high x 80mm diameter steel legs, overall size 1500 x 700 x 760mm high with and including 400 x 550 x 590mm four drawer mobile pedestal as per detail JD B6	No	1		
	<u>Office 2 (room 70):</u>				
115	32mm Thick x 600mm wide Max-on-top HPL worktop, wall mounted with and including 44 x 44mm hardwood support rail and top mounted to front with and including 32 x 32mm hardwood rail, colour as per Architect, overall unit size 600mm wide x 760mm high as per detail JD B4	m	5.14		
116	32mm Thick x 600mm wide Max-on-top HPL worktop, with and including three drawer unit, including all bearers, etc. finished with Max-on-top HPL faced boarding, colour per Architect, assembly size overall 600 x 600 x 760mm high as per JD B3	No	2		
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	<u>Store (room 71):</u>				
117	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 2190mm long, and including floor mounted bearer as per detail JD A1	m	3.62		
	<u>Wheelchair Repair (room 72):</u>				
118	Floor and wall mounted four tier shelving with 69 x 22mm hardwood support battens and consisting of 22mm thick laminated timber shelves all varnished, unit 450mm wide and 2102mm high as per detail JD A3	m	7.79		
	<u>Consulting 3 (room 73):</u>				
119	Steel wall mounted rack fixed to wall with 50 x 30 x 3mm galvanised mild steel angle brackets, including welding, mitring and fixed to wall with and including 100 x 120 x 5mm thick base plate and 100 x 100 x 5mm thick base plate each with M10 diameter masonry bolts, rack filled with and including 50 x 50mm aperture welded wire mesh, welded to frame along perimeter, all steel powder coated, assembly 900mm wide and 900mm high as per detail JD D1	m	3.77		
120	32mm Thick x 600mm wide Max-on-top HPL worktop counter top supported with wall bearer and 710mm high x 80mm diameter steel legs, overall size 1500 x 700 x 760mm high with and including 400 x 550 x 590mm four drawer mobile pedestal as per detail JD B6	No	1		
	<u>A.D.L. Kitchen (room 74):</u>				
121	Floor mounted cupboard formed of 16mm melamine faced boarding with 94 x 32mm hardwood floor bearers, unit 600mm wide and 2257mm high as per detail JD A5	m	2.00		
122	Floor mounted cupboard formed of 16mm melamine faced boarding with 94 x 32mm hardwood floor bearers, with and including cut-out for oven (elsewhere measured) unit 600mm wide and 2257mm high as per detail JD A8	m	1.50		
123	32mm Thick x 600mm wide Rustenburg granite worktop counter top, with and including cut-out for sink/basin (elsewhere measured), wall mounted with and including steel angle brackets and floor mounted with 728mm high x 80mm diameter steel legs, unit 760mm high as per detail JD C2	m	3.13		
124	Wall mounted open cupboard formed of 16mm Max-on-top faced boarding, overall 300mm wide x 648mm high, including all required bearers, etc. as per detail JD C7	m	3.13		
	Carried to Collection				
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125	32mm Thick x 600mm wide Rustenburg granite worktop counter top supported with wall bearer and 728mm high x 80mm diameter steel legs, overall size 1500 x 600 x 760mm high with and including cut-out for stove hob (elsewhere measured) as per detail JD C11	No	1		
<u>Wheelchair Seating (room 75):</u>					
126	32mm Thick x 600mm wide Max-on-top HPL worktop counter top supported on and including purpose made steel angle brackets fixed to wall and 728mm high x 80mm diameter steel leg, unit 760mm high, as per detail JD B9	m	7.96		
127	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 800mm long as per detail JD B10	m	4.63		
<u>O.T. Gym 2 (room 78):</u>					
128	32mm Thick x 600mm wide Max-on-top HPL worktop counter top over floor mounted unit 900mm high including bearers, finished with 16mm Max-on-top HPL faced boarding as per detail JD B2	m	9.42		
129	Wall mounted cupboard formed of 16mm Max-on-top faced boarding with 4mm glass panel to front, overall 292mm wide x 849mm high, including all required bearers, etc. as per detail JD B2	m	4.73		
<u>Reception/Security (room 80):</u>					
130	32mm Thick x 600mm wide Max-on-top HPL worktop, wall mounted with and including 44 x 44mm hardwood support rail and top mounted to front with and including 32 x 32mm hardwood rail, colour as per Architect, overall unit size 600mm wide x 760mm high as per detail JD B4	m	1.80		
131	32mm Thick x 600mm wide Max-on-top HPL worktop counter top over floor mounted unit 760mm high including bearers, finished with 16mm Max-on-top HPL faced boarding, unit 600mm wide and 760mm high as per detail JD B5	m	1.06		
132	32mm Thick x 600mm wide Rustenburg granite worktop counter top, with and including cut-out for sink/basin (elsewhere measured), wall mounted with and including steel angle brackets and floor mounted with 870mm high x 80mm diameter steel legs, unit 900mm high as per detail JD C1 and JD C2	m	1.20		
133	Wall mounted open cupboard formed of 16mm Max-on-top faced boarding, overall 300mm wide x 648mm high, including all required bearers, etc. as per detail JD C2	m	1.20		
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134	32mm Thick x 600mm wide Max-on-top HPL worktop, with and including three drawer unit, including all bearers, etc. finished with Max-on-top HPL faced boarding, colour per Architect, assembly size overall 600 x 600 x 760mm high as per JD B3	No	1	
	<u>Walking Aid Store (room 82):</u>			
135	Floor and wall mounted four tier shelving with 69 x 22mm hardwood support battens and consisting of 22mm thick laminated timber shelves all varnished, unit 450mm wide and 2102mm high as per detail JD A3	m	5.89	
136	Wall mounted white epoxy coated adjustable steel shelving brackets with slots cut in for hanging of aid devices with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 800mm long similar to detail JD C3	m	3.86	
	<u>Office (room 87):</u>			
137	32mm Thick x 600mm wide Max-on-top HPL worktop, wall mounted with and including 44 x 44mm hardwood support rail and top mounted to front with and including 32 x 32mm hardwood rail, colour as per Architect, overall unit 760mm high as per detail JD B4	m	5.77	
138	32mm Thick x 600mm wide Max-on-top HPL worktop, with and including three drawer unit, including all bearers, etc. finished with Max-on-top HPL faced boarding, colour per Architect, assembly size overall 600 x 600 x 760mm high as per JD B3	No	3	
	<u>Store (room 88):</u>			
139	Wall mounted white epoxy coated adjustable steel shelving brackets for timber shelves faced with Max-on-top HPL with and including 30 x 15mm epoxy coated steel wall bands at 500mm centres, 2190mm long, and including floor mounted bearer as per detail JD A1	m	5.44	
	<u>Consulting 4 (room 89):</u>			
140	Floor mounted cupboard formed of 16mm melamine faced boarding with 94 x 32mm hardwood floor bearers, unit 600mm wide and 2257mm high as per detail JD A5	m	1.09	
	<u>Consulting 3 (room 90):</u>			
141	Floor mounted cupboard formed of 16mm melamine faced boarding with 94 x 32mm hardwood floor bearers, unit 600mm wide and 2257mm high as per detail JD A5	m	1.09	
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<u>Consulting 2 (room 91):</u>				
142	Floor mounted cupboard formed of 16mm melamine faced boarding with 94 x 32mm hardwood floor bearers, unit 600mm wide and 2257mm high as per detail JD A5	m	1.09	
<u>Consulting 1 (room 92):</u>				
143	Floor mounted cupboard formed of 16mm melamine faced boarding with 94 x 32mm hardwood floor bearers, unit 600mm wide and 2257mm high as per detail JD A5	m	1.09	
<u>Physiotherapy Gym (room 94):</u>				
144	32mm Thick x 450mm wide Max-on-top HPL worktop counter top over floor mounted unit 760mm high including bearers, finished with 16mm Max-on-top HPL faced boarding, unit 600mm wide and 760mm high as per detail JD B7	m	5.40	
<u>Unisex WC (room 97):</u>				
145	32mm Thick x 385mm wide Rustenburg granite worktop counter top, with and including cut-out for sink/basin (elsewhere measured), wall mounted with and including steel angle brackets and floor mounted with 870mm high x 80mm diameter steel legs, unit 900mm high as per detail JD C4	m	1.10	
<u>Change Room (room 98):</u>				
146	32mm Thick x 600mm wide Rustenburg granite worktop counter top, with and including cut-out for sink/basin (elsewhere measured), wall mounted with and including steel angle brackets and floor mounted with 870mm high x 80mm diameter steel legs, unit 900mm high as per detail JD C4 and JD C5	m	1.80	
147	Extra over above for rounding corner of granite top approximately 300mm radius	No	1	
<u>Covered Entrance (room 100):</u>				
148	Timber bench formed of 69 x 32mm hardwood slats with rounded ends and fixed with self tapping screws counter-sunk to and including 25 x 25 x 2mm thick galvanised mild steel frame including welding, mitring and all powder coated, at maximum 800mm centres, bench 585mm wide and 450mm high as per detail JD C10	m	5.18	
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Item No		Unit	Quantity	Rate	Amount
	<u>SECTION No. 2: BUILDING WORKS</u>				
	<u>BILL No. 7: CEILINGS, PARTITIONS & ACCESS FLOORING</u>				
	The Tenderer is referred to the relevant Clauses in the separate Supplementary Preambles hereunder and Department of Public Works PW371 document and SANS 2001 Series documents				
	<u>SUPPLEMENTARY PREAMBLES</u>				
	<u>Proprietary products in descriptions</u>				
	Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted				
	<u>Descriptions</u>				
	Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins or shot pinned to brickwork or concrete				
	Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 600mm centres, and where described as "bolted" the bolts have been given elsewhere				
	<u>NAILED UP CEILINGS</u>				
	<u>9.5mm Thick Gyproc RhinoBoard or other approved taper edged gypsum ceiling boarding, secured to and including 38 x 50mm sawn softwood brandering at 400mm centres at joints, against walls, etc. including skimming boarding with and including RhinoLite skimming plaster:</u>				
1	Ceiling fixed horizontally	m2	1 656		
	<u>Gypsum cornices plugged to walls:</u>				
2	100mm Coved cornice secured to walls	m	1 533		
	<u>SUSPENDED CEILINGS</u>				
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	<u>9.5mm Thick Gyproc Gyprex or other approved vinyl faced gypsum ceiling boarding, secured to and including Donnceil T37K grid, with screws to main tees at 1200mm centres and 35 x 32mm high cross tees at 600mm centres, with and including all necessary angles, cleats, hangers, grids, locking type end clips, etc.:</u>			
3	Suspended ceiling system fixed not exceeding 1m below steel roof structure, spaced at approximately 1200mm centres	m2	43	
4	Ditto, but exceeding 1m and not exceeding 2m	m2	44	
5	Ditto, but exceeding 2m and not exceeding 3m	m2	30	
	<u>12,5mm Thick Gyproc Soundbloc or other approved acoustic ceiling tiles size 600 x 1200mm, laid on and including Donnceil T37 grid, 35 x 37mm high slotted main tees at 1200mm centres and 35 x 32mm high cross tees at 600mm centres, with exposed face of tee white powder coated, including all necessary angles, cleats, hangers, grids, locking type end clips, etc.:</u>			
6	Suspended ceiling system fixed not exceeding 1m below timber trusses at approximately 1200mm centres	m2	4	
	<u>Shadowline SM25 or other approved powder coated cornices fixed in accordance with the manufacturer's instructions:</u>			
7	Cornice fixed securely along perimeter of suspended ceiling to wall	m	145	
	<u>PARTITIONS, ETC. (PROVISIONAL)</u>			
	<u>Gypwall Classic 63/F60S46 or similar approved RhinoWall Standard Ultrasteel Stud Drywall:</u>			
	Drywall partitioning system with overall thickness of 114mm, shall comprise steel stud and track system, stud size 63,5mm with vertical Drywall Ultrasteel studs at maximum 600mm centres friction fitted to the head and floor tracks with similar additional vertical studs as necessary at abutments, ends, etc. and covered on both sides with two layers of 12,5mm taper-edged Rhinoboard screwed to studding with drywall screws at maximum 220mm centres and natural anodised aluminium capping piece on top. Boards are to be butt jointed and finished with tape and Rhinolite plaster all in accordance with the manufacturer's instructions. Intersections and abutments are measured separately and descriptions shall be deemed to include any additional studs, corner beads, jointing compound, tape, etc.			
8	Partitioning 3135mm high with head and floor track plugged	m	31	
9	Extra over for ends	No	18	
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10	Extra over for intersections	No	2	
11	Extra over for shopfront door assembly opening, size 1200 x 2125mm high (door elsewhere measured)	No	1	
12	Extra over for shopfront door assembly opening, size 2390 x 2094mm high (door elsewhere measured)	No	1	
13	Extra over for shopfront door assembly opening, size 2900 x 2094mm high (door elsewhere measured)	No	1	
	<u>Insulation</u>			
14	51mm Thick glass tissue faced on one side Glasswool Cavitybatt or equal and approved insulation in cavity of partitioning, installed all in accordance with the manufacturer's instructions	m2	89	
	<u>TOILET PARTITIONS, ETC.</u>			
	<u>Vitrex Vitraflex or other approved toilet cubicle assembly, complete overhead braces and hanging clamps, supporting feet, with colour to be confirmed by the Architects, including setting up complete in strict accordance with the manufacturer's instructions:</u>			
15	Overhead brace securely fixed	m	4	
16	Hanging clamp	No	4	
17	Supporting foot	No	4	
18	Wall stile size 100 x 1830mm high secured to wall, supporting foot and one hanging clamp (supporting foot and hanging clamp elsewhere measured)	No	2	
19	Wall stile size 120 x 1830mm high secured to wall, supporting foot and one hanging clamp (supporting foot and hanging clamp elsewhere measured)	No	2	
20	Middle stile size 300 x 1830mm high secured to two supporting feet, partition and two hanging clamps (supporting feet and hanging clamps elsewhere measured)	No	2	
21	Partition door size 760 x 1780mm high, fixed as required complete with all ironmongery	No	4	
22	Toilet partition size 1900 x 1830mm high secured to wall and end stile (end stile elsewhere measured)	No	2	
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BUILDING WORKS
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CEILINGS, PARTITIONS & ACCESS FLOORING

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	<u>SECTION No. 2: BUILDING WORKS</u>				
	<u>BILL No. 8: FLOOR COVERINGS, PLASTIC LININGS, ETC.</u>				
	The Tenderer is referred to the relevant Clauses in the separate Supplementary Preambles hereunder and Department of Public Works PW371 document and SANS 2001 Series documents				
	<u>SUPPLEMENTARY PREAMBLES</u>				
	<u>Proprietary products in descriptions</u>				
	Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted				
	<u>FLOOR COVERINGS, CARPETS, ETC.</u>				
	<u>2,5mm Thick Floorworx Surestep Safety or other approved fully flexible vinyl sheeting, including fixing with welded joints on self-levelling screed (elsewhere measured) with adhesive and installed in accordance with the manufacturer's instructions:</u>				
1	On self-levelling screed (elsewhere measured)	m2	312		
2	Turn-up over cove former (elsewhere measured) and up against plastered wall not exceeding 300mm girth	m	142		
	<u>3,2mm Thick ECOsurface rubber flooring made from recycled tires with EPDM multi-coloured flecks in colour (Asphalt Jungle 2513) or other approved fully flexible rubber sheeting, including fixing with welded joints on self-levelling screed (elsewhere measured) with adhesive and installed in accordance with the manufacturer's instructions:</u>				
3	On self-levelling screed (elsewhere measured)	m2	180		
4	Turn-up over cove former (elsewhere measured) and up against plastered wall not exceeding 300mm girth	m	87		
	<u>3,4mm Thick Forbo 19dB modulup in colour (Rustik Oak) or other approved fully loose lay acoustic vinyl sheeting.</u>				
5	On self-levelling screed (elsewhere measured)	m2	37		
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6	Turn-up over cove former (elsewhere measured) and up against plastered wall not exceeding 300mm girth	m	35	
	<u>3,4mm Thick Forbo 19dB modulup in colour (Lime) or other approved fully loose lay acoustic vinyl sheeting.</u>			
7	On self-levelling screed (elsewhere measured)	m2	4	
8	Turn-up over cove former (elsewhere measured) and up against plastered wall not exceeding 300mm girth	m	9	
	<u>2,5mm Thick Floorworx Surestep Safety in colour (Dark Wenge) or other approved fully flexible vinyl sheeting, including fixing with welded joints on self-levelling screed (elsewhere measured) with adhesive and installed in accordance with the manufacturer's instructions:</u>			
9	On self-levelling screed (elsewhere measured)	m2	277	
10	Turn-up over cove former (elsewhere measured) and up against plastered wall not exceeding 300mm girth	m	108	
	<u>2,5mm Thick Floorworx Sphera Element in colour (Mist) or other approved fully flexible vinyl sheeting, including fixing with welded joints on self-levelling screed (elsewhere measured) with adhesive and installed in accordance with the manufacturer's instructions:</u>			
11	On self-levelling screed (elsewhere measured)	m2	1 470	
12	Turn-up over cove former (elsewhere measured) and up against plastered wall not exceeding 300mm girth	m	522	
	<u>2,5mm Thick Floorworx Sphera Element in colour (Ash Grey) or other approved fully flexible vinyl sheeting, including fixing with welded joints on self-levelling screed (elsewhere measured) with adhesive and installed in accordance with the manufacturer's instructions:</u>			
13	On self-levelling screed (elsewhere measured)	m2	391	
14	Turn-up over cove former (elsewhere measured) and up against plastered wall not exceeding 300mm girth	m	175	
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	<u>2.5mm Thick Floorworx Sphera Element in colour (Whisper Grey) or other approved fully flexible vinyl sheeting, including fixing with welded joints on self-levelling screed (elsewhere measured) with adhesive and installed in accordance with the manufacturer's instructions:</u>			
15	On self-levelling screed (elsewhere measured)	m2	933	
16	Turn-up over cove former (elsewhere measured) and up against plastered wall not exceeding 300mm girth	m	559	
	<u>2.5mm Thick Floorworx Sphera Element in colour as per Architect or other approved fully flexible vinyl sheeting, including fixing with welded joints on self-levelling screed (elsewhere measured) with adhesive and installed in accordance with the manufacturer's instructions:</u>			
17	On self-levelling screed (elsewhere measured)	m2	569	
	<u>2.5mm Thick Marmoleum Modular in colour as per Architect or other approved vinyl tiles, (extra over for cut-outs in vinyl sheeting elsewhere measured) including fixing with welded joints (where required) on self-levelling screed (elsewhere measured) with adhesive and installed in accordance with the manufacturer's instructions:</u>			
18	On self-levelling screed (elsewhere measured)	m2	148	
	<u>Belgotex or other approved 7mm thick Metro carpet tile, heavy commercial with structured needlepunch construction of miracle fibre fitted to walls with approved adhesive in colour sky grey in accordance with the manufacturer's instructions:</u>			
19	500 x 500mm Tile on plastered walls (elsewhere measured)	m2	24	
	<u>ACCESSORIES TO COVERED SKIRTINGS, ETC.</u>			
	<u>Polyflor or other approved accessories including securing in accordance with the manufacturer's instructions:</u>			
20	CF20 Polycove cove former fixed horizontally at junction of floor and wall	m	1 645	
21	CS20 Polycap capping strip fixed horizontally at top of sheeting (elsewhere measured)	m	1 645	
22	CF20 Polycove cove former 150mm high fixed vertically to internal corner of wall	No	400	
	<u>POLISH, SEALERS, ETC.</u>			
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	<p><u>Dust mop or vacuum the floor to remove loose soil and dust, scrub the floor using a solution of FloorworX Maintain diluted 1:10 with clean water with a rotary machine fitted with a blue pad, remove the residue immediately after scrubbing using a wet/dry vacuum, rinse with clean water using a mop and allow the floor to dry. Dry buff the floor using a rotary or high speed machine fitted with a white pad, apply FloorworX Spray Buff in a fine stream or mist onto the floor in front of a rotary machine fitted with a red pad and work in until dry and achieving a smooth surface and constant level of gloss:</u></p>				
23	On vinyl sheeting to floors	m2	4 338		
	<p><u>Dust mop and clean to remove all dust, scrub the sheeting using a solution of FloorworX Maintain diluted 1:10 with clean water with a soft hand brush, remove the residue immediately after scrubbing using a wet/dry procedure, rinse with clean water using a soft cloth and allow the sheeting to dry. Spray with FloorworX Spray Buff in a fine stream or mist onto the sheeting and work in until dry to achieve a smooth surface and constant level of gloss:</u></p>				
24	On vinyl sheeting to walls	m2	247		
	<p><u>ARTIFICIAL GRASSING</u></p> <p>Artificial grass is to be laid on and include suitable weedkiller, geotech fabric and a 50mm layer of 7mm diameter crusher dust to be included in the cost of installation.</p> <p>A eight year guarantee on workmanship and material is required by the Principal Agent</p> <p><u>Easygrass Type Play Elite or other approved artificial grass complete with silica sand treatment installed as per manufacturer's instructions:</u></p>				
25	25mm Thick pile height artificial grass glued to concrete edging (elsewhere measured)	m2	271		
26	Extra over for 100 x 100mm Concrete edge to perimeter of grassing area for securing grassing edge including all necessary excavations, formwork, compaction, grading, carting away, etc.	m	120		
	<p style="text-align: right;">Carried to Collection</p> <p>Section No. 2 BUILDING WORKS Bill No. 8 FLOOR COVERINGS, PLASTIC LININGS, ETC.</p>			R	

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Bill No. 8

FLOOR COVERINGS, PLASTIC LININGS, ETC.

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BUILDING WORKS
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FLOOR COVERINGS, PLASTIC LININGS, ETC.

Item No		Unit	Quantity	Rate	Amount
	<p><u>SECTION No. 2: BUILDING WORKS</u></p> <p><u>BILL No. 9: IRONMONGERY (PROVISIONAL)</u></p> <p>The Tenderer is referred to the relevant Clauses in the separate Supplementary Preambles hereunder and Department of Public Works PW371 document and SANS 2001 Series documents</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary products in descriptions</u></p> <p>Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted</p> <p><u>Fixing of ironmongery</u></p> <p>Descriptions of wall mounted and floor standing ironmongery items shall be deemed to include for fixing in position and all fixing accessories.</p> <p>Descriptions of proprietary items shall be deemed to include fixing in position and all fixing accessories as specified by the manufacturer.</p> <p><u>Finishes to ironmongery</u></p> <p>Where applicable finishes to ironmongery are indicated by suffixes in accordance with the following list:</p> <p>BS Satin bronze lacquered CP Chromium plated SC Satin chromium plated SE Silver enamelled GE Grey enamelled</p> <p>AS Anodised silver AB Anodised bronze AG Anodised gold ABL Anodised black PB Polished brass PL Polished and lacquered PT Epoxy coated SD Sanded Fixing</p>				
	Carried to Collection				R
	<p>Section No. 2 BUILDING WORKS Bill No. 9 IRONMONGERY (PROVISIONAL)</p>				

Descriptions of wall mounted and floor standing ironmongery items shall be deemed to include for fixing in position and all fixing accessories

Descriptions of proprietary items shall be deemed to include fixing in position and all fixing accessories

Unless otherwise described locks shall have two keys each

HINGES, BOLTS, ETC.

Dormakaba or other approved:

1	DBB-SS-009 102 x 75 x 3mm two ball bearing butt hinge	No	250
2	DBC-SS-022 Adjustable roller bolt	No	4
3	150mm Galvanised barrel bolt fitted to top and bottom of door leaf	No	12
4	PHA2-S-DD Two point locking panic bar for single door including PHA micro switch, leaf 1000mm wide x 2270mm high	Sets	1
5	PHA3-S-DD Three point locking panic bar for double door including PHA micro switch, leaf 1000mm wide x 2270mm high	Sets	6

Alufab or other approved:

6	1040 100mm Aluminium sinkless hinge fixed to aluminium door	Pairs	71
7	2040 200mm Aluminium sinkless hinge fixed to aluminium door	Pairs	19
8	M1519AS 150mm Anodised aluminium flush bolt	No	32

LOCKS

Dormakaba or other approved:

9	DO36S SS cylinder sashlock	No	91
10	DO37D SS cylinder deadlock	No	24
11	DCE-002 SS Round cylinder escutcheon	No	12
12	DWC-005 bathroom WC indicator and turnknob	No	4
13	DWC-006 Bathroom WC indicator and turnknob for physically impaired	No	6

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Bill No. 9
IRONMONGERY (PROVISIONAL)

14	DMWC-SS-008 Bathroom deadlock	No	10	
15	DSC204101 MK 40,5mm five pin euro-profile single cylinder master keyed	No	5	
16	DDC206301 MK 63mm five pin euro-profile double cylinder master keyed	No	110	
17	DKC206301 MK 63mm five pin euro-profile double cylinder grand master keyed	No	1	
18	DO38R NP rebate conversion kit	No	9	
19	PHT3901 Exterior access lock with lever handle	Sets	1	
<u>HANDLES</u>				
<u>Dormakaba or other approved:</u>				
20	DFP-SS-025 120 x 40mm Rectangular flush pull handle	No	6	
21	DPH-215-BTB 382 x 32mm D-Shaped offset tubular pull handle	No	34	
22	DPH-301-C 149 x 19mm Straight tubular pull handle	No	4	
23	DHP-430-CR-SF 170 x 170mm plate including pull handle, complete with cut out and screws	No	3	
24	DHPL-430-BL-SF 170 x 170mm plate including pull handle, complete with cut out and screws	No	6	
25	DHPL-430-CL-SF 170 x 170mm plate including pull handle, complete with cut out and screws	No	3	
26	PHT3901 exterior access lock with lever handle (cylinder not included)	Pairs	12	
27	TH120 BP lever handle on 170 x 170mm stainless steel back plate with cylinder cut out	Pairs	55	
28	TH120 SS Lever handle on rose with cylinder escutcheon	Pairs	36	
<u>POLISHED STAINLESS STEEL PUSH AND KICK PLATES</u>				
<u>Dormakaba or other approved:</u>				
29	DKP-430-GF 900 x 870mm kick plate with and including countersunk holes for screws (screws included)	No	2	
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30	DKP-430-GF 900 x 913mm kick plate with and including countersunk holes for screws (screws included)	No	12
31	DKP-430-GF 900 x 950mm kick plate with and including countersunk holes for screws (screws included)	No	2
32	DKP-430-SF 900 x 805mm kick plate with and including countersunk holes for screws (screws included)	No	12
33	DKP-430-SF 900 x 900mm kick plate with and including countersunk holes for screws (screws included)	No	12
34	DKP-430-SF 900 x 913mm kick plate with and including countersunk holes for screws (screws included)	No	10

DOOR CLOSER ASSEMBLIES

Dormakaba or other approved:

35	TS91B Non hold open slide channel door closer fixed to timber, steel or aluminium door lining/frame	No	1
36	TS91B Hold open slide channel door closer fixed to timber, steel or aluminium door lining/frame	No	15
37	TS83 DC EN 3-6 Regular arm delayed closing door closer fixed to timber, steel or aluminium door lining/frame with pull side fixing	Sets	2
38	TS83 DC PA - PAB EN 3-6 Parallel arm delayed closing door closer fixed to timber, steel or aluminium door lining/frame with push side fixing including parallel arm bracket	Sets	6
39	TS83 DC PA - PAB EN 3-6 Parallel arm non hold open door closer fixed to timber, steel or aluminium door lining/frame with push side fixing including parallel arm bracket	Sets	3
40	TS83 DC PA - PAB EN 7 Parallel arm non hold open door closer fixed to timber, steel or aluminium door lining/frame with push side fixing including parallel arm bracket	Sets	1
41	BTS75 SAA-HO Non hold open with single action floor spring	Sets	4

SLIDING DOOR GEAR ASSEMBLIES

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IRONMONGERY (PROVISIONAL)

<u>SA Sliding Sales or other approved sliding gear assembly:</u>					
42	S3 Sliding gear door pack set for single timber door, with bottom channel fixed to underside of door, including bottom guide, top track, end caps, top hanger, side fixing brackets, removable track joint, door stops, woolpile, fascia, etc. including installation in strict accordance with the manufacturer's instructions	No	3		
<u>DOOR STOPS, CABIN HOOKS, ETC.</u>					
<u>Dormakaba or other approved:</u>					
43	DDS-SS-017 floor mounted door stop	No	88		
44	DHC-SS-031B stainless steel hat and coat hook with rubber buffer	No	4		
45	DDH-SS-020 wall buffer	No	5		
46	DPS-SS-032 stainless steel dust proof strike mounted to wall	No	16		
<u>Halcast or other approved:</u>					
47	166 CH SC 200mm brass cabin hook and eye, with and including 100 x 100 x 75mm thick chamfered wrot Meranti block twice bolted to wall with anchor bolts	No	40		
<u>LETTERS, NAMEPLATES, ETC.</u>					
<u>Contractor to provide samples of nameplates for approval of the Architect</u>					
<u>Dormakaba or other approved:</u>					
48	DSS-130 M Male sign	No	1		
49	DSS-131 F Female sign	No	1		
50	DSS-132 MF Male/female sign	No	1		
51	DSS-133 P Disabled persons sign	No	6		
52	DSS-150 MF Male/female sign	No	1		
<u>PINNING BOARDS, WRITING BOARDS, PROJECTION SCREENS, ETC.</u>					
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<u>NEC or other approved:</u>				
53	Ceiling mounted projector screen size 3000 x 2300mm high including mounting brackets, etc.	No	2	
<u>Vitrex or other approved:</u>				
54	Pinning board size 1200 x 900mm high	No	49	
55	Pinning board size 2400 x 1200mm high	No	29	
56	White board size 1800 x 1200mm high	No	37	
57	White board size 2400 x 1200mm high	No	5	
58	White board size 3000 x 1200mm high	No	11	
<u>Parrot or other approved:</u>				
59	Display case with pinning board, aluminium frame and 4mm thick toughened glass hinged door, lockable size 900 x 600mm high	No	3	
60	Display case with pinning board, aluminium frame and 4mm thick toughened glass sliding doors, lockable size 1200 x 900mm high	No	6	
<u>BATHROOM FITTINGS, ETC.</u>				
<u>Franke or other approved:</u>				
61	Stainless steel (Code BHM9P) single towel rail unit, with and including end brackets plugged to wall	No	3	
62	Fold down seat, size 484 x 526mm (Code CNTX400A) fitted to wall	No	3	
<u>Kimberley Clarke or other approved:</u>				
63	Toilet tissue dispenser MR2 S/S T/T Code SA426130	No	19	
64	Stainless steel hand towel dispenser Reflex MK2 Code SA426125	No	66	
65	Stainless steel wall bin Disposer Plus Code SA426135	No	66	
66	Foam soap dispenser Code SA427716	No	66	
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	<u>Railman or other approved polished stainless steel disabled toilet accessories and fixing in accordance with the manufacturer's instructions:</u>				
67	SR5 straight grab rail to wall	No	3		
68	SR1 flush valve rail to wall	No	3		
	<u>Ceramic soap holder:</u>				
69	152 x 305mm Semi recessed double holder	No	1		
	<u>Vaal or other approved:</u>				
70	Soap dish Code 71511085 semi recessed double holder	No	3		
	<u>Shower rail/curtain assemblies:</u>				
71	32mm Diameter chromium plated rail 1500mm long, with two ends fixed to and including chromium plated end brackets, plugged and screwed to wall, fitted with and including waterproof flexible PVC shower curtain size 1800 x 2000mm high with adjustable PVC stays and sliders	No	3		
	<u>CURTAIN TRACKS</u>				
	<u>MS Forwin or other approved anodised aluminium bed privacy rails, complete with all fittings and suspended from and fixing to suspended grid ceiling system, fibre cement/gypsum suspended ceilings and walls, in accordance with the manufacturer's instructions:</u>				
72	Suspended from ceiling including 12 gliders per metre, hangers, brackets, stopped ends, ceiling flanges, etc. supplied with and including hospital curtain 2100mm high to suit lengths specified	m	23		
73	Extra over for end plugged	No	12		
74	Extra over for 45 degree bend	No	12		
75	Extra over for circular bend 400mm radius	No	12		
	<u>SUNDRIES</u>				
	<u>Nelxulas or other approved:</u>				
76	50mm Long brushed stainless steel super heavy duty short bath single towel hook fixed to wall	No	8		
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	<p><u>SECTION No. 2: BUILDING WORKS</u></p> <p><u>BILL No. 10: STRUCTURAL STEELWORK (PROVISIONAL)</u></p> <p>The Tenderer is referred to the relevant Clauses in the separate Supplementary Preambles hereunder and Department of Public Works PW371 document and SANS 2001 Series documents</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>General</u></p> <p>The contractor shall include for all required OHS items as per the included OHS plan including any scaffolding that may be required when pricing this bill section.</p> <p><u>Descriptions</u></p> <p>Descriptions of bolts to be Grade 8.8 and shall be deemed to include nuts and washers unless otherwise stated</p> <p>Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete</p> <p>Descriptions of L-shaped and U-shaped anchor bolts shall be deemed to include bending, threading, nuts and washers and embedding in concrete. Where anchor bolts are described as embedded in sides or soffits of concrete it shall be deemed to include holes through formwork.</p> <p>Description of welds to be 6mm continuous fillet welds unless otherwise stated</p> <p><u>Hot dip galvanising</u></p> <p>Where hot dip galvanising is specified, it should be executed in accordance with SANS 121 specification for coastal conditions, unless otherwise described</p> <p><u>SHOP PRIMED STEEL ROOF MEMBERS, ETC.</u></p> <p>Painting to steel roof truss members is measured in the relevant trade</p>			
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	<p>Section No. 2 BUILDING WORKS Bill No. 10 STRUCTURAL STEELWORK (PROVISIONAL)</p>		R	

All steel to be Grade S355JR

Welded trusses with gussets, connection plates, including all welding, etc.:

Replacement of structural steelwork in roof structure and access corridor with gussets, connection plates, including all welding or fixing (bolts elsewhere measured) as directed by the Engineer:

1	80 x 80 x 10 Equal angle steel false rafter with thirty eight holes for bolts (elsewhere measured) bolted to brickwork and other angle welded to steel rafter (elsewhere measured) including two holes for bolts (elsewhere measured)	t	0.50
2	125 x 75 x 12 Unequal angle steel members including holes for bolts (elsewhere measured) bolted to other steel members	t	2.31
3	175 x 75 x 12 Unequal angle steel members including holes for bolts (elsewhere measured) bolted to other steel members	t	1.10
4	100 x 100 x 4mm Square hollow section beam welded to end plate (elsewhere measured) with 6mm fillet welds	t	0.04
5	160 IPE beams	t	0.16
6	260 x 100 x 38kg/m Steel channel beam	t	2.00
7	406 x 178 x 54kg/m Universal beam	t	0.59
<u>Columns and baseplates.:</u>			
8	260 x 90 RSC column	t	0.13
9	152 x 152 x 30 UC column	t	0.42
10	90 x 90 x 8mm Thick cleat four times holed for bolts (elsewhere measured) and bolted to column	No	4
11	403 x 178 x 12mm Thick endplate four times holed for bolts (elsewhere measured) and welded to column	No	2
12	260 x 100 x 12mm Thick baseplate twice holed for bolts (elsewhere measured) and welded to column	No	2
13	350 x 300 x 12mm Thick baseplate four times holed for bolts (elsewhere measured) and welded to column	No	4

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STRUCTURAL STEELWORK (PROVISIONAL)

<u>Purlins, girts, bracing, etc.:</u>				
14	220 x 180 x 6mm End plate embedded 150mm deep in brickwork course and with four holes for bolts (elsewhere measured)	No	2	
<u>Hot dipped galvanised bolts to structural steel elements, etc.</u>				
15	M12 Grade 8.8 bolt 150mm long, screwed one end with lock nut and flat washer secured in brickwork with Hilti HIT-HY 170 chemical adhesive	No	24	
16	M12 Grade 8.8 bolt 150mm long, screwed one end with lock nut and flat washer	No	416	
17	M20 Grade 8.8 bolt 150mm long, screwed one end with lock nut and flat washer	No	24	
18	M16 Grade 8.8 bolt 150mm long, screwed one end with lock nut and flat washer secured in brickwork with Hilti HIT-HY 500 chemical adhesive	No	6	
19	M16 Grade 8.8 bolt 150mm long, screwed one end with lock nut and flat washer	No	8	
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STRUCTURAL STEELWORK (PROVISIONAL)

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	<p><u>SECTION No. 2: BUILDING WORKS</u></p> <p><u>BILL No. 11: METALWORK</u></p> <p>The Tenderer is referred to the relevant Clauses in the separate Supplementary Preambles hereunder and Department of Public Works PW371 document and SANS 2001 Series documents</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary products in descriptions</u></p> <p>Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted</p> <p><u>General</u></p> <p>Descriptions of bolts shall be deemed to include nuts and washers.</p> <p>Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete.</p> <p>Metalwork described as "holed for bolt(s)" shall be deemed to exclude the bolts unless otherwise described.</p> <p>Each window shall be tested for water tightness with water sprayed on by means of a 20mm hosepipe using adequate pressure. If in the opinion of the principal agent, the pressure proves to be inadequate, then the pressure in the hosepipe shall be boosted by means of compressed air or other approved means.</p> <p>Aluminium doors and windows shall comply with AAAMSA design and performance criteria for built up areas.</p> <p>Glazing shall comply with SAGGA regulations. Glass shall be type 6.38mm laminated performance glass as shown on the window schedules / drawings appended to these bills of quantities.</p> <p>Glass thickness shall comply with SAGGA regulations irrespective of thicknesses shown on the schedules/drawings.</p> <p>Doors and windows shall be supplied with protective tape and plastic and shall be removed only once surrounding trades have been completed.</p>				
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The following certificates shall be provided prior to commencement of site work:

- 1.) A copy of the relevant AAAMSA Performance Test Certificate from the manufacturer/contractor supplying the architectural aluminium product
- 2.) A Certificate of Conformance confirming that anodising or powder coating has been processed in accordance with SANS 999 and SANS 1796
- 3.) A powder guarantee of not less than 15 years issued by the powder manufacturer. The specific conditions contained in this guarantee shall form part of the powder coating process
- 4.) A Certificate of Conformance confirming that glazing has been installed in accordance with SANS 0137, ensuring that safety glazing materials have been installed in the mandatory areas and that each individual pane of safety glazing materials has been permanently marked
- 5.) A warranty from the manufacturer of the laminated safety glass and/or hermetically sealed glazing units guaranteeing the products against delamination and colour degradation for a period of not less than five years including Glazing COC

All windows to be approved by the Architect prior to installation.

Hot dip galvanising

Where hot dip galvanising is specified, it should be executed in accordance with SANS 121:2011 (ISO 1461:2009), unless otherwise described

STAINLESS STEEL HANDRAILS, TOP RAILS, ETC. (PROVISIONAL)

EZRails or other approved stainless steel (Grade 316) top rail, including all scribing, welding, setting up in position, adjusting, etc. in matt finish.:

1	50mm Diameter rail	m	282
2	Extra over 50mm diameter rail for bend	No	140
3	Extra over 50mm diameter rail for rounded closed end	No	128

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METALWORK

4	3mm Thick standard bracket bolted to 50mm diameter rail and coverplate (both elsewhere measured)	No	236	
5	3mm Thick standard coverplate 50mm diameter welded to bracket (elsewhere measured), three times holed for and bolted to wall (bolts elsewhere measured)	No	236	
6	10mm Diameter expansion bolt 70mm long	No	708	
<u>CORNER PROTECTORS TO WALLS</u>				
<u>50 x 50 x 2mm Thick aluminium angle corner protector, natural anodized finish, glued to wall with contact adhesive, countersunk holed along two edges for and screwed to wall with and including countersunk headed stainless steel screws at 150mm centres:</u>				
7	100mm Girth protection plate 2100mm long, once bent and secured to wall	No	55	
<u>STEEL WINDOWS (PROVISIONAL)</u>				
Tenderer to note that some frames are not square and have slight slants to top and bottom sections of steel windows				
<u>Steel window frame (RFX7) welded into existing window frame where damaged sections removed (elsewhere measured):</u>				
8	Frame welded into position and prepared for glazing and painting (elsewhere measured)	m	491	
<u>ALUMINIUM WINDOWS</u>				
Burglar bars allowed for all opening sections to be hot dip galvanised mild steel and powder coated to match window, manufactured from 12 x 12mm section horizontal members at 150mm spacing and ends fixed to window frame with self tapping security screws				
Ironmongery to include standard factory fittings including friction stays, project out sash hardware, glazing gaskets and seals all to be approved by the Architect.				
<u>Natural anodised aluminium casement windows extruded from 6063T6 aluminium alloy with minimum wall thickness of 1,6mm thick glazed with 6,38mm thick translucent laminated safety glass plugged to brickwork or concrete, including clear silicone sealant applied around:</u>				
9	Window assembly size 1383 x 600mm high consisting of fixed glazed pane 1303 x 520mm high	No	1	
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10	Window assembly size 1200 x 1200mm high consisting of fixed glazed pane as per VP04 in view panel schedule	No	1	
11	Window assembly size 700 x 1953mm high consisting of top fixed glazed pane 620 x 520mm high, divided with one horizontal transome from fixed glazed pane 620 x 1273mm high	No	10	
12	Window assembly size 2601 x 600mm high consisting of fixed glazed pane 2521 x 520mm high	No	2	
13	Window assembly size 1500 x 1200mm high consisting of fixed glazed pane as per VP01 in view panel schedule	No	12	
14	Window assembly size 2817 x 600mm high consisting of fixed glazed pane 2737 x 520mm high	No	1	
15	Window assembly size 2880 x 600mm high consisting of fixed glazed pane 2800 x 520mm high	No	2	
16	Window assembly size 3050 x 600mm high consisting of fixed glazed pane 2970 x 520mm high	No	2	
17	Window assembly size 3926 x 600mm high consisting of fixed glazed pane 3846 x 520mm high	No	1	
18	Viewing panel size 1800 x 1195mm high divided into two equal sections divided by one vertical mullion, each consisting of top section with fixed perforated glazed panel top section size 900 x 345mm high, divided from bottom with one horizontal transome bottom section consisting of fixed glazed panel size 900 x 850mm high and other with sliding glazed panel size 900 x 850mm high as per VP02 in view panel schedule	No	1	
	<u>Natural anodised aluminium casement windows extruded from 6063T6 aluminium alloy with minimum wall thickness of 1,6mm thick double glazed with 6,5mm thick laminated glass with 12mm desiccant spacer for sound insulation, soundprufe glazing or similar approved, plugged to soundbloc partition (elsewhere measured), including clear silicone sealant applied around:</u>			
19	Viewing panel size 1200 x 1335mm high divided by one horizontal transome, top section consisting of fixed noise reduction glazed panel size 1200 x 345mm high, bottom section with fixed noise reduction glazed panel size 1200 x 990mm high as per VP03 in window schedule	No	1	
	<u>ALUMINIUM SHOPFRONTS, DOORS, ETC.</u>			
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Natural anodised aluminium shopfront or doors glazed with 6.38mm thick laminated safety glass plugged to brickwork or concrete, including clear silicone sealant applied around:

20	Door assembly with single door and frame size 850 x 2051mm high, divided in two unequal glazed sections with one horizontal transome 220mm high, bottom glazed section size 680 x 540mm high with lower horizontal transome 150mm high and top glazed section size 680 x 1056mm high, overall size 940 x 2095mm high as DT03 in door schedule	No	6
21	Door assembly with single door and sidelight one side, sidelight section comprising of fixed top glazing size 180 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 180 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1200 x 2125mm high as per DT09 in door schedule	No	1
22	Door assembly including frame (suitable for Gridnic GO Panel) with single door and sidelight one side, sidelight section comprising of fixed top glazing size 301 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 301 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1321 x 2125mm high as per DT09 in door schedule	No	1
23	Door assembly including frame (suitable for Gridnic GO Panel) with single door and sidelight one side, sidelight section comprising of fixed top glazing size 470 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 470 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1490 x 2125mm high as per DT09 in door schedule	No	1
24	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 420 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 420 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1600 x 2094mm high as per DT08 in door schedule	No	2

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25	Door assembly with single door and sidelight one side, sidelight section comprising of fixed top glazing size 480 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 480 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1500 x 2125mm high as per DT09a in door schedule	No	7	
26	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 485 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 485 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1665 x 2094mm high as per DT08 in door schedule	No	1	
27	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 515 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 515 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1695 x 2094mm high as per DT08 in door schedule	No	1	
28	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 560 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 560 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1740 x 2094mm high as per DT08 in door schedule	No	1	
Carried to Collection				R
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29	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 610 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 610 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1790 x 2094mm high as per DT08 in door schedule	No	1	R
30	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 640 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 640 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1880 x 2094mm high as per DT08a in door schedule	No	3	
31	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 660 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 660 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1900 x 2094mm high as per DT08a in door schedule	No	2	
32	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 675 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 675 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1915 x 2094mm high as per DT08a in door schedule	No	1	
Carried to Collection				
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33	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 720 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 720 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1900 x 2094mm high as per DT08 in door schedule	No	1	R
34	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 710 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 710 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 1950 x 2094mm high as per DT08a in door schedule	No	1	
35	Door assembly with double doors and frame size 1740 x 2095mm high, each divided in two unequal glazed sections with one horizontal transome 220mm high, bottom glazed section size 660 x 540mm high with lower horizontal transome 150mm high and top glazed section size 660 x 1059mm high, overall size 1660 x 2054mm high	No	1	
36	Door assembly with double doors and frame (suitable for Gridnic GO Panel) size 1740 x 2095mm high, each divided in two unequal glazed sections with one horizontal transome 220mm high, bottom glazed section size 660 x 540mm high with lower horizontal transome 150mm high and top glazed section size 660 x 1059mm high, overall size 1660 x 2054mm high	No	6	
37	Door assembly with double doors and frame size 1915 x 2095mm high, each divided in two unequal glazed sections with one horizontal transome 220mm high, bottom glazed section size 748 x 540mm high with lower horizontal transome 150mm high and top glazed section size 748 x 1059mm high, overall size 1835 x 2054mm high	No	2	
Carried to Collection				
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38	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 870 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 870 x 710mm high, third sidelight section comprising of fixed top glazing size 130 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 130 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 2280 x 2094mm high as per DT08b in door schedule	No	1	R
39	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 870 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 870 x 710mm high, third sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 2390 x 2094mm high as per DT08b in door schedule	No	2	
40	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 870 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 870 x 710mm high, third sidelight section comprising of fixed top glazing size 750 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 750 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 2900 x 2094mm high as per DT08b in door schedule	No	2	
Carried to Collection				
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41	Door assembly with double doors and sidelights each side, sidelight sections identical comprising of fixed glazing size 700 x 1145mm high separated by 100mm horizontal transome, bottom fixed glazing size 700 x 690mm high, double door leafs comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed glazing size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 3200 x 2094mm high as per DT06 in door schedule	No	2		
42	Door assembly with double doors and sidelights each side, sidelight sections identical comprising of fixed glazing size 800 x 1145mm high separated by 100mm horizontal transome, bottom fixed glazing size 800 x 690mm high, double door leafs comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed glazing size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 3400 x 2094mm high as per DT06 in door schedule	No	3		
43	Door assembly with double doors and sidelights each side, sidelight sections identical comprising of two top hung to open out glazing sections size 700 x 610mm high separated by 100mm horizontal transome, bottom fixed glazing size 700 x 750mm high, double door leafs comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed glazing size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 3300 x 2094mm high as per DT06a in door schedule	No	3		
44	Door assembly with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 240 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 240 x 710mm high, second sidelight section comprising of fixed top glazing size 870 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 870 x 710mm high, third sidelight section comprising of fixed top glazing size 1140 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 1140 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 3290 x 2094mm high as per DT08b in door schedule	No	1		
Carried to Collection					R
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45	Door assembly including frame (suitable for Gridnic GO Panel) with single door and sidelights each side, first sidelight section comprising of fixed top glazing size 160 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 160 x 710mm high, second sidelight section comprising of fixed top glazing size 795 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 795 x 710mm high, third sidelight section comprising of fixed top glazing size 810 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 810 x 710mm high, fourth sidelight section comprising of fixed top glazing size 795 x 1204mm high separated by 100mm horizontal transome, bottom section fixed aluminium sheet panel size 795 x 710mm high, door comprising of fixed glazing size 730 x 1059mm high separated by 220mm horizontal transome, bottom fixed aluminium sheet panel size 730 x 540mm high, bottom with horizontal transome 150mm high, overall size 3700 x 2094mm high as per DT08c in door schedule	No	1
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STAINLESS STEEL DOOR LININGS

1.6mm Thick double rebated linings suitable for half brick walls/partitions, fitted with and including three Dorma DBB-SS-009 or other approved two ball bearing butt hinges welded to rebates in linings:

46	Lining for door size 813 x 2032mm high	No	4
47	Lining for door size 913 x 2032mm high	No	54
48	Lining for door size 1800 x 2032mm high	No	1

1.6mm Thick double rebated linings suitable for one brick walls, fitted with and including three Dorma DBB-SS-009 or other approved two ball bearing butt hinges welded to rebates in linings:

49	Lining for door size 913 x 2032mm high	No	12
50	Lining for door size 1013 x 2032mm high	No	1
51	Lining for door size 1613 x 2032mm high	No	2
52	Lining for door size 1800 x 2032mm high	No	1

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Section No. 2
BUILDING WORKS
Bill No. 11
METALWORK

1.6mm Thick double rebated linings suitable for Gridnic GO Panel walls/partitions, fitted with and including three Dorma DBB-SS-009 or other approved two ball bearing butt hinges welded to rebates in linings:

53 Lining for door size 1712 x 2032mm high

No

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BUILDING WORKS
Bill No. 11
METALWORK

Section No. 2

Bill No. 11

METALWORK

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Section No. 2
BUILDING WORKS
Bill No. 11
METALWORK

Item No		Quantity	Rate	Amount
	<u>SECTION No. 2: BUILDING WORKS</u>			
	<u>BILL No. 12: TILING</u>			
	The Tenderer is referred to the relevant Clauses in the separate Supplementary Preambles hereunder and Department of Public Works PW371 document and SANS 2001 Series documents			
	<u>SUPPLEMENTARY PREAMBLES</u>			
	<u>Proprietary products in descriptions</u>			
	Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted			
	<u>WALL TILING</u>			
	<u>600 x 300 x 7,5mm Thick matt white glazed ceramic tiles fixed to plaster with approved tile adhesive, 3mm wide continuous joints in both directions pointed with white/black epoxy grout:</u>			
1	On walls including one key coat	m2	310	
2	On walls in isolated panels, splashbacks, etc. including one key coat	m2	11	
3	On walls in narrow widths including one key coat	m2	10	
	<u>Sundry cutting and fitting to all types of tiling:</u>			
4	Fair cutting and fitting around pipe not exceeding 50mm diameter	No	104	
5	Fair cutting and fitting around pipe exceeding 50mm not exceeding 110mm diameter	No	57	
	<u>SUNDRIES</u>			
	<u>Kirk or other approved:</u>			
6	8mm High aluminium straight edge trim Code SQE080.N	m	246	
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	Section No. 2 BUILDING WORKS Bill No. 12 TILING			

Bill No	<u>SECTION SUMMARY - BUILDING WORKS</u>	Page No	Amount
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8	FLOOR COVERINGS, PLASTIC LININGS, ETC.	89	
9	IRONMONGERY (PROVISIONAL)	97	
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11	METALWORK	114	
12	TILING	115	
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Item No		Quantity	Rate	Amount
	<p><u>SECTION No. 3: PLUMBING & DRAINAGE (PROVISIONAL)</u></p> <p><u>BILL No. 1: PLUMBING & DRAINAGE</u></p> <p>The Tenderer is referred to the relevant Clauses in the separate Supplementary Preambles hereunder and Department of Public Works PW371 document and SANS 2001 Series documents</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Proprietary products in descriptions</u></p> <p>Reference to any particular trademark, name, patent, design, type, specific origin or producer is purely to establish a standard for requirements. Products or articles of an equivalent standard may be substituted</p> <p><u>"Polycop" polypropylene pipes:</u></p> <p>Polypropylene pipes 54 mm diameter and under shall be seamless copper coloured class 16 pipes jointed with "Fast-fuse" heat welded thermoplastic or brass compression fittings as designed for use with copper pipes as stated.</p> <p>Pipes shall be firmly fixed to walls etc with coloured nylon snap-in pipe clips with provision for accommodating thermal movement and jointed and fixed strictly in accordance with the manufacturer's instructions.</p> <p>All pipe diameters are nominal external.</p> <p>Polypropylene pipes 63 mm diameter and over shall be class 12 pipes jointed with cast iron "Supraclamp" running joints.</p> <p>Fusion welded bends, once or twice mitred as necessary, and tees shall be factory manufactured.</p> <p>Fusion welded bends and tees shall include jointing to pipes with PVC rubber ring double Z joint couplers.</p> <p>Branch tees shall include flanged and bolted joints to "Polycop" branch pipes in addition and for brass compression male iron to copper straight couplers.</p>			
	Carried to Collection			
	<p>Section No. 3 PLUMBING & DRAINAGE (PROVISIONAL) Bill No. 1 PLUMBING & DRAINAGE</p>		R	

Reducers shall include jointing to pipes with PVC rubber ring double Z joint couplers and reducers shall be of sufficient overall length to accommodate same.

All pipes shall be jointed and fixed strictly in accordance with the manufacturer's instructions.

All pipe diameters are nominal external.

Concrete pipes:

Pipes shall be jointed with ogee joints with rubber collars or socket and spigot joints with rubber rings.

uPVC pipes and fittings:

Soil, waste and vent pipes and fittings shall be solvent weld jointed.

uPVC pressure pipes and fittings:

Pipes for water supply shall be of the class stated.

Pipes of 40mm diameter and smaller shall be plain ended with solvent welded uPVC loose sockets and fittings.

Pipes of 50mm diameter and greater shall have sockets and spigots with push in type integral rubber ring joints. Bends shall be uPVC and all other fittings shall be cast iron, all with similar push-in type joints.

Copper pipes:

Pipes shall be hard drawn and half-hard pipes of the class stated. Class 0 (thin walled hard drawn) pipes shall not be bent. Class 1 (thin walled half-hard), class 2 (half-hard) and class 3 (heavy walled half-hard) pipes shall only be bent with benders with inner and outer formers. Fittings to copper waste, vent and anti-syphon pipes, capillary solder fittings and compression fittings shall be "Cobra Watertech" type. Capillary solder fittings shall comply with ISO 2016. Only compression fittings shall be used in walls or in ground.

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 to Collection

Section No. 3
PLUMBING & DRAINAGE (PROVISIONAL)
Bill No. 1
PLUMBING & DRAINAGE

R

Reducing fittings:

Where fittings have reducing ends or branches they are described as "reducing". In the case of pipes with diameters not exceeding 60mm only the largest end or branch size is given. Should the contractor wish to use other fittings and bushes or reducers he may do so on the understanding that no claim in this regard will be entertained. In the case of pipes with diameters exceeding 60mm all sizes are given and no claim for extra bushes, reducers, etc will be entertained.

Wire gratings:

Descriptions of gutter outlets etc shall be deemed to include wire balloon gratings.

Excavations:

No claim for rock excavation will be entertained unless the contractor has timeously notified the quantity surveyor thereof prior to backfilling.

"Soft rock" and "hard rock" shall be as defined in "Earthworks".

Laying, backfilling, bedding, etc. of pipes:

Pipes shall be laid and bedded and trenches shall be carefully backfilled in accordance with manufacturers' instructions.

Where no manufacturers' instructions exist pipes shall be laid in accordance with clauses 5.1 and 5.2 of each of the following:

SABS 1200 L : Medium-pressure pipelines

LD : Sewers

LE : Stormwater drainage

Pipe trenches etc shall be backfilled in accordance with clauses 3, 5.5, 5.6, 5.7 and 7 of SABS 1200

DB : Earthworks (Pipe trenches)

Pipes shall be bedded in accordance with clauses 3.1 to 3.4.1, 5.1 to 5.3 and 7 of SABS 1200

LB : Bedding (Pipes).

Unless otherwise described bedding of rigid pipes shall be class B bedding.

Flush pans:

Flush pans shall have straight or side outlets and "P" or "S" traps as necessary.

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Section No. 3
PLUMBING & DRAINAGE (PROVISIONAL)
Bill No. 1
PLUMBING & DRAINAGE

R

Stainless steelbasins, sinks, wash troughs, urinals, etc:

Units shall have standard aprons on all exposed edges and tiling keys against walls where applicable.

Waste unions:

Descriptions of waste unions shall be deemed to include rubber or vulcanite plugs and chains fixed to fittings.

Chasing:

Rates for items are to include for chasing pipes into walls where applicable.

Disinfection of water pipework

All pipework is to be disinfected in accordance with SABS 1200L.

Excavation and filling

Excavation and backfilling must be done using hand held tools only.

Flexible connectors

Tenderers are to allow for the pricing of flexible connectors to all instances where deemed necessary. No extra will be entertained in this regard.

Laying, backfilling, bedding, etc. of pipes

Where no manufacturer's instructions exist pipes shall be laid in accordance with clauses 5.1 and 5.2 of each of the following: SABS 1200 L : Medium pressure pipelines LD : Sewers LE : Stormwater drainage.

Internal water supplies

Prices for all piping laid in ground, inspection chambers, etc. shall include for excavations, keeping free of water, distributing surplus material on site (carting away has been separately measured) and backfilling in selected material (imported fill where required will be separately measured).

Holes, chases, etc. are deemed to be included in the descriptions of the pipework.

Carried to Collection

Section No. 3
PLUMBING & DRAINAGE (PROVISIONAL)
Bill No. 1
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R

Testing of installations/reticulation

The Contractor is to allow for testing of the internal water supply and fire supply installations per building as this will be completed as per the sectional completion requirements, as elsewhere described.

SANITARY PLUMBING

uPVC piping in accordance with SABS 967, including all straight couplings, cutting and waste, etc.:

1	50mm Pipe	m	459
2	110mm Pipe	m	144
3	50mm Pipe chased into walls	m	16
4	50mm Pipe laid in filling under floors	m	250
5	110mm Pipe laid in filling under floors	m	8

Extra over uPVC piping for the following fittings:

6	50mm Bend	No	226
7	110mm Bend	No	23
8	110mm Pan connector	No	19
9	50mm Access bend	No	78
10	110mm Access bend	No	22
11	50mm Access junction	No	68
12	110mm Access junction	No	19
13	110mm Two-way vent valve	No	19

Testing sanitary plumbing installation:

14	Complete installation		Item
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WATER SUPPLY

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Section No. 3
PLUMBING & DRAINAGE (PROVISIONAL)
Bill No. 1
PLUMBING & DRAINAGE

<u>Polycop or other approved polypropylene piping, including chasing into brick walls if required:</u>			
15	15mm Pipe	m	294
16	15mm Pipe chased into walls	m	20
17	22mm Pipe	m	20
18	22mm Pipe chased into walls	m	11
19	28mm Pipe	m	14
20	35mm Pipe	m	12
21	42mm Pipe	m	10
<u>Extra over Polycop pipes for brass compression fittings:</u>			
22	15mm Pipe fittings	No	185
23	22mm Pipe fittings	No	16
24	28mm Pipe fittings	No	6
<u>Class 2 copper piping in accordance with SABS 460, including straight couplings, cutting and waste, etc.:</u>			
25	15mm Pipe	m	271
26	15mm Pipe chased into walls	m	81
27	22mm Pipe	m	30
28	22mm Pipe chased into walls	m	20
29	28mm Pipe	m	10
30	35mm Pipe	m	20
31	42mm Pipe	m	10
<u>Extra over copper piping for the following Conex type fittings:</u>			
32	15mm Fittings	No	520
33	22mm Fittings	No	24
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34	28mm Fittings	No	12
35	35mm Bend	No	8
36	35mm Reducer	No	4
37	35mm Reducing tee	No	6
38	35mm Elbow	No	8
39	35mm Tee	No	6
40	42mm Bend	No	8
41	42mm Reducer	No	6
42	42mm Reducing tee	No	8
43	42mm Elbow	No	6
44	42mm Tee	No	4
	<u>Paper lagging:</u>		
45	Thermaflex protective tube around 15mm pipe and couplings	m	210
46	Thermaflex protective tube around 22mm pipe and couplings	m	25
47	Thermaflex protective tube around 35mm pipe and couplings	m	10
48	Preformed fibreglass with canvas wrapping and metal cladding around 22mm pipe and couplings	m	10
	<u>Sundries:</u>		
49	22mm Brass Fullway gate valve with non-rising spindle to SABS 776	No	2
	<u>Testing water supply installation:</u>		
50	Complete installation		Item

SANITARY FITTINGS

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Section No. 3
PLUMBING & DRAINAGE (PROVISIONAL)
Bill No. 1
PLUMBING & DRAINAGE

Supply and fit the following sanitary fittings and equipment together with loose ancillary fittings supplied therewith, including unloading, storing, unpacking, hoisting or lowering as required, fixing and building into position, cutting all mortices and chases as required, cutting, brackets, clamps, etc. and connecting up pipework and handing over in perfect working order at completion

All gaps between fittings and/or tiles and walls to be filled with white silicone

Franke or other approved - Grade 304 (18/10) polished stainless steel:

51	450mm Diameter Rondo RDX6 10-45 Model 1990012 prep bowl, fixed to cupboard (elsewhere measured) with securing clips and sealed with silicone adhesive along edges including 38mm waste fitting Code 1120166441 including plug complete with plumbing kit Spazi F/1 Code 1120166437	No	2
52	Trendline Model 711 drop-in single bowl sink Code 1030040346 size 1000 x 460mm, fixed to cupboard (elsewhere measured) with securing clips and sealed with silicone adhesive along edges including 38mm waste fitting Code 1120166441 including plug complete with plumbing kit Spazi F/1 Code 1120166437	No	1
53	Trendline Model 712 drop-in single bowl sink Code 1030172061 size 1200 x 535mm, fixed to cupboard (elsewhere measured) with securing clips and sealed with silicone adhesive along edges including 38mm waste fitting Code 1120166441 including plug complete with plumbing kit Spazi F/1 Code 1120166437	No	1
54	Trendline Model 722 drop-in double centre bowl sink Code 1030011 size 1800 x 535mm, fixed to cupboard (elsewhere measured) with securing clips and sealed with silicone adhesive along edges, 38mm waste fittings Code 1120166441 including plugs complete with plumbing kit Spazi F/2 Code 1120166438	No	2
55	Mini scrub unit SMS Code 2630049 complete with galvanised wall fixing plate, complete with bolts and integral 300mm high splashback with two tapholes complete with 90mm waste outlet and basket stainer fitting	No	1
56	Combination bedpan and washup sink Code EC6 350050, complete with integral 150mm high rear splashback and all fitments (flush valve FM.1, pillar mixer CP171/041, hand spray CP297 with nozzle)	No	1
57	Bedpan and bottle rack type BBR 4 size 660 x 350 x 505mm deep, including setting up and fixing to wall	No	1

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Section No. 3
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PLUMBING & DRAINAGE

58	Wall mounted slophopper CH Code 351350, complete with 38mm flush pipe and FM1 flush valve with 100mm high integral splashbacks to sides and back, stainless steel grid and wall brackets supplied complete with tap bracket Code 354952 and removable grid Code 351356	No	1		
	<u>Architec or other approved:</u>				
59	White Alpin Code 318450000 450mm diameter vanity counter top basin, fixed to cupboard (elsewhere measured) sealed with silicone adhesive along edges, 38mm waste fittings Code 1120166441 including plugs complete with plumbing kit Spazi F/1 Code 1120008	No	1		
	<u>Duravit or other approved:</u>				
60	D-Code 7054500002 wash hand basin size 450 x 340mm, with one taphole and overflow complete with installation kit Code 8448Z0 without pedestal	No	58		
61	D-Code 0337540000 wash hand basin size 445 x 435mm, with taphole and overflow complete with installation kit Code 8448Z0 without pedestal fixed to cupboard (elsewhere measured) with securing clips and sealed with silicone adhesive along edges	No	6		
62	D-Code 253509 vitreous china wall hung WC pan with white seat and cover Code 0067310000, complete connected to Geberit cistern (elsewhere measured) set at a height 400mm above finished floor level	No	19		
63	D-Code 082930 vitreous china wall mounted urinal with standard jet nozzle, inlet-set, waste, bottle trap connected to Geberit cistern (elsewhere measured) set at a height 700mm above finished floor level	No	2		
	<u>Geberit or other approved concealed units, including cutting recess in brickwork as required and concealing after completion, etc.:</u>				
64	Kombifix concealed element Code 110350005 complete with UP320 Sigma concealed cistern, with Actuator dual flush plate Code 115882SN1 stainless steel brushed finish installed complete to wall hung WC pan (elsewhere measured)	No	19		
65	Kombifix concealed element Code 457611001 in combination with inlet adaptor Code 242042001 and actuator plate Type 10 Code 116015SN1, to cover service opening including mounting frame all in stainless steel brushed finish with and including securing bar and flush time settings with air nozzles and conduit pipe installed complete to wall mounted urinal (elsewhere measured)	No	2		
	Carried to Collection				
	Section No. 3 PLUMBING & DRAINAGE (PROVISIONAL) Bill No. 1 PLUMBING & DRAINAGE				R

TAPS, VALVES, ETC.

Cobra Watertech or other approved:

66	15mm Ledimo LO-291/044 CP sink mounted sink mixer with aerator swivel outlet	No	7
67	15mm Code 232-10 angle regulating valve with 350mm long service connection flexihose and capnut	No	12
68	22mm 1 Jet vandal resistant shower head including male inlet, flow restrictor, self cleaning spray nozzle complete including installation and connection to shower valve (elsewhere measured)	No	1
69	22mm KM2-301/N Stop tap metering with non hold open, self closing with steel wall flange complete with male connection ends installed complete	No	1
70	15mm Type 1080 Ball-o-Flo ballcock	No	166
71	22mm Type 1080 Ball-o-Flo ballcock	No	10
72	35mm Type 1080 Ball-o-Flo ballcock	No	4

Schell or other approved:

73	15 x 15mm Code 52055405 angle valve	No	130
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Hansgrohe or other approved:

74	Cosmos E2 Code 31733223 single basin mixer	No	59
75	Decor shower finishing set Code 31967003 with concealed body DN15 Code 13620180 and Schell vandal resistant shower head Code 018440699 complete	No	3
76	Crometta 85 shower set mono with hose and shower bar 65cm Code 2772800 with hand shower Code 28561000 and adjustable slider and chrome plated wall supports complete	No	3

Kludi or other approved:

77	Medi Care Code 349220524 wall mounted single lever mixer	No	2
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WASTE UNIONS, TRAPS, ETC.

Carried to Collection

R

Section No. 3
PLUMBING & DRAINAGE (PROVISIONAL)
Bill No. 1
PLUMBING & DRAINAGE

Section No. 3

Bill No. 1

PLUMBING & DRAINAGE

COLLECTION

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Carried to FINAL SUMMARY

R

Section No. 3
PLUMBING & DRAINAGE (PROVISIONAL)
Bill No. 1
PLUMBING & DRAINAGE

Item No		Quantity	Rate	Amount
	<u>SECTION No. 4: SMME PACKAGES (PROVISIONAL)</u>			
	<u>BILL No. 1: SMME PACKAGES</u>			
	<u>SUPPLEMENTARY PREAMBLES</u>			
	Tenderers to take note that 30% of the building works, excluding specialist work, are to be contracted to SMME's. Provisional Sums are provided for this purpose and bids will be called for after award for these packages on a selected sub-contractor basis.			
	The Tenderer is to price all associated administrative, supervision, mentoring costs, profit and attendance in the relevant sections of the Preliminaries as no claims for additional costs will be entertained.			
	The 30% is made up of all building works excluding the following: Provisional Sums Electrical Specialist Works Mechanical Works Escalation and Contingencies			
	These are monetary provisions only and the use, value and payment thereof are subject to adjustment based on actual costs through contractually approved variation orders calculated in terms of the prescribed contractual directives.			
	<u>SMME PACKAGES</u>			
	<u>MASONRY</u>			
1	Provide the amount of R440 000.00 (Four Hundred and Forty Thousand Rand for SMME package to complete the masonry	Item		440 000.00
	<u>PLASTERING</u>			
2	Provide the amount of R1 780 000.00 (One Million Seven Hundred and Eighty Thousand Rand for SMME package to complete the plastering	Item		1 780 000.00
	<u>GLAZING</u>			
3	Provide the amount of R430 000.00 (Four Hundred and Thirty Thousand Rand for SMME package to complete the glazing	Item		430 000.00
	Carried to Collection			R
	Section No. 4 SMME PACKAGES (PROVISIONAL) Bill No. 1 SMME PACKAGES			

<u>PAINTWORK</u>			
4	Provide the amount of R910 000.00 (Nine Hundred and Ten Thousand Rand for SMME package to complete the paintwork	Item	910 000.00
<u>CP ELECTRICAL INSTALLATION</u>			
5	Provide the amount of R2 790 000.00 (Two Million Seven Hundred and Ninety Thousand Rand for SMME package to complete the electrical installation in the CP Block	Item	2 790 000.00
<u>BLOCK H ELECTRICAL INSTALLATION</u>			
6	Provide the amount of R1 390 000.00 (One Million Three Hundred and Ninety Thousand Rand for SMME package to complete the electrical installation in Block H	Item	1 390 000.00
<u>EXTERNAL WORKS</u>			
7	Provide the amount of R6 080 000.00 (Six Million and Eighty Thousand Rand for SMME package for external works	Item	6 080 000.00
Carried to Collection			
Section No. 4 SMME PACKAGES (PROVISIONAL) Bill No. 1 SMME PACKAGES		R	

Section No. 4

Bill No. 1

SMME PACKAGES

COLLECTION

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Amount

Carried to FINAL SUMMARY

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Section No. 4
SMME PACKAGES (PROVISIONAL)
Bill No. 1
SMME PACKAGES

CP: HIGH DENSITY SHELVING

4 Provide the sum of R180,000.00 (One Hundred and Eighty Thousand Rand) for high density shelving

Item 180 000,00

5 Profit on above item

Item

6 Attendance on ditto

Item

CP: SPECIALIST EQUIPMENT AND FITTINGS

7 Provide the sum of R1,500,000.00 (One Million Five Hundred Thousand Rand) for Specialist Equipment and Fittings

Item 1 500 000,00

8 Profit on above item

Item

9 Attendance on ditto

Item

BLOCK H: SPECIALIST ALTERATIONS TO PREFABRICATED STRUCTURE

10 Provide the sum of R1,300,000.00 (One Million Three Hundred Thousand Rand) for Specialist Alterations to Prefabricated Structure

Item 1 300 000,00

11 Profit on above item

Item

12 Attendance on ditto

Item

BLOCK H: ENTRANCE CANOPY

13 Provide the sum of R100,000.00 (One Hundred Thousand Rand) for entrance canopy

Item 100 000,00

14 Profit on above item

Item

15 Attendance on ditto

Item

BLOCK H: FURNITURE

16 Provide the sum of R1,000,000.00 (One Million Rand) for Furniture

Item 1 000 000,00

17 Profit on above item

Item

18 Attendance on ditto

Item

MONETARY PROVISIONS

Carried to Collection

R

Section No. 5
PROVISIONAL SUMS
Bill No. 1
PROVISIONAL SUMS

COMMUNITY LIAISON OFFICER

19 Provide the sum of R96,000.00 (Ninety Six Thousand Rand) for the employment of a Community Liaison Officer (R8,000.00 per month for the duration of contract plus sundries)

Item 96 000.00

PLACEMENT OF CANDIDATE PROFESSIONAL

20 Provide the sum of R360,000.00 (Three Hundred and Sixty Thousand Rand) for the Placement/In-Service training of two (2) unemployed graduates towards a Professional Registration within the Built Environment at the cost of R15,000.00 (Fifteen Thousand Rand) per month each, employed by the Principal Contractor for the duration of the contract

Item 360 000.00

PLACEMENT OF STUDENT

21 Provide the sum of R264,000.00 (Two Hundred and Sixty Four Thousand Rand) for the Placement/In-Service training of two (2) students within the Built Environment at the cost of R11,000.00 (Eleven Thousand Rand) per month each, employed by the Principal Contractor for the duration of the contract

Item 264 000.00

Carried to Collection

R

Section No. 5
PROVISIONAL SUMS
Bill No. 1
PROVISIONAL SUMS

Section No. 5

Bill No. 1

PROVISIONAL SUMS

COLLECTION

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Section No. 5
PROVISIONAL SUMS
Bill No. 1
PROVISIONAL SUMS

Section No	<u>CECILIA MAKIWANE HOSPITAL: PHASE 1 CP & H - FINAL SUMMARY</u>	Page No	Amount
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2	BUILDING WORKS	116	
3	PLUMBING & DRAINAGE (PROVISIONAL)	128	
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5	PROVISIONAL SUMS	135	
	<u>ELECTRICAL INSTALLATION</u>		
	VOLUME 1.1: CP: ICT INSTALLATION AND ACCESS CONTROL		SUM
	VOLUME 1.1: BLOCK H: ICT INSTALLATION AND ACCESS CONTROL		SUM
	<u>MECHANICAL INSTALLATION</u>		
	VOLUME 2.1: CP: MECHANICAL INSTALLATION - Fire Detection		SUM
	VOLUME 2.2: CP: MECHANICAL INSTALLATION - Heating Ventilation & Air Conditioning		SUM
	VOLUME 2.3: CP: MECHANICAL INSTALLATION - Fire Protection Installation		SUM
	VOLUME 2.4: CP: MECHANICAL INSTALLATION - Domestic Water		SUM
	VOLUME 2.1: BLOCK H: MECHANICAL INSTALLATION - Fire Detection		SUM
	VOLUME 2.2: BLOCK H: MECHANICAL INSTALLATION - Heating Ventilation & Air Conditioning		SUM
	VOLUME 2.3: BLOCK H: MECHANICAL INSTALLATION - Sprinkler System		SUM
	VOLUME 2.4: BLOCK H: MECHANICAL INSTALLATION - Medical Gas		SUM
	VOLUME 2.5: BLOCK H: MECHANICAL INSTALLATION - Autoclave Equipment		SUM
	Sub Total		R
	Carried Forward		R

Section No	Page No	Amount
<u>CECILIA MAKIWANE HOSPITAL: PHASE 1 CP & H - FINAL SUMMARY</u>		
	Brought Forward	R
<u>MONETARY PROVISIONS</u>		
<p>The following monetary provisions have been made in the contract and must be omitted from the contract sum at the start of the contract and used as directed below.</p> <p><i>Please note: These are monetary provisions only and the use, value and payment thereof are subject to adjustment based on actual costs through contractually approved variation orders and escalation costs calculated in terms of the prescribed contractual escalation calculations directives respectively.</i></p>		
<u>CONTINGENCIES</u>		
	Provide the sum of R2,000,000.00 (Two Million Rand) for Contingencies to be used or deducted in full at the Principal Agent's discretion	R 2 000 000.00
<u>ESCALATION</u>		
	Provide the sum of R2,500,000.00 (Two Million Five Hundred Thousand Rand) for statutory increase (CPAP), to be adjusted, used and paid as instructed by the Client for and based on contractually calculated escalation per item 25.3.4 of the contract data of the Preliminaries Bill and in terms of clauses 17, 25 and 26 of the Principal Building Agreement (refer JBCC).	R 2 500 000.00
	Sub Total	R
	VALUE ADDED TAX 15%	R
	TOTAL BUILDING WORKS INCLUDING VAT	R
	Carried to C1.1 - Form of Offer and Acceptance	R

VOLUME 1.1 CP

ELECTRICAL INSTALLATION

ICT Installation

Vol. 1.1 Part 2
DETAILED SPECIFICATIONS

PROJECT TITLE:	UPGRADE & ADDITIONS EXISTING BUILDING (THE OLD OPD BUILDING IN THE OLD PART OF THE HOSPITAL) FOR TREATMENT OF CEREBRAL PALSY PATIENTS AT CECILIA MAKIWANE HOSPITAL – ICT AND SECURITY INSTALLATIONS
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1.0 INTRODUCTION & GENERAL

Should there be any conflict or ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority: -

- Schedule of Quantities
- Detailed Specification
- Drawings

Should the Tenderer notice any inconsistencies between these sections, it is his responsibility to notify the Engineer in order to obtain clarification thereon.

2.0 SCOPE OF WORK

The main contract is for the Upgrade & Additions to Existing Building (The old OPD Building in the old part of the Hospital) for treatment of Cerebral Palsy patients at Cecilia Makiwane Hospital, in Mdantsane, East London. This document covers, for the installation, testing and commissioning of ICT and Security Installations. The work entailed under this contract shall be:

2.1 ICT INSTALLATION

This installation entails:

- Installation of data switch with suitable wall mount data cabinet
- Installation of data and network cabling including terminating to points in various buildings
- Linking of new installation with existing hospital network
- Supply and issuing of Operations and Maintenance manuals for the installation
- Provision of as-built drawings
- Configuration of installation working with client's IT personnel

2.2 SECURITY INSTALLATION

The security installation has been broken into two installations viz; Access Control and CCTV. The work entailed on each installation is listed below.

- **Access Control**
 - Installation of door magnets on access-controlled doors
 - Installation of biometric/card readers and "Touch Free" release button
 - Emergency break-glass door unit with alarm
 - Linking of new installation with existing hospital network
 - Interfacing of the installation with fire detection
 - Supply and issuing of Operations and Maintenance manuals for the installation
 - Provision of as-built drawings

Cecilia Makiwane Hospital - Cerebral Palsy Unit

- Training of DOH staff on how to operate and maintain the equipment
- Intercom system complete with push-button on the main door, handset in the security room and its associated cabling
- **CCTV**
 - Installation of 4MP Dome cameras along the passages
 - Installation of Video recorder (PC) and viewing monitor wall-mounted in the security room including software
 - Cabling between cameras and linking of new installation with existing hospital network
 - Supply and issuing of Operations and Maintenance manuals for the installation
 - Provision of as-built drawings
 - Training of DOH staff on how to operate and maintain the equipment

The Subcontractor is responsible for providing the installation in accordance with this Specification and as shown on tender drawings.

The intent of this document is a performance specification for a modular security management system encompassing the sub-systems described. Tenderers are at liberty to offer enhancements to the equipment specified.

The security subcontract will be inclusive of the following IP based installations:

- Door Monitoring
- Access Control
- Electro-mechanical and Magnetic locks
- Biometric/card readers
- Closed Circuit Television Cameras, Monitors and Recording
- Linking new installations with existing hospital network

Tenderers are encouraged to tender a main option which would represent a compliance with the specification and quantities and would relate to the completed Bills of Quantities. Alternative options may be offered together with a full motivation and separate Bills of Quantities.

In instances where reference is made or inferred to particular products, it only serves the purpose of defining a required standard. Tenderers are requested to offer the best and most suitable products for the application.

General items include the following:

- a) Cable trays to be supplied and used where possible and all cable to be neatly and securely tied with cable ties.
- b) If no cable trays, all cables to be installed in conduit and correctly secured.
- c) No cables may be left to lay on the ceiling boards.
- d) All cable loops to have minimum of 20% spare capacity.
- e) All cabling to electronic locks is to be installed on the secure side.
- f) No joins in cable will be accepted.
- g) All junction boxes and boards to be correctly mounted.
- h) All door monitors will be of the 20mm recessed type unless specified otherwise.
- i) All readers must be wired to facilitate the reader sounder and other functionalities.
- j) All electronic devices, power supplies and any other control equipment must be mounted neatly in suitable enclosures to protect them against damage and tampering.

Each enclosure will be fitted with a tamper switch and all power supplies are to be monitored.

- k) All floor, room and ceiling voids to be protected and monitored for smoke, fire and water.
- l) All power supplies will be battery backed up with a 12Vdc, sealed rechargeable lead acid battery.
- m) All CCTV, access control, fire detection and monitoring, plus emergency evacuation systems are to be connected to UPS power with battery back-up. Head end equipment must be provided with dual UPS power from different power breakers.
- n) On system hand-over, the installation is to be complete and FULLY functional.
- o) A complete set of user friendly operating instructions to be provided.
- p) Adequate operator training to be included in tender price.
- q) A complete set of design architecture drawings depicting correct positioning of all equipment to be supplied.
- r) All devices including public address speakers and access control devices must be labelled according to the floor number and location on the floor. A register of the items installed and the corresponding numbering must be supplied on hand over.
- s) All equipment must be networkable and facilitate remote monitoring and operation.

3.0 SPECIFICATION

Local and Supply Authority

The project location is in Cecilia Makiwane, Mdantsane, East London.

The area to be renovated consist of single-storey buildings.

Site Conditions

Equipment shall be suitable for the following conditions:

Ambient temperature	-5°C to 40°C
Altitude	0m
Relative Humidity	32°C dB Temperature 22°C wB Temperature
Nominal LV Supply	400/231 [no load] 4 wire, 3 phase system with earthed neutral.
Nominal HV Supply	11kV 3-wire system.
Frequency	50 Hz.

Details to be submitted with the tender document:

Should the tenderer in any way differ from the Specification, the differences shall be stated in detail. The information shall be included in a covering letter accompanying the tender, stating the paragraph of the Specification where the requirements are deviated from.

It shall be noted that the information entered in the schedules will not relieve the Subcontractor of his obligations to comply with the Specification.

3.1 ACCESS CONTROL

General

Tenderers shall submit a proposal for a modular access control and security management.

Tenderers shall respond fully to the following minimum criteria as well as any additional options offered:

System architecture, modular at all levels, to allow:

- Software elements to be installed as required in different locations.
- Large number of controllers to be connected via flexible multidrop interfacing.
- Software and hardware able to support local and remote sites.

Core software to be employed, providing set up and monitoring without affecting stand-alone operation of field elements and controllers.

Tenderers shall state their choice of software and support systems, based on stability, versatility and performance.

Field controllers to provide application needs and distributed intelligence, system speed and integrity as well as integral power supplies for powering door locks, etc.

Controllers to accommodate built-in communications firmware for communication with the core software.

Description of the following features offered by the system:

- Card holders and card production
- Monitor and Control
- Access Configuration
- Reports and storage [archive]
- Alarm Graphics
- Guard Clocking
- Video Identification [Video and Audio badging]
- Asset Tag discrimination
- Image monitoring
- Event trigger [external actions]
- Time Synchroniser
- Local Printing

Multiple alarm conditions, priorities, acknowledge, input monitoring capability.

- Availability of reporting and monitoring.
- History and session logs.
- History and database reports
- Time recording
- Card transaction record and tracking.

The system shall provide at least the following features, [capacities given are minimum requirements], to be extendable with +50%:

Tenderers are requested to provide under separate heading in their tender submission, the following rates for higher access level readers, that may be available in the system offered, or may be imported into the system from other manufacturers:

- Biometric reader with Wiegand Interface (include card reader)

Tenderers shall confirm that the above higher level readers can be accommodated at any reader point in the system, in the card reader positions as indicated on the drawings.

The access control system will consist of a central processor located in the equipment room adjacent to the security control room with terminals as follows:

- [a] The reception counter on ground floor level shall be provided with two terminals for visitors card validation and tenant card validity checking. [Extend to four stations for +50% extension]
- [b] Visitors arriving by vehicle [one driver per vehicle] or on foot at the entrance, will be issued with a temporary card, which must be exchanged for a metal or other token to operate the exit boom [or pedestrian turnstile] upon leaving the premises. Tenderers shall allow for the provision of temporary plastic cards and tokens [1 000 per day +50% future], as well as for the required token-operated releases for the exit boom and exit pedestrian turnstile. [Both these being off-line devices]

The access control system shall be provided with a guard clocking/patrol facility, which will allow a user programmed route and time-lapse facility between card readers. This will allow the holders of defined cards to follow the route and if there is any deviation in route or time between stations, [too short or too long], then an alarm shall be raised in the Security Control Room.

Access cards offered shall be suitable for use with or without photographs of the holder.

The card readers shall have a positive means of indication to show that the card reader is on-line and whether a transaction is accepted or rejected.

Tenderers are advised that normal type proximity [or Smart Card option] cards will be used to be programmed for visitors. Tenderers shall allow high-reliability, dual reading visitor's card retrieval devices at the pedestrian barrier exit line at the main reception [full details to be submitted].

Specification

The Specification covers all activities up to final commissioning and maintenance during the guarantee period of the installation.

- IP Based Access control
- Full Integration of the above

Tenderers shall allow for the future extension of the systems and equipment offered for an additional 20% extension of all systems.

Access Control termination boxes will be provided on and will be all linked to the Hospital network.

The Access Control (ACS) Installation shall include but not be limited to:

- The installation of the ACS, supply, delivery, installation, testing, integration, commissioning, guarantee and maintenance of the Access Control Installation.

Cecilia Makiwane Hospital - Cerebral Palsy Unit

- The provision of all necessary equipment, tools, accessories and test equipment to complete the Security Installation.
- The timeous provision of building work details.
- The provision of shop drawings showing all wiring routes, equipment details, equipment positions, [including fixing details], sleeves, etc.
- The compilation of manuals including a full schedule of equipment installed spares lists, "As Built" drawings and information as set out in the Specification.

Related work by others

The following related work associated with this Subcontract will be carried out by other parties as specified:

Access Control Subcontractor and Main Contract

The following work will be provided by the Main Contractor:

- Provisions of penetrations in walls and structure for reticulation of cabling.
- Closing of ducts and opening through concrete slabs after installation of wiring and piping.
- Setting out of all equipment

Access Control Subcontractor and Electrical Subcontract

The following work will be provided by the Electrical Subcontractor:

- A 400V 3-phase or 240V [uninterrupted] power supply point at each point as required and identified by the Subcontractor. Any transformers or converters required for other voltages shall form part of this subcontract and shall be priced with associated equipment.
- All conduit and wiring channels.

Access Control Subcontractor and the Fire Detection, Alarm and Extinguishing System Subcontractor

The following related work will be provided by the Fire Detection, Alarm and Extinguishing System Subcontractor:

- The Fire Detection, Alarm and Extinguishing System Subcontractor will provide signals for the interfacing of the Fire Detection and Security Systems. These signals will be wired to terminal strips in the equipment racks in the Security Control Room. Connections of these signals to the Security System including wiring forms part of this Subcontract.
- The Fire Detection, Alarm and Extinguishing System monitoring and control computers will be located in the Security Control room.

The Access Control and CCTV installation Subcontractor will be required to liaise with the Fire Detection, Alarm and Extinguishing System Subcontractor if not the same Subcontractor to co-ordinate the requirements in respect of space, wiring routes and access.

Sub-Contracting

Tenderers are advised that no part of the Access Control and CCTV installation may be sub-contracted to companies external to the permanent employment of the Subcontractor, except for purposes of Empowerment as submitted in pre-qualification submissions. It is a specific requirement that all operational team members responsible for installation, commissioning and training shall be permanent employees of the tenderer.

Confidentiality

It is a condition of issue of these documents that the successful Subcontractor shall maintain full confidentiality of the documents and drawings.

During the course of the Subcontract, the successful Subcontractor shall institute such procedures to ensure proper control over copies of documentation and drawings. Such procedures may vary from time to time but shall include:

- Numbering of all prints of shop drawings and recording issue.
- Return of all drawings when superseded.

Conduits and wire-ways

All conduits and wire-ways required by the Subcontractor will be supplied and installed by the subcontractor as provided for in the bills of quantities.

Trunking in place of conduits will be preferred for neatness in areas of exposed slabs.

The Subcontractor shall provide shop drawings for requirements over and above those already indicated for co-ordination purposes. These shall in particular, show size and position of outlet boxes as well as details of any special fixings that are required. All additional wire ways and power supplies to be supplied on shop drawings that may be accordance with the product specified

All wiring required to make the Security System operational shall form part of this Subcontract. This shall include all power and control wiring from the 400V/240V power points installed by the Electrical Subcontractor.

All wire ways in the Security Control and Equipment rooms are excluded from this subcontract and will be installed by the Electrical Subcontractor.

MAGNETIC LOCKS AND STRIKES

Magnetic locks shall be fitted to all doors shown on the drawings and/or schedules.

The doors shall be in the locked position during normal operation and shall only be possible to open a door in one of the following ways:

- From the outside by presenting a valid card to the corresponding card reader and thereby activating the magnetic lock.
- From the outside by withdrawing the bolt from the strike with a key without activating the magnetic lock.

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- By the fire system in the event of a fire. A main override will be provided at the control desk to override all magnetic locks in the event of a fire.
- By means of a green break glass emergency feature, operable in the event of a software failure.

The Subcontractor shall ensure and test that all magnetic locks are powered by the nearest available POE+ switch.

Should the magnetic lock be powered by a dedicated power supply, the installer is to ensure and test that the unit operates on UPS power if available.

All doors shall be equipped with a door closer which will be supplied and installed by the Contractor.

The magnetic locks shall be suitable for intermittent duty i.e. doors are normally locked and released only momentarily from time to time.

Locks to be installed by subcontractor requiring openings will be made by the main contractor. Where possible, locks must be recessed in doors/frames and the subcontractor is responsible for coordinating the required cut-outs etc. with the main contractor to be made in the door manufacturer's factory prior to delivery to site.

It will be the responsibility of the Subcontractor to identify to the Contractor doors to be equipped at the factory with concealed door loops and/or other equipment.

The installation of the magnetic lock and the alignment of the door to ensure proper operation shall be the responsibility of the Subcontractor.

CLOSED CIRCUIT TV SYSTEMS

A closed circuit television surveillance system shall be provided for surveillance of areas as shown on the drawings. The system shall allow for an extension of + 30% of equipment for further project phases.

1.4.1 General

- Biometric/Card Reader combo
- Access cards
- Network capability [with Client interface]
- Storage of minimum 3 years for all transactions, to be confirmed with Department of Defence
- Anti-pass back facility
- Audit trails
- Off-line capability; minimum of 25 000 events
- Exception report capability
- Maintenance; UPS and battery backup
- SLA's and maintenance contracts in place
- Minimum 60 months manufacturer's warranty on all equipment from date of commissioning
- Servers to be housed in server rooms or secure and adequately ventilated areas.
- All areas to have reader in/no touch release button out; unless specified otherwise
- High risk areas to have second verification facilities
- All high risk areas [server rooms, security Control Room/control room] to have one-on-one access control facility
- Door contacts on all external fire escape and high risk doors.
- Emergency override key switch must be installed on all vital areas [server rooms]

Cecilia Makiwane Hospital - Cerebral Palsy Unit

- All break glass [Green emergency door release] units must be monitored to indicate alarm condition.
- All access control doors must be fitted with automatic door closers [by others]
- All reader and break glass units as well as intercoms must be fitted to be wheel chair friendly
- The hardware and software must form part of the fully integrated computerised system.
- The system shall be modular in nature, and shall permit expansion of both capacity and functionality through the addition of control panels, card readers, and sensors.
- The system shall incorporate the necessary hardware, software, and firmware to collect, transmit, and process alarm, tamper and trouble conditions, access requests, and advisories in accordance with the security procedures of the facility.
- The system shall control the flow of authorized personnel traffic through the secured areas of the facility.
- Monitoring stations to be provided at main access points to determine status of card users and transactions.
- System must provide for host/visitor function.
- Card capture system for visitor card retrieval – with reader built into the device
- Card retrievers on visitors exit lanes - with reader built into the device
- System must accommodate black listing facility.
- All fire escape doors must be fitted with a local sounder alarm on the floor side of the door.
- Event interfacing with CCTV to be established
- System should provide for visitors and staff parking allocation control.
- System must provide for an intranet visitors pre booking facility.
- Visitors system must activate and de-activate visitor's cards
- One card must be used for vehicle and visitor entry after confirmation at reception.
- Visitor system must query internal database
- Provision must be made for on-site image back-ups on an external storage device.

1.4.2

Cameras

Colour cameras with Infra-Red capabilities shall be installed in positions as indicated on the drawings or as measured in the Bills of Quantities. Camera positioning will be determined by positioning of equipment in the Server and Plant rooms. The main areas to be equipped with CCTV will be:

- Service areas
- Entrances
- Lifts foyers
- Fire escape doors
- Foyers
- Strategic areas
- General areas

Cameras will be powered by dedicated network switches, provided by the infrastructure. The Camera's must be IP based, and able to run off POE or POE+ Cameras operating at 24V shall be equipped with a dedicated power supply, which will be priced as part of the camera.

Cameras shall only be sourced from approved suppliers able to provide ongoing support and service. Tenderers shall state the manufacture of cameras and control systems offered.

Cecilia Makiwane Hospital - Cerebral Palsy Unit

The cameras indicated shall be fitted with Image Motion Detection to enable image transmission to be event triggered, or by access or alarm within the system. It shall be possible to define separate motion detection areas within the camera field of view, with each motion detection section to be armed or disarmed in accordance with time settings.

CCTV cameras shall be offered as high resolution, with conversion to monochrome facility in low light conditions, [less than ½ Lux]. Tenderers shall state the resolution performance of cameras offered.

All outdoor cameras shall be provided with an environmental housing.

The Subcontractor shall allow to install cameras by means of suitable mounting brackets against face brick and granite surfaces. In all cases an extended mounting arm of high quality steel or aluminium, 500mm in length, shall be allowed. The bracket and extension arm shall allow for adjustment of the camera. Although it is preferred the brackets are sourced from the camera supplier samples shall be provided for approval to the Contractor.

Dome cameras will be required with the following features:

- Sizes of 270 and 360mm diameter
- Camera will be mounted on ceiling
- Pendant dome colour will be white
- Lower dome colour will be smoked
- Auto focus/zoom with simple override to manual operation

1.4.3 LCD Monitors

Four 42" [inch] LCD monitors shall initially be required in the Main Security Control Room [allow for 30% extension].

The following basic requirements for viewing images shall be achieved:

- Stored images retrievable from log in 2 seconds.
- View live images from up to 4 cameras through one operator station, or up to 4 operation stations to view one camera.
- Zoom feature must be available for display images.
- Authorisation levels shall be available for all cameras, to select or prevent image display.
- Images displayed must be provided with digital Pan, Tilt and Roll functions.
- Tenderers shall state the viewing performance in fps that may be achieved by viewing multiple cameras at full size, as well as available trade-offs between frames capture rate and picture quality.

The following controls shall be mounted on the front of the monitor:

- On/Off power switch.
- Brightness control.
- Contrast control.

Horizontal and vertical hold controls shall be incorporated. These controls shall preferably be front mounted but easily accessible rear mounted controls will be accepted.

The monitors shall be freestanding with no cut-outs being accepted in the control desk. The Subcontractor shall note that all the monitors will be in close proximity to each other. It is therefore essential that all monitors are adequately screened and properly earthed. Any mutual interference and beat frequency that result shall be corrected at the expense of the Subcontractor.

Adequate cooling shall be provided in the design of the control desk for the monitors. This shall include ventilation slots at the rear of the control desk and pass through for cabling.

All wiring shall be neatly bonded and arranged. All intermediate power and control wiring shall terminate at numbered terminal strips. Video cables shall terminate on associated equipment using accepted connectors. Power and signal cables shall be separated throughout. Screened cables shall be used wherever possibility of mutual interference exists.

Cognisance shall be taken in the selection of the cabling to ensure cables will comply with the distance requirements between the cameras and the Security Control Room. Cabling shall be sized and selected to prevent degradation of the signal over the cables.

It is emphasised that the monitors shall be arranged to provide optimum viewing angles.

The subcontract includes all equipment and materials, cables and connections, terminals, plugs and sockets covers, finishing pieces, power skirting, etc. required to provide a neat and operationally complete installation.

1.4.4 Network Video Recorder (NVR) Hardware Platform

- The Network Video Recorder, a device for recording IP based video from IP output cameras or analog cameras that have been converted to IP output shall consist of a PC Compatible Chassis and other specified components, as shown in the following sub sections that together create the Network Video Recorder.
- NVR Chassis Configuration
- NVR Chassis which shall support a maximum of four video capture boards, one hard drive for OS and Software and up to eight (8) Serial ATA hard drives using Multi-Drive hard disk controller for video storage. RAID 5 hard disk controller configuration shall be available as an additional cost option.
- The end-user shall have the option of providing their own NVR chassis under the condition that it meets or exceeds the specifications as follows:
 - ✚ Intel Motherboard
 - ✚ 3.2 Ghz Processor Or Greater
 - ✚ 8 GB Of RAM or Greater
 - ✚ 800 Mhz Front Side Bus
 - ✚ Latest Microsoft Windows
 - ✚ 10/100/1000 Ethernet
 - ✚ Storage on SATA, SCSI or Fibre (internal or external)
 - ✚ Net Meeting
 - ✚ CD-ROM Drive

Mouse, keyboard and monitor (for initial setup)

Vol. 1.1 Part 2

BILLS OF QUANTITIES - NOTES TO TENDERERS

PROJECT TITLE:	UPGRADE & ADDITIONS EXISTING BUILDING (THE OLD OPD BUILDING IN THE OLD PART OF THE HOSPITAL) FOR TREATMENT OF CEREBRAL PALSY PATIENTS AT CECILIA MAKIWANE HOSPITAL – ICT AND SECURITY INSTALLATIONS
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- 1 All queries will only be answered in writing by the Engineer responsible for the project.
- 2 The Bills of Quantities form part of and must be read in conjunction with the specification which contains the full description of the work to be done and material and equipment to be used. Unless otherwise described in the Bills of Quantities, reference should be made to the specification for the full meaning of description of work to be done and materials and equipment to be used in this service. Tenderers are requested to check the formulas in the Bills of Quantities and are responsible for the accuracy of their formulas/calculations.
- 3 The total tender price in the tender form shall constitute the contract price of the successful Tenderer. Tenderers are advised to check their item extensions and total additions, as no claim for arithmetical errors will be considered.
- 4 No alterations, erasure or addition is to be made in the text of the Schedule of Prices. Should any alteration, erasure or addition be made it will not be recognised but the original wording of the Schedule of Prices will be adhered to.
- 5 The Priced Bills of Quantities of the successful Tenderer will be checked and the Employer reserves the right to call for adjustments to any individual price and to rectify any discrepancy whilst the total tender price, as submitted, remains unaltered.
- 6 The responsibility for accuracy of the quantities written into the schedules remains with the person who prepared the schedules. The Tenderer shall be relieved of responsibility of measuring quantities at the tender stage, and the tender sum submitted shall be in respect of the quantities set out in the schedules although he will be required to make his assessment of items such as brackets, fixings, etc., from details stated in the schedules and shall include in the item prices for such small installation materials as are required for the complete installation in accordance with the specification. Conductor prices shall include for wastage and sagging.
- 7 All conductors have been measured exclusive of sagging and wastage. The Contractors prices must therefore include for sagging as well as wastage.
- 8 All prices entered in these Bills of Quantities shall include for supply [unless otherwise stated], installation, testing, commissioning, guarantee with free maintenance during the Guarantee period and profit but excluding VAT.
- 9 The successful Tenderer and the Employer or his Agent may agree that the total of any bill or bills, including any variations by way of additions thereto or deductions therefrom, represents a fair accurate quantification of the items set out in the bills and the parties may agree to final payment on that basis. In the event of any dispute as to the quantities, the disputed item or items shall be adjusted where necessary.

- 10 The quantities in these Bills of Quantities are not to be used for ordering materials.
- 11 The description of each item shall, unless other-wise stated herein, be held to include making, conveying and delivering, unloading, storing, unpacking, hoisting, setting, fitting and fixing in position, all installation materials and sundries, cutting and waste, sagging, patterns, models and templates, plant, temporary works, return of packing, establishment charges, profit and all other obligations arising out of the conditions of contract.
- 12 All measurements are net and Tenderers must allow for wastage in the item rate submitted.
- 13 All provisional sums shall be expended as directed by the Employer and any balance remaining shall be deducted from the amount of the contract sum.
- All items described as "Provisional" shall be measured as executed and paid for according to prices in the Bills of Quantities and any unexpended amounts shall be deducted from the amount of the contract sum. No work for which "Provisional" items are provided shall be commenced without written instructions from the Employer.
- 14 It is a requirement of the contract that the work shall be carried out in the manner that is most economical on materials. Unless otherwise indicated by the Employer, the Electrical Contractor is required to use the shortest practical route for all conductors subject to the restrictions of the specification and good electrical practice.
- 15 The terms in the Bills of Quantities are based on standard Eskom/Telkom assemblies. The Tenderer shall take careful notice to the make-up of these assemblies with regard to the inclusion/exclusion of excavation, poles, stays, earthing and other items.
- 16 The prices shall be fixed and not subject to adjustment for inflation for the period between contract and programmed completion as set out in the contract.

Tenderers are to specifically note that the Bills of Quantities must be priced as per the quantities provided. Any change in the descriptions and/or additional information must be made in an alternative offer.

No quantities in the original Bills of Quantities or description of equipment offered are to be changed and must remain as is.

Note:

It will be expected of the successful tenderer to submit a full re-measured Bills of Quantities within twenty-one [21] days after acceptance of the tender price.

CECILIA MAKIWANE HOSPITAL - CEREBAL PALSY

SECURITY INSTALLATIONS

BILL NO. 1 : PROVISIONAL AND SUPERVISION AMOUNTS

ITEM	DESCRIPTION	UNIT	QTY	RATE	TENDER AMOUNT
	A Preliminary and General item is provided to cover the Contractor's charges for compliance with the Conditions of Contract and this Specification, including the provision, maintenance and removal of his site establishment, etc.				
1,10	FIXED CHARGES				
1.1.1	Site Establishment	Sum	1		
1.1.2	Removal of Site Establishment	Sum	1		
1.1.3	Provision of Electricity and Water	Sum	1		
1.1.4	Provision of Toilet Facilities	Sum	1		
1.1.5	<u>Other Fixed-charge Obligations</u>	Sum	1		
	(Please Specify)	Sum	1		
	. . . . .	Sum	1		
1,20	CONTRACTUAL REQUIREMENTS				
1.2.1	Provision of Sureties	Sum	1		
1.2.2	Insurances	Sum	1		
1.2.3	Third Party Insurance	Sum	1		
1.2.4	Guarantee of the Works	Sum	1		
1.2.5	Provide Test Results	Sum	1		
1.2.6	Provision of Record Drawings	Sum	1		
1.2.7	All OHSA Requirements including safety equipment and clothing	Sum	1		
1.2.8	All HIV / AIDS Specification Requirements	Sum	1		
1.2.9	<u>Other Value Related Obligations</u>	Sum	1		
	(Please Specify)	Sum	1		
	. . . . .	Sum	1		
1,30	TIME-RELATED ITEMS		1		
1.3.1	Contractual Requirements	Sum	1		
1.3.2	Operation and Maintenance of Site Establishment	Sum	1		
1.3.3	Supervision for the Duration of Contract	Sum	1		
1.3.4	<u>Other Time-Related Obligations</u>	Sum	1		
	(Please Specify)	Sum	1		
	. . . . .	Sum	1		
TOTAL SCHEDULE NO. 1 TO PRICE SUMMARY					

CECILIA MAKIWANE HOSPITAL - CEREBAL PALSY

SECURITY INSTALLATIONS

BILL NO. 2 : CCTV

ITEM	DESCRIPTION	UNIT	QTY	RATE	TENDER AMOUNT
2.1	CCTV FIELD EQUIPMENT				
	CCTV field equipment:				
2.1.1	2MP: Starrlight quality - Dome 1080P Low light minidome camera with varifocal lens and autofocus capabilities, WDR and light finder capabilities. High dynamic range with intelligent noise reduction, iris control with forensic capture. Camera to be vandal proof				
	Supply	each	6		
	Install	each	6		
2.1.2	Cat 6a Cable including terminations				
	Supply	m	900		
	Install	m	900		
	Terminations onto new and existing installations including connectors	each	15		
2.1.3	POE + Network Switches 24 port	each	1		
2.1.4	19" Wall mounted cabinet for above complete with glass door and screws	each	1		

TOTAL SCHEDULE NO. 2 TO PRICE SUMMARY					

CECILIA MAKIWANE HOSPITAL - CEREBAL PALSY

SECURITY INSTALLATIONS

BILL NO. 3 : ACCESS CONTROL

ITEM	DESCRIPTION	UNIT	QTY	RATE	TENDER AMOUNT
3.1	ACCESS CONTROL				
3.1.1	Physical Access Controllers as per Impro IPX400i with intergrated PSU and battery backup	each	1		
3.1.2	Access Reader Biometric + Card (Indoor) similar to Morphoaccess Sigma with unlock tokens	each	2		
3.1.3	Cat 6a Cable including terminations				
	Supply	m	300		
	Install	m	300		
	Terminations onto new and existing installations including connectors	each	5		
3.1.4	Mylar cable [4 pair]	m	150		
3.1.5	Breakglass units with alarm bell	each	2		
3.1.6	Door Contacts	each	4		
3.1.7	Touch free door release (stainless steel)	each	2		
3.1.8	Electro-Magnetic Lock	each	4		
TOTAL SCHEDULE NO. 3 TO PRICE SUMMARY					

CECILIA MAKIWANE HOSPITAL - CEREBAL PALSY

SECURITY INSTALLATIONS

BILL NO. 4: SUNDRY ITEMS

ITEM	DESCRIPTION	UNIT	QTY	RATE	TENDER AMOUNT
4.1	Housekeeping, sundry items, consumable stocks such as circuit beads engraving, labels etc.	Sum	1		
4.2	Testing of Installation Testing and commissioning of the system in the Hospital Control Room	Item	1		
4.3	Operating and Maintenance manuals Operating and Maintenance manuals (3 hard copy files and 3 CDs)	Sets	3		
4.4	Prepare record drawings for submission to Engineer	Item	1		
4.5	Training				

Training of 6 hospital staff in the complete functioning of the System,

Item

1

TOTAL SCHEDULE NO. 4 TO PRICE SUMMARY

CECILIA MAKIWANE HOSPITAL - CEREBAL PALSY

**SECURITY INSTALLATIONS
SUMMARY OF MAIN BILL**

DESCRIPTION	TENDER
BILL NO. 1 : P&G'S	
BILL NO. 2 : CCTV	
BILL NO. 3 : ACCESS CONTROL	
BILL NO. 4 : SUNDRY ITEMS	
SUBTOTAL	

10% Contingency _____

Total Excluding VAT _____

15% VAT _____

Total including VAT to Form of Offer _____

REMINDER NOTE

The Total Price including Main Contractor's Mark-up which excludes VAT, must be carried over to the final summary in Volume 1 and all fixed amounts shown in the price schedule must be included therein. No adjustments will be made for any failure by Tenderers to include the fixed amounts in the Total Price for this particular installation.

SUB-CONTRACTOR'S NAME:

DATE:

SIGNATURE:

N.B. The above-named Sub-Contractor is to be employed on this contract. Substitute Sub-Contractors are not acceptable.

The price submitted include all Main Contractor's 'Profit and Mark up BUT Exclude the VAT when transferring price to Volume 1 of the Final Summary Total of the Main Contractor's Document

VOLUME 1.1 BLOCK H

ELECTRICAL INSTALLATION

ICT Installation

Vol. 1.1 Part 2
DETAILED SPECIFICATIONS

PROJECT TITLE:	UPGRADE & ADDITIONS EXISTING BUILDING (BLOCK H) FOR OPHTHALMOLOGY SERVICES AT CECILIA MAKIWANE HOSPITAL – ICT AND SECURITY INSTALLATIONS
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1.0 INTRODUCTION & GENERAL

Should there be any conflict or ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority: -

- Schedule of Quantities
- Detailed Specification
- Drawings

Should the Tenderer notice any inconsistencies between these sections, it is his responsibility to notify the Engineer in order to obtain clarification thereon.

2.0 SCOPE OF WORK

The main contract is for the upgrade & additions existing building (Block H) for Ophthalmology services at Cecilia Makiwane Hospital, in Mdantsane, East London. This document covers, for the installation, testing and commissioning of ICT and Security Installations. The work entailed under this contract shall be:

2.1 ICT INSTALLATION

This installation entails:

- Installation of data switch with suitable wall mount data cabinet
- Installation of data and network cabling including terminating to points in various buildings
- Linking of new installation with existing hospital network
- Rerouting and repositioning of existing cables and ICT points in line with repurposed areas
- Supply and issuing of Operations and Maintenance manuals for the installation
- Provision of as-built drawings
- Configuration of installation working with client's IT personnel

2.2 SECURITY INSTALLATION

The security installation has been broken into two installations viz; Access Control. The work entailed on each installation is listed below.

- **Access Control**
 - Installation of door magnets on access-controlled doors
 - Installation of biometric/card readers and "Touch Free" release button
 - Emergency break-glass door unit with alarm
 - Linking of new installation with existing hospital network
 - Interfacing of the installation with fire detection
 - Supply and issuing of Operations and Maintenance manuals for the installation
 - Provision of as-built drawings

Cecilia Makiwane Hospital – Ophthalmology Services (Block H)

- Training of DOH staff on how to operate and maintain the equipment
- Intercom system complete with push-button on the main door, handset in the security room and its associated cabling

The Subcontractor is responsible for providing the installation in accordance with this Specification and as shown on tender drawings.

The intent of this document is a performance specification for a modular security management system encompassing the sub-systems described. Tenderers are at liberty to offer enhancements to the equipment specified.

The security subcontract will be inclusive of the following IP based installations:

- Door Monitoring
- Access Control
- Electro-mechanical and Magnetic locks
- Biometric/card readers
- Closed Circuit Television Cameras, Monitors and Recording
- Linking new installations with existing hospital network

Tenderers are encouraged to tender a main option which would represent a compliance with the specification and quantities and would relate to the completed Bills of Quantities. Alternative options may be offered together with a full motivation and separate Bills of Quantities.

In instances where reference is made or inferred to particular products, it only serves the purpose of defining a required standard. Tenderers are requested to offer the best and most suitable products for the application.

General items include the following:

- a) Cable trays to be supplied and used where possible and all cable to be neatly and securely tied with cable ties.
- b) If no cable trays, all cables to be installed in conduit and correctly secured.
- c) No cables may be left to lay on the ceiling boards.
- d) All cable loops to have minimum of 20% spare capacity.
- e) All cabling to electronic locks is to be installed on the secure side.
- f) No joins in cable will be accepted.
- g) All junction boxes and boards to be correctly mounted.
- h) All door monitors will be of the 20mm recessed type unless specified otherwise.
- i) All readers must be wired to facilitate the reader sounder and other functionalities.
- j) All electronic devices, power supplies and any other control equipment must be mounted neatly in suitable enclosures to protect them against damage and tampering. Each enclosure will be fitted with a tamper switch and all power supplies are to be monitored.
- k) All floor, room and ceiling voids to be protected and monitored for smoke, fire and water.
- l) All power supplies will be battery backed up with a 12Vdc, sealed rechargeable lead acid battery.
- m) All access control, fire detection and monitoring, plus emergency evacuation systems are to be connected to UPS power with battery back-up. Head end equipment must be provided with dual UPS power from different power breakers.

- n) On system hand-over, the installation is to be complete and FULLY functional.
- o) A complete set of user friendly operating instructions to be provided.
- p) Adequate operator training to be included in tender price.
- q) A complete set of design architecture drawings depicting correct positioning of all equipment to be supplied.
- r) All devices including public address speakers and access control devices must be labelled according to the floor number and location on the floor. A register of the items installed and the corresponding numbering must be supplied on hand over.
- s) All equipment must be networkable and facilitate remote monitoring and operation.

3.0 SPECIFICATION

Local and Supply Authority

The project location is in Cecilia Makiwane, Mdantsane, East London.

The area to be renovated consist of single-storey buildings.

Site Conditions

Equipment shall be suitable for the following conditions:

Ambient temperature	-5°C to 40°C
Altitude	0m
Relative Humidity	32°C dB Temperature 22°C wB Temperature
Nominal LV Supply	400/231 [no load] 4 wire, 3 phase system with earthed neutral.
Nominal HV Supply	11kV 3-wire system.
Frequency	50 Hz.

Details to be submitted with the tender document:

Should the tenderer in any way differ from the Specification, the differences shall be stated in detail. The information shall be included in a covering letter accompanying the tender, stating the paragraph of the Specification where the requirements are deviated from.

It shall be noted that the information entered in the schedules will not relieve the Subcontractor of his obligations to comply with the Specification.

3.1 ACCESS CONTROL

General

Tenderers shall submit a proposal for a modular access control and security management.

Tenderers shall respond fully to the following minimum criteria as well as any additional options offered:

System architecture, modular at all levels, to allow:

- Software elements to be installed as required in different locations.

Cecilia Makiwane Hospital – Ophthalmology Services (Block H)

- Large number of controllers to be connected via flexible multidrop interfacing.
- Software and hardware able to support local and remote sites.

Core software to be employed, providing set up and monitoring without affecting stand-alone operation of field elements and controllers.

Tenderers shall state their choice of software and support systems, based on stability, versatility and performance.

Field controllers to provide application needs and distributed intelligence, system speed and integrity as well as integral power supplies for powering door locks, etc.

Controllers to accommodate built-in communications firmware for communication with the core software.

Description of the following features offered by the system:

- Card holders and card production
- Monitor and Control
- Access Configuration
- Reports and storage [archive]
- Alarm Graphics
- Guard Clocking
- Video Identification [Video and Audio badging]
- Asset Tag discrimination
- Image monitoring
- Event trigger [external actions]
- Time Synchroniser
- Local Printing

Multiple alarm conditions, priorities, acknowledge, input monitoring capability.

- Availability of reporting and monitoring.
- History and session logs.
- History and database reports
- Time recording
- Card transaction record and tracking.

The system shall provide at least the following features, [capacities given are minimum requirements], to be extendable with +50%:

- [a] Transactions per 24 hour period 12 000 [+50%]
- [b] Number of cards
200 staff [+50%, provision only]
200 visitors [+50%, provision only]
- [c] Maximum card verification time 0.5 sec
- [d] Personnel records for each cardholder, which shall contain the following minimum information:
 - Name
 - Address

Cecilia Makiwane Hospital – Ophthalmology Services (Block H)

- Next of Kin
- Telephone Number [Home]
- Telephone Number [Work]
- Employee Number
- Identity number
- Unit number
- Car registration number
- Other information [10 lines of 80 characters per line], which shall be password, protected.

- [e] Anti-pass back operation at all levels [local and global as programmed].
- [f] Minimum of 24 levels of security each with four separately programmable time zones per level.
- [g] Minimum of 16 programmable time zones.
- [h] Automatic visitors card voiding. [Refer retrieval system specified.]
- [i] Lost card voiding with associated alarm.
- [j] Alarms for invalid transactions.
- [k] Event of alarm logging as selected with associated reports.
- [l] Automatic personnel logging for selected areas.
- [m] Personnel location interrogation.
- [n] Visitor/host attachment
- [o] Duress alarms
- [p] System alarm/event/protocol printer
- [q] Full interface [event recording, logging, lock-out, etc.] with CCTV and door monitoring system as required.
- [r] Four digit PIN option and Duress PIN function.

The Access Control system alarm and selected event recording [including video ID of visitors and vehicles as required] shall have a seven-day wrap-around storage capacity.

Tenderers are requested to tender the following option:

- Main Offer
Proximity card readers and cards as described above

Tenderers are requested to provide under separate heading in their tender submission, the following rates for higher access level readers, that may be available in the system offered, or may be imported into the system from other manufacturers:

- Biometric reader with Wiegand Interface (include card reader)

Tenderers shall confirm that the above higher level readers can be accommodated at any reader point in the system, in the card reader positions as indicated on the drawings.

The access control system will consist of a central processor located in the equipment room adjacent to the security control room with terminals as follows:

- [a] The reception counter on ground floor level shall be provided with two terminals for visitors card validation and tenant card validity checking. [Extend to four stations for +50% extension]
- [b] Visitors arriving by vehicle [one driver per vehicle] or on foot at the entrance, will be issued with a temporary card, which must be exchanged for a metal or other token to operate the exit boom [or pedestrian turnstile] upon leaving the premises. Tenderers shall allow for the provision of temporary plastic cards and tokens [1 000 per day +50% future], as well as for the required token-operated releases for the exit boom and exit pedestrian turnstile. [Both these being off-line devices]

The access control system shall be provided with a guard clocking/patrol facility, which will allow a user programmed route and time-lapse facility between card readers. This will allow the holders of defined cards to follow the route and if there is any deviation in route or time between stations, [too short or too long], then an alarm shall be raised in the Security Control Room.

Access cards offered shall be suitable for use with or without photographs of the holder.

The card readers shall have a positive means of indication to show that the card reader is on-line and whether a transaction is accepted or rejected.

Tenderers are advised that normal type proximity [or Smart Card option] cards will be used to be programmed for visitors. Tenderers shall allow high-reliability, dual reading visitor's card retrieval devices at the pedestrian barrier exit line at the main reception [full details to be submitted].

Specification

The Specification covers all activities up to final commissioning and maintenance during the guarantee period of the installation.

- IP Based Access control
- Full Integration of the above

Tenderers shall allow for the future extension of the systems and equipment offered for an additional 20% extension of all systems.

Access Control termination boxes will be provided on and will be all linked to the Hospital network.

The Access Control (ACS) Installation shall include but not be limited to:

- The installation of the ACS, supply, delivery, installation, testing, integration, commissioning, guarantee and maintenance of the Access Control Installation.
- The provision of all necessary equipment, tools, accessories and test equipment to complete the Security Installation.
- The timeous provision of building work details.
- The provision of shop drawings showing all wiring routes, equipment details, equipment positions, [including fixing details], sleeves, etc.
- The compilation of manuals including a full schedule of equipment installed spares lists, "As Built" drawings and information as set out in the Specification.

Related work by others

The following related work associated with this Subcontract will be carried out by other parties as specified:

Access Control Subcontractor and Main Contract

The following work will be provided by the Main Contractor:

- Provisions of penetrations in walls and structure for reticulation of cabling.
- Closing of ducts and opening through concrete slabs after installation of wiring and piping.
- Setting out of all equipment

Access Control Subcontractor and Electrical Subcontract

The following work will be provided by the Electrical Subcontractor:

- A 400V 3-phase or 240V [uninterrupted] power supply point at each point as required and identified by the Subcontractor. Any transformers or converters required for other voltages shall form part of this subcontract and shall be priced with associated equipment.
- All conduit and wiring channels.

Access Control Subcontractor and the Fire Detection, Alarm and Extinguishing System Subcontractor

The following related work will be provided by the Fire Detection, Alarm and Extinguishing System Subcontractor:

- The Fire Detection, Alarm and Extinguishing System Subcontractor will provide signals for the interfacing of the Fire Detection and Security Systems. These signals will be wired to terminal strips in the equipment racks in the Security Control Room. Connections of these signals to the Security System including wiring forms part of this Subcontract.
- The Fire Detection, Alarm and Extinguishing System monitoring and control computers will be located in the Security Control room.

The Access Control and CCTV installation Subcontractor will be required to liaise with the Fire Detection, Alarm and Extinguishing System Subcontractor if not the same Subcontractor to co-ordinate the requirements in respect of space, wiring routes and access.

Sub-Contracting

Tenderers are advised that no part of the Access Control and CCTV installation may be sub-contracted to companies external to the permanent employment of the Subcontractor, except for purposes of Empowerment as submitted in pre-qualification submissions. It is a specific requirement that all operational team members responsible for installation, commissioning and training shall be permanent employees of the tenderer.

Confidentiality

It is a condition of issue of these documents that the successful Subcontractor shall maintain full confidentiality of the documents and drawings.

During the course of the Subcontract, the successful Subcontractor shall institute such procedures to ensure proper control over copies of documentation and drawings. Such procedures may vary from time to time but shall include:

- Numbering of all prints of shop drawings and recording issue.
- Return of all drawings when superseded.

Conduits and wire-ways

All conduits and wire-ways required by the Subcontractor will be supplied and installed by the subcontractor as provided for in the bills of quantities.

Trunking in place of conduits will be preferred for neatness in areas of exposed slabs.

The Subcontractor shall provide shop drawings for requirements over and above those already indicated for co-ordination purposes. These shall in particular, show size and position of outlet boxes as well as details of any special fixings that are required. All additional wire ways and power supplies to be supplied on shop drawings that may be accordance with the product specified

All wiring required to make the Security System operational shall form part of this Subcontract. This shall include all power and control wiring from the 400V/240V power points installed by the Electrical Subcontractor.

All wire ways in the Security Control and Equipment rooms are excluded from this subcontract and will be installed by the Electrical Subcontractor.

MAGNETIC LOCKS AND STRIKES

Magnetic locks shall be fitted to all doors shown on the drawings and/or schedules.

The doors shall be in the locked position during normal operation and shall only be possible to open a door in one of the following ways:

- From the outside by presenting a valid card to the corresponding card reader and thereby activating the magnetic lock.
- From the outside by withdrawing the bolt from the strike with a key without activating the magnetic lock.
- By the fire system in the event of a fire. A main override will be provided at the control desk to override all magnetic locks in the event of a fire.
- By means of a green break glass emergency feature, operable in the event of a software failure.

The Subcontractor shall ensure and test that all magnetic locks are powered by the nearest available POE+ switch.

Should the magnetic lock be powered by a dedicated power supply, the installer is to ensure and test that the unit operates on UPS power if available.

All doors shall be equipped with a door closer which will be supplied and installed by the Contractor.

Cecilia Makiwane Hospital – Ophthalmology Services (Block H)

The magnetic locks shall be suitable for intermittent duty i.e. doors are normally locked and released only momentarily from time to time.

Locks to be installed by subcontractor requiring openings will be made by the main contractor. Where possible, locks must be recessed in doors/frames and the subcontractor is responsible for coordinating the required cut-outs etc. with the main contractor to be made in the door manufacturer's factory prior to delivery to site.

It will be the responsibility of the Subcontractor to identify to the Contractor doors to be equipped at the factory with concealed door loops and/or other equipment.

The installation of the magnetic lock and the alignment of the door to ensure proper operation shall be the responsibility of the Subcontractor.

Vol. 1.1 Part 2

BILLS OF QUANTITIES - NOTES TO TENDERERS

PROJECT TITLE:	UPGRADE & ADDITIONS EXISTING BUILDING (BLOCK H) FOR OPHTHALMOLOGY SERVICES AT CECILIA MAKIWANE HOSPITAL – ICT AND SECURITY INSTALLATIONS
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- 1 All queries will only be answered in writing by the Engineer responsible for the project.
- 2 The Bills of Quantities form part of and must be read in conjunction with the specification which contains the full description of the work to be done and material and equipment to be used. Unless otherwise described in the Bills of Quantities, reference should be made to the specification for the full meaning of description of work to be done and materials and equipment to be used in this service. Tenderers are requested to check the formulas in the Bills of Quantities and are responsible for the accuracy of their formulas/calculations.
- 3 The total tender price in the tender form shall constitute the contract price of the successful Tenderer. Tenderers are advised to check their item extensions and total additions, as no claim for arithmetical errors will be considered.
- 4 No alterations, erasure or addition is to be made in the text of the Schedule of Prices. Should any alteration, erasure or addition be made it will not be recognised but the original wording of the Schedule of Prices will be adhered to.
- 5 The Priced Bills of Quantities of the successful Tenderer will be checked and the Employer reserves the right to call for adjustments to any individual price and to rectify any discrepancy whilst the total tender price, as submitted, remains unaltered.
- 6 The responsibility for accuracy of the quantities written into the schedules remains with the person who prepared the schedules. The Tenderer shall be relieved of responsibility of measuring quantities at the tender stage, and the tender sum submitted shall be in respect of the quantities set out in the schedules although he will be required to make his assessment of items such as brackets, fixings, etc., from details stated in the schedules and shall include in the item prices for such small installation materials as are required for the complete installation in accordance with the specification. Conductor prices shall include for wastage and sagging.
- 7 All conductors have been measured exclusive of sagging and wastage. The Contractors prices must therefore include for sagging as well as wastage.
- 8 All prices entered in these Bills of Quantities shall include for supply [unless otherwise stated], installation, testing, commissioning, guarantee with free maintenance during the Guarantee period and profit but excluding VAT.
- 9 The successful Tenderer and the Employer or his Agent may agree that the total of any bill or bills, including any variations by way of additions thereto or deductions therefrom, represents a fair accurate quantification of the items set out in the bills and the parties may agree to final payment on that basis. In the event of any dispute as to the quantities, the disputed item or items shall be adjusted where necessary.
- 10 The quantities in these Bills of Quantities are not to be used for ordering materials.

- 11 The description of each item shall, unless other-wise stated herein, be held to include making, conveying and delivering, unloading, storing, unpacking, hoisting, setting, fitting and fixing in position, all installation materials and sundries, cutting and waste, sagging, patterns, models and templates, plant, temporary works, return of packing, establishment charges, profit and all other obligations arising out of the conditions of contract.
- 12 All measurements are net and Tenderers must allow for wastage in the item rate submitted.
- 13 All provisional sums shall be expended as directed by the Employer and any balance remaining shall be deducted from the amount of the contract sum.
- All items described as "Provisional" shall be measured as executed and paid for according to prices in the Bills of Quantities and any unexpended amounts shall be deducted from the amount of the contract sum. No work for which "Provisional" items are provided shall be commenced without written instructions from the Employer.
- 14 It is a requirement of the contract that the work shall be carried out in the manner that is most economical on materials. Unless otherwise indicated by the Employer, the Electrical Contractor is required to use the shortest practical route for all conductors subject to the restrictions of the specification and good electrical practice.
- 15 The terms in the Bills of Quantities are based on standard Eskom/Telkom assemblies. The Tenderer shall take careful notice to the make-up of these assemblies with regard to the inclusion/exclusion of excavation, poles, stays, earthing and other items.
- 16 The prices shall be fixed and not subject to adjustment for inflation for the period between contract and programmed completion as set out in the contract.

Tenderers are to specifically note that the Bills of Quantities must be priced as per the quantities provided. Any change in the descriptions and/or additional information must be made in an alternative offer.

No quantities in the original Bills of Quantities or description of equipment offered are to be changed and must remain as is.

Note:

It will be expected of the successful tenderer to submit a full re-measured Bills of Quantities within twenty-one [21] days after acceptance of the tender price.

CECILIA MAKIWANE HOSPITAL - OPHTHALMOLOGY SERVICES (BLOCK H)

ICT INSTALLATIONS AND ACCESS CONTROL

BILL NO. 1 : PROVISIONAL AND SUPERVISION AMOUNTS

ITEM	DESCRIPTION	UNIT	QTY	RATE	TENDER AMOUNT
	A Preliminary and General item is provided to cover the Contractor's charges for compliance with the Conditions of Contract and this Specification, including the provision, maintenance and removal of his site establishment, etc.				
1,10	FIXED CHARGES				
1.1.1	Site Establishment	Sum	1,00		
1.1.2	Removal of Site Establishment	Sum	1,00		
1.1.3	Provision of Electricity and Water	Sum	1,00		
1.1.4	Provision of Toilet Facilities	Sum	1,00		
1.1.5	Other Fixed-charge Obligations	Sum	1,00		
	(Please Specify).	Sum	1,00		
	. . . . .	Sum	1,00		
1,20	CONTRACTUAL REQUIREMENTS				
1.2.1	Provision of Sureties	Sum	1,00		
1.2.2	Insurances	Sum	1,00		
1.2.3	Third Party Insurance	Sum	1,00		
1.2.4	Guarantee of the Works	Sum	1,00		
1.2.5	Provide Test Results	Sum	1,00		
1.2.6	All OSHA Requirements including safety equipment and clothing	Sum	1,00		
1.2.7	All HIV / AIDS Specification Requirements	Sum	1,00		
1.2.8	Other Value Related Obligations	Sum	1,00		
	(Please Specify).	Sum	1,00		
	. . . . .	Sum	1,00		
1,30	TIME-RELATED ITEMS		1,00		
1.3.1	Contractual Requirements	Sum	1,00		
1.3.2	Operation and Maintenance of Site Establishment	Sum	1,00		
1.3.3	Supervision for the Duration of Contract	Sum	1,00		
1.3.4	Other Time-Related Obligations	Sum	1,00		
	(Please Specify).	Sum	1,00		
	. . . . .	Sum	1,00		
TOTAL SCHEDULE NO. 1 TO PRICE SUMMARY					

CECILIA MAKIWANE HOSPITAL - OPHTHALMOLOGY SERVICES (BLOCK H)**ICT INSTALLATIONS AND ACCESS CONTROL****BILL NO. 2: ICT (DATA AND TEL WIRING) INSTALLATION**

ITEM	DESCRIPTION	UNIT	QTY	RATE	TENDER AMOUNT
2.1	NETWORK SWITCHES				
2.1.1	Supply and install 48 port network switch	no	1		
2.1.2	Supply and install wall mounted cabinet suitable for above network switch with glass door	no	1		
2.2	TELEPHONE BOARD				
	The supply and installation of flush board with soft wood backing architrave and hinged door				
2.2.1	Supply and install 300 x 300 x 100 board	No.	0		
2.3	HORIZONTAL CABLING				
2.3.1	The supply and installation of horizontal unshielded CAT6 UTP cable as per specification.	m	2000,00		
2.3.2	The supply and installation of horizontal unshielded CAT6a UTP cable as per specification	m	100,00		
2.3.3	The supply and installation of Telephone cabling similar to existing price to include terminating cable onto RJ11 in power skirting	m	600,00		
2.3.4	Termination of horizontal cabling onto patch panels in patch rooms. The labour to terminate the cabling onto the horizontal patch panel shall be allowed for under this heading	no	60		
2.3.5	The supply and installation in the floors/ceiling of unshielded RJ45 data connectors in powerskirting/unistrut/void duct as per the specification, complete with shutters and adequate space for cable numbering. This item relates only to the RJ 45 connectors and the housings. CAT6 UTP	no	60		
2.3.6	Data termination plate sized for the mounting of the data outlet housing on the void duct in the floor/ceiling [recessed type]. The data termination plate shall have 3 x punch-outs 250mm x 127mm mounted on P9000 - to be verified prior to installation.	no	5		
2.3.7	Data cover plate for a 4x4 box with data cut-out similar or equal to Legrand Arteor with RJ45	no	5		
2.5	LABELLING				
2.5.1	The supply and installation of heat shrink type labels at either end of the data cable as specified.	no	100,00		
2.5.2	Labels consisting of engraved Perspex tags glued onto the 6 way 4-port outlets indicating the data connector number as per the specification and DOH requirements	no	20		
2.5.3	Labelling of the data points on the ceiling T's underneath the ceiling to facilitate easy referencing and identification of location of voice and data points underneath the raised access floor tiles	no	20		
2.6	PROVISIONAL ALLOWANCES				
2.6.1	Trace existing ICT network and link it to the new installation including rerouting existing services to new areas				
	Team leader	Hrs	48,00		

		Assistant	Hrs	48,00		
TOTAL SCHEDULE TO NEXT PAGE						
TOTAL FROM PREVIOUS PAGE						
2.7	TESTING					
2.7.1	Testing and commissioning of the entire Installation		Sum	1,00		
2.8	ON SITE SUPPORT					
	It is expected of the vendor to provide support for the pre and post contract works for assisting the tenant whilst moving into the building.					
2.8.1	Team hours required for the on-site support. The hourly rate will be for a team comprising a team leader and one assistant					
		Team leader	Hrs	48,00		
		Assistant	Hrs	48,00		
TOTAL SCHEDULE NO. 2 TO PRICE SUMMARY						

BILL NO. 3: ACCESS CONTROL AND INTERCOM INSTALLATION

ITEM	DESCRIPTION	UNIT	QTY	RATE	TENDER AMOUNT
3.1	ACCESS CONTROL				
3.1.1	Physical Access Controllers with intergrated PSU and battery backup	No	1		
3.1.2	Access Reader Biometric + Card (Indoor) similar to Morphoaccess Sigma with unlock tokens	No	1		
3.1.3	CAT 6 cable	m	100		
3.1.4	Mylar cable [4 pair]	m	100		
3.1.5	Breakglass units with alarm bell	No	1		
3.1.6	Door Contacts	No	2		
3.1.7	Touch free door release (stainless steel)	No	1		
3.1.8	Electro-Magnetic Lock suitable for double door openings	No	2		
3.2	INTERCOM				
	Supply, Install, test and commission a complete intercom system including all necessary accessories and cabling at positions shown on the drawings				
3.2.1	1 button wall mounted Audio Only handset complete with mounting accessories	No	1		
3.2.2	1-button intercom front panel made of natural anodized satin finish aluminum. With polycarbonate bracket, it features pictograms to indicate the status of the system and 1 button with name tag size 66 x 15 mm. To pair up with an intercom module. Impact resistance rating IK07.	No	1		
3.2.3	Cabling to link handset to front panel including electro-magnetic door lock	m	50		
3.2.4	Testing and commissioning of installation	Sum	1		

TOTAL SCHEDULE NO. 3 TO PRICE SUMMARY					

CECILIA MAKIWANE HOSPITAL - OPHTHALMOLOGY SERVICES (BLOCK H)

BILL NO. 4 : SUNDRY ITEMS

ITEM	DESCRIPTION	UNIT	QTY	RATE	TENDER AMOUNT
4.1	Housekeeping, sundry items, consumable stocks such as engraving, labels etc.	Sum	1		
4.2	Testing of complete installation in terms of the regulations	Sum	1		
4.3	Operating and Maintenance manuals (hard copies and CD)	Sets	3		
4.4	Training of 6 hospital staff in the complete functioning of the System,	Item	1		

TOTAL SCHEDULE NO. 4 TO PRICE SUMMARY					

CECILIA MAKIWANE HOSPITAL - OPHTHALMOLOGY SERVICES (BLOCK H)

ICT INSTALLATIONS AND ACCESS CONTROL

PRICE SUMMARY PAGE

BILL NO.	DESCRIPTION	AMOUNT
1	PRELIMINARY & GENERAL	
2	ICT	
3	Security - Access Control and CCTV	
4	Sundry Items	
SUBTOTAL		

10% Contingency _____

Total Excluding VAT _____

15% VAT

Total including VAT to Form of Offer _____

REMINDER NOTE

The Total Price including Main Contractor's Mark-up which excludes VAT, must be carried over to the final summary in Volume 1 and all fixed amounts shown in the price schedule must be included therein. No adjustments will be made for any failure by Tenderers to include the fixed amounts in the Total Price for this particular installation.

SUB-CONTRACTOR'S NAME:

DATE:

SIGNATURE:

N.B. The above-named Sub-Contractor is to be employed on this contract. Substitute Sub-Contractors are not acceptable.

The price submitted include all Main Contractor's 'Profit and Mark up BUT Exclude the VAT when transferring price to Volume 1 of the Final Summary Total of the Main Contractor's Document

VOLUME 2.1 CP

MECHANICAL INSTALLATION

FIRE DETECTION

VOLUME 2.1 PART 1: EARLY WARNING FIRE DETECTION - 1 SCOPE OF WORKS

EARLY WARNING SMOKE DETECTION & SUPPRESSION EQUIPMENT INSTALLATIONS

1. **GENERAL**

- 1.1 The Standard for Uniformity in Construction Procurement published in terms of the Construction Industry Development Board (CIDB) Act, 2000 (Act No. 38 of 2000), the Standardized Construction Procurement Documents for Engineering and Construction Works as issued by the CIDB and any other relevant documentation pertaining thereto must be studied and all principles in this regard must be applied to all procurement documentation, practices and procedures.

2. **THE CONTRACT**

2.1 **EARLY WARNING SMOKE DETECTION & SUPPRESSION INSTALLATIONS**

The work to be carried out and commissioned by a SAQCC Fire approved installer:

- a. Installation of new early warning fire detection & suppression equipment, as per SANS 10400 Section T; SANS 10139 & SAN 322
- b. Testing and Commissioning, as per SANS 10400 Section T; SANS 10139 & 322,
- c. Manuals, Drawings, OEM Literature,

2.2 **Existing**

All installations new. Building Existing.

2.3 **Order of The Works**

As per the building contractors' program of works.

VOLUME 2 PART 2: EARLY WARNING FIRE DETECTION - STANDARD SPECIFICATION

AUTOMATIC FIRE DETECTION INSTALLATIONS

1.0 INTRODUCTION AND GENERAL

The system shall offer the best possible compromise between the initial expenditure and the long term interest and redemption charges and running / operating costs.

All workmanship and materials used in the execution of the works shall conform with modern practice and the entire installation shall comply fully with all relevant requirements of governmental and the Local Authority whose jurisdiction embraces the location of the site.

2.0 REFERENCES

The work shall be carried out strictly in accordance with:

- a. The Machinery and Occupational Safety Act of 1984.
- b. All relevant Regulations and Bylaws of the Municipal Council and Fire Department concerned.
- c. The National Fire Protection Association (NFPA) No 12.
- d. SANS 0139-1981 -Code of Practice for The Prevention, Automatic Detection and Extinguishing of Fire in Buildings.
- e. BS 5839 and European Standard EN 54, Parts' 2 and 4.

Where no Building, Municipal, Health or Fire Department Act, Regulation, Bylaw or other requirement exist, nor any SANS standard or detailed requirement by the Engineers then the Contractor's terms of reference shall always be the current editions of NFPA handbook.

3.0 INSTALLATION GENERAL PRACTICES

- a. All electrical equipment shall comply with the relevant SANS or BSS where applicable, and to SANS 10142, Code of Practice for the Wiring of Premises.
- b. Material shall be subject to the approval of the Engineer, to whom samples shall be submitted upon request.
- c. Cable sizes for each circuit shall be selected to ensure that the current carrying capacity will be adequate and that the voltage drop at the equipment served will comply with the Code of Practice for the Wiring of Premises.
- d. Wiring shall be carried out in PVC insulated cables enclosed in Class B conduit or approved trunking. Alternatively, M.I.M.S., fire resistant cable, or PVCSWAPVC cable may be used where convenient, and where permitted under the section Wiring between Detection Zones hereunder.
- e. All cables, cable trays, conduits (other than those encased in concrete or chased into walls), and cable trays shall run parallel with, or at right angles to the structure or walls. Their routes shall be co-ordinated with piping and duct systems. They may run on the surface of walls and ceilings in all plantrooms, in ceiling voids and in underfloor voids where permitted by the clause Wiring between Detection Zones. Elsewhere they shall be concealed in an approved manner.
- f. No cable or electrical shall be routed within 75 mm of a hot water pipe.

4.0 WIRING BETWEEN DETECTION ZONES

The control wires or power cables between the control panel, the battery pack, a detection zone or where the wiring of a detector circuit passes through any other detector zone, shall be one of the following:-

- a. Mineral insulated metal sheathed cable which shall complying with all SANS and BS EN codes. The Contractor may be required to demonstrate to the Engineer that he is proficient in making off these types of cables.
- b. PVC insulated annealed copper wire complying with SANS 150, housed within conduits which are buried into cement or brickwork. Surface conduits between zones will not be permitted.
- c. Fire resistant cables in compliance with SANS 150 and SANS Method 494 Resistance of cables to Fire Propagation.
- d. PVCSWAPVC cables and terminations complying with SANS 150.
- e. Aluminium cables will not be permitted.

5.0 CABLES AND WIRING

5.1 MIMS Cables

- a. MIMS cables shall be mineral insulated copper sheathed and copper core cables equal to pyrotenax of not less than 600 volt grade. Aluminium cables will not be permitted.
- b. Minimum sizes for MIMS cables shall be 1,5 mm² for power and 1,00 mm² for control wiring.
- c. Tails shall be sleeved with silicone rubber insulation in appropriate colour.
- d. All cable fixings shall tie by means of factory manufactured brass or copper saddles or clips, secured by brass or cadmium plated screws.
- e. Clips or saddles shall be provided within 150 mm of fittings, accessories or bends, and not more than 600 mm apart elsewhere. No more than 4 cables shall be secured by a single saddle.
- f. A straight length of cable shall be left adjacent to termination glands to enable the glands to be readily withdrawn. The cables shall be made-off with approved standard pot-type seals and accessories as applicable.
- g. The minimum bending radius of cables shall be 6 times the cable diameter.
- h. Where a number of cables run parallel they shall be dressed into a neat symmetrical arrangement without sagging or distortion. Care shall be taken to avoid flattening or indentation of cable sheaths.
- i. Where cables come into contact with dissimilar metals, which may give rise to corrosion, the Contractor shall adequately separate the surfaces with PVC tape or by other approved means.
- j. Where cables pass through holes in metal-work, the holes shall be neatly bushed to prevent damage to the sheath.
- k. Cables shall not be buried directly in plaster, concrete or similar materials.
- l. Where installation in these materials is necessary, the cables shall be enclosed in a suitable duct, pipe or conduit, which is provided with bushed ends to prevent damage to the cable sheath.
- m. Cables shall be mechanically protected where they rise from floors in exposed positions and where they may be exposed to accidental damage.

5.2 PVC Insulated Wire

- a. PVC insulated copper wire conductors shall be of South African origin, manufactured to comply with SANS 150.
- b. Where PVC insulated wires are used, the installation shall comprise PVC insulated copper conductors drawn into duct or conduit. Where such wires are drawn into conduits it shall be carried out in accordance with standard electrical practice, and shall be subject to the approval of the Engineer.
- c. No joints in the PVC wires between terminal points will be permitted under any circumstances.

5.3 Fire Resistant Cables

- a. The fire resistant cable shall be constructed of silicon rubber insulated copper conductors housed in a protective PVC sheath bonded to coated aluminium foil. This shall be as per PH120 Fire Resistant Cable Fire Resistant Cable or similar approved.
- b. These cables shall be installed in the manner prescribed for MIMS cables, with attention being paid to any special requirements regarding terminations, radius of bends, etc., as prescribed by the manufacture.
- c. No joints in this cable will be permitted.

5.4 Armoured Cables

- a. PVC/SWAPVC cables and cable terminations shall comply with SANS 150 and shall be of 660 volt grade.
- b. These armoured cables where permitted, may:
 - Lay flat on cable trays, fixed with approved ties.
 - Where the cable tray is vertical, the armoured cables are to be held in position by approved straps.
 - Fixing with wire is not permitted.
 - Be fixed to the masonry with saddles.
 - Be fixed to unistrut with the approved fixing saddles.
- c. Where the cable is in a ventilation air path (other than the underfloor void of a computer room) the outer PVC sheath is to be removed after fixing if so demanded by the local authorities.

- d. No joints in PVC cables will be permitted under any circumstances.
- e. The PVC cable glands shall consist of the brass cone type with waterproof seal, equal to "DESCO", and shall be suitable for PVCSWAPVC general purpose 660 volt grade cable.

6.0 CONDUITS

- a. Conduit shall be heavy gauge welded screwed steel conduit to SANS 162 and powder coated yellow.
- b. Conduit shall be clean, true and free from internal obstructions.
- c. Burrs shall be removed with taper reamer. All free ends shall be fitted with approved bushes.
- d. No conduit shall be less than 25 mm nominal diameter.
- e. No surface conduits, PVC conduit or box trunking will be permitted between two separate detection zones or between detection and non-detection zone. They can however be used within a single detection or gas protected zone to interconnect the detectors and other equipment housed within that zone.
- f. The entire conduit system shall be watertight, electrically and mechanically continuous.
- g. During installation, the ends of conduit shall be temporarily plugged to prevent the ingress of dirt and moisture.
- h. Conduits shall be securely saddled along the length of the run and saddles shall be provided within 500 mm of all fittings or terminations.
- i. Sets and bends shall be made cold with approved bending machines in such a manner that there is no damage to or distortion of the conduit. In locations where it is not practicable to use sets for changes in direction, such changes shall be made by the use of approved screwed fittings.
- j. All sets and bends shall be such that they permit cables to be drawn easily into the conduits after installation.
- k. All junction boxes provided to facilitate the drawing-in of cables shall be located in positions which will be readily accessible in the completed project.
- l. Inspection fittings shall not be used as "Loop-in" points.
- m. The whole conduit installation shall be a "Loop-in" installation.
- n. Conduits shall be installed in such a manner that they are free from mechanical stress.
- o. No threads shall be visible after erection, other than at running joints.
- p. Running threads shall be thoroughly painted.
- q. Final connections to plant (other than in cases where the items can be mounted directly to termination boxes) shall be run to a junction box adjacent to the item of equipment.
- r. Flexible conduit connections are to be installed between the round terminal box adjacent to a ceiling void detector and its ceiling mounted remote indication lamp. The flexible conduit plus the PVC wires contained therein shall be left sufficiently long to allow for the indication of the lamp in the centre of a ceiling tile (which may not fall directly beneath the terminal box). There shall be no stress imposed on the flexible conduit.
- s. Before the drawing in of any conductors the conduit installation shall be complete with lock-nuts, bushes and all other accessories in accordance with standard electrical practice. Conduits shall be cleaned out and swabbed dry internally.

7.0 CABLE TRAYS

- a. Cable trays shall be of Pyrotenax, unistrut or other approved manufacture.
- b. The size and gauge of all trays shall be chosen to suit each particular application. They shall be adequately stiffened and braced both transversely and longitudinally, ensuring a true finished run.
- c. All screws, washers, nuts, etc. used in the installation of the trays shall be cadmium plated.
- d. All trays, fittings, brackets, etc. shall be galvanised or electro-tinned and where exposed shall be painted after erection in accordance with the details as specified herein.
- e. All trays shall be supported by brackets at intervals sufficiently small to produce a robust installation and to ensure that there is no perceptible deflection of the finished tray and its associated supports.
- f. All bends, tee-offs, changes in section and changes in direction shall be made with factory finished fittings.
- g. All joints shall be made with approved jointing plates. Lapped joints will not be permitted.

8.0 TRUNKING

- a. Trunking shall be manufactured from galvanised sheet metal of a thickness not less than 1 mm for runs, and 1,6 mm for bends, off-sets, reducing pieces, etc.
- b. Trunking shall comply with BS 4678.
- c. Covers shall be of the same material as the trunking and shall not exceed 1,2m in length.
- d. All screws, nuts, washers, etc. shall be cadmium plated.
- e. The trunking and covers shall be braced as necessary to ensure rigidity, and the open side of the trunking shall be provided with right angled returns to receive the covers.
- f. The covers shall be securely fixed to the trunking by means of approved clips or fasteners.
- g. The trunking shall be supported to brackets at intervals sufficiently small to produce a robust rigid installation and to ensure that there is no perceptible deflection of the trunking between supports.

- h. All bends, tee-offs, changes in section and changes in direction shall be made in factory-manufactured fittings.
- i. All joints shall be butt joints, made with internal fishplates.
- j. Lapped joints will not be permitted.
- k. Screws shall be cut off flush with the top of the nuts after erection, and shall be filed smooth and painted.
- l. The trunking is to be cut square where cutting is necessary for jointing etc. Cut edges shall be smoothed off with a file.
- m. Plastic trunking may be permitted at the Engineers discretion and subject to his approval of the specific material offered.

9.0 CONTROL PANELS

9.1 General

- a. The control panel shall be wired in the factory and not on site. The only connections to be made in the panel on site shall be the interconnection with the field wiring.
- b. All outgoing circuits shall terminate on numbered terminals with approved lugs where the numbers correspond to those reflected on the as-built drawings.
- c. Wires within the cubicle shall bear an identification number at both ends. Numbering shall be by approved wiring ferrules securely attached so that they will not slip off when the wire is removed from its terminal.
- d. The numbering shall correspond to the drawings. Handwritten numbers or adhesive tape bearing numbers will not be acceptable.
- e. When a device is removed from the loop, it must be reflected on the panel as a faulty device and it must be clear once the device has been re-installed.

10.0 ZONE PANEL

10.1 General

- a. Allow to supply and install a zone layout with a building plan and line unit numbers located adjacent each fire control panel.

11.0 NETWORKING

11.1 General

- a. The networking capabilities of the system shall be such that all control panels may be connected via optical medium. The system shall ensure rugged and reliable "peer to peer" operation. It shall be possible to remove and add to the network to allow for easy expansion of the system.
- b. The network shall use an industry standard protocol such as ARCNET or ETHERNET to ensure that no data is corrupted.
- c. The network is to feature:
 - Inter-panel Input/Output programming.
 - Remote uploading/downloading of system configurations to individual panels.
 - Remote maintenance.
 - RS232 nodes for connection to graphics packages, building management systems and modems.
 - Global repeater panel.
 - LCD repeaters.

12.0 LINE ISOLATORS

Loop isolators are to be connected in to the loop circuit and monitor for short circuit. In the event of a short circuit occurring the loop isolators on each side of the short circuit are to disconnect and isolate that portion of the loop from the system, enabling the remainder of the system to function normally.

A light emitting diode (LED) must illuminate when a loop/line isolator is in an open condition.

VOLUME 2.1 PART 3: EARLY WARNING FIRE DETECTION - DETAILED SPECIFICATION

AUTOMATIC FIRE DETECTION INSTALLATIONS

1.0 INTRODUCTION & GENERAL

This Detail Specification complements & qualifies the foregoing standard specifications of material & workmanship. The Standard Specification should be regarded as a basis and guideline, with this Detailed Specification taking preference where any ambiguity is concerned.

In the event of any further technical ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority:

- a) Schedule of quantities
- b) Project specification
- c) Drawings (loose and bound-in)
- d) Standard specification

2.0 SITE CONDITIONS

Location: Cecelia Makiwhane Hospital, Cerebral Palsy Dept., Buffalo City, Eastern Cape

3.0 SCOPE OF WORK

The standard specification shall apply unless otherwise indicated in this section.

The drawings issued herewith and listed in the relevant section are to be read in conjunction with the specification and all items mentioned, together with all ancillary equipment necessary for the correct installation, operation and full compliance with the Standards and codes must be provided, notwithstanding the fact that they may not have been included in detail in these documents.

The bidder shall, at the time of bidding, draw the Engineer's attention to any omissions or discrepancy between the specification and the drawings and request from him clarification of details or responsibilities.

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

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

If any such items of equipment, brackets and accessories, etc., have been omitted from a supplier's quotation, or incidental work is necessary, the bidder must include for all such items and work in the bid.

The whole installation shall be in accordance with the latest edition of the Occupational Health and Safety Act: No. 85 of 1993. All regulations framed therein, shall be carried out to the satisfaction of the Engineer.

All equipment offered by the bidder shall be to the approval of the duly appointed Engineer, prior to installation. This Standard Specification and the Detailed Specification with drawings shall be carefully adhered to by the bidder. Equipment installed without the approval of the Engineer will have to be removed at the Contractor's expense and be replaced with officially approved listed items.

The successful bidder will be required to prove to the Engineer that he has qualified personnel on his staff establishment as well as recognised test equipment for the successful completion of a safe working installation.

The contractor shall employ only skilled artisans and technicians approved by the Engineer who are competent in this type of work. The work shall be carried out in accordance with the standards laid down by the Engineer.

The contracting firm shall be recognised contractor specialising in this field and approved by the Engineer.

The work performed shall comprise the supply, delivery, off-loading, interim storage, installation, testing, commissioning and leaving in good working order of the complete fire detection and evacuation system installation inclusive of all guarantees as specified herein and the supply of 'AS IS' installation record drawings, Maintenance and Operating Manuals for:

- Supply and installation of a Category L1 automatic fire detection and alarm evacuation system equipment.
- Supply and installation of PVC conduit and galvanised steel trunking.
- The liaison with:
 - Building/Principal Contractor, and their Domestic Sub-contractors,
 - Electrical Sub-contractor,
 - Air Conditioning Sub-contractor,
- Testing and commissioning (SAQCC Commissioner) of all equipment in the fire protected areas with and in conjunction with the Air Conditioning Sub-contractor.

This Sub Contract also includes all electrical works for the installation but excludes the power supply to the Main Panel which will be provided by others.

Notwithstanding any omission in this specification the installations shall be complete in all respects. This condition shall be recognised in the preparation of all working drawings submitted for approval. Further, despite any approval of working drawings given by and on behalf of the Main Contractor the responsibility for correct functioning of the plant during tests, inspection and the maintenance period shall rest entirely with the successful bidder.

The installation shall be strictly in accordance with the approved drawings or such further drawings, modifications, or instructions as may be given by the Engineer concerned, or that are found to be necessary, and such modifications or instructions shall be deemed to be within the specification for the purpose of the bid, and shall not vitiate the contract.

Payment for such modifications will only be made on certification by the Engineer to the effect that such modifications have involved additional expense to the Sub-Contractor.

The following sections of Work are excluded:

- Builder's work e.g. cut-outs in walls to Tenderer's specifications, including chasing and making good of walls.
- The cutting of holes in suspended ceilings and ceiling tiles for the fixing of detector heads, sirens and other fire devices.
- Tiling, painting or decorating after installation
- Provision of suitable 220 V / 1 phase power supply for Control Panel.

3.0 SITE CONDITIONS

The site shall be serviced as far as electricity services are concerned, although Tenderers must make provision for an alternative electricity supply during installation.

The equipment specified herein shall be designed to operate at the environmental parameters as follows:

Location: Cecelia Makiwhane Hospital, Cerebral Palsy Dept., Buffalo City, Eastern Cape

4.0 PROGRAMME

The Sub Contractor shall complete the installation within the time stipulated. The Sub Contractor will be required to report to the Principal Contractor, generally on a weekly basis (or more often if required by the Principal Contractor), progress of work and any difficulties arising, to enable the Principal Contractor to update the programme.

The sequence in which the work is to be carried out shall be decided upon in consultation with the Principal Contractor. The Sub Contractor shall thereafter submit an adequately detailed Sub Contractor's installation programme for approval within two (2) weeks of the Sub Contract being awarded unless otherwise indicated herein after.

This programme must be periodically updated as the work progresses and as may be necessary to meet changing site conditions and alterations to the overall installation programme.

Programmes shall take the form of bar charts, network diagrams and schedules as may be required by the Main Contractor or as applicable, and shall reflect quantities of work as required for supervision purposes and measurements.

As a minimum the programme shall reflect:

- sequence and timing of installation activities.
- sequence and latest event times of major equipment ordering, manufacture and delivery dates.
- sequence and dates for the submission of drawings and samples for approval.
- sequence and dates for factory and site inspections and tests.
- target and achieved work quantities on a weekly, fortnightly and monthly basis.

In preference all work is to be undertaken by staff in the full time employ of the bidder.

All work which is to be undertaken by "Domestic Sub Contractors" of the Sub Contractor will be clearly identified in the bid submission and the Sub Contractors to be used subject to prior approval of the Client and/or Engineer and/or Principal Contractor; failure to comply with this requirement may result in the "Domestic Sub Contractors" being removed from site.

All costs in replacing the undesirable "Domestic Sub Contractor" or any delays incurred as a consequence of this will be entirely for the Sub Contractor's account.

5.0 PROJECT TECHNICAL SPECIFICATION

The bidder shall allow for programming the work in such a manner as to not disrupt the Main Contractor's programme. Sequence of work to suit the Sub Contractor's requirements will not be guaranteed nor accepted.

Claims from Sub Contractors arising out of broken work sequences or agreed programmes changed due to contingent requirements, will not be considered unless full motivations for the extra costs are submitted; the motivation for extra costs must justify costs in terms of the accepted programme and any unforeseen and justifiable additional staffing levels required to meet targets revised with insufficient notice. Reallocation of staff and/or acceleration of work will not be reason enough to claim for extra costs unless the Sub Contractor can prove that he has indeed had to pay for staff's idle time which was not or could not be envisaged at the time of bidding and/or drawing up the installation programme and sequence. When claiming for extra cost all out of town cost will be disallowed as it is assumed that the Sub Contractor has fully staffed premises in the vicinity of the site.

The Subcontractor must also assume that work may be required to continue uninterrupted outside of normal working hours and/or for an extended and/or unbroken period of time.

5.1 Automatic Fire Detection System

The building is to be constructed, the system will have a new analogue addressable fire detection system with corresponding line devices as specified in the bill of quantities and drawings provided.

All fire signals received by a sensor are to be confirmed by a sensor in a zone or any break glass unit; all confirmed signals will be automatically relayed to the Main Fire Alarm Panel unit. If not cancelled (reset) within a specified time (less than four minutes) all signals which are not confirmed will be automatically relayed via the GSM unit to the pre-programmed contact numbers and/or Fire Brigade. The person attending to the alarm can call for more time by pressing the "More Time" push button in which instance the clock will be reset to zero and a new cycle (programmable between 0 and 999 seconds) will be initiated. During such cycle the attendant must be capable of investigating the source of the alarm and cancel it (by pushing the reset button) at any panel in the event of a false alarm or confirm it (by pushing the accept button) at any panel or by breaking the glass of any break glass unit.

It must be noted that operation of the "More Time" push button shall be overridden by the triggering of a second sensor/device in the same zone or via a break glass unit.

The fire detection and alarm evacuation installation shall operate as follows:

In the event of a confirmed fire condition the fire alarm system is to automatically:

- Sound the evacuation sounders located in the building (a pulsing tone)
- Isolate the power supplies to fresh air fans, extraction fans, kitchen canopy systems fans in the specific zones and activate the appurtenant fire dampers

These functions will be grouped differently depending on what zone the signal originates from. The device address and location, as defined on the drawings, shall be indicated on the L.C.D. display of the fire control panel.

Information relating to the alarm (or fault condition) shall pass to the C.P.U. and in turn be displayed on the display terminal.

The generation of a fire alarm shall immediately initiate the following, within the affected fire zone only.

- In public, areas where sounders have been located at ceiling level, these shall operate in the affected zone only. However, facility shall be incorporated at the Main Fire control Panel to manually override the immediate activation of such devices if so required, and then to manually activate such sounders by zone. (a pulsing tone)
- All interface signals to other services within the affected zone, shall be initiated.
- Isolate the power supplies to ventilation fans in the specific zones and activate the appurtenant fire dampers
- Failure of a single fire control panel shall not affect the proper functioning of other fire control panels within the network, and the devices and equipment linked to them.
- The panel shall also incorporate a "Commission" key switch and a "Day/Night" key switch.

6.0 **EQUIPMENT SPECIFICATIONS**

6.1 General

The following description details the design parameters for the operation, control, dimensions, finishes, etc. for the Fire Detection unit installation. These parameters are the minimum requirements, and the sub-contractor may offer equipment that exceeds these specifications. All relevant technical information to be submitted with tender.

6.2 Optical Smoke Detectors and Bases

The location of optical smoke detectors are indicated on the drawing provided with this document and the Tenderer shall supply and install units that shall meet or better the following specifications:

- a. The detectors shall operate on a 24 V d.c. power supply, and be suitable for connection in the circuit to the control panel using two wire system.
- b. The detector base section shall be suitable for easy removal and replacement of the detectors, and shall allow for the interchanging of the different types of detectors without any modifications being necessary.
- c. The base to be employed shall depend on the special mounting conditions required, and shall be suitable for one or more of the following:
 - surface / wall mounting
 - mounting in damp / plant rooms
 - suspended mounting
 - underside of ceiling
 - explosion proof mounting, with intrinsic safety
- d. A visual alarm detection indication lamp shall be incorporated on each detector which shall illuminate or flash on the detector activated. If not visible over 360° the detector shall be orientated so that the indication light faces towards the entrance to the room, or to where it can easily be visible on entry to the space in an emergency.
- e. Unit is to feature:
 - Measure of smoke density from 0.5 to 10 particle range.
 - Active output proportional to the amount of smoke present in the chamber.
 - Output value of the sensor to provide data regarding contamination levels in sensor and electronic circuit.
 - Comply with Standard EN54 Part 7.

6.3 Manual Call Points Units

Breakglass / Manual call point units are to be provided for each zone as indicated on the drawings. These are to be suitable for manual initiation of an alarm for their respective zones.

The Tenderer shall provide and install equipment that meet or better the following specifications:

Each of the different types of mechanical / electrical breakglass units shall be:

- have a well illustrated front
- where specifically called for, a stainless steel or anodised aluminium lift flap, suitably illustrated on its face shall be provided to cover the unit to offer additional protection against accidental breakage.

The types of acceptable mechanical call point units are:

a. Press-to-Activate

The electrical circuit will be activated on the button (housed behind the breakglass front) being pressed. This unit should generally be employed in preference to the break-to-activate type.

The unit shall be fire engine red with the front of the unit clearly displaying the words "FIRE / BRAND"

Recessed / chased-in round dia. 63 galvanised boxes shall be provided and installed by the electrical sub-contractor for mounting of the breakglass units, unless measured elsewhere.

6.4 Ceiling Mounted Sirens and Bases

The Tenderer shall provide and install sirens and bases that are under ceiling mounted as indicated on the drawing provided with this document. The units shall meet or better the following specification:

- a. Operate on 24 V d.c.
- b. Feature a shallow base as they are under ceiling mounted.
- c. Be fire engine red in colour.
- d. Be a compact high volume warning sounder and emit a sound level greater than 85 Db at 3 m.

Round dia. 63 galvanised boxes shall be provided and installed by the electrical sub-contractor, for the sirens unless measured elsewhere.

6.5 Line Devices

All line devices shall comply with the standard specification. The type and location of line devices are shown on the drawings.

Line Relays:

The Sub Contractor will provide the line relay and connect to a 24V contactor coil. The contactor and wiring to its contacts to be carried out under this contract but as part of the Air Conditioning installation.

Interface Units:

The interface units used shall be with Normally Open contacts either of the 'fire' or 'non-fire' types; an end of line resistors shall be provided with each interface unit.

The Sub Contractor will be expected to provide the interface units and connect to voltage free contacts which are to be monitored as follows:

- Contact open Normal
- Contact closed Alarm
- Wiring open Fault
- Wiring shorted Fault

6.6 Flashing Strobe / Beacon

Flashing Strobes / Beacons must use high efficiency LED's as their light source. In areas with high back ground noise, visual indicators accompany sounders to ensure that the alarm is recognised. Depending on the colour and flash rate, beacons can provide additional information about the nature of the alarm.

Features:

- IP Rating: IP65 (Standard)
- Operating Temp: -20°C to +70°C
- Construction: UV Stabilised Polycarbonate Weight: 0.14kg

Units are to be programmed to operate in the zone were a line device has activated only.

6.7 Sounder Drivers

A dual monitored line output unit (Sounder drivers) shall monitor and switch two separate 24V dc lines to sounder devices. The Sub Contractor shall provide all necessary components and interface units for the proper operation of the sounder devices by the sounder drivers.

The Sounders shall operate independently in zones or generally all together.

7.0 OPERATING AND MAINTENANCE INSTRUCTIONS

Three sets of instruction manuals shall be provided. Each manual shall comprise of the following sections, bound in a vinyl plastic covered folder with the name of the project typewritten on a card inserted into a clear plastic covered cardholder on the front cover and spine and shall be handed to the Main Contractor on completion of the installation:

- Table of Contents
- Functional Description of Plant (as installed)
- Operation of Plant (as installed – step by step instructions).
- Performance Testing Procedures including Test Report
- Maintenance Instructions (in schedule form setting out each item of plant, the description and frequency of maintenance operations required). Instructions on testing fire detection system must also be provided.
- Spare Parts (list of spare parts that shall be required, with detailed description of each part, make, model or part number and supplier's name and address).
- Descriptive Literature (for all items of plant and equipment).
- Record Drawings (of plant as installed to include plant layout drawings showing component location, control and wiring diagrams and schematic piping diagrams).

8.0 GUARANTEE

The entire fire detection and alarm evacuation system installation shall be fully guaranteed for 12 (twelve) calendar months from date of acceptance by the Engineer. During the guarantee period, the sub-contractor shall be responsible for the making good of any defects reported by the Tenant. The guarantee shall be ceded to the Superintendent following acceptance of the installation.

9.0 MAINTENANCE

The fire detection sub-contractor shall be responsible for the maintenance of the entire plant during the guarantee period, as specified in this document. Record of all services are to be kept and copies signed by the Superintendent.

The maintenance of the plant shall be undertaken by the Maintenance Staff after expiry of the guarantee period(s).

A hand-over to the Maintenance Staff representative is to be carried out on the plant 4 weeks before expiry of the guarantee period(s).

10.0 CERTIFICATION ON COMPLETION OF GUARANTEE & MAINTENANCE PERIOD

In the month prior to the expiry of the guarantee and first twelve months maintenance period the Engineer shall inspect and, if necessary, retest the installation so as to be able to provide the Tenant with a certificate, within fourteen days of the guarantee expiry date, to confirm that the guarantee has been honoured and that the installation has been properly serviced at required regular intervals by the fire detection sub-contractor.

11.0 SAMPLES & ALTERNATIVES

Samples will be requested where and when required.

The tender prices shall be based on the equipment as specified and not on any alternatives. Should the tenderer wish to submit prices for alternatives, he shall do so separately, in a letter or similar correspondence, attached to the tender. The use of any alternative equipment, if any, will be evaluated and decided on after tender award, when the costs, etc. will be negotiated with the successful tenderer

The Engineer reserves the right to call for prices on alternative equipment subsequent to tender submission.

12.0 SCHEDULES OF INFORMATION

The schedules of information contained in this document consists of 2 sections:

- Information supplied by the Engineer (schedules of drawings, cables, distribution boards, etc. as applicable).
- Information to be supplied by the sub-contractor at tender stage (tender form, information on the makes, types and ratings of equipment and materials offered, schedules of prices and rates for variations, schedules of quantities, etc. as applicable).

Tenderers must complete, at the time of tendering, the "Schedule of Material Offered", and provide sufficient technical details to enable the equipment concerned to be identified without ambiguity.

It is not sufficient for a Tenderer to state "as specified" in the schedules.

Failure to complete these schedules (if applicable) may render a tender invalid.

13.0 DRAWINGS

13.1 General

Generally, the term "detail" shall mean that the drawing is exact in all aspects to what shall be provided. Where the term "illustration" is used, however, it shall be construed that the drawing is to be regarded as a proposal or guideline as to what is to be provided, manufactured or supplied.

13.2 Tender Drawings

Refer to the proposed Fire Detection and Alarm Evacuation Installation as provided with this document.

13.3 Construction / Workshop Drawings

The successful tenderer shall submit construction drawings (or detailed catalogues) of the manufactured equipment, such as mounting details, etc., for consideration by the Engineer prior to manufacture/supply thereof.

The Engineers approval of construction or workmanship drawings does not relieve the sub-contractor of his responsibility with regards to any of the deviations from the requirements of this contract unless the Engineer has been clearly informed, in writing, of such deviations at the time of submission and the Engineer subsequently gives written approval for the specific deviation. Similarly, the Engineer's approval shall not relieve the sub-contractor of responsibility for errors or omissions in the construction / workmanship drawings.

13.4 Record Drawings

The sub-contractor must prepare record drawings of the completed installation as constructed, indicating cable runs, equipment mounting details, circuiting & distribution board details, sleeve pipe positions, etc.

The contract shall not be deemed as complete until these drawings have been submitted.

13.5 Fire Detection System

The following drawings are required:

- Layout drawings
- Schematic circuit drawings
- Internal circuit drawings of all panels, etc.
- Wiring drawings showing wire colour codes and numbers as well as all connections onto terminal strips (markers to be approved by the Engineer).

The following documents are required:

- Full description of the system.
- Operating instructions.
- Installation instructions.
- Commissioning instructions.
- Maintenance instructions, maintenance schedule and trouble shooting guide.
- Programme printout

14.0 **SUPERVISION, WORKMANSHIP AND DELAYS**

The work shall at all times, for the entire duration of the contract, be executed under the supervision of a skilled and competent representative of the sub-contractor, who must be able and authorised to receive and execute instructions on behalf of the sub-contractor. This person must be a registered and accredited person, as described by the OHS Act. It must be noted that the staff complement of the sub-contractor shall remain similar throughout the duration of the contract, for all sections of the Works.

In the event that inferior materials or bad workmanship, on the part of the sub-contractor, leads to remedial work requiring redesign by the Engineer, the cost of this work, including related professional fees, shall be borne by the sub-contractor.

Similarly, should delays in the contract be caused by poor performance on the part of the sub-contractor causing the engineer to spend extra-ordinary time on the project, the extra costs incurred shall be borne by the sub-contractor.

These costs will be based on the SAACE hourly rate and will be deducted from claims due to from claims which will become due to the sub-contractor.

15.0 **COMPLIANCE WITH REGULATIONS, STANDARDS AND CODES**

The sub-contractor shall arrange for all inspections and testing of the installation as required. All notices, fees, including inspection and re-inspection, are the responsibility of the sub-contractor and all the relevant costs shall be borne by him.

The workmanship throughout the Works will be to the satisfaction of the Employer. Any materials or workmanship considered as faulty or incorrectly or inadequately erected or repaired, will be substituted, altered or rectified to the satisfaction of the Employer, without additional cost to the Employer.

The Works will be executed in strict accordance with the following:

- All relevant by-laws and regulations of local authorities.
- All relevant SANS, BS and other international standards.
- The Occupational Health and Safety Act of 1993.

16.0 COMMISSIONING AND TESTING

16.1 Commissioning

A documented method shall be followed whereby the sub-contractor shall ensure that his installation is correctly constructed in accordance with the manufacturers' specifications, consultant's specification, consultant's design and all Codes of Practice and International Design Codes.

The commissioning procedure must allow for signing off of the major items of equipment by a qualified person in terms of the codes. These signed off documents will form part of the record drawings.

16.2 Performance Tests

The sub-contractor shall be responsible for the physical testing, in the manufacturing works, or on site, of the items of plant or systems as required by the Engineer. These tests shall be performed by the sub-contractor or supplier of the equipment, and where called for, the Engineer shall witness such tests. The Engineer may also only witness a representative sample of the equipment tests. In any event, the sub-contractor will supply documentary proof of full performance tests of all relevant equipment.

16.3 Acceptance Tests

Acceptance tests will be performed on site of the working system or sub system, to show that the Works, as installed, is functioning according to the specifications and design. The onus for the correct functioning of the systems is still on the sub-contractor irrespective of whether the Engineer has witnessed the acceptance tests or not.

Prior to the system being taken into use, a certificate of compliance must be provided. The works shall not be deemed complete without this certificate.

16.4 Fire Detection and Alarm Evacuation System Testing Equipment

Testing equipment required for the successful commissioning of the Works described herein is to be made available by the sub-contractor.

All arrangements for this equipment or instructing of testing specialists to undertake this work and all associated costs, including professional fees shall be deducted from money due to the sub-contractor.

17.0 BUILDER'S WORK

The onus is on the sub-contractor to point out and check the requirements for and positioning and correctness of all builder's work for his services.

18.0 MAKING GOOD

With exception of making good to the cut-outs and drilled holes for piping, the sub-contractor will carry out, in all instances any work to be made good such as damage to, or disturbance of the building installations caused by himself or his employees during the execution of the contract at his own cost.

19.0 SITE MEETINGS

The sub-contractor's representative shall be expected to attend an official site meeting at the onset of the project including scheduled technical and site meetings during the contract period. For meetings termed as "technical and site", a site representative is required and must be competent and able to interpret and receive and act on instructions on behalf of the sub-contractor. The tenderer shall price all relevant P & G costs, overheads, travelling, etc. for these meetings.

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - CEREBRAL PALSY
VOLUME 2,1 PART 3: EARLY WARNING DETECTION SYSTEMS

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
	<u>Bill No. 1 : Preliminary and General</u>					
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1,2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1,3	Tools and equipment, Communication, transport.					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1,5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1			
1,6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1			
1,7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	Item	1			
1,8	Additional testing and balancing at disgression of the mechanical engineer.	Item	1			
Total Carried forward to Summary Page						

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PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
	<u>BILL NO. 2 : FIRE DETECTION EQUIPMENT</u>					
2,1	ADDRESSABLE FIRE CONTROL PANEL Supply, Install, test, commission and provide 12 month guarantee for Fire Control and Alarm Panel c/w battery back-up and charger.					
	1 Loop Panel	no.	0			
	2 Loop Panel	no.	1			
2,2	ADDRESSABLE OPTICAL SMOKE DETECTORS Supply, Install, test, commission and provide 12 month guarantee for Optical Smoke Detectors c/w bases.	no.	102			
2,3	ADDRESSABLE REMOTE LIGHT EMITTING DIODE Supply, Install, test, commission and provide 12 month guarantee for Remote Light Emitting Diode (LED) to suit detection device detailed c/w bases.	no.	27			
2,4	ADDRESSABLE HEAT DETECTORS Supply, Install, test, commission and provide 12 month guarantee for Heat Detectors c/w bases.	no.	5			
2,5	LINEAR BEAM DETECTORS Supply, Install, test, commission and provide 12 month guarantee for set of Linear Beam Detectors c/w bases (beam detection coverage, 30m wide x 100m span).	Sets	0			RATE
2,6	ADDRESSABLE MANUAL CALL POINTS Supply, Install, test, commission and provide 12 month guarantee for Breakglass Units - Type 1 c/w bases.	no.	10			
2,7	ADDRESSABLE SIREN WITH BUILT-IN FLASHING STROBE WARNING LIGHT Supply, Install, test, commission and provide 12 month guarantee for Siren with build-in Flashing Strobe c/w bases.	no.	8			
2,8	ADDRESSABLE FLASHING STROBE WARNING LIGHT Supply, Install, test, commission and provide 12 month guarantee for Flashing Strobe Warning Light c/w bases.	no.	16			
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PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
2,9	PAINTING OF TERMINAL UNITS Etch and paint the following line units to colour Black. Exact shade of black will be confirmed prior to					
2,9,1	Smoke detector	no.	0			RATE
2,9,2	LED indicator	no.	0			RATE
2,9,3	Siren and Strobe combination	no.	0			RATE
2,10	MAGNETIC DOOR HOLD-BACKS Supply, install, test, commission and provide a 12 month guarantee for set of Magnetic Door Hold-Backs c/w bases.	no.	5			
2,11	DOOR CONTACTORS Supply, Install, test, commission and provide 12 month guarantee for door contactors linked to Main Fire Control Panel.	Sets	10			
2,12	LINE ISOLATORS Supply, install, test, commission and provide a 12 month guarantee for Line Isolators c/w bases.	no.	0			RATE
2,13	LINE RELAYS Supply, install, test, commission and provide a 12 month guarantee for Line Relay unit. Line Relay to be linked to ventilation systems, kitchen canopies.	no.	92			
2,14	VOLTAGE FREE CONTACTORS Supply, install, test, commission and provide a 12 month guarantee for voltage free contactors to link Air-system, Ventilation and Smoke Extraction system and etc all as specified.	no.	6			
2,15	FIBRE OPTIC CONNECTION Supply, install, test, commission and provide a 12 month guarantee for Westermo Converters ODW732 Single	no.	1			
2,16	FIRE REPEATER PANEL Supply, install, test, commission and provide a 12 month guarantee for Fire Repeater panels.	no.	1			
2,17	FIRE PROOF CABLE Supply, install, test, commission and provide a 12 month guarantee for fire proof cable with a fire rating of 30 minutes or higher, all as specified.	m	1415			
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	INTER-LOCKING SYSTEM					

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PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
2,18	Supply, install, test, commission and provide a 12 month guarantee for inter-locking of fire detection system with Air-conditioning System, Ventilation System, System, Smoke Extraction System and etc.	no.	1			
2,19	A3 FRAMED FIRE ZONE PANEL Supply and install an A3 frame fire zone panel indicating all zones on that floor with devices numbering. Zones to be in different colour for easy readability. All frames to be installed next to the panels (Main / Repeater panels and etc.	no.	2			
2,20	SPRAGUE CONDUIT Supply, Install, test, commission and provide 12 month guarantee for Sprague Conduit c/w bases, couplings mounting brackets & boxes etc all as specified). installed next to the panels (Main / Repeater panels and etc.	m	414			
2,21	NETWORK CARD Supply, Install, test, commission and provide 12 month guarantee for class A redundant 32 node network, via	no.	1			
2,22	RS485 Supply, Install, test, commission and provide 12 month for RS485 cable, in sleeve provided by others.	m	500			
2,23	PVC CONDUIT Supply, Install, test, commission and provide 12 month guarantee for PVC conduit chased into brickwork, cast into concrete or fixed onto trusses including cutting, bending, galvanised saddles, bushes, etc.					
2,23,1	25mm diameter conduit	m	1415			
2,23,2	32mm diameter conduit	m	425			
2,23,3	60 mm round boxes	no.	271			
2,24	GALVANISED CONDUIT BOXES					
2,24,1	Supply, Install, test, commission and provide 12 month guarantee for round box for 32 & 25mm conduit, back or side entry for 1, 2, 3 or 4-way chased into brickwork, cast into concrete or fixed onto trusses including couplings bushes, cover plates and fixing materials.	no.	10			
2,24,2	Supply, Install, test, commission and provide 12 month guarantee for 75 x 75 x 50 box (for manual call points) for 25mm conduit, chased into brickwork or cast into concrete.	no.	10			
Subtotal Carried forward to Next Page						
Subtotal Brought forward from Previous Page						
2,25	WIRING CHANNEL (P2000) Supply, Install, test, commission and provide 12 month guarantee for P2000 wiring channel, galvanised channel					

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - CEREBRAL PALSY
 VOLUME 2,1 PART 3: EARLY WARNING DETECTION SYSTEMS**

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
2,3	cover including suspension hangers, end caps and etc.	m	0			
	220 to 24 V Step Down Power Supply Unit Supply, Install, test, commission and provide 12 month guarantee for boxed power supply unit, 100 -220 Vdc, c/w battery.	no.	5			
Total Carried forward to Summary Page						

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - CEREBRAL PALSY
 VOLUME 2,1 PART 3: EARLY WARNING DETECTION SYSTEMS**

PRICE SUMMARY

BILL NO.	DESCRIPTION	AMOUNT
1	BILL NO. 1 : P&G	
2	BILL NO. 2 : FIRE DETECTION EQUIPMENT	
SUBTOTAL		
CONTINGENCY 2,5%		
SUBTOTAL		

REMINDER NOTE

The Total Price including Main Contractor's Mark-up which excludes VAT, must be carried over to the final summary in Volume 1 and all fixed amounts shown in the price schedule must be included therein. No adjustments will be made for any failure by Tenderers to include the fixed amounts in the Total Price for this particular installation.

SUB-CONTRACTOR'S NAME:

DATE:

SIGNATURE:

N.B. The above-named Sub-Contractor is to be employed on this contract. Substitute Sub-Contractors are not acceptable.

The price submitted include all Main Contractor's 'Profit and Mark up BUT Exclude the VAT when transferring price to Volume 1 of the Final Summary Total of the Main Contractor's Document

VOLUME 2.1 PART 5: EARLY WARNING FIRE DETECTION - SCHEDULE OF MATERIALS OFFERED

AUTOMATIC FIRE DETECTION INSTALLATIONS

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities. The schedules will be scrutinised by the Engineer and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB : Only one manufacturer's name to be inserted for each item.

Item	Material	Make or trade name	Country of Origin
1.	ADDRESSABLE FIRE CONTROL PANEL		
2.	ADDRESSABLE OPTICAL SMOKE DETECTORS		
3.	ADDRESSABLE REMOTE LIGHT EMITTING DIODE (LED)		
4.	ADDRESSABLE OPTICAL HEAT DETECTORS		
5.	ADDRESSABLE MANUAL CALL POINTS		
6.	WEATHER PROOF ADDRESSABLE MANUAL CALL POINTS		
7.	ADDRESSABLE SIREN		
8.	ADDRESSABLE FLASHING STROBE WARNING LIGHT		
9.	FIRE RESISTANT CABLE		
10.	ITERPHASE / RELAY UNITS		
11.			
12.			
13.			

NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor. Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.

VOLUME 2.2 CP

MECHANICAL INSTALLATION

HVAC

VOLUME 2.2 PART 1: HVAC - SCOPE OF WORKS

HEATING VENTILATION AND AIR CONDITIONING EQUIPMENT

1. GENERAL

- 1.1 The Standard for Uniformity in Construction Procurement published in terms of the Construction Industry Development Board (CIDB) Act, 2000 (Act No. 38 of 2000), the Standardized Construction Procurement Documents for Engineering and Construction Works as issued by the CIDB and any other relevant documentation pertaining thereto must be studied and all principles in this regard must be applied to all procurement documentation, practices and procedures.

2. THE CONTRACT

2.1 HEATING VENTILATION AND AIR CONDITIONING EQUIPMENT

The work to be carried out and commissioned by a SAQCC gas approved installer:

- a. Split type air conditioning inverter heat pump units,
- b. Blygold / Bluechem or equal and approved corrosion treatment,
- c. Fresh air and extraction ventilation systems,
- d. Testing and Commissioning, as per SANS 10400 Section T & W and SANS 10252,
- e. Manuals, Drawings, OEM Literature,

2.2 Existing

All installations new. Building is Existing.

2.3 Order of The Works

As per the building contractors' program of works.

VOLUME 2.2 PART 2: HVAC - STANDARD SPECIFICATION

1.0 GENERAL

The scope of Work is as stated in 1.0

The system shall offer the best possible compromise between the initial expenditure and the long term interest and redemption charges and running/operating costs.

The design and installation shall comply with the codes of practice and standards promulgated by recognized authorities in the fields of air-conditioning, refrigeration, ventilation, piping, electrical technology and all other branches of engineering science applicable, such as the S.A.N.S., B.S.S., A.S.H.R.A.E., SMACNA and A.S.M.E.

All workmanship and materials used in the execution of the works shall conform to modern practice and the entire installation shall comply fully with all relevant requirements of governmental and the Local Authority whose jurisdiction embraces the location of the site.

2.0 BIDS

2.1 Conditions of bid

The attention of bidders is drawn to the conditions of bid as indicated on the official bid form.

2.2 Modifications

Bidders are at liberty to submit modifications based on their standard practice and such modifications, with reasons therefore, shall be clearly stated in the bid. The price for this shall not be included in the net bid price but shall be stated separately as an extra or an omission.

2.3 Checking of bid documents

On receipt of the bid documents, the bidder must, prior to submitting his bid, check all the bid documents and should any difference or discrepancy between or in the Drawings and Specification be detected by the bidder, he shall seek in writing a decision also in writing of the Representative/Agent on the true intent and meaning of the bid documents as the East London Industrial Development Zone cannot be held liable for the additional cost of extra work that may be caused as a result thereof.

2.4 Scope of bid price

The bid price and all prices and/or rates which are inserted into the price schedules in the Specification and transferred to the bid form, must be for the execution and completion of the Works in accordance with the Drawings, Specifications and Conditions of Contract, as well as for the provision of all labour, materials, workmanship, machinery, plant and everything that is or may become necessary.

If there are or may be any exemptions from levies, customs duties, tax, etc applicable on materials, goods or work, the bidder must make his own arrangements therefore, as the bid price shall be regarded as comprehensive.

2.5 Value Added Tax

The bid price shall include Value Added Tax payable in terms of the Value Added Tax act, 1991 (Act 89 of 1991).

2.6 Information required with bids

Bidders shall supply with their bids a full specification where necessary, including dimensioned drawings or sketches of the plant, and a complete wiring diagram of any automatic controls.

Particulars shall be given as set out in the schedule concerned which shall be filled in by the bidder. Failure to comply with these requirements may render the bid liable to disqualification.

2.7 Proof that materials are available

A bidder may be required, before acceptance of his bid, to furnish proof to the satisfaction of the Representative/Agent that he is in a position to secure all the materials required to complete the Contract within the contract period stated in the contract documents.

2.8 Bid documents and ownership thereof

The bid documents consisting of the official bid form, the specifications and the drawings (if any) scheduled in the Specification, and which have been made available to bidders, are the property of the East London Industrial Development Zone and shall be returned to the East London Industrial Development Zone, whether or not a bid is submitted.

3.0 THE SITE

3.1 Definition of Site

Location: Dora Nginza Hospital, Gqeberha (Port Elizabeth), Eastern Cape

Altitude: 0 m above Sea Level.

External: Summer Max. Average : 26°C
Winter Min. Average : 6°C

3.2 Inspection of Site

Bidders shall visit the Site before bidding and satisfy themselves as to the local conditions, the accessibility of the Site, the full extent and nature of the work to be done and the conditions affecting the execution of the Contract generally. Claims on the grounds of lack of knowledge in such respects or otherwise will not be entertained.

3.3 The Site

The Site to be occupied by the Contractor will be clearly defined on the site plan, or will be pointed out to him by the Representative/Agent. The Contractor will on no account be allowed to extend his operations beyond the boundaries of the Site.

3.4 Procedure of work (Site in occupation)

If the site will be in occupation during the course of the Contract, the Works shall be carried out at such times and in such manner as will cause the least inconvenience to the occupants, and still allow the work to be proceeded with expeditiously. The instruction of the Representative/Agent shall be complied with in regard to the carrying out of any portion of the works which in his opinion requires to be expedited and priority shall be given to such work as and when directed.

(Site not in occupation)

If the Site will not be in occupation during the course of the Contract, the Works shall be proceeded with expeditiously. Priority shall be given to any portion of the Works as indicated in the Specification.

3.5 Existing services

If the Contractor encounters any existing services such as cables, pipes or sewers during the execution of the works, he must immediately notify the Representative/Agent, halting all work in the vicinity thereof, until instructions to proceed have been given by the Representative/Agent. Electric wires, telephone wires, pipes, etc., shall not be interfered with during the course of the Contract, but should it be necessary to disconnect or cut any such wires or pipes the Representative/Agent shall be advised thereof and his instructions awaited.

3.6 Protection of trees, shrubs and plants

The Contractor will be held responsible for any damage to trees, shrubs and plants on the Site and shall make good such damage at his own expense.

Trees, shrubs and plants may only be removed as indicated on the Drawings. The remaining trees, shrubs and plants may not be removed, cut back or disturbed in any way without the written consent of the Representative/Agent.

3.7 Water for the Works

The contractor shall provide all water he may require for the execution of the Works at his own expense.

3.8 Electricity for the Works

The Contractor shall provide all electricity for the execution of the Works at his own expense.

3.9 Recoverable materials property of Contractor

Items specified to be removed, taken out, demolished or dismantled and which are not specified for re-use, or for handing over to the Representative/Agent or others, become the property of the Contractor and must be removed from the Site immediately.

4.0 **ADMISSION TO SITE**

4.1 Permission for admission to and establishment on Site

Before the Site is visited by bidders or before the successful bidder (Contractor) establishes himself on the Site, the Representative/Agent's prior approval must be obtained. The Representative/Agent will, in the case of a Site located in defence or other security areas, make arrangements with the unit commander, or in the case of other Government sites, with the officer-in-charge, for permits for inspection of the Site for bidding purposes.

5.0 **PAINTING**

Painting shall only be necessary to those items which would normally be visible or visible when serviced, all mild steel or other components which would otherwise suffer corrosion if unpainted, however, shall be painted with two coats of rust-proof paint whether such components are normally visible or not.

Items which are factory-painted need not be repainted other than any making good which may be necessary. All plants requiring painting shall be correctly prepared and painted. No untreated metal surfaces shall be permitted on the project.

Items which are not galvanized or similarly protected against rust and corrosion shall be painted, as later detailed herein. No equipment, hanger brackets, etc., shall be permitted to be delivered on site in unprotected form; they shall be factory-coated with an approved zinc-rich prime coat before dispatch from their place of manufacture.

Painting shall comprise the following consecutive processes. First thoroughly clean, descale and degrease all surfaces, in accordance with acknowledged good practice, follow with a good coating of approved zinc-rich primer and finish with two coats of quality high-gloss enamel of an acceptable make. Final finish shall be to the full approval of the Engineer.

With the exception of ducting and piping, items with a galvanized finish, such as cable trays, need not be painted but shall be properly cleaned with a suitable proprietary galvanized iron cleaning fluid.

Particular care shall be taken that appropriate primers be used as a basis for painting and that paint be of high quality manufacture, all to provide a completely satisfactory finish to the approval of the Engineer. It shall be noted that galvanized surfaces are to be treated to ensure proper bonding of paint.

Whereas it would not be necessary to paint any ductwork conduits or pipe work installed in roof voids, shafts masonry ducts, etc., or where not normally visible, it is a requirement that such equipment be properly cleaned, treated with two coats of rust proofing paint if not galvanized or not metal subject otherwise to rust.

All equipment on the project shall be colour-coded in accordance with standards recognized in the Republic of South Africa and, where possible, to comply with relevant South African National Standard Colour Codes. (SANS. 01091-1975).

6.0 **PIPEWORK**

Refrigeration pipe work shall be carried out in seamless refrigeration quality copper tubing, suitable provision being made that the piping is not subjected to any stresses by vibration from the compressors.

7.0 **EQUIPMENT SUPPORTS**

Where equipment supports, stands, platforms and suspension brackets are indicated, specified or necessary for ductwork, pipe work, etc., the Sub-contractor shall provide supporting structures

capable of carrying the load without distortion, affixed to the building structure in such a manner as not to subject it to undue stress.

Supporting of any rotating equipment shall incorporate vibration mountings of the type and selection specified in the applicable clauses referring to equipment bases herein.

All methods of suspension or supports shall be submitted to the Engineer for approval and for reference to the Structural Engineer where necessary prior to manufacture or installation.

Generally, supports shall preferably be proprietary products such as Unistrut or failing this, shall be of mild steel sections, purpose fabricated for their application. Under no circumstances whatever will sheet metal straps or plastic tie-wraps be accepted as a supporting method.

All supports shall cradle the item to be supported; shall not be riveted or welded to the equipment to be carried except in exceptional circumstances approved by the Engineer. Rod hangers shall not exceed one meter in length and be of minimum diameter 12 mm. For longer suspensions use mild steel angles. Angel iron supports shall be of 25 mm x 3 mm minimum. All supporting structures for equipment shall be dip galvanized.

Fastening methods shall employ REDHEAD or RAMSET anchor bolts or their equivalent for fixing supports to the building structure, it not being permissible to utilize gunpowder shot-driven bolts for this purpose unless prior approval be obtained.

Pipe work supporting holder bats shall be the product of a recognized manufacturer of such equipment, shop-fabricated saddles or similar devices being unacceptable unless limited space available necessitates their use. On insulated pipe work, hardwood inserts consisting of two-round machine cut pieces of timber shall be clamped around the pipe, insulation being cut away at such points, to allow proper support fitting. Wooden inserts shall be of the same thickness as adjoining insulation and 50 mm longer than the width of the holder bat support, to permit correct finishing of the insulation of vapour sealing to them.

Cable and flexible pipes shall be supported on Unistrut or equivalent perforated galvanized cable trays, manufactured by specialists, shop-fabricated trays or racks not being acceptable. The cable tray shall be suspended or bracketed using suitable mild steel angles.

8.0 DRAINS

The sub-contractor to provide all necessary drain piping laid to suitable falls from every item requiring such drainage. Such drains shall be run to the adjacent relevant drain points shown on the Drawings.

Drainage pipe work shall be adequately sized and carried out generally in medium grade galvanized piping and secured to wall (where applicable), all connections to equipment being effected with conical faced unions or flanged.

Drainage pipe work of longer than 4,5m run shall be provided with cleaning eyes on all bends to facilitate maintenance.

All condensate drainage is to terminate to the nearest drain.

9.0 ASSEMBLY OF COMPONENTS

9.1 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.

9.2 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.

10.0 WELDING

10.1 Welding shall be carried out in accordance with the current edition of SANS 044 Parts I to VII where applicable.

- 10.2 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.
- 10.3 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.
- 10.4 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.
- 10.5 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 SANS 0455.
- 10.6 Only welders in possession of a valid approved competence certificate shall be employed.
- 10.7 All welds must show proper fusion.
- 10.8 Where welding is contemplated in pipe work 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 Engineer and tested. Should faulty welding be discovered, all other joints shall be X-ray tested by the SANS or an approved body, all at the expense of the Contractor.

11.0 GALVANISING

- 11.1 Unless otherwise specified in the Detailed Specification the following items shall always be galvanised:
- a) Fabricated mild steel sections exposed to the weather.
 - b) Steel grilles and louvers exposed to the weather.
- 11.2 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.
- 11.3 All hot dip galvanising shall be carried out in accordance with SANS 0934 and SANS 0763 where applicable, including preparation for galvanising.
- 11.4 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.
- 11.5 Castings shall be sound, dense and clean, and free from distortion, porosity, carbon and slag enclosures, blowholes, and other injurious conditions.
- 11.6 Welding flux shall be chipped away and all welds wire brushed before galvanising.
- 11.7 The surface to be galvanised shall be free from paint, oil, grease and similar impurities.
- 11.8 All exposed surfaces including welds shall be thoroughly sand blasted prior to galvanising.
- 11.9 The Engineer 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.
- 11.10 The galvanising coating shall be smooth, adherent, continuous and free from black spots or flux stains.
- 11.11 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.

- 11.12 Repairs to galvanised coatings will not be accepted. Items damaged will need to be re-galvanised.
- 11.13 Coating thickness shall be as per table 1 of SANS 0763 unless otherwise specified in the Detailed Specification.
- 11.14 The SANS requirement for uniformity shall apply.
- 11.15 Galvanised surfaces specified with paint finishing shall not be passivated.

12.0 BEARINGS

12.1 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.

12.2 Bushed Bearings

Only where specifically stated in the Detailed 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.

12.3 Self-lubricating or oil less bearings

Self-lubricating or oil less 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.

13.0 NOISE AND VIBRATION CONTROL

13.1 General

Unless otherwise specified in the Detailed 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 SANS 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 SANS 0103 shall be rectified to comply with SANS 0103 at the Contractor's own expense.

In all plant room 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.

13.2 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.

14.0 **DAMPING**

14.1 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 shear 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.

15 **PUMPS**

Where condensate pumps are required, the pumps shall be totally enclosed in the corner of the surface mounted trunking, and shall be specified to pump the maximum condensate generated by the unit.

16.0 **FANS**

16.1 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.

16.2 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.

16.3 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 Detailed 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 Detailed Specification shall not be exceeded.

17.0 PIPING

17.1 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.

17.2 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.

17.3 Pipe Supports

In all critical applications and within the first ten meters 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.

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.

17.4 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.

18.0 SOUND ATTENUATORS

18.1 Where required, in order to comply with the noise and vibration criteria already laid down, or where specified in the Detailed 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 plant room.

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.

- 18.2 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 plant room and shall be installed to prevent noise breakout from the plant room via the ductwork.

Where specified in the Detailed 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.

- 18.3 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.

19.0 AIR FILTERS

19.1 General

Filters of the type, size and quantity as specified in the Detailed Specification shall be provided.

Filter efficiency and arresstance shall be in accordance with ASHRAE Test Standard 52-76.

Filters and filter holding frames shall be of approved manufacture with standardised dimensions to enable replacement with equivalent filters of all recognised manufacturers.

Construction and manufacture of all components shall be such that under no circumstances any unfiltered air can by-pass filters or filter banks.

Sufficient space shall be allowed in front or behind filters, as applicable, to enable inspection and servicing.

Proper access doors shall be fitted to filter service areas.

Filters installed close to exposed air inlets shall be weather protected with weather louvers and a wire mesh screen.

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.

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.

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.

Unless otherwise specified in the Detailed Specification only dry media filters are required. 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.

Where air filters of the washable type are specified in the Detailed 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. Where washable filters are specified one complete set of spare filters shall be provided.

19.2 Panel Filters

Panel filters shall be of the pleated type and not less than 50mm thick.
The filter shall be washable or disposable as specified.

Synthetic media shall be used bounded together with galvanised wire for reinforcing and bonded in the frame ensuring no air bypass.

The frame shall be galvanised steel or a distortion and corrosion free moulding.
Initial synthetic dust arrestance shall be not less than 70% with dust holding capacity needed in excess of 300g per square meter nominal face area.
Initial dust spot efficiency shall be not less than 20%.

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.

19.3 Pad Type Panel Filters

Pad type panel filters shall make use of disposable replacement media of thickness as specified, but generally not less than 25mm thick.

Disposable media supplied and the filter in general shall comply with 24.1 above, unless otherwise specified.

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.

19.4 Extended Surface Intermediate Efficiency Filters

Filter media shall be self-supporting, leak-free and stable under all airflow conditions.
Front frames shall be of aluminium, galvanised steel or reinforced high-density hard polyurethane foam with a continuous foam rubber gasket.
"Slide-in" type of arrangements will not be accepted for filters in this class.
Filter depths less than 150mm will not be accepted.

Galvanised protection screens shall be fitted to match the airflow arrangement.
Initial synthetic dust arrestance shall be not less than 85% with dust holding capacity not less than 1500g per square meter nominal face area.

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.

19.5 High Efficiency Particulate Air Filters (HEPA)

Filter media shall be self-supporting leak-free and stable under all airflow conditions.

The media shall be bonded in to a pressed and sealed particle board housing.
Unless otherwise specified in the Detailed Specification filters shall be provided with silicone filled channel seals.

"Slide-in" type of arrangements will not be accepted for filters in this class.
Filters shall be arranged in two or three stage configuration with the primary filters complying with clauses above as specified in the Detailed Specification.

Filter depths less than 300mm will not be accepted and effective filter media surface area shall exceed 50m per square meter nominal face area.

Each filter shall be individually tested in the factory for leakage with a DOP aerosol and supplied to site in completely sealed protection containers.

Corrugated media separators shall be of aluminium or Kraft paper.
Filter efficiency shall be not less than 99,9% when tested with 0,3 micrometer Dioctylphthalate smoke.

Dust holding capacity shall not be less than 2 000g per square meter nominal face area.

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.

Pressure monitoring across the HEPA filters is required with warning light and/or alarm as specified.

19.6 Filter Holding Frames

Filter holding frames shall be the manufacturer's standard product installed and used in accordance with his recommendations.

Holding frames shall be manufactured from at least 16 gauge galvanised or epoxy powder coated steel. Holding frames may be bolted or riveted together and shall be suitably reinforced in larger arrangements to withstand all possible operating conditions.

Fasteners shall be positive sealing type and a minimum of four fasteners per filter is required. Fasteners shall match the particular filter, filter arrangement and frame.

20.0 **MEASUREMENT OF COMPLETED WORK**

The attached Bills of Quantities is provisional, which means that the Bill does not represent the exact scope of work to be performed and completed and that every piece of completed work will be measured and agreed with the Contractor before payment is processed.

21.0 **UNAUTHORISED EXPENDITURE**

Although the Engineer has conducted the audit of the buildings installations other items may have degraded in the intervening period up to site handover. It is therefore very imperative for the Contractor to bring to the Engineer's attention as soon as he / she realises that the work measured in the Bill of Quantities may be appreciably exceeded. Failure to observe this procedure where the Contractor proceeds with excessive additional work without authorisation will be tantamount to unauthorised expenditure which may lead to non-payment for unauthorised work.

22.0 **SPECIFICATIONS & STANDARDS**

The works carried out under this Contract shall be governed by the:

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

23.0 **SCHEDULE OF MATERIALS**

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

24.0 **QUALITY OF MATERIALS**

Materials are to comply with the relevant South African National Standards (SANS), or to IEC specifications, where no SANS specifications exist. All materials used shall bear the SANS mark of approval as applicable.

25.0 **PROGRAMME AND PLANNING**

The sequence, in which the work must be carried out, must be established in consultation with the Main Contractors construction programme, Sub-contractors and their respective Domestic contractors. The Engineer must be kept informed on the progress all the time.

26.0 **SUPERVISION**

The work shall, at all times be carried out under the supervision of a skilled and competent representative of the Contractor, who will be able and be authorised to receive and carry out instructions on behalf of the Contractor.

27.0 WORKMANSHIP

All inferior work shall, on indication by the Engineer, immediately be removed and rectified by and at the expense of the Contractor.

28.0 SUPPLY OF MATERIAL

The Employer reserves the right to supply any items of material or equipment to the Contractor for installation. The Contractor must arrange for taking delivery of and providing safe storage for these materials and he will be held responsible for all damages to or loss of such materials while they are in his custody.

29.0 COMPLETION

Completion shall take place only after the whole installation has been accepted by the Engineer and

- (a) All damage that may have been done by the Contractor in the process of the installation has been repaired and made good
- (b) All tests of the Mechanical installation has been done and tests results have been submitted to the Engineer,
- (c) The completed Certificate of Compliance as specified has been submitted to the Engineer,
- (d) All equipment guarantees, if any have been submitted to the Engineer,
- (e) The work site has been cleared of all debris and waste materials and left in a neat and tidy condition.

VOLUME 2.2 PART 3: HVAC - DETAILED SPECIFICATIONS

1.0 INTRODUCTION & GENERAL

This Detail Specification complements & qualifies the foregoing standard specifications of material & workmanship. The Standard Specification should be regarded as a basis and guideline, with this Detailed Specification taking preference where any ambiguity is concerned.

In the event of any further technical ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority:

- a) Schedule of quantities
- b) Project specification
- c) Drawings (loose and bound-in)
- d) Standard specification

2.0 SITE CONDITIONS

Location: Cecilia Makiwane Hospital, Buffalo City, Eastern Cape
Altitude: 0 m above Sea Level.

3.0 SCOPE OF WORK

General

The standard specification shall apply unless otherwise indicated in this section.

The drawings issued herewith and listed in the relevant section are to be read in conjunction with the specification and all items mentioned, together with all ancillary equipment necessary for the correct installation, operation and full compliance with the Standards and codes must be provided, notwithstanding the fact that they may not have been included in detail in these documents.

The bidder shall, at the time of bidding, draw the Engineer's attention to any omissions or discrepancy between the specification and the drawings and request from him clarification of details or responsibilities.

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

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

If any such items of equipment, brackets and accessories, etc., have been omitted from a supplier's quotation, or incidental work is necessary, the bidder must include for all such items and work in the bid.

The whole installation shall be in accordance with the latest edition of the Occupational Health and Safety Act: No. 85 of 1993. All regulations framed therein, shall be carried out to the satisfaction of the Engineer.

All equipment offered by the bidder shall be to the approval of the duly appointed Engineer, prior to installation. This standard specification and the supplementary specification with drawings shall be carefully adhered to by the bidder. Equipment installed without the approval of the Engineer will have to be removed at the Contractor's expense and be replaced with officially approved listed items.

The successful bidder will be required to prove to the Engineer that he has qualified personnel on his staff establishment as well as recognised test equipment for the successful completion of a safe

working installation.

The contractor shall employ only skilled artisans and technicians approved by the Engineer who are competent in this type of work. The work shall be carried out in accordance with the standards laid down by the Engineer.

The contracting firm shall be recognised contractor specialising in this field and approved by the Engineer.

The work performed shall comprise the supply, delivery, off-loading, interim storage, installation, testing, commissioning and leaving in good working order of the complete electric access goods only lift installation inclusive of all guarantees as specified herein and the supply of 'AS IS' installation record drawings, Maintenance and Operating Manuals for:

Heating Ventilation and Air Conditioning Systems Overview:

- Natural Ventilation louvers, motorised + sleeve & aluminium weather louver, incl motor and cable / controller,
- Ducted in line air ventilation systems,
 - Aluminium weather louvers,
 - Galvanised ducting, transfers, bends etc.
 - Filter boxes + filters & differential pressure measuring equipment,
 - Various In line silent fans plug fans,
 - Sound attenuators,
 - Diffusers,
 - Wired on off controllers,

The liaison with a Building/Principal Contractor, Electrical Subcontractor, and their Domestic Subcontractors if and when required

Testing and commissioning of all air-conditioning and ventilation system equipment in conjunction with the Fire Detection and Alarm Evacuation Systems Sub-contractor.

This Sub Contract also includes all electrical work for the installations but excludes the power supply to the isolator provided by others.

Notwithstanding any omission in this specification the installations shall be complete in all respects. This condition shall be recognised in the preparation of all working drawings submitted for approval. Further, despite any approval of working drawings given by and on behalf of the Main Contractor the responsibility for correct functioning of the plant during tests, inspection and the maintenance period shall rest entirely with the successful bidder.

The installation shall be strictly in accordance with the approved drawings or such further drawings, modifications, or instructions as may be given by the Engineer concerned, or that are found to be necessary, and such modifications or instructions shall be deemed to be within the specification for the purpose of the bid, and shall not vitiate the contract.

Payment for such modifications will only be made on certification by the Engineer to the effect that such modifications have involved additional expense to the Sub-Contractor.

4.0 PROGRAM

The Sub Contractor shall complete the installation within the time stipulated. The Sub Contractor will be required to report to the Principal Contractor, generally on a weekly basis (or more often if required by the Principal Contractor), progress of work and any difficulties arising, to enable the Principal Contractor to update the programme or forward plan any changes.

The sequence in which the work is to be carried out shall be decided upon in consultation with the Principal Contractor. The Sub Contractor shall thereafter submit an adequately detailed Sub Contractor's installation programme for approval within two (2) weeks of the Sub Contract being awarded unless otherwise indicated herein after.

This programme must be periodically updated as the work progresses and as may be necessary to

meet changing site conditions and alterations to the overall installation programme.

Programmes shall take the form of bar charts, network diagrams and schedules as may be required by the Main Contractor or as applicable, and shall reflect quantities of work as required for supervision purposes and measurements.

As a minimum the programme shall reflect:

- sequence and timing of installation activities.
- sequence and latest event times of major equipment ordering, manufacture and delivery dates.
- sequence and dates for the submission of drawings and samples for approval.
- sequence and dates for factory and site inspections and tests.
- target and achieved work quantities on a weekly, fortnightly and monthly basis.

In preference all work is to be undertaken by staff in the full time employ of the bidder.

All work which is to be undertaken by "Domestic Sub Contractors" of the Sub Contractor will be clearly identified in the bid submission and the Sub Contractors to be used subject to prior approval of the Client and/or Engineer and/or Principal Contractor; failure to comply with this requirement may result in the "Domestic Sub Contractors" being removed from site.

All costs in replacing the undesirable "Domestic Sub Contractor" or any delays incurred as a consequence of this will be entirely for the Sub Contractor's account.

5.0 DESIGN CONDITIONS

Indoor: 24°C 50% RH

Outdoor: 31°C DB; 22.8 °C DB

6.0 VENTILATION SYSTEM DESCRIPTION

6.1 General

The bidder shall allow for programming the work in such a manner as to not disrupt the Main Contractor's programme. Sequence of work to suit the Sub Contractor's requirements will not be guaranteed nor accepted.

Claims from Sub Contractors arising out of broken work sequences or agreed programmes changed due to contingent requirements, will not be considered unless full motivations for the extra costs are submitted; the motivation for extra costs must justify costs in terms of the accepted programme and any unforeseen and justifiable additional staffing levels required to meet targets revised with insufficient notice. Reallocation of staff and/or acceleration of work will not be reason enough to claim for extra costs unless the Sub Contractor can prove that he has indeed had to pay for staff's idle time which was not or could not be envisaged at the time of bidding and/or drawing up the installation programme and sequence. When claiming for extra cost all out of town cost will be disallowed as it is assumed that the Sub Contractor has fully staffed premises in the vicinity of the site.

The Subcontractor must also assume that work may be required to continue uninterrupted outside of normal working hours and/or for an extended and/or unbroken period of time.

6.2 EQUIPMENT SPECIFICATION

6.2.1 All standard off the shelf ventilation equipment will be natural anodised aluminium unless otherwise specified.

6.2.2 DESIGN CONSTRAINTS

Refer to the drawings provided with this specification for:

Heating, Air Conditioning & Ventilation:

- 2217-M-T-101 HVAC

7.0 ELECTRICAL

Overloads shall be adjustable to approximately 25% higher than the relevant motor overload current.

Wiring in panels shall be neatly run in vertical or horizontal lines and each terminal shall be numbered to accord with the relevant wiring and control diagram. Circuit breakers, timers, relays, etc. shall be labelled in accordance with the wiring diagram and the item of plant served.

8.0 OPERATING AND MAINTENANCE MANUALS

8.1 Operating Manuals

Three complete sets of operating manuals shall be supplied by the Contractor, two sets to the Engineer for onward forwarding to the Employer and one for the User Department's use.

Manuals must be compiled in layman's language.

At least one month before commissioning, one draft copy shall be submitted to the Department/Engineer for comments and approval.

Operating manuals shall give a clear description of and the purpose of the installation.

- (a) Paper copies of all approved drawings and diagrams.
- (b) Detailed description of the different components used in the installation.
- (c) On- and off switching procedures.
- (d) Guidelines for routine-test to be carried out by the User Department inclusive of the periods during which tests are to be undertaken.
- (e) Detailed instructions for procedures to be followed during a fault

The following drawings are required:

- Layout drawings
- Wiring drawings showing wire colour codes and numbers as well as all connections onto terminal strips (markers to be approved by the Engineer) of all plant new and existing.

The following documents are required:

- Full description of the system.
- Operating instructions.
- Installation instructions.

- Commissioning instructions.
- Maintenance instructions, maintenance schedule and trouble shooting guide.

8.2 Maintenance Manuals

Two complete sets of maintenance manuals (Technical) prepared in English, shall be supplied by the Contractor.

At least one month before commissioning a draft copy shall be submitted to the Department/Engineer for comments and approval.

Maintenance manuals shall consist of the following:

- (a) A general description of the system.
- (b) A general description of the controls.
- (c) Schedule of equipment, model numbers, optional extras, modifications, electrical power requirements, etc.
- (d) Detailed monthly, quarterly, semi annually and annual preventative maintenance procedures.
- (e) Manufacturer's catalogues clearly indicating type, size and model of equipment supplied.
- (f) Tabulated commissioning data of all equipment and the system, indicating- as measured and according to specification - requirements.
- (g) List of suppliers, addresses and telephone numbers.
- (h) List of spare parts for all equipment.
- (i) Fault tracing/finding procedures.

The following drawings are required:

- Layout drawings
- Wiring drawings showing wire colour codes and numbers as well as all connections onto terminal strips (markers to be approved by the Engineer) of all plant new and existing.

The following documents are required:

- Full description of the system.
- Operating instructions.
- Installation instructions.
- Commissioning instructions.
- Maintenance instructions, maintenance schedule and trouble shooting guide.

Manuals shall be bound in a firm hard cover.

The information shall be clear and readable and supplied with an index.

The above-mentioned manuals shall be available at first delivery. Delivery of the installation will not be accepted without the manuals.

9.0 TRAINING OF STAFF

The bidder shall allow for sufficient time for instructing the User's appointed responsible persons in the correct operation of all plant and equipment, procedures to be followed in the event of faults etc.

Two sets of instruction manuals shall be provided. Each manual shall comprise of the following sections, bound in a vinyl plastic covered folder with the name of the project typewritten on a card inserted into a clear plastic covered cardholder on the front cover and spine and shall be handed to the Main Contractor on completion of the installation:

- Table of Contents
- Functional Description of Plant (as installed)
- Operation of Plant (as installed – step by step instructions for setting temperatures, etc.)
- Plant and Equipment (a scheduled list of all major plant to include description, make, model number and supplier's name and address).
- Performance Testing Procedures including Test Report
- Maintenance Instructions (in schedule form setting out each item of plant, the description and frequency of maintenance operations required).
- Spare Parts (list of spare parts that shall be required, with detailed description of each part, make, model or part number and supplier's name and address).
- Descriptive Literature (for all items of plant and equipment).
- Record Drawings (of plant as installed to include plant layout drawings showing component location, control and wiring diagrams and schematic piping diagrams).

10.0 GUARANTEE

The entire air-conditioning and ventilation / extraction installation shall be fully guaranteed for twelve calendar months from date of acceptance by the Engineer and contract practical completion date.

During the guarantee period, the Tenderer shall be responsible for the making good of any defects reported by the Tenant. The guarantee shall be ceded to the Superintendent following acceptance of the installation.

11.0 MAINTENANCE

The air-conditioning Tenderer shall be responsible for the maintenance of the entire plant during the guarantee period, as specified in this document. During this period the plant shall be serviced quarterly including filter cleaning and the Superintendent undertakes to provide access to the plant at suitable times during trading hours. Record of all services shall be kept and copies signed by the Superintendent.

12.0 CERTIFICATION ON COMPLETION OF GUARANTEE & MAINTENANCE PERIOD

Included in the pricing for the installation of the package plant is a 12 month quarterly service plan.

In the month prior to the expiry of the guarantee / first twelve months maintenance period, the Engineer shall inspect and, if necessary, retest the installation so as to be able to provide the Superintendent with a certificate, within fourteen days of the guarantee expiry date. This is to confirm that the guarantee has been honoured and that the installation has been properly serviced at required regular intervals by the air-conditioning Tenderer.

13.0 SAMPLES & ALTERNATIVES

Samples (within reason) will be requested by the Engineer and are to be made available on-site for inspection / approval.

The tender prices shall be based on the equipment as specified and not on any alternatives. Should the Tenderer wish to submit prices for alternatives, he shall do so separately, in a letter or similar correspondence, attached to the tender. The use of any alternative equipment, if any, will be evaluated and decided on after tender award, when the costs, etc. will be negotiated with the successful Tenderer.

The Engineer reserves the right to call for prices on alternative equipment subsequent to tender submission.

14.0 SCHEDULES OF INFORMATION

The schedules of information contained in this document consists of 2 sections:

Information supplied by the Engineer (schedules of drawings, etc. as applicable).

Information to be supplied by the Tenderer at tender stage (tender form, information on the makes, types and ratings of equipment and materials offered, schedules of prices and rates for variations, schedules of quantities, etc. as applicable).

Tenderers must provide, at the time of tendering, in the "Schedule of Material Offered", sufficient details to enable the equipment concerned to be identified without ambiguity.

It is not sufficient for a Tenderer to state "as specified" in the schedules.

Failure to complete these schedules may render a tender invalid.

15.0 DRAWINGS

15.1 General

Generally, the term "detail" shall mean that the drawing is exact in all aspects to what shall be provided. Where the term "illustration" is used, however, it shall be construed that the drawing is to be regarded as a proposal or guideline as to what is to be provided, manufactured or supplied.

15.2 Tender Drawings

Refer to the tender drawing as provided with this document.

15.3 Construction / Workshop Drawings

The successful Tenderer shall submit construction drawings (or detailed catalogues) of the manufactured equipment, such as mounting details, etc., for consideration by the Engineer prior to manufacture/supply thereof.

The Engineer's approval of construction or workmanship drawings does not relieve the Tenderer of his responsibility with regards to any of the deviations from the requirements of this contract unless the Engineer has been clearly informed, in writing, of such deviations at the time of submission and the Engineer subsequently gives written approval for the specific deviation. Similarly, the Engineer's approval shall not relieve the Tenderer of responsibility for errors or omissions in the

construction / workmanship drawings.

15.4 Record Drawings

The Tenderer must prepare record drawings of the completed installation as constructed, indicating cable runs, equipment mounting details, circuiting & distribution board details, sleeve pipe positions, etc.

The contract shall not be deemed as complete until these drawings have been submitted.

16.0 **SUPERVISION, WORKMANSHIP AND DELAYS**

The work shall at all times, for the entire duration of the contract, be executed under the supervision of a skilled and competent representative of the Tenderer, who must be able and authorized to receive and execute instructions on behalf of the Tenderer. This person must be a registered and accredited person, as described by the OHS Act. It must be noted that the staff complement of the Tenderer shall remain similar throughout the duration of the contract, for all sections of the Works.

In the event that inferior materials or bad workmanship, on the part of the Tenderer, leads to remedial work requiring redesign by the Engineer, the cost of this work, including related professional fees, shall be borne by the Tenderer.

Similarly, should delays in the contract be caused by poor performance on the part of the Tenderer causing the engineer to spend extraordinary time on the project, the extra costs incurred shall be borne by the Tenderer.

These costs will be based on the CESA hourly rate and will be deducted from claims due to from claims which will become due to the Tenderer.

17.0 **COMPLIANCE WITH REGULATIONS, STANDARDS AND CODES**

The Tenderer shall arrange for all inspections and testing of the installation as required. All notices, fees, including inspection and re-inspection, are the responsibility of the Tenderer and all the relevant costs shall be borne by him.

The workmanship throughout the Works will be to the satisfaction of the Employer. Any materials or workmanship considered as faulty or incorrectly or inadequately erected or repaired, will be substituted, altered or rectified to the satisfaction of the Employer, without additional cost to the Employer.

The Works will be executed in strict accordance with the following:

- All relevant by-laws and regulations of local authorities.
- All relevant SANS, BS and other international standards.
- The Occupational Health and Safety Act of 1993.

18.0 **COMMISSIONING AND TESTING**

18.1 General

Upon practical completion of this Sub Contract the Sub Contractor shall allow for providing the Engineer with a complete commissioning schedule indicating the actual test results and measurement of all the design or specified data/variables.

Tests to demonstrate the capacity specified and general operating characteristics of all plant shall be made under the direction of the Engineer at any time before the practical completion inspection under conditions imposed by him.

The Sub Contractor shall be responsible for supplying test equipment which is to the Engineer's satisfaction; any costs incurred by the Sub Contractor in supplying adequate instrumentation will be entirely for his account. Test instruments shall be tested for accuracy by an approved laboratory or by the manufacturer and certificates showing the degree of accuracy shall be furnished to the Engineer if required.

On satisfactory completion of all tests and after the completed installation has been inspected and passed as satisfactory by the Engineer, the installation will be accepted as being practically complete and be handed over to the Employer.

The Sub-Contractor shall be responsible for supplying an itemised set of test results for the Engineer's approval; the Engineer may at his discretion request the Sub-Contractor to re run at the Sub Contractor's expense any test which he has not witnessed or with which he feels not satisfied.

The following shall be recorded/measured for each separate installation as specified and installed under this contract:

Description of installation tested;

Date and time of test;

Ambient temperature conditions (measured in the shade):

(a) Dry bulb temperature

(b) Wet bulb temperature

(c) % RH

19.0 BUILDER'S WORK

The onus is on the Tenderer to point out and check the requirements for and positioning and correctness of all builder's work for his services.

20.0 MAKING GOOD

The builder is to be made aware of all works, timeously, relating to the impact of this installation(s). The Tenderer will carry out, in all instances any work to be made good such as damage to, or disturbance of the building installations caused by himself or his employees during the execution of the contract at his own cost.

21.0 SITE MEETINGS

The Tenderer's representative shall be expected to attend an official site meeting at the onset of the project including scheduled technical and site meetings during the contract period. For meetings termed as "technical or site", a site representative for the nominated Tenderer is required to attend and this person must be competent and able to interpret and receive and act on instructions on behalf of the Tenderer.

The Tenderer shall price all relevant P & G costs, overheads, travelling, etc. for these meetings.

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - CEREBRAL PALSY
VOLUME 2,2 PART 3: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
	<u>Bill No. 1 : Preliminary and General</u>					
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1,2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1,3	Tools and equipment, Communication, transport.					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1,5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1			
1,6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1			
1,7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	Item	1			
1,8	Additional testing and balancing at disgression of the mechanical engineer.	Item	1			
Total Carried forward to Summary Page						

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - CEREBRAL PALSY
VOLUME 2,2 PART 3: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PRICED ESTIMATE BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
2,0	<u>Bill No. 2 : Fresh Air Ventilation Equipment Installation</u>					
	<u>Weather Louvers</u>					
	Supply and install natural anodised aluminium external weather louvre, c/w internal galvanised sheetmetal sleeve for joining internal damper to louver, and with concealed fixing, incl flanges & mesh vermin proofing.					
2,1	150 x 150 mm	no.	3			
2,2	350 x 350 mm	no.	0			
2,3	560 x 1120 mm	no.	86			
2,4	Aluminium architrave 50 mm wide by internal dimension 560 x 1120 mm	no.	86			
	<u>Motorised Damper</u>					
	Supply and install galvanised steel motorised damper, c/w 220V open/close drive actuator, cable, controller switch. 220V 1PH, 1,5 W. Minimum 5nm Torque, manual override, push button reset, 95 deg of rotation, run time 150 seconds, IP54 protection.					
2,5	150 x 150 mm	no.	0			
2,6	350 x 350 mm	no.	0			
2,7	560 x 1120 mm	no.	86			
	<u>Galvanised Sheet Metal Transfer</u>					
	Supply and install transfers, incl flanges.					
2,8	150 x 150 mm to 160 mm	no.	3			
2,9	160 mm to 200 mm	no.	0			
2,10	200 mm to 250 mm	no.	0			
2,11	200 mm to 300 mm	no.	0			
2,12	250 mm to 300 mm	no.	0			
2,13	600 x 600 mm to 400 mm	no.	0			
2,14	400 mm diam to 1190 x 500 mm	no.	2			
	<u>Sound Attenuator</u>					
	Supply and install podded sound attenuator, 2D, incl flanges.					
2,15	160 mm	no.	3			
2,16	200 mm	no.	0			
2,17	400 mm	no.	0			
	<u>In Line Axial Fans</u>					
2,18	EAF 1 Axial in line silent fan, 500 / 160; Q = 40 l/s @ 60 Pa & 21 dB.	no.	3			
2,19	EAF 2 Axial in line silent fan, 1000 / 200; Q = 170 l/s @ 80 Pa & 21 dB.	no.	0			
2,20	Supply and install Axial in line fan, 400 mm Diam; Q = 290 l/s @ 85 Pa; 1440 RPM.	no.	0			
Carried forward to Next Page						

PHASE 1
 CMH - CEREBRAL PALSY
 VOLUME 2,2 PART 3: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PRICED ESTIMATE BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
Carried forward from Previous Page						
<u>Galvanised Sheet Metal Ducting</u>						
Supply and install diam round sheet metal ducting, incl flanges.						
2,21	160 mm diameter	m	30			
2,22	200 mm diameter	m	0			
2,23	250 mm diameter	m	0			
2,24	300 mm diameter	m	0			
2,25	400 mm diameter	m	0			
<u>Flexible Ducting</u>						
Supply and install Insulated Flexible Ducting.						
2,26	160 mm diameter	m	5			
<u>Galvanised Sheet Metal Spigot</u>						
Supply and install Spigot outlet:						
4 2,27	200 x 200 mm	no.	0			
2,28	160 mm diam	no.	5			
2,29	200 mm diam	no.	0			
2,30	250 mm diam	no.	0			
<u>Galvanised Sheet Metal Elbow</u>						
Supply and install 90 deg elbow, medium radius, incl flanges:						
2,31	160 mm diam	no.	2			
2,32	250 mm diameter	m	0			
2,33	300 mm diameter	m	0			
2,34	315 mm diam	no.	0			
<u>Galvanised Sheet Metal Tee</u>						
Supply and install Tee Piece, incl flanges:						
2,35	200 mm diam equal	no.	0			
2,36	250 mm diam equal	no.	0			
2,37	300 mm diam equal	no.	0			
2,38	315 mm diam equal	no.	0			
<u>Galvanised Sheet Metal End Cap</u>						
Supply and install Galvanised steel end cap, incl flanges.						
2,39	160 mm	No	3			
2,40	250 mm	No	0			
2,41	300 mm	No	0			
2,42	315 mm	No	0			
Carried forward to Next Page						

PHASE 1
 CMH - CEREBRAL PALSY
 VOLUME 2,2 PART 3: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PRICED ESTIMATE BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
Carried forward from Previous Page						
	<u>Diffuser / Louver</u>					
	Supply and install aluminium construction, c/w adjustable dampers, powder coated to Architect's approval colour, mouting brackets.					
2,43	150 x 150 mm	no.	0			
2,44	200 x 200 mm	no.	0			
2,45	160 mm diam	no.	5			
	<u>Door Grills</u>					
	Supply and install aluminium construction, double sided, mouting brackets.					
2,46	150 x 150 mm	no.	0			
	<u>Fan Controller</u>					
2,47	2 pole fan controller, on / off wired remotely and installed in conduit and round box provided by others.	no.	5			
	<u>Electrical</u>					
2,48	Connect plug fan to isolator or connect cable to isolator, provided.	no.	5			
2,49	Connect motorised louver to isolator, provided.	no.	0			
2,50	Additional 3 x 0,75 mm ² control cable for motorised dampers.	m	860			
	<u>Transport to Site</u>					
2,51	Transport all equipment to site.	Sum	1			
Total Carried forward to Summary Page						

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - CEREBRAL PALSY
VOLUME 2,2 PART 3: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
3,0	<u>Bill No. 3 : Extract Air Ventilation Equipment Installation</u>					
	<u>Weather Louvers</u>					
	Supply and install external weather louvre, powder coated to Architect's approval colour with concealed fixing, incl flanges & vermin proofing.					
3,1	150 x 150 mm	no.	0			
3,2	350 x 350 mm	no.	2			
3,3	400 x 300 mm	no.	0			
3,4	450 x 450 mm	no.	3			
3,5	600 x 600 mm	no.	3			
3,6	1000 x 160 mm	no.	0			
3,7	1000 x 400 mm	no.	0			
3,8	1100 x 400 mm	no.	0			
3,9	3300 x 400 mm	no.	0			
	<u>Motorised Weather Louvers</u>					
	Supply and install motorised external weather louvre, powder coated to Architect's approval colour with concealed fixing, I/O for fire override,incl flanges.					
3,10	1100 x 2400 mm	no.	0			
3,11	1500 x 2400 mm	no.	0			
3,12	1900 x 2100 mm	no.	0			
3,13	2000 x 800 mm	no.	0			
3,14	2300 x 2400 mm	no.	0			
3,15	3000 x 2400 mm	no.	0			
	<u>Galvanised Sheet Metal Transfer</u>					
	Supply and install transfers, powder coated to Architect's approval colour, incl flanges.					
3,16	350 x 350 mm to 200	no.	2			
3,17	450 x 450 mm to 200 mm	no.	3			
3,18	600 x 600 mm to 300 mm	no.	3			
3,19	600 x 160 mm to 200	no.	0			
3,20	600 x 300 mm to 315 mm	no.	0			
3,21	1000 x 160 mm to 315	no.	0			
3,22	1100 x 400 mm to 400	no.	0			
3,23	3000 x 400 mm to 400	no.	0			
	<u>Sound Attenuator</u>					
	Supply and install podded sound attenuator, 2D, incl flanges.					
3,24	200 mm	no.	3			
3,25	315 mm	no.	3			
3,26	400 mm	no.	0			
Carried forward to Next Page						

PHASE 1
 CMH - CEREBRAL PALSY
 VOLUME 2,2 PART 3: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
Carried forward from Previous Page						
<u>In Line Axial Fans</u>						
3,27	Supply and install Axial in line fan, 315 mm Diam; Q = 2758 l/s @ 45 Pa; 1440 RPM.	no.	0			
3,28	Supply and install Axial in line fan, 400 mm Diam; Q = 800 l/s @ 360 Pa; 2880 RPM @ 20 Deg.	no.	0			
3,29	Supply and install Axial in line fan, 400 mm Diam; Q = 3600 l/s @ 300 Pa; 2880 RPM @ 34 Deg.	no.	0			
3,30	Supply and install Axial in line fan, 400 mm Diam; Q = 1100 l/s @ 80 Pa; 2880 RPM @ 8 Deg.	no.	0			
3,31	EAF 1 Axial in line silent fan, 1000 / 200; Q = 150 l/s @ 80 Pa & 21 dB.	no.	8			
<u>Galvanised Sheet Metal Ducting</u>						
Supply and install diam round sheet metal ducting, incl flanges.						
3,32	150 mm diameter	m	18			
3,33	200 mm diameter	m	40			
3,34	250 mm diameter	m	10			
3,35	300 mm diameter	m	20			
<u>Flexable Ducting</u>						
Supply and install Insulated Flexable Ducting.						
3,36	160 mm diameter	m	18			
3,37	200 mm diameter	m	2			
<u>Galvanised Sheet Metal Spigot</u>						
Supply and install Spigot outlet:						
3,38	160 mm	no.	0			
3,39	200 mm	no.	18			
3,40	250 mm	no.	0			
3,41	300 mm	no.	0			
<u>Galvanised Sheet Metal Elbow</u>						
Supply and install 90 deg elbow, medium radius, incl flanges:						
3,42	200 mm diam	no.	0			
3,43	300 mm diam	no.	2			
<u>Galvanised Sheet Metal End Cap</u>						
Supply and install Galvanised steel end cap, incl flanges.						
3,44	200 mm	No	0			
3,45	250 mm	No	0			
3,46	300 mm	No	8			
Carried forward to Next Page						

PHASE 1
 CMH - CEREBRAL PALSY
 VOLUME 2,2 PART 3: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
Carried forward from Previous Page						
	<u>Diffuser / Louver</u>					
	Supply and install aluminium construction, c/w adjustable dampers, powder coated to Architect's approval colour, mouting brackets.					
3,47	150 x 300 mm	no.	0			
3,48	200 x 300 mm	no.	0			
3,49	900 x 250 mm	no.	0			
3,50	1000 x 300 mm	no.	0			
3,51	200 mm diam	no.	20			
	<u>Door Grills</u>					
	Supply and install aluminium construction, double sided, mouting brackets.					
3,52	250 x 250 mm	no.	0			
3,53	300 x 300 mm	no.	13			
	<u>Fan Controller</u>					
3,54	2 pole fan controller, on / off wired remotely and installed in conduit and round box provided by others.	no.	8			
	<u>Electrical</u>					
3,55	Connect plug fan to isolator or connect cable to isolator, provided.	no.	8			
3,56	Connect motorised louver to isolator, provided.	no.	0			
	<u>Transport to Site</u>					
3,57	Transport all equipment to site.	Sum	1			
Total Carried forward to Summary Page						

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - CEREBRAL PALSY
 VOLUME 2,2 PART 3: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION**

PRICED ESTIMATE BILL OF QUANTITIES

PRICE SUMMARY

BILL NO.	DESCRIPTION	AMOUNT
1	Bill No. 1 : P&G	
2	Bill No. 2 : Fresh Air Ventilation Equipment Installation	
3	Bill No. 3 : Extract Air Ventilation Equipment Installation	
SUBTOTAL CONTINGENCY 2,5% SUBTOTAL		

REMINDER NOTE

The Total Price including Main Contractor's Mark-up which excludes VAT, must be carried over to the final summary in Volume 1 and all fixed amounts shown in the price schedule must be included therein. No adjustments will be made for any failure by Tenderers to include the fixed amounts in the Total Price for this particular installation.

SUB-CONTRACTOR'S NAME:

DATE:

SIGNATURE:

N.B. The above-named Sub-Contractor is to be employed on this contract. Substitute Sub-Contractors are not acceptable.

The price submitted include all Main Contractor's 'Profit and Mark up BUT Exclude the VAT when transferring price to Volume 1 of the Final Summary Total of the Main Contractor's Document

VOLUME 2.2 PART 5: HVAC - SCHEDULE OF MATERIALS OFFERED

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities.

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

NB : **Only one manufacturer's name to be inserted for each item.**

Item	Material	Make or trade name	Country of Origin
1.	Weather Louvers		
2.	Motorised Dampers		
3.	Axial Air Fans		
4.	Silent Type Air Fans		
5.	Sound Attenuators		
6.	Swirl Diffusers		
7.	Ceiling Disc Diffusers		
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			

NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor.

Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.

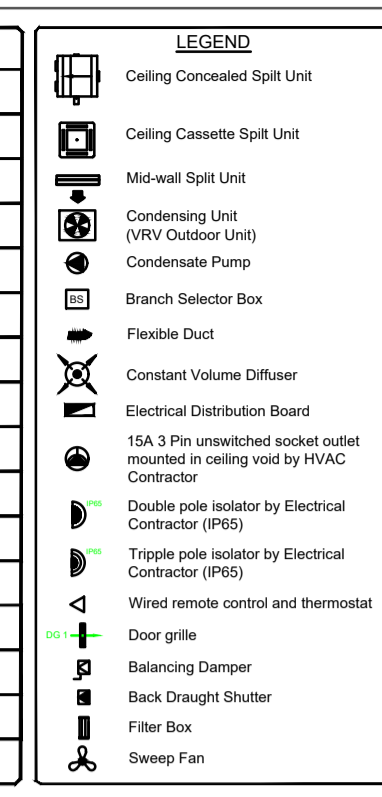


PASSIVE VENTILATION EQUIPMENT		QTN
FAL1	600 x 1200 mm natural anodized aluminium weather lower low mesh screen, galvanneal sheet metal above	86
FAL1	600 x 1200 mm galvanneal sheet metal dampers, low motorised electric actuator, linkage, drive arm etc. and open / close selector and cable	86

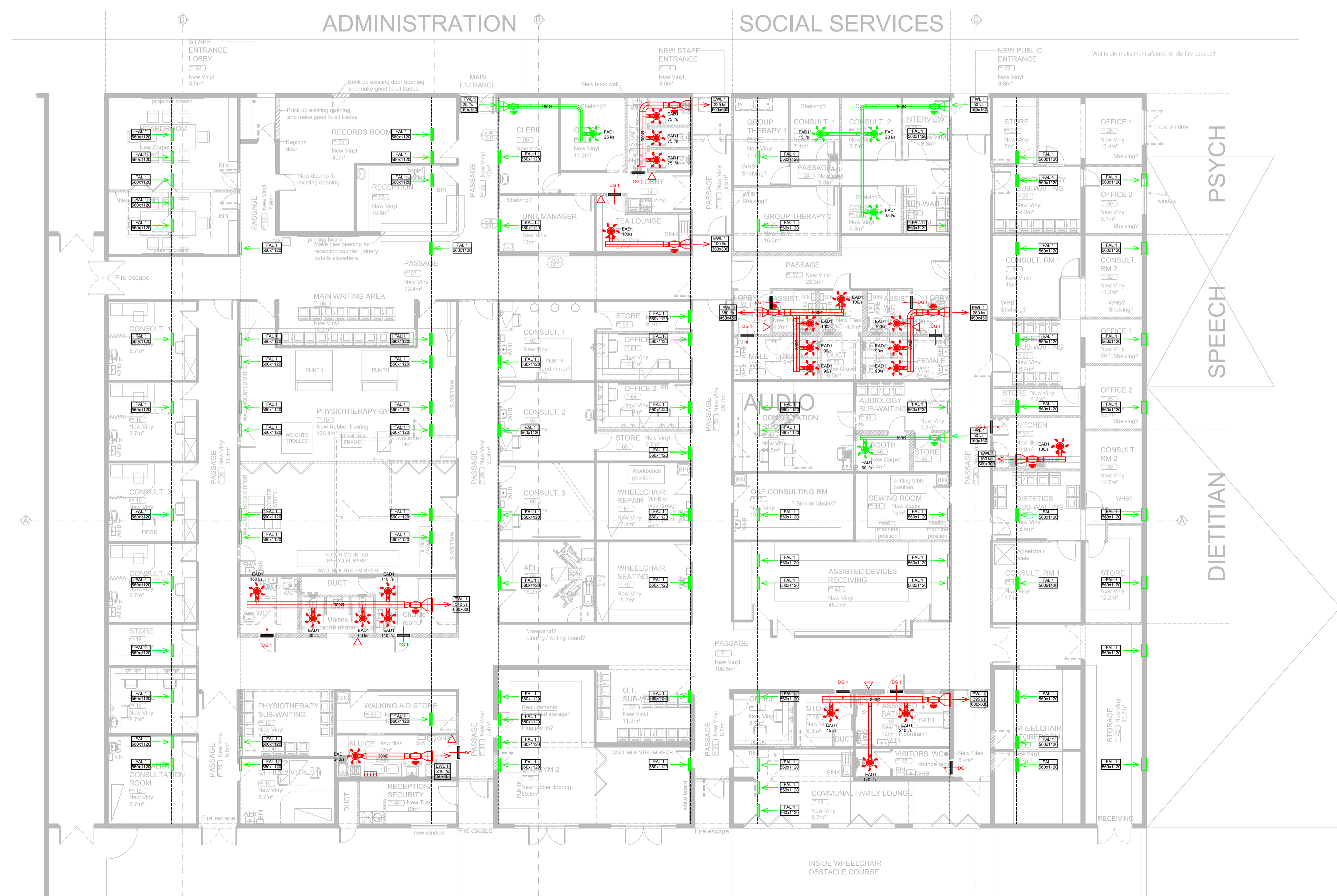
AIR CONDITIONING EQUIPMENT		QTN

SUPPLY AIR VENTILATION EQUIPMENT		QTN
WL1	Aluminium extruded profile weather lower 150 x 320 mm	3
FAF1	TD Silent air supply air fan 500/160 Q = 75 l/s @ 100 Pa, 0.15 kW 15 A SBC	3
FAD1	Supply air ceiling disc diffuser Ø = 150 mm powder coated white	5

EXTRACT AIR VENTILATION EQUIPMENT		QTN
WL1	Aluminium extruded profile weather lower 300 x 320 mm	2
WL2	Aluminium extruded profile weather lower 450 x 450 mm	3
WL3	Aluminium extruded profile weather lower 600 x 600 mm	3
EAF1	TD Silent air supply air fan 500/160 Q = 280 l/s @ 175 Pa, 0.12 kW 15 A SBC	5
EAF2	TD Silent air supply air fan 1000/200 Q = 220 l/s @ 175 Pa, 0.12 kW 15 A SBC	1
EAF3	TD Silent air supply air fan 1000/200 Q = 540 l/s @ 175 Pa, 0.12 kW 15 A SBC	2
EAD1	Supply air ceiling disc diffuser Ø = 160 mm powder coated white	18
EAD2	Supply air ceiling disc diffuser Ø = 250 mm powder coated white	2
DG1	Natural anodized aluminium door grill, double sided 300 x 300 mm	13



GENERAL NOTES:



REVISIONS			
REV	DATE	INIT.	DESCRIPTION
00	06/07/23	TW	Issued for Information

CLIENT

TITLE
HEATING VENTILATION AND AIR CONDITIONING EQUIPMENT LAYOUT

CMH
CEREBRAL PALSY



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DESIGN	TENDER	CONSTRUCTION
DESIGNED BY: T.WARNE	SCALE 1:50	
DRAWN T.WARNE	DATE 02/07/2023	PRINT DATE 02/08/2023
CHECKED BY: Travis Warne	REGISTRATION No. 201770017	
SIGNED		
DRAWING NO. 2217-M-D-101 HVAC CP	REV No. 00	

VOLUME 2.3 CP

MECHANICAL INSTALLATION

Fire Protection Installation

VOLUME 2.3 PART 1: FIRE PROTECTION EQUIPMENT - 1 SCOPE OF WORKS

FIRE PROTECTION EQUIPMENT INSTALLATIONS

1. GENERAL

- 1.1 The Standard for Uniformity in Construction Procurement published in terms of the Construction Industry Development Board (CIDB) Act, 2000 (Act No. 38 of 2000), the Standardized Construction Procurement Documents for Engineering and Construction Works as issued by the CIDB and any other relevant documentation pertaining thereto must be studied and all principles in this regard must be applied to all procurement documentation, practices and procedures.

2. THE CONTRACT

2.1 FIRE PROTECTION EQUIPMENT INSTALLATIONS

The work to be carried out and commissioned by a SAQCC Fire approved installer:

- a. Installation of new hose reel, hydrant and extinguisher equipment, as per SANS 10400 Section T & SANS 10252,
- b. Installation of new galvanised steel water reticulation,
- c. Testing and Commissioning, as per SANS 10400 Section T and SANS 10139,
- d. Manuals, Drawings, OEM Literature,

2.2 Existing

All installations new. Building Existing.

2.3 Order of The Works

As per the building contractors' program of works.

VOLUME 2.3 PART 2: FIRE PROTECTION STANDARD SPECIFICATION

1.0 GENERAL

- 1.1 This standard specification applies to, and is to be read in conjunction with the particular technical specifications.
- 1.2 In so far as the conditions contained herein are at variance with anything contained in the particular specification, the contract shall be interpreted in terms of the particular specification for each particular service.
- 1.3 Equipment, materials and operational methods, shall comply with the relevant South African Bureau of Standards Specification or the British Standard Specification, wherever such specification exists, whether prescribed or not. Preference will be given to the latest issue of the SANS specification where both such specifications exist, unless otherwise prescribed in this or the particular specification.

2.0 OCCUPATIONAL HEALTH AND SAFETY ACT

- 2.1 All equipment supplied and installed under the contract shall meet the requirements of the Occupational Health and Safety Act (Act No 85 of 1994, (as amended) and all other relevant statutory requirements and the Contractor shall comply with the requirements laid down by the Inspector of Machinery under this Act.

3.0 DRAWINGS

- 3.1 The drawings issued with this specification do not purport to show the exact position, size or details of construction of equipment.
- 3.2 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.
- 3.3 Drawings showing any alternative suggestions differing from the Engineer's design must be submitted with tenders.
- 3.4 Within four weeks of signing of the contract (or date of order) the successful tenderer shall submit to the Engineer or his duly appointed representative the following working drawings:
 - 3.4.1 Plant room lay-out showing total operating mass of equipment and the positions and sizes of the water and drain connections required.
 - 3.4.2 Construction details of all items manufactured by the air conditioning and/or ventilation Contractor, such as air plenums, duct work, bases etc.
 - 3.4.3 Dimensions and positions of all holes through walls, slabs, etc., and any amendments to the sizes or positions of return grilles, louvred openings, etc., indicated on the Engineer's drawings.
- 3.5 Approval by the Engineer of drawings submitted by the Contractor shall not relieve him of his liability to carry out the work in accordance with the requirements of the contract documents.
- 3.6 Positions and sizes of return air grilles, louvred openings, openings through reinforced concrete beams and slabs, etc., as indicated on the drawings shall be adhered to as far as possible. Amendments will only be considered if absolutely unavoidable.

4.0 MANUFACTURER'S RATINGS

- 4.1 All equipment such as fans, compressors, cooling towers, pumps, etc., shall be operated well within the manufacturer's ratings. Equipment offered for use beyond these limits will not be considered.

- 4.2 Tenderers must submit manufacturer's ratings of all equipment offered. Ratings shall be given in the SI system.
- 5.0 POWER, WATER AND DRAIN CONNECTIONS
- 5.1 Power, water and drain points in the plant rooms will be provided to a point by others.
- 5.2 All plumbing between equipment and water and drain points shall form part of the contract.
- 6.0 NOTICES
- 6.1 The Contractor shall supply and install all notices and warning signs that are required in terms of the Occupational Health and Safety Act, by local by-laws or regulations and by these documents. This includes notices prohibiting entry to un-authorized persons, etc.
- 6.2 A log-book and log-book stand must be provided for each plant room. This must take the form of an A5 size hard cover note book fixed by a light chain through the top left-hand corner to a writing surface.
- 7.0 WELDING
- 7.1 Welding shall be carried out in accordance with the current edition of SANS 044 Parts 1 to VII where applicable.
- 7.2 All welded fillet or butt joints shall be free from porosity, cavities and entrapped slag. Joints shall be ground smooth if required for aesthetic reasons only. If strength is required, they shall not be ground.
- 7.3 The joints in the weld run, where welding has been recommenced, shall be as smooth as possible and shall show no pronounced hump or crater in the weld surface.
- 7.4 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 a reinforcement of not more than 3 mm in the case of butt welds.
- 7.5 The weld face shall be uniform in appearance throughout its length.
- 7.6 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 SANS 455.
- 7.7 Only welders in possession of a valid approved competence certificate shall be employed.
- 7.8 When pipes are welded, tenderers must allow for pipe joints (where chosen by the Engineer's Representative) to be X-ray tested by the SANS or other approved body for sound welding at the Contractor's expense or for joints to be cut for examination purposes. After the removal of these joints, the piping must be made good by the Contractor. Should any of the welds prove unsatisfactory, the Contractor may be called upon, at his own expense, to have all welds examined by X-ray. The X-ray examination shall be carried out by the South African Bureau of Standards or other approved body.
- 7.9 All welds must show proper fusion.
- 8.0 GALVANISING
- 8.1 All hot dip galvanizing shall be carried out in accordance with SANS 934 and SANS 763 where applicable.
- 8.2 Mild steel plate and sections shall be of good commercial quality, or higher grades, best suited for galvanizing. The materials shall be free from slag or coarse laminations, fine fissures and rolled-in impurities.
- 8.3 Castings shall be sound, dense and clean, and free from distortion, porosity, carbon and slag

enclosures, blow-holes, and other injurious conditions.

- 8.4 Welding flux shall be chipped away and all welds wire brushed before galvanizing.
- 8.5 The surfaces to be galvanised shall be free from paint, oil, grease, and similar impurities.
- 8.6 All exposed surfaces including welds shall be thoroughly sand blasted prior to galvanizing.
- 8.7 The Engineer shall have the right to inspect all steel components before galvanizing, 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.
- 8.8 The galvanised coating shall be smooth, adherent, continuous and free from black spots or flux stains.
- 8.9 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. The zinc bath shall contain not less than 98.5% pure zinc.
- 8.10 The deposits expected from galvanised coatings shall be as follows: -

MATERIAL THICKNESS	COATING GRAMS PER m2	APPROXIMATE THICKNESS
Bolts and Nuts	275 - 300	0,033 - 0,036 mm
1,25 mm to 2 mm	400	0,056 mm
2 mm to 5 mm	535	0,07 mm
5 mm and over	760	0,108 mm

9.0 COUPLINGS

Couplings shall be aligned by means of a clock gauge and the results entered in the commissioning data included in the Operating and Maintenance manuals.

10.0 BEARINGS

10.1 ANTI-FRICTION

10.1.1 Anti-friction bearings shall include all bearings which provide rolling contact between one or more sets of hardened steel balls or rollers and the hardened steel rings or raceways.

10.1.2 Anti-friction bearings shall be of approved manufacture.

10.1.3 To facilitate maintenance, spares inter-changeability 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 the manufacturer's requirements.

10.2 BUSHED BEARINGS

10.2.1 Only where specifically stated and in cases 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.

- 10.2.2 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.
- 10.3 SELF-LUBRICATING OR OIL-LESS BEARINGS
 - 10.3.1 Self-lubricating or oil-less bearings shall only be used on application of light loads and low velocities in moisture free and low humidity and conditions and where access to bearings is difficult and likely to be neglected during servicing.
 - 10.3.2 The type of bearing metal composition used shall have friction and wear resistant properties akin to those of grease lubricated bushed bearings.
- 11.0 GENERAL MACHINERY PROTECTION
 - 11.1 COUPLING AND SHAFT GUARDS
 - 11.1.1 All high-speed couplings, projecting shaft ends and every dangerous moving part of machinery within normal reach of a person shall be protected by a guard manufactured from not less than 1,5 mm mild steel plate.
 - 11.1.2 The guards shall be neatly formed and securely fixed in position.
 - 11.2 BELT GUARDS
 - 11.2.1 All belt or rope drives shall be adequately protected by a belt guard.
 - 11.2.2 The guard shall be manufactured from 25 mm wire mesh or open type expanded metal, securely braced and stiffened with light rolled steel sections and bolted in position. They shall be in accordance with the Occupational Health and Safety Act of 1994 (as amended).
 - 11.3 CHAIN DRIVES
 - 11.3.1 All chain drives shall be fitted with sheet chain cases and lubrication facilities to the chain manufacturer's recommendations. All joints shall be dust tight and arranged for convenient installation and dismantling.
 - 11.3.2 Each chain case shall be fitted with a hinged inspection door, drain hole and plug.
- 12.0 QUALITY OF MATERIALS
 - 12.1 Only materials of high quality shall be used throughout and shall be subject to the approval of the Engineer.
 - 12.2 All materials, where applicable, shall conform in respect of quality, manufacture, tests and performance, with the requirements of the SANS standards, or, where no such standards exist, they shall conform with the appropriate current specification of the British Standards Institution. Materials manufactured in South Africa shall be used wherever possible.
 - 12.3 Imported materials shall comply with the requirements of the relevant SANS or BS Specifications, although these materials need not necessarily bear the SABS mark.
 - 12.4 All materials shall be suitable for the site conditions. These conditions shall include weather conditions as well as prevailing conditions during installation and subsequent use.
 - 12.5 Should the materials or components not be suitable for use under temporary site conditions the Contractor shall provide at his own cost, suitable protection until these unfavorable site conditions cease to exist.

13.0 MAINTENANCE INSTRUCTIONS

- 13.1 As requested in the particular specification the Contractor shall provide operating and maintenance manuals/instructions at the time of hand-over of the installation.
- 13.2 The manuals shall include the following:
 - 13.2.1 Maintenance instructions for all components of the plant which shall include maintenance items required over and above those included in the maintenance schedules attached to this specification, troubleshooting guide, part numbers of all replacement items, capacity curves of pumps, fans and compressors, belt sizes, types and lengths, serial numbers of all principal pieces of equipment, etc.
 - 13.2.2 The names, addresses and telephone numbers of manufacturers or their agents.
 - 13.2.3 Receiver test certificates.
 - 13.2.4 A complete set of the "as built" drawings reduced in size to fit the manuals.
- 13.3 The operating and maintenance instructions specified above shall be obtained from the equipment manufacturer and where no such manuals exist, they shall be compiled by the Contractor to the best of his ability.
- 13.4 The contract shall be considered incomplete until all tests have been conducted to the satisfaction of the Engineer and all drawings and manuals have been handed over.

14.0 MAINTENANCE, SERVICING AND GUARANTEE

14.1 MAINTENANCE AND SERVICING

- 14.1.1 The Contractor shall be responsible for all maintenance and servicing of the installation during the 12-month guarantee period in accordance with the service schedules attached to this specification. Such additional items as required by the manufacturer of the equipment shall be included. (See also clause 13.2)

Four (4) services are required during this period on dates to be agreed at the first delivery inspection. The final service shall be carried out approximately 14 days before final delivery and expiry of the guarantee.

The contractor shall complete the service schedules and submit copies thereof together with his invoice for the servicing to the engineer after each service.

- 14.1.2 During the 12-month guarantee period the Contractor shall make good any defects due to inferior materials and workmanship and maintain all plant and equipment in perfect operating condition.
- 14.1.3 The Contractor shall maintain the plant log book on site in which he shall record, sign and date all work carried out at each inspection as well as log all temperature and pressure readings.
- 14.1.4 The Contractor shall allow for all expendable materials necessary for servicing such as lubricating oils, grease, refrigerant, cleaning materials etc.

14.2 GUARANTEE PERIOD

- 14.2.1 The CONTRACTOR shall unconditionally guarantee all new plant and equipment (machinery) for a minimum period of twelve (12) months from the date of hand over to the Engineer.

If the CONTRACTOR or his supplier has a standard guarantee which exceeds the minimum warranty called for, the remaining portion of such extended warranty must be ceded to the client.

- 14.2.2 The guarantee shall cover the performance of the WORKS and any defects due to inferior materials and/or workmanship, fair wear and tear excepted, and the CONTRACTOR shall repair any such

defects without delay.

This guarantee shall include malfunction, and water, refrigerant gas, oil, or air leaks, and all adjustments.

14.2.3 Should the performance of any part of the complete WORKS become unsatisfactory so as to become detrimental to its functional use, the CONTRACTOR shall replace any such part or the complete WORKS with equipment as prescribed by the Engineer.

14.2.4 If any such defects are not remedied without delay, the Engineer reserves the right to have such defect repaired at the risk and cost of the CONTRACTOR by another CONTRACTOR whom the Engineer deems to be proficient in the WORK. This to be without prejudice to any rights the Engineer has against the installation CONTRACTOR. The Engineer will give written notice to the installation CONTRACTOR of such instances where he appoints another CONTRACTOR to remedy defects in the WORKS.

14.3 PREVENTIVE MAINTENANCE SERVICES.

Preventive maintenance servicing of plant and equipment shall be carried out in accordance with the maintenance schedules and programs to be supplied by the Engineer. Copies must be made as required of these schedules.

15.0 ELECTRICAL EQUIPMENT AND INSTALLATION

15.1 Unless otherwise stated in the particular specification tenderers must allow in their price for the complete electrical installation and wiring.

15.2 All electrical equipment and wiring shall be in accordance with the current issue of the Standard Wiring Regulations (SANS1 0142) (as amended).

15.3 Three phase power will be provided by others in the plant room.

15.4 Ammeters and pilot lights shall be provided for electric heaters.

14.5 All motors over 5 kW shall be provided with an approved electronic type motor protection unit.

15.6 In conventional field assembled plants lighting shall be provided for filter, coil and fan chambers, etc and shall comprise of bulk-head fittings permanently fixed to the walls or ceiling and earthed directly to the main earthing bar of the switchboard by means of a 4 mm² bare copper earth continuity conductor, in addition to being earthed by means of the continuity of the conduit as specified.

15.7 A single phase power point will be provided in the plant room by others for this lighting.

16.0 AUTOMATIC CONTROL SYSTEMS

16.1 Unless otherwise specified either electric or electronic controls may be offered. All control devices shall perform the functions indicated and operate in the required sequence.

16.2 The performance of controllers shall be stable under all conditions and shall be such that an aperiodic recovery of the controlled variable is obtained following a disturbance. Means of adjusting the control loop stability, such as adjustable proportional bands, adjustable reset rates etc., shall be provided on controllers when applicable.

17. DRIVES

17.1 Compressors and pumps shall be direct coupled to their driving motors.

17.2 The drives between centrifugal fans and motors shall be by means of grooved pulleys and V-belts.

17.3 V-belt drives shall be designed in accordance with CKS 332. Motors shall be mounted on slide rails for adequate belt tensioning and replacement.

- 17.4 All drives shall be protected by stout 25 mm wire mesh guards and shall be in accordance with the Occupational Health and Safety Act of 1994 (as amended).
- 18.0 EQUIPMENT BASES
- 18.1 Bases for centrifugal fans, compressors, air cooled condensers, air compressors, pumps and motors etc., shall consist of reinforced concrete cast into sheet metal formers at least 150 mm deep.
- 18.2 Bases shall be reinforced with at least 13 mm reinforcing bars located at 150 mm centers each way.
- 18.3 The mass ratio between bases and equipment shall be at least 1:1 for fans and 1,5:1 for pumps.
- 18.4 Concrete bases for the pumps shall be large enough to support pipes and fittings between the pumps and flexible connections.
- 18.5 Bases generally shall be large enough to accommodate the motors and driven equipment. Equipment shall be bolted onto the concrete inertia base.
- 18.6 Spring isolators shall be installed between concrete inertia bases and floor plinths and between the cooling towers or evaporative condensers and floor plinths.
- 18.7 Structural steel bases shall be provided for the cooling towers and evaporative condensers if their framework does not permit point support.
- 18.8 Either free standing stable spring or caged spring with snubber may be used. Spring isolators shall be installed with leveling bolts and shall incorporate 6 mm thick ribbed neoprene acoustical pads bonded to the base.
- 18.9 Spring diameters shall be large enough to prevent excessive rocking of equipment during start-up and normal operation.
- 18.10 Isolators shall be chosen to give a static deflection corresponding to a ratio of 3:1 of the lowest disturbing frequency to the natural frequency of the mounting.
- 18.11 Bases and spring isolators shall be arranged to give a clearance of approximately 25 mm between the underside of the bases and floor plinths.
- 18.12 Floor plinths of sufficient height shall be installed under all equipment by the air conditioning contractor. The plinths shall be large enough to accommodate the concrete inertia bases and spring isolators. Floor plinths shall also be provided under items of equipment which do not require concrete inertia bases such as cooling towers, air plenums, etc. The plinths under the air plenum shall be at least 100 mm higher than the finished floor level in the plant room.
- 19.0 RUNNING OF PIPES
- 19.1 Pipes and ducts shall be installed in accordance with the drawings issued with the supplementary specification.
- 19.2 The drawings are schematic and do not purport to show the exact positions of pipes nor the details of construction and installation. All final dimensions must be checked on site before the fabrication of piping sections.
- 19.3 Pipe sleeves with at least 6 mm clearance filled with a resilient material shall be provided where refrigerant tubing or water piping passes through walls or slabs.
- 19.4 Where beams, stanchions or other obstructions interfere with the straight running of pipes or ducts, suitable offsets shall be provided or changes in the section of the duct made, without altering the cross-sectional area.

- 19.5 Tenderers should make themselves conversant with complete drawings of the 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 for these shall be made in the tendered price.
- 19.6 A complete set of drawings of the building may be inspected at the office of the Architect.
- 20.0 PAINTING
- 20.1 All exposed galvanised sheet metal work in plant rooms, air conditioned and ventilated spaces, basements, corridors etc., shall be painted.
- 20.2 Ducts shall be identified by coloured symbols as specified in clause 6 of SANS 0173-1980.
- 20.3 The temporary white rust preventative compound on new galvanised sheet metal shall be removed by means of washing, brushing and if necessary, abrasion with a special solvent or compound used for this purpose. The surface shall be well rinsed and dried. It shall then be painted with one coat of zinc dust/zinc oxide paint to SANS 910 or one coat of calcium plumbate primer to SANS 912 followed by one under coat to SANS 681 type II and one coat high gloss enamel paint to SANS 630, Grade I, as top coat, the colour of which will be determined by the Engineer.
- 20.4 The entire air-conditioning unit casing, including galvanised iron eliminators, sumps, drip pans, fans etc., shall be painted internally with two coats of epoxy-tar paint to SANS 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.
- 20.5 Ferrous cooling tower and evaporative condenser casings, including galvanised iron eliminators sumps and fans and internal areas of connecting ductwork shall be internally painted as specified above. Externally the casings shall be painted as specified in clause 48.3. Factory painted equipment will also be acceptable.
- 20.6 Exposed hot water piping with canvas covered insulation shall be painted two coats of bitumen aluminium paint to SANS 802.
- 20.7 Exposed uninsulated galvanised piping shall be thoroughly degreased. In case a detergent is used, the surfaces shall be well rinsed and dried. It shall then be painted with one coat of zinc dust/zinc oxide paint to SANS 910, or one coat of calcium plumbate primer to SANS 912, followed by either one undercoat to SANS 681, type II, and one coat high gloss enamel paint to SANS 630, Grade I, as topcoat or two coats of PVA to SANS 634, Grade I.
- 20.8 Uninsulated black piping, flat-iron, angle-iron and rods for supports, brackets, duct stiffeners, etc., shall be painted on all sides with a zinc chromate primer to SANS 679, Type I followed by two coats of enamel paint to SANS 630, Grade I.
- 20.9 Where specified in the supplementary specification aluminium shall be painted with a wash primer to SANS 723, followed by a zinc chromate primer to SANS 679, Type I, and two coats of enamel paint to SANS 630, Grade I.
- 20.10 Motors, compressors, pumps etc., shall be painted light grey. Belt guards shall be painted bright red.
- 20.11 Before any painting is applied the steel surfaces shall be prepared according to SANS 064, (Code for preparation of steel surfaces for painting.)
- 20.12 Where specified in the particular specification steel surfaces shall be cleaned and then treated by the hot phosphate process to a minimum weight of 1,6 gr/m² coating followed by two coats of baking enamel to SANS 783, Type I.
- 21.0 GENERAL REQUIREMENTS FOR FIRE INSTALLATIONS

All fire pipe installations shall adhere to the technical and particular specifications of the Employer, and shall include the following general requirements:

- 21.1 Piping shall conform to the requirements of SANS.
- 21.2 Pipes shall be cut accurately to measurements established on site and installed without springing or forcing and properly clear of windows, doors and other openings. All piping shall be reamed after cutting and shall be clean, straight and free of defects.
- 21.3 Drawings are generally diagrammatic and indicative of work to be installed. Routing and arrangement of piping shall be as indicated, subject to site conditions and the appropriate requirements of SANS rules.

Clashes with other trades shall be avoided and fittings, valves, drain points, etc shall be located so as to ease access, maintenance and operation of the system. Note that required offsets, fittings, valves, drains, etc are not necessarily indicated.
- 21.4 Pipe runs shall be straight and direct as possible, in general forming right angles with or parallel to walls or other piping, and neatly spaced. Piping shall be installed so that there is sufficient clearance between finished coverings of piping, fittings and adjoining work. Sleeves shall be provided where piping passes through partitions, beams, slabs, etc.
- 21.5 Valved and capped drain points shall be provided at all low points in the piping network. Unions or flanged connections shall be provided to aid dismantling of the piping should it be required.
- 21.6 No cold springing shall be allowed. Pipe sections shall be fabricated/cut to length accurately in order to avoid cold springing.
- 21.7 Where necessary, adequate temporary supports shall be installed during erection so as not to overstress piping or equipment to which piping is connected.
- 21.8 All supports shall conform to the requirements of SANS, and no perforated straps or strip steel shall be used.
- 21.9 Piping which is subject to vertical movements shall be provided with springs or other suitable supports.
- 21.10 Hangers shall be installed in such a manner that they cannot be disengaged by any pipe or support steel movement.
- 21.11 No pipe shall be suspended from another pipe except if specifically called for on the drawings or in the particular specification (Part 3).
- 21.12 The Contractor shall be responsible for selecting the sizes and types of pipe hangers, supports and support devices not shown on the drawings, but which are necessary for the completion of the installation. Support spacing shall be as specified in paragraph 23.0 The Contractor shall supply details of all calculations to the Engineer for scrutiny together with two marked up prints showing the location and types of all supports/pipe hangers to be installed prior to ordering and commencing installation.
- 21.13 During construction all pipe ends shall be kept plugged to prevent any ingress of dirt, rubble etc.

22.0 PIPING

- 22.1 Steel piping shall be solid drawn, heavy grade steam quality piping conforming to ASTM/A106 Schedule 40 or to B.S. 1387/1967 (heavy quality) or SANS 62/1971. In all instances the latest editions and amendments to these specifications shall apply.

In plant rooms piping may be welded, prefabricated off-site to aid in installation and connection to pumps, storage tanks, etc. Welding shall be carried out as specified in paragraph 7.0 of this specification.

Generally, pipe sections shall be screwed together using malleable iron threaded fittings, class 150 and 300 in accordance with ASME B 16.3. Only eccentric fittings shall be used

at changes in pipe size. No bushing shall be used in lieu of reducing fittings. Screwed joints shall be screwed up tightly using an approved jointing compound such as PTFE tape. Hemp joints will not be accepted.

Pipes joined with grooved fittings (e.g., Klambon or Victaulic) shall be joined by a listed combination of fittings, gaskets, and grooves. Grooves cut or rolled on pipe shall be dimensionally compatible with the fittings and pressure at which the system is to operate.

Where flanges are used, they shall be in accordance with ASME B16.5. Steel slip-on boss flanges for welding shall have a nominal pressure at least 10% in excess of the maximum fluid pressure. Where equipment is supplied complete with flanges not in accordance with the above specification, a matching weld-on flange is to be used for connecting up such equipment. Bolts in flanges are to be high tensile steel and of the correct length such that no more than 1,5 clear threads protrude beyond the nuts after tightening to the correct torque. In flanged joints new gaskets shall be used for every assembly operation unless such an assembly is intended solely for initial fitting. Gasket material shall be fibre composition or similar material suitable for the system operating pressure and temperature.

22.2 Underground piping shall be class 16 HDPE piping and weld-on flanges in accordance with SANS 0533-2

Pipes shall be laid on a 100 mm sand-bedding cradle and covered with 300 mm sand before backfilling. The total cover over the piping shall be a minimum of 900mm generally and 1100mm under roadways. All backfilling shall be to the Engineers approval.

Where required thrust blocks shall be cast between the pipe and the undisturbed trench material. At thrust blocks the pipe bend shall be wrapped with a "Densopol 80 HT Tape" (or equal and approved) so that no concrete comes into direct contact with the HDPE piping.

23.0 All underground piping shall be pressure tested prior to it being covered.
PIPE SUPPORTS AND HANGERS

All necessary pipe hangers, brackets, supports, stanchions and anchors shall be designed, supplied and installed by the Contractor, in accordance with SANS.

23.1 Maximum pipe support spacing shall be as follows:

Pipe Diameter	Max support Spacing
20 mm	3 m
25 mm	3.6 m
32 mm	3.6 m
40 mm	4.5 m
50 mm	4.5 m
65 mm	4.5 m
80 mm	4.5 m
100 mm	4.5 m
150 mm	6 m
200 mm	6 m

The contractor will be required to ensure that the hangers/supports selected are conservatively rated for the carrying capacity required. (Refer to paragraph 21.12).

23.2 There shall be at least one pipe support for each mechanical pipe joint .

23.4 Components of any pipe support shall be securely attached to each other by means of bolts or threaded rod with nuts and washers.

23.5 All components of all pipe supports shall be galvanized.

24 VALVES AND FITTINGS

All valves, check valves, shut-off valves, etc. shall be of a pressure class greater than or equal to pressure class of the piping.

All valves controlling water supplies for fire systems or portions thereof, should be accessible to authorized persons during emergencies. Permanent ladders, chain-operated hand wheels, or other acceptable means should be provided where necessary.

Outside control valves shall be located within a fenced enclosure under the control of the owner, sealed in the open position, and inspected weekly as part of an approved maintenance and safety procedure.

- 24.1 Valves greater than 50mm diameter shall be of the butterfly type with resilient rubber seats. 100 mm and 150 mm diameter valves shall be equipped with gear operated closing mechanism. Valves shall conform to BS 5155 and shall be KERR fig. no 104A or similar or equal and approved.
- 24.2 Valves up to and including 50mm diameter shall be of the screwed and socketed type with bronze body and gated with non- rising spindle.
- 24.3 Valves shall be labelled as follows:
- (a) Main stop valves, control valves, etc shall be labeled by means of rust-free metal tags indicating their purpose and the section they isolate, if isolating valves.
 - (b) The tags shall be securely fixed to the valve and shall be clearly legible.
 - (c) All letters on labels shall be engraved or punched. No painted or plastic embossed labels will be accepted.
- 24.4 Strainers shall be of the Y-type with cast iron body, stainless steel or bronze strainer element and shall be equipped with flanged ends. The hole sizes of the strainer element shall be maximum 1 mm \varnothing and be removable without dismantling of pipe-work. Strainers shall be suitable for a temperature of up to 90°C at a 1 600 kPa pressure rating and installed with the element facing downwards or a maximum of 45° sideways.
- 24.4 Non-return valves shall be of the spring-loaded wafer dual flap plate type fitted between two flanges. They shall be equipped with a cast iron body, aluminium bronze plates, stainless steel springs and neoprene seals on the plates. The valves shall be suitable for working pressures of up to 1 600 kPa.

25 PUMPS

- 26.1 Pump sets shall conform and be installed as detailed in SANS and these specifications. The number and type of pump sets will be detailed in the Particular Specification (Part 3) and will comprise some or all of the following
- (a) Electrical driven jockey pump set
 - (b) Electrical driven main sprinkler/fire pump and drive.
 - (c) Diesel driven main sprinkler/fire pump and drive.
 - (d) Sprinkler/fire pump starting arrangement.
 - (e) Electric and Engine drive controllers and ancillary equipment.
 - (f) Water flow test devices.
 - (g) Fuel storage and piping
- The pump sets shall be, installed, tested, commissioned and certified in accordance with SANS and the Local Authority's requirements.
- 26.2 Prior to ordering and installation, the Contractor shall provide a full set of plans and detailed data describing the following for scrutiny and/or approval by the Engineer and Local Authority:
- (a) Pumps
 - (b) Pump drivers

- (c) Drive controllers
- (d) Power supply
- (e) Starting arrangements
- (f) Piping and fittings
- (g) Suction and discharge connections
- (h) Water supply and/or storage conditions

Each pump unit shall be provided with certified test curves from the manufacturer showing brake horsepower, flow and head capacities. The Contractor shall provide this information to the Engineer and Local Authorities for approval.

- 26.3 The Contractor shall perform and certify a full field acceptance test on the completed installation in accordance with SANS. This test shall be witnessed by the Engineer and Local Authority.
- 26.4 The following information shall be embossed on a plate fixed to each pump:
- (i) flow capacity (l/sec);
 - (ii) pump head (metres water gauge);
 - (iii) impeller size;
 - (iv) pump speed
 - (v) required motor power;
 - (vi) make of pump;
 - (vii) model;
 - (viii) date of purchase.
- 26.5 Pumps shall be of the centrifugal end-suction type listed for fire protection service. It shall be possible to remove the impellers without removing the pump from its mountings.
- Pumps shall comply with the following requirements:
- (a) Impellers shall be double entry radial types of bronze or cast iron.
 - (b) Casings shall be of cast iron with renewable casing wear rings. The casing wear rings shall be made of cast chrome steel.
 - (c) Shaft seals shall be of the mechanical type.
 - (d) Bearings shall be grease lubricated anti friction types.
 - (e) Pump shafts shall be of stainless steel.
 - (f) An auto priming system shall be provided.
 - (g) Pump cooling devices shall be provided to prevent over heating of pumps when operating at closed head.
- 26.6 Characteristic curves showing capacity, head, efficiency NPSH, power required and operating range shall be submitted to the Engineer at tender stage. Prior to installation, a complete set of test certificates shall be submitted for approval to the Engineer and Local Authority indicating all performance characteristics of the pump to be installed.
- 26.7 A pressure gauge must be provided downstream of the pump outlet backpressure valve and on the pump suction side.
- 26.8 An approved flow test device and pipe connection shall be provided in the delivery line downstream of the non-return valve, in order to carry out a running flow/pressure test on the pump at approximately full load when the test valve is fully open. The test pipe shall be piped back to the water tank.
- 26.9 Pumps shall be mounted on mild steel bases, adequately corrosion protected by hot dip galvanizing after manufacture. Pump bases shall be filled in with concrete and properly secured to the floor.
- 27.0 DRIVE MOTORS
- 27.1 Electric drive motors shall be drip proof conforming to BS 2613 and BS 170. Windings shall at least be according IP55 of IEC 144. High temperature permanent sealed bearings shall be used. Motor

speeds shall preferably be limited to 1450 rpm but shall not exceed 2950 rpm.

27.2 Diesel engines shall be naturally aspirated air cooled types capable of being started without the use of wicks, cartridges, heater plugs or ether, at an engine room temperature of 4°C. They must be capable of accepting full load within 15 seconds from receipt of the signal to start.

27.3 Engines shall be capable of operating continuously at full load at the site conditions for a period of 8 hours. The Contractor supplying the pumping set shall supply to the Engineer and Local Authority a statement giving the 8-hour power rating of the engine at speeds of 1000 rpm, 1400 rpm, 1800 rpm, 2200 rpm, 2600 rpm and the maximum speed. Any of the speeds quoted which are in excess of the maximum speed rating of the engine may be omitted and the maximum speed and corresponding rating shall be given.

27.4 Speed and Number of Strokes

The engine must be of the solid injection, compression ignition type, with a running speed for reciprocating engines up to 750 kW not exceeding 1500 rpm. Generally, engines of the four stroke, industrial type, designed for stationary operation are preferred. Two-stroke engines of the pump assisted uniflow scavenged type will be considered if their specific fuel consumption (kg fuel used per kW hour) is equivalent to or better than that of the equivalent four stroke engine.

27.5 Fuel Classification

The engine shall be rated for diesel fuel as normally available in South Africa and in compliance with SABS 342 -1969 or B.S.2869 -1970, Class A1 , (as amended) for diesel fuel with a minimum octane rating of 40 and nett calorific value of 10000 kcal/kg (39600 kJ/kg).

27.6 Rating of Plant

The rating of the engine shall take cognisance of the site conditions, site altitude and include all auxiliary equipment such as radiator and fan, oil pump, water pump, air filter, governor, battery charger (generator) etc. The output stated shall only be the nett available, after the above have been allowed for.

The engine output must be de-rated in accordance with BS 5514 for the site conditions stated in the particular specification.

27.7 Overload Facility

The engine shall be capable of delivering 10% overload for one (1) hour in any 12-hour period of continuous running.

27.8 Engine Appearance

The engine shall be of neat appearance and all water, lubricating and diesel oil lines, filters and stop cocks shall be of top quality and completely leak free.

27.9 Service Connections

All service connections to the engine shall be flexible to prevent vibration being transmitted between plant and building, and to prevent damage to these lines and connections.

27.10 Supporting Framework

The engine and pump shall be mounted on one common steel supporting frame manufactured of channel iron or other equivalent steel work to provide a rigid and solid foundation. The main frame shall be of the "skid" base type. If no "skid" base is provided, suitable for free standing, holding down bolts and vibration eliminators to the generator set manufacturer's specification must be provided. This subframe shall be supported from a main frame by anti-vibration mountings. Duplex anti-vibration mounts shall be used.

The inner frame and its supports shall be of sufficient height above floor level to permit installation of a drip tray and for draining of engine oil.

The drip tray must be sloped and made of mild steel. It must be fixed in the frame beneath the engine and alternator and a drain pipe fitted with a plug must be extended from the lowest point of the drip tray to beyond the frame in an easily accessible position.

27.11 Heat Protection

All engine piping, whether flexible or rigid, shall either be of the heat resistant type or adequately protected against damage by radiant heat. This also applies to any wiring attached to the engine.

27.12 Crankcase Vent Pipe

The crankcase vent pipe shall be taken to the drip tray to collect oil condensate.

27.13 Bearings

Engine bearings for the crankshaft and connecting rods, big and small ends shall be of the bush type, split sleeve type, or roller type. The bearing types and metals shall be suitable for operating in the worst site conditions.

27.14 Lubrication

The lubrication shall be by means of a force-fed pressure system supplying circulating oil to all bearings, gear trains and important moving parts. A gear driven oil pump shall be incorporated with an oil cooler if necessary. The oil cooler shall have a thermostatically controlled oil bypass valve to control the oil inlet temperature by proportionate bypassing. 250 hour running time, full flow oil filters with automatic bypass and replaceable elements shall be fitted.

An isolating valve shall be fitted in the oil line from the make up tank to the sump in order to facilitate sump draining without the loss of new oil from the make up tank.

27.15 Cooling

27.15.1 General

Cooling of engines may be either by air or by water.

27.15.2 Water Cooling

Where radiators are used, they shall be of the heavy-duty industrial air blast type, pressurised and sized for continuous full load operation.

The fan shall be designed and run in a direction such that cool air is drawn across the generator, engine and radiator in that order.

Removable ducting shall be provided between the radiator and the louvre in the wall opening.

Fans must be liberally sized to enable engines to operate well within their maximum temperature limits (but without running too cool) at the ambient site conditions stated in the particular specification or at a plant room temperature of 40 deg C whichever is the higher.

In water cooled engines water circulation shall be pump driven by means of an integral engine mounted centrifugal pump.

If under exceptional circumstances cooling towers are required these will be specified separately in the particular specification. It will be required that they be of stainless steel or fibre glass and that particular attention be paid to plant room ventilation under these circumstances.

27.15.3 Air Cooling

In air cooled engines air ducts shall be provided to positively exhaust hot air and to prevent re-circulation. Integral engine mounted fans are required to ensure air flow across the various components in the order listed above.

Discharge ducting must be taken straight up through the roof of the plant room and must be made with strategically placed flanged joints, etc to enable it to be easily removed for servicing and maintenance purposes (if required), and/or to permit removal of the set without having to remove the ducting. Quick action type lock nuts or screws to enable quick and easy dismantling of ductwork are required. Self tapping screws are unacceptable.

The ducting must be fixed to the roof structure, must be flashed to render the exit point waterproof and must be fitted with an expanded metal bird screen at the discharge end(s).

The ducting must be made in such a way that expansion and contraction of the ducting will be taken up by sliding joints or similar.

The discharge end of the ducting must be fitted with a cover to prevent the ingress of rain water at times when the set is not running. Over and above, a drain point for accumulated moisture must be provided at the lowest point of the ducting. This drain must be piped to just outside the plant room door. Drainage of moisture from the ducting must be such as to prevent the diesel engine from getting wet.

Ducting must be made of 16-gauge galvanised iron suitably cross braced to prevent drumming.

27.16 Speed Control

The engine shall be provided with a suitable governor to control the engine speed to within 10% of its rated speed under any condition of load up to the full load rating. The governor shall be field adjustable.

27.17 Air System

The air system shall consist of two items, viz. the incoming combustion air and the exhaust gas.

27.17.1 Combustion Air

Combustion air filtration shall be by means of dry type, cartridge, high efficiency air filters fitted and sized for 500-hour operation and supplied complete with a service indicator. Oil bath air filters may be fitted and used in existing plant only. Air filters must be of Donaldson manufacture or similar, equal and approved.

27.17.2 Exhaust Gas

Exhaust gas shall be piped, the piping being fitted with expansion joints, silencer and discharged to atmosphere.

The expansion joints shall be of the stainless steel, concertina type, flexible, flanged and bolted to the exhaust manifold or turbo-charger outlet as applicable. Stainless steel bolts and nuts of the appropriate size must be used. Care must be exercised that exhaust pipe and silencer supports at the expansion joints are so positioned that no strain is placed on the manifold joint, turbo-charger, piping or silencer.

The silencer shall be of stainless steel, of the baffle or absorption type of a size and construction such that a sound level of 75 dB absolute is not exceeded within two meters of the exhaust. The exhaust pipe shall be of stainless steel, insulated and of sufficient size to ensure that the back pressure is acceptable within the limits of the engine manufacturer. The exhaust system shall be offset from the centre line of the plant to allow for hoists or cranes to remove the engine.

The piping shall have bends with a minimum radius of 2,5 times the pipe diameter, insulated with 25 mm thick insulating rope and cloth or similar suitable approved insulating material, and be wrapped and sealed in bright polished class 430 stainless steel sheeting.

Stainless steel nuts and bolts must be used in assembling the exhaust system. Flanged joints are required to aid dismantling.

Exhaust piping over 100mm diameter must have a minimum thickness of 1,6mm.

Once the exhaust is external to the building, no insulation is necessary. The entire system shall be supported with flexible hangers, brackets, clamps, etc.

27.18 Engine Fuelling

Engine fuelling shall be by means of an engine mounted pump with the governor-controlled fuel injection pump(s) and injectors all arranged for easy access and maintenance.

A fuel filter with replaceable elements shall be fitted between the lift pump and the injection pump, suitable for the full flow of fuel at full load. The filter must take out particles down to 5 microns in size, or less, and be of Donaldson or similar, equal and approved manufacture.

A primary, heavy-duty filter/water separator shall be fitted before the lift pump in the fuel line from the tank. This water separator shall be of Donaldson or similar, equal and approved manufacture, shall be suitable for 250-hour operation and be easily maintained.

Copper tubing shall be used from the sludge filter to the engine components, but steel tubing may be used on the overflow from the injectors to the fuel tank. Note that galvanised piping is not acceptable. All piping shall be neatly run and securely fixed with saddles and clamps taking cognisance of flexibility to prevent vibration damage as stated in Clause 27.9 .

27.19 Starter Motor

Starting of the plant shall be by means of an engine mounted, electric starter motor on sets up to 500 KVA. Above this size two motors will be required. The starter motor(s) shall be suitably sized to easily spin the plant under "cold start" Winter / Summer conditions without the use of special starting equipment.

Two interlocks shall be incorporated, one electrical and one mechanical, preventing the starter motor engaging unless the engine is at rest.

The starter motor(s) shall be 12- or 24-volts D.C. fitted with an approved device for positive engagement. The starter motor shall be controlled from the plant panel.

27.20 Jacket Water Heaters

Water cooled engines shall be fitted with immersion heaters of a minimum of 1,5 kW up to 5 kW capacity in order to ensure that the jacket water temperature is warm enough for the engine to start easily from cold and under severe cold conditions. Heaters must be so situated as to promote thermo-syphoning of the water with the piping connections installed in such a manner that the cooling system thermostat does not impede the free flow of this thermosyphoning water. The temperature shall be thermostatically controlled via a relay and the elements fed at 220 volts with M.C.B. protection at the panel.

27.21 Battery

The battery shall consist of a number of cells to form a 12- or 24-volt D.C. supply suitably sized to start the engine. These cells shall be of the lead acid type with flat terminals, rated at 1,5 volts/cell and mounted on a suitable frame with a timber base. The battery shall be as close as is practical to the starter motor, but separate from any vibrating parts of the set.

The battery discharge capacity with full cranking current for 60 seconds at a temperature of 5 deg C shall not fall below a cell voltage of 1,5 volts. This voltage is considered the minimum to

satisfactorily operate the 12 or 24 V. D.C. control equipment on the control panel (i.e., after three starting attempts, each of 10 seconds, the panel control voltage shall not be below 20 volts D.C.)

The battery under normal conditions shall be continually trickle charged from the Control Panel charger (reference must be made to clause 28.9).

Under running conditions, the battery shall be charged from an engine driven brushless Alternator/Rectifier complete with auto rate control.

The battery cables must be run clear of all exhaust piping and other hot surfaces and must be fixed in position so as to ensure correct reconnection of the cables in the event of the battery being changed or removed. The cables must be liberally sized in order to minimize the voltage drop to the starter motor.

27.22 Protection Equipment on Engine

The protection of the set is covered under paragraph 28.0 but the following monitoring equipment is required as listed hereunder:

27.22.1 Alarm signal system in wall mounted or floor standing control board for indicating "shut down" of the following items:

- a) Fail to start / starter circuit lockout
- b) High water temperature (sensed on engine side of the thermostat) or high head temperature in the case of air-cooled engines
- c) Low oil pressure
- d) High oil temperature (if required)
- e) Low fuel pressure (if required)
- f) Engine over/under speed

27.22.2 Gauges in the wall mounted or floor standing control panel showing:

- a) Fuel oil pressure (if required)
- b) Lubricating oil pressure
- c) Lubricating oil temperature (if required)
- d) Jacket water temperature

27.22.3 All necessary sensors for alarm circuits.

27.22.4 All necessary fuel cut off solenoids

27.22.5 A manual shut off valve before the lift pump in the fuel line at the day tank.

27.23 Coupling

The engine/pump coupling shall be by means of a flange adaptor ring or bell housing incorporating a shock absorbing coupling. The flexible coupling shall be direct coupled to the engine and alternator with no gears so that the engine and alternator run at 1500 rpm or the regular engine speed compatible with 50Hz power generation.

27.24 Fuel Tanks and Pumps

27.24.1 Day Tank

A combined fuel storage and day service tank shall be supplied with each set. The tank shall be mounted on a self-supporting floor standing steel frame at a minimum height of 400 mm above floor level (to provide a gravity feed to the engine) or integral with the engine/pump support base. This service tank shall be mounted close to the plant, within the plant room, hold a minimum of 150 litres and a maximum of 200 litres. A full height transparent gauge tube shall be fitted to the service tank. The gauge tubing must be similar or equal to that supplied by Lister diesel engines. (Plastic tubing will not be permitted). If called for in the particular specification a dip stick may be supplied and fitted in lieu of the gauge glass.

The service tank shall be so designed and mounted such that water and sludge can collect at the lowest point and be easily drained off by means of a stop cock. The lower gauge tube connection must be fitted with a shut-off valve.

A manual ball type shut off valve between the service tank and the lift pump shall be incorporated in the steel or copper fuel feed pipeline.

27.24.2 Fuel Piping

In principle the fuel lines shall all be medium class steel to SABS 62 or BS 1387 (but not galvanised) with appropriate bends to provide an expansion facility. Copper shall only be used from the primary filter to the engine pumps.

A fusible link mounted directly above the set and connected to a dead weight operated fuel shut-off valve will be required in instances where the day tank is situated in a separate room to the generating set.

27.24.3 Fuel Pumps

One diesel fuel pump suitably sized, shall be fitted adjacent to the service tank.

It shall be a centrifugal pump complete with electric motor, starter, isolator and float switches. Level control and float switches for control of the pump(s) shall be mounted within the service tank.

Float switches shall be "REMEX" level controllers (or similar and equal and approved). Three float switches will be required, one to operate the pump (on/off), one for a low-level alarm and the other for an extra low level engine cut-out. A facility for running the pump manually is required.

It must be possible to mute all alarms but the indicator light(s) must remain on until the tank has been refilled at which time they should cancel automatically.

The float switches shall be of such a type that they can be tested manually without opening the tank. They must further be installed in such a manner that they do not foul each other.

28 CONTROL PANEL

28.1 General

The control system may consist of plug in, low voltage relays of the octal base type or solid-state PC control. The panel shall provide full protection for the diesel pump set.

28.2 Sheet Metal Work

The control panel and components shall be of approved design, manufacture and construction and shall be complete in all respects with all necessary equipment, bars, connections, wiring and accessories. The panel shall be robustly constructed, shall be in accordance with standard accepted practice, comply to the relevant S.A.B.S. Code of Practice and/or BSS 162/1961, and shall have an attractive appearance.

The panel shall be totally enclosed, dust and moisture proof as well as rodent and insect proof with full gland plates fitted at appropriate heights. The panel shall be floor standing and have a steel

plinth. Doors shall be of folded and welded construction, with suitable bracing to eliminate buckling, and all doors and cover plates shall have rubber seals and grommets.

A construction of angle iron and loose sheets will not be acceptable, neither will pop-rivets or self tapping screws.

All steel work shall be thoroughly de-rusted. Millscale shall be removed by shot blast or other approved means and the steel work then degreased, followed by bonderising or similar phosphoric inhibitive treatment. A zinc chromate primer shall be applied, followed by two coats of best quality white enamel inside and three coats of enamel (Electric Orange) on the outside, sprayed and baked on. Bolt heads or thumb screws securing the panels shall be chromium plated. The latches securing the doors shall have positive locking devices and no spring-loaded ball latches or similar will be accepted.

28.3 Approvals

Before commencement of manufacture of the panel, full working drawings must be submitted for approval by the Engineer. When the panel is under construction, and again upon completion but prior to delivery to site, the manufacturer must notify the Engineer so that the panel can be inspected and approved.

28.4 Components

All components where possible shall bear the SABS mark or if not available the equivalent B.S. or DIN mark.

All components shall be entirely suitable for their application and the switchgear shall be suitable for the site and location. Space shall be provided for the incoming and outgoing cable circuits.

All cut edges and drilled holes of Bakelite or similar insulation board must be treated with electrical varnish. All equipment, levers, handles, keys, etc. required for operation of the panel must be included together with suitable clips or trays to store these when not in use.

28.5 Guarantee

The whole of the panel and components shall be guaranteed for a period of 12 months from the date of hand-over to the Owner

28.6 Equipment

The following equipment shall be included on the panel:

- (a) 1 meter (220 V AC) to indicate the total running hours the plant has been in operation.
- (b) 1 voltmeter (as per BS 89), approximately 125 mm scale to read 0 to 415 volts.
- (c) Control relays, start relays, three crank start relays, start failure relay, fuel supply relay (solenoid), continually rated alarm relay, oil pressure relay, oil temperature relay, overspeed relay, water overheat relay, jacket water heater relay, alarm relay, low fuel relay.
- (d) Illuminated resettable fault indicators, coupled to a common continuously rated hooter or low current electronic type yodel alarm for: low oil pressure, high oil temperature, high water temperature, engine overspeed, failure to start, pump overload, low fuel level, extra low fuel level engine trip
- (e) Auto/Test/Manual/ off selector key switch
- (f) Battery charger
- (g) MCB's for:- Battery Charger, Jacket water heater, fuel pump

(h) Lamp and alarm test facility.

28.7 Sequence of Operation

The control panel shall be so designed to provide the following:

28.7.1 A water pressure sensing relay which in the event of a fall in pressure the timing sequence shall be :

28.7.1.1 An immediate command to the engine to start.

28.7.1.2 Once the command to start has been given, three start attempts shall be allowed each of 10 seconds with a 10 second delay between each attempt. In the event of failure to start within these 3 initial attempts, the starting system shall switch off and a L.V. alarm shall be initiated. Any further start attempts may only be carried out when the plant is in the "manual" position.

28.7.1.3 Fault reset after identification and rectification of same shall be by switching the selector to the "off" position and then back to the desired mode.

28.8 Protection of Plant

The panel shall automatically provide the following protection with the alarm circuiting and tripping devices operating off the 12- or 24-volt D.C. Battery as applicable.

	Hooter or Siren	Visual Light Indicator	Lock out	Fuel Solenoid off
Overspeed	X	X	X	X
Under speed or overload	X	X	X	X
High Temperature	X	X	X	X
Low Oil Pressure	X	X	X	X
3 Starts Failure	X	X	X	X
Low Fuel Alarm	X	X		
Battery Charger Failure	X	X		
Extra Low Fuel Cut-out	X	X	X	

All the above shall have the necessary re-set buttons.

28.9 Battery Charger

28.9.1 The charger module shall be a mains (220 V) operated unit to continuously trickle charge the engine starter battery.

It must be of the modulating type similar or equal to those supplied by Messrs Vaal, Romberg, Semi-Conductor Services, or P & S Power Products or be as further specified here.

28.9.2 A "loss of charge" alarm relay shall be provided to indicate failure of the charger. This should be a current monitor.

28.9.3 The output voltage (27,6 volts D.C. or 13,8 volts if applicable) shall be via full wave rectification and be kept within 1% of the float charge voltage.

28.9.4 The 220-volt input voltage may vary between 200/240 volts and the equipment, (transformer etc) must be capable of handling this discrepancy.

28.9.5 During the "cranking/start" period and during running of the diesel engine the battery charger shall be disconnected via a relay. Charging of the battery shall then be by means of an engine mounted alternator.

28.9.6 The charger shall be equipped with:

- (a) Overload protection on the 24 (12) volt side
- (b) One 72 x 72 mm shielded type ammeter showing the charging rate
- (c) One 72 x 72 mm shielded type voltmeter with a spring return, normally open, push-button switch for indicating battery voltage
- (d) Relays for "failure alarms" and "running/start"
- (e) Transformer and full wave solid state rectifier complete with capacitors where applicable.
- (f) HRC fuses or fast acting MCB's on the secondary side

28.9.7 The battery charger shall be fully incorporated into the main control panel and be built to the same general specification (see paragraph 28.1) Relays shall preferably be of the "Octal" base type or equal and approved.

28.9.8 Ventilation.

The position of the battery charger shall allow for good ventilation and not be below any of the other switch gear or relays.

28.10 Log Book

A plastic covered log book shall be supplied for each plant room.

28.11 Emergency Lighting

A 24 (12) Volt emergency light must be incorporated into the top section of the control panel in order to provide sufficient illumination for the safe operation and checking of the control panel. This light must switch on automatically in the event of a mains failure.

29.0 COMMISSIONING OF PLANT & EQUIPMENT

29.1 All instruments used shall be provided by the Contractor and shall be accurately calibrated and maintained in good working order.

29.2 Testing and balancing shall not begin until the system has been completed and is in full working order.

29.3 Tests shall be conducted by the Contractor in the presence of a Representative of the Engineer.

29.4 Two copies of the complete test reports shall be submitted to the Engineer prior to the first delivery of the project. Reports shall cover test and balance analysis for all air distribution and hydraulic systems. Sound tests for room type air conditioning equipment and all diffusers in occupied areas shall be included in the report. Reports shall be neatly typed.

VOLUME 2.3 PART 3 FIRE PROTECTION TECHNICAL SPECIFICATION

1.0 Introduction and General

This detail specification complements and qualifies the foregoing standard specifications of material & workmanship. The standard specification should be regarded as a basis and guideline, with this detailed specification taking preference where any ambiguity is concerned.

In the event of any further technical ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority (unless stated elsewhere in Conditions of Contract).

- Schedule of quantities
- Detailed specification
- Drawings
- Standard specification

2.0 Scope of Work

This subcontract calls for the supply, installation, testing and commissioning of the specified Fire Protection Installation for the Construction of New Integrated Traffic Control Centre at Middelburg.

2.1 The following sections of work are included:

- a. Supply and Installation of complete:
 - Fire protection installation, complete with all pipework, holderbats, isolating valves, hose reels, hydrants (where indicated) and the connection of the reticulation to the underground civil fire mains connection, either within a valve box or a saddle.
 - Handheld fire extinguishers.
 - Signage.
 - All installed by SAQCC approved installer.
- b. Testing and certification:
 - Performing and submission of test records (as per SANS requirement) and certificates.
 - Issuing of SAQCC Fire Certificate of Compliance
 - Supply of Operators and Maintenance Manuals
 - Basic maintenance training for building maintenance staff
 - Provision of a twelve-month guarantee for the installation including a full service prior to expiry.
 - All other materials and labour necessary to complete the Works in full accordance with the specification and design contained or referred to in this document.

2.2 The following sections of work are excluded:

- Builder's work e.g., cut-outs in walls to Tenderer's specifications, including chasing and making good of walls.

3.0 Site Conditions

3.1 General

The equipment specified herein shall be designed to operate at the environmental parameters particular to Middleburgh and surrounds.

4.0 Fire Mains Service Connection

4.1 New Fire mains bulk supply line to be installed by main contractor / civil contractor.

5.0 Pipe Locations, Materials and Specifications

For steel piping of 75 mm diameter and larger (i.e. flanged) the hot dip galvanising to SANS 763, 1977 (when required) shall be after fabrication.

6.0 Pipe Jointing and Fittings

Mild Steel Piping and/or Galvanised:

- 6.1 Mild steel piping shall be joined by means of screwed sockets, navy unions or flanges. Red lead jointing or other approved jointing compounds may be used sparingly and exposed threads shall be painted with zinc chromate primer or equivalent paint to prevent rusting.
- 6.2 Where it is required to remove sections of pipe or where pipe joints will need to be tightened after installation and testing, unions or flanges must be provided to facilitate the work,
- 6.3 Welding construction is only permitted for pipes of 50 mm diameter or larger and then only when prefabricated and welded in the workshop of the installing engineers whose welding procedures, pre-approved by the Insurance Council of South Africa.

NO WELDING OR HEAT CUTTING IS PERMITTED ON ANY SITE OF ERECTION

The edges of pipe to be welded shall be machine bevelled wherever possible. Gas cuts shall be true and free of all burned material. Before welding the surfaces shall be thoroughly cleaned and degreased. Piping shall be carefully aligned. No metal shall project within the pipe. Mitred joints will not be allowed.

Only welded fittings prefabricated by recognised manufacturers will be permitted. No other prefabricated welding fittings will be permitted without the express approval of the Engineer.

For branch piping sixty five millimetres (65 minimum) in size or larger, use welding tees, with flanged outlet. For piping 200 mm and larger use shaped spigots and welding neck flanges. Cracks, pinholes, excessive undercutting etc. shall be removed and the joints rewelded. Welders and welding processes shall meet the requirements of the SANS Code for welders.

- 6.4 Jointing of mild steel and galvanised piping using grooved pipe fittings and couplings may be used provided they have been approved by SANS. Proper gaskets, designed for the applications shall always be used. Approval by the consulting Engineers must in all cases be obtained prior to the utilisation of such fittings.

7.0 INSTALLATION OF PIPING

All piping shall be installed in an approved manner to meet structural and architectural requirements, to avoid interference with the work of other trades and be finished in a neat and workmanlike manner with true alignments and grades. Piping shall be run to ensure sufficient access for inspection, testing, servicing, etc.

7.1 Storage

Deliver and store to Suppliers recommendations with plugged ends. Clean pipes thoroughly. In addition it is required that pipes are stored off the ground and under cover.

Keep the ends closed during erection with temporary caps. Before any pipe is installed it shall be upended and pounded to remove any foreign matters present.

7.2 Installation

Slope of Pipes

In order to prevent air being lodged, the pipe lines shall have a proper inclination throughout the work.

Also the sloping shall be such that the system can be thoroughly drained.

7.3 Underground Piping

- a) Unless otherwise specified, the Contractor shall not be responsible for the digging and backfilling of pipe trenches for underground piping in his contract. He is however to ensure that the excavations and laying of piping is in accordance with SANS 1 200 06, LD and LD, and that this specification is adhered to so that his installation can be correctly installed.
- b) The trenches shall be of such depth that when properly laid at least 750 mm of soil shall cover the top of the pipe.
- c) The pipes shall be laid on a clean, soft soil bed not less than 750 mm deep. When backfilling the trench, it shall firstly be filled to approximately 150 mm above the pipe again with clean soft soil and then compacted after which the final filling is to be made and again compacted (care shall be taken to ensure that no large stones or debris occur in the filling material).

- d) In the case of cement and uPVC piping the Contractor must ensure that the trenches are recessed where couplings or fittings are positioned such that the pipe lies flat on the bed. This is to prevent the fittings supporting the length of pipe. The Contractor is also to allow for any pipe movements, such as thrust at bends etc. Concrete blocks in accordance with manufacturer's specifications shall be provided at these points. Where asbestos cement piping cross roads etc., the pipe shall be protected by casting into concrete not less than 100 mm over the top of the pipe.
- e) Where steel or uPVC pipes are to cross roadways, under connecting corridors, etc., the Contractor shall provide PVC sleeves through which the pipes will pass. It shall be at a depth of not less than 750 mm below the surface and shall be encased in concrete not less than 150 mm all round. These sleeves are to be two pipe sizes above the size of the water pipe to permit the removal and the replacement of the pipe should the need arise.

7.4 Internal Pipe Runs

All piping shall be installed parallel to, or at right angles with building walls and partitions.

In general, all pipes shall be supported from the building structure in a neat and workmanlike manner, and whenever possible, parallel runs of piping shall be grouped together.

- a) Where pipes pass through walls, floors, ceilings, etc., they shall be sleeved. The sleeves shall be of PVC material and allow for pipe thermal reactions.
- c) Where pipe sizes are reduced, proper reducing fittings shall be used. On no account will bushes be accepted.
- d) Horizontal take-offs from vertical pipes shall be long enough before the next fixing to take up any movements or shall have an expansion loop to provide this facility.
- e) Every tube section shall be installed to have the possibility of expansion and contraction without restriction. It shall be anticipated that no deflection acts on very short tube section. Expansion loops or expansion joints and anchors shall be fitted in order to reduce the displacement of individual line elements and to deflect them to the points where they can act without damage.

7.5 Concealment of Pipework

Pipework must not be embedded in the concrete floors of a building, nor should it be concealed in any other situation where difficulty or undue expense would be involved in making alterations or additions which may subsequently be necessary. Concealment of pipework is particularly to be deprecated in the case of buildings in multiple tenure where erection of partitions to suit tenants may impair the effective distribution of water from the sprinklers and necessitate alterations in the positioning of sprinklers.

7.6 Pipe Hangers and Supports

- a) All pipes shall be supported from the building structure in a neat and workmanlike manner and, wherever possible, parallel runs of horizontal piping shall be grouped together on trapeze hangars.
- b) Vertical risers shall be supported at each floor line with pipe clamps. The use of wire, perforated metal straps, nails and so forth, to support pipes will not be permitted. Hanging of pipes from other pipes will also not be permitted.
- c) Vertical runs shall be secured by means of rustless holderbats or other clamps. Duckfoot supports shall be provided at the bottom of a vertical section of large piping (100 mm and above) to support the weight of the pipe and the water.

Under no circumstances shall a vertical pipe be supported from its highest point. Should any fittings be installed in the vertical sections, care shall be taken to ensure that these fittings are not in a state of tension through the combined weight of the pipe and the water.

- d) Horizontal pipes shall be supported by means of galvanised hangers at close enough centres to prevent sagging. The minimum recommended spacings for supports and hanger rod size shall be set out below:
- e) The hangers shall be protected against rust and adjustable in height. They shall be manufactured from rods of the diameter as specified above, one end threaded and bolted to an angle iron cleat or Unistrut section suitably secured to the structure. The other end shall be formed into an eye and bolted to the pipe clamp.

7.7 Changes in Material

Where piping material changes occur (i.e. copper to steel etc.) dielectric unions must be furnished and installed.

7.8 Threaded Pipe

The pipe connection shall be cut square and full threaded with clean cut tapering threads and shall be reamed after threading. All threaded connections shall be made with approved thread compound applied to male threads only, and shall be so made up that not more than two (2) threads will be exposed.

7.9 Testing of Water Piping

All piping installed on the project shall be hydraulically tested as specified herein. The Contractor shall provide all equipment required to make these tests.

Piping may be tested a section at a time in order to facilitate the construction programme.

The Contractor shall fill the section of the pipe to be tested with water and bring the section up to test pressure with a positive displacement type test pump. The tests shall be conducted by the Contractor in the presence of the Engineer or his representative. Gauges used in the tests shall have been recently calibrated with a dead weight tester.

All tests shall have full test pressure applied to the piping for a minimum of twenty-four (24) hours

The test pressure at any section of the system shall not be less than one and a half times the system working pressure or 1 500 kPa (Maximum) unless otherwise stated under Part Four of the specification. When the test pressure has fallen over 6 percent (%) during the twenty-four (24) hour test period, the point of leakage shall be found, repaired and the test repeated. This procedure shall be followed until the piping system has been proven absolutely tight.

The use of chemicals or so-called "stop-leak" compounds will not be permitted at any time.

When instruments or gauges are installed in the piping system, they shall be removed during the tests if subject to damage from shock or excessive pressure. This does not apply to control valves.

Leaks shall not be repaired by mastic or other temporary means. All leaks shall be repaired by removal of the section that is leaking and reinstalling new material with joints as specified herein before.

7.10 Flushing of System Pipework

There must be a 50 mm diam. flushing connection fitted on the incoming main below each installation control valve. These flushing points must be plugged to prevent misuse.

7.11 Terminal Drain Valve

25 mm drain valves must be fitted at the extremity of the distribution pipe at each level of protection. This is to indicate that there is water at this point and that no blank flanges are left in the installation. The valve should be positioned at hand level and must be normally strapped closed.

8.0 **Fittings**

8.1 All fittings, including safety devices are to be placed and sized.

9.0 **Safety Devices**

9.1 Where applicable.

10.0 **Handling And Storage Of Materials, Fittings And Components**

10.1 Pipes, fittings and components shall be handled carefully to obviate damage

10.2 Manufacturers' advice shall be followed as to how their products should be loaded, transported, unloaded and sorted

11.0 **Identification**

11.1 Colour Coding

11.1.1 General

All equipment shall be colour-coded in accordance with standards recognised, and where possible to comply with relevant SANS colour codes unless specified otherwise.

11.1.2 Colour Coding of Pipes

Identification of the contents of pipes shall either be by painting a 100 mm wide primary colour band or by using self-adhesive PVC coloured tape. The colour of the paint or tape shall comply with SANS 0140 Identification Colour Marking, Part III, Contents of Pipelines, as detailed below.

The colour names referred to in the table s are specified in SANS 1091.

TABLE OF COLOUR CODING FOR PIPELINES AS PER SANS 0140 PART III - 1978

CONTENTS OF PIPE PRIMARY COLOUR BANDS

FIRE FIGHTING

- All Pipes Signal Red

12.0 **Sterilization**

12.1 N/A

13.0 **Builders Work**

13.1 The Engineer will prepare details showing where all sleeves are to be positioned before any structural concrete is cast.

13.2 The Engineer's approval, in writing, must be obtained before any holes or chases are cut in any structural component i.e. brickwork, concrete, steel or timber.

13.3 The Contractor shall be responsible for cutting chases and holes in walls and slabs to accommodate his services which must be coordinated in liaison with the Main Contractor who will be responsible for making good.

14.0 **Excavation**

14.1 General:

Tenderers are to note that excavation shall be carried out by the main contractor.

15.0 **Operating And Maintenance Details**

15.1 Two complete sets of operating manuals complete with spares schedules, as-fitted layout drawings, schematic diagrams and operating and general maintenance information, bound in hardcover ring binders shall be prepared by the Contractor and delivered to the Engineer 14 days prior to practical completion for approval, at or before final handover.

15.2 A full "RECORD" set of drawings shall also be submitted to the engineer for record purposes.

16.0 **Schedules Of Information**

16.1 The schedules of information contained in this document consists of 2 sections :

- a. Information supplied by the Engineer (schedules of drawings, sleeves etc. as applicable.)
- b. Information to be supplied by the Contractor at tender stage

(tender form, information on the makes, types and ratings of equipment and materials offered, schedules of prices and rates for variations, schedules of quantities, etc. as applicable.)

16.2 Tenderers are required to enter, at the time of tendering, in the "Schedule of Equipment and Material Offered", sufficient details to enable the equipment concerned to be identified without ambiguity.

16.3 It is not sufficient for a tender to state "as specified" in the schedules.

16.4 Failure to complete these schedules (if applicable) may render a tender invalid.

17.0 **Samples And Alternatives**

17.1 Tenderers may be required to submit for approval, comment or records samples of materials, apparatus or components, and also drawings, schematic diagrams or technical details, including calculations, upon which their design and/or offer is based before any contract is awarded. Such details may also be called for during the course of the Contract prior to installation. Any approvals given or comments made shall be on the generality of the scheme and shall not relieve the Contractor of his responsibility to ensure the full compliance with all performance and regulatory criteria.

NOTE : A request for submission of samples or drawings does not imply that the Tenderer's quotation will necessarily be accepted.

17.2 Any particular make or model of equipment referred to in the Documentation is for guidance purposes only in setting standards / types / performances required; equipment that is equal or superior in all respects, and to the approval of the Engineer, may be offered by Tenderers. No reference to any particular make of any equipment shall be construed as that equipment having been selected by the Engineer or Client and the Contractor shall be fully responsible for the guarantee and performance of such equipment.

18.0 **Certification On Completion Of Guarantee And Maintenance Period**

19.1 In the month prior to the expiry of the guarantee and first twelve months maintenance period the Engineer shall inspect and, if necessary, retest the installation so as to be able to provide the Tenant with a certificate, within fourteen days of the guarantee expiry date, to confirm that the guarantee has been honoured and that the installation has been properly serviced at required regular intervals by the sub-contractor.

18.2 The cylinders shall be guaranteed from date of take over for a period of three years on the tank, insulation and outer casing and for one year on the electrical components

19.0 **Supervision Of Workmanship And Details**

19.1 The work shall at all times, for the entire duration of the contract, be executed under the supervision of a skilled and competent representative of the subcontractor, who must be able and authorized to receive and execute instructions on behalf of the Mechanical Subcontractor.

19.2 In the event that inferior materials or bad workmanship, on the part of the subcontractor, leads to remedial work requiring redesign by the Engineer, the cost of this work, including related professional fees, shall be borne by the Subcontractor.

19.3 Similarly, should delays in the contract be caused by poor performance on the part of the Contractor causing the Engineer to spend extraordinary time on the project, the extra costs incurred shall be borne by the Contractor.

These costs will be based on the SAACE hourly rates and will be deducted from claims due or claims which will become due to the Contractor.

20.0 **Making Good**

20.1 The subcontractor will carry out in all instances any work to be made good such as damage to, or disturbances of the building installations caused by himself or his employees during the execution of the contract, at his own cost.

21.0 **Test And Inspections - Pressure Testing And Quality Control**

21.1 The Contractor shall, at no extra cost to the contract, provide all the necessary equipment and facilities to conduct all tests as directed by the Engineer and or Supply Authorities.

22.0 **Commissioning And Testing**

22.1 Commissioning:

A documented method shall be followed whereby the mechanical subcontractor shall ensure that his installation is correctly constructed in accordance with the manufacturers' specifications, consultant's specification, consultant's design and all codes of practice and international design codes.

The commissioning procedure must allow for signing off of the major items of equipment by a qualified person in terms of the codes. These signed off documents will form part of the record drawings.

22.2 Performance Tests:

The mechanical subcontractor shall be responsible for the physical testing, in the manufacturing works, or on site, of the items of plant or systems as required by the Engineer. These tests shall be performed by the mechanical subcontractor or supplier of the equipment, and where called for, the Engineer shall witness such tests. The Engineer may also only witness a representative sample of the equipment tests. In any event, the mechanical subcontractor will supply documentary proof of full performance tests of all relevant equipment.

22.3 Acceptance Tests:

All brass fittings and valves shall be certified by the manufacturers to be free From de-zincification and will be subjected to check tests as set out in the Detailed Specification

Acceptance tests will be performed on site of the working system or sub system, to show that the works, as installed, is functioning according to the specifications and design. The onus for the correct functioning of the systems is still on the mechanical subcontractor irrespective of whether the Engineer has witnessed the acceptance tests or not. Prior to the system being connected, a test certificate must be issued by / given to the local electricity supply authorities.

23.0 **Compliance With Regulations, Standards And Codes**

23.1 The subcontractor will arrange for all inspections and testing of the installation after completion, including the issuing of the Certificate of Compliance. All notices, fees, including inspection and re-inspection are the responsibility of the subcontractor and all the relevant costs shall be borne by him.

23.2 The workmanship throughout the Works will be to the satisfaction of the Employer. Any materials or workmanship considered as faulty or incorrectly or inadequately erected or repaired, will be substituted, altered or rectified to the satisfaction of the Employer, without additional cost to the Employer.

23.3 The Works will be executed in strict accordance with the following:-

- a. All relevant by-laws and regulations of local authorities.
- b. All relevant SANS, BS and other international standards of the latest revision, where applicable.
- c. The Occupational Health and Safety Act of 1993 as amended.

24.0 **Monthly Certificates**

24.1 Pro forma claim forms are available from the Engineer. These are available in a blank copied format or as a computer file in Excel. This is the preferred method of submitting payment claims. Should the subcontractor have developed his own method of claiming, this may be submitted to the Engineer for consideration.

25.0 **Programme**

25.1 The subcontractor must conform to the programme as submitted by the principal Contractor. The estimated period for completion, as tendered, is as per the builders programme. The cost of overtime, additional labour and plant for the completion of the works, in accordance with the programme, must be included in the Tenderer's price for the project. The cost of any work outside the requirements of the programme or necessary under exceptional circumstances will be for the Employers' account only if covered under a variation order.

25.0 **Drawings**

25.1 Tender Drawings

All drawings, those supplied loose, as well as those bound in, form part of this enquiry and are listed below:

- 2217-D-M-101 FP CP Rev A

It is the Tenderer's responsibility to inform the Engineer as to the absence of any of these drawings.

26.0 **Sufficiency Of Tender**

26.1 The Tenderer's offer shall be for the supply, delivery, installation and commissioning of the complete installation as detailed, described or implied in this document and on the accompanying drawings.

26.2 The Tenderer's offer shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the Works and that the rates and prices he has entered in the schedules shall cover all his obligations under the contract for the proper completion of the Works.

27.0 **Measurement**

27.1 The Tenderer shall not make any assumption regarding the installation. If there is any doubt or ambiguity, the Engineer must be consulted. The Tenderer shall take cognisance of the fact that the schedule of quantities is re-measurable and the quantities may be adjusted at the end of the contract.

27.2 All measurements are nett, unless otherwise stated, and Tenderers must allow in the rate for wastage.

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - CEREBRAL PALSY
VOLUME 2,3 PART 3: FIRE FIGHTING EQUIPMENT INSTALLATIONS

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
	<u>Bill No. 1 : Preliminary and General</u>					
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1,2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1,3	Tools and equipment, Communication, transport.					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1,5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1			
1,6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1			
1,7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	Item	1			
1,8	Additional testing and balancing at disgression of the mechanical engineer.	Item	1			
Total Carried forward to Summary Page						

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - CEREBRAL PALSY
VOLUME 2,3 PART 3: FIRE FIGHTING EQUIPMENT INSTALLATIONS

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	INSTALL RATE	AMOUNT
2,00	BILL No. 2: FIRE FIGHTING EQUIPMENT					
2,1	<u>Steel Piping</u> Supply and install steel piping to ASTM A106 #40 or SANS 62 as specified (heavy quality)					
.01	200 mm	m	0			
.02	150 mm	m	0			
.03	100 mm	m	0			
.04	80 mm	m	0			
.05	65mm	m	0			
.06	50mm	m	0			
.07	40mm	m	0			
.08	32mm	m	0			
0,09	25mm	m	72			
0,10	Thrust Block 2,4 Ton/m ²	m ²	0			
2,2	<u>Pipe Hangers & Brackets(steel piping)</u> as specified					
.01	200 mm	no	0			
.02	150 mm	no	0			
.03	100 mm	no	0			
.04	80 mm	no	0			
.05	65mm	no	0			
.06	50mm	no	0			
.07	40mm	no	0			
.08	32mm	no	0			
.09	25mm	no	36			
	Pipe Fittings					
2,3	<u>Bends</u>					
.01	200 mm	no	0			
.02	150mm	no	0			
.03	100mm	no	4			
.04	80 mm	no	2			
.05	50mm	no	0			
.06	40mm	no	0			
.07	32mm	no	3			
.08	25mm	no	6			
2,4	<u>Tees Equal</u>					
.01	150mm	no	0			
.02	100mm	no	2			
.03	65mm	no	0			
.04	50mm	no	0			
.05	40mm	no	0			
.06	32mm	no	1			
.07	25mm	no	1			
		no				
Carried forward						

SCHEDULE NO 2: SPRINKLER INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY			
Brought forward						
2,5	<u>Reducers</u>					
	.01 100 - 75 mm	no	1			
	.02 75 - 65 mm	no	1			
	.03 65 - 50 mm	no	1			
	.04 50 - 40 mm	no	1			
	.05 40 - 32 mm	no	1			
	.06 32 - 25 mm	no	1			
2,6	<u>Couplings</u>					
	.01 100 - 75 mm	no	0			
	.02 75 - 65 mm	no	0			
	.03 65 - 50 mm	no	0			
	.04 50 - 40 mm	no	0			
	.05 40 - 32 mm	no	0			
	.06 32 - 25 mm	no	1			
2,7	<u>Isolating Valves</u>					
	.01 150mm	no	0			
	.02 100mm	no	1			
	.03 65mm	no	0			
	.04 50mm	no	0			
	.05 40mm	no	0			
	.06 32mm	no	0			
	.07 25mm	no	2			
2,8	<u>Painting and Finishing</u>					
	Allow for painting sprinkler and fire hose reel piping as follows					
	.01 Etching primer coat	sum	1			
	.02 Undercoat (different colour to primer)	sum	1			
	.03 Final coat - colour as specified by architect	sum	1			
	Testing and Commissioning					
	Allow for testing and commissioning of the systems	sum	1			
	<u>Valve Chamber</u>					
	Bulk Valve Chamber - Cover Dimension 400 x 324 mm; Frame Dimension 533 x 458 x 152 mm, clear opening 380 x 305 mm	no	0			
2,9						
Carried forward						

SCHEDULE NO 2: SPRINKLER INSTALLATION

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY			
Brought forward						
<p><u>Fire Hose Reels</u></p>						
<p>Fire hose reels to comply with requirements contained in SANS 543 and maintained in accordance with the requirements as given in SANS 1475-2.</p>						
<p>Supply, install, test and commission:</p>						
2,9	30 m length of fibre braid reinforced neoprene mm internal diameter	no	2			
2,10	Tamper seals	no	2			
<p><u>Fire Extinguishers</u></p>						
<p>Hand held fire extinguishers shall comply with the requirements contained in SANS 1910 or SANS 1151, and shall be installed, maintained and serviced in accordance with SANS 10105-1 and SANS 1475-1.</p>						
2,11	5 kg CO2 hand held fire extinguisher.	no	6			
2,12	4,5 kg DCP hand held fire extinguisher.	no	6			
2,13	Tamper seals	no	12			
<p><u>Waterproof Tape</u></p>						
2,14	Self adhesive waterproof tape 2,5 mm	m	0			
<p><u>Hydrant</u></p>						
<p>80 x 65mm "Woodlands Type" or equally approved brass right-angle hydrant valve with cap and chain</p>						
		no	0			
<p><u>Hydrant Pedestal</u></p>						
<p>Unreinforced concrete hydrant pedestal 1.1m high overall cast around vertical pipe with bottom 600mm below ground, 340 x 340mm square at base and tapering to 210 x 210mm overall octagonal shaped top, finished in all exposed faces in 1:3 cement plaster with all angles rounded including formwork and setting 600mm deep in ground, excavation in all material, backfilling, carting away surplus material, risk of collapse, dewatering, backfilling, compaction, and two coats of approved golden yellow paint to exposed surfaces, as per Engineer's drawing.</p>						
		no	0			
Carried forward to summary						

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - CEREBRAL PALSY
 VOLUME 2,3 PART 3: FIRE FIGHTING EQUIPMENT INSTALLATIONS**

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	SUPPLY RATE	INSTALL RATE	AMOUNT
4,0	<p>BILL No. 3: FIRE SIGNAGE EQUIPMENT</p> <p><u>Fire Signage</u></p> <p>Aluminium Framed Wall Mounted Brackets ABS PVC 150 mm Signs</p> <p>ALL "E" TYPE SIGNS IS WHITE FIGURES AND BORDER ON GREEN BACKGROUND</p> <p>ALL "F" TYPE SIGNS ARE RED REVERSE ENGRAVED ON ON WHITE BACKGROUND WITH 4mm RED BORDER LINE</p> <p>All internal signage to be SANS 1186/5</p> <p>Supply and install the following:</p>					
4,1	2 compartment Type F1 (Arrow & Extinguisher)	No	4			
4,2	3 compartment Type F4 (Arrow; Extinguisher & Hose Reel)	No	4			
4,3	4 compartment Type F7 (Arrow & Running Man)	No	8			
4,4	1 Compartment Type E1 (EXIT sign)	No	8			
4,5	2 compartment Type E1 (Arrow & Running Man)	No	8			
Carried forward to summary						

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - CEREBRAL PALSY
 VOLUME 2,3 PART 3: FIRE FIGHTING EQUIPMENT INSTALLATIONS**

FINAL SUMMARY PAGE

BILL NO.	DESCRIPTION	AMOUNT
1	BILL NO. 1 : P&G	
2	BILL No. 2: FIRE FIGHTING EQUIPMENT	
3	BILL No. 3: FIRE SIGNAGE EQUIPMENT	
SUBTOTAL		
CONTINGENCY 2,5%		
SUBTOTAL		

REMINDER NOTE

The Total Price including Main Contractor's Mark-up which excludes VAT, must be carried over to the final summary in Volume 1 and all fixed amounts shown in the price schedule must be included therein. No adjustments will be made for any failure by Tenderers to include the fixed amounts in the Total Price for this particular installation.

SUB-CONTRACTOR'S NAME:

DATE:

SIGNATURE:

N.B. The above-named Sub-Contractor is to be employed on this contract. Substitute Sub-Contractors are not acceptable.

The price submitted include all Main Contractor's 'Profit and Mark up BUT Exclude the VAT when transferring price to Volume 1 of the Final Summary Total of the Main Contractor's Document

VOLUME 2.3 PART 5 SCHEDULE OF MATERIALS OFFERED

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities.

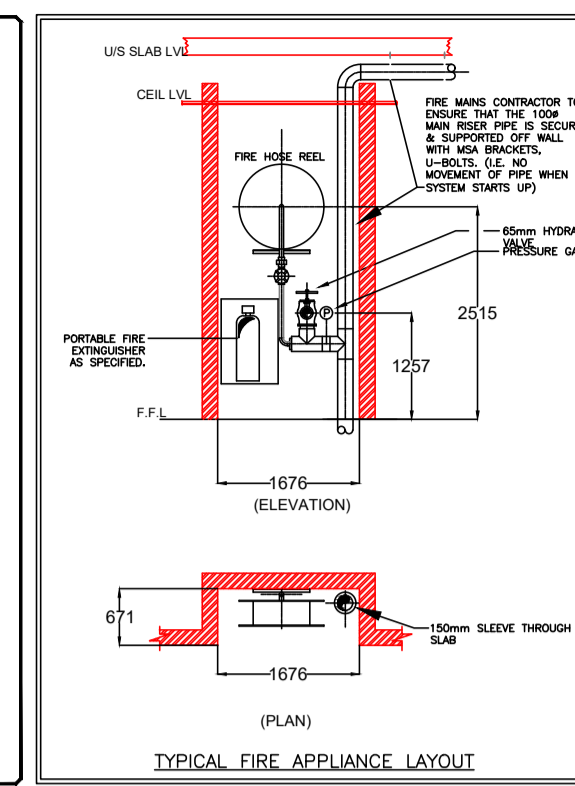
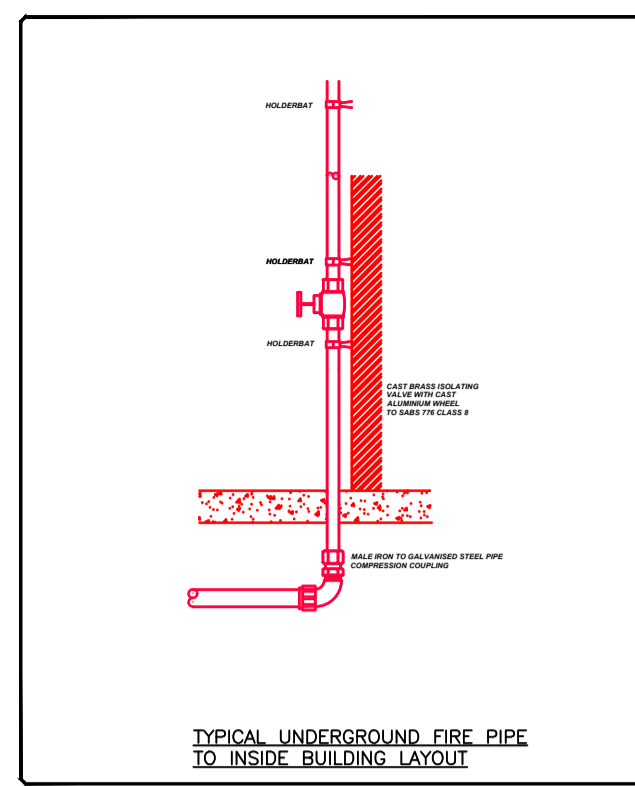
The schedules will be scrutinised by the Engineer and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB : **Only one manufacturer's name to be inserted for each item.**

Item	Material	Make or trade name	Country of Origin
1.	Gavanised steel pipe		
2.	Non-Return Valves		
3.	Isolating valves		
4.	Strainers		
5.	Angle valves		
6.	Manholes		
7.	30m Hose Reels		
8.	Hand Held Fire Extinguishers		
9.	Pressure Gauges		
10.	Hydrant Connections		

NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor.

Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.



Installation Notes

- ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT ON SITE.
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL AND OTHER DRAWINGS.
- ALL PIPEWORK TO BE MILDSTEEL GALVANISED.
- REGULATION SIGNAGE WILL BE ACCOMPANIED WITH ALL FIRE EXTINGUISHERS & HOSE REELS.
- ALL SERVICES TO HANG FROM TRUSSES AND PERLINS ONLY. NO

FIRE PROTECTION EQUIPMENT	Qty
65 mm Ø HYDRANT CONNECTION	0
30 m HOSE REEL	4
4.5 kg DCP HANDHELD EXTINGUISHER	12

FIRE ESCAPE SIGNAGE INSTALLATION NOTE:
FIRE EXTINGUISHER/HOSE REEL SIGNAGE TO BE PLACED AT FIRE EXTINGUISHER/HOSE REEL EQUIPMENT AS INDICATED ON THE DRAWING PLAN, BY THE SYMBOL SHOWN BELOW.

SYMBOL	DESCRIPTION
	9.0 kg DCP FIRE EXTINGUISHER
	FIRE MAINS PIPING
	NON RETURN VALVE
	ISOLATING VALVE
	30m FIRE HOSE REEL (25# CONN.)
	45m FIRE HYDRANT (100# CONN.) COMPLETE WITH 45 m FIRE HOSE, COUPLINGS AND CLIPBOARD
	FIRE PUMP CONTROL PANEL
	PRESSURE VESSEL
	PRESSURE SWITCH
	PRESSURE GAUGE - 2500 KPA
	PRESSURE REDUCING VALVE

GENERAL NOTES:

REV	DATE	INIT.	DESCRIPTION
00	06/07/23	TW.	Issued for Information

REVISIONS

CLIENT

TITLE
FIRE PROTECTION EQUIPMENT LAYOUT

CMH
CEREBRAL PALSY



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DESIGN	TENDER	CONSTRUCTION
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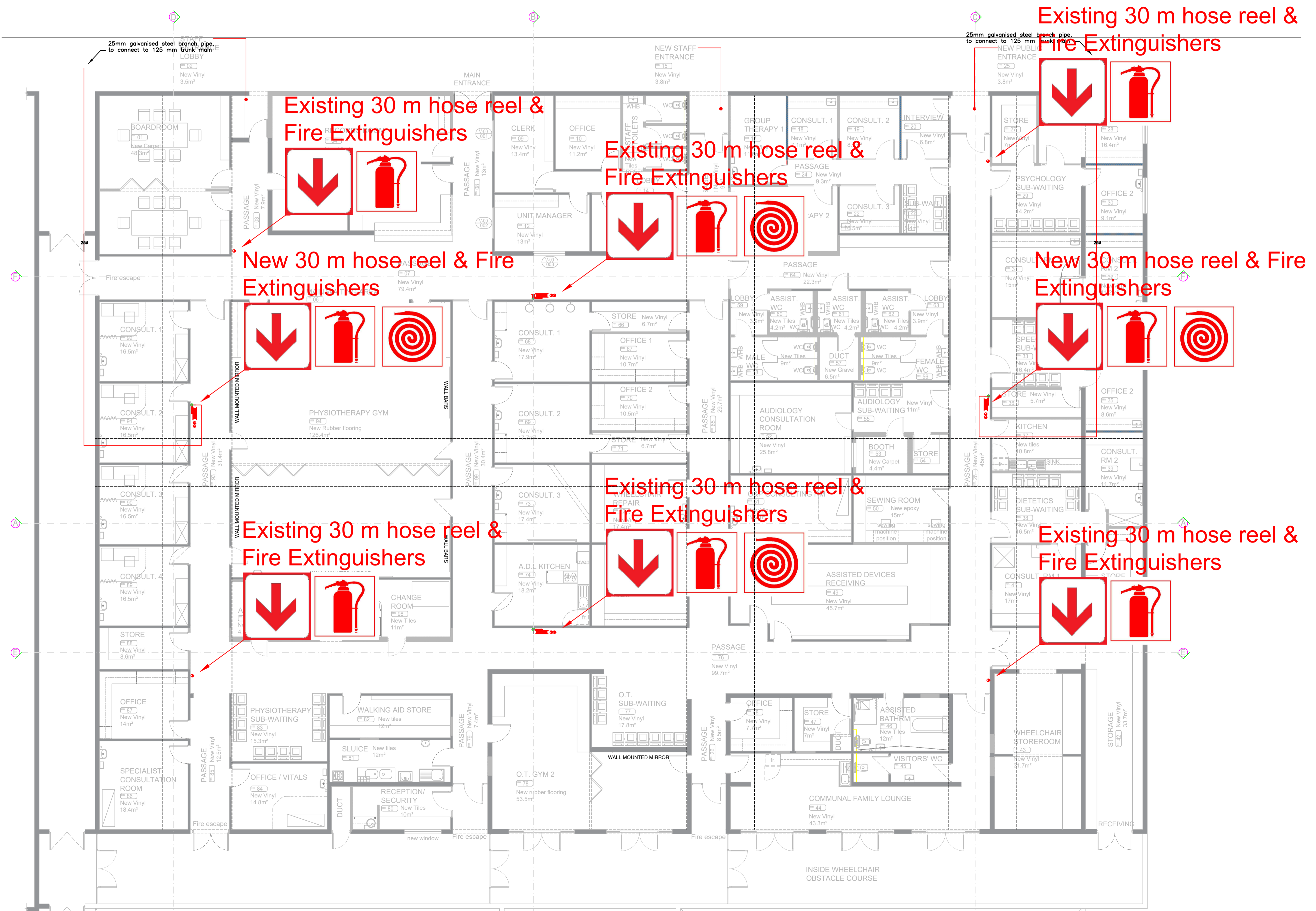
DESIGNED BY: T.WARNE SCALE: 1:50

DRAWN: T.WARNE DATE: 02/07/2023 PRINT DATE: 02/08/2023

CHECKED BY: Travis Warne
REGISTRATION No. 201770017

SIGNED:

DRAWING NO. 2217-M-D-101 FP CP REV No. 00



VOLUME 2.4 CP

MECHANICAL INSTALLATION

Domestic Water

VOLUME 2.4 PART 1: DOMESTIC WATER & HEATING EQUIPMENT INSTALLATION - 1 SCOPE OF WORKS

DOMESTIC WATER INSTALLATION

1. GENERAL

- 1.1 The Standard for Uniformity in Construction Procurement published in terms of the Construction Industry Development Board (CIDB) Act, 2000 (Act No. 38 of 2000), the Standardized Construction Procurement Documents for Engineering and Construction Works as issued by the CIDB and any other relevant documentation pertaining thereto must be studied and all principles in this regard must be applied to all procurement documentation, practices and procedures.

2. THE CONTRACT

2.1 EARLY WARNING SMOKE DETECTION & SUPPRESSION INSTALLATIONS

The work to be carried out and commissioned by a PIRB / IOPSA approved plumber:

- a. Installation of new domestic water reticulation and equipment, as per SANS 10252,
- b. Testing and Commissioning, as per SANS 10252,
- c. Manuals, Drawings, OEM Literature,

2.2 Existing

All installations new. Building Existing.

2.3 Order of The Works

As per the building contractors' program of works.

VOLUME 2.4 PART 2: DOMESTIC WATER & HEATING EQUIPMENT TECHNICAL SPECIFICATION

1.0 GENERAL REQUIREMENTS

1.1 Project Specification

1.1.1 This specification applies to, and is to be read in conjunction with the drawings for the hot and cold-water reticulation to the building. Furthermore, this specification covers only the piping within the buildings. The requirements pertaining to the sections of piping from the ring mains to the buildings are covered by the civil engineer's specifications. Similarly, all tap fittings, shower fittings shall be to the architect's specification as detailed elsewhere.

1.1.2 In so far as the conditions contained herein are at variance with anything contained in the drawings, clarification shall be sought from the Engineer though generally the contract shall be interpreted in terms of the information contained on the drawings.

1.2 Occupational Health and Safety Act

1.2.1 All equipment supplied and installed under the contract shall meet the requirements of the Occupational Health and Safety Act (Act No 85 of 1994, (as amended) and all other relevant statutory requirements and the Contractor shall comply with the requirements laid down by the Inspector of Machinery under this Act.

1.3 Notices

1.3.1 The Contractor shall supply and install all notices and warning signs that are required in terms of the Occupational Health and Safety Act, by local by-laws or regulations and by these documents.

This includes notices prohibiting entry to un-authorized persons, etc.

1.4 Drawings

1.4.1 The drawings issued with this specification do not 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 Drawings showing any alternative suggestions differing from the Engineer's design must be submitted with tenders.

1.4.5 Approval by the Engineer of drawings submitted by the Contractor shall not relieve him of his liability to carry out the work in accordance with the requirements of the contract documents.

1.4.6 Project Drawings

The following drawings form part of this specification and must be read in conjunction with it:

- 2218-M-C-101 DW Ground Floors Rev A

1.5 Quality of Materials

1.5.1 Only materials of high quality shall be used throughout and shall be subject to the approval of the Engineer.

1.5.2 All materials, where applicable, shall conform in respect of quality, manufacture, tests and performance, with the requirements of the SABS / SANS standards, or, where no such standards exist, they shall conform to the appropriate current specification of the British Standards Institution. Materials

manufactured in South Africa shall be used wherever possible.

- 1.5.3 Imported materials shall comply with the requirements of the relevant SABS / SANS or BS Specifications.
- 1.5.4 All materials shall be suitable for the site conditions. These conditions shall include weather conditions as well as prevailing conditions during installation and subsequent use.
- 1.5.5 Should the materials or components not be suitable for use under temporary site conditions the Contractor shall provide at his own cost, suitable protection until these unfavorable site conditions cease to exist.

1.6 **Tests and Inspections - Pressure Testing and Quality Control**

The Contractor shall, at no extra cost to the contract, provide all the necessary equipment and facilities to conduct all tests as directed by the Engineer and or Supply Authorities.

1.7 **Builder's Work**

- 1.7.1 The Structural Engineer's approval, in writing, must be obtained before any holes or chases are cut in any structural component i.e. brickwork, concrete, steel or timber.
- 1.7.2 The Contractor shall be responsible for cutting chases and holes in walls and slabs to accommodate his services which must be coordinated in liaison with the Main Contractor who will be responsible for making good.

1.8 **Protection of Equipment**

It shall be the responsibility of the Contractor to protect all reticulation work and fittings that have been tested and accepted by the Engineer in writing during the currency of the contract.

2.0 **SUMMARY OF SCOPE OF WORK**

This specification is for the supply, delivery, installation, testing and commissioning of fully functional internal water reticulation and hot water generating systems as well as any ancillary equipment as described below:

- 2.1 Hot and cold-water reticulation systems,
- 2.2 Heat Pump water heating system consisting of 1 6.5 kW output heat pump and 1000 L storage vessel. Included in the installation are:
 - All SANS required safety equipment, operating valves, strainers, etc.
 - Circulating pumps between heat pump and storage vessel, as specified or as per recommended minimum by heat pump manufacturer,
 - Control Panel,
 - Thermostatic mixing valves,
 - Insulation,
 - Bracketing, supports, drip trays, overflows,
 - Standby electrical heating elements, temperature controllers and sensors etc.
- 2.3 All piping, fittings, piping supports, valves, etc.
- 2.4 The heat pump frames shall be equipped with fastening points etc.
- 2.5 Maintenance and operating manuals, parts lists, manufacturer's data sheets, as built pipe diagrams showing valve locations, maintenance schedules and list of recommended spares for all equipment.
- 2.6 Pressure testing of all piping to a pressure of 600kPa, pressure testing of solar panels and geysers after installation to a pressure not exceeding the max. Allowable operating pressure as specified by the manufacturer, operational testing and commissioning of the installation and training of staff in the use, care and maintenance of the equipment. All pressure testing must be witnessed and signed off by engineer.
- 2.7 All test certificates, electrical compliance certificates and local authority approvals.
- 2.8 Full maintenance during the 5year guarantee period and full documentation to enable the end user to implement the 5-year guarantee on the solar equipment as specified.
- 2.9 All other items and requirements, whether specifically mentioned or not, for complete, functional and safe heat pump water heating systems complying with all the relevant codes and specifications.

2.10 All safety notices, safety plan and safety equipment.

3.0 PIPING SPECIFICATIONS

3.1 Copper Piping

Copper piping for domestic water services shall in all cases comply with the requirements of SABS 460 Class 2 and 3. For applications below ground class 3 shall be used, wrapped with Denso tape or similar.

Piping above ground shall be of class 2 and be jointed with capillary soldered fittings. Provision must however be made for union couplings in strategic places.

Pipes shall be firmly and neatly chased in or fixed to walls, as directed by the Principal Agent. Holder bats, saddles or brackets shall be of copper, bronze or brass. Holder batts, clips, etc shall be fixed to timber roof trusses or walls with brass screws. Piping chased into walls shall be wrapped with two layers of brown paper (Kraft) and covered with 3:1 cement mortar mix. Note that wrapping piping with old cement bags is **not** acceptable.

Hot water piping shall be of thin wall hard drawn copper.

3.2 Capillary Soldered Jointing of Copper Piping

3.2.1 Unless otherwise specified, all copper pipes shall be jointed with approved capillary solder type fittings, each joint being formed by cutting the pipe-ends square with a pipe cutter. If the tube end to be soldered is dirty due to cement, bitumen or tape-gum, it shall be mechanically cleaned with steel wool or abrasive paper prior to soldering.

3.2.2 The area to be soldered should then be thinly coated with a self-cleaning into the fitting apply a flame using a LPG Gas blow lamp, (or an electric resistance machine) to the assembly to heat the tube and fitting for not longer than about 10 seconds. Then remove the flame completely and test the temperature of the joint by placing the wire solder at the mouth of the fitting. If the solder does not melt, remove the solder and heat again with the flame for a few seconds more. Test again with the solder. If the solder melts freely, hold the solder at about 45o to the mouth of the fitting, allowing it to melt and with steady pressure the solder will be drawn into the joint. DO NOT overheat the assembly and never hold the solder in the flame. Allow only the heat of the assembly to melt the solder.

3.2.3 Unless otherwise specified use only 2- or 3-mm solid core wire solder, type 97/3 (97% tin and 3% copper.) A careful check should be made to ensure that a ring of solder is visible around the mouth of the fitting.

3.2.4 Solders containing lead are not acceptable and not allowed.

3.2.5 No resin core or acid core solders are acceptable.

3.2.6 Fittings and pipes must be wiped clean with a damp cloth after jointing. Joints that have been fluxed should be soldered within one hour.

3.2.7 Copper pipes specified to be jointed with compression fittings shall be jointed with approved brass metal fittings with coupling nuts and rotary sleeve pieces.

3.2.8 All necessary couplings, connectors, elbows, tees and other fittings as may be required, shall be provided.

3.2.9 Copper pipes to be specified to be jointed with flared type fittings, shall be jointed with approved brass metal fittings with coupling nuts and cone.

3.2.9 N.B. Capillary, compression and flared type fittings used in jointing copper pipes must be of such a bore as will correctly fit the pipes, to ensure satisfactory jointing.

3.2.10 Compression ring or flared cone fittings shall always be used when making mechanical connections - see Clause 2.7 and Appendix A.

3.2.11 Note that compression type fittings may **NOT** be used with Class 0 copper piping.

3.3 **Brazing of Copper Piping**

3.3.1 If piping is to be brazed self fluxing copper/phosphorous with 2% minimum silver similar to Silbralloy shall be used.

3.4 **Labour Bends**

All labour bends shall be made with an approved bending machine in conjunction with a bending spring to give a uniform and even radius without ripple. Such bends shall be substantially undistorted.

3.5 **Services Chased in to Walls**

3.5.1 Hot water pipes buried in walls and floors shall be wrapped in two layers of stiff brown paper before being built in to aid thermal expansion of the pipes. It is **not** acceptable to use old cement bags for this purpose.

All copper water pipes chased into walls or cast into concrete slabs or columns shall be jointed using **capillary fittings only**.

3.6 **Connections to Wash Hand Basins, Baths, Sinks, etc**

Connection to all fittings (viz. taps, cisterns, machines, etc.) shall be mechanically made and not brazed or hard soldered. In this respect take note of clause 2.2.11 - it will be required that a suitable section of class 1 copper piping be joined to class 0 piping (where this has been used for the reticulation) and that the requisite compression fittings then be fixed to the class 1 copper piping. Jointing compounds (Teflon Pipe Sealer by Loctite or other approved and/or P.T.F.E. tape) shall be lead free and sparingly used.

Small diameter connections off the ring mains may be made using approved saddle connectors in conjunction with "Ball Valves" in accordance with the manufacturer's recommendations.

3.7 **De-Zincification**

All brass fittings and valves shall be certified by the manufacturers to be free from de-zincification and will be subjected to check tests as set out in Appendix A.

3.8 **Pipe Supports and Support Spacing**

All pipe work both vertical and horizontal shall be supported along its length with brackets capable of carrying the combined mass of the pipe and water and shall be spaced at the following maximum centres:

Diameter of c/c Brackets/ hangers/ holderbats (mm)	15 - 22	28 - 35	42 - 54	76 - 108	Pipe (mm)
	1200	2000	2500	3000	

Unistrut: Type P1000 - 3300 (hot dip galvanised)
Brackets: P1108 - P1126 (see standard drawing)

All copper pipes shall be electrically insulated from holder batts, etc with P.V.C. tape wound around the piping.

Other support systems shall be subject to approval by the Engineer or his duly appointed representative.

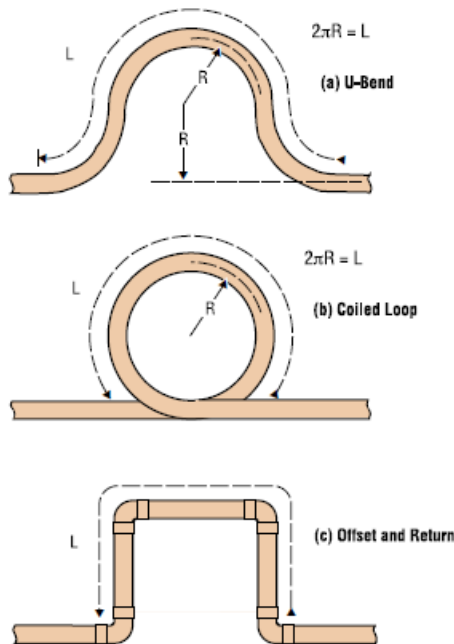
3.9 Pipe Gradients

Hot water pipes shall be laid to a minimum gradient of 1 in 200 with auto air release valves positioned at the highest points and vented to the outside.

3.10 Allowance for Expansion of Piping

All straight long runs in copper tubing shall be interrupted every 15 m with an offset or an expansion loop.

Expansion loops shall be provided as per standard practice for copper piping. The loop dimensions shall be as a minimum as follows:



Expected expansion in mm		LOOP LENGTH L AND RADIUS R FOR DIFFERENT PIPE ϕ		
		15mm ϕ	22mm ϕ	25mm ϕ
12	L	1250	1500	1700
	R	200	230	280
25	L	1700	2000	2400
	R	270	320	380
38	L	2200	2500	3000
	R	350	400	500

3.10 Pipe Gradients

Hot water pipes shall be laid to a minimum gradient of 1 in 200 with auto air release valves positioned at the highest points and vented to the outside.

4.0 VALVES AND FITTINGS

4.1 Isolating Valves

All toilets, kitchen areas etc. shall have a main isolating valve surface mounted inside those areas to aid maintenance.

Isolating valves are not allowed in the roof areas except for connections to geysers as shown on the drawings

Isolating valves on the cold water line shall be of the stop cock pattern up to 42 mm diameter and of sluice or gate valve pattern above 42 mm dia.

Where the static pressure is below 200 kPa all isolating valves on the hot and cold water system shall be of the sluice or gate valve pattern.

"Stop-cocks" or "Ball-valves" shall precede all individual fittings i.e. toilet cisterns, hot water geysers, washing machines etc. All "Ball-valves" shall have hard chrome plated balls seated on Teflon seats.

4.2 Non-Return Valves

All non-return valves shall be of the lift type pattern.

4.3 Automatic Air Release Valves

Automatic air release valves shall be installed at all high points in the reticulation system where air locks can occur or as detailed by the Engineer.

Air release valves shall be preceded by an isolating valve and vented to the outside.

5.0 Insulation Materials

5.1 All hot water piping must be insulated throughout with high density polystyrene R value of not less than 1 m².KW insulation.

5.2 Exterior hot water insulation must be protected with a protective membrane UV-resistant water and weather-resistant, pre-fabricated, self-adhering, sheet-type membrane. Should Tenderers wish to offer any other insulating material in lieu of the above full details must be submitted with tenders. Such alternative insulating materials may only be used if approved by the Engineer or his duly appointed representative.

5.3 The following minimum thicknesses of insulation are required:

Pipe Size	Thickness of Preformed Sections
Up to 40 mm diameter	25 mm
50 mm to 80 mm diameter	40 mm
100 mm diameter and over	50 mm

These minimum thicknesses are given as a guide. Tenderers are required to ensure that the insulation applied to piping is sufficient to ensure that the outside surface temperature of the insulated areas does not exceed 45 Deg C at an ambient air temperature of 20 Deg C.

5.4 Preformed insulation sections must be fixed in place by means of 15 mm wide bands of aluminium or similar non-corroding material applied at the rate of at least two per metre length on insulation.

Pre-formed insulation sections must be ordered specifically for steel or for copper piping. Pre-formed sections made to copper pipe sizes may under no circumstances be used for steel piping and vice-versa.

5.5 Prior to insulation, the piping must be rubbed down where the original primer coat is damaged and all loose rust and scale removed. Thereafter the piping must be touched up with new primer and one coat heat resistant aluminium paint.

5.6 Valves and fittings must be left un-insulated. Pipe insulation adjacent to such fittings must be neatly chamfered off and finished off with sheet metal covers.

No more than 50 mm and no less than 40 mm of piping adjacent to fittings may be left un-insulated.

5.7 Where joints are cut out and repaired, the Contractor must re-paint the new welds prior to the application of insulation.

6.0 HEAT PUMPS

- 6.1 Heat pumps shall be of the air-to-water, water-to-water or air-to-air.
- 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.
- 6.3 Shell and tube condensers are preferred for air to water applications.
- 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.
- 6.5 Condenser and condenser piping circuits shall be properly insulated.
- 6.6 A condensate drip pan of stainless steel 430 shall be fitted and piped to the nearest building drain, allowing for defrost cycles.
- 6.7 Heat pumps shall be selected for a maximum compressor running operation of 20 hours per day.
- 6.8 Reverse cycle automatically controlled defrost shall be provided as standard. Defrost shall be demand controlled and not timer controlled.
- 6.9 The heat pump shall be suitable for operating with ambient wet bulb temperatures as low as -10°C and as high as 40°C.
- 6.10 Heat pumps for central heating hot water shall heat the water to 60°C (or as specified) and shall be selected to ensure correct functioning with water inlet temperature as low as 40°C and as high as 50°C.
- 6.11 Heat pumps with a coefficient of performance (COP) of less than 3.0 at ambient wet bulb temperature of 10°C with secondary circuit inlet temperature 40°C will not be acceptable.
- 6.12 Each heat pump shall be fitted with a control and fault indication panel to provide status indication on fault occurrence and operation mode.
- 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.
- 6.14 Heat pumps shall be fitted with head pressure control set at ensuring constant 60°C water supply temperature at all possible water inlet temperatures and flows.
- 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. CH.PWD.XI 4.13 Operating pressures and temperatures shall comply with the manufacturer's recommendations.
- 6.16 Provision shall be made in the refrigerant circuits for liquid collection during periods of not being in use.
- 6.17 The compressor shall be interlocked with the evaporator fan/s and the flow switch to prevent operation unless these elements are functional.
- 6.18 Time delay relay shall be incorporated in the control system of each heat pump to prevent simultaneous start up.
- 6.19 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.
- 6.20 The following operating and safety controls shall be provided:
 - a) High and low refrigerant pressure, manual reset type, safety switch,
 - b) Low ambient air temperature safety switch,
 - c) Current overload protection on compressor(s), pump(s), and fans,
 - d) Compressor short cycling on low demand,

- 6.21 The standby heater is required with a heat pump application the standby heater shall be switched on automatically on heat pump failure with heating called for.
- 6.22 Suction and discharge pressure gauges shall be provided on the instrument panel.
- 6.23 Noise levels shall be under 60db.
- 6.24 Easily detachable/ openable panels of rigid construction giving access to all working parts of the unit shall be provided.
- 6.25 All valves, fittings, etc for a complete operational system are not indicated, but must be included in the price.
- 6.26 Set of temperature gauges included on the send and return pipes.
- 6.27 All spare parts for the heat pumps should be available from local South African suppliers that keep stock of these items with no lead times for supplying.

7.0 **HOT WATER STORAGE VESSEL**

- 7.1 The storage vessel shall be manufactured from at least 2.5 mm thick steel. The geyser shall be internally coated with vitreous enamel capable of withstanding thermal shock and temperatures up to 130°C. Each geyser shall be guaranteed for a period of five years and shall be supplied complete with sacrificial anode suitable for use in water.
- 7.2 A minimum of 60mm high density polyurethane insulation shall be used between the inner tank and outer cover. The minimum R value of the insulation shall be 2.00m².°K/W.
- 7.3 The solar geysers shall be complete with full jacketed heat exchanger coil radially covering at least 97% of the storage cylinder.
- 7.4 The cold-water inlet shall be fitted with a sparge pipe to reduce the turbulence and forces on the standby electrical element.
- 7.5 All pipe connections shall be for diameter of pipe indicated on drawings.
- 7.6 The standby electrical heating element shall be from Incoloy 825 with a watt density below 8W/cm². The element tubes shall be marked with the manufacturers batch number with traceable reference to the material of manufacture that must be Incoloy 825. The element heating capacity shall be stamped on the element boss.
- 7.7 Each Cylinder shall as a minimum be supplied and installed with the following:
- Earth stud bonded to the earth system as well as earth bonding straps between the hot and cold-water pipes and any metallic cover etc.
 - Two vacuum breakers-one on the cold-water supply and one on the hot water outlet. The vacuum breakers must be mounted at least 300mm above the geyser and must be directly over the drip tray.
 - Pressure and temperature safety valve complete with independent 22 mm copper piping to a safe position outside the building.
 - Drain point and drain valve all mounted above the drip tray.
 - 400kPa combination pressure control, expansion and isolating valve with strainer.
 - Sacrificial anode.
 - Safety thermostat.
 - 4x 3 kW Incoloy 825 heating element.
 - Electrical isolating switch 1m from geyser complete with glands and flexible wire way to carry wiring to geyser element.
 - Bronze ball valves with stainless steel balls and handles to shut off the hot- and cold-water during maintenance.

- 7.8 The hot water cylinders shall be of a Vertical configuration as appropriate and be capable of accepting an add on heating system which may comprise of solar units, heat pumps or other fuel saving systems.
- 7.9 Pressure reducing valves shall be S.A.B.S. approved and factory set to maintain a pressure of 100 +/- 10 kPa at the cylinder outlet. The pressure reducing unit shall have as an integral part of that unit:
- (a) A pressure release valve with drain connection to protect the cylinder against thermal expansion of the water.
 - (b) A built-in strainer.
 - (c) A built-in non-return valve associated with the reducing valve.
 - (d) Isolating valves fitted to the inlet and outlet sides of the reducing valves.
 - (e) Combined Temperature, Pressure and Vacuum release valves fitted into the delivery side of the cylinder. The T.P. valve shall have a drain connection built into it and shall be fitted so that the probe is in the cylinder. The drain from the reducing valve and T.P.V. valve shall be laid to a fall of 1:60 minimum and discharge over a gully. The drain pipe shall be a minimum of 22 mm diameter.
 - (f) Pressure reducing valves shall be installed in accordance with the manufacturer's recommendations and **MUST BE POSITIONED FOR EASY MAINTENANCE.**
- 7.10 Certificates are required from the manufacturer of the hot water cylinders confirming at they have been pressure tested to 2,5 times the normal working pressure of 400 kPa gauge.

The hot water cylinders shall be guaranteed from date of practical completion of the installation for a period of three years on the tank, insulation and outer casing and for one year on the electrical components.

8.0 CIRCULATING PUMPS

- 8.1 The circulating pump shall be mounted with screwed unions so that the pump can be easily removed for servicing.
- 8.2 The pump body shall be from coated cast iron. The motor shaft, impeller, seal rings, jacket and shaft bushes/bearings shall be from non-corroding material. The motor body shall be from die cast aluminium. Seals and thrust rings shall be from ceramic capable of operating at the specified temperature (110°C) in a 30% propylene glycol solution.
- 8.3 The pump motor shall be capable of operating at 220/230V AC in an ambient temperature of at least 40°C. The motor insulation shall be at least class H according to NEMA. The protection rating shall be at least to IP44.
- 8.4 The pumps shall be controlled by a differential temperature controller as described under the section **BASIC OPERATION OF THE SYSTEM.**

9.0 ELECTRICAL WORK AND CONTROL PANELS

- 9.1 All electrical work must conform to SANS 1082 and a certificate of conformance (COC) must be issued for the installation. All cables must be secured to galvanised cable baskets. Wiring shall be done inside conduit.
- 9.2 All conduit, cable baskets and general items must be installed square, vertical and horizontal within the accuracy of a builder's level.
- 9.3 The main isolator and main circuit breaker shall be double pole for single phase units and triple pole for

three phase units. The complete system shall be earthed and the COC shall cover all equipment associated with the installation.

- 9.4 The electrical supply from the nearest DB shall be done as part of this contract. Cable shall be fixed with saddles at maximum 400 mm intervals or be placed on galvanised cable baskets. All entry and exit points shall be fitted with bushes to prevent wire damage caused by sharp ends. Cable/wire sizes shall conform to the requirements of SANS 1082. All cable and wire loading shall include for all the electrical items plus an additional allowance of at least 20%.
- 9.5 The temperature controller shall be of the digital electronic type with at least two PT100 temperature sensor inputs. All the control parameters such as differential temperature, dead band and hysteresis shall be adjustable. The PT100 sensors shall be installed into the solar panel inlet and outlet pipes using pocketed temperature sensor wells with sealing glands. The temperature sensor leads shall be at least the three-wire type specifically made for PT100 sensors.
- 9.6 The controller output shall switch an interfacing relay to control the circulating pump. The pump shall not run if the glycol return temperature is higher than the solar panel outlet temperature.
- 9.7 The controller shall be placed in an easily accessible position without undue long leads.
- 9.9 The following equipment should be installed on the control panel as standard equipment for the installation:
- a) a main isolating switch;
 - b) circuit-breaker protection;
 - c) contactors;
 - d) thermal overcurrent protection;
 - e) surge breakers when the installation is exposed to the weather;
 - f) undervoltage and overvoltage protection in accordance with the relevant standards;
 - g) phase-failure and rotation protection (three-phase motors);
 - h) low water level protection;
 - i) short-circuit protection.

The size and characteristics of the equipment given above shall be determined by the following factors:

- a) the electrical fault level of installation;
- b) the starting current of pumps;
- c) the running current of pumps; and
- d) the supply voltage to the installation

10.0 **HYDRAULIC TESTING OF WATER PIPES**

All water piping shall be hydraulically tested to a pressure equal to 3 times the working pressure but not less than 1000 kPa held for 60 minutes or as long as it takes to inspect every joint in the section being tested, whichever is the greater. The test shall take place in the presence of the Engineer or his duly appointed representative with the results being recorded for inclusion in the practical completion documentation and certification.

Under no conditions shall "leak cure chemicals" be introduced into the reticulation system.

All leaks shall be made good, so that the quality of the original components is not altered and so that the repairs are to the satisfaction of the Engineer or his duly appointed representative.

The Contractor shall provide all the necessary equipment required to carry out the tests on the pipes. Piping shall be tested in sections as the work progresses and before being covered in trenches or wall or floor chases. The completed pipe line shall also be pressure tested just prior to practical completion of the installation.

Failure to comply with the above will result in the contractor being required to expose the piping in question **at his own expense** in order for the pressure tests to be carried out.

11.0 PAINTING

All exposed and visible reticulation lines shall be painted by the Contractor. All piping shall be colour coded in accordance with the requirements of the SABS colour code. Identification of the contents of a pipe line shall be by means of painting a colour code on the pipes as required by the SABS colour code and these bands shall be painted on by the Contractor.

The colour coding shall consist of a primary colour only or of primary and secondary colour and shall generally consist of 300mm long primary colour bands painted around the pipe. Where applicable a central 100mm secondary colour band shall be added. Where short lengths of pipes run through occupied areas and in plant rooms the primary colour shall be applied to their entire length.

Where only bands can be applied they shall be at intervals of not more than 6m apart and adjacent to each side of a bend, valve, etc.

Where pipe runs are hidden, i.e. within ducts, false ceilings, etc colour coding bands shall be provided opposite each access panel or similar.

Arrows indicating the direction of flow of the contents of the pipe shall be applied as per colour coding bands.

21.0 LABELLING OF VALVES, ETC.

All main stop valves, control valves, etc. shall be labelled by means of rustless metal tags indicating their purpose and the section they isolate, if isolating valves. The tags shall be securely fixed to the valves, and shall be clearly legible.

Letters on labels shall be punched. No painted labels or plastic embossed labels will be accepted.

Alternatively 12 mm wide stainless steel tape embossed labels may be used fixed with copper wire to the relevant valves.

13.0 WARRANTY

The contractor is to guarantee all the systems and workmanship for a period of twelve (12) months against any defects (latent or obvious), non-conformance and/or failure from date of first delivery. The glycol expansion tanks, indirect solar geysers, solar panels and brackets shall carry a guarantee of 5 years. Documentation to support such a guarantee on the equipment shall be provided for safe keeping by DRPW. Any defects and/or failure that may occur or become evident during the guarantee period shall be rectified within twenty four (24) hours after being notified of the occurrence of the defect. In the event that such failure and/or defect constitute a threat to the health and safety of the user and/or occupants, the contractor shall take immediate steps to rectify the fault. Any faulty item that becomes evident during the guarantee period shall be replaced with new and not repaired. The contractor shall also submit to the Department of Public Works AND school management a full report describing the nature of failure, cause of failure and possible methods to prevent future failure.

In the event that the contractor does not attend to such defects after being notified, the Department of Public Works and/or user reserve the right to effect the rectification of the defect and recover the costs thus incurred from the contractor.

14.0 MAINTENANCE

Immediately after each interim or final practical completion inspection all defects noted shall be rectified. Latent defects appearing within three (3) months or as specified, shall be rectified by the Contractor at no charge to the client.

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
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VOLUME 2,4 PART 3: DOMESTIC WATER AND HEATING EQUIPMENT

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
	<u>Bill No. 1 : Preliminary and General</u>					
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1,2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1,3	Tools and equipment, Communication, transport.					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)					
	Fixed	Item	1			
	Value Related	Item	1			
	Time Related	Item	1			
1,5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1			
1,6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1			
1,7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	Item	1			
1,8	Additional testing and balancing at disgression of the mechanical engineer.	Item	1			
Total Carried forward to Summary Page						

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PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	ESTIMATE			
			QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
2,0	BILL NO. 2 : HOT & COLD WATER PIPING Copper Piping Copper piping above ground to SANS 460 class 2 installed in accordance with the specification, drawings and manufacturer's recommendations. Pipe hanger & support bracket spacing to be as per the table on the drawings. Piping - chased into brickwork must be wrapped in two layers of kraft paper as specified.					
2,1	76 mm dia	m	0			RATE
2,2	54 mm dia	m	485			
2,3	42 mm dia	m	65			
2,4	35 mm dia	m	30			
2,5	28 mm dia	m	145			
2,6	22 mm dia	m	24			
2,7	15 mm dia	m	530			
	Bends Capillary soldered bends: (Maksal or equal and approved)					
2,8	76 mm dia	No.	0			RATE
2,9	54 mm dia	No.	69			
2,10	42 mm dia	No.	33			
2,11	35 mm dia	No.	10			
2,12	28 mm dia	No.	16			
2,13	22 mm dia	No.	12			
2,14	15 mm dia	No.	212			
	Tees Capillary soldered tees: (Maksal or equal and approved)					
2,15	76 mm dia	No.	0			RATE
2,16	54 mm dia	No.	106			
2,17	42 mm dia	No.	10			
2,18	35 mm dia	No.	5			
2,19	28 mm dia	No.	40			
2,20	22 mm dia	No.	12			
2,21	15 mm dia	No.	106			
	Isolating valves Ball valves, full bore with lever, hard chrome plated balls and teflon seats					
2,22	54 mm dia	No.	10			
2,23	42 mm dia	No.	5			
2,24	35 mm dia	No.	2			
2,25	28 mm dia	No.	5			
2,26	22 mm dia	No.	2			
2,26	15 mm dia	No.	106			
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PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	ESTIMATE			
			QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
Total Carried forward From Previous Page						
<u>Pipe hangers and brackets</u>						
2,28	76 mm dia	No.	0			RATE
2,29	54 mm dia	No.	485			
2,30	42 mm dia	No.	65			
2,31	35 mm dia	No.	30			
2,32	28 mm dia	No.	145			
2,33	22 mm dia	No.	24			
2,34	15 mm dia	No.	530			
<u>Non Return Valves</u>						
2,35	28 mm dia	No.	2			
2,36	22 mm dia	No.	1			
<u>Vacuum Breakers</u>						
2,37	54 mm dia	No.	8			
2,38	42 mm dia	No.	1			
2,39	22 mm dia	No.	1			
<u>Insulation</u>						
All exposed hot water piping to be insulated with high density polystyrene R value of not less than 1 m ² .KW						
2,40	76 mm dia	m	0			RATE
2,41	54 mm dia	m	485			
2,42	42 mm dia	m	65			
2,43	35 mm dia	m	30			
2,44	28 mm dia	m	145			
2,45	22 mm dia	m	24			
2,46	15 mm dia	m	530			
Protective membrane UV-resistant water and weather-resistant, pre-fabricated, self-adhering, sheet-type to fit diameters listed below:						
2,47	76 mm dia	m	0			RATE
2,48	54 mm dia	m	485			
2,49	42 mm dia	m	65			
2,50	35 mm dia	m	30			
2,51	28 mm dia	m	145			
2,52	22 mm dia	m	24			
2,53	15 mm dia	m	530			
<u>Reducers</u>						
2,54	54 to 15 mm dia	No.	106			
2,55	42 to 35 mm dia	No.	2			
2,56	35 to 28 mm dia	No.	26			
2,57	22 to 15 mm dia	No.	6			
<u>Braided Flexible Hoses</u>						
2,58	15 mm	m	106			
Total Carried forward to Next Page						

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PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	ESTIMATE			
			QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
Total Carried forward From Previous Page						
	<u>Bib tap</u>					
2,59	15 mm	No.	1			
	<u>Pressure Reducing Valve</u>					
2,60	54 mm	No.	1			
	<u>Pressure Balancing Valve</u>					
2,61	54 mm	No.	1			
	<u>Sundry Items</u>					
2,62	Solder, flux, consumables required to complete the installation	Lot	1			
2,63	Connection to sanitary ware fittings	No.	106			
2,64	Flushing & cleaning pipework system	m	352			
2,65	Pressure testing of parts of the installation	No.	8			
2,66	Pressure testing complete installation	No.	1			
2,67	Painting of piping	m	1279			
2,68	Labelling of valves & piping	Lot	1			
2,69	De-zincification tests	Lot	1			
	<u>Manhole</u>					
2,70	Supply, install, test and commission domestic water manhole 400 x 400 mm with hinged cover.	No.	0			RATE
2,71	Supply, install, test and commission domestic water manhole 1000 x 1000 mm with hinged cover.	No.	0			RATE
	<u>Connection to Civil Mains</u>					
2,72	Trenching and laying of pipe from installation to civil main, incl backfilling.	m	0			RATE
2,73	Connection of domestic water main to civil main	No.	1			
	<u>Coring Through Brickwork</u>					
2,74	Core through 220 mm brick work, 100 mm diam core.	No	6			
	<u>Training of Staff</u>					
2,75	Training of staff on operation of units; ; location of equipment and basic day to day maintenance.	No	1			
Total Carried forward to Summary Page						

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BILL NO. 3: WATER HEATING EQUIPMENT

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
3,0	<u>BILL NO. 3 : WATER HEATING EQUIPMENT</u>					
	<u>HEAT PUMP</u>					
3,1	HEAT PUMP: MINIMUM 6,5 KW OUTPUT TO 55 DEG CELSIUS; COP LESS THAN 3; 150 L/HR RECOVERY; VERTICAL DISCHARGE UNIT.	No.	1			
3,2	HEAT ACCUMULATOR TANK (1000L) - VERTICAL HOT WATER STORAGE TANK, INSULATION VALUE OF MINIMUM R = 2 OR BETTER, CLAD IN STAINLESS STEEL, ALL SANS SAFETY EQUIPMENT AS STANDARD, PREWIRED CONTROL PANEL, ELECTRICAL BACK UP 4x 3kW INCALLOY ELEMENTS. UNIT MUST COME READY WITH FLANGE CONNECTIONS FOR HEAT PUMP.	No.	1			
3,3	HEAT PUMP CIRCULATION PUMPS: 2l/min @ 7m H OR AS PER OEM HEAT PUMP MINIMUM REQUIREMENT	No.	1			
3,4	RING MAIN CIRCULATION PUMPS: 8l/min @ 15m H	No.	2			
3,5	PUMPS DRY RUN PROTECTION	No.	2			
3,6	PIPES, ELBOWS, TEE'S, FLOAT VALVE, ETC	SUM	1			
Total Carried forward to Next Page						

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BILL NO. 3: WATER HEATING EQUIPMENT

ITEM	DESCRIPTION	UNIT	QTY	SUPPLY RATE	INSTALL RATE	AMOUNT
Total Carried forward From Previous Page						
3,4	PANELS volt and ammeters, pilot lights etc. soft starter main isolating switch circuit-breaker protection contactors for each heat pump thermal overcurrent protection surge breakers when the installation is exposed to the weather undervoltage and overvoltage protection in accordance with the relevant standards phase-failure and rotation protection (three- low water level protection short-circuit protection	No.	1			
3,8	COMMISIONING; TRAINING & HANDOVER	No.	1			
3,9	THERMOSTATIC MIXING VALVE 54MM	No.	1			
3,10	ALL EXPOSED HOT WATER PIPING TO BE INSULATED WITH HIGH DENSITY POLYSTYRENE R VALUE OF NOT LESS THAN 1 M ² .KW	Sum	1			
Total Carried forward to Summary Page						

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PRICE SUMMARY

BILL NO.	DESCRIPTION	AMOUNT
1	BILL NO. 1 : P&G	
2	BILL NO. 2 : HOT & COLD WATER PIPING	
3	BILL NO. 3 : WATER HEATING EQUIPMENT	
4	PC SUM: REMOVAL OF REDUNDANT EQUIPMENT	25 000,00
SUBTOTAL		
CONTINGENCY 2,5%		
SUBTOTAL		

REMINDER NOTE

The Total Price including Main Contractor's Mark-up which excludes VAT, must be carried over to the final summary in Volume 1 and all fixed amounts shown in the price schedule must be included therein. No adjustments will be made for any failure by Tenderers to include the fixed amounts in the Total Price for this particular installation.

SUB-CONTRACTOR'S NAME:

DATE:

SIGNATURE:

N.B. The above-named Sub-Contractor is to be employed on this contract. Substitute Sub-Contractors are not acceptable.

The price submitted include all Main Contractor's 'Profit and Mark up BUT Exclude the VAT when transferring price to Volume 1 of the Final Summary Total of the Main Contractor's Document

VOLUME 2.4 PART 2: SCHEDULE OF MATERIALS OFFERED

DOMESTIC WATER & HEATING EQUIPMENT INSTALLATION

SCHEDULE OF MATERIALS OFFERED

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities.

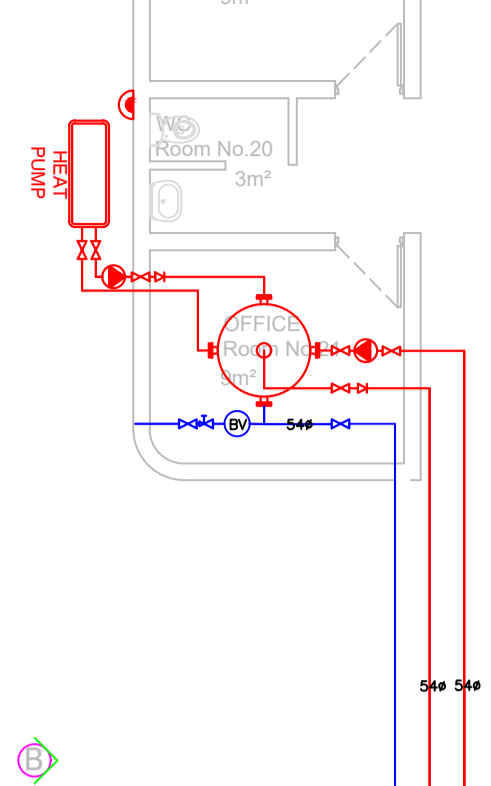
The schedules will be scrutinised by the Engineer and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB : Only one manufacturer's name to be inserted for each item.

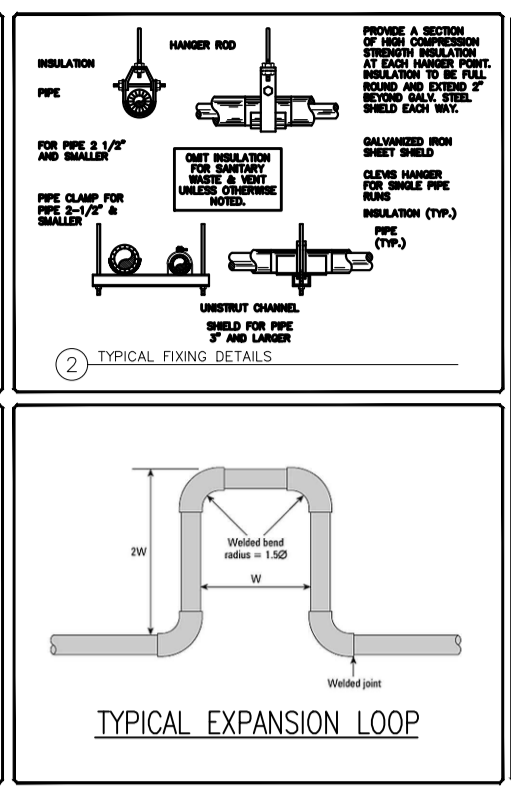
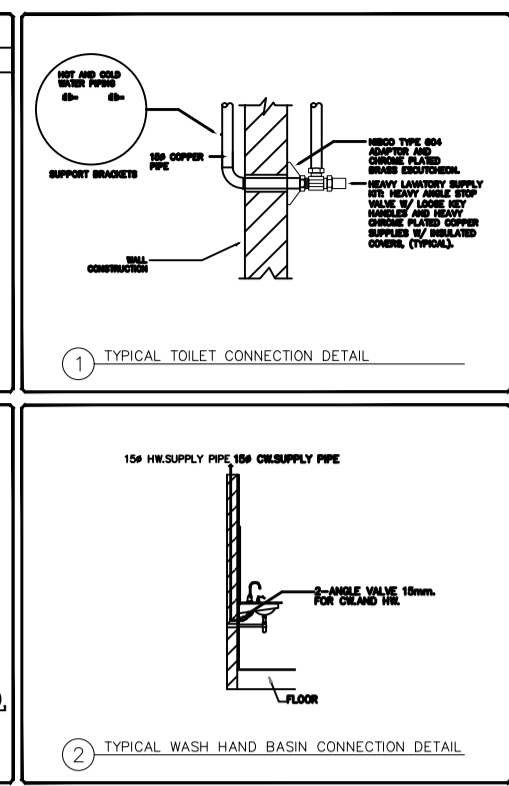
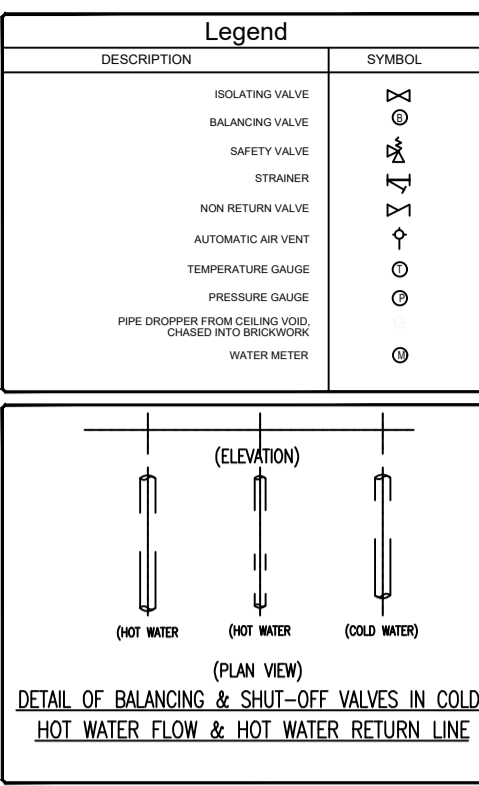
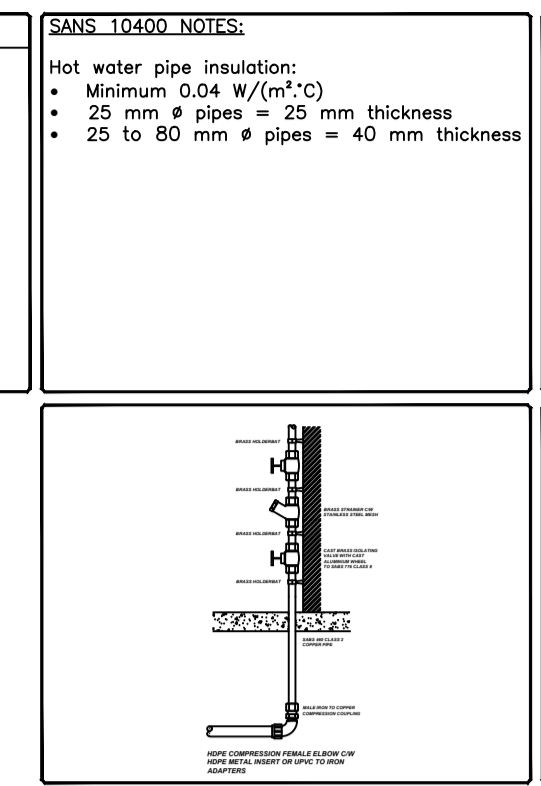
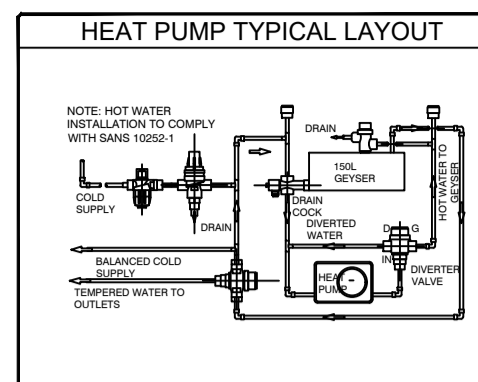
Item	Material	Make or trade name	Country of Origin
1.	Copper Piping		
2.	Isolating Valves		
3.	Strainers		
4.	Non-Return Valves		
5.	Safety Valves		
6.	Vacuum Breakers		
7.	Balancing Valves		
8.	Pressure Reducing Valves		
9.	Solar Vacuum Tube Collectors		
10.	Pipe Insulation		
11.	Hangars		
12.	Heat Pump		
13.	Storage Cylinder		
14.	Thermostatic Mixing Valves		
15.			

NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor.

Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.



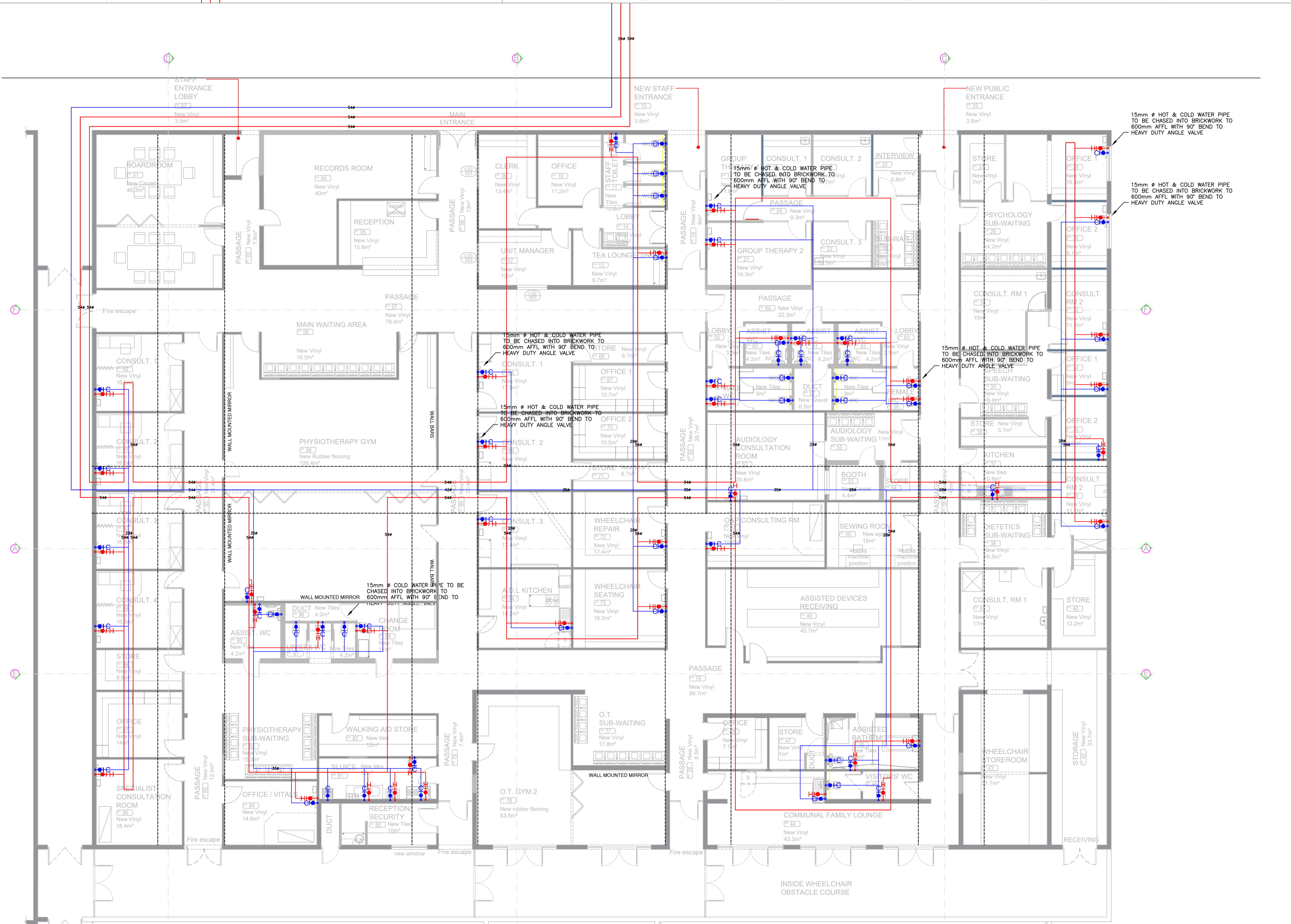
1. HEAT PUMP
 - 1.1. OUTPUT: 6.5 kW @ 55 °C
 - 1.2. INPUT: 1.85 kW
 - 1.3. RECOVERY: 150 litres/hr
 - 1.4. ELECTRICAL:
 - 1.4.1. Start A 28 amps
 - 1.4.2. Run A 8.2 amps
2. HOT WATER STORAGE TANK
 - 2.1. CAPACITY: 1100 L
 - 2.2. ELECTRICAL BACK UP INCLUDED
3. HOT WATER CIRCULATING PUMPS
 - 3.1. Q: 8 l/min @ 15 m



- INSTALLATION NOTES:**
1. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORK.
 2. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL AND OTHER DRAWINGS.
 3. ALL PIPING CHASED INTO WALLS TO BE SABS 480 CLASS 1 AND MUST BE WRAPPED WITH BRIDGES PAPER PRIOR TO WALL CHASES BEING COVERED.
 4. ALL PIPING TO BE PRESSURE TESTED TO 600kPa PRIOR TO BEING CONCEALED IN WALL CHASES ETC.
 5. ALL COLD WATER FLOW AND RETURN LINES TO BE INSULATED WITH THERMAFLUX. EXPOSED HOT WATER PIPES TO BE INSULATED WITH PREFORMED FIBRE GLASS WITH CANVAS WRAPPING AND METAL CLADDING. HOT WATER PIPES IN SHAFTS & CEILINGS TO BE CLADDED WITH PREFORMED FIBRE GLASS AND CANVAS WRAPPING ONLY.
 6. BALL TYPE SHUT-OFF VALVES TO BE FITTED IN ALL BRANCHES TO WIPER'S BATHS, SHOWERS AND TOILETS (i.e. HOT & COLD WATER PIPING).
 7. PIPING TO RUN IN ROOF SPACE FIXED WITH HOLDER BATS ETC AS INDICATED IN THE SPECIFICATION. (NOTE THAT NO GALVANISED HOLDER BATS MAY BE USED TO SUPPORT COPPER PIPING).
 8. PIPE SUPPORT SPACING TO BE AS INDICATED IN THE STANDARD SPECIFICATION.
 9. MAINLINE AIR BLENDS VALVES TO BE FITTED AT ALL HIGH POINTS IN THE HOT AND COLD WATER PIPING.
 10. ALL HOT TAPS TO BE ON LHS AND COLD TAPS ON RHS OF FITTINGS.
 11. REFER TO GENERAL NOTES FOR DRAWING REFERENCE PURPOSES.
 12. FLOW RATERS OF 6 L/MIN TO ALL BASINS AND SHOWERS.

GENERAL NOTES:

REV	DATE	INIT.	DESCRIPTION
00	06/07/23	TW.	Issued for Information



REVISIONS

REV	DATE	INIT.	DESCRIPTION
00	06/07/23	TW.	Issued for Information

CLIENT

TITLE

DOMESTIC WATER
RETICULATION AND WATER
HEATING
EQUIPMENT LAYOUT

CMH
CEREBRAL PALSY



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Fax: 043 742 3883

DESIGN	TENDER	CONSTRUCTION
DESIGNED BY:	T.WARNE	SCALE: 1:50
DRAWN	DATE	PRINT DATE
T.WARNE	02/07/2023	02/08/2023
CHECKED BY:	Travis Warne	
REGISTRATION No.	201770017	
SIGNED:		
DRAWING NO.	REV No.	
2217-M-D-101 DW CP	00	

VOLUME 2.1 BLOCK H

MECHANICAL INSTALLATION

Fire Detection

VOLUME 2.1 PART 1: EARLY WARNING FIRE DETECTION - 1 SCOPE OF WORKS

EARLY WARNING SMOKE DETECTION & SUPPRESSION EQUIPMENT INSTALLATIONS

1. **GENERAL**

- 1.1 The Standard for Uniformity in Construction Procurement published in terms of the Construction Industry Development Board (CIDB) Act, 2000 (Act No. 38 of 2000), the Standardized Construction Procurement Documents for Engineering and Construction Works as issued by the CIDB and any other relevant documentation pertaining thereto must be studied and all principles in this regard must be applied to all procurement documentation, practices and procedures.

2. **THE CONTRACT**

2.1 **EARLY WARNING SMOKE DETECTION & SUPPRESSION INSTALLATIONS**

The work to be carried out and commissioned by a SAQCC Fire approved installer:

- a. Installation of additional fire detection terminal units / line units, to new ceiling installations, as per SANS 10400 Section T; SANS 10139 & SAN 322
- b. Inert gas suppression systems to theatre 1 & 2
- c. Testing and Commissioning, as per SANS 10400 Section T; SANS 10139 & 322,
- d. Manuals, Drawings, OEM Literature,

2.2 **Existing**

Early warning fire detection system is existing. Building is Existing.

2.3 **Order of The Works**

As per the building contractors' program of works.

VOLUME 2 PART 2: EARLY WARNING FIRE DETECTION - STANDARD SPECIFICATION

AUTOMATIC FIRE DETECTION INSTALLATIONS

1.0 INTRODUCTION AND GENERAL

The system shall offer the best possible compromise between the initial expenditure and the long term interest and redemption charges and running / operating costs.

All workmanship and materials used in the execution of the works shall conform with modern practice and the entire installation shall comply fully with all relevant requirements of governmental and the Local Authority whose jurisdiction embraces the location of the site.

2.0 REFERENCES

The work shall be carried out strictly in accordance with:

- a. The Machinery and Occupational Safety Act of 1984.
- b. All relevant Regulations and Bylaws of the Municipal Council and Fire Department concerned.
- c. The National Fire Protection Association (NFPA) No 12.
- d. SANS 0139-1981 -Code of Practice for The Prevention, Automatic Detection and Extinguishing of Fire in Buildings.
- e. BS 5839 and European Standard EN 54, Parts' 2 and 4.

Where no Building, Municipal, Health or Fire Department Act, Regulation, Bylaw or other requirement exist, nor any SANS standard or detailed requirement by the Engineers then the Contractor's terms of reference shall always be the current editions of NFPA handbook.

3.0 INSTALLATION GENERAL PRACTICES

- a. All electrical equipment shall comply with the relevant SANS or BSS where applicable, and to SANS 10142, Code of Practice for the Wiring of Premises.
- b. Material shall be subject to the approval of the Engineer, to whom samples shall be submitted upon request.
- c. Cable sizes for each circuit shall be selected to ensure that the current carrying capacity will be adequate and that the voltage drop at the equipment served will comply with the Code of Practice for the Wiring of Premises.
- d. Wiring shall be carried out in PVC insulated cables enclosed in Class B conduit or approved trunking. Alternatively, M.I.M.S., fire resistant cable, or PVCSWAPVC cable may be used where convenient, and where permitted under the section Wiring between Detection Zones hereunder.
- e. All cables, cable trays, conduits (other than those encased in concrete or chased into walls), and cable trays shall run parallel with, or at right angles to the structure or walls. Their routes shall be co-ordinated with piping and duct systems. They may run on the surface of walls and ceilings in all plantrooms, in ceiling voids and in underfloor voids where permitted by the clause Wiring between Detection Zones. Elsewhere they shall be concealed in an approved manner.
- f. No cable or electrical shall be routed within 75 mm of a hot water pipe.

4.0 WIRING BETWEEN DETECTION ZONES

The control wires or power cables between the control panel, the battery pack, a detection zone or where the wiring of a detector circuit passes through any other detector zone, shall be one of the following:-

- a. Mineral insulated metal sheathed cable which shall complying with all SANS and BS EN codes. The Contractor may be required to demonstrate to the Engineer that he is proficient in making off these types of cables.
- b. PVC insulated annealed copper wire complying with SANS 150, housed within conduits which are buried into cement or brickwork. Surface conduits between zones will not be permitted.
- c. Fire resistant cables in compliance with SANS 150 and SANS Method 494 Resistance of cables to Fire Propagation.
- d. PVCSWAPVC cables and terminations complying with SANS 150.
- e. Aluminium cables will not be permitted.

5.0 CABLES AND WIRING

5.1 MIMS Cables

- a. MIMS cables shall be mineral insulated copper sheathed and copper core cables equal to pyrotenax of not less than 600 volt grade. Aluminium cables will not be permitted.
- b. Minimum sizes for MIMS cables shall be 1,5 mm² for power and 1,00 mm² for control wiring.
- c. Tails shall be sleeved with silicone rubber insulation in appropriate colour.
- d. All cable fixings shall tie by means of factory manufactured brass or copper saddles or clips, secured by brass or cadmium plated screws.
- e. Clips or saddles shall be provided within 150 mm of fittings, accessories or bends, and not more than 600 mm apart elsewhere. No more than 4 cables shall be secured by a single saddle.
- f. A straight length of cable shall be left adjacent to termination glands to enable the glands to be readily withdrawn. The cables shall be made-off with approved standard pot-type seals and accessories as applicable.
- g. The minimum bending radius of cables shall be 6 times the cable diameter.
- h. Where a number of cables run parallel they shall be dressed into a neat symmetrical arrangement without sagging or distortion. Care shall be taken to avoid flattening or indentation of cable sheaths.
- i. Where cables come into contact with dissimilar metals, which may give rise to corrosion, the Contractor shall adequately separate the surfaces with PVC tape or by other approved means.
- j. Where cables pass through holes in metal-work, the holes shall be neatly bushed to prevent damage to the sheath.
- k. Cables shall not be buried directly in plaster, concrete or similar materials.
- l. Where installation in these materials is necessary, the cables shall be enclosed in a suitable duct, pipe or conduit, which is provided with bushed ends to prevent damage to the cable sheath.
- m. Cables shall be mechanically protected where they rise from floors in exposed positions and where they may be exposed to accidental damage.

5.2 PVC Insulated Wire

- a. PVC insulated copper wire conductors shall be of South African origin, manufactured to comply with SANS 150.
- b. Where PVC insulated wires are used, the installation shall comprise PVC insulated copper conductors drawn into duct or conduit. Where such wires are drawn into conduits it shall be carried out in accordance with standard electrical practice, and shall be subject to the approval of the Engineer.
- c. No joints in the PVC wires between terminal points will be permitted under any circumstances.

5.3 Fire Resistant Cables

- a. The fire resistant cable shall be constructed of silicon rubber insulated copper conductors housed in a protective PVC sheath bonded to coated aluminium foil. This shall be as per PH120 Fire Resistant Cable or similar approved.
- b. These cables shall be installed in the manner prescribed for MIMS cables, with attention being paid to any special requirements regarding terminations, radius of bends, etc., as prescribed by the manufacture.
- c. No joints in this cable will be permitted.

5.4 Armoured Cables

- a. PVCSWAPVC cables and cable terminations shall comply with SANS 150 and shall be of 660 volt grade.
- b. These armoured cables where permitted, may:
 - Lay flat on cable trays, fixed with approved ties.
 - Where the cable tray is vertical, the armoured cables are to be held in position by approved straps.
 - Fixing with wire is not permitted.
 - Be fixed to the masonry with saddles.
 - Be fixed to unistrut with the approved fixing saddles.
- c. Where the cable is in a ventilation air path (other than the underfloor void of a computer room) the outer PVC sheath is to be removed after fixing if so demanded by the local authorities.
- d. No joints in PVC cables will be permitted under any circumstances.
- e. The PVC cable glands shall consist of the brass cone type with waterproof seal, equal to "DESCO", and shall be suitable for PVCSWAPVC general purpose 660 volt grade cable.

6.0 CONDUITS

- a. Conduit shall be heavy gauge welded screwed steel conduit to SANS 162 and powder coated yellow.
- b. Conduit shall be clean, true and free from internal obstructions.
- c. Burrs shall be removed with taper reamer. All free ends shall be fitted with approved bushes.
- d. No conduit shall be less than 25 mm nominal diameter.
- e. No surface conduits, PVC conduit or box trunking will be permitted between two separate detection zones or between detection and non-detection zone. They can however be used within a single detection or gas protected zone to interconnect the detectors and other equipment housed within that zone.
- f. The entire conduit system shall be watertight, electrically and mechanically continuous.
- g. During installation, the ends of conduit shall be temporarily plugged to prevent the ingress of dirt and moisture.
- h. Conduits shall be securely saddled along the length of the run and saddles shall be provided within 500 mm of all fittings or terminations.
- i. Sets and bends shall be made cold with approved bending machines in such a manner that there is no damage to or distortion of the conduit. In locations where it is not practicable to use sets for changes in direction, such changes shall be made by the use of approved screwed fittings.
- j. All sets and bends shall be such that they permit cables to be drawn easily into the conduits after installation.
- k. All junction boxes provided to facilitate the drawing-in of cables shall be located in positions which will be readily accessible in the completed project.
- l. Inspection fittings shall not be used as "Loop-in" points.
- m. The whole conduit installation shall be a "Loop-in" installation.
- n. Conduits shall be installed in such a manner that they are free from mechanical stress.
- o. No threads shall be visible after erection, other than at running joints.
- p. Running threads shall be thoroughly painted.
- q. Final connections to plant (other than in cases where the items can be mounted directly to termination boxes) shall be run to a junction box adjacent to the item of equipment.
- r. Flexible conduit connections are to be installed between the round terminal box adjacent to a ceiling void detector and its ceiling mounted remote indication lamp. The flexible conduit plus the PVC wires contained therein shall be left sufficiently long to allow for the indication of the lamp in the centre of a ceiling tile (which may not fall directly beneath the terminal box). There shall be no stress imposed on the flexible conduit.
- s. Before the drawing in of any conductors the conduit installation shall be complete with lock-nuts, bushes and all other accessories in accordance with standard electrical practice. Conduits shall be cleaned out and swabbed dry internally.

7.0 CABLE TRAYS

- a. Cable trays shall be of Pyrotenax, unistrut or other approved manufacture.
- b. The size and gauge of all trays shall be chosen to suit each particular application. They shall be adequately stiffened and braced both transversely and longitudinally, ensuring a true finished run.
- c. All screws, washers, nuts, etc. used in the installation of the trays shall be cadmium plated.
- d. All trays, fittings, brackets, etc. shall be galvanised or electro-tinned and where exposed shall be painted after erection in accordance with the details as specified herein.
- e. All trays shall be supported by brackets at intervals sufficiently small to produce a robust installation and to ensure that there is no perceptible deflection of the finished tray and its associated supports.
- f. All bends, tee-offs, changes in section and changes in direction shall be made with factory finished fittings.
- g. All joints shall be made with approved jointing plates. Lapped joints will not be permitted.

8.0 TRUNKING

- a. Trunking shall be manufactured from galvanised sheet metal of a thickness not less than 1 mm for runs, and 1,6 mm for bends, off-sets, reducing pieces, etc.
- b. Trunking shall comply with BS 4678.
- c. Covers shall be of the same material as the trunking and shall not exceed 1,2m in length.
- d. All screws, nuts, washers, etc. shall be cadmium plated.
- e. The trunking and covers shall be braced as necessary to ensure rigidity, and the open side of the trunking shall be provided with right angled returns to receive the covers.
- f. The covers shall be securely fixed to the trunking by means of approved clips or fasteners.
- g. The trunking shall be supported to brackets at intervals sufficiently small to produce a robust rigid installation and to ensure that there is no perceptible deflection of the trunking between supports.
- h. All bends, tee-offs, changes in section and changes in direction shall be made in factory-manufactured fittings.
- i. All joints shall be butt joints, made with internal fishplates.
- j. Lapped joints will not be permitted.

- k. Screws shall be cut off flush with the top of the nuts after erection, and shall be filed smooth and painted.
- l. The trunking is to be cut square where cutting is necessary for jointing etc. Cut edges shall be smoothed off with a file.
- m. Plastic trunking may be permitted at the Engineers discretion and subject to his approval of the specific material offered.

9.0 CONTROL PANELS

9.1 General

- a. The control panel shall be wired in the factory and not on site. The only connections to be made in the panel on site shall be the interconnection with the field wiring.
- b. All outgoing circuits shall terminate on numbered terminals with approved lugs where the numbers correspond to those reflected on the as-built drawings.
- c. Wires within the cubicle shall bear an identification number at both ends. Numbering shall be by approved wiring ferrules securely attached so that they will not slip off when the wire is removed from its terminal.
- d. The numbering shall correspond to the drawings. Handwritten numbers or adhesive tape bearing numbers will not be acceptable.
- e. When a device is removed from the loop, it must be reflected on the panel as a faulty device and it must be clear once the device has been re-installed.

10.0 ZONE PANEL

10.1 General

- a. Allow to supply and install a zone layout with a building plan and line unit numbers located adjacent each fire control panel.

11.0 NETWORKING

11.1 General

- a. The networking capabilities of the system shall be such that all control panels may be connected via optical medium. The system shall ensure rugged and reliable "peer to peer" operation. It shall be possible to remove and add to the network to allow for easy expansion of the system.
- b. The network shall use an industry standard protocol such as ARCNET or ETHERNET to ensure that no data is corrupted.
- c. The network is to feature:
 - Inter-panel Input/Output programming.
 - Remote uploading/downloading of system configurations to individual panels.
 - Remote maintenance.
 - RS232 nodes for connection to graphics packages, building management systems and modems.
 - Global repeater panel.
 - LCD repeaters.

12.0 LINE ISOLATORS

Loop isolators are to be connected in to the loop circuit and monitor for short circuit. In the event of a short circuit occurring the loop isolators on each side of the short circuit are to disconnect and isolate that portion of the loop from the system, enabling the remainder of the system to function normally.

A light emitting diode (LED) must illuminate when a loop/line isolator is in an open condition.

VOLUME 2.1 PART 3: EARLY WARNING FIRE DETECTION - DETAILED SPECIFICATION

AUTOMATIC FIRE DETECTION INSTALLATIONS

1.0 INTRODUCTION & GENERAL

This Detail Specification complements & qualifies the foregoing standard specifications of material & workmanship. The Standard Specification should be regarded as a basis and guideline, with this Detailed Specification taking preference where any ambiguity is concerned.

In the event of any further technical ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority:

- a) Schedule of quantities
- b) Project specification
- c) Drawings (loose and bound-in)
- d) Standard specification

2.0 SITE CONDITIONS

Location: Cecelia Makiwhane Hospital, Block H, Buffalo City,
Eastern Cape

3.0 SCOPE OF WORK

The standard specification shall apply unless otherwise indicated in this section.

The drawings issued herewith and listed in the relevant section are to be read in conjunction with the specification and all items mentioned, together with all ancillary equipment necessary for the correct installation, operation and full compliance with the Standards and codes must be provided, notwithstanding the fact that they may not have been included in detail in these documents.

The bidder shall, at the time of bidding, draw the Engineer's attention to any omissions or discrepancy between the specification and the drawings and request from him clarification of details or responsibilities.

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

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

If any such items of equipment, brackets and accessories, etc., have been omitted from a supplier's quotation, or incidental work is necessary, the bidder must include for all such items and work in the bid.

The whole installation shall be in accordance with the latest edition of the Occupational Health and Safety Act: No. 85 of 1993. All regulations framed therein, shall be carried out to the satisfaction of the Engineer.

All equipment offered by the bidder shall be to the approval of the duly appointed Engineer, prior to installation. This Standard Specification and the Detailed Specification with drawings shall be carefully adhered to by the bidder. Equipment installed without the approval of the Engineer will have to be removed at the Contractor's expense and be replaced with officially approved listed items.

The successful bidder will be required to prove to the Engineer that he has qualified personnel on his staff establishment as well as recognised test equipment for the successful completion of a safe working installation.

The contractor shall employ only skilled artisans and technicians approved by the Engineer who are competent in this type of work. The work shall be carried out in accordance with the standards laid down by the Engineer.

The contracting firm shall be recognised contractor specialising in this field and approved by the Engineer.

The work performed shall comprise the supply, delivery, off-loading, interim storage, installation, testing, commissioning and leaving in good working order of the complete fire detection and evacuation system installation inclusive of all guarantees as specified herein and the supply of 'AS IS' installation record drawings, Maintenance and Operating Manuals for:

- Supply and installation of new ceiling detectors and interphase relay units to an existing Siemens FC722 Series addressable automatic fire detection and alarm evacuation system,
- Supply and installation of 2x inert gas fire suppression systems to the theatres,
- Supply and installation of PVC conduit and galvanised steel trunking.
- The liaison with:
 - Building/Principal Contractor, and their Domestic Sub-contractors,
 - Electrical Sub-contractor,
 - Air Conditioning Sub-contractor,
- Testing and commissioning (SAQCC Commissioner) of all equipment in the fire protected areas with and in conjunction with the Air Conditioning Sub-contractor.

This Sub Contract also includes all electrical works for the installation but excludes the power supply to the Main Panel which will be provided by others.

Notwithstanding any omission in this specification the installations shall be complete in all respects. This condition shall be recognised in the preparation of all working drawings submitted for approval. Further, despite any approval of working drawings given by and on behalf of the Main Contractor the responsibility for correct functioning of the plant during tests, inspection and the maintenance period shall rest entirely with the successful bidder.

The installation shall be strictly in accordance with the approved drawings or such further drawings, modifications, or instructions as may be given by the Engineer concerned, or that are found to be necessary, and such modifications or instructions shall be deemed to be within the specification for the purpose of the bid, and shall not vitiate the contract.

Payment for such modifications will only be made on certification by the Engineer to the effect that such modifications have involved additional expense to the Sub-Contractor.

The following sections of Work are excluded:

- Builder's work e.g. cut-outs in walls to Tenderer's specifications, including chasing and making good of walls.
- The cutting of holes in suspended ceilings and ceiling tiles for the fixing of detector heads, sirens and other fire devices.
- Tiling, painting or decorating after installation
- Provision of suitable 220 V / 1 phase power supply for Control Panel.

3.0 SITE CONDITIONS

The site shall be serviced as far as electricity services are concerned, although Tenderers must make provision for an alternative electricity supply during installation.

The equipment specified herein shall be designed to operate at the environmental parameters as follows:

Location: Cecelia Makiwhane Hospital, Block H, Buffalo City, Eastern Cape

4.0 PROGRAMME

The Sub Contractor shall complete the installation within the time stipulated. The Sub Contractor will be required to report to the Principal Contractor, generally on a weekly basis (or more often if required by the Principal Contractor), progress of work and any difficulties arising, to enable the Principal Contractor to update the programme.

The sequence in which the work is to be carried out shall be decided upon in consultation with the Principal Contractor. The Sub Contractor shall thereafter submit an adequately detailed Sub Contractor's installation programme for approval within two (2) weeks of the Sub Contract being awarded unless otherwise indicated herein after.

This programme must be periodically updated as the work progresses and as may be necessary to meet changing site conditions and alterations to the overall installation programme.

Programmes shall take the form of bar charts, network diagrams and schedules as may be required by the Main Contractor or as applicable, and shall reflect quantities of work as required for supervision purposes and measurements.

As a minimum the programme shall reflect:

- sequence and timing of installation activities.
- sequence and latest event times of major equipment ordering, manufacture and delivery dates.
- sequence and dates for the submission of drawings and samples for approval.
- sequence and dates for factory and site inspections and tests.
- target and achieved work quantities on a weekly, fortnightly and monthly basis.

In preference all work is to be undertaken by staff in the full time employ of the bidder.

All work which is to be undertaken by "Domestic Sub Contractors" of the Sub Contractor will be clearly identified in the bid submission and the Sub Contractors to be used subject to prior approval of the Client and/or Engineer and/or Principal Contractor; failure to comply with this requirement may result in the "Domestic Sub Contractors" being removed from site.

All costs in replacing the undesirable "Domestic Sub Contractor" or any delays incurred as a consequence of this will be entirely for the Sub Contractor's account.

5.0 PROJECT TECHNICAL SPECIFICATION

The bidder shall allow for programming the work in such a manner as to not disrupt the Main Contractor's programme. Sequence of work to suit the Sub Contractor's requirements will not be guaranteed nor accepted.

Claims from Sub Contractors arising out of broken work sequences or agreed programmes changed due to contingent requirements, will not be considered unless full motivations for the extra costs are submitted; the motivation for extra costs must justify costs in terms of the accepted programme and any unforeseen and justifiable additional staffing levels required to meet targets revised with insufficient notice. Reallocation of staff and/or acceleration of work will not be reason enough to claim for extra costs unless the Sub Contractor can prove that he has indeed had to pay for staff's idle time which was not or could not be envisaged at the time of bidding and/or drawing up the installation programme and sequence. When claiming for extra cost all out of town cost will be disallowed as it is assumed that the Sub Contractor has fully staffed premises in the vicinity of the site.

The Subcontractor must also assume that work may be required to continue uninterrupted outside of normal working hours and/or for an extended and/or unbroken period of time.

5.1 **Automatic Fire Detection System**

The building is existing, the analogue addressable fire detection system is existing, with new line devices as specified in the bill of quantities and drawings provided.

All fire signals received by a sensor are to be confirmed by a sensor in a zone or any break glass unit; all confirmed signals will be automatically relayed to the Main Fire Alarm Panel unit.

6.0 **EQUIPMENT SPECIFICATIONS**

6.1 General

The following description details the design parameters for the operation, control, dimensions, finishes, etc. for the Fire Detection unit installation. These parameters are the minimum requirements, and the sub-contractor may offer equipment that exceeds these specifications. All relevant technical information to be submitted with tender.

6.2 Optical Smoke Detectors and Bases

The location of optical smoke detectors are indicated on the drawing provided with this document and the Tenderer shall supply and install units that shall meet or better the following specifications:

- a. The detectors shall operate on a 24 V d.c. power supply, and be suitable for connection in the circuit to the control panel using two wire system.
- b. The detector base section shall be suitable for easy removal and replacement of the detectors, and shall allow for the interchanging of the different types of detectors without any modifications being necessary.
- c. The base to be employed shall depend on the special mounting conditions required, and shall be suitable for one or more of the following:
 - surface / wall mounting
 - mounting in damp / plant rooms
 - suspended mounting
 - underside of ceiling
 - explosion proof mounting, with intrinsic safety
- d. A visual alarm detection indication lamp shall be incorporated on each detector which shall illuminate or flash on the detector activated. If not visible over 360° the detector shall be orientated so that the indication light faces towards the entrance to the room, or to where it can easily be visible on entry to the space in an emergency.
- e. Unit is to feature:
 - Measure of smoke density from 0.5 to 10 particle range.
 - Active output proportional to the amount of smoke present in the chamber.
 - Output value of the sensor to provide data regarding contamination levels in sensor and electronic circuit.
 - Comply with Standard EN54 Part 7.

6.5 Line Devices

All line devices shall comply with the standard specification. The type and location of line devices are shown on the drawings.

Line Relays:

The Sub Contractor will provide the line relay and connect to a 24V contactor coil. The contactor and wiring to its contacts to be carried out under this contract but as part of the Air Conditioning installation.

Interface Units:

The interface units used shall be with Normally Open contacts either of the 'fire' or 'non-fire' types; an end of line resistors shall be provided with each interface unit.

The Sub Contractor will be expected to provide the interface units and connect to voltage free contacts which are to be monitored as follows:

- Contact open Normal
- Contact closed Alarm
- Wiring open Fault
- Wiring shorted Fault

7.0 **OPERATING AND MAINTENANCE INSTRUCTIONS**

Three sets of instruction manuals shall be provided. Each manual shall comprise of the following sections, bound in a vinyl plastic covered folder with the name of the project typewritten on a card inserted into a clear plastic covered cardholder on the front cover and spine and shall be handed to the Main Contractor on completion of the installation:

- Table of Contents
- Functional Description of Plant (as installed)
- Operation of Plant (as installed – step by step instructions).
- Performance Testing Procedures including Test Report
- Maintenance Instructions (in schedule form setting out each item of plant, the description and frequency of maintenance operations required). Instructions on testing fire detection system must also be provided.
- Spare Parts (list of spare parts that shall be required, with detailed description of each part, make, model or part number and supplier's name and address).
- Descriptive Literature (for all items of plant and equipment).
- Record Drawings (of plant as installed to include plant layout drawings showing component location, control and wiring diagrams and schematic piping diagrams).

8.0 **GUARANTEE**

The entire fire detection and alarm evacuation system installation shall be fully guaranteed for 12 (twelve) calendar months from date of acceptance by the Engineer. During the guarantee period, the sub-contractor shall be responsible for the making good of any defects reported by the Tenant. The guarantee shall be ceded to the Superintendent following acceptance of the installation.

9.0 **MAINTENANCE**

The fire detection sub-contractor shall be responsible for the maintenance of the entire plant during the guarantee period, as specified in this document. Record of all services are to be kept and copies signed by the Superintendent.

The maintenance of the plant shall be undertaken by the Maintenance Staff after expiry of the guarantee period(s).

A hand-over to the Maintenance Staff representative is to be carried out on the plant 4 weeks before expiry of the guarantee period(s).

10.0 CERTIFICATION ON COMPLETION OF GUARANTEE & MAINTENANCE PERIOD

In the month prior to the expiry of the guarantee and first twelve months maintenance period the Engineer shall inspect and, if necessary, retest the installation so as to be able to provide the Tenant with a certificate, within fourteen days of the guarantee expiry date, to confirm that the guarantee has been honoured and that the installation has been properly serviced at required regular intervals by the fire detection sub-contractor.

11.0 SAMPLES & ALTERNATIVES

Samples will be requested where and when required.

The tender prices shall be based on the equipment as specified and not on any alternatives. Should the tenderer wish to submit prices for alternatives, he shall do so separately, in a letter or similar correspondence, attached to the tender. The use of any alternative equipment, if any, will be evaluated and decided on after tender award, when the costs, etc. will be negotiated with the successful tenderer

The Engineer reserves the right to call for prices on alternative equipment subsequent to tender submission.

12.0 SCHEDULES OF INFORMATION

The schedules of information contained in this document consists of 2 sections:

- Information supplied by the Engineer (schedules of drawings, cables, distribution boards, etc. as applicable).
- Information to be supplied by the sub-contractor at tender stage (tender form, information on the makes, types and ratings of equipment and materials offered, schedules of prices and rates for variations, schedules of quantities, etc. as applicable).

Tenderers must complete, at the time of tendering, the "Schedule of Material Offered", and provide sufficient technical details to enable the equipment concerned to be identified without ambiguity.

It is not sufficient for a Tenderer to state "as specified" in the schedules.

Failure to complete these schedules (if applicable) may render a tender invalid.

13.0 DRAWINGS

13.1 General

Generally, the term "detail" shall mean that the drawing is exact in all aspects to what shall be provided. Where the term "illustration" is used, however, it shall be construed that the drawing is to be regarded as a proposal or guideline as to what is to be provided, manufactured or supplied.

13.2 Tender Drawings

Refer to the proposed Fire Detection and Alarm Evacuation Installation as provided with this document.

13.3 Construction / Workshop Drawings

The successful tenderer shall submit construction drawings (or detailed catalogues) of the manufactured equipment, such as mounting details, etc., for consideration by the Engineer prior to manufacture/supply thereof.

The Engineer's approval of construction or workmanship drawings does not relieve the sub-contractor of his responsibility with regards to any of the deviations from the requirements of this contract unless the Engineer has been clearly informed, in writing, of such deviations at the time of submission and the Engineer subsequently gives written approval for the specific deviation. Similarly, the Engineer's approval shall not relieve the sub-contractor of responsibility for errors or omissions in the construction / workmanship drawings.

13.4 Record Drawings

The sub-contractor must prepare record drawings of the completed installation as constructed, indicating cable runs, equipment mounting details, circuiting & distribution board details, sleeve pipe positions, etc.

The contract shall not be deemed as complete until these drawings have been submitted.

13.5 Fire Detection System

The following drawings are required:

- Layout drawings
- Schematic circuit drawings
- Internal circuit drawings of all panels, etc.
- Wiring drawings showing wire colour codes and numbers as well as all connections onto terminal strips (markers to be approved by the Engineer).

The following documents are required:

- Full description of the system.
- Operating instructions.
- Installation instructions.
- Commissioning instructions.
- Maintenance instructions, maintenance schedule and trouble shooting guide.
- Programme printout

14.0 **SUPERVISION, WORKMANSHIP AND DELAYS**

The work shall at all times, for the entire duration of the contract, be executed under the supervision of a skilled and competent representative of the sub-contractor, who must be able and authorised to receive and execute instructions on behalf of the sub-contractor. This person must be a registered and accredited person, as described by the OHS Act. It must be noted that the staff complement of the sub-contractor shall remain similar throughout the duration of the contract, for all sections of the Works.

In the event that inferior materials or bad workmanship, on the part of the sub-contractor, leads to remedial work requiring redesign by the Engineer, the cost of this work, including related professional fees, shall be borne by the sub-contractor.

Similarly, should delays in the contract be caused by poor performance on the part of the sub-contractor causing the engineer to spend extra-ordinary time on the project, the extra costs incurred shall be borne by the sub-contractor.

These costs will be based on the SAACE hourly rate and will be deducted from claims due to from claims which will become due to the sub-contractor.

15.0 COMPLIANCE WITH REGULATIONS, STANDARDS AND CODES

The sub-contractor shall arrange for all inspections and testing of the installation as required. All notices, fees, including inspection and re-inspection, are the responsibility of the sub-contractor and all the relevant costs shall be borne by him.

The workmanship throughout the Works will be to the satisfaction of the Employer. Any materials or workmanship considered as faulty or incorrectly or inadequately erected or repaired, will be substituted, altered or rectified to the satisfaction of the Employer, without additional cost to the Employer.

The Works will be executed in strict accordance with the following:

- All relevant by-laws and regulations of local authorities.
- All relevant SANS, BS and other international standards.
- The Occupational Health and Safety Act of 1993.

16.0 COMMISSIONING AND TESTING

16.1 Commissioning

A documented method shall be followed whereby the sub-contractor shall ensure that his installation is correctly constructed in accordance with the manufacturers' specifications, consultant's specification, consultant's design and all Codes of Practice and International Design Codes.

The commissioning procedure must allow for signing off of the major items of equipment by a qualified person in terms of the codes. These signed off documents will form part of the record drawings.

16.2 Performance Tests

The sub-contractor shall be responsible for the physical testing, in the manufacturing works, or on site, of the items of plant or systems as required by the Engineer. These tests shall be performed by the sub-contractor or supplier of the equipment, and where called for, the Engineer shall witness such tests. The Engineer may also only witness a representative sample of the equipment tests. In any event, the sub-contractor will supply documentary proof of full performance tests of all relevant equipment.

16.3 Acceptance Tests

Acceptance tests will be performed on site of the working system or sub system, to show that the Works, as installed, is functioning according to the specifications and design. The onus for the correct functioning of the systems is still on the sub-contractor irrespective of whether the Engineer has witnessed the acceptance tests or not.

Prior to the system being taken into use, a certificate of compliance must be provided. The works shall not be deemed complete without this certificate.

16.4 Fire Detection and Alarm Evacuation System Testing Equipment

Testing equipment required for the successful commissioning of the Works described herein is to be made available by the sub-contractor.

All arrangements for this equipment or instructing of testing specialists to undertake this work and all associated costs, including professional fees shall be deducted from money due to the sub-contractor.

17.0 BUILDER'S WORK

The onus is on the sub-contractor to point out and check the requirements for and positioning and correctness of all builder's work for his services.

18.0 MAKING GOOD

With exception of making good to the cut-outs and drilled holes for piping, the sub-contractor will carry out, in all instances any work to be made good such as damage to, or disturbance of the building installations caused by himself or his employees during the execution of the contract at his own cost.

19.0 SITE MEETINGS

The sub-contractor's representative shall be expected to attend an official site meeting at the onset of the project including scheduled technical and site meetings during the contract period. For meetings termed as "technical and site", a site representative is required and must be competent and able to interpret and receive and act on instructions on behalf of the sub-contractor. The tenderer shall price all relevant P & G costs, overheads, travelling, etc. for these meetings.

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - BLOCK H
VOLUME 2,1 PART 4: EARLY WARNING DETECTION & GAS SUPPRESSION SYSTEMS

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Bill No. 1 : Preliminary and General</u>				
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.3	Tools and equipment, Communication, transport.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.5	Provision of updated record drawings and manuals as specified including As-Installed drawings	Item	1		
1.6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1		
1.7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	Item	1		
1.8	Additional testing and balancing at discription of the mechanical engineer.	Item	1		
Total Carried forward to Summary Page					

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
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CMH - BLOCK H
VOLUME 2,1 PART 4: EARLY WARNING DETECTION & GAS SUPPRESSION SYSTEMS

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BILL NO. 2 : FIRE DETECTION EQUIPMENT				
2,1	ADDRESSABLE FIRE CONTROL PANEL Supply, Install, test, commission and provide 12 month guarantee for expansion module for additional 2 loops	no.	1		
2,2	ADDRESSABLE OPTICAL SMOKE DETECTORS Supply, Install, test, commission and provide 12 month guarantee for Optical Smoke Detectors c/w bases.	no.	9		
2,3	LINE RELAYS Supply, install, test, commission and provide a 12 month guarantee for Line Relay unit. Line Relay to be linked to ventilation systems, kitchen canopies.	no.	2		
2,4	VOLTAGE FREE CONTACTORS Supply, install, test, commission and provide a 12 month guarantee for voltage free contactors to link Air-system, Ventilation and Smoke Extraction system and etc all as specified.	no.	2		
2,5	FIRE PROOF CABLE Supply, install, test, commission and provide a 12 month guarantee for fire proof cable with a fire rating of 30 minutes or higher, all as specified.	m	260		
2,6	INTER-LOCKING SYSTEM Supply, install, test, commission and provide a 12 month guarantee for inter-locking of fire detection system with Air-conditioning System, Ventilation System, System, Smoke Extraction System and etc.	no.	2		
2,7	SPRAGUE CONDUIT Supply, Install, test, commission and provide 12 month guarantee for Sprague Conduit c/w bases, couplings mounting brackets & boxes etc all as specified). installed next to the panels (Main / Repeater panels and etc.	m	17		
	PVC CONDUIT Supply, Install, test, commission and provide 12 month guarantee for PVC conduit chased into brickwork, cast into concrete or fixed onto trusses including cutting, bending, galvanised saddles, bushes, etc.				
2,8	25mm diameter conduit	m	260		
2,9	32mm diameter conduit	m	78		
2,10	60 mm round boxes	no.	13		
Total Carried forward to Next Page					
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PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
2,11	WIRING CHANNEL (P2000) Supply, Install, test, commission and provide 12 month guarantee for P2000 wiring channel, galvanised channel cover including suspension hangers, end caps and etc.	m	100		
2,12	PROGRAMING / MODIFICATION Update existing fire detection protocols, sequencing etc.	no.	1		
2,13	TESTING Testing of entire system to ensure all modifications; additions to system intergrade, to ensure 100% operational status	no.	1		
2,14	Training Training of staff on operation of units; location of equipment	No	3		
2,15	Electrical Connect equipment to isolator or connect cable to isolator, provided.	No	1		
Total Carried forward to Summary Page					

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VOLUME 2,1 PART 4: EARLY WARNING DETECTION & GAS SUPPRESSION SYSTEMS

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	BILL NO. 3 : FIRE SUPPRESSION EQUIPMENT				
3,1	FIRE SUPPRESSION EQUIPMENT Supply, Install, test, commission and provide 12 month guarantee for localised Inert gas flooding fire suppression system, incl. ECU panel, cylinder, IG55 gas, pony activation cylinder, pipework, nozzle etc.				
3,2,1	ADDRESSABLE FIRE CONTROL PANEL EN12094-1; 2 & 4 Approved Addressable Gas Suppression Control Panel, to intergrate into existing Seimans FC722 system, c/w sealed lead acid batteries	No	2		
3,2,2	EN12094-1; 2 & 4 Approved Addressable Gas Suppression Control Panel Approved Addressable Panels c/w sealed lead acid batteries, IP67 rated.	No	0		
3,3	ADDRESSABLE MUTI SENSOR DETECTORS Supply, Install, test, commission and provide 12 month guarantee for Optical Smoke Detectors c/w bases.	No	8		
3,4	ADDRESSABLE SOUNDER (ALARM SIREN) Supply, Install, test, commission and provide 12 month guarantee for Sounder (Alarm Siren) complete with bases.	No	4		
3,5	IO LINE RELAY UNIT Supply, install, test, commision and provide a 12 month guarantee for Line Relay unit. Input/Output device to be linked to ventilation systems, kitchen canopies.	No	2		
3,6	FIRE PROOF CABLE Supply, install, test, commision and provide a 12 month guarantee for fire proof cable with a fire rating of 30 minutes or higher, all as specified.	m	80		
3,7	GAS SUPPRESSION RELIEF VENT Supply, install, test, commision and provide a 12 month guarantee for gas suppression relief vent. 2 hr fire rated.	No	2		
3,8	200/300 BAR INERGEN SUPPRESSION SYSTEM GAS BANK Supply, install, test, commision and provide a 12 month for 200/300 bar gas banks, incl galvanised SC40 piping, elbows, Tees, reducers, sockets, nipples, nozzles, clamps etc. for complete installation for:				
3,8,1	Theatre 1 31 m ² floor area 3,4 m high (slab to soffit) no suspended floor or ceiling				
	Supply	No	1		
	Install	No	1		
Total Carried forward to Next Page					

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PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Total Carried From Previous Page					
3,8,2	Theatre 2 31 m ² floor area 3,4 m high (slab to soffit) no suspended floor or ceiling				
	Supply	No	1		
	Install	No	1		
3,8,3	ROOM INTEGRITY TESTING Supply, install, test, commission and provide a 12 month guarantee for room integrity test.	No	2		
3,8,4	NETWORK CARD Supply, install, test, commission and provide a 12 month guarantee for two (2x) Westermo Converters ODW732 Single Mode, Fibre to 485, for connection of fire detection system to IDZ control room	no.	2		
3,8,5	RS485 Supply, Install, test, commission and provide 12 month for RS485 cable, in sleeve provided by others.	m	100		
3,8,6	Training Training of staff on operation of units; location of equipment and basic day to day maintenance.	No	3		
3,8,7	Electrical Connect equipment to isolator or connect cable to isolator, provided.	No	2		
Total Carried forward to Summary Page					

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 PHASE 1
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 VOLUME 2,1 PART 4: EARLY WARNING DETECTION & GAS SUPPRESSION SYSTEMS**

PRICE SUMMARY

BILL NO.	DESCRIPTION	AMOUNT
1	BILL NO. 1 : P&G	
2	BILL NO. 2 : FIRE DETECTION EQUIPMENT	
3	BILL NO. 3 : FIRE SUPPRESSION EQUIPMENT	
SUBTOTAL		
CONTINGENCY 2,5%		
SUBTOTAL		

REMINDER NOTE

The Total Price including Main Contractor's Mark-up which excludes VAT, must be carried over to the final summary in Volume 1 and all fixed amounts shown in the price schedule must be included therein. No adjustments will be made for any failure by Tenderers to include the fixed amounts in the Total Price for this particular installation.

SUB-CONTRACTOR'S NAME:

DATE:

SIGNATURE:

N.B. The above-named Sub-Contractor is to be employed on this contract. Substitute Sub-Contractors are not acceptable.

The price submitted include all Main Contractor's 'Profit and Mark up BUT Exclude the VAT when transferring price to Volume 1 of the Final Summary Total of the Main Contractor's Document

VOLUME 2.1 PART 5: EARLY WARNING FIRE DETECTION - SCHEDULE OF MATERIALS OFFERED

AUTOMATIC FIRE DETECTION INSTALLATIONS

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities. The schedules will be scrutinised by the Engineer and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB : **Only one manufacturer's name to be inserted for each item.**

Item	Material	Make or trade name	Country of Origin
1.	ADDRESSABLE FIRE CONTROL PANEL EXPANSION MODULE		
2.	ADDRESSABLE OPTICAL SMOKE DETECTORS		
3.	FIRE RESISTANT CABLE		
4.	ITERPHASE / RELAY UNITS		
5.	FIRE SUPPRESSION GAS CONTROL PANEL		
6.	SCHEDULE 40 PIPING		
7.	ACTUATOR		
8.	NOZZELS		
9.	SCHEDULE 40 PIPING		
10.	MULTI DETECTOR		
11.			
12.			
13.			

NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor. Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.

VOLUME 2.2 BLOCK H

MECHANICAL INSTALLATION

HVAC

VOLUME 2.2 PART 1: HVAC - SCOPE OF WORKS

HEATING VENTILATION AND AIR CONDITIONING EQUIPMENT

1. GENERAL

- 1.1 The Standard for Uniformity in Construction Procurement published in terms of the Construction Industry Development Board (CIDB) Act, 2000 (Act No. 38 of 2000), the Standardized Construction Procurement Documents for Engineering and Construction Works as issued by the CIDB and any other relevant documentation pertaining thereto must be studied and all principles in this regard must be applied to all procurement documentation, practices and procedures.

2. THE CONTRACT

2.1 HEATING VENTILATION AND AIR CONDITIONING EQUIPMENT

The work to be carried out and commissioned by a SAQCC gas approved installer:

- a. Remedial works to existing HVAC ducting:
 - New branch ducting and ceiling diffusers,
 - Removal of existing supply air grills and blanking of spigot,
 - Rebalancing of existing supply air grills & system,
- b. Supply and installation of VRF Condenser & Air Handling Unit Hybrid Systems to new theatres.
- c. Blygold / Bluechem or equal and approved corrosion treatment,
- d. New extract air system,
- e. Testing and Commissioning, as per SANS 10400 Section T & W and SANS 10252,
- f. Manuals, Drawings, OEM Literature,

2.2 Existing

HVAC systems are existing, theatre systems are new. Building is Existing.

2.3 Order of The Works

As per the building contractors' program of works.

VOLUME 2.2 PART 2: HVAC - STANDARD SPECIFICATION

1.0 GENERAL

The scope of Work is as stated in 1.0

The system shall offer the best possible compromise between the initial expenditure and the long term interest and redemption charges and running/operating costs.

The design and installation shall comply with the codes of practice and standards promulgated by recognized authorities in the fields of air-conditioning, refrigeration, ventilation, piping, electrical technology and all other branches of engineering science applicable, such as the S.A.N.S., B.S.S., A.S.H.R.A.E., SMACNA and A.S.M.E.

All workmanship and materials used in the execution of the works shall conform to modern practice and the entire installation shall comply fully with all relevant requirements of governmental and the Local Authority whose jurisdiction embraces the location of the site.

2.0 BIDS

2.1 Conditions of bid

The attention of bidders is drawn to the conditions of bid as indicated on the official bid form.

2.2 Modifications

Bidders are at liberty to submit modifications based on their standard practice and such modifications, with reasons therefore, shall be clearly stated in the bid. The price for this shall not be included in the net bid price but shall be stated separately as an extra or an omission.

2.3 Checking of bid documents

On receipt of the bid documents, the bidder must, prior to submitting his bid, check all the bid documents and should any difference or discrepancy between or in the Drawings and Specification be detected by the bidder, he shall seek in writing a decision also in writing of the Representative/Agent on the true intent and meaning of the bid documents as the East London Industrial Development Zone cannot be held liable for the additional cost of extra work that may be caused as a result thereof.

2.4 Scope of bid price

The bid price and all prices and/or rates which are inserted into the price schedules in the Specification and transferred to the bid form, must be for the execution and completion of the Works in accordance with the Drawings, Specifications and Conditions of Contract, as well as for the provision of all labour, materials, workmanship, machinery, plant and everything that is or may become necessary.

If there are or may be any exemptions from levies, customs duties, tax, etc applicable on materials, goods or work, the bidder must make his own arrangements therefore, as the bid price shall be regarded as comprehensive.

2.5 Value Added Tax

The bid price shall include Value Added Tax payable in terms of the Value Added Tax act, 1991 (Act 89 of 1991).

2.6 Information required with bids

Bidders shall supply with their bids a full specification where necessary, including dimensioned drawings or sketches of the plant, and a complete wiring diagram of any automatic controls.

Particulars shall be given as set out in the schedule concerned which shall be filled in by the bidder. Failure to comply with these requirements may render the bid liable to disqualification.

2.7 Proof that materials are available

A bidder may be required, before acceptance of his bid, to furnish proof to the satisfaction of the Representative/Agent that he is in a position to secure all the materials required to complete the Contract within the contract period stated in the contract documents.

2.8 Bid documents and ownership thereof

The bid documents consisting of the official bid form, the specifications and the drawings (if any) scheduled in the Specification, and which have been made available to bidders, are the property of the East London Industrial Development Zone and shall be returned to the East London Industrial Development Zone, whether or not a bid is submitted.

3.0 THE SITE

3.1 Definition of Site

Location: Cecelia Makawane Hospital, Buffalo City, Block H, Eastern Cape

Altitude: 0 m above Sea Level.

External: Summer Max. Average : 26°C
Winter Min. Average : 6°C

3.2 Inspection of Site

Bidders shall visit the Site before bidding and satisfy themselves as to the local conditions, the accessibility of the Site, the full extent and nature of the work to be done and the conditions affecting the execution of the Contract generally. Claims on the grounds of lack of knowledge in such respects or otherwise will not be entertained.

3.3 The Site

The Site to be occupied by the Contractor will be clearly defined on the site plan, or will be pointed out to him by the Representative/Agent. The Contractor will on no account be allowed to extend his operations beyond the boundaries of the Site.

3.4 Procedure of work (Site in occupation)

If the site will be in occupation during the course of the Contract, the Works shall be carried out at such times and in such manner as will cause the least inconvenience to the occupants, and still allow the work to be proceeded with expeditiously. The instruction of the Representative/Agent shall be complied with in regard to the carrying out of any portion of the works which in his opinion requires to be expedited and priority shall be given to such work as and when directed.

(Site not in occupation)

If the Site will not be in occupation during the course of the Contract, the Works shall be proceeded with expeditiously. Priority shall be given to any portion of the Works as indicated in the Specification.

3.5 Existing services

If the Contractor encounters any existing services such as cables, pipes or sewers during the execution of the works, he must immediately notify the Representative/Agent, halting all work in the vicinity thereof, until instructions to proceed have been given by the Representative/Agent. Electric wires, telephone wires, pipes, etc., shall not be interfered with during the course of the Contract, but should it be necessary to disconnect or cut any such wires or pipes the Representative/Agent shall be advised thereof and his instructions awaited.

3.6 Protection of trees, shrubs and plants

The Contractor will be held responsible for any damage to trees, shrubs and plants on the Site and shall make good such damage at his own expense.

Trees, shrubs and plants may only be removed as indicated on the Drawings. The remaining trees, shrubs and plants may not be removed, cut back or disturbed in any way without the written consent of the Representative/Agent.

3.7 Water for the Works

The contractor shall provide all water he may require for the execution of the Works at his own expense.

3.8 Electricity for the Works

The Contractor shall provide all electricity for the execution of the Works at his own expense.

3.9 Recoverable materials property of Contractor

Items specified to be removed, taken out, demolished or dismantled and which are not specified for re-use, or for handing over to the Representative/Agent or others, become the property of the Contractor and must be removed from the Site immediately.

4.0 **ADMISSION TO SITE**

4.1 Permission for admission to and establishment on Site

Before the Site is visited by bidders or before the successful bidder (Contractor) establishes himself on the Site, the Representative/Agent's prior approval must be obtained. The Representative/Agent will, in the case of a Site located in defence or other security areas, make arrangements with the unit commander, or in the case of other Government sites, with the officer-in-charge, for permits for inspection of the Site for bidding purposes.

5.0 **PAINTING**

Painting shall only be necessary to those items which would normally be visible or visible when serviced, all mild steel or other components which would otherwise suffer corrosion if unpainted, however, shall be painted with two coats of rust-proof paint whether such components are normally visible or not.

Items which are factory-painted need not be repainted other than any making good which may be necessary. All plants requiring painting shall be correctly prepared and painted. No untreated metal surfaces shall be permitted on the project.

Items which are not galvanized or similarly protected against rust and corrosion shall be painted, as later detailed herein. No equipment, hanger brackets, etc., shall be permitted to be delivered on site in unprotected form; they shall be factory-coated with an approved zinc-rich prime coat before dispatch from their place of manufacture.

Painting shall comprise the following consecutive processes. First thoroughly clean, descale and degrease all surfaces, in accordance with acknowledged good practice, follow with a good coating of approved zinc-rich primer and finish with two coats of quality high-gloss enamel of an acceptable make. Final finish shall be to the full approval of the Engineer.

With the exception of ducting and piping, items with a galvanized finish, such as cable trays, need not be painted but shall be properly cleaned with a suitable proprietary galvanized iron cleaning fluid.

Particular care shall be taken that appropriate primers be used as a basis for painting and that paint be of high quality manufacture, all to provide a completely satisfactory finish to the approval of the Engineer. It shall be noted that galvanized surfaces are to be treated to ensure proper bonding of paint.

Whereas it would not be necessary to paint any ductwork conduits or pipe work installed in roof voids, shafts masonry ducts, etc., or where not normally visible, it is a requirement that such equipment be properly cleaned, treated with two coats of rust proofing paint if not galvanized or not metal subject otherwise to rust.

All equipment on the project shall be colour-coded in accordance with standards recognized in the Republic of South Africa and, where possible, to comply with relevant South African National Standard Colour Codes. (SANS. 01091-1975).

6.0 **PIPEWORK**

Refrigeration pipe work shall be carried out in seamless refrigeration quality copper tubing, suitable provision being made that the piping is not subjected to any stresses by vibration from the compressors.

7.0 EQUIPMENT SUPPORTS

Where equipment supports, stands, platforms and suspension brackets are indicated, specified or necessary for ductwork, pipe work, etc., the Sub-contractor shall provide supporting structures capable of carrying the load without distortion, affixed to the building structure in such a manner as not to subject it to undue stress.

Supporting of any rotating equipment shall incorporate vibration mountings of the type and selection specified in the applicable clauses referring to equipment bases herein.

All methods of suspension or supports shall be submitted to the Engineer for approval and for reference to the Structural Engineer where necessary prior to manufacture or installation.

Generally, supports shall preferably be proprietary products such as Unistrut or failing this, shall be of mild steel sections, purpose fabricated for their application. Under no circumstances whatever will sheet metal straps or plastic tie-wraps be accepted as a supporting method.

All supports shall cradle the item to be supported; shall not be riveted or welded to the equipment to be carried except in exceptional circumstances approved by the Engineer. Rod hangers shall not exceed one meter in length and be of minimum diameter 12 mm. For longer suspensions use mild steel angles. Angel iron supports shall be of 25 mm x 3 mm minimum. All supporting structures for equipment shall be dip galvanized.

Fastening methods shall employ REDHEAD or RAMSET anchor bolts or their equivalent for fixing supports to the building structure, it not being permissible to utilize gunpowder shot-driven bolts for this purpose unless prior approval be obtained.

Pipe work supporting holder bats shall be the product of a recognized manufacturer of such equipment, shop-fabricated saddles or similar devices being unacceptable unless limited space available necessitates their use. On insulated pipe work, hardwood inserts consisting of two-round machine cut pieces of timber shall be clamped around the pipe, insulation being cut away at such points, to allow proper support fitting. Wooden inserts shall be of the same thickness as adjoining insulation and 50 mm longer than the width of the holder bat support, to permit correct finishing of the insulation of vapour sealing to them.

Cable and flexible pipes shall be supported on Unistrut or equivalent perforated galvanized cable trays, manufactured by specialists, shop-fabricated trays or racks not being acceptable. The cable tray shall be suspended or bracketed using suitable mild steel angles.

8.0 DRAINS

The sub-contractor to provide all necessary drain piping laid to suitable falls from every item requiring such drainage. Such drains shall be run to the adjacent relevant drain points shown on the Drawings.

Drainage pipe work shall be adequately sized and carried out generally in medium grade galvanized piping and secured to wall (where applicable), all connections to equipment being effected with conical faced unions or flanged.

Drainage pipe work of longer than 4,5m run shall be provided with cleaning eyes on all bends to facilitate maintenance.

All condensate drainage is to terminate to the nearest drain.

9.0 ASSEMBLY OF COMPONENTS

9.1 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.

9.2 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.

10.0 WELDING

- 10.1 Welding shall be carried out in accordance with the current edition of SANS 044 Parts I to VII where applicable.
- 10.2 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.
- 10.3 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.
- 10.4 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.
- 10.5 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 SANS 0455.
- 10.6 Only welders in possession of a valid approved competence certificate shall be employed.
- 10.7 All welds must show proper fusion.
- 10.8 Where welding is contemplated in pipe work 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 Engineer and tested. Should faulty welding be discovered, all other joints shall be X-ray tested by the SANS or an approved body, all at the expense of the Contractor.

11.0 GALVANISING

- 11.1 Unless otherwise specified in the Detailed Specification the following items shall always be galvanised:
 - a) Fabricated mild steel sections exposed to the weather.
 - b) Steel grilles and louvers exposed to the weather.
- 11.2 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.
- 11.3 All hot dip galvanising shall be carried out in accordance with SANS 0934 and SANS 0763 where applicable, including preparation for galvanising.
- 11.4 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.
- 11.5 Castings shall be sound, dense and clean, and free from distortion, porosity, carbon and slag enclosures, blowholes, and other injurious conditions.
- 11.6 Welding flux shall be chipped away and all welds wire brushed before galvanising.
- 11.7 The surface to be galvanised shall be free from paint, oil, grease and similar impurities.
- 11.8 All exposed surfaces including welds shall be thoroughly sand blasted prior to galvanising.
- 11.9 The Engineer 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.
- 11.10 The galvanising coating shall be smooth, adherent, continuous and free from black spots or flux stains.
- 11.11 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.

- 11.12 Repairs to galvanised coatings will not be accepted. Items damaged will need to be re-galvanised.
- 11.13 Coating thickness shall be as per table 1 of SANS 0763 unless otherwise specified in the Detailed Specification.
- 11.14 The SANS requirement for uniformity shall apply.
- 11.15 Galvanised surfaces specified with paint finishing shall not be passivated.

12.0 BEARINGS

12.1 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.

12.2 Bushed Bearings

Only where specifically stated in the Detailed 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.

12.3 Self-lubricating or oil less bearings

Self-lubricating or oil less 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.

13.0 NOISE AND VIBRATION CONTROL

13.1 General

Unless otherwise specified in the Detailed 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 SANS 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 SANS 0103 shall be rectified to comply with SANS 0103 at the Contractor's own expense.

In all plant room 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.

13.2 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.

14.0 **DAMPING**

14.1 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 shear 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.

15 **PUMPS**

Where condensate pumps are required, the pumps shall be totally enclosed in the corner of the surface mounted trunking, and shall be specified to pump the maximum condensate generated by the unit.

16.0 **FANS**

16.1 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.

16.2 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.

16.3 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 Detailed 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 Detailed Specification shall not be exceeded.

17.0 PIPING

17.1 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.

17.2 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.

17.3 Pipe Supports

In all critical applications and within the first ten meters 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.

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.

17.4 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.

18.0 SOUND ATTENUATORS

18.1 Where required, in order to comply with the noise and vibration criteria already laid down, or where specified in the Detailed 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 plant room. 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.

- 18.2 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 plant room and shall be installed to prevent noise breakout from the plant room via the ductwork.

Where specified in the Detailed 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.

- 18.3 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.

19.0 AIR FILTERS

19.1 General

Filters of the type, size and quantity as specified in the Detailed Specification shall be provided.

Filter efficiency and arrestance shall be in accordance with ASHRAE Test Standard 52-76.

Filters and filter holding frames shall be of approved manufacture with standardised dimensions to enable replacement with equivalent filters of all recognised manufacturers.

Construction and manufacture of all components shall be such that under no circumstances any unfiltered air can by-pass filters or filter banks.

Sufficient space shall be allowed in front or behind filters, as applicable, to enable inspection and servicing.

Proper access doors shall be fitted to filter service areas.

Filters installed close to exposed air inlets shall be weather protected with weather louvers and a wire mesh screen.

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.

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.

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.

Unless otherwise specified in the Detailed Specification only dry media filters are required. 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.

Where air filters of the washable type are specified in the Detailed 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. Where washable filters are specified one complete set of spare filters shall be provided.

19.2 Panel Filters

Panel filters shall be of the pleated type and not less than 50mm thick.
The filter shall be washable or disposable as specified.

Synthetic media shall be used bounded together with galvanised wire for reinforcing and bonded in the frame ensuring no air bypass.

The frame shall be galvanised steel or a distortion and corrosion free moulding.
Initial synthetic dust arrestance shall be not less than 70% with dust holding capacity needed in excess of 300g per square meter nominal face area.
Initial dust spot efficiency shall be not less than 20%.

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.

19.3 Pad Type Panel Filters

Pad type panel filters shall make use of disposable replacement media of thickness as specified, but generally not less than 25mm thick.
Disposable media supplied and the filter in general shall comply with 24.1 above, unless otherwise specified.
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.

19.4 Extended Surface Intermediate Efficiency Filters

Filter media shall be self-supporting, leak-free and stable under all airflow conditions.
Front frames shall be of aluminium, galvanised steel or reinforced high-density hard polyurethane foam with a continuous foam rubber gasket.
"Slide-in" type of arrangements will not be accepted for filters in this class.
Filter depths less than 150mm will not be accepted.

Galvanised protection screens shall be fitted to match the airflow arrangement.
Initial synthetic dust arrestance shall be not less than 85% with dust holding capacity not less than 1500g per square meter nominal face area.

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.

19.5 High Efficiency Particulate Air Filters (HEPA)

Filter media shall be self-supporting leak-free and stable under all airflow conditions.

The media shall be bonded in to a pressed and sealed particle board housing.
Unless otherwise specified in the Detailed Specification filters shall be provided with silicone filled channel seals.

"Slide-in" type of arrangements will not be accepted for filters in this class.
Filters shall be arranged in two or three stage configuration with the primary filters complying with clauses above as specified in the Detailed Specification.

Filter depths less than 300mm will not be accepted and effective filter media surface area shall exceed 50m per square meter nominal face area.

Each filter shall be individually tested in the factory for leakage with a DOP aerosol and supplied to site in completely sealed protection containers.

Corrugated media separators shall be of aluminium or Kraft paper.
Filter efficiency shall be not less than 99,9% when tested with 0,3 micrometer Dioctylphthalate smoke.

Dust holding capacity shall not be less than 2 000g per square meter nominal face area.

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.
Pressure monitoring across the HEPA filters is required with warning light and/or alarm as specified.

19.6 Filter Holding Frames

Filter holding frames shall be the manufacturer's standard product installed and used in accordance with his recommendations.

Holding frames shall be manufactured from at least 16 gauge galvanised or epoxy powder coated steel. Holding frames may be bolted or riveted together and shall be suitably reinforced in larger arrangements to withstand all possible operating conditions.

Fasteners shall be positive sealing type and a minimum of four fasteners per filter is required. Fasteners shall match the particular filter, filter arrangement and frame.

20.0 **MEASUREMENT OF COMPLETED WORK**

The attached Bills of Quantities is provisional, which means that the Bill does not represent the exact scope of work to be performed and completed and that every piece of completed work will be measured and agreed with the Contractor before payment is processed.

21.0 **UNAUTHORISED EXPENDITURE**

Although the Engineer has conducted the audit of the buildings installations other items may have degraded in the intervening period up to site handover. It is therefore very imperative for the Contractor to bring to the Engineer's attention as soon as he / she realises that the work measured in the Bill of Quantities may be appreciably exceeded. Failure to observe this procedure where the Contractor proceeds with excessive additional work without authorisation will be tantamount to unauthorised expenditure which may lead to non-payment for unauthorised work.

22.0 **SPECIFICATIONS & STANDARDS**

The works carried out under this Contract shall be governed by the:

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

23.0 **SCHEDULE OF MATERIALS**

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

24.0 **QUALITY OF MATERIALS**

Materials are to comply with the relevant South African National Standards (SANS), or to IEC specifications, where no SANS specifications exist. All materials used shall bear the SANS mark of approval as applicable.

25.0 **PROGRAMME AND PLANNING**

The sequence, in which the work must be carried out, must be established in consultation with the Main Contractors construction programme, Sub-contractors and their respective Domestic contractors. The Engineer must be kept informed on the progress all the time.

26.0 **SUPERVISION**

The work shall, at all times be carried out under the supervision of a skilled and competent

representative of the Contractor, who will be able and be authorised to receive and carry out instructions on behalf of the Contractor.

27.0 WORKMANSHIP

All inferior work shall, on indication by the Engineer, immediately be removed and rectified by and at the expense of the Contractor.

28.0 SUPPLY OF MATERIAL

The Employer reserves the right to supply any items of material or equipment to the Contractor for installation. The Contractor must arrange for taking delivery of and providing safe storage for these materials and he will be held responsible for all damages to or loss of such materials while they are in his custody.

29.0 COMPLETION

Completion shall take place only after the whole installation has been accepted by the Engineer and

- (a) All damage that may have been done by the Contractor in the process of the installation has been repaired and made good
- (b) All tests of the Mechanical installation has been done and tests results have been submitted to the Engineer,
- (c) The completed Certificate of Compliance as specified has been submitted to the Engineer,
- (d) All equipment guarantees, if any have been submitted to the Engineer,
- (e) The work site has been cleared of all debris and waste materials and left in a neat and tidy condition.

VOLUME 2.2 PART 3: HVAC - DETAILED SPECIFICATIONS

1.0 INTRODUCTION & GENERAL

This Detail Specification complements & qualifies the foregoing standard specifications of material & workmanship. The Standard Specification should be regarded as a basis and guideline, with this Detailed Specification taking preference where any ambiguity is concerned.

In the event of any further technical ambiguity between sections of this enquiry, then the sections will be considered in the following order of priority:

- a) Schedule of quantities
- b) Project specification
- c) Drawings (loose and bound-in)
- d) Standard specification

2.0 SITE CONDITIONS

Location: Cecilia Makiwane Hospital, Block H, Buffalo City, Eastern Cape
Altitude: 0 m above Sea Level.

3.0 SCOPE OF WORK

General

The standard specification shall apply unless otherwise indicated in this section.

The drawings issued herewith and listed in the relevant section are to be read in conjunction with the specification and all items mentioned, together with all ancillary equipment necessary for the correct installation, operation and full compliance with the Standards and codes must be provided, notwithstanding the fact that they may not have been included in detail in these documents.

The bidder shall, at the time of bidding, draw the Engineer's attention to any omissions or discrepancy between the specification and the drawings and request from him clarification of details or responsibilities.

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

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

If any such items of equipment, brackets and accessories, etc., have been omitted from a supplier's quotation, or incidental work is necessary, the bidder must include for all such items and work in the bid.

The whole installation shall be in accordance with the latest edition of the Occupational Health and Safety Act: No. 85 of 1993. All regulations framed therein, shall be carried out to the satisfaction of the Engineer.

All equipment offered by the bidder shall be to the approval of the duly appointed Engineer, prior to installation. This standard specification and the supplementary specification with drawings shall be carefully adhered to by the bidder. Equipment installed without the approval of the Engineer will have to be removed at the Contractor's expense and be replaced with officially approved listed items.

The successful bidder will be required to prove to the Engineer that he has qualified personnel on his staff establishment as well as recognised test equipment for the successful completion of a safe

working installation.

The contractor shall employ only skilled artisans and technicians approved by the Engineer who are competent in this type of work. The work shall be carried out in accordance with the standards laid down by the Engineer.

The contracting firm shall be recognised contractor specialising in this field and approved by the Engineer.

The work performed shall comprise the supply, delivery, off-loading, interim storage, installation, testing, commissioning and leaving in good working order of the complete electric access goods only lift installation inclusive of all guarantees as specified herein and the supply of 'AS IS' installation record drawings, Maintenance and Operating Manuals for:

Heating Ventilation and Air Conditioning Systems Overview:

- Remedial works to existing HVAC ducting:
 - New branch ducting and ceiling diffusers,
 - Removal of existing supply air grills and blanking of spigot,
 - Rebalancing of existing supply air grills & system,
- Supply and installation of VRF Condenser & Air Handling Unit Hybrid Systems to new theatres:
 - Air handling units Q = 585 l/@ 1085 Pa (20 Air Changes per hour) 100% fresh air unit
 - Double skin modular air handling unit approved proprietary manufacture and shall incorporate the following:
 - cooling / heating coil,
 - backward curved double inlet aerofoil, belt driven centrifugal fan with adjustable fan speed (variable pitch pulley),
 - Washable pleated primary filters G4 (EN779 G4),
 - Secondary pocket filters F9 (EN779 F9),
 - High Efficiency Particle Air Filters F13 (EN1822H13),
 - Standalone electrical supply panel, c/w essential and non-essential sides,
 - Differential pressure gauge across each filter bank,
 - Variable speed frequency controllers to electronically control the fan drives to maintain design air flow,
 - Stainless steel condensate drip trays,
 - Air handling unit frame and Coil support frames to be type 304 stainless steel,
 - Name plate clearing showing units manufacturer, design air volume, fan speed, cooling capacity, filter data.
 - Temperature range shall be 18°C to 24°C and relative humidity 45% to 60%. Separate temperature controls in each theatre to be provided. No on and off switching of air handling plant to be done from within the theatres.
 - Delivery of the conditioned air shall be by downward movement from the ceiling to supply outlets located withing ceiling.
 - All ductwork beyond the Hepa filter housing shall be in solid ducting to the air terminal. The final connection to the terminal where alignment necessitates a maximum of 300mm of flexible ducting, of the wire mould type, may be employed. At the end of the duct branch a "Lobster Back" (Galvanised sheet metal bend) shall be employed followed by the flexible joint, i.e. of the wire mould ducting type.
 - Condensate water discharge shall go to sewer.
 - New extract air system,

The liaison with a Building/Principal Contractor, Electrical Subcontractor, and their Domestic Subcontractors if and when required

Testing and commissioning of all air-conditioning and ventilation system equipment in conjunction with the Fire Detection and Alarm Evacuation Systems Sub-contractor.

This Sub Contract also includes all electrical work for the installations but excludes the power

supply to the isolator provided by others.

Notwithstanding any omission in this specification the installations shall be complete in all respects. This condition shall be recognised in the preparation of all working drawings submitted for approval. Further, despite any approval of working drawings given by and on behalf of the Main Contractor the responsibility for correct functioning of the plant during tests, inspection and the maintenance period shall rest entirely with the successful bidder.

The installation shall be strictly in accordance with the approved drawings or such further drawings, modifications, or instructions as may be given by the Engineer concerned, or that are found to be necessary, and such modifications or instructions shall be deemed to be within the specification for the purpose of the bid, and shall not vitiate the contract.

Payment for such modifications will only be made on certification by the Engineer to the effect that such modifications have involved additional expense to the Sub-Contractor.

4.0 PROGRAM

The Sub Contractor shall complete the installation within the time stipulated. The Sub Contractor will be required to report to the Principal Contractor, generally on a weekly basis (or more often if required by the Principal Contractor), progress of work and any difficulties arising, to enable the Principal Contractor to update the programme or forward plan any changes.

The sequence in which the work is to be carried out shall be decided upon in consultation with the Principal Contractor. The Sub Contractor shall thereafter submit an adequately detailed Sub Contractor's installation programme for approval within two (2) weeks of the Sub Contract being awarded unless otherwise indicated herein after.

This programme must be periodically updated as the work progresses and as may be necessary to meet changing site conditions and alterations to the overall installation programme.

Programmes shall take the form of bar charts, network diagrams and schedules as may be required by the Main Contractor or as applicable, and shall reflect quantities of work as required for supervision purposes and measurements.

As a minimum the programme shall reflect:

- sequence and timing of installation activities.
- sequence and latest event times of major equipment ordering, manufacture and delivery dates.
- sequence and dates for the submission of drawings and samples for approval.
- sequence and dates for factory and site inspections and tests.
- target and achieved work quantities on a weekly, fortnightly and monthly basis.

In preference all work is to be undertaken by staff in the full time employ of the bidder.

All work which is to be undertaken by "Domestic Sub Contractors" of the Sub Contractor will be clearly identified in the bid submission and the Sub Contractors to be used subject to prior approval of the Client and/or Engineer and/or Principal Contractor; failure to comply with this requirement may result in the "Domestic Sub Contractors" being removed from site.

All costs in replacing the undesirable "Domestic Sub Contractor" or any delays incurred as a consequence of this will be entirely for the Sub Contractor's account.

5.0 DESIGN CONDITIONS

Indoor: 24°C 50% RH

Outdoor: 31°C DB; 22.8 °C DB

6.0 VENTILATION SYSTEM DESCRIPTION

6.1 General

The bidder shall allow for programming the work in such a manner as to not disrupt the Main Contractor's programme. Sequence of work to suit the Sub Contractor's requirements will not be guaranteed nor accepted.

Claims from Sub Contractors arising out of broken work sequences or agreed programmes changed due to contingent requirements, will not be considered unless full motivations for the extra costs are submitted; the motivation for extra costs must justify costs in terms of the accepted programme and any unforeseen and justifiable additional staffing levels required to meet targets revised with insufficient notice. Reallocation of staff and/or acceleration of work will not be reason enough to claim for extra costs unless the Sub Contractor can prove that he has indeed had to pay for staff's idle time which was not or could not be envisaged at the time of bidding and/or drawing up the installation programme and sequence. When claiming for extra cost all out of town cost will be disallowed as it is assumed that the Sub Contractor has fully staffed premises in the vicinity of the site.

The Subcontractor must also assume that work may be required to continue uninterrupted outside of normal working hours and/or for an extended and/or unbroken period of time.

6.2 EQUIPMENT SPECIFICATION

6.2.1 All standard off the shelf ventilation equipment will be natural anodised aluminium unless otherwise specified.

6.2.2 DESIGN CONSTRAINTS

Refer to the drawings provided with this specification for:

Heating, Air Conditioning & Ventilation:

- 2217-M-T-101 HVAC Block H

7.0 ELECTRICAL

Overloads shall be adjustable to approximately 25% higher than the relevant motor overload current.

Wiring in panels shall be neatly run in vertical or horizontal lines and each terminal shall be numbered to accord with the relevant wiring and control diagram. Circuit breakers, timers, relays, etc. shall be labelled in accordance with the wiring diagram and the item of plant served.

8.0 OPERATING AND MAINTENANCE MANUALS

8.1 Operating Manuals

Three complete sets of operating manuals shall be supplied by the Contractor, two sets to the Engineer for onward forwarding to the Employer and one for the User Department's use.

Manuals must be compiled in layman's language.

At least one month before commissioning, one draft copy shall be submitted to the Department/Engineer for comments and approval.

Operating manuals shall give a clear description of and the purpose of the installation.

- (a) Paper copies of all approved drawings and diagrams.
- (b) Detailed description of the different components used in the installation.
- (c) On- and off switching procedures.
- (d) Guidelines for routine-test to be carried out by the User Department inclusive of the periods during which tests are to be undertaken.
- (e) Detailed instructions for procedures to be followed during a fault

The following drawings are required:

- Layout drawings
- Wiring drawings showing wire colour codes and numbers as well as all connections onto terminal strips (markers to be approved by the Engineer) of all plant new and existing.

The following documents are required:

- Full description of the system.
- Operating instructions.
- Installation instructions.
- Commissioning instructions.
- Maintenance instructions, maintenance schedule and trouble shooting guide.

8.2 Maintenance Manuals

Two complete sets of maintenance manuals (Technical) prepared in English, shall be supplied by the Contractor.

At least one month before commissioning a draft copy shall be submitted to the Department/Engineer for comments and approval.

Maintenance manuals shall consist of the following:

- (a) A general description of the system.
- (b) A general description of the controls.
- (c) Schedule of equipment, model numbers, optional extras, modifications, electrical power requirements, etc.

- (d) Detailed monthly, quarterly, semi annually and annual preventative maintenance procedures.
- (e) Manufacturer's catalogues clearly indicating type, size and model of equipment supplied.
- (f) Tabulated commissioning data of all equipment and the system, indicating- as measured and according to specification - requirements.
- (g) List of suppliers, addresses and telephone numbers.
- (h) List of spare parts for all equipment.
- (i) Fault tracing/finding procedures.

The following drawings are required:

- Layout drawings
- Wiring drawings showing wire colour codes and numbers as well as all connections onto terminal strips (markers to be approved by the Engineer) of all plant new and existing.

The following documents are required:

- Full description of the system.
- Operating instructions.
- Installation instructions.
- Commissioning instructions.
- Maintenance instructions, maintenance schedule and trouble shooting guide.

Manuals shall be bound in a firm hard cover.

The information shall be clear and readable and supplied with an index.

The above-mentioned manuals shall be available at first delivery. Delivery of the installation will not be accepted without the manuals.

9.0 TRAINING OF STAFF

The bidder shall allow for sufficient time for instructing the User's appointed responsible persons in the correct operation of all plant and equipment, procedures to be followed in the event of faults etc.

Two sets of instruction manuals shall be provided. Each manual shall comprise of the following sections, bound in a vinyl plastic covered folder with the name of the project typewritten on a card inserted into a clear plastic covered cardholder on the front cover and spine and shall be handed to the Main Contractor on completion of the installation:

- Table of Contents
- Functional Description of Plant (as installed)
- Operation of Plant (as installed – step by step instructions for setting temperatures, etc.)
- Plant and Equipment (a scheduled list of all major plant to include description, make, model number and supplier's name and address).
- Performance Testing Procedures including Test Report
- Maintenance Instructions (in schedule form setting out each item of plant, the description and frequency of maintenance operations required).
- Spare Parts (list of spare parts that shall be required, with detailed description of each part, make, model or part number and supplier's name and address).

- Descriptive Literature (for all items of plant and equipment).
- Record Drawings (of plant as installed to include plant layout drawings showing component location, control and wiring diagrams and schematic piping diagrams).

10.0 GUARANTEE

The entire air-conditioning and ventilation / extraction installation shall be fully guaranteed for twelve calendar months from date of acceptance by the Engineer and contract practical completion date.

During the guarantee period, the Tenderer shall be responsible for the making good of any defects reported by the Tenant. The guarantee shall be ceded to the Superintendent following acceptance of the installation.

11.0 MAINTENANCE

The air-conditioning Tenderer shall be responsible for the maintenance of the entire plant during the guarantee period, as specified in this document. During this period the plant shall be serviced quarterly including filter cleaning and the Superintendent undertakes to provide access to the plant at suitable times during trading hours. Record of all services shall be kept and copies signed by the Superintendent.

12.0 CERTIFICATION ON COMPLETION OF GUARANTEE & MAINTENANCE PERIOD

Included in the pricing for the installation of the package plant is a 12 month quarterly service plan.

In the month prior to the expiry of the guarantee / first twelve months maintenance period, the Engineer shall inspect and, if necessary, retest the installation so as to be able to provide the Superintendent with a certificate, within fourteen days of the guarantee expiry date. This is to confirm that the guarantee has been honoured and that the installation has been properly serviced at required regular intervals by the air-conditioning Tenderer.

13.0 SAMPLES & ALTERNATIVES

Samples (within reason) will be requested by the Engineer and are to be made available on-site for inspection / approval.

The tender prices shall be based on the equipment as specified and not on any alternatives. Should the Tenderer wish to submit prices for alternatives, he shall do so separately, in a letter or similar correspondence, attached to the tender. The use of any alternative equipment, if any, will be evaluated and decided on after tender award, when the costs, etc. will be negotiated with the successful Tenderer.

The Engineer reserves the right to call for prices on alternative equipment subsequent to tender submission.

14.0 SCHEDULES OF INFORMATION

The schedules of information contained in this document consists of 2 sections:
 Information supplied by the Engineer (schedules of drawings, etc. as applicable).
 Information to be supplied by the Tenderer at tender stage (tender form, information on the makes, types and ratings of equipment and materials offered, schedules of prices and rates for variations, schedules of quantities, etc. as applicable).
 Tenderers must provide, at the time of tendering, in the "Schedule of Material Offered", sufficient details to enable the equipment concerned to be identified without ambiguity.
 It is not sufficient for a Tenderer to state "as specified" in the schedules.
 Failure to complete these schedules may render a tender invalid.

15.0 DRAWINGS

15.1 General

Generally, the term "detail" shall mean that the drawing is exact in all aspects to what shall be provided. Where the term "illustration" is used, however, it shall be construed that the drawing is to be regarded as a proposal or guideline as to what is to be provided, manufactured or supplied.

15.2 Tender Drawings

Refer to the tender drawing as provided with this document.

15.3 Construction / Workshop Drawings

The successful Tenderer shall submit construction drawings (or detailed catalogues) of the manufactured equipment, such as mounting details, etc., for consideration by the Engineer prior to manufacture/supply thereof.

The Engineer's approval of construction or workmanship drawings does not relieve the Tenderer of his responsibility with regards to any of the deviations from the requirements of this contract unless the Engineer has been clearly informed, in writing, of such deviations at the time of submission and the Engineer subsequently gives written approval for the specific deviation. Similarly, the Engineer's approval shall not relieve the Tenderer of responsibility for errors or omissions in the construction / workmanship drawings.

15.4 Record Drawings

The Tenderer must prepare record drawings of the completed installation as constructed, indicating cable runs, equipment mounting details, circuiting & distribution board details, sleeve pipe positions, etc.

The contract shall not be deemed as complete until these drawings have been submitted.

16.0 SUPERVISION, WORKMANSHIP AND DELAYS

The work shall at all times, for the entire duration of the contract, be executed under the supervision of a skilled and competent representative of the Tenderer, who must be able and authorized to receive and execute instructions on behalf of the Tenderer. This person must be a registered and accredited person, as described by the OHS Act. It must be noted that the staff complement of the Tenderer shall remain similar throughout the duration of the contract, for all sections of the Works.

In the event that inferior materials or bad workmanship, on the part of the Tenderer, leads to remedial work requiring redesign by the Engineer, the cost of this work, including related professional fees, shall be borne by the Tenderer.

Similarly, should delays in the contract be caused by poor performance on the part of the Tenderer causing the engineer to spend extraordinary time on the project, the extra costs incurred shall be borne by the Tenderer.

These costs will be based on the CESA hourly rate and will be deducted from claims due to from claims which will become due to the Tenderer.

17.0 COMPLIANCE WITH REGULATIONS, STANDARDS AND CODES

The Tenderer shall arrange for all inspections and testing of the installation as required. All notices, fees, including inspection and re-inspection, are the responsibility of the Tenderer and all the relevant costs shall be borne by him.

The workmanship throughout the Works will be to the satisfaction of the Employer. Any materials or workmanship considered as faulty or incorrectly or inadequately erected or repaired, will be

substituted, altered or rectified to the satisfaction of the Employer, without additional cost to the Employer.

The Works will be executed in strict accordance with the following:

- All relevant by-laws and regulations of local authorities.
- All relevant SANS, BS and other international standards.
- The Occupational Health and Safety Act of 1993.

18.0 COMMISSIONING AND TESTING

18.1 General

Upon practical completion of this Sub Contract the Sub Contractor shall allow for providing the Engineer with a complete commissioning schedule indicating the actual test results and measurement of all the design or specified data/variables.

Tests to demonstrate the capacity specified and general operating characteristics of all plant shall be made under the direction of the Engineer at any time before the practical completion inspection under conditions imposed by him.

The Sub Contractor shall be responsible for supplying test equipment which is to the Engineer's satisfaction; any costs incurred by the Sub Contractor in supplying adequate instrumentation will be entirely for his account. Test instruments shall be tested for accuracy by an approved laboratory or by the manufacturer and certificates showing the degree of accuracy shall be furnished to the Engineer if required.

On satisfactory completion of all tests and after the completed installation has been inspected and passed as satisfactory by the Engineer, the installation will be accepted as being practically complete and be handed over to the Employer.

The Sub-Contractor shall be responsible for supplying an itemised set of test results for the Engineer's approval; the Engineer may at his discretion request the Sub-Contractor to re run at the Sub Contractor's expense any test which he has not witnessed or with which he feels not satisfied.

The following shall be recorded/measured for each separate installation as specified and installed under this contract:

Description of installation tested;

Date and time of test;

Ambient temperature conditions (measured in the shade):

- (a) Dry bulb temperature
- (b) Wet bulb temperature
- (c) % RH

19.0 BUILDER'S WORK

The onus is on the Tenderer to point out and check the requirements for and positioning and correctness of all builder's work for his services.

20.0 MAKING GOOD

The builder is to be made aware of all works, timeously, relating to the impact of this installation(s). The Tenderer will carry out, in all instances any work to be made good such as damage to, or disturbance of the building installations caused by himself or his employees during the execution of

the contract at his own cost.

21.0 SITE MEETINGS

The Tenderer's representative shall be expected to attend an official site meeting at the onset of the project including scheduled technical and site meetings during the contract period. For meetings termed as "technical or site", a site representative for the nominated Tenderer is required to attend and this person must be competent and able to interpret and receive and act on instructions on behalf of the Tenderer.

The Tenderer shall price all relevant P & G costs, overheads, travelling, etc. for these meetings.

BNM CONSORTIUM - RNA CONSULTING ENGINEERS**PHASE 1****CMH - BLOCK H****VOLUME 2,2 PART 4: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION****PROVISIONAL SCHEDULE OF QUANTITIES**

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Bill No. 1 : Preliminary and General</u>				
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.3	Tools and equipment, Communication, transport.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1		
1.6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1		
1.7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	Item	1		
1.8	Additional testing and balancing at discession of the mechanical engineer.	Item	1		
Total Carried forward to Summary Page					

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - BLOCK H
VOLUME 2,2 PART 4: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
2,0	<u>Bill No. 2 : Theatre Air Conditioning System</u>				
	<u>Outdoor Unit - Heat Pump</u> Supply and Install:				
2,1	Heat recovery VRV IV P COMPACT unit, REYQ8T or similar approved, for use in hybrid air options AHU or similar. 100% fresh air.	No.	2		
	<u>Expansion Valve Kit</u> Supply and Install:				
2,2	Expansion valve kit for air handling applications	No.	2		
	<u>Selector Cable</u> Supply and Install:				
2,3	Cool/heat selector cable	No.	2		
	<u>Contoller</u> Supply and Install:				
2,4	Controller	No.	2		
	<u>Refrigerant Piping</u> Supply and Install:				
2,5	9.5 mm	m	20		
2,6	19,1 mm	m	20		
2,7	R410A extra refrigerant charge	kg	3,6		
	<u>Out Door Unit Electrical</u> All wiring to and from control panel to be included in rate for panel including all wiring to controls and wiring channels, wiring trays and cable accessories. Supply and Install:				
2,8	Supply, Install, test, commission, provide 12 month guarantee and Electrical COC for VRV air conditioning Distribution Board for VRV outdoors units, incl. all contactors, displays, controls, timers, glands wiring etc. DB MUST BE STAR DELTA DESIGN.	No.	2		
	<u>Outdoor Units Bluchem Treatment</u>				
2,9	Allow for Bluchem chemical oxidization treatment to all external units condenser coils.	No.	2		
	<u>Controls</u>				
2,10	Wired Controls for the control of the Theatre Units to be positioned on the Main Theatre Panel within Theatres	No.	2		
Total Carried forward to Next Page					

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VOLUME 2,2 PART 4: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Total Carried forward From Previous Page					
	<u>Air Handling Units</u>				
	Supply and install double skin air handling units c/w cooling / heating coil, belt driven aerofoil BCDIDW fan, primary filters, secondary filters and final HEPA filters at 0.5 microns at 90-95% Class 10000 (Iso Class 7), including sound insulating rubber pads. Condensate drip tray to be Stainless steel. 100% fresh air.				
	<ul style="list-style-type: none"> • On coil dry bulb temp. – 32°C • On coil wet bulb temp. - 17°C • Off coil dry bulb temp. – 10.9°C • Off coil wet bulb temp. – 10.7°C 				
3,10	Air-handling unit supplying 585 l/s of air including primary and secondary filters, Hepa Filters and Magnihelic Gauges across the filters with magnihelic gauges over filters.	No.	2		
3,11	Fire dampers 500 x 500 mm supply air ducting.	No.	2		
	<u>Air Handling Unit Electrical</u>				
	Supply and Install:				
	All wiring to and from control panel to be included in rate for panel including all wiring to controls and wiring channels, wiring trays and cable accessories.				
3,12	Air handling unit to have separate electrical distribution panel (Essential and non essential sections), c/w variable speed drive frequency controller, with direct fan drives to maintain design airflow, differential pressure switch measured elsewhere.	No.	2		
	<u>Sheet Metal Ducting - Internally Insulated</u>				
	All insulation to be internal to duct. Quantity measured is net duct surface area (x2) including bends, tapers, etc.				
	Supply and Install:				
3,13	450 mm diam	m	40		
3,14	90 deg elbow - long radius 450 mm diam	No.	6		
3,15	90 deg elbow - long radius 400 x 400 mm	No.	8		
3,16	Air handling unit discharge transformation 295 x 295 to 450 mm diam	No.	2		
3,17	Duct end piece 450 mm diam	No.	2		
Total Carried forward to Next Page					
Total Carried forward From Previous Page					

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VOLUME 2,2 PART 4: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PROVISIONAL SCHEDULE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>Diffusers</u> Supply and Install:				
3,18	495 x 495 mm supply air diffusers powder coated white c/w OBD.	No.	4		
	<u>Sound Attenuator</u> Supply and Install:				
3,19	450 mm diam melanix lined type sound attenuator.	No.	4		
	<u>AHU Filtration</u> Supply and Install:				
3,20	Supply and installation of 50 mm primary washable pleated filters 600 x 600 mm to EN779G4	No.	8		
3,21	Supply and installation of secondary cartridge type disposable filters 600 x 600 mm to EN779F6	No.	8		
3,22	Supply and installation of final HEPA filters 600 x 600 mm to EN1822H13	No.	8		
3,17	<u>Testing</u> Validation testing shall be performed as per the requirements of ISO 14644-2, within the recommended time interval to demonstrate compliance.				
3.17.1	Airborne particle concentration limit test (0.5 µm to 5 µm)	No.	4		
3.17.2	Airflow volume and airflow velocity test	No.	4		
3.17.3	Air pressure difference test	No.	4		
3.17.4	Installed filter leakage test	No.	4		
3.17.5	Airflow visualization test	No.	4		
3.17.6	Room condition recovery test	No.	4		
Total Carried forward to Summary Page					

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VOLUME 2,2 PART 4: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3,0	<u>Bill No. 3 : Extract Air Ventilation Equipment Installation</u>				
	<u>Weather Louvers</u> Supply and install: External weather louvre, powder coated to Architect's approval colour with concealed fixing, incl flanges & vermin proofing.				
3,1	900 x 900 mm	no.	1		
	<u>Galvanised Sheet Metal Transfer</u> Supply and install: Powder coated to Architect's approval colour, incl flanges.				
3,2	900 x 900 mm to 400 mm diam	no.	1		
3,3	400 mm diam to 450 mm diam	no.	1		
	<u>Sound Attenuator</u> Supply and install: Podded sound attenuator, 2D, incl flanges.				
3,4	400 mm	no.	3		
	<u>In Line Axial Fans</u> Supply and install:				
3,5	Axial in line fan, 400 mm Diam; Q = 1171 l/s @ 160 Pa; 2880 RPM.	no.	1		
	<u>Galvanised Sheet Metal Ducting</u> Supply and install diam round sheet metal ducting, incl flanges.				
3,6	450 mm diameter	m	19		
3,7	300 mm diameter	m	5		
	<u>Flexible Ducting</u> Supply and install Insulated Flexible Ducting.				
3,8	300 mm diameter	m	3		
	<u>Galvanised Sheet Metal Spigot</u> Supply and install Spigot outlet:				
3,9	300 mm	no.	3		
	<u>Galvanised Sheet Metal Elbow</u> Supply and install 90 deg elbow, medium radius, incl flanges:				
3,10	450 mm diam	no.	1		
Carried forward to Next Page					

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 VOLUME 2,2 PART 4: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Carried forward from Previous Page					
	<u>Galvanised Sheet Metal End Cap</u>				
	Supply and install Galvanised steel end cap, incl flanges.				
3,11	450 mm diam	No	1		
	<u>Diffuser / Louver</u>				
	Supply and install aluminium construction, c/w adjustable dampers, powder coated to Architect's approval colour, mouting brackets.				
3,12	495 x 495 mm	no.	3		
	<u>Door Grills</u>				
	Supply and install aluminium construction, double sided, mouting brackets.				
3,13	500 x 500 mm	no.	3		
	<u>Fan Controller</u>				
3,14	2 pole fan controller, on / off wired remotely and installed in conduit and round box provided by others.	no.	1		
	<u>Electrical</u>				
3,15	Connect plug fan to isolator or connect cable to isolator, provided.	no.	1		
	<u>Transport to Site</u>				
3,16	Transport all equipment to site.	Sum	1		
Total Carried forward to Summary Page					

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 PHASE 1
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 VOLUME 2,2 PART 4: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
4,0	<u>Bill No. 4 : Remedial Work to Existing HVAC Equipment Installation</u>				
	<u>Sheet Metal Ducting - Internally Insulated</u>				
	All insulation to be internal to duct. Quantity measured is net duct surface area (x2) including bends, tapers, etc.				
	Supply and Install:				
4,1	250 mm diameter	m	20		
	<u>Flexable Ducting</u>				
	Supply and install Insulated Flexable Ducting.				
4,2	250 mm diameter	m	15		
	<u>Galvanised Sheet Metal Spiqot</u>				
	Supply and install Spiqot outlet:				
4,3	250 mm	no.	10		
	<u>Galvanised Sheet Metal Elbow</u>				
	Supply and install 90 deg elbow, medium radius, incl flanges:				
4,4	250 mm diam	no.	10		
	<u>Diffuser / Louver</u>				
	Supply and install:				
	Aluminium construction, c/w adjustable dampers, powder coated to Architect's approval colour, mounting brackets.				
4,5	150 mm	no.	10		
	<u>Transport to Site</u>				
4,6	Transport all equipment to site.	Sum	1		
Total Carried forward to Summary Page					

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
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 VOLUME 2,2 PART 4: HEATING VENTILATION AND AIR CONDITIONING INSTALLATION**

PRICED ESTIMATE BILL OF QUANTITIES

PRICE SUMMARY

BILL NO.	DESCRIPTION	AMOUNT
1	Bill No. 1 : P&G	
2	Bill No. 2 : Fresh Air Ventilation Equipment Installation	
3	Bill No. 3 : Extract Air Ventilation Equipment Installation	
4	Bill No. 4 : Remedial Work to Existing HVAC Equipment Installation	
SUBTOTAL CONTINGENCY 2,5% SUBTOTAL		

REMINDER NOTE

The Total Price including Main Contractor's Mark-up which excludes VAT, must be carried over to the final summary in Volume 1 and all fixed amounts shown in the price schedule must be included therein. No adjustments will be made for any failure by Tenderers to include the fixed amounts in the Total Price for this particular installation.

SUB-CONTRACTOR'S NAME:

DATE:

SIGNATURE:

N.B. The above-named Sub-Contractor is to be employed on this contract. Substitute Sub-Contractors are not acceptable.

The price submitted include all Main Contractor's 'Profit and Mark up BUT Exclude the VAT when transferring price to Volume 1 of the Final Summary Total of the Main Contractor's Document

VOLUME 2.2 PART 5: HVAC - SCHEDULE OF MATERIALS OFFERED

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities.

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

NB : **Only one manufacturer's name to be inserted for each item.**

Item	Material	Make or trade name	Country of Origin
1.	VRF Condensers		
2.	Air Handling Units		
3.	Copper Piping		
4.	Cable Tray		
5.	Diffusers		
6.	Fire Dampers		
7.	Ceiling disc valves		
8.	Flexible Ducting		
9.	Weather louvers		
10.	Axial In Line Fans		
11.	Silencers		
12.	Door grilles		
13.			
14.			
15.			
16.			
17.			
18.			

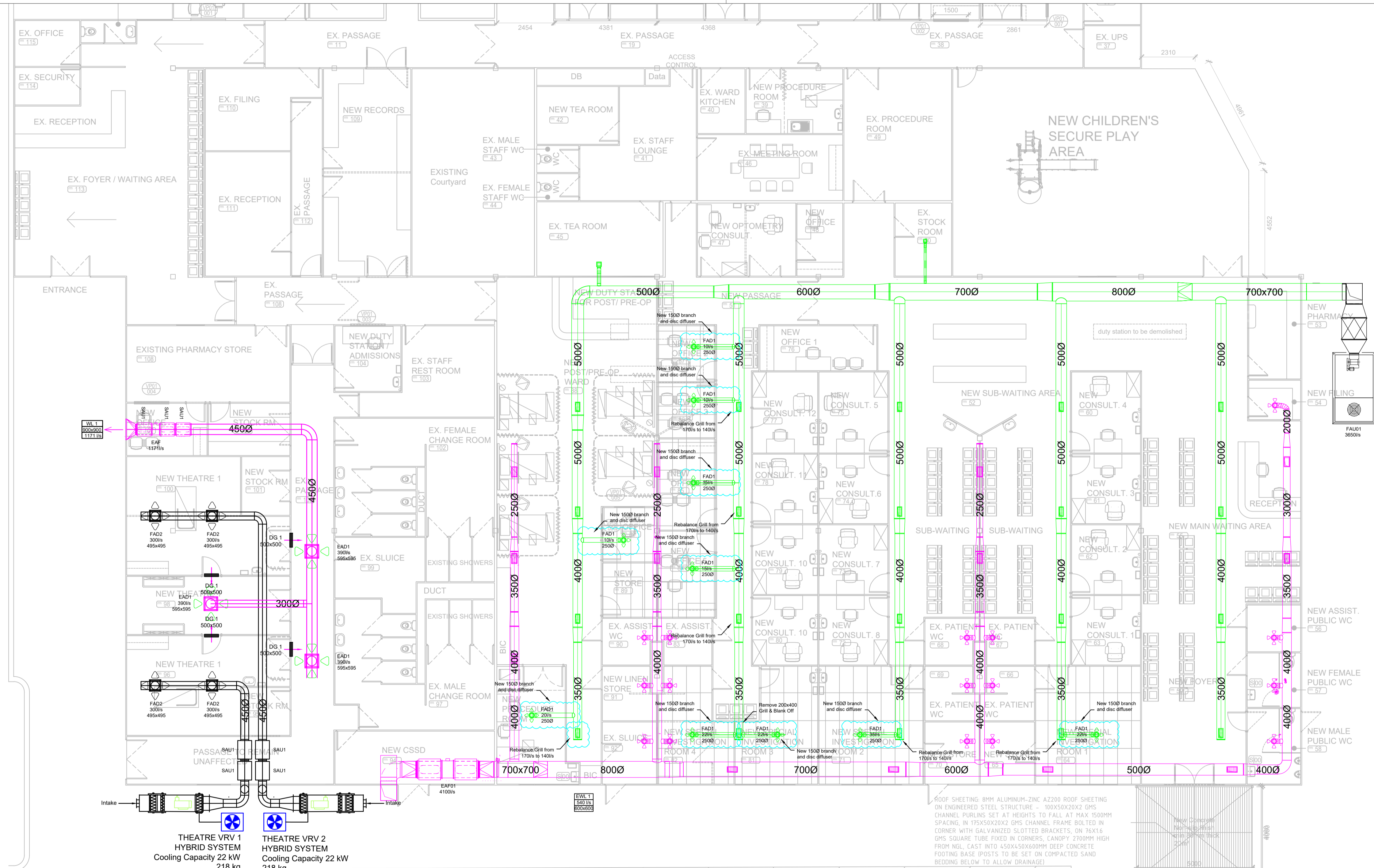
NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor.

Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.

NEW AIR CONDITIONING EQUIPMENT		QTN	SUPPLY AIR VENTILATION EQUIPMENT		QTN	EXTRACT AIR VENTILATION EQUIPMENT		QTN
FAD1	1500 Ceiling disc diffuser	10				WLE1	900 x 900 aluminum weather louver	1
VRV1	220W (8HP) variable refrigerant condenser	2				SAU1	4000 x 1200mm silencer	3
AHU1	HORIZONTAL MAXAIR MODLAIR AHU • 585 l/s @ 1085 Pa (20 AC/H) • Primary Filters G4 (Washable Pleated EN779G4) • Secondary Filters F9 (Pocket Filters EN779F9) • Final HEPA Filters F13 (EN1822H13)	2				EAD1	595 x 595 EGA exhaust grill	3
SAU1	4000 x 1200mm silencer	4				DG1	500 x 500 mm door grill, double sided	4
FAD2	495 x 495 EGA supply air grill	4						

LEGEND	
	Ceiling Concealed Split Unit
	Ceiling Cassette Split Unit
	Mid-wall Split Unit
	Condensing Unit (NEW Outdoor Unit)
	Condensate Pump
	Branch Selector Box
	Flexible Duct
	Constant Volume Diffuser
	Electrical Distribution Board
	15A 3 Pin unswitched socket outlet mounted in ceiling void by HVAC Contractor
	Double pole isolator by Electrical Contractor (P65)
	Triple pole isolator by Electrical Contractor (P65)
	Wired remote control and thermostat
	Door grille
	Balancing Damper
	Back Draught Shutter
	Filter Box
	Sweep Fan

GENERAL NOTES:



THEATRE VRV 1
HYBRID SYSTEM
Cooling Capacity 22 kW
218 kg

THEATRE VRV 2
HYBRID SYSTEM
Cooling Capacity 22 kW
218 kg

- HORIZONTAL MAXAIR MODLAIR AHU:
- 585 l/s @ 1085 Pa (20 AC/H)
 - Primary Filters G4 (Washable Pleated EN779G4)
 - Secondary Filters F9 (Pocket Filters EN779F9)
 - Final HEPA Filters F13 (EN1822H13)

ROOF SHEETING: 8MM ALUMINUM-ZINC A2200 ROOF SHEETING ON ENGINEERED STEEL STRUCTURE - 100X50X20X2 GMS CHANNEL PURLINS SET AT HEIGHTS TO FALL AT MAX 1500MM SPACING, IN 175X50X20X2 GMS CHANNEL FRAME BOLTED IN CORNER WITH GALVANIZED SLOTTED BRACKETS, ON 10X16 GMS SQUARE TUBE FIXED IN CORNERS, CANOPY 2700MM HIGH FROM NGL, CAST INTO 450X450X600MM DEEP CONCRETE FOOTING BASE (POSTS TO BE SET ON COMPACTED SAND BEDDING BELOW TO ALLOW DRAINAGE)

REVISIONS			
REV	DATE	INIT.	DESCRIPTION
00	06/07/23	TW.	Issued for Information

CLIENT

TITLE
HEATING VENTILATION AND
AIR CONDITIONING
EQUIPMENT LAYOUT

CMH
BLOCK H



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DESIGN	TENDER	CONSTRUCTION
	✓	

DESIGNED BY: T.WARNE SCALE: 1:50

DRAWN: T.WARNE DATE: 26/01/2024 PRINT DATE: 26/01/2024

CHECKED BY: Travis Warne
REGISTRATION No. 201770017

SIGNED: DRAWING NO. 2217-M-D-101 HVAC BLOCK H REV No. A

VOLUME 2.3 BLOCK H

MECHANICAL INSTALLATION

Sprinkler System

VOLUME 2.3 PART 1: SPRINKLERS - SCOPE OF WORKS

HEATING VENTILATION AND AIR CONDITIONING EQUIPMENT

1. GENERAL

- 1.1 The Standard for Uniformity in Construction Procurement published in terms of the Construction Industry Development Board (CIDB) Act, 2000 (Act No. 38 of 2000), the Standardized Construction Procurement Documents for Engineering and Construction Works as issued by the CIDB and any other relevant documentation pertaining thereto must be studied and all principles in this regard must be applied to all procurement documentation, practices and procedures.

2. THE CONTRACT

2.1 HEATING VENTILATION AND AIR CONDITIONING EQUIPMENT

The work to be carried out and commissioned by a ASIB approved installer:

- a. Remedial works to existing sprinkler system:
 - New branch sprinklers + pendant sprinklers to ceiling panels,
- b. Testing and Commissioning, as per ASIB,
- c. Manuals, Drawings, OEM Literature,

2.2 Existing

Sprinkler systems are existing. Building is Existing.

2.3 Order of The Works

As per the building contractors' program of works.

VOLUME 2.3 PART 2: SPRINKLERS - STANDARD SPECIFICATION

1.0 GENERAL

- 1.1 This standard specification applies to, and is to be read in conjunction with the particular technical specifications for sprinkler installations (Part 3)
- 1.2 In so far as the conditions contained herein are at variance with anything contained in the particular specification, the contract shall be interpreted in terms of the particular specification for each particular service.
- 1.3 Equipment, materials and operational methods, shall comply with the relevant South African Bureau of Standards Specification and ASIB 11th Edition Rules, where both such specifications exist, unless otherwise prescribed in this or the particular specification.

2.0 OCCUPATIONAL HEALTH AND SAFETY ACT

- 2.1 All equipment supplied and installed under the contract shall meet the requirements of the Occupational Health and Safety Act (Act No 85 of 1994, (as amended) and all other relevant statutory requirements and the Contractor shall comply with the requirements laid down by the Inspector of Machinery under this Act.

3.0 DRAWINGS

- 3.1 The drawings issued with this specification do not purport to show the exact position, size or details of construction of equipment.
- 3.2 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.
- 3.3 Drawings showing any alternative suggestions differing from the Engineer's design must be submitted with tenders.
- 3.4 Within four weeks of signing of the contract (or date of order) the successful tenderer shall submit to the Engineer or his duly appointed representative the following working drawings:
 - 3.4.1 Plant room lay-out showing total operating mass of equipment and the positions and sizes of the water and drain connections required.
 - 3.4.2 Construction details of all items manufactured by the air conditioning and/or ventilation Contractor, such as air plenums, duct work, bases etc.
 - 3.4.3 Dimensions and positions of all holes through walls, slabs, etc., and any amendments to the sizes or positions of return grilles, louvred openings, etc., indicated on the Engineer's drawings.
- 3.5 Approval by the Engineer of drawings submitted by the Contractor shall not relieve him of his liability to carry out the work in accordance with the requirements of the contract documents.
- 3.6 Positions and sizes of return air grilles, louvred openings, openings through reinforced concrete beams and slabs, etc., as indicated on the drawings shall be adhered to as far as possible. Amendments will only be considered if absolutely unavoidable.

4.0 MANUFACTURER'S RATINGS

- 4.1 All equipment such as fans, compressors, cooling towers, pumps, etc., shall be operated well within the manufacturer's ratings. Equipment offered for use beyond these limits will not be considered.
- 4.2 Tenderers must submit manufacturer's ratings of all equipment offered. Ratings shall be given in the SI system.

5.0 POWER, WATER AND DRAIN CONNECTIONS

5.1 All plumbing between equipment and water and drain points is existing.

6.0 NOTICES

6.1 The Contractor shall supply and install all notices and warning signs that are required in terms of the Occupational Health and Safety Act, by local by-laws or regulations and by these documents. This includes notices prohibiting entry to un-authorized persons, etc.

7.0 WELDING

7.1 Welding shall be carried out in accordance with the current edition of SANS 044 Parts 1 to VII where applicable.

7.2 All welded fillet or butt joints shall be free from porosity, cavities and entrapped slag. Joints shall be ground smooth if required for aesthetic reasons only. If strength is required, they shall not be ground.

7.3 The joints in the weld run, where welding has been recommenced, shall be as smooth as possible and shall show no pronounced hump or crater in the weld surface.

7.4 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 a reinforcement of not more than 3 mm in the case of butt welds.

7.5 The weld face shall be uniform in appearance throughout its length.

7.6 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 SANS 455.

7.7 Only welders in possession of a valid approved competence certificate shall be employed.

7.8 When pipes are welded, tenderers must allow for pipe joints (where chosen by the Engineer's Representative) to be X-ray tested by the SANS or other approved body for sound welding at the Contractor's expense or for joints to be cut for examination purposes. After the removal of these joints, the piping must be made good by the Contractor. Should any of the welds prove unsatisfactory, the Contractor may be called upon, at his own expense, to have all welds examined by X-ray. The X-ray examination shall be carried out by the South African Bureau of Standards or other approved body.

7.9 All welds must show proper fusion.

8.0 GALVANISING

8.1 All hot dip galvanising shall be carried out in accordance with SANS 934 and SANS 763 where applicable.

8.2 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.

8.3 Castings shall be sound, dense and clean, and free from distortion, porosity, carbon and slag enclosures, blow-holes, and other injurious conditions.

8.4 Welding flux shall be chipped away and all welds wire brushed before galvanising.

8.5 The surfaces to be galvanised shall be free from paint, oil, grease, and similar impurities.

8.6 All exposed surfaces including welds shall be thoroughly sand blasted prior to galvanising.

8.7 The Engineer shall have 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.

- 8.8 The galvanised coating shall be smooth, adherent, continuous and free from black spots or flux stains.
- 8.9 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. The zinc bath shall contain not less than 98.5% pure zinc.
- 8.10 The deposits expected from galvanised coatings shall be as follows:-

MATERIAL THICKNESS	COATING GRAMS PER m2	APPROXIMATE THICKNESS
Bolts and Nuts	275 - 300	0,033 - 0,036 mm
1,25 mm to 2 mm	400	0,056 mm
2 mm to 5 mm	535	0,07 mm
5 mm and over	760	0,108 mm

9.0 GUARANTEE PERIOD

- 9.1 The CONTRACTOR shall unconditionally guarantee all new installations and equipment for a minimum period of twelve (12) months from the date of hand over to the Engineer.

If the CONTRACTOR or his supplier has a standard guarantee which exceeds the minimum warranty called for, the remaining portion of such extended warranty must be ceded to the client.

- 9.2 The guarantee shall cover the performance of the WORKS and any defects due to inferior materials and/or workmanship, fair wear and tear excepted, and the CONTRACTOR shall repair any such defects without delay.

This guarantee shall include malfunction, and water, refrigerant gas, oil, or air leaks, and all adjustments.

- 9.3 Should the performance of any part of the complete WORKS become unsatisfactory so as to become detrimental to its functional use, the CONTRACTOR shall replace any such part or the complete WORKS with equipment as prescribed by the Engineer.

- 9.4 If any such defects are not remedied without delay, the Engineer reserves the right to have such defect repaired at the risk and cost of the CONTRACTOR by another CONTRACTOR whom the Engineer deems to be proficient in the WORK. this to be without prejudice to any rights the Engineer has against the installation CONTRACTOR. The Engineer will give written notice to the installation CONTRACTOR of such instances where he appoints another CONTRACTOR to remedy defects in the WORKS.

9.5 PREVENTIVE MAINTENANCE SERVICES.

Preventive maintenance servicing of plant and equipment shall be carried out in accordance with the maintenance schedules and programs to be supplied by the Engineer. Copies must be made as required of these schedules.

10.0 RUNNING OF PIPES

- 10.1 Pipes shall be installed in accordance with the drawings issued with the supplementary specification.
- 10.2 The drawings are schematic and do not purport to show the exact positions of pipes nor the details of construction and installation. All final dimensions must be checked on site before the fabrication of piping sections.
- 10.3 Pipe sleeves with at least 6 mm clearance filled with a resilient material shall be provided where refrigerant tubing or water piping passes through walls or slabs.
- 10.4 Where beams, stanchions or other obstructions interfere with the straight running of pipes or ducts, suitable offsets shall be provided or changes in the section of the duct made, without altering the cross-sectional area.
- 10.5 Tenderers should make themselves conversant with complete drawings of the 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 for these shall be made in the tendered price.
- 10.6 A complete set of drawings of the building may be inspected at the office of the Architect.

11.0 PAINTING

- 11.1 All exposed galvanised sheet metal work in plant rooms, air conditioned and ventilated spaces, basements, corridors etc., shall be painted.
- 11.2 Ducts shall be identified by coloured symbols as specified in clause 6 of SANS 0173-1980.
- 11.3 The temporary white rust preventative compound on new galvanised sheet metal shall be removed by means of washing, brushing and if necessary, abrasion with a special solvent or compound used for this purpose. The surface shall be well rinsed and dried. It shall then be painted with one coat of zinc dust/zinc oxide paint to SANS 910 or one coat of calcium plumbate primer to SANS 912 followed by one under coat to SANS 681 type II and one coat high gloss enamel paint to SANS 630, Grade I, as top coat, the colour of which will be determined by the Engineer.
- 11.4 The entire air-conditioning unit casing, including galvanised iron eliminators, sumps, drip pans, fans etc., shall be painted internally with two coats of epoxy-tar paint to SANS 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.
- 11.5 Ferrous cooling tower and evaporative condenser casings, including galvanised iron eliminators sumps and fans and internal areas of connecting ductwork shall be internally painted as specified above. Externally the casings shall be painted as specified in clause 48.3. Factory painted equipment will also be acceptable.
- 11.6 Exposed hot water piping with canvas covered insulation shall be painted two coats of bitumen aluminium paint to SANS 802.
- 11.7 Exposed uninsulated galvanised piping shall be thoroughly degreased. In case a detergent is used, the surfaces shall be well rinsed and dried. It shall then be painted with one coat of zinc dust/zinc oxide paint to SANS 910, or one coat of calcium plumbate primer to SANS 912, followed by either one undercoat to SANS 681, type II, and one coat high gloss enamel paint to SANS 630, Grade I, as topcoat or two coats of PVA to SANS 634, Grade I.
- 11.8 Uninsulated black piping, flat-iron, angle-iron and rods for supports, brackets, duct stiffeners, etc., shall be painted on all sides with a zinc chromate primer to SANS 679, Type I followed by two coats of enamel paint to SANS 630, Grade I.
- 11.9 Where specified in the supplementary specification aluminium shall be painted with a wash primer to SANS 723, followed by a zinc chromate primer to SANS 679, Type I, and two coats of enamel

paint to SANS 630, Grade I.

- 11.10 Motors, compressors, pumps etc., shall be painted light grey. Belt guards shall be painted bright red.
- 11.11 Before any painting is applied the steel surfaces shall be prepared according to SANS 064, (Code for preparation of steel surfaces for painting.)
- 11.12 Where specified in the particular specification steel surfaces shall be cleaned and then treated by the hot phosphate process to a minimum weight of 1,6 gr/m² coating followed by two coats of baking enamel to SANS 783, Type I.

12.0 GENERAL REQUIREMENTS FOR SPRINKLER INSTALLATIONS

All automatic sprinkler pipe installations shall adhere to the technical and particular specifications of the Employer, and shall include the following general requirements:

- 12.1 Piping shall conform to the requirements of SANS 10287.
- 12.2 Pipes shall be cut accurately to measurements established on site and installed without springing or forcing and properly clear of windows, doors and other openings. All piping shall be reamed after cutting and shall be clean, straight and free of defects.
- 12.3 Drawings are generally diagrammatic and indicative of work to be installed. Routing and arrangement of piping shall be as indicated, subject to site conditions and the appropriate requirements of SANS 10287 and current ASIB rules.

Clashes with other trades shall be avoided and fittings, valves, drain points, etc shall be located so as to ease access, maintenance and operation of the system. Note that required offsets, fittings, valves, drains, etc are not necessarily indicated.
- 12.4 Pipe runs shall be straight and direct as possible, in general forming right angles with or parallel to walls or other piping, and neatly spaced. Piping shall be installed so that there is sufficient clearance between finished coverings of piping, fittings and adjoining work. Sleeves shall be provided where piping passes through partitions, beams, slabs, etc.
- 12.5 Valved and capped drain points shall be provided at all low points in the piping network. Unions or flanged connections shall be provided to aid dismantling of the piping should it be required.
- 12.6 No cold springing shall be allowed. Pipe sections shall be fabricated/cut to length accurately in order to avoid cold springing.
- 12.7 Where necessary, adequate temporary supports shall be installed during erection so as not to overstress piping or equipment to which piping is connected.
- 12.8 All supports shall conform to the requirements of SANS 10287, and no perforated straps or strip steel shall be used.
- 12.9 Piping which is subject to vertical movements shall be provided with springs or other suitable supports.
- 12.10 Hangers shall be installed in such a manner that they cannot be disengaged by any pipe or support steel movement.
- 12.11 No pipe shall be suspended from another pipe except if specifically called for on the drawings or in the particular specification (Part 3).
- 12.12 The Contractor shall be responsible for selecting the sizes and types of pipe hangers, supports and support devices not shown on the drawings, but which are necessary for the completion of the installation. Support spacing shall be as specified in paragraph 23.0 The Contractor shall supply details of all calculations to the Engineer for scrutiny together with two marked up prints showing the location and types of all supports/pipe hangers to be installed prior to ordering and commencing

installation.

12.13 During construction all pipe ends shall be kept plugged to prevent any ingress of dirt, rubble etc.

13.0 PIPING

14.1 Steel piping shall be solid drawn, heavy grade steam quality piping conforming to ASTM/A106 Schedule 40 or to B.S. 1387/1967 (heavy quality) or SANS 62/1971. In all instances the latest editions and amendments to these specifications shall apply.

In plant rooms piping may be welded, prefabricated off-site to aid in installation and connection to pumps, storage tanks, etc. Welding shall be carried out as specified in paragraph 7.0 of this specification.

Generally pipe sections shall be screwed together using malleable iron threaded fittings, class 150 and 300 in accordance with ASME B 16.3. Only eccentric fittings shall be used at changes in pipe size.

Pipes joined with grooved fittings (eg Klambon or Victaulic) shall be joined by a listed combination of fittings, gaskets, and grooves. Grooves cut or rolled on pipe shall be dimensionally compatible with the fittings and pressure at which the system is to operate.

Where flanges are used they shall be in accordance with ASME B16.5. Steel slip-on boss flanges for welding shall have a nominal pressure at least 10% in excess of the maximum fluid pressure. Where equipment is supplied complete with flanges not in accordance with the above specification, a matching weld-on flange is to be used for connecting up such equipment. Bolts in flanges are to be high tensile steel and of the correct length such that no more than 1,5 clear threads protrude beyond the nuts after tightening to the correct torque. In flanged joints new gaskets shall be used for every assembly operation unless such an assembly is intended solely for initial fitting. Gasket material shall be fibre composition or similar material suitable for the system operating pressure and temperature.

14.2 Underground piping shall be class 16 uPVC piping as per ASIB specification.

Pipes shall be laid on a 100 mm sand-bedding cradle and covered with 300 mm sand before backfilling. The total cover over the piping shall be a minimum of 900mm generally and 1100mm under roadways. All backfilling shall be to the Engineers approval.

Where required thrust blocks shall be cast between the pipe and the undisturbed trench material. At thrust blocks the pipe bend shall be wrapped with a "Densopol 80 HT Tape" (or equal and approved) so that no concrete comes into direct contact with the HDPE piping.

All underground piping shall be pressure tested prior to it being covered.

15.0 PIPE SUPPORTS AND HANGERS

All necessary pipe hangers, brackets, supports, stanchions and anchors shall be designed, supplied and installed by the Contractor, in accordance with SANS 10287.

15.1 Maximum pipe support spacing shall be as follows:

Pipe Diameter	Max support Spacing
20 mm	3 m
25 mm	3.6 m
32 mm	3.6 m
40 mm	4.5 m
50 mm	4.5 m
65 mm	4.5 m
80 mm	4.5 m
100 mm	4.5 m

150 mm	6 m
200 mm	6 m

The contractor will be required to ensure that the hangers/supports selected are conservatively rated for the carrying capacity required. (Refer to paragraph 21.12).

15.2 The following requirements shall also apply:

15.2.1 At least one hanger supporting range pipes is required between adjacent sprinklers.

15.2.2 At least one hanger supporting range pipes is required between a sprinkler and a distribution pipe.

15.2.3 The minimum distance between any sprinkler and hanger shall be 150 mm.

15.2.4 There shall be at least one pipe support for each mechanical pipe joint .

15.2.5 Components of any pipe support shall be securely attached to each other by means of bolts or threaded rod with nuts and washers.

15.3 All components of all pipe supports shall be galvanized.

18.0 SPRINKLERS

Sprinkler heads shall conform to the regulations set out in SANS 10287 and all local authority requirements. They shall be installed in positions as indicated on the drawings.

Unless otherwise specified or indicated, sprinkler heads shall be cast brass with quartzoid bulb and be of the conventional pattern.

Heads subject to abnormal heating conditions are to be of sufficiently high temperature rating to prevent accidental discharge.

Sprinkler temperature ratings are to be specified as per intended use.

Heavy wire sprinkler guards are to be provided for heads which are liable to be accidentally damaged in the normal course of events.

18.1 Sprinklers shall be located such that there will be minimum interference to the discharge pattern by structural members such as beams, columns, girders, trusses or other obstructing features. Unless otherwise specified sprinklers shall be located at the appropriate distance below ceilings and beams, columns, girders and roof trusses as set out in SANS 10287.

18.2 Sprinklers shall be located in positions indicated on the drawings, below air conditioning and ventilation ducting within ceiling spaces. The sprinklers shall be provided where rectangular ducts exceed 800 mm in width and under circular ducts exceeding 1 000 mm in diameter unless there is at least 150 mm clearance from adjacent walls when the width without protection may be 1 000 mm and 1 200 mm respectively.

18.3 Where sprinklers are located less than 2-meter apart baffle plates shall be provided. They shall be 200 mm wide and 150 mm high and constructed of galvanized sheet metal, located midway between sprinklers. The tops of the baffles shall extend above the sprinkler head deflectors by a minimum of 150 mm.

A manual ball type shut off valve between the service tank and the lift pump shall be incorporated in the steel or copper fuel feed pipeline.

VOLUME 2.3 PART 3: SPRINKLERS - DETAILED SPECIFICATION

3.1 GENERAL

3.1.1 STANDARD TECHNICAL SPECIFICATION

This part of the specification takes precedence over the Standard Specification in respect of any discrepancies in the description of equipment materials.

3.1.2 REFERENCE DRAWINGS

The following drawings form part of this specification and must be read in conjunction with it:

2217-M-T-101-SPRK Sprinkler Fire Suppression Equipment Layout

3.1.3 SHOP DRAWINGS

The successful tenderer will be required to submit for approval two copies of all shop and installation drawings within three (3) weeks of the tender being awarded to him.

Any builder's work requirements must be clearly indicated on the shop drawings and it will be the responsibility of the Contractor to supply these in good time so as to avoid delays in the main building program.

3.1.4 CONTRACT PROGRAM

As the successful tenderer will become a **nominated sub-contractor** to the main Contractor, it must be noted that all contract programs and progress must be coordinated with the main Contractor's program. Note that the main contractor's contractual completion date is to be advised.

3.1.5 MAINTENANCE AND GUARANTEE

Note that in terms of the contract conditions all new plant and equipment is to be guaranteed for a period of twelve (12) calendar months from the date of hand-over of the installation.

Note further that tenderers are to include in their tender price for monthly service and maintenance visits during the guarantee period. Maintenance is to be done in accordance with the schedules to be included in the maintenance and operating manuals.

Copies of service reports shall be submitted to the Engineer on a monthly basis failing which the cost of the services may be deducted from retention monies held.

3.1.6 MAINTENANCE AND OPERATING MANUALS

Maintenance and operating manuals (3 copies) are required for this project - the Contractor will be required to submit a full set of as built drawings including wiring diagrams to the Engineer on completion of the contract. These drawings should preferably be done on a CAD system with copies of the drawings being submitted as well on computer discs in an Autocad or DXF format.

3.2 SITE DESCRIPTION, SCOPE OF CONTRACT, ETC

3.2.1 SITE DESCRIPTION

Existing factory/warehouse facility situated at Cecelia Makiwane Hospital, Buffalo City, Eastern Cape Province. The facility is operational. Works are for internal changes to the existing facility.

3.2.2 SITE CONDITIONS

Site conditions are as follows:

- (a) Altitude approximately 0 m above sea level.
- (b) Electrical Supply 380-400 Volts, 3 phase, 50 Hz, 4 wire.
- (c) Ambient Air conditions Summer 31°C db / 21°C wb
Winter 10°C db / □□80% r.h

3.2.3 SCOPE OF CONTRACT

The following items form part of this contract:

Remedial works to existing sprinkler system:

- New branch sprinklers + pendant sprinklers to ceiling panels,

Installation is classified as follows:

- Hazard:
 - Ordinary Hazard,
- 5 mm/min density, 15mm diam 68 Deg C, K – 8.0 (Metric) Pendant type to ceilings,
- 216 m² AMAO,
- Max roof Height 6m,

3.2.3.2 Commissioning and testing of the installation as a whole.

3.2.3.3 Builder's work and shop drawings

3.2.3.4 Operating and maintenance manuals.

3.2.3.5 As-built drawings.

3.2.3.6 Training of maintenance personnel in the operation and basic maintenance of the system

3.2.3.7 Maintenance and servicing of the plant during the guarantee period.

Tenderers must allow for all plant and equipment necessary for the completion of the installation, whether expressly mentioned in the specification or drawings or not.

Should any clarification of the specification or drawings be required, or should any discrepancies between sections of the document become apparent during the tender period, such queries must be immediately be brought to the Engineer for clarification.

Claims arising afterwards based on want of knowledge will not be entertained.

3.2.4 WORK TO BE CARRIED OUT BY OTHER PARTIES

N/A

3.2.5 PROGRAM

The sprinkler installation sub-contractor will become a domestic sub contractor to the main contractor and will be required to draw up a program for completion based on the following parameters taken from the main contractor's preliminary program:

- (a) The main contractor's start date to be advised
- (b) The anticipated contract completion date to be advised.
- (c) A copy of the program must be submitted to the Engineer prior to commencement of work.
- (d) Cognisance must be taken of the main contractor's preliminary and general conditions of contract.

3.2.6 SUPERVISION AND SITE ORGANISATION

The Contractor shall, whilst the contract works are in progress employ at least one good and competent Supervisor careful and skilled in all aspects of the trade and callings required by the contract. This Supervisor shall be on site whenever work associated with the contract is being carried out and shall at all other times be available to attend queries by the Engineer.

The Supervisor shall be the Contractor's authorised representative on site and must be available to attend progress meetings when called upon to do so by the Engineer.

The Supervisor shall be appointed to the contract as soon as possible after the awarding of the contract. The Supervisor shall from the time of his appointment onwards attend all meetings relevant to the contract called by the Engineer whether or not these take place prior to work actually starting on site.

The Supervisor shall not be transferred from his position unless on the express instructions of the Engineer.

The Contractor shall at all times have on site copies of all pertinent drawings as well as a copy of the specification. The Contractor shall institute the necessary procedures to ensure the drawings on site are the latest issue and that all superceded drawings are removed from site.

Tenderers shall at the time of tender name both the Contract Manager and responsible Director.

3.2.7 **GUARANTEE PERIOD**

All new plant and equipment shall be guaranteed for a period of twelve (12) months from the date of hand-over of the plant to the Client.

3.2.8 **INSURANCE**

Tenderers must include in their tender prices for insurance of the works as per the main contract.

3.2.9 **SITE MEETINGS**

Allowance shall be made in tender prices for attendance at two (2) site meetings per month.

3.3 **DETAILED TECHNICAL REQUIREMENTS**

3.3.1 **Outline Requirements**

The drawings attached to this specification are schematic in nature and it will be required of the contractor to submit detailed working drawings for the sprinkler system based on the following parameters:

- a) Compliance with the requirements of ASIB 12th Edition Rules & SANS 10287,

Detailed designs shall be carried out by persons competent, qualified and experienced in this type of installation.

3.3.2 **Sprinkler Design Criteria**

The sprinkler contractor's appointed competent person, shall verify the fire hazard classifications, if necessary, by analogy to similar installations in accordance with the SANS 10287 Code of Practice & ASIB Rules Edition 12. The successful contractor shall confirm to the engineer all details pertaining to the type of sprinklers used at the design stage for the completion of the contract.

The schematic system, for the building, shown on the drawings is based on:

- a discharge density of 5 mm/min density, 68 Deg C, K – 8.0 (Metric)
- Pendant type sprinkler, 68 deg Celsius temperature rating,
- Maximum height of ceiling is 6 m,

3.3.3 **Piping, Valves and Fittings**

Reference must be made to clauses of the Standard Specification.

All piping above ground shall be steel piping to ASTM A106 schedule 40 or SANS 62 (heavy quality). Underground piping shall be class 16 HDPE to SANS 0533-2. Allowance shall be made for the appropriate adaptors at joints between steel and HDPE piping.

Piping shall be suspended from the structure of the building by means of hangers designed and sized to suit the weight of piping (filled with water) to be used. Note that pipe hangers clamped to the structure are preferred. Note further that should structural elements need to be drilled for purposes of affixing hangers or if it is necessary to weld hangers to the structure this may only be done with the express written permission and requirements of the structural engineer. Such requirements, etc shall be established prior work being put in hand.

Pipe joints and hanger spacing's shall be as specified in the Standard Specification.

All in accordance with the requirements of SANS 10287 & ASIB 12th Edition Rules.

3.3.4 Water Storage Tank

Not applicable.

3.3.5 Sprinkler Booster Pumps

Not applicable.

3.3.6 Electrical Work

Not applicable.

3.3.7 Alarms

Not applicable.

2.3.7 Occupational Health and Safety Act

The sprinkler installation must comply fully with the relevant SANS specifications and all the requirements of the Occupational Health and Safety Act. All tests, certificates, and registration requirements imposed by the Act and the relevant SANS specifications must be allowed for and supplied in terms of this contract.

2.3.8 Guarantee Period

The installation shall be guaranteed for a period of twelve (12) calendar months from the date of practical completion of the installation and hand-over to the client.

During this period the sprinkler installation contractor will be responsible for the servicing and maintenance of the installation.

2.3.9 Servicing and Maintenance

After expiry of the 12 month guarantee period it is recommended that the contractor enter into a maintenance contract with the client and to this end it is preferred that tenderers have competent in-house service and repair personnel in the Eastern Cape (East London or Port Elizabeth) .

2.3.10 Builder's Work

A detailed drawing accurately showing all builder's work required in connection with the sprinkler installation must be done and submitted to the Engineer within two (2) weeks of the contract being awarded to him. This drawing must additionally indicate all structural loads imposed by the sprinkler piping and equipment on the building.

2.3.11 Operating and Maintenance Manuals

Three copies of the operating and maintenance manuals including as-built drawings and all plant details are required. A draft copy of the manual shall be submitted for approval prior to the final documents being completed. The final documents shall be handed to the Engineer at the time of practical completion.

It is a requirement of this contract that designated members of the staff of the owner be instructed in basic maintenance requirements, e.g. how to re-set the equipment after a power failure, etc.

2.3.12 Commissioning and Testing

Refer to Clause 29.0 of the Standard Specifications (Part 2).

In commissioning the installation, all operating parameters shall be recorded.

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - BLOCK H
VOLUME 2,3 PART 4: SPRINKLER FIRE SUPPRESSION EQUIPMENT INSTALLATION

SCHEDULE OF QUANTITIES (PROVISIONAL)

SCHED 2

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	RATE	AMOUNT
1,0	<u>Bill No. 1 : Preliminary and General</u>				
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
1,2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,3	Tools and equipment, Communication, transport.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
	Attendance at site meetings	Sum	1		
1,5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1		
1,6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1		
1,7	<u>DAYWORK SCHEDULE</u>				
	Personnel				
	Coded welder	hr			Rate only
	Registered electrician	hr			N/A
	Registered HVAC technician	hr			N/A
	Apprentice	hr			Rate only
	Labourer	hr			Rate only
Carried forward to Next Page					

Carried forward from Previous Page				
1,9	<u>GUARANTEE</u>			
	12 month guarantee of plant and equipment as specified	Sum	1	
	Allowance for servicing the plant during the guarantee period			
	Monthly service calls to check plant operation, clean filters, etc	No	8	
	3 monthly minor service as specified	No	3	
	Annual major service at the end of the guarantee period	No	1	
1.10	<u>Additional Tests</u>			
	Allow for additional tests as direct by the Consulting Engineer	Item		
1.11	<u>Additional items</u>			
	Any additional items the contractor wishes to allow for: (Specify)			
Total Carried forward to Summary Page				

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - BLOCK H
VOLUME 2,3 PART 4: SPRINKLER FIRE SUPPRESSION EQUIPMENT INSTALLATION

SCHEDULE OF QUANTITIES (PROVISIONAL)

SCHEDULE NO 2: SPRINKLER INSTALLATION PHASE 1

ITEM NO		UNIT	QUAN-TITY	RATE	AMOUNT
2,0	Bill No. 2 : SPRINKLER EQUIPMENT				
2,1	Decommission existing sprinkler valve, drain system, make ready for alterations	no.	1,0		
2,2	Steel Piping Supply and install steel piping to ASTM A106 #40 or SANS 62 as specified (heavy quality)				
	50mm	m	56		
	40mm	m	41		
	32mm	m	42		
	25mm	m	73		
2,3	Pipe Hangers & Brackets(steel piping) as specified				
	50mm	no	28		
	40mm	no	21		
	32mm	no	21		
	25mm	no	37		
	Pipe Fittings				
2,4	Bends				
	50mm	no	10		
	40mm	no	60		
	32mm	no	60		
	25mm	no	60		
2,6	Tees				
	100x100x100	no	5		
	50x50 x 25 mm	no	6		
	40x40 x 25 mm	no	6		
	32x32 x 25 mm	no	7		
2,7	Reducers				
	100-50 mm	no	4		
	50-40 mm	no	4		
	40-32 mm	no	3		
	32-25 mm	no	3		
Carried forward to Next Page					

Carried forward from Previous Page			
2,8	Couplings		
	50mm	no	19
	40mm	no	14
	32mm	no	14
	25mm	no	24
2,9	Nipples		
	25 mm	no	18
2,10	Sprinkler Heads		
	Supply and install glass bulb type sprinkler heads rated to give a coverage of 5mm/min/sq m floor area (Viking or Victaulic or equal and approved) including piping connections to range pipes		
	Ordinary Hazard K-Factor 8; 15 mm Thread 68 Deg C Pendant	no	18
2,11	Painting and Finishing		
	Allow for painting sprinkler and fire hose reel piping as follows		
	Etching primer coat	sum	1
	Undercoat (different colour to primer)	sum	1
	Final coat - colour as specified by architect	sum	1
2,12	Recommisioning and pressure testing	sum	1
2,13	Testing and Commissioning		
	Allow for testing and commissioning of the systems	sum	1
Total Carried forward to Summary Page			

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - BLOCK H
VOLUME 2,3 PART 4: SPRINKLER FIRE SUPPRESSION EQUIPMENT INSTALLATION

SCHEDULE OF QUANTITIES (PROVISIONAL)

ITEM NO	DESCRIPTION	UNIT	QUAN-TITY	RATE	AMOUNT
3,0	<u>BILL NO. 3: ASIB INSPECTION AND APPROVAL</u>				
3,1	Liaise and coordinate with ASIB for submission of drawings + calculations for approval	Sum	2		
3,2	ASIB inspection fee	Sum	2		
Total Carried forward to Summary Page					

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - BLOCK H
 VOLUME 2,3 PART 4: SPRINKLER FIRE SUPPRESSION EQUIPMENT INSTALLATION**

PROVISIONAL SCHEDULE OF QUANTITIES

FINAL SUMMARY PAGE

BILL NO	Description	AMOUNT
1	Bill No. 1 : Preliminary and General	
2	Bill No. 2 : SPRINKLER EQUIPMENT	
3	BILL NO. 3: ASIB INSPECTION AND APPROVAL	
SUBTOTAL		
CONTINGENCY 2,5%		
SUBTOTAL		

REMINDER NOTE

The Total Price including Main Contractor's Mark-up which excludes VAT, must be carried over to the final summary in Volume 1 and all fixed amounts shown in the price schedule must be included therein. No adjustments will be made for any failure by Tenderers to include the fixed amounts in the Total Price for this particular installation.

SUB-CONTRACTOR'S NAME:

DATE:

SIGNATURE:

N.B. The above-named Sub-Contractor is to be employed on this contract. Substitute Sub-Contractors are not acceptable.

The price submitted include all Main Contractor's 'Profit and Mark up BUT Exclude the VAT when transferring price to Volume 1 of the Final Summary Total of the Main Contractor's Document

**6 SCHEDULE OF INFORMATION
SPRINKLER INSTALLATION**

The following schedules shall be completed in full. Failure to do so may result in the tender being invalidated.

6.1 Piping, Valves, Fittings, etc

The following items of information must be supplied in full supplemented if necessary by illustrative pamphlets, etc.

- (a) Grade of steel piping
- (b) Grade of HDPE piping
- (c) Make, type and SANS/BSS figure no. of:
 - (i) Butterfly valves
 - (ii) Non-return valves
 - (iii) Strainers
 - (iv) Pipe flanges
 - (v) Pressure gauges
 - (vi) Pressure sensors
 - (vii) Pipe hangers
 - (viii) Control valves
 - (ix) Drain valves
 - (x) Water gong
- d) Type and flow rate of sprinkler heads , Class:
 - (i) ESFR
 - (ii) Extra high Hazard
 - (iii) Ordinary Hazard
- e) Rupture temperature
- f) Number of sprinkler heads allowed for in tender

6.2 Servicing and Maintenance

- a) From where will servicing and maintenance of the installation be carried out?

.....
.....
.....
.....

(Address, contact name, telephone, fax and cel phone numbers required)

6.3 Deviations from Specification

- a) List deviations from the specification (if any)

.....
.....
.....
.....

Installation Notes

1. ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE PRIOR TO COMMENCING ON SITE.
2. THIS DRAWING MUST BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL AND OTHER DRAWINGS.
3. ALL PIPING TO BE MILDSTEEL GALVANISED.
4. REGULATION SIGNAGE WILL BE ACCOMPANIED WITH ALL FIRE EXTINGUISHERS & HOSE REELS.
5. ALL SERVICES TO HANG FROM TRUSSES AND PERLINS ONLY. NO

AUTOMATIC SPRINKLER EQUIPMENT	Qty
15 mm Ordinary Hazard Pendant Sprinklers	51

Legend

SYMBOL	DESCRIPTION
●	PENDANT SPRINKLER HEAD, INTERMEDIATE
—	FIRE SPRINKLER PIPING
⊗	NON RETURN VALVE
⊘	ISOLATING VALVE
⊞	30m FIRE HOSE REEL (250 CONN)
⊞	45m FIRE HYDRANT (1000 CONN.) COMPLETE WITH 45 m FIRE HOSE, COUPLINGS AND CLIPBOARD
□	FIRE PUMP CONTROL PANEL
⊞	PRESSURE VESSEL
⊞	PRESSURE SWITCH
⊞	PRESSURE GAUGE - 2500 KPA
⊞	PRESSURE REDUCING VALVE

DESIGN NOTES:

- AREA / NO. OF SPRINKLERS = AVERAGE SPACING
2405 / 231 = 10.42m²
- AMAO / AVERAGE SPACING = NO. OF SPRINKLERS IN OPERATION
216m² / 10.42m² = 20.727 (IN OPERATION 21SPK.)
- DENSITY X ACTUAL SPACING = DISCHARGE
5mm/min X 11.62m² = 58.124/min (MINIMUM OF 60l/min USED)
- 150 BRASS CONV. 68°C Q/R
MIN OPERATING PRESSURE = 56.250kPa (OPK)
K = 8.0 (METRIC)
- NOTED DRAWING IS NOT DRAWN TO SCALE AND IS FOR SCHEMATIC REPRESENTATION ONLY.

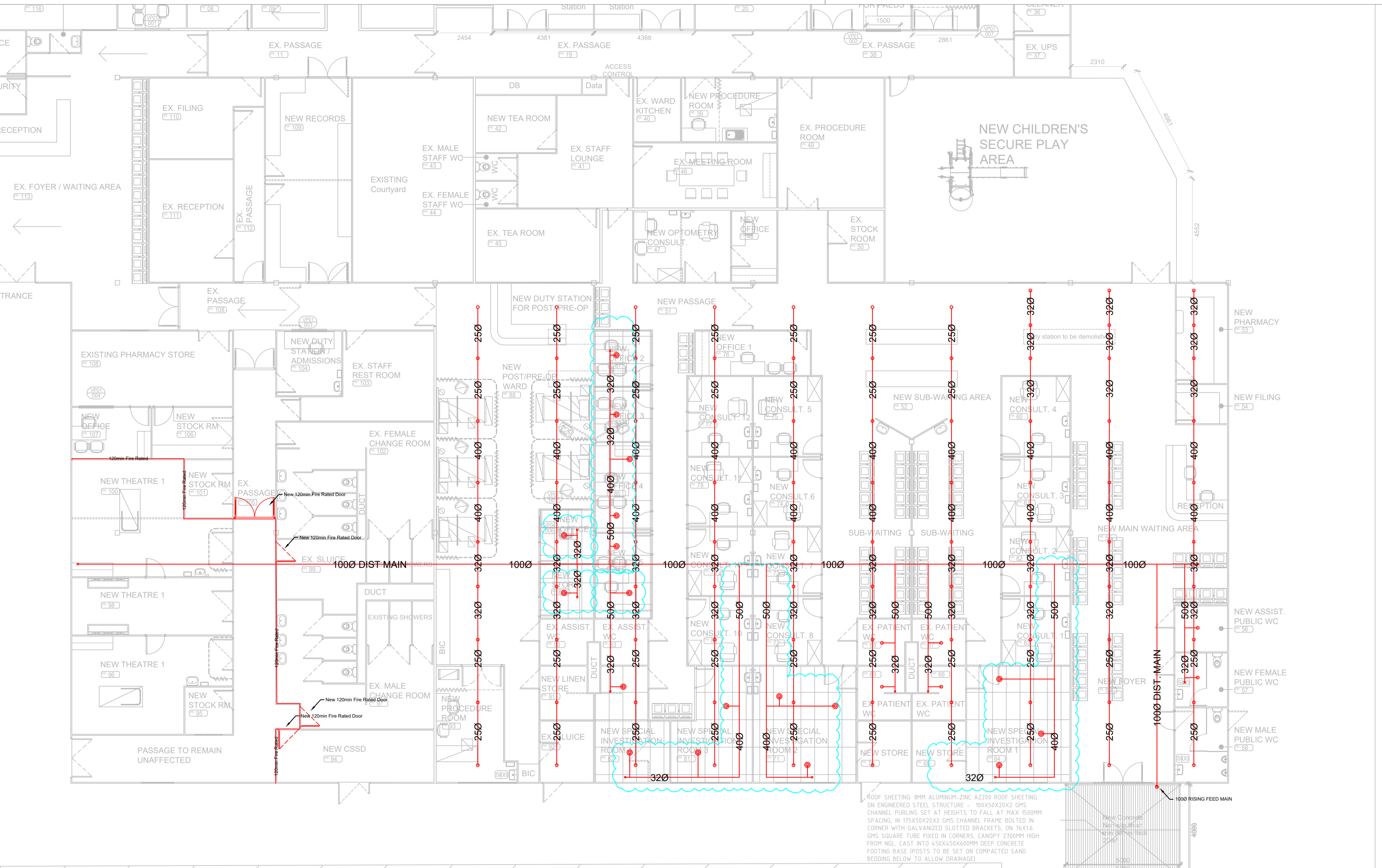
GENERAL NOTES:

REV	DATE	INIT.	DESCRIPTION
00	06/07/23	TW	Issued for Information

CLIENT

TITLE

SPRINKLER FIRE SUPPRESSION EQUIPMENT LAYOUT



ROOF SHEETING 8MM ALUMINIUM-ZINC AZ200 ROOF SHEETING ON ENGINEERED STEEL STRUCTURE - 100X50X2X2 GMS CHANNEL PURLINS SET AT HEIGHTS TO FALL AT MAX 1500MM SPACING, IN 175X50X20X2 GMS CHANNEL FRAME BOLTED IN CORNER WITH GALVANIZED SLOTTED BRACKETS, ON 76X16 GMS SQUARE TUBE FIXED IN CORNERS, GANGPY 2700MM HIGH FROM NGL. CAST INTO 450X450X600MM DEEP CONCRETE FOOTING BASE (POSTS TO BE SET ON COMPACTED SAND BEDDING BELOW TO ALLOW DRAINAGE)

REVISIONS

REV	DATE	INIT.	DESCRIPTION
00	06/07/23	TW	Issued for Information

CLIENT

TITLE

SPRINKLER FIRE SUPPRESSION EQUIPMENT LAYOUT

CMH BLOCK H



CESA
Consulting Engineers South Africa

RNA CONSULTING ENGINEERS
Consulting Electrical & Mechanical Engineers

7 King Street, Southernwood, East London, 5201
E-Mail: office@rnaconsulting.co.za

P.O. Box 12359, Amalinda, 5252
Tel: 043 742 0041
Fax: 043 742 3883

DESIGN	TENDER	CONSTRUCTION

DESIGNED BY: T. WARNE

SCALE: 1:50

DRAWN: T. WARNE

DATE: 26/01/2024

PRINT DATE: 26/01/2024

CHECKED BY: Travis Warne

REGISTRATION No. 201770017

SIGNED:

DRAWING NO. 2217-M-T-101 SPRK BLOCK H

REV No. A

VOLUME 2.4 BLOCK H

MECHANICAL INSTALLATION

Medical Gas

VOLUME 2.4 PART 1: MEDICAL GAS - SCOPE OF WORKS

HEATING VENTILATION AND AIR CONDITIONING EQUIPMENT

1. GENERAL

- 1.1 The Standard for Uniformity in Construction Procurement published in terms of the Construction Industry Development Board (CIDB) Act, 2000 (Act No. 38 of 2000), the Standardized Construction Procurement Documents for Engineering and Construction Works as issued by the CIDB and any other relevant documentation pertaining thereto must be studied and all principles in this regard must be applied to all procurement documentation, practices and procedures.

2. THE CONTRACT

2.1 HEATING VENTILATION AND AIR CONDITIONING EQUIPMENT

The work to be carried out and commissioned by a SAQCC gas approved installer:

- a. Remedial works to existing medical gas O2 and LP air systems:
 - Removal of existing O2 and LP air terminal units,
 - Removal of gas branch piping from wall mounted trunking,
 - Removal of high-level branch supply O2 and LP air piping,
 - Blanking off of main supply branches O2 and LP air piping,
- b. New branch piping from main supply to new O2 and LP air wall mounted terminals,
- c. New medical gas reticulation and terminal units to 2x new minor theatres,
- d. New medical gas alarm panel, pressure switches & cabling,
- e. New main supply piping for Vacuum and N2O from central gas plant room,
- f. Testing and Commissioning, as per ASIB,
- g. Manuals, Drawings, OEM Literature,

2.2 Existing

Medical Gas systems are existing. Building is Existing.

2.3 Order of The Works

As per the building contractors' program of works.

VOLUME 2.4 PART 2: MEDICAL GAS - STANDARD SPECIFICATION

NOTE:

These standard specifications outline the basic principles of materials and workmanship to be utilized and employed in this installation. The Detail Specification contains the exact methods to be employed and the equipment to be installed. The Detail Specification thus takes precedence over these standard specifications.

MEDICAL GAS AND VACUUM INSTALLATIONS

1. INTRODUCTION

1.1 General

This specification contains standard technical requirements for medical gas and vacuum installations and anesthetic mask scavenging systems.

1.2 Project Specification

This standard specification and drawings will at times have to be read in conjunction with project specification and drawings in which the specific requirements, scope and layout of the installation are set out.

Where contradictions arise between such project specifications and drawings and this standard specification and standard drawings, the project drawings and project specification will take precedence.

1.3 Queries

Where queries or disputes in interpretation of this specification and standard drawings vis- à-vis project specifications and drawings arise, the matter must be referred to the Secretary for Health or his duly appointed representative, whose decision will be final and binding.

1.4 Competence of Installation Technicians

It is a requirement that all pipe fitters employed in medical gas and vacuum installations are able to show proof of knowledge of, and experience in such installations before commencing work on a medical gas and vacuum system.

1.5 Permit to Work

Prior to any person working on or isolating any medical gas system, a Permit to Work, as described below, and as per form B15, will be required.

1.5.1 General

The Permit to Work system is applicable to the servicing, repair, alteration and extension of existing installations within a Hospital, or any action, such as the closure of an isolating valve, which restricts the supply. This means that Permits shall also be obtained before any major item of central plant, e.g. manifold, control panel, compressor, or vacuum pump (including and standby plant), is isolated prior to servicing, repair or overhaul. The system is applicable to work on installations already in service.

1.5.2 Routine Changing of Cylinders

Permits are not necessary for the routine replacement of cylinders on manifolds nor for the recharging of liquid oxygen vessels, provided there is no danger of the supply being disrupted when these tasks are undertaken.

1.5.3 Planned Preventive Maintenance (PPM) Work

Permits will not be required for routine daily or weekly inspections (where the service is not interrupted), but follow-up work will usually involve the issue of a Permit.

1.5.4 Substantial Alterations, Extensions to, or Overhaul of Existing Installations

Work described on the Permit should normally be completed in one day, though provision is made for some carryover. Work likely to take more than one day may be initiated on the Permit, but should be

carried out under normal procedures for engineering work of this nature and commissioned in accordance with the requirements of part 2 of this specification.

1.5.5 Capital Works

Capital works undertaken by the Province's Works Department and other similar new work should be connected to an existing system only after a break point has been established. The new capital work should be tested and commissioned in the normal manner as provided for in part 2 of this specification.

1.6 Standard Drawings

The standard drawings listed here form part of this specification and must be read in conjunction with it: -

See attached drawings.

1.7 Other Standards and Publications

The following publications must be read in conjunction with this specification: -

- 1.7.1 Occupation Health and Safety Act (Act No. 85 of 1994) As amended.
- 1.7.2 Standard Specification for Electrical Installations Pertaining to Mechanical Equipment.
- 1.7.3 SABS 099 – 1974 The construction of air receivers.
- 1.7.4 SABS 460 – 1975 Copper and copper alloy tubing.
- 1.7.5 SABS 763 – 1977 Hot-dip (galvanised) zinc coatings.
- 1.7.6 SABS 948 – 1978 Three phase induction motors part 1 low voltage standard motors.
- 1.7.7 SABS 1091 – 1975 National colour standard for paint.
- 1.7.8 SABS 1189 – 1978 Single phase induction motors.
- 1.7.9 SABS 1062 – 1985 Vacuum and pressure gauges.
- 1.7.10 SABS 1409 – 1986 Outlet sockets and probes for medical services used in hospitals.
- 1.7.11 SABS 0224 Non flammable medical gas pipeline systems.
- 1.7.12 SABS 0142 Wiring of Premises
- 1.7.13 CKS 64 – 1967 Compressed Air for breathing.
- 1.7.14 CKS 332 – 1977 Industrial V-belts.
- 1.7.15 CKS 605 – 1987 Medical gas regulators.
- 1.7.16 IUSS Regulation IUSS Building Engineering Services.

2. **PROCEDURE FOR VALIDATION AND VERIFICATION OF MEDICAL GAS PIPELINE SYSTEMS**

2.1 **GENERAL**

The following tests, as applicable, are required for any additional/modifications to piping. Tests are not required after servicing of or repairs to outlet points.

2.1.1 Important Notes - The system being tested may not be commissioned until all tests as specified have been satisfactorily completed.

2.1.2 The pre commissioning tests (i.e. N°s 1 – 20) are to be executed/witnessed by: -

- a) the contractors authorised representative
- b) the responsible competent person
- c) the project manager (if applicable)
- d) the consultant (if applicable)

2.1.3 The identity tests (i.e. N°s 20 – 21) are to be executed/witnessed by the persons as listed in 2.1.2 above, plus: -

- a) The responsible clinical technician
- b) Anesthetist/medical officer

2.1.4 It is incumbent upon the contractor executing the works to submit a written request for testing/commissioning to the project manager or competent person, at least 14 days prior to the proposed date. The project manager/competent person will then advise of all parties in writing of the confirmed date(s).

2.1.5 The contractor is to provide all necessary pressure testing equipment and gas. The Department of Health (CMTD) will provide the gas analyser.

2.1.6 The sequence of tests in this procedure is important and should be followed.

2.1.7 All tests will need to be planned and carried out by the appropriate persons. Forward planning will be necessary to ensure that the necessary persons and test equipment will be available.

2.1.8 Summaries of the tests required on the pipeline carcass and on the total pipeline system are given in Tables 1 and 2.

TABLE 1 SUMMARY OF TESTS REQUIRED ON PIPELINE CARCASS

Test Order	Description	Specification Clause	Form
1	Labelling and marking	2.2.1	B1
2	Sleeving and supports	2.2.2	B1
3	Leakage	2.2.3	B1
4	Cross-connection	2.2.4	B2

TABLE 2 SUMMARY OF TESTS REQUIRED ON PIPELINE SYSTEM

Test Order	Description	Specification Clause	Form
5	Leakage from total compressed system	2.3.1	B3
6	Leakage into total vacuum system	2.3.2	B4
7	Closure of Isolating Valves	2.3.3	B5
8	Zoning of Isolating Valves	2.3.3	B5
9	Cross-connection	2.3.4	B6
10	Flow and pressure drop at terminal units	2.3.5	B7
11	Mechanical function of terminal units	2.3.5	B7
12	Gas specificity of terminal units	2.3.5	B7
13	NIST connectors (Probes)	2.3.5	B7
14	Performance tests of the pipeline system	2.3.6	B8
15	Functional tests of supply system	2.3.7	B9
16	Pressure safety valves	2.3.8	B10
17	Warning systems	2.3.9	B11
18	Verification of drawings	2.3.10	B12
19	Filling with medical air	2.3.11	B14
20	Purging and filing with specific gases	2.3.12	B13
21	Gas identity	2.2.13	B14

3. **MEDICAL GAS PIPING INSTALLATION**

3.1 Quality of Medical Gas Piping

3.1.1 Medical Gas ('MG') tubing is designed to meet the stringent requirements laid down for the distribution of medical gases in hospital services. Two categories are recognized, viz: -

- a) High pressure distribution; and
- b) Low-pressure distribution.

Only 'MG' grade to be used.

The necessary of tube bore cleanliness cannot be over-emphasized.

3.1.2 Compliance with S.A.B.S. Specifications

All piping used for medical gas and vacuum installations must be of copper and in compliance with SABS 460 – 1975 (latest amendments).

All copper tubing must be in metric sizes and comply with the sizes as used for domestic plumbing services. "Half hard" piping is required up to 35mm outside diameter in straight lengths 5,5 or 3 meters long and hard drawn piping for all larger sizes in 5,5m straight lengths.

3.1.3 Physical Properties

3.1.3.1 High Pressure Applications

"Serpentines" may be in soft annealed copper coils. Manifolds shall be in hard drawn straight copper in exact lengths of 5,5 meters or 3 meters or as described in paragraph 3.7.

3.1.3.2 Low Pressure Applications

All tubes will normally be in the "half hard" condition as standard, up to 35mm outside diameter to facilitate bending but when specially needed and for larger sizes tubes can be specified to be in the hard-drawn condition.

3.1.4 Freedom from Defects

Eddy current testing shall be carried out on all tubes to ensure freedom from physical defects as specified in ASTM Standard E243. Contractors may be required, at the discretion of the Secretary for Health, to obtain copies of documentation proving compliance with this requirement from the piping supplier.

3.1.5 Bore Cleanliness

3.1.5.1 General

All tubes shall be processed in such a manner that the bores are bright and clean. The use of carbon tetrachloride as a cleaning agent is not permissible. The measure of acceptable cleanliness shall be that specified in ASTM B.280. This requires that when the interior of a test sample of the tube is washed with trichloro-ethylene, or other solvent such as re- distilled chloroform or re-distilled trichloro-ethylene, the residue remaining upon evaporation of the solvent shall not exceed 0,0376 g/m².

3.1.5.2 The following processes have to be undertaken on Medical Grade Copper Tubing before and after annealing at the manufacturer's premises.

- a) Blowpipes clean with medically pure compressed air.
- b) Use steam vapour aggrivation next for cleaning inside of pipes.
- c) Use a hot detergent for washing of the pipes internally.
- d) Finally use a soft abrasive cleaning organic liquid. The final responsibility for ensuring that clean tubing is used in the installation rests with the Contractor. The above steps are required for all the tubing sizes in order to ensure compliance with paragraph 3.1.5.1.

3.1.6 Identification and Packing

3.1.6.1 Identification

All straight length tubes shall be identified by means of a continuous red line printed along the length of the tube, and shall have the ends protected with red plastic caps to prevent ingress of foreign matter during storage and transport.

All coiled tubes shall have their ends mechanically sealed and shall be marked M.G. All piping must be stored off the ground in a clean, safe area with the ends capped at all times.

3.1.6.2 Packaging

All straight length tubes shall be packed and delivered in timber cases of suitable size and capacity, normally half tonne (500kg) net.

All coiled tubes shall be packed in M.G. standard cardboard boxes and marked M.G.

3.2 Valves and Fittings

3.2.1 Valves

All valves are to be ball valves, with stainless steel bodies and balls and PTFE or Teflon seals.

They shall be suitable for a working pressure of 1000kPa gauge. Pipelines must be properly secured by holder bats in close proximity to the and on either side of each valve.

Valves shall be fitted into the pipeline by means of capillary hard soldered joints containing silver (see paragraph 3.3).

All types of valves tendered for shall be submitted for approval to the Secretary of Health prior to installation. The valve handle shall be the same colour as allocated to the gas.

3.2.2 Fittings

Bends and tees must be of wrought copper capillary fittings with internal stops.

Note that where pipe bends of a radius greater than 5 pipe diameters are required the tubing may be bent, provided that no flattening or thinning of the tube occurs at any point.

Bends in Class 2 tubing shall be free from flattening, buckling or thinning of the tube wall at any point. Form bends are permissible up to 28mm diameter. Elbow type fittings shall not be used unless for special purposes specified in the project specification.

Note further that makeshift methods of forming reducers, tees, joints, etc. Such as butt brazing of piping will under no circumstances be acceptable.

All clean and degreased valves and fittings shall be supplied to site in individual heat sealed plastic bags, which may only be opened just prior to installation.

3.3 Pipe Joints

Only capillary hard solder fittings for M.G. copper classes 0 and 2 tubing, shall be used up to 28mm outside diameter. Class 0 to be utilised in all larger sizes. The fittings shall be degreased similar to the Medical grade copper tubing.

Medical grade copper tubes joined by means of capillary fittings shall be jointed with hard solder with working temperatures between 600°C and 700°, using: -

- a) Self fluxing copper/phosphorous 7% minimum silver rod, as Afrox Silfos 15, or other approved.
- b) When using self-fluxing hard solder, care must be taken to ensure that the joint is not overheated.

Alcohol or borax based mixtures or resin and similar paste fluxes may under no circumstances be used.

All screw joints must be sealed by tinning the male thread with soft solder.

3.4 Pipe Sizing and Routing

3.4.1 General

Special provision may be made in the building for holes through, and chases in the walls for piping by the building contractor, but all sleeves, brackets and fixings must be done in terms of the medical gas contract. Where the builder is to do the chasing, it will be the responsibility of the Medical Gas and Vacuum Contractor to point out to the builder in good time the exact position and size of openings and chases. The Medical Gas Contractor will be held responsible at all times for the final positioning of outlets and conduits.

3.4.2 Pipe Sizing

The size of pipes for main runs and branch lines are as shown on the project drawings. The gas flow rates in MG piping must be as per the guidelines laid down by the U.K. Department of Health and Social Security in Hospital Technical Memorandum No. 22 and SABS 051. When ring mains are used these sizes can be reduced. Terminal connections to all outlet points, except as shown otherwise, may not be less than 10mm OD for oxygen, 12mm for vacuum and scavenge piping and 6mm for nitrous oxide.

3.4.3 Pipe Routes

Both horizontal and vertical pipe runs shall conform to the following sequence. From top to bottom and from left to right as appropriate. Oxygen, Nitrous Oxide, Vacuum, Low Pressure Air, High Pressure Compressed Air and Scavenging.

Horizontal pipe runs shall whenever possible not be lower than 2400mm above the floor level, unless they are suitably protected and accessible for maintenance staff.

Wherever practicable piping is to run on external walls below the eaves.

3.4.4 Wall Outlet Points

All wall outlet points shall be positioned 1,5m above finished floor level, the position in the room being shown on the project drawings.

3.5 Pipe Supports

Pipe runs in roof spaces, covered ways, under eaves and on the outside of buildings, i.e. where not in a space normally inhabited, shall be secured with "Fischer" clips. Other types of holder batts, which Tenderers may wish to offer, must first receive the approval of the Secretary for Health. In all cases dissimilar metals must be isolated.

The centre distance of supports shall not exceed the following up to and including: - Up to 10mm

outside diameter pipe	-	1,00m
12 to 15mm outside diameter pipe	-	1,25m
22mm outside diameter pipe	-	1,80m
28mm outside diameter pipe	-	2,5m
35 to 76mm	-	see project design drawings

It is required that piping be run in support trays except when mounted against a wall. Unistrut P4000 or

equal approved supports shall be used for this duty. The support shall be fixed to the structure by means of at least two suitable brackets, expanding and/or fixing bolts. The pipes shall be fixed to the support by means of P1108 – 2025 series clamps or equal.

3.6 Protection of Piping

Where pipes are to be hidden (i.e. buried in walls or structures) they shall run in conduit or other suitable hard protective piping, or run in metal channels built in and flush with the finished wall surface, with suitable covers painted to match the wall finish.

Where pipes are to be run in a location where they may be damaged by trolleys, stretchers or similar mobile equipment, or where they may be interfered with by the general public or other unauthorized person, they shall be protected by encasement in pipes or metal channels up to a height of 2m. The route of the pipes shall be so selected that they are out of the reach of traffic and the general public.

Piping in ducts, roof spaces or above suspended ceilings shall be laid in Admiralty type cable trays. These cable trays must wherever possible be installed 150mm clear of any other piping or conduits run in the same roof space, unless otherwise authorized by the Secretary for Health.

All pipes in operating theatres shall be concealed or built in. Surface mounting in existing buildings will be considered in all other areas if sanctioned by the Secretary for Health.

Where the pipes pass through walls and ceilings, etc., they shall be sleeved and provided with wall plates, which shall be rust free and painted to match the general wall finish. Where several pipes, of different diameter are surface mounted side by side, the saddle centre distance appropriate for the smallest diameter pipe shall also be used for the larger pipes.

3.7 Brackets

Pipe support brackets and clamps shall be hot-dip galvanised to SABS 763.

4. Cleaning

After assembly, the manifold, header, fittings and connections shall be blown out with medical compressed air and cleaned as specified in paragraph 3.1.5.2. A brass or copper plate shall be mounted on the manifold, stating test pressure, date of manufacture and manufacturer's name.

A certificate shall be submitted to the Secretary for Health to this effect by the Testing Authority as outlined in paragraph 2.

5 Operating Instructions

Detailed, clearly printed instructions on how to operate the manifold and including any drawings, which may be necessary, shall be provided by the contractor. These shall be mounted in glass fronted frames fixed to the wall above the manifold by the contractor.

6 Accommodation

The accommodation for the medical gas installation is existing: -

- i) A machine room for the medical air compressor, vacuum and scavenging units.
- ii) A gas bank room, or partitioned area, for oxygen and nitrous oxide cylinders.
- iii) A separate partitioned area for each of medical compressed air and each other medical gas that may be required.
- iv) An empty gas cylinder store.
- v) A full cylinder gas store.

4.7 Safety and Relief Valve Settings

Safety valve and alarm settings shall be as per Figure 1 below (as per SABS 0224 – 1990)

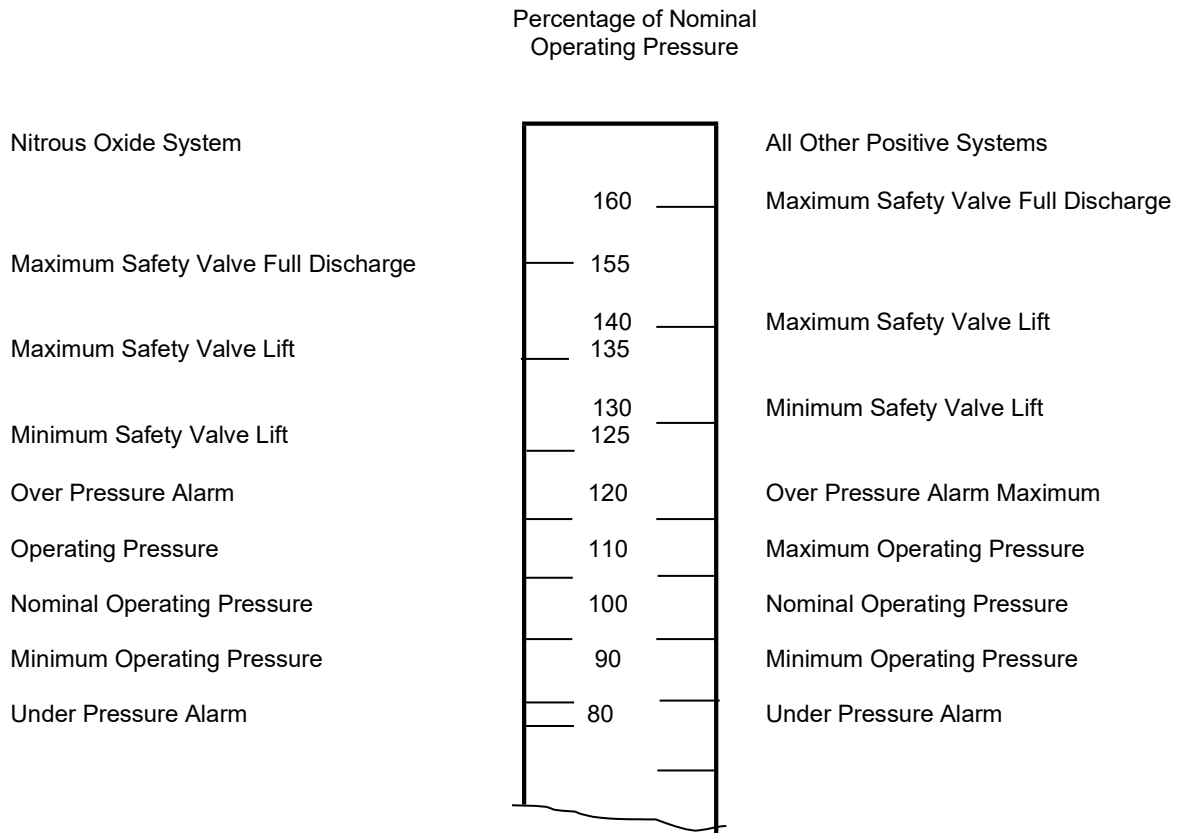


Figure 1 – Pressure Safety Valve and Alarm Pressure Settings

Note that safety valve exhaust piping is not required – the valve may vent into the plant room.

5. **MEDICAL GAS WARNING SYSTEM**

5.1 General

Visual and audible alarms will be a part of the medical gas system. The main function will be to indicate a malfunction as detailed in the warning light system described below.

A green light will indicate power continuity for the system. A "fault" on the banks for each "gas" shall be indicated by means of two RED lights, i.e. one for the left bank and one for the right. When a "fault" condition occurs, a RED light will come on and indicate whether the left or right bank is "faulty", i.e. when pressure has fallen in that bank. The light indicating the fault will remain on until such time as the "fault" condition has been rectified, i.e. a depleted bank has been replaced with a fresh supply of full cylinders.

Simultaneously with the above light indication, an alarm, which may be a buzzer or siren, will sound at the slave alarm panel only. The alarm can be muted at the slave indicating alarm panel in the appropriate area, but must recur at fixed time intervals until the fault is rectified.

A slave indicating alarm panel shall be placed in an area, which is manned 24 hours a day. The position of this panel will be dictated by local conditions as specified in the project specification and drawings.

These areas are as follows: - i)

Reception Centre.

ii) Casualty and Main Theatre. iii)

Maternity Section.

5.1.1 Power Supply for Indicating Lights

The indicating lights shall be served by a 24 V DC supply and shall not have relays to actuate them. The system shall employ solid state circuitry. The cable shall be laid in trays reserved for medical gas installation and then fixed by means of saddles of an approved type, at one meter centers. A single phase 15 amp switch socket supply point shall be provided adjacent to the alarm panel, connected directly to the distribution board on a separate circuit by an electrical contractor.

6. **MEDICAL GAS OUTLETS**

All wall outlets shall be positioned 1,5m above floor level in positions shown on the drawings.

Where extensions are being carried out to existing hospital layouts, it is essential that the medical gas outlets are identical to those already in use. Fittings and outlets from the same supplier shall be used throughout the entire hospital.

Outlet points on all new hospital installations shall be flush mounted, non-protruding, quick coupling, self-isolating types with safety keyed connections, similar or equal to Heyer outlets to the configurations outlined in S.A.B.S. Specification 1409 – 1986 (outlet sockets and probes for medical gas and vacuum services used in Hospitals).

The probes must be marked the same colour as the cover plate. For new installations in existing hospitals where surface mounting of tubing and fittings is specified, outlet points shall be as above and be of the surface mounted type. The use of check valves incorporated in the outlet point is optional and depends on the project.

6.1 Indexing

The medical gas outlets and probes shall be indexed and mated such that under no circumstances can anything but the correct probe be inserted into the appropriate gas outlet valve; for example, it shall not be possible to insert a N₂O probe in an oxygen outlet or vice versa. The probes and outlets shall also be correctly identified. This shall be achieved by easily distinguishable shapes of probes and outlets and by permanent colouring of the probes and outlets. The outlets and probes must be as per the above S.A.B.S Specification.

6.2 Grouping

Each probe shall have permanently and clearly engraved upon it, the identification of the service, e.g. O₂, N₂O, Vac, Air and HP Air.

When a group of outlets are installed adjacent to each other the order from left to right as given above, shall always be followed. The outlets shall be such that the valve mechanism is easily accessible for maintenance purposes without having to unsolder pipe connections or break into the wall etc. Outlets shall receive the approval of the Secretary for Health, before installation.

Probes used in outlets under pressure shall have unidirectional flow.

6.3 Cover Plates

Each outlet shall have permanently and clearly engraved on the cover plate: - The

full word **Oxygen**

The full word **Nitrous Oxide**

The full word **Vacuum**

The full word **Air Low Pressure**

The full word **Air High Pressure**

Cover plates may be constructed of laminated glass fiber reinforced with resin and with silk-screen printed transfer laid in between.

6.4 Labelling

Each medical gas outlet is to be labeled with a 30 x 10 x 4mm thick plastic label, screwed or pop-riveted to the outlet / or wall/ trunking immediately adjacent to the point. The label is to be the colour as per the gas (see colour coding item 12.).

For any new or replacement installation the Project Manager is to supply in writing for numbers from the Department of Health Head Office : Facilities Management, with full details of, and the locations of each outlet. Similarly, any redundant points are to be listed.

7. **ISOLATING VALVES**

7.1 Isolating valve cabinets shall be installed wherever shown on the drawings. They shall be of a size equal to that indicated for the pipeline in which they will be installed and shall be full bore. All valves except those mounted in the gas bank room or above suspended ceiling panels shall be housed as described in paragraph 5.3.

All isolating valves for gases and vacuum must be as specified in paragraph 3.2.1.

7.2 Positioning of Isolating Valves – Main and Branch Lines

Isolating valves serving outlets, which are located either singly or in groups, shall be placed in the same area as the outlet or outlets they are intended to serve and on the same floor. They shall not be placed in the roof or inaccessible spaces but high up on the wall under the ceiling where they can be reached by skilled maintenance staff. Where suspended ceilings are installed, the valves may be installed above the ceiling, and the applicable panel is to be marked "Medical Gas Isolating Valves Behind this Panel". In such cases, valve boxes are not required. A vacuum bottle trap is to be installed with each set of valves.

7.3 Isolating Valve Boxes

7.3.1 General

The design of the valve boxes shall be similar to the distribution board used for electrical distribution in buildings, and shall be complete with architrave frame and flush piano- hinged door with catch. The valve boxes shall be large enough to accommodate the number of isolating valves,

which shall serve the branch lines shown on the drawings.

Reference must be made to drawing number M040301.

Where surface mounted pipelines are specified, valve boxes shall be of the surface mounted type and the complete box is to be painted white. The box is to be butted up to the ceiling.

In the case of ceiling mounted valve boxes the frame shall be suspended from the concrete ceiling or roof timbers by adjustable hangers designed to suit the installation and which allows the frame to sit neatly and securely against the underside of the false ceiling or ceiling panel.

Valves boxes mounted in ceiling voids must in addition be locked with brass padlocks. All locks a particular installation must be keyed alike; keys must be handed to the Department's Representative at the time of first delivery.

7.3.2 Valve Boxes – Paint Finish

All metal parts shall be degreased, rinsed, pickled, rinsed, phosphate, neutralized and then thoroughly dried. This process shall be followed up within 48 hours by white epoxy coating or one layer of a high quality zinc chromate primer, followed by two coats of good quality white alkyd based enamel. The minimum film thickness of the paint shall not be less than 63 micrometer.

Care shall be taken that all edges are properly covered by paint.

Paint used on boxes shall have an impact resistance of 2,20 J on 0,9mm mild steel plate and a scratch resistance of 2000g.

7.4 Valve Boxes – Markings

An engraved nameplate shall be fitted to the door of each valve box to read as follows: -

**AUTHORISED PERSONS ONLY
MEDICAL GAS
ISOLATING VALVES
DO NOT CLOSE**

Engraved isoprene nameplates shall be provided inside the cabinet to identify each valve. Each valve shall be painted according to the colour(s) specified in the colour code, paragraph 11. A notice indicating the room(s) fed shall be fixed inside each box. Room identification is to be obtained from the Architect and shall be by means of room number only – descriptive terms shall not be used. Valves boxes shall be installed as described in paragraph 5.3.1. Valve boxes and control cabinet doors shall have handles incorporating a mechanical door catch. Control cabinets and valve boxes shall be lockable with an electrical panel type square key. All isolating valves shall be Clearly and permanently labeled indicating the area served. This labelling shall be done by the Medical Gas Contractor.

8. **MEDICAL COMPRESSED AIR**

8.1 Required Pressures

There are two systems of medically pure compressed air in general use. System A which is to supply air to operating theatres for use on surgical instruments and System B, which is to supply air for respiratory purposes to wards and theatres.

System A units shall be High Pressure Air, regulated between 700 kPa and 800 kPa gauge and System B shall for Low Pressure Air, regulated at 400 kPa gauge.

8.2 Piping System

The medical compressed air system, so far as pipe runs, outlets, etc. are concerned, shall be as specified in the Project Specification. Pipes shall be of medical grade copper as specified in paragraph 2.1 above.

The air shall be free from oil moisture and bacteria. The pressure requirements for respiratory purposes are for use either as a driving gas for respiratory machines, or for air/oxygen mixing. The medical gas keyed probes shall be in accordance with S.A.B.S. 1409 – 1986 (Outlets Sockets and Probes for Medical Services used in Hospitals).

The medical compressed air shall be dried by bacterial filtration desiccant driers and refrigerated air driers as detailed in the Project Specification.

Starting at the plant room and immediately after the compressor, receiver, driers, filters, etc., the supply line shall be split and pressure reducing valves installed in each leg to produce the required pressure for the low pressure supply lines system B and high pressure lines system A. the pipelines shall each have relief valves to prevent excess pressure build-up in case of regulator failure.

9. **VACUUM SYSTEMS**

9.1 General

The vacuum shall be provided by two vacuum pumps driven by electric motors, with receiver and one set of controls. The pumps shall be of the reciprocating type, silent running, suitable for the purpose and be of a capacity as stated in the project specification. The vacuum shall not rise above 50 kPa absolute when the system is in full operation. The vacuum pump's electric motors shall be connected to the standby generator.

9.2 Operating Range

The pumps must each be capable of maintaining a vacuum of 60% of peak demand and will normally cycle between the range 20 kPa absolute maximum and 50 kPa absolute minimum. Diversity factors in accordance with good standard practice shall be applied in the sizing of the vacuum pump and piping.

A terminal point flow rate of 15 litres per minute with a diversity factor, varying from 20% to 100%, can be used for pipe sizing, depending on the location of the Hospital.

9.3 Installation

If required, the vacuum pump shall be fitted with a silencer of the expansion vessel type. The vacuum pump shall be mounted as specified in paragraph 8.7. The pipe connections to the receiver shall be resilient. A bacterial filter is not required.

9.4 Vacuum Bottle Traps

These shall be of the Afrox single valve, or other approved, type. Bottle traps are to be located in visible positions in service areas, as close as possible to the area(s) being served.

10. **SCAVENGING SYSTEMS (Low Vacuum High Volume)**

10.1 General

Exhalation of anesthetic gases from closed circuit absorbers, respirators and any anesthetic equipment shall be subjected to a separate suction system which shall remove the anesthetic gases and exhaled air to the outside of the building, released in such a position so as to avoid re-contamination through recirculation. The scavenging system shall operate on the low vacuum high volume principle.

The outlet point shall be positioned at the extreme right-hand position of all the medical gas and vacuum terminal points when required to be wall mounted or on the bottom surface of the gas pendant.

An operating pressure of 6 kPa gauge is required. It shall be capable of evacuating a least 25 l/min at each outlet point. It shall overcome the system resistance. A dedicated piping system is required i.e. scavenging is to be done by means of a central turbine fan suction unit. The scavenging system shall have a capacity as detailed in the project specification.

Reference must be made to standard drawing M040305.

10.2 Scavenging System Layout

The ducting may be in P.V.C piping or copper tubing and all joints must be sealed airtight. Dampers must be provided in the ducting to balance the system (refer to drawing M040305).

The distribution plenum shall be made of rigid PVC and shall be sealed airtight. Such a system shall be connected to the theatre pendant or wall outlet. The fittings are all to be 30mm to ISO 5356 with 12mm terminal pipe sizing. The flexible tube must be installed on the pendant in a manner allowing for removal of the access plate without damage.

11. **BOOM ARMS AND PENDANTS**

11.1 General

Booms arms and pendants may be provided for medical gas outlets in operating theatres. They are to be positioned in the theatre to suit the specialist surgical teams as shown on the particular drawings. The fixed pendant shall be 1,9m clear above the finished floor level.

11.2 Installation

The method of mounting a pendant on concrete ceilings shall be shown on standard drawing M040302. The bolts for holding the mounting flange shall be cast into the concrete or shall be expanding bolts. A suggested method of mounting pendants where fibrous plaster or board ceilings are used is also shown on drawing M040302. If contractors wish to employ another method, then this method must be approved by the Secretary for Health prior to the work being put in hand.

11.3 Pipe and Electrical Connections

Whichever method of installation is used, contractors must ensure that easy removal of the pendant is possible, i.e. it shall be possible to disconnect all pipe and electrical connections to the pendant easily. The electrical supply to the pendant will be installed by an electrical contractor, the conduits terminating the end boxes. It will, however, be the responsibility of the medical gas contractor to arrange for the correct position thereof and to carry out the final connecting up of the electrical equipment.

VOLUME 2.4 PART 3: MEDICAL GAS – DETAILED SPECIFICATION

1.0 Medical Gas Piping

Reference must be made to the Standard Specification (Part C3.5 of this specification) and to SANS 1453-1988 (latest amendments).

The required piping routes are indicated on the drawings and shall be adhered to.

It will be the medical gas contractor's responsibility to install the necessary piping as indicated on the drawings. It is thus essential that great care be taken to avoid damage during piping installation.

Piping to be chased into walls shall be run in appropriate conduiting 15 mm larger in diam. Chasing of the walls for this conduiting shall be the responsibility of the medical gas and vacuum contractor and shall be done, together with the installation thereof and terminal boxes to suit the service outlet points prior to the walls being plastered. Should walls be chased after plastering and/or painting it will be the medical gas contractor's responsibility to make good the affected area at his own cost and to the satisfaction of the architect.

2.0 Medical Gas Service Outlet Valves

All outlets will be supplied by the medical bedhead supplier, complete with piping to ceiling void. Connection of reticulation to piping is required as part of this installation.

3.0 Medical Air Compressors

Supplied by hospital. Connection to this equipment forms part of this pricing document.

4.0 Vacuum Plant

Supplied by hospital. Connection to this equipment forms part of this pricing document.

5.0 LP Air Compressors

Supplied by hospital. Connection to this equipment forms part of this pricing document.

6.0 Oxygen Bank

Supplied by hospital. Connection to this equipment forms part of this pricing document.

7.0 N2O Bank

Supplied by hospital. Connection to this equipment forms part of this pricing document.

8.0 Isolating Valve Cabinets

Reference must be made to section in this specification.

9.0 Warning Light Panels

Reference must be made to section 3.7 of part four of this specification.

A full electronic warning light panel incorporating the following functions is required in the main oxygen and nitrous oxide gas bank room:

- a) Oxygen main bank "Normal" and "Failed"
- b) Oxygen standby bank "Normal" and "Failed"
- f) Vacuum plant "Normal" and "Failed"
- g) Power On indicator light
- h) Fault re-set button (main panel in gas bank room only)
- i) Alarm mute button
- k) Audible fault alarm

Slave panels incorporating all the functions as listed except for the fault re-set button are required to be installed at the nurses' stations in each of the following areas:

- (i) Operating Theatre / CSSD block
- (ii) Anti Natal Clinic
- (iii) Ward 1
- (iv) Ward 2

When a fault occurs the appropriate "Failed" light shall flash and an audible alarm shall sound on each

of the main and slave panels. An alarm mute facility shall be provided on each panel. The "Failed" indicator lights shall continue flashing until the fault has been rectified and the main panel has been re-set.

10.0 Commissioning and Testing

Reference must be made to section 10.0 of part four of this specification.

It is again stressed that responsibility for the correct operation of the piped medical gas and vacuum installation rests entirely with the medical and vacuum contractor. This includes pipe cleanliness, continuity of individual gas supplies, correct operation of compressed air plant, vacuum plant and warning light system.

Pressure testing of the reticulation system shall be carried out as described in part four of this specification. Pressure test certificates indicating the sections tested, the date, pressure attained, duration and outcome of the tests shall be submitted to the Engineer and included in the operating and maintenance manuals.

Anti-confusion checks of the system shall be carried out by the contractor and when he is satisfied that there are no cross-connections, etc the entire system shall be verified by the Engineer in the presence of the contractor and a representative of the hospital staff or Department of Health. The results of the anti-confusion tests shall be entered on the forms to be provided and signed off by the Engineer, contractor, and representative of the hospital staff.

Note that practical completion of the installation will not be taken unless and until all relevant tests have been satisfactorily carried out and all faults corrected.

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - BLOCK H
 VOLUME 2,4 PART 4 MEDICAL GAS INSTALLATION**

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
1,0	BILL NO. 1 : PRELIMINARY AND GENERAL				
1.1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,3	Tools and equipment, Communication, transport.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1.4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1		
1,6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1		
1,7	Final inspection of the works by an accredited representative and signing off of the installation	Item	1		
1,8	The bidder must price for his staff to wear distinctive overalls/work clothes and hard hats. For the duration of the contract name tags must be provided to all employees on site, whether in work clothes or not				
1,9	Provide for atendance of health and safety meetings called by the Main Contractor				
Total Carried forward to Summary Page					

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - BLOCK H
 VOLUME 2,4 PART 4 MEDICAL GAS INSTALLATION**

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
2,0	BILL NO. 2 : REMOVAL OF EXISTING REDUNDANT EQUIPMENT				
2,1	Removal of Oxygen Piping 15 & 12 mm	m	133		
2,2	Removal of LP Air Piping 15 & 12 mm	m	133		
2,3	Removal of Terminal Units Oxygen	No.	72		
2,4	LP Air	No.	72		
2,5	Box and return terminal units to hospital maintenance	Sum	1		
2,6	Cut into branch pipe and blank off 15 mm Oxygen	No.	4		
2,7	15 mm LP Air	No.	4		
2,8	22 mm Oxygen	No.	2		
2,9	22 mm LP Air	No.	3		
2,10	28 mm Oxygen	No.	1		
2,11	28 mm LP Air	No.	0		
	COPPER PIPE WORK				
2,12	New Oxygen piping 15 mm	m	6		
2,13	New LP air piping 15 mm	m	6		
	TERMINAL UNITS				
	Terminal Unit + Connection of piping to terminal.				
2,14	Oxygen outlets	No.	1		
2,15	Nitrous oxide outlets	No.	1		
	STRAIGHT COUPLERS - SOLDER TO SOLDER				
2,16	15 mm	No.	12		
	ELBOW 90° - FITTING TO SOLDER & SOLDER TO SOLDER				
2,17	15 mm	No.	6		
	Hydraulic pipe hangers and brackets				
2,18	15 mm	No.	12		
Total Carried forward to Next Page					

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - BLOCK H
 VOLUME 2,4 PART 4 MEDICAL GAS INSTALLATION**

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Total Carried From Previous Page					
PIPE IDENTIFICATION AND COLOUR CODING & EARTHING					
2,19	Application of colour banding and flow directions as per SANS 0224 and SANS 06	Sum	Lot		
2,20	Bonding to earth of all piping at entrance to each building as per SANS 0224	Sum	Lot		
CLEANING & DISSINFECTION					
2,21	Cleaning, flushing and disinfection of piping	Sum	Lot		
TESTING					
2,22	Testing of entire system to ensure all modifications; additions to system intergrate, to ensure 100% operational status	No.	1		
Total Carried forward to Summary Page					

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - BLOCK H
VOLUME 2,4 PART 4 MEDICAL GAS INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3,0	BILL NO. 3 : COPPER PIPE WORK & FITTINGS TO THEATRE Capillary type copper tube fittings to SANS 1067 Part 2 including cutting, reaming and soldering of joints with hard type solder and pipe supports as specified. Pipe work to run in conduit chased into walls, or in bed head ductings or above ceiling NOTE: Straight couplers, fitting reducers and bends up to 28 diam will not be measured as separate items and are to be included in the rates for straight piping. Supply, delivery to site and installation to SANS 1453 copper pipe work Class as specified.				
3,1	Oxygen piping 15 mm	m	184		
3,2	22mm	m	21		
3,3	Oxygen piping chased into walls 15 mm	m	20		
3,4	Oxygen piping in bedhead truncking 15 mm	m	10		
3,5	Nitrous Oxide Piping 15 mm	m	403		
3,6	Nitrous Oxide piping chased into walls 15 mm	m	20		
3,7	Nitrous Oxide piping in bedhead truncking 12 mm	m	10		
3,8	Low Pressure Medical Air Piping 15 mm	m	184		
3,9	22mm	m	21		
3,10	Low presure air piping chased into walls 15 mm	m	20		
3,11	Low pressure air piping in bedhead truncking 15 mm	m	10		
Total Carried forward to Next Page					

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - BLOCK H
 VOLUME 2,4 PART 4 MEDICAL GAS INSTALLATION**

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Total Carried From Previous Page					
3,12	Vacuum Piping 15 mm 22 mm 28 mm 35 mm	m m m m	184 21 10 403		
3,13	Vacuum piping chased into walls 15 mm	m	20		
3,14	Vacuum piping in bedhead trunking 15 mm	m	10		
TEES - SOLDER TO SOLDER TO SOLDER					
3,15	Oxygen: 15 mm	No.	12		
3,16	Nitrous Oxide: 12 mm	No.	2		
3,17	Vacuum: 15 mm	No.	22		
3,18	22 mm	No.	10		
3,19	28 mm	No.	10		
3,20	35 mm	No.	10		
3,21	Low Pressure Air 15 mm	No.	14		
STRAIGHT COUPLERS - SOLDER TO SOLDER					
3,22	15 mm	No.	107		
3,23	22 mm	No.	21		
3,24	28 mm	No.	10		
3,25	35 mm	No.	67		
ELBOW 90° - FITTING TO SOLDER & SOLDER TO SOLDER					
3,26	15 mm	No.	60		
3,27	22 mm	No.	26		
3,28	28 mm	No.	22		
3,29	35 mm	No.	22		
Total Carried forward to Next Page					

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - BLOCK H
 VOLUME 2,4 PART 4 MEDICAL GAS INSTALLATION**

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
Total Carried From Previous Page					
FITTING REDUCERS - FITTING TO SOLDER TO SOLDER					
3,30	22 to 15 mm	No.	20		
3,31	28 to 22 mm	No.	30		
3,32	35 to 28 mm	No.	30		
Hydraulic pipe hangers and brackets					
3,33	15 mm	No.	221		
3,34	22 mm	No.	21		
3,35	28 mm	No.	10		
3,36	35 mm	No.	403		
PIPE IDENTIFICATION AND COLOUR CODING & EARTHING					
3,37	Application of colour banding and flow directions as per SANS 0224 and SANS 06	Sum	Lot		
3,38	Bonding to earth of all piping at entrance to each building as per SANS 0224	Sum	Lot		
GAS PLANT ROOM					
Decommission plant, prep pipework, cut into existing main supply feed and connect					
3,39	Vacuum 35 mm to 76 mm diam main supply feed	No.	1		
3,40	N2O 15 mm to 35 mm diam main supply pipe	No.	1		
CLEANING & DISSINFECTON					
3,41	Cleaning, flushing and disinfection of piping	Sum	Lot		
TESTING					
3,42	Testing of entire system to ensure all modifications; additions to system intergrate, to ensure 100% operational status	No.	1		
Total Carried forward to Summary Page					

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - BLOCK H
VOLUME 2,4 PART 4 MEDICAL GAS INSTALLATION

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
4,0	BILL NO. 4 : OUTLETS, VALVES, VALVE BOXES & LINE EQUIPMENT TO THEATRE Connection of piping to terminal and dropper supplied by bedhead supplier.				
4,1	Oxygen outlets	No.	6		
4,2	Nitrous oxide outlets	No.	4		
4,3	Vacuum outlets	No.	8		
4,4	Low pressure medical air outlets	No.	6		
4,5	Scavenge outlet	No.	2		
	VALVES Supply, deliver to site and installation of stainless steel three piece ball valves with renewable seals and seats. Oxygen, Nitrous Oxide & LPA				
4,6	15 mm	No.	24		
4,7	22 mm	No.	3		
4,8	28 mm	No.	3		
4,9	35 mm	No.	3		
4,10	Supply, deliver to site and installation of 22 mm diam vacuum bottle trap c/w isolating and by-pass valves, glass bottle and mounting bracket equivalent to Afrox ECD medical Pipeline Vacuum Bottle Trap	No.	2		
	VALVE BOXES Supply, deliver to site and installation of surface mounted valve boxes c/w all labels and indicators as specified Valve boxes containing isolating valves and exposed indication gauges; gauges included in price, valves measure elsewhere.				
4,11	4 way	No.	2		
	Alarm panel:				
4,12	Supply, deliver to site and installation of Medical alarm main panel, panel to include oxygen, vacuum and low pressure medical air alarms.	No.	1		
4,13	Supply, deliver to site and installation of pressure sensors, minimum leak devices and interconnecting wiring.	No.	1		
	Total Carried forward to Next Page				
	Total Carried From Previous Page				

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - BLOCK H
 VOLUME 2,4 PART 4 MEDICAL GAS INSTALLATION**

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
4,14	Supply, delivery to site and installation of uninterruptible power supply for alarm panel in theatre block. UPS unit to be located in cylinder room. Supply, deliver to site and installation of Mylar screened conductor, for connection between panels and sensors. Drawn into conduit.	No.	1		
4,15	0.22 mm sq x 2 Core screened cable Scavenge System Supply and Install:	m	80		
4,16	Extract fan, or similar, RB7/0,5 single inlet radial bladed, direct drive fan, c/w 0,55 kW, 2850 rpm, 380 3 Phase motor, Q = 0,118 m³/s at 68,6 WG	No.	1		
4,17	Exhaust plenum, lined with 15 mm insulation, flame spread index of 0, Suction pipes, tested to 70 litres/min at suction pressure of 20 mm H2O.	No. m	1		
4,18	22 mm piping CLEANING & DISSINFECTION	m	50		
4,19	Cleaning, flushing and disinfection of piping TESTING	Sum	Lot		
4,20	Testing of entire system to ensure all modifications; additions to system intergrate, to ensure 100% operational status	No.	1		
Total Carried forward to Summary Page					

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - BLOCK H
 VOLUME 2,4 PART 4 MEDICAL GAS INSTALLATION**

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
5,0	BILL NO. 5: TESTING AND COMMISSIONING				
5,1	Line Pressure Test Oxygen	Sum	1		
5,2	Nitrous oxide	Sum	1		
5,3	Low pressure medical air	Sum	1		
	Gas Purity Tests				
5,4	Oxygen	Sum	1		
5,5	Nitrous oxide	Sum	1		
5,6	Low pressure medical air	Sum	1		
5,7	Vacuum	Sum	1		
	O&M Manuals				
5,8	Submit Maintenance and Operating Manuals for approvals and carry out required changes for approval.	sum	1		
	Documentation				
5,9	Submit complete approval and release forms. Hard copy format only	sum	1		
5,10	Operating manuals	set	3		
5,11	Maintenance manuals	set	3		
5,12	Prints of "RECORD" DRAWINGS	set	3		
	Training				
10,16	Training of hospital staff	day	3		
Total Carried forward to Summary Page					

**BNM CONSORTIUM - RNA CONSULTING ENGINEERS
 PHASE 1
 CMH - BLOCK H
 VOLUME 2,4 PART 4 MEDICAL GAS INSTALLATION**

PRICE SUMMARY

BILL NO.	DESCRIPTION	AMOUNT
1	BILL NO. 1 : PRELIMINARY AND GENERAL	
2	BILL NO. 2 : REMOVAL OF EXISTING REDUNDANT EQUIPMENT	
3	BILL NO. 3 : COPPER PIPE WORK & FITTINGS TO THEATRE	
4	BILL NO. 4 : OUTLETS, VALVES, VALVE BOXES & LINE EQUIPMENT TO THEATRE	
5	BILL NO. 5: TESTING AND COMMISSIONING	
SUBTOTAL		
CONTINGENCY 2,5%		
SUBTOTAL		

REMINDER NOTE

The Total Price including Main Contractor's Mark-up which excludes VAT, must be carried over to the final summary in Volume 1 and all fixed amounts shown in the price schedule must be included therein. No adjustments will be made for any failure by Tenderers to include the fixed amounts in the Total Price for this particular installation.

SUB-CONTRACTOR'S NAME:

DATE:

SIGNATURE:

N.B. The above-named Sub-Contractor is to be employed on this contract. Substitute Sub-Contractors are not acceptable.

The price submitted include all Main Contractor's 'Profit and Mark up BUT Exclude the VAT when transferring price to Volume 1 of the Final Summary Total of the Main Contractor's Document

VOLUME 2.4 PART 5: MEDICAL GAS – MATERIALS AND EQUIPMENT OFFERED

The following schedules shall be completed in full. Failure to do so may invalidate the tender.

Medical Gas Piping

Piping material
.....
Country of origin
.....
To which SANS specification does
It comply
.....

Medical Gas Service Outlet Valves

Maker's name & model
.....
Country of origin
.....
To which SANS specification do
they comply
.....

Isolating Valve Cabinets

Maker's name
.....
Dimensions
.....
Make & type of isolating valves
.....
Make & size of pressure gauges
.....
Do the units comply with the specification ?

Warning Light Panels

Maker's name & model
(a) Main panels
.....
(b) Slave panels
.....
Do the units comply with the specification ?
.....

LEGEND

- VALVE BOX
- ⊠ MEDICAL GAS ALARM PANEL
- ⊠ ISOLATING VALVE
- OXYGEN LINE
- NITROUS OXIDE LINE
- VACUUM LINE
- LOW PRESSURE MEDICAL AIR LINE
- SCAVENGING LINE
- OXYGEN OUTLET
- NITROUS OXIDE OUTLET
- VACUUM OUTLET
- LOW PRESSURE MEDICAL AIR OUTLET
- SCAVENGING OUTLET
- VACUUM TRAP
- PRESSURE SWITCH

GENERAL NOTES:

REVISIONS			
REV	DATE	INIT.	DESCRIPTION
00	06/07/23	TW.	Issued for Information

CLIENT

TITLE
MEDICAL GAS EQUIPMENT LAYOUT

CMH
 BLOCK H



COPYRIGHT
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DESIGN	TENDER	CONSTRUCTION
	✓	

DESIGNED BY: T. WARNE SCALE: 1:50

DRAWN: T. WARNE DATE: 26/01/2024 PRINT DATE: 26/01/2024

CHECKED BY: Travis Warne
 REGISTRATION No. 201770017

SIGNED:

DRAWING NO. 2217-M-T-101 MG BLOCK H REV No. A



ROOF SHEETING: 8MM ALUMINIUM-ZINC AZ200 ROOF SHEETING ON ENGINEERED STEEL STRUCTURE - 100X50X20X2 GMS CHANNEL PURLINS SET AT HEIGHTS TO FALL AT MAX 1500MM SPACING, IN 175X50X20X2 GMS CHANNEL FRAME BOLTED IN CORNER WITH GALVANIZED SLOTTED BRACKETS, ON 76X16 GMS SQUARE TUBE FIXED IN FORMERS, CANOPY 270MM HIGH

VOLUME 2.5 BLOCK H

MECHANICAL INSTALLATION

Autoclave Equipment

VOLUME 2.5 PART 1: AUTOCLAVE EQUIPMENT - 1 SCOPE OF WORKS

AUTOCLAVE EQUIPMENT INSTALLATIONS

1. GENERAL

- 1.1 The Standard for Uniformity in Construction Procurement published in terms of the Construction Industry Development Board (CIDB) Act, 2000 (Act No. 38 of 2000), the Standardized Construction Procurement Documents for Engineering and Construction Works as issued by the CIDB and any other relevant documentation pertaining thereto must be studied and all principles in this regard must be applied to all procurement documentation, practices and procedures.

2. THE CONTRACT

2.1 EARLY WARNING SMOKE DETECTION & SUPPRESSION INSTALLATIONS

The work to be carried out and commissioned by a approved installer:

- a. Installation of new 160L pass through autoclave,
- b. Water treatment plant,
- c. Testing and Commissioning,
- d. Manuals, Drawings, OEM Literature,

2.2 Existing

Building is Existing.

2.3 Order of The Works

As per the building contractors' program of works.

VOLUME 2.5 PART 2: AUTOCLAVE EQUIPMENT – PROJECT SPECIFICATION

STERILIZATION EQUIPMENT

These standard specifications outline the basic principles of materials and workmanship to be utilised and employed in this installation. The detail specification (Part 5A) details the exact methods to be employed and the equipment to be installed. The Detail Specification thus takes precedence over these standard specifications.

1.0 GENERAL

1. GENERAL

This supplementary specification is for the supply, delivery, and installation of two high pressure high vacuum electric steam sterilizers (autoclaves) and all ancillary equipment and two table top type flash autoclave units c/w stainless steel wall mounting bracket.

Where reference is made in this specification and any drawings and documents mentioned therein to the Factories, Machinery and Building Works Act of 1941 this shall be deemed to be replaced by the Occupational Health and Safety Act, 1993.

Where reference is made in the Specifications and any drawings and documents mentioned therein to "Secretary for Public Works" or "Department of Public Works" or "Director General: Community Development" and "Department of Community Development", this shall be replaced by "Director General: Public Works" and "Department of Public Works" respectively.

This specification must be considered as part of the Reference Standards:

Bids shall only be considered if the following requirements are strictly adhered to during the bid process:

- The main bid shall comply with the specification in all respects and no changes will be allowed in the Price Schedule or in the information schedules.
- The Schedules of the bid document must be completed fully and in detail for the bid. Any incomplete section will be regarded as not to specification and may lead to disqualification of the bid.
- Bidders may hand in alternative bids together with the main bid. Alternative bids will be considered if the main bid is acceptable. Alternatives shall be presented on separate pages but in the same format and details per the Specification. It shall be clearly shown what the differences are between the main offer and the alternative offers.
- When the total bid price of the installation is carried over to the price schedule form, it must include the first 12 months maintenance as specified.
- Bidders must ensure that the bid document is studied in full and that all the conditions are complied with during the bid process.

2. DRAWINGS AND APPROVAL

The bid drawings must be returned with the bid. Any proposed alterations to the layout shall be indicated on these drawings in red ink and may only be submitted as an alternative bid.

Not later than three weeks after signing the contract, or receiving verbal instruction, the successful bidder shall submit to the Engineer either four copies of his detailed working drawings, or written confirmation that the bid drawings will be used.

Approval by the Engineer of drawings submitted by the Contractor shall not relieve the Contractor of his liability to carry out the work in accordance with the requirements of the contract documents.

3. SCOPE OF WORK

General

The standard specification shall apply unless otherwise indicated in this section.

The drawings issued herewith and listed in the relevant section are to be read in conjunction with the specification and all items mentioned, together with all ancillary equipment necessary for the correct installation, operation and full compliance with the Standards and codes must be provided, notwithstanding the fact that they may not have been included in detail in these documents.

The bidder shall, at the time of bidding, draw the Engineer's attention to any omissions or discrepancy between the specification and the drawings and request from him clarification of details or responsibilities.

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

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

If any such items of equipment, brackets and accessories, etc., have been omitted from a supplier's quotation, or incidental work is necessary, the bidder must include for all such items and work in the bid.

The work performed shall comprises:

The supply, delivery, off-loading, interim storage, installation, testing, commissioning and leaving in good working order of the complete Autoclave installation inclusive of all guarantees as specified herein and the supply of 'AS IS' installation record drawings, Maintenance and Operating Manuals for:

- The supply and installation of one electric 160 litre autoclaves double door (pass through) Type autoclaves.
- All wiring
- The commissioning, staff training and handing over of the installation inclusive of all manuals, drawings and OEM literature and the training of Hospital personnel in the operation and maintenance of the Autoclave as required and specified.
- The liaison with a Building Contractor carrying out building work as specified if and when required.

4. DESIGN CONDITIONS

Location: Cecelia Makiwane Hospital, Buffalo City, Eastern Cape,

Altitude: 0 m above mean sea level

External: Summer Max. Average : 34,0 DB : 23,0 WB

Winter Min. Average : 10,0 DB : 55% RH

5. 160 LITRE AUTOCLAVE

The Autoclaves shall conform to SANS 982-2009. Amplifications of the specific standard clauses and additional requirements are contained hereafter. The equipment supplied must be capable of meeting all requirements stated hereafter.

1. SCOPE

1.1 The autoclave shall have an independent steam supply and be suitable for sterilizing:

unwrapped utensils
instruments (flash cycle)
hollow ware
wrapped goods (packs)
porous loads
fluids
rubber goods wrapped and unwrapped

2. DEFINITION

3. TYPES

The sterilizer shall be Type B

4. FUNCTIONAL REQUIREMENTS

4.1 STEAM CONTROL AND PRESSURE

4.1.1 Pressure Reducing Valve

The jacket/chamber inlet shall be fitted with a safety valve set to release steam at 10% above set point.

Steam pressure in the chamber and jacket shall be controlled by means of differential pressure switches which will control the pulsing of steam.

4.1.2 Steam Separator

4.1.3 Operating Pressure

4.2 AIR REMOVAL SYSTEM

Air removal shall be via a multistage liquid ring vacuum pump. The pump shall be mounted a resilient anti-vibration mounting fixed to a stainless steel drip tray.

4.3 OPERATOR CONTROLS

4.3.1 General

All controls shall be clearly and permanently marked in English.

4.3.2 Handles and Hand-Wheels

Valve handles shall be smooth and not less than 55 mm in diameter.

4.4 CYCLE AND STAGE CONTROLS

4.4.1 Automatic Control

4.4.2 Operating Cycle

An operating cycle shall consist of the following stages or any combination thereof (a)

Preliminary stage

(b) Stage 1 -Air Removal:

(c) Stage 2- Steam Admission:

The pre selected sterilization temperature shall be:

134° C to 138° C - unwrapped utensils, instruments wrapped goods, porous loads
(excluding rubber)

- hollow ware, rubber goods wrapped and unwrapped, fluids

(d) Stage 3 - Sterilization

The sterilization temperature shall be maintained in the chamber for the minimum required period depending on the cycle.

(e) Stage 4- Drying

4.4.3 Stage Control Settings

Access for adjusting purposes to the duration of the pulsing sterilisation and vacuum periods shall not be open to the operator.

(a) The number of pulses in Stage 1 shall not be less than five.

(b) The temperature and pressure of the sterilisation stage shall be adjusted at the pressure switches.

(c) The duration of the drying stage shall be adjustable.

4.4.4 Conversion to Fluid Sterilisation

All autoclaves shall be capable of sterilising fluids on the down draught principle.

4.4.5 Manual Control

Not Required

4.4.6 Cycle Progress Indicators

Shall consists of white cluster L.E.D.'s behind coloured square plasticshrouds; each indicator shall be clearly denominated via black on white engraved traffolite labels .

4.4.7 Indication of Sterilization Failure

The visual display shall be as per 4.4.6 above.

4.4.8 Leak Test Facility

Shall be accessible only to maintenance personnel via a dedicated switch in the control panel.

4.5 STERILIZING EFFICIENCY

5. CONSTRUCTIONAL REQUIREMENTS

5.1.GENERAL

(a) The sterilizer shall have a horizontal chamber of rectangular cross section.

5.2 SIZE

The size and shape of the inside of the chamber shall be:

160 litre sterilizer

5.3 DOORS

5.3.1 Provision of Doors

Double Door type
(Pass through)

5.3.3 Door Interlocks

5.3.4 Door Gaskets

Door gaskets shall be of the inflatable stationary type housed in a machined groove on the chamber frame.

When deflated the gasket shall not stand proud of the frame.

The gaskets shall be inflated by steam and deflated by the vacuum pump

5.4 THERMAL INSULATION

Shall be cladded over with 1,0 mm aluminium sheeting

5.5 THERMOSTATIC STEAM TRAP AND STEAM/CONDENSATE DISCHARGE

5.6 AIR FILTER

5.7 PRESSURE,VACUUM AND TEMPERATURE GAUGES

5.7.1 General

5.7.2 Temperature Gauge

The temperature gauge shall consist of a calibrated resistance type thermometer PT 100 with a digital display on the front fascia of the sterilizer.

5.7.3 Temperature Recorder

Provision shall be made in the drain pocket for the installation of an additional PT 100 thermometer and in the control panel for the installation of an output module comprising an RS 232 interface and 9 pin serial female plug on the face of the sterilizer surround. Where such plug is not fitted the cut-out shall be covered with a stainless steel plate screwed to the sterilizer surround and the additional socket in the drain pocket shall be plugged with a screwed stainless steel tapered thread plug. The output module shall be suitable for transmitting the output to a standard 80

column dot-matrix printer without requiring additional equipment/software and shall provide a discrete record of time and temperature. The output module shall not generate an error/fault condition in the event of the printer not being connected to the output plug, or in the event of the printer being connected to the output plug but the power not being switched on.

5.7.4 Jacket Pressure Gauge

5.7.5 Chamber Pressure- Vacuum Gauge

5.8 LOAD HANDLING EQUIPMENT

5.8.1 General Features

5.8.2 Shelves

Shelves shall be manufactured from round bar A/Sf Grade 304 stainless steel stock only, shelves manufactured from expanded mesh will not be acceptable.

The guides or runners that enable the shelves to be partly withdrawn shall be fixed to the chamber by means of removable set screws of the same material and grade as the chamber and the guides/runners.

5.8.3 Loading Carriage and Transfer Trolley

5.8.3.1 Loading Carriage

Guide rails or channels shall be screwed to the chamber and removable so that the chamber may be left free of guide rails or channels.

The guide rails or channels shall be fixed to the chamber by means of removable set screws of the same material and grade as the chamber and the guide rails/channels.

5.8.4 Base Pallet

Guide rails or channels shall be screwed to the chamber and removable so that the chamber may be left free of guide rails or channels.

The guide rails or channels shall be fixed to the chamber by means of removable set screws of the same material and grade as the chamber and the guide rails/channels.

6. ELECTRICAL EQUIPMENT (GENERAL) AND STEAM GENERATOR (TYPE B STERILIZER ONLY)

6.1 GENERAL

6.2 STEAM GENERATOR

The steam generator shall be in addition be fitted with a proprietary reliable fail safe conductivity control system to control the conductivity of the water in the steam generator within a value (adjustable) which will prevent carry over of water into the steam jacket. The control system shall consist of a probe which samples water at discrete (adjustable) intervals from within the generator and at top water level (where the water conductivity is high) by bleeding a fixed amount of water through an orifice not exceeding 6 mm in diameter. In the event of the conductivity of the measured sample exceeding the set value the control system will cause water to be discharged from the generator at top water level until the measured sample reaches the set value.

The steam generator shall be suitable for operating with the water available at the site. Bleed-off generator water shall be programmed to occur at the end of each steaming cycle and not only at the end of the sterilizing cycle only.

The bleed-off rate shall be adjusted during commissioning and as a function of water quality on site.

6.2.1 General

6.2.2 Water Level Marking

6.2.3 Heaters

6.2.3.1 General

The heating elements shall be suitable for operation in hard water and shall be of Inco/loy 823 or alternative alloy suitable for hard water.

6.2.3.2 Insulation Resistance

6.2.3.3 Dielectric Strength

6.2.3.4 Leakage Current

6.2.3.5 Earthing

6.2.3.6 Loading

7. MARKING AND INSTRUCTIONS

7.1 NAME PLATE

7.2 INSTRUCTION BOOKLETS

Instruction booklets shall be in English only.

7.3 PRESSURE VESSEL TEST CERTIFICATES

8. INSPECTION AND METHOD OF TEST

8.1 INSPECTION

8.2 TEST SEQUENCE

8.3 AUTOMATIC OPERATION TESTS

8.3.1 Preparation of Sterilizer

8.3.2 Test 1 Procedure

8.3.3 Test 2 Procedure

8.4 AIR REMOVAL TEST

8.5 LEAK TEST

8.5.1 Apparatus

8.5.2 Procedure

8.6 STERILITY TEST (BOWIE AND DICK AUTOCLAVE TAPE TEST)

8.6.1 Materials

8.6.2 Towel Condition

8.6.3 Making up the Test Pack

8.6.4 Procedure

8.7 TEST ON ELECTRICAL EQUIPMENT (TYPE B STERILIZERS ONLY)

8.7.1 Insulation Resistance

8.7.2 Dielectric Strength Test

8.7.3 Leakage Current Test

8.7.4 Earthing Resistance Test

8.7.5 Loading

6. COMPLIANCE WITH REGULATIONS AND STANDARD SPECIFICATION

The general construction, material and components of the sterilizer as specified, shall fully comply where applicable with the latest requirements of:

- (i) The machinery and Occupational Health and Safety Act No. 85 of 1993.
- (ii) The South African Bureau of Standards Specification SANS 982 -1990.
- (iii) The South African Bureau of Standards Code of Practice SANS 0142.

A certificate issued by the inspection authority under whose supervision the pressure vessel is manufactured shall be provided with each Autoclave.

The chamber and jacket shall be of the standard double wall stainless steel clad boiler plate fabricated construction, designed and manufactured in accordance with B.S. 5500 or equivalent and approved.

The control panel, associated components and wiring shall be installed in compliance with Department of Public Works and Land Affairs Standard Specification for the Electrical Equipment and installation for Mechanical Services Issue VIII September 1984.

Bacteriological filters shall comply with BS3970.

7. TYPE AND SIZE OF STERILIZER

The sterilizer shall be of the rectangular, horizontal, recessed high pressure, high speed, pulsing, single door, jacketed type, and shall be suitable for sterilizing unwrapped utensils, instruments (flash cycle), hollow ware, wrapped goods (packs) porous loads, fluids, rubber goods wrapped and unwrapped.

The sterilizer shall have a chamber capacity of 0,16 m³.

The sterilizer shall be designed for a maximum working pressure of 300 kPa gauge, using dry saturated steam supplied from an electric steam generator forming integral part of the Autoclave. The operating temperatures shall be 138 °C and 121 °C.

8. STERILIZING CHAMBER AND JACKET

The sterilizing chamber shall be constructed of AISI 304L Stainless Steel.

A solid head ring, shall be welded to the open end of the autoclave; the head ring shall support the clamps which hold the door.

The chamber shall be constructed in such a way as to facilitate the fitting of internal shelves or the use of internal and external loading equipment.

One end of the sterilizing chamber shall be closed by a suitably reinforced flat end which shall be of the same material as the chamber and shall be welded thereto. The jacket of the sterilizer shall be manufactured for a working pressure of 300 kPa; the sterilizing chamber shall be designed for a similar pressure alternating with absolute vacuum.

On completion of manufacture, the chamber and jacket shall each be subjected to a hydraulic test, in accordance with the relevant approved Code of Construction.

9. STERILIZER DOOR

The sterilizer door shall be of the manual sliding counter balanced type. The door shall be fabricated from the same material as the chamber.

The door shall be sealed by means of an inflatable gasket. The gasket must be capable of ensuring a steam and vacuum tight joint and be designed to withstand a pressure in the chamber of 480 kPa or absolute vacuum.

Means shall be provided so that:-

- (i) The rise of pressure inside the chamber is prevented, prior to the door being completely closed and locked in position.
- (ii) The sterilizing cycle cannot commence until the door is fully closed and locked in position.
- (iii) The release of the door from the closed and locked position is prevented unless the pressure inside the chamber has been reduced to atmospheric pressure.
- (iv) The door cannot be opened until the sterilizing cycle has been fully completed.
- (v) The chamber is effectively vented to atmosphere before the door opening mechanism is released.

10. CONTROL SYSTEM

The control shall be automatic. The control system shall be of the Microprocessor type.

11. OPERATION

INSTRUMENT PACKS, POROUS LOADS, HOLLOW-WARE, WRAPPED AND UNWRAPPED RUBBER GOODS CYCLE

The removal of air from the loaded chamber, shall be by means of a pulsing system as hereafter specified. The sequence of operation shall be effected automatically and without manual interference once the cycle is commenced.

To commence the cycle the chamber is loaded and the door is closed and locked by means of a capstan wheel. When the start button is pressed the following sequence of stages shall commence:

Stage 1 : Air Removal

Sufficient air shall be removed from the loaded chamber to permit achievement of the temperature-time relationship during STAGE 2.

The automatic control shall be capable of providing the following sequence of events during STAGE 1:-

- (i) Reduction of pressure within the loaded chamber to a reduced gauge pressure of -80 kPa
- (ii) Admission of steam to restore pressure within the chamber to a positive gauge pressure of 30 kPa.
- (iii) Isolation of steam supply. Reduction of pressure within the loaded chamber to a reduced gauge pressure -80 kPa
- (iv) The conditions specified under 9(ii) and (iii) shall be repeated a further four times to give a total of five pulses.

The automatic control shall then change to STAGE 2. The vacuum pump shall continue to run throughout the following stages.

Stage 2 : Sterilization

Steam shall be admitted to the chamber to provide sterilizing conditions within the chamber load. The temperature shall be sensed and indicated from the chamber drain and shall accord with the following time-temperature relationship. Within the total stage a temperature of 135 oc - 121 oc in the instance of rubber goods - shall be maintained for not less than four minutes. If at any time during the timed sterilizing period of four minutes the temperature should fall below 135 oc - 121 oc in the instance of rubber goods - , the timer shall automatically reset to starting point and shall

only start timing again when the correct temperature has been restored in order to guarantee that, at the end of sterilizing period, the load in chamber has been continuously subjected to steam at a temperature of 135 oc - 121 oc in the instance of rubber goods -for a period of four minutes.

The automatic control shall then change the process to STAGE 3. Visual indication that the sterilizing period is in operation must be provided.

Stage 3 : Exhaust and Drying

The automatic control shall close the steam to chamber valve and open the exhaust to condenser and water to condenser valves. Visual indication that the exhaust and drying stage is in progress shall be provided.

When the chamber pressure has been reduced to -60 kPag the drying timer shall start and run for 30 minutes after which the process shall change to STAGE 4.

Stage 4 : Air Admission

Means shall be provided for the drying vacuum, specified above, to be broken via a bacteriological air filter as specified beforehand.

Stage 5 : Cycle Complete

Visual indication that the full sterilizing cycle is complete shall be provided, after which the door can be opened.

Cycle Abort

The control circuit shall include a facility to monitor the time taken to attain the required pressure, vacuum and temperature conditions. Should any of the required conditions not be met (within a period which shall be adjustable) per stage, the cycle shall abort and audible alarm and flashing indicator lamp shall indicate "UNSTERILE" at which point it shall be possible to open the sterilizer door.

FLUIDS CYCLE

A selector switch shall be provided which when turned to fluids and the start button is pressed the following sequence of stages shall commence:-

Stage 1 : Air Removal

The pressure within the loaded chamber shall be reduced to -80 kPa. The automatic control shall then change to STAGE 2.

Stage 2 : Steam to Chamber

Steam shall be admitted to the chamber via the down draught method until a temperature of 121 oc is reached. The automatic control shall then change to STAGE 3.

Stage 3 : Sterilization

Within the total stage a temperature of 121 deg Celcius shall be maintained for not less than thirty minutes.

The automatic control shall then change the process to STAGE 4.

Stage 4 : Slow Exhaust

The steam shall be slowly exhausted via a needle (slow exhaust) valve, which shall be set in such a way that the period in which the pressure shall be reduced, from the sterilizing pressure of 105 kPa to a pressure of 15 kPa , shall not be less than twenty minutes in a loaded chamber.

The automatic control shall then change the process to STAGE 5.

Stage 5 : Air Flush

Air shall be drawn through the chamber via the filter, the open air valve, chamber drain needle and vacuum pump. When the chamber pressure has been reduced to 15 kPa pressure the vacuum pump shall continue to run for ten minutes with the air valve open.

The automatic control shall change the process to STAGE 6.

Stage 6 : Cycle Complete

Visual indication that the full sterilizing cycle is complete shall be provided, after the door can be opened.

Cycle Abort

The control circuit shall include a facility to monitor the time taken to attain the required pressure, vacuum and temperature conditions. Should any of the required conditions not be met (within a period which shall be adjustable) per stage, the cycle shall abort and audible alarm and flashing indicator lamp shall indicate "UNSTERILE" at which point it shall be possible to open the sterilizer door.

UNWRAPPED INSTRUMENTS (FLASH) CYCLE

The removal of air from the loaded chamber, shall be by means of a single pulse system as hereafter specified. The sequence of operation shall be effected automatically and without manual interference once the cycle is commenced.

To commence the cycle the chamber is loaded and the door is closed and locked by means of a capstan wheel. When the start button is pressed the following sequence of stages shall commence:

Stage 1 : Air Removal

Sufficient air shall be removed from the loaded chamber to permit achievement of the temperature-time relationship during STAGE 2.

The automatic control shall be capable of providing the following sequence of events during STAGE 1:-

- (i) Reduction of pressure within the loaded chamber to a reduced gauge pressure of -80 kPa
- (ii) Admission of steam to restore pressure within the chamber to a positive gauge pressure of 30 kPa.
- (iii) Isolation of steam supply. Reduction of pressure within the loaded chamber to a reduced gauge pressure -80 kPa

The automatic control shall then change to STAGE 2. The vacuum pump shall continue to run throughout the following stages.

Stage 2 : Sterilization

Steam shall be admitted to the chamber to provide sterilizing conditions within the chamber load. The temperature shall be sensed and indicated from the chamber drain and shall accord with the following time-temperature relationship.

Within the total stage a temperature of 135 °C shall be maintained for not less than four minutes. If at any time during the timed sterilizing period of four minutes the temperature should fall below 135 °C the timer shall automatically reset to starting point and shall only start timing again when the correct temperature has been restored in order to guarantee that, at the end of sterilizing period, the load in chamber has been continuously subjected to steam at a temperature of 135 °C for a period of four minutes.

The automatic control shall then change the process to STAGE 3. Visual indication that the sterilizing period is in operation must be provided.

Stage 3 : Exhaust

The automatic control shall close the steam to chamber valve and open the exhaust to condenser and water to condenser valves. Visual indication that the exhaust and drying stage is in progress shall be provided.

When the chamber pressure has been reduced to -80 kPag the process shall change to STAGE 4.

Stage 4 : Air Admission

Means shall be provided for the residual steam exhaust vacuum, specified above, to be broken via a bacteriological air filter as specified before hand.

Stage 5 : Cycle Complete

Visual indication that the full sterilizing cycle is complete shall be provided, after which the door can be opened.

Cycle Abort

The control circuit shall include a facility to monitor the time taken to attain the required pressure, vacuum and temperature conditions. Should any of the required conditions not be met (within a period which shall be adjustable) per stage, the cycle shall abort and audible alarm and flashing indicator lamp shall indicate "UNSTERILE" at which point it shall be possible to open the sterilizer door.

LEAK TEST FACILITY

An automatic leak test facility shall be provided as per SASS 982 - 1990 Clause 4.4.8

The selection of the leak test shall be by means of a switch which shall be clearly marked "LEAK TEST"; the switch shall be fitted inside the control pane/located at the rear of the sterilizer.

12. STEAM JACKET

When the condensate discharge is connected to the condensate return line the jacket condensate discharge line shall be provided with a balanced pressure thermostatic steam trap, non return valve and strainer.

13. CONDENSATE DISCHARGE TO DRAIN

The condensate discharge line from the jacket and chamber shall be provided with a suitable air break before discharging into the drain. A means shall be provided to prevent the emission of steam and vapour from the air break.

14. DRAIN DISCHARGE

The temperature of water which is discharged to drain shall not exceed 70 °C.

15. EXHAUST DISCHARGE

The sterilizer shall be provided and fitted with a condenser of sufficient capacity to condense the exhaust steam. The water supply to the condenser shall be automatically controlled as specified in Packs Exhaust and Drying Cycle.

16. SAFETY VALVES

The sterilizer shall be fitted with a safety valve of the vertical, direct spring loaded type with screwed side discharge, directly connected to the steam space at the top of the jacket by a pipe of minimum length. The safety valve shall be capable of being set and locked by means of a lock and key.

The valve shall release steam at its set pressure and shall be capable of holding the pressure in the sterilizer at no more than 10% above its normal working pressure.

17. AIR ADMISSION

Air admission to the sterilizer to break the chamber vacuum shall be through a bacteriological filter with an efficiency of 99,8% and which shall be capable of removing particles of 3 micron size and larger. The filter shall be located at least 1200mm above floor level. The filter element shall be easily replaceable.

18. VACUUM PRODUCTION

The vacuum shall be produced by an electrically driven vacuum pump of the water ring type which shall be capable of producing and maintaining a reduced gauge pressure of -80 kPa at sea level.

19. THERMAL INSULATION

The sterilizer shall be lagged externally with thermal insulating material of such thickness that the rate of heat transfer does not exceed 1 watt/(m²/K). The lagging shall be aluminium foil covered and shall be securely strapped and held in position and clad over with 1mm thick aluminium sheeting.

20. STERILIZER FASCIA AND INSULATION

The sterilizer shall be provided with a 1,2 mm thick, AISI grade 304, number 3 finish (satin) front fascia and architrave, sized to overlap the sterilizer opening through the wall. The fascia shall have no sharp edges and when fixed in position shall fit tight against the wall. The following instruments and fittings shall be provided on the front panel:

- (i) One dial pressure gauge calibrated 0-400 kPa to register jacket pressure and with the maximum working pressure marked on the dial in red.
- (ii) One dial compound pressure gauge calibrated -100 to 400 kPa to register chamber pressure. The maximum working pressure shall be marked on the dial in red. The minimum chamber vacuum shall be marked on the dial in green.
- (iii) One digital type thermometer calibrated 0 to 150 °C to indicate the temperature to accuracy of within 1°C between 0 and 150 °C.

(All pressure gauges shall be 100mm diameter)

- (iv) Main control switch
- (v) Steam Generator on
- (vi) Cycle and status indicators

- (vii) Cycle Selector
- (viii) 9 pin serial plug for printer

All gauges shall be vapour proof with non ferrous metal or stainless steel casings. Pressure gauges shall be provided with vibration dampening devices. All the above mentioned instruments and fittings shall be flush mounted.

21. VALVES AND PIPING

Cycle control valves shall be electrically activated and shall be fitted with Teflon discs.

Copper piping may be used, such piping shall be to SABS 460 Class 2. Compression fittings shall only used for connection to fittings which require to be removed for servicing.

22. PRESSURE CONTROL

Control of steam pressure shall be by means of a suitably rated pressure switch controlled, normally closed, solenoid valve.

23. FRAME AND BASE

The frame and base shall be of robust mild steel constructive and shall stand a minimum of 15mm clear of the finished floor level. The steelwork shall be deburred, degreased and painted with:

Primer Coat	: Plascon Stratholyde PA10
Undercoat	: SABS 681 Type 11 Plascon Universal
Enamel Finishing Coat	: SABS 630 Typec Plascon Universal Enamel

or equivalent and approved.

24. LEVELLING SCREWS

A minimum of four stainless steel levelling screws shall be provided together with stainless steel base pads of a minimum of 50mm diameter, 5 mm thick.

25. SPECIAL REQUIREMENTS

The autoclaves shall be of the Micro processor controlled type; the microprocessor shall be programmable via a laptop computer output port (RS232 or RS 400). All programme software shall be supplied with the 07M manuals together with a printout and digital copy of the programme.

The control of the sterilization temperature will be by means of steam pressure control inside the chamber via pre-set differential pressure switches (Sauter or Honeywell or approved equivalent).

The sterilization failure control will be activated via a PT 100 analogue set-point control module connected to two set point potentiometers set at 121 °c and 134 °c respectively. The control unit will provide an open/close contact for actuation of the non sterile/sterilization failure alarms.

The active potentiometer shall be activated via a relay with gold contacts; the relays will be switched via the PLC. The analogue set point unit shall be connected to fascia mounted digital display.

Cycle selection will be via a fascia mounted rotary selection switch. Each position to be clearly indicated as follows:

1- PACKS

2- RUBBER ROODS

3 -INSTRUMENTS

4- FLUIDS

A leak test selector switch shall be mounted inside the control panel and accessible only to the maintenance personnel.

The following shall be fascia mounted on all autoclaves:

- (i) Jacket pressure gauge
- (ii) Chamber pressure/vacuum gauge
- (iii) Digital temperature display
- (iv) Indicator Cluster LED's as follows:
 - (a) Power On -Yellow
 - (b) Door Open - Red
 - (c) Air Removal- White
 - (d) Sterilization- White
 - (e) Exhaust and Drying- White
 - (D) Air Admission -White
 - (g) Cycle complete- Green
 - (h) Non Sterile- Red
 - (i) Steam Generator On -White
 - 0) Low Generator Water- Red
 - (k) Steam Generator Fault- Red

The following controls shall be provided on all autoclaves

- (a) Cycle start push button
- (b) Cycle abort push button
- (c) Power on rotary switch
- (d) Cycle selector rotary switch
- (e) Steam Generator Power on rotary switch

In addition the autoclaves shall be fitted with a 9 pin Serial Port plug from a dedicated output module connected to an RS232 interface for operating an 80 column dot matrix printer to record cycle variables.

All autoclaves shall be capable of being modified by simply changing Input/Output connections between the cycle selector switch and the PLC.

All autoclaves, shall be fitted with liquid ring vacuum pumps.

All solenoid, isolating and safety valves shall be clearly identified by describing their function via engraved aluminium labels containing the following descriptions in English only:

- WATER SOLENOID (ii) STEAM TO JACKET (iii) WATER INLET
- EXHAUST SOLENOID
- SLOW EXHAUST
- VACUUM BREAK SOLENOID (vii) STEAM TO CHAMBER
- MAIN STEAM INLET
- WATER INLET TO STEAM GENERATOR (x) BLOW DOWN VALVE

26. STEAM GENERATOR

Steam for the autoclave shall be generated by an independent element type generator incorporating hard water type electric resistance elements. The generator shall be constructed to an accepted code and tested in terms of the regulations pertaining to Vessels Under Pressure of the Occupational Health and Safety Act 83 of 1993. The generator shall incorporate the following:

- Automatic level control
- Pumped supply water
- Low water cut-out and alarm
- Pressure control and over pressure relief valves
- Automatic bleed off to control water conductivity (cycle and timer controlled)
- Automatic blow down to dispose of sludge (cycle and timer controlled)
- All pipe work between the steam generator and the autoclave shall be executed in SABS 460 CL2 copper pipe work; the generator chamber shall be manufactured from a material which shall be not subject to galvanic and anodic corrosion, stress corrosion cracking and knife line attack and pitting when in contact with water (at site conditions) at a temperature of 140 oc.

The autoclave fascia shall be fitted with status/indicator lights showing the generator status i.e. elements on, low water in generator chamber etc.

27. WATER SOFTNER

An ion exchange type water softener shall be installed to provide soft water to the steam generator. The softener shall be fitted with a fine mesh strainer and pre filter with manual backwash upstream of the inlet to the resin cylinder to filter out coarse impurities; a by-pass feature shall be incorporated in the softener to allow for supply of raw water should the softener require to be disconnected.

The softener shall incorporate mechanically operated valves and shall be constructed entirely of non metallic materials or corrosion resistant metal. Resin regeneration shall be initiated by a timer controlled water meter (i.e. it shall not be possible to regenerate the resin during day working hours). The brine tank shall be supplied complete with a tank overflow safety valve. The soft water flow shall be at least equal to the peak water demand/consumption of two autoclave steam generators operating simultaneously.

28. ELECTRICAL INSTALLATION

Three phase 380 volt 4 wire plus earth supply shall be provided in the form of an isolator by others to within three metres of the Autoclave; the Sub Contractor will be responsible for connecting to the isolators of all DB/Control panels of the Autoclave installed under this contract.

Final connections from the D. B./control panel and or isolator to the various units inclusive of all switchgear, inter-connecting cable, wiring channels, instrumentation and controls etc will form part of the contract and will be carried out in accordance with the Standard Electrical specification contained in this document.

The panel shall incorporate 'Run' (Green) and 'Trip' (Red) indication lights for each motor and the Steam Generator as well as a 'Power On' (Orange) light, and a lamp test unit. Each circuit push button and light shall be provided with black on white engraved identification labels.

The electrical control panel shall be of the indoor, surface wall mounted MCP with lockable hinged door type of pickled passivated and painted 3Cr12 steel. The panel, including switchgear and wiring shall

generally conform with the requirements of the Standard Specification for Electrical Work of this document.

The Sub Contractor shall make due allowance for fault current requirements. Fault current reduction by the installation of a fused switch or fuses shall be acceptable provided that all equipment is adequately protected against phase failure and single phasing including single phase equipment when such equipment is connected to a common neutral.

Final connections from the isolators/ circuit breakers to the various motors inclusive of all switch gear, inter-connecting cables, wiring channels, instrumentation and controls etc. will form part of the contract.

Where required in terms of the 'Wiring Code for Premises' SABS 0142-1987, the Contractor shall provide all additional local isolators.

Individual supplies to motors or Sub-Distribution Boards shall run vertically and horizontally in cable ladders or cable trays; where used all trunking shall be painted orange.

Supply to the pump motor, and softener will consist of a 15 Amp switched socket outlet provided by others; the Sub Contractor shall allow for providing the necessary flex and plugs.

29. INSTRUMENTATION

All pressure gauges, thermometers, "U" tubes, isolation stopcocks, manometers, etc., required for the efficient operation of the plant to the entire satisfaction of the Engineer, shall be provided for. Only reliable, durable and weather proof instrumentation shall be used.

All pressure and vacuum gauges shall include the following:

- o stainless casings
- o stainless steel bezel
- o vibration dampening valves (glycerine filled gauges shall not be used)
- o gauge cock
- o black on white numbering

The gauges shall be selected so that the indicator never exceeds 2/3 of the full gauge scale

30. BUILDER'S WORK

In general all builder's work will form part of the Contractor's responsibilities unless otherwise agreed. The Autoclave Contractor may, if necessary, be required to liaise closely with a Building or Contractor in his employ or the Client's staff in this regard to ensure timeous installation of such items. Dimensions and positions will be the responsibility of the Autoclave Contractor. Unless otherwise specified all building work will be undertaken by the Building Contractor.

31. ALTERNATIVE OFFER

The Bidder must quote strictly in accordance with the Engineer's specification and drawings, and alternative offers requested in the documentation but should the bidder wish to propose further alternative offers to the specification, then the bidder must provide complete technical details on the alternative equipment proposed and list amounts ("ADD" or "OMIT"), in the Schedule of Alternative Offers provided in this bid document. Unless all the relevant information as listed in the equipment schedules is provided, full assessment of the alternative offer cannot be made and such offers shall not be considered. No changes to the design or equipment specified will be considered after adjudication of the contractor for this contract.

The bidder shall be at liberty to offer alternative equipment, however his main offer shall be based on the equipment specified.

32. TESTS AND COMMISSIONING

Upon part completion and commissioning of this contract, but before final completion and handover, the Contractor shall allow for in his bid amount and provide the Engineer with a complete commissioning schedule indicating the actual test results and measurements of the following, for each separate installation as specified and installed under this contract:

Description of installation tested; Date and time of test;
Ambient temperature conditions (measured in the shade): (a) Dry bulb temperature
(b) Wet bulb temperature

Performance Tests

The measurement and verification of actual air volumes, temperatures, steam and water flow rates, etc., achieved on each of the systems, compared to design/specified quantities and indicating variations from specification:

- (a) Total air delivery from vacuum pump

- (b) Steam supply temperature | pressure and chamber | jacket pressure | temperatures in kPa and °C

- (c) Vacuum leak test to SABS 982-1990 (d) Sterility tests to SABS 982-1990
- (e) Print-out record of tests

(D) Power absorbed (amps at 220 or 380 Vas applicable) at the:

- Each system
- Overload setting on contactor
- Maximum full load current

(g) Tests on electrical equipment to SANS 982-1990

On three phase systems or motors, the electrical current must be measured and checked in each of the three phases.

Capacity Testing

Tests to demonstrate the capacity specified and general operating characteristics of all plant shall be made under the direction of the Engineer at any time of the final inspection under conditions imposed by him.

Capacities of equipment shall be determined by operating tests of not less than 4 hours duration after table conditions have been established. Test procedures shall be in accordance with SASS 0157 and other generally recognised test codes as far as field conditions permit.

Capacities shall be based on quantities measured during such tests.

All instruments and appliances required for initial tests by the Sub Contractor shall be furnished by him. If gauges and thermometers which are to be left permanently installed are used for tests, they shall not be installed until these tests, to avoid inaccuracy.

The Sub Contractor shall be responsible for supplying test equipment which is to the Engineer's satisfaction; any costs incurred by the Sub Contractor in supplying adequate instrumentation will be entirely for his account.

Test instruments shall be tested for accuracy by an approved laboratory or by the Manufacturer and certificates showing the degree of accuracy shall be furnished to the Engineer. On satisfactory completion of all tests and after the completed installation has been inspected and passed as satisfactory by the Engineer, the installation will be taken over by the Employer. To this effect, the Engineer will issue a "Taking Over" certificate.

The Sub Contractor shall be responsible for supplying an itemised set of test results for the Engineer's approval; the Engineer may at his discretion request the Contractor to re run at the Contractor's expense any test which he has not witnessed or with which he feels not satisfied. The subcontractor shall prove to the Engineer that the bleed-of water settings are capable of controlling water conductivity in the steam generator by drawing samples and recording water conductivity at the start, during_ and at the end of at least four full autoclave cycles.

Steaming Capacity: _____

The nominal I adjusted steaming capacity shall be within the specified limits.

Heating Capacity:

The system shall conform and produce at least 100% of the rated or design heating capacity.

Airflow:

The air flows obtained shall be at least equal to the value given on the name plate as specified by the manufacturer or to the design values.

Steam Pipe Testing:

Piping shall be tested with a water pressure of not less than 1 1/2 times the maximum working pressure. Care shall be taken to avoid putting excessive pressures on mechanical seals, safety devices, etc.

The system shall be filled and all air vented at least 24 hours before the actual test pressure is applied. Test pressure shall be maintained for not less than 30 minutes and must be maintained to the satisfaction of the Engineer after the force pump has been disconnected. Leaks in screwed fittings shall be corrected by remaking the joints. Leaks in welded joints shall be cut out and re-welded. Caulking of leaks will not be permitted.

Capacity Testing:

Tests to demonstrate the capacity specified and general operating characteristics of all burner components shall be made under the direction of the Engineer at any time of the final inspection under conditions imposed by him.

Capacities of pumps, heaters, fans and other equipment shall be determined by operating tests of not less than 4 hours duration after stable conditions have been established. Test procedures shall be in accordance with SABS codes or where these do not exist, ASME, ISO and other generally recognised test codes as far as field conditions permit.

Capacities shall be based on temperature and air and water quantities measured during such tests. Water quantities shall be measured from the existing feed water meters. Water quantities read from pump curves may not be used to determine capacities.

The temperature difference required to determine capacities shall be measured with thermometers having graduations that permit interpolations with an accuracy of 1%.

Air quantities may be measured by pitot tube, anemometer or velometer, depending on the velocity and other conditions of flow.

All instruments and appliances required for initial tests by the Contractor shall be furnished by him. If gauges and thermometers which are to be left permanently installed are used for tests, they shall not be installed until these tests, to avoid inaccuracy.

Unless otherwise specified the Contractor shall be responsible for supplying test equipment which is to the Engineer's satisfaction; any costs incurred by the Contractor in supplying adequate instrumentation will be entirely for his account.

Test instruments shall be tested for accuracy by an approved laboratory or by the manufacturer and certificates showing their accuracy shall be furnished to the Engineer. On satisfactory completion of all tests and after the completed installation has been inspected and passed as satisfactory by the Engineer, the installation will be taken over by the Employer. To this effect, the Engineer will issue a "Taking Over" certificate.

The Contractor shall be responsible for supplying an itemised set of test results for the Engineer's approval; the Engineer may at his discretion request the Contractor to re run at the Contractor's expense any test which he has not witnessed or with which he feels not satisfied.

Acceptance of Plant:

The entire plant must be tested and will not be cleared for acceptance until the performance meets with the specification, the Operating and Maintenance Manuals have been submitted, approved and accepted in their final form and the necessary schematic control and electrical diagrams.

Upon completion and commissioning of this contract, but before final completion and handover, the Contractor shall allow for in his bid amount and provide the Engineer with a complete commissioning schedule indicating the actual test results and measurements of the following, for each separate installation as specified and installed under this contract:

- (a) Description of installation tested; (b) Date and time of test;
- (c) Ambient temperature conditions (measured in the shade):

- Dry bulb temperature
- Wet bulb temperature
- %RH

Performance Tests:

The measurement and verification of actual air volumes, temperatures, fuel | water | steam flow rates, boiler efficiency etc., achieved must be compared to specified quantities indicating variations from specification.

NOTE: On three phase systems or motors, the electrical current must be measured and checked in each of the three phases.

33. MAINTENANCE AND SERVICE CONTRACT

The bidder shall include for servicing and maintaining the installation on behalf of the client for the Guarantee period.

The bidder shall allow for and include in his bid for one year of free service and at least four quarterly inspections of the complete installation at intervals not exceeding three (3) months after completion and handover.

It is a requirement of the Hospital and the Client that bidders have permanently available staff on a 24 hour call-out basis available to effect any emergency repairs and/or adjustments which may be required to any of the plant installed under this contract. Bidders without such a facility are discouraged from submitting an offer and shall not be recommended.

This information, as well as a full and detailed description, listing the extent of the service/ maintenance work to be carried out at each service, is to be shown separately in the Operating and Maintenance Manual.

34. GUARANTEE OF THE INSTALLATION

The entire installation shall be subject to a 12 months guarantee on each complete item of equipment or component thereof.

35. OPERATING MANUALS

Three complete sets of operating manuals shall be supplied by the Contractor, one set to the Engineer for onward forwarding to the Employer and one for the User Department's use. Manuals must be compiled in layman's language.

At least one month before commissioning, one draft copy shall be submitted to the Department/Engineer for comments and approval.

Operating manuals shall give a clear description of and the purpose of the installation.

- (a) Paper copies of all approved drawings and diagrams.
- (b) Detailed description of the different components used in the installation.
- (c) On- and off switching procedures.
- (d) Guidelines for routine-test to be carried out by the User Department inclusive of the periods during which tests are to be undertaken.
- (e) Detailed instructions for procedures to be followed during a fault

36. MAINTENANCE MANUALS

Three complete sets of maintenance manuals (Technical) prepared in English, shall be supplied by the Contractor.

At least one month before commissioning a draft copy shall be submitted to the Department/Engineer for comments and approval. Maintenance manuals shall consist of the following:

- (a) A general description of the system.
- (b) A general description of the controls.
- (c) Schedule of equipment, model numbers, optional extras, modifications, electrical power requirements, etc.
- (d) Detailed monthly, quarterly, semi annually and annual preventative maintenance

procedures.

- (e) Manufacturer's catalogues clearly indicating type, size and model of equipment supplied.
- (f) Tabulated commissioning data of all equipment and the system, indicating- as measured and according to specification- requirements.
- (g) List of suppliers, addresses and telephone numbers. (h) List of spare parts for all equipment.
- (i) Fault tracing/finding procedures. Manuals shall be bound in a firm hard cover.

The information shall be clear and readable and supplied with an index.

The above mentioned manuals shall be available at first delivery. Delivery of the installation will not be accepted without the manuals.

The bidder shall for instructing the User's appointed responsible persons in the correct Autoclave, water softener and booster pump and pre-filter operation.

A set of instructions shall be affixed inside the CSDSD the operation, maintenance and fault reporting procedures required of the operators. A similar notice shall be affixed in the plant room for the booster pump, pre-filter and water softener.

38. LOCAL EQUIPMENT AND MATERIAL

The preference certificates are attached to the bid form. Preference will be given to South African materials or items manufactured locally from South African materials which comply with the technical requirements of the Specification.

39. SCHEDULES OF PARTICULARS AND INFORMATION

All schedules which accompany this bid notice, form an integral part of it and shall be duly completed in every detail.

Equipment offered shall be capable of performing the specified duties and complying with the Specification requirements in all respects; SHOULD it transpire that such equipment, even when offered by make, model and/or type, is unsuitable of meeting, or performing in accordance with the Specification requirements in any respect, the Contractor or Sub-contractor shall nevertheless be responsible for any additional costs incurred in providing the required or suitable equipment.

Whenever a specific make, model or type of equipment has been prescribed in the Specification and the bidder offers an alternative, or equal make or type of equipment in his bid, the Department will on acceptance of such a bid inform the prospective contractor in writing as to the make, and/or type of equipment accepted; HOWEVER, it should be noted that the use of works "OR EQUAL" by the bidder is to be discouraged and could lead to the disqualification of the bid.

The bidder shall submit adequately detailed technical and pictorial information on all the equipment which is offered under the main bid offer and equally detailed information on any equipment which he wishes to offer as alternative to his main bid offer. Inadequately detailed alternatives shall not be considered for adjudication. All equipment comprising the main bid offer will be deemed to comply with the specification irrespective of what stated to the contrary on any pictorial information. Deviations from the specification will only be considered if stated and detailed in the appropriate forms

The bidder shall submit detailed information on the construction, control and operation of the steam generator and autoclave.

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - BLOCK H
VOLUME 2,5 PART 3 : AUTOCLAVE EQUIPMENT

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>BILL NO. 1 : PRELIMINARY AND GENERAL</u>				
1,1	Compliance with General Conditions of Contract : Insurances, Sureties, etc as outlined in the Principal Contractor's Preliminaries.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,2	Establish on Site and provision of buildings and storage facilities including de-establishment of site, cleaning and tidying up after completion of contract				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,3	Tools and equipment, Communication, transport.				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,4	Contract Management, Company overheads and supervision of the Works including attendance of site meetings (2 per month)				
	Fixed	Item	1		
	Value Related	Item	1		
	Time Related	Item	1		
1,5	Provision of all drawings and manuals as specified including As-Installed drawings	Item	1		
1,6	Liaison with Local Supply Authority, compliance with OSH Act, Local By-laws and any other statutory regulations	Item	1		
1,7	Any additional item not specifically mentioned or included in the Bills of Quantities which the Tenderer may wish to detail. (Specify)	Item	1		
Total Carried forward to Summary Page					

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - BLOCK H
VOLUME 2,5 PART 3 : AUTOCLAVE EQUIPMENT

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
2,0	<u>BILL NO. 2 : AUTOCLAVE EQUIPMENT</u>				
	Autoclave				
2,1	160 litre autoclave, Double-door autoclaves for use in Hospital CSSD facilities. Pass-through type units with lock separating sterile and non-sterile areas. C/w micorprocessor controls for temperature and pressure, built in steam generator, autmatic condensation including waste piping, PT100 flexibnle temperature sensors, automatic door locking and unlocking, all as specified.	No.	1		
	Training				
2,2	Training of autoclave operators	Day	3		
	Testing and Commisioning				
2,3	Test and Commision kitchen equipment, certify and hand to client, vacuum drop test and sterility test.	No.	1		
	Training Folder				
2,4	Write up of training given for each piece of equipment, register of all persons trained on each day.	No.	1		
	As Built Drawings				
2,5	Submit as built draqwings for approval.	Sum	1		
	O&M Manuals				
2,6	Submit maintenance and operating manuals for approval	Sum	1		
Total Carried forward to Summary Page					

BNM CONSORTIUM - RNA CONSULTING ENGINEERS
PHASE 1
CMH - BLOCK H
VOLUME 2,5 PART 3 : AUTOCLAVE EQUIPMENT

PROVISIONAL BILL OF QUANTITIES

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
3,0	<u>BILL NO. 3 : WATER TREATMENT EQUIPMENT</u>				
	Water Softener Supply and Install:				
3,1	Water treatment plant for softening of water to autoclave equipment. Including: Brine tank Water softener 20 mm copper piping water line, incl valves connections etc. 20 mm copper piping main water line, incl valves connections etc.	No.	1		
	Electrical Connection of equipment to electrical power outlet provided by others	No.	1		
	Calibration Testing of water and calibration of system	No.	12		
	Training Training of operators	Day	3		
2,2	Testing and Commisioning				
2,3	Test and Commision equipment, certify and hand to client	No.	1		
	Training Folder				
2,4	Write up of training given for each piece of equipment, register of all persons trained on each day.	No.	1		
	As Built Drawings				
2,5	Submit as built draqwings for approval.	Sum	1		
	O&M Manuals				
2,6	Submit maintenance and operating manuals for approval	Sum	1		
Total Carried forward to Summary Page					

SCHEDULE OF MATERIALS OFFERED

The Tenderer must complete the following schedules and submit them with the priced Bill of Quantities.

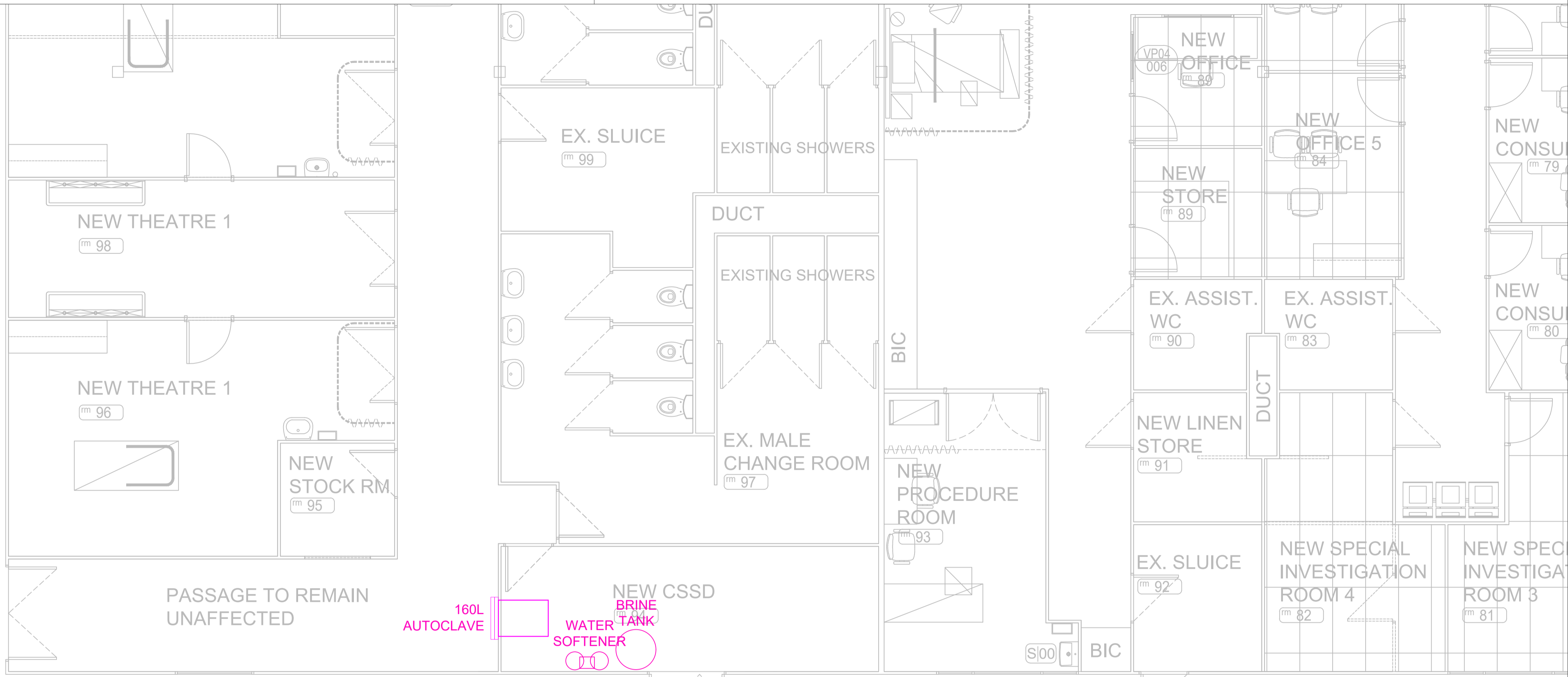
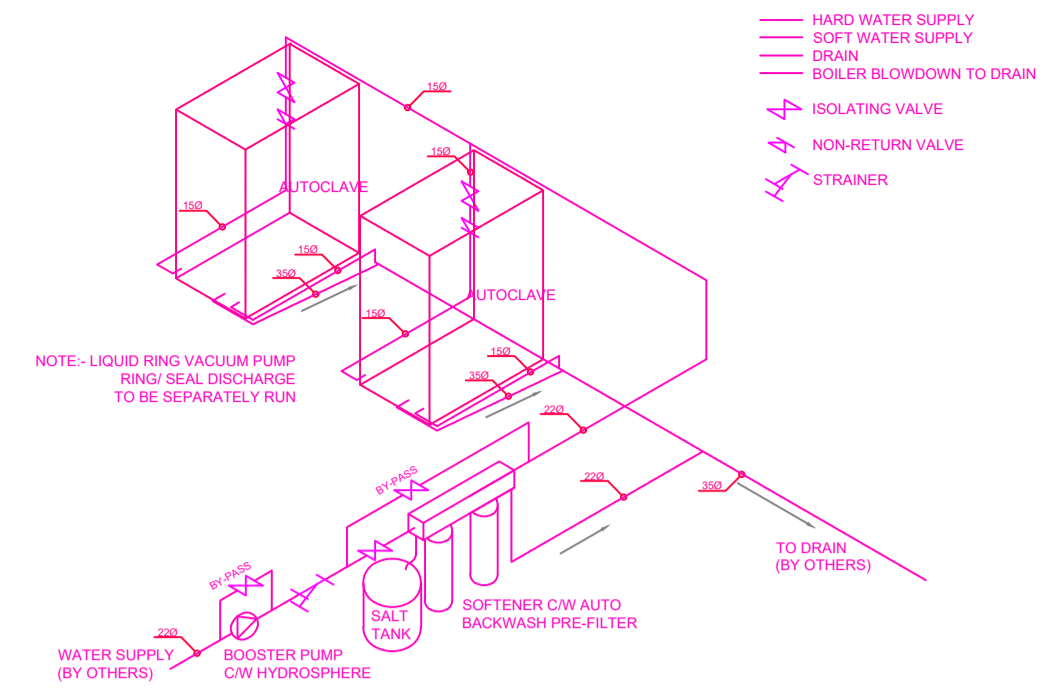
The schedules will be scrutinised by the Engineer and should any material offered not comply with the requirements contained in the specification, the Contractor will be required to supply material in accordance with the contract at no additional cost.

NB : Only one manufacturer's name to be inserted for each item.

Item	Material	Make or trade name	Capacity	Country of Origin	SANS Approved (y/n)
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					

NOTE : Tenderers are to note that under no circumstances may materials be installed other than offered in the above materials schedule, which has been approved and accepted by the Contractor.

Should the successful tenderer wish to supply materials other than those originally offered, prior written approval must be obtained from the Contractor before any orders are placed.



GENERAL NOTES:

REVISIONS			
REV	DATE	INIT.	DESCRIPTION
00	06/07/23	TW.	Issued for Information

CLIENT

TITLE
AUTOCLAVE EQUIPMENT LAYOUT

CMH
 BLOCK H



COPYRIGHT
RNA CONSULTING ENGINEERS
 Consulting Electrical & Mechanical Engineers
 7 King Street, Southernwood, East London, 5201
 E-Mail: office@rnaconsulteng.co.za
 P.O. Box 12359, Amalinda, 5252
 Tel: 043 742 0041
 Fax: 043 742 3883

DESIGN	TENDER	CONSTRUCTION
		✓

DESIGNED BY: T. WARNE
 SCALE: 1:50

DRAWN: T. WARNE
 DATE: 26/01/2024
 PRINT DATE: 26/01/2024

CHECKED BY: Travis Warne
 REGISTRATION No.: 201770017
 SIGNED.

DRAWING NO.: 2217-M-T-101 ACLAVE BLOCK H
 REV No.: A

5.PART C3 - SCOPE OF WORKS

C3.1 SCOPE OF WORKS

DESCRIPTION OF THE WORKS:

The following works to be carried out at the Cecilia Makiwane Hospital site in Mdantsane, East London:

Cerebral Palsy Renovations 2125m²

An existing building (the old OPD building in the old part of the hospital) was identified as suitable for upgrading for this purpose.

The following services will be rendered at the Cerebral Palsy Centre of Excellence:

- Social Workers
- Dietetics
- Physiotherapy
- Psychology
- Speech Therapy
- Audiology
- Occupational Therapy
- Ancillary Spaces

The layout of the proposed space is quite well-suited to the CP Rehab function due to the nature of the rooms and the wide corridors. As stated above, the space was previously used as an OPD and has numerous consulting spaces, waiting areas and ablutions for patients and staff alike. However, the internal layout will be modified to suite the new requirements for treating patients with CP and be compliant with current norms and standards.

The scope of work will include full renovation of the existing space:

- Replacing roof sheeting and rainwater goods, include new insulation.
- Remedial work to structural roof members.
- Remedial work to clerestory windows. Replace all glazing.
- Remedial work to ceilings.
- Plumbing and drainage.
- All internal finishes will be replaced – new floor finishes, new sanitary fittings and fixtures, new joinery fittings, new doors, painting of walls, tiling where necessary.
- Asbestos removal (if any) – refer to section 5.13

Associated Electrical and Mechanical Works

Electrical installation
ICT installation, Access Control and CCTV
Access Control
Fire Detection Installation
HVAC Installation
Fire Protection Installation
Domestic Water Installation

Block H: Existing Block H in order to accommodate Ophthalmology Services Area Renovations 2363m²

Block H was established as a donation by a consortium led by Siemens to increase bed capacity for the admission of Covid-19 positive patients. It was utilized in 2021. Following the drop in patients requiring admission, hospital management identified Block H to be suitable to be repurposed for the Ophthalmology Department at CMH.

Block H is not a traditional brick structure but was constructed by Gridnic, making use of their Insulated Panels to build this original 100 bed field hospital in 3 months. It included ER's, doctors'

quarters, kitchens, ablutions and offices. It has a concrete floor and exposed services (no ceiling void).

The space will be altered from a planning point of view to suit the needs of the Ophthalmology Department. Existing walls and apertures will be kept where possible but some demolitions will be required as well as some new walls (using the same panels) The Department will include:

- Two eye theatres, with autoclave area, sluice area, linen area, change rooms for doctors, pre and post operative areas.
- Wards – 50 beds in total, which will include male, female, paediatric, isolation rooms and high care beds.
- Eye pharmacy
- Staff areas, including meeting room, lounges, tea kitchens, on-call rooms and general ablutions.
- Outpatient Clinic, making allowance for 100 patients and will include consulting rooms, special investigation rooms, procedure room, offices and storerooms.

The entire ward will require new vinyl floor finish and in certain areas a new ceiling will be required.

Existing fixtures and fittings will be used where they are as far as possible but new sanitaryware, joinery and ironmongery will be required where planning had to be amended.

The building is provided with excellent back-up power supply and general M&E services, including medical gas. However, some additional services will be required due to the addition of the two eye theatres.

Associated Electrical and Mechanical Works

Electrical installation
ICT installation, Access Control and CCTV
Access Control
Fire Detection Installation
HVAC Installation
Sprinkler Installation
Medical Gas Installation
Autoclave Equipment

External Works entail the following:

Parking Areas
Security Fencing to Parking Areas
Upgrading to Soil Drainage
Upgrading to Water reticulation
Upgrading to Stormwater
Retainer concrete block wall

Health and Safety

- Site camp development and demarcation
- Demarcation and hoarding of construction areas, separation from operational hospital operations
- Installation of required risk based and legislated signage

- Implementing good hygiene to prevent biological agents exposure
- Control access to construction areas
- Identification of known and unknown services
- Safe demolition including Asbestos removal as per Regulations
- Safe working from heights, inclusive of ladders, scaffolding and Mobile Elevated Work Platforms
- Reduction of noise, dust and vibration exposures
- Control and regular removal of waste generated from construction works
- Safe handling of chemicals
- Management of fire risks on site
- Safe stacking and storage of articles and equipment
- Creating safe and clear walk and pathways
- Safe handling, use and storage of works equipment
- Safe handling, use and installation of electrical and mechanical works
- Use of lock out and tag of systems
- Issue, handle and correct use of PPE

The existing hospital shall remain functional.

SMME Specifications

The following specification governs the employment of SMMEs as Domestic Sub-Contractors and is binding to the Contractor. Its purpose is to enhance the methods that are implemented to improve the development of local SMMEs.

This specification is to be read in conjunction with following applicable documents:

- (a) Any applicable form of contract used between the Contractor and DOH (The JBCC Principal Building Agreement (PBA) Edition 6.2 (May 2018))
- (b) Tender Document for the appointment of the Contractor;

The following specification governs the employment of SMME subcontractors:

1. SMME Subcontract

The Contractor shall appoint all SMME subcontractors in terms of an agreement that provides for fair and equitable conditions of contract compatible with the JBCC PBA Edition 6.2 (May 2018). All work and the associated risks related to SMME subcontractors shall be the direct responsibility of the Contractor.

2. SMME Subcontract Target

Thirty Percent (30%) of the Tender Value (excluding Socio Economic Value, CPAP/escalation, Contingency, OHS, Preliminaries, CIDB B.U.I.L.D Program and Value-Added Tax (VAT)) must be executed by SMMEs. It is compulsory for the Principal Contractor to achieve this target as the principal contractors performance against this target will be monitored.

Contractors will be required to supply verified monthly statements/schedules (verified by their auditors) indicating the % achieved for that month. A cumulative schedule also needs to be maintained for each month that has passed.

3. A SMME subcontractor is defined as follows:
- A targeted enterprise;
 - A business concern operating in any business sector and which complies with the qualitative and quantitative criteria outlined in the Schedule contained in the National Small Business Act (Act No. 102 of 1996);
 - An entity which must have an active registration status with the CIDB, targeted CIDB Grade designations 1 to 6;

4. Procurement and contracting of SMME subcontractors

The Appointed contractor must take note that the P&G main section document allow for the appointment of an SMME Mentor or Mentors if more than one are require.

After the Award of the Contract, the Contractor will have to start the process of procuring and subcontracting SMME subcontractors to achieve the tendered SMME Participation Goal of 30%. This contracting process for subcontracting SMMEs must commence after the commencement of the Contract Period and shall be completed prior to the commencement of the Contraction Period. It is a condition that the Employer shall not give the Contractor possession of site until the above process is and the appointment of SMME subcontractors is complete. The Contractor shall take due cognisance to also programme this SMME contracting process in its detailed construction programme.

The SMME Subcontractors must be procured as follows:

- 4.1. The identification of potential SMME's subcontractors to tender for the SMME packages shall be determined by the recognized community representatives/ structures, involving but not be limited by the Local Ward Councillor, the Social Facilitator and the PSC.
- 4.2. A competitive tender process obtaining at least three tenders from SMME subcontractors for each SMME package.
- 4.3. The SMME package documents will be prepared by the representative PSP's in conjunction with the Contract. The PSP's will provide the measured works portion of the tender document, to which the Contractor shall include his conditions of subcontract and requirements.
- 4.4. The tender documents will issued to the SMME subcontractors to tender.
- 4.5. The Contractor shall facilitate a mandatory briefing session with the invited SMME subcontractors. The briefing session must be attended by the representative PSP's including the OHS Agent and social facilitator.
- 4.6. The Contractor shall provide assistance to the prospective SMMES and ensure;
- 4.6.1. They understand the liabilities and responsibilities of the subcontract.
- 4.6.2. Scope of the SMME package
- 4.6.3. Procedures for submitting tenders.
- 4.6.4. Understanding the pricing and implications of the tendered rates.
- 4.6.5. Procedures and basis of tender adjudication.
- 4.6.6. Subcontract conditions and implications when awarded.
- 4.7. Adjudication
- 4.7.1. Contractor to receive all tenders at a specific location, in sealed tender submissions, placed in a tender box provided by the Contractor prior to the closing date and time. Late tenders will not be considered.
- 4.7.2. Contractor to maintain a tender submission register, recording tender receipt.
- 4.7.3. Tenders to be evaluated by the Contractor in terms of the tender conditions and submit a draft tender evaluation to the PA within 5 working days of the closing of tenders.
- 4.7.4. The PA will have the right to
- 4.7.4.1. Interview the tenderer

- 4.7.4.2. Clarify any aspect of the tender
- 4.7.4.3. Verify the eligibility of the tenderer
- 4.7.4.4. Conduct a rate analysis to clarify rates and prices.
- 4.7.5. The Contractor shall provide reasonable opportunity to tenderers, to correct patent errors, without altering the total tendered sum.
- 4.8. Award of tender
- The Contractor shall
- 4.8.1. Notify unsuccessful tenderers
- 4.8.2. Award/ appoint the SMME subcontractor
- 4.8.3. Compile and sign the SMME subcontract agreements.

5. Construction and close out

It is assumed that the Principal Contractor has allowed adequate time in the construction programme for training of SMMEs and included such training costs. The training shall include but not limited to:

- Compilation and maintenance of the Occupational Health, Safety and Environmental File and compliance with Construction Regulations by a CHS Officer (CHSO) registered with the South African Council for the Project Management Professions.
- Setting up and Maintaining Cash Flow, Construction Programme and Method Statement.
- Setting up and Maintaining Quality Management Plan and Risk Register.
- Basic Conditions of Contract of the relevant contract and setting up short term contracts for labour as per the main contract.
- Balancing of Bill of Quantities, Financial Control and Management.
- Technical Training.
- Methods of Measuring Resource Productivity.
- Measurement of Work Done, Interim Payment Certificate and Compilation.
- Dispute Avoidance and Resolution Procedures.

The Principal Contractor shall be responsible for the compilation of each subcontract agreement and ensuring that the terms and conditions are consistent with all requirements therefore as are specified in or reasonably to be inferred from the provisions of this Contract. All costs associated with the tender process including the conclusion of the agreement are for the Principal Contractor's account.

The Principal Contractor shall on a fulltime basis closely mentor, manage and supervise all SMMEs and shall manage, guide and assist each SMME in all aspects of management, execution and completion of its subcontract. This shall typically include the on-site productivity planning and management of:

- Materials Management
- Cost Management
- Contract Management
- Health & Safety Management
- Quality Management
- Communication Management

Payment for such on-going assistance is to be included in the Preliminaries and General section of the Bills of Quantities.

The Principal Contractor shall manage all SMME's throughout the construction period and will assist in the compilation of the final account of each SMME package. Payment for such on-going assistance is to be included in the Preliminaries and General section of the Bills of Quantities.

The Principal Contractor shall, on completion of each and every subcontract completed in accordance with the provisions of this Specification, issue free of charge to the SMME within 7 days of the completion of the subcontract, a Certificate of Experience on a single A4 page stating:

- (i) Contract title;

- (ii) Contractor's full name and address;
- (iii) Principal agent's name and address;
- (iv) SMME name and address;
- (v) Scope or extent of the subcontract works;
- (vi) Value of the subcontract works;
- (vii) Applicable level of the subcontract;
- (viii) Duration of the subcontract;
- (ix) Date of completion of the subcontract; and
- (x) Description of the training undergone by the SMME;

No provision or requirement set out in this Specification shall be deemed to relieve the Principal Contractor of any liability or obligation under the contract between the CDC and the Principal Contractor, and the Principal Contractor shall be fully liable for the acts, defaults and neglects of any SMMEs, his agents or employees, as fully as if they were the acts, defaults and neglects of the Principal Contractor, his agents or employees.

The Principal Contractor is not to permit SMME subcontractors to further subcontract on any other conditions than those applying in the project specification to subcontractors or SMME subcontractors.

The Tenderer is to price all associated administrative, supervision, mentoring costs, profit and attendance in the relevant sections of the Preliminaries as no claims for additional costs will be entertained.

These are monetary provisions only and the use, value and payment thereof are subject to adjustment based on actual costs through contractually approved variation orders calculated in terms of the prescribed contractual directives.

The SMME Packages involves the following works:

Masonry and Plastering – New brickwork internal to the structure including all new plaster required.

Glazing – Replacement of existing panes to 6,38mm safety glass.

Paintwork – General painting to new and previously painted areas: Surfaces shall be thoroughly washed down and allowed to dry completely before any paint is applied. Blistered or peeling paint shall be completely removed and cracks shall be opened, filled with a suitable filler and finished smooth.

Electrical Installations to the CP Unit and to the Block H

External Works – Temporary screens, cleaning and clearing of concrete areas, tree removal, new parking areas, court yard areas, stormwater reticulation, water reticulation, soil drainage, fencing.

Sequence of Works:

The facility is not occupied and no decanting is required.

C3.2 RESTRICTIONS AND CONSTRAINTS

- The completion of the project is urgent and work shall be executed during normal working hours i.e. 7h30 till 17h00 weekdays only. Work required to be executed outside of these hours must be arranged with the Facilities Manager and the Chief Executive of the hospital, in advance.
- Noise must be kept to a minimum and within acceptable levels at all times.

- All shut-offs and tie/cut-ins to existing services must be arranged in advance with the Facilities Manager and a methodology with appropriate mitigation of risks must be prepared by the contractor and submitted to the relevant Professional discipline in advance, for approval.
- Dust emanating from the work site must be controlled at all times.

C3.3 OPERATIONAL PROTOCOLS

- Security is a priority, and the site shall be kept safe at all times.
- The approved Health and Safety plan shall be adhered to at all times
- All staff members of the contractor shall wear PPE at all times
- All staff members of the contractor shall be specifically identifiable at all times and to this end shall wear a predetermined coloured overall to be able to enter and work on the site.
- Regular meetings, the frequency of which is to be determined, shall be held with the management of the hospital to always ensure a cohesive spirit of co-operation
- The successful contractor must take into account that other contractors may be busy with construction in close proximity to the works and allowance must be made in the contractor's submission to accommodate these parties.

C3.4 ACCESS AND SITE ESTABLISHMENT

- Prospective bidders are to fully familiarize themselves with the site and access to the site and restricted area for site establishment. Allowance for temporary construction access etc. shall be deemed to be included in contractor's price/bid. Prospective bidders are to familiarize themselves with the site as no additional costs shall be entertained.
- No Contractor's representatives or worker's are allowed to sleep at establishment area or within hospital complex.
- The Contractors are required to price for establishment and de-establishment in the Preliminaries section of the Bills of Quantities.

C3.5 ACCEPTANCE OF TENDERS

- The Employer is not bound to accept the lowest, or any tender, or any portion of any tender

C3.6 MINIMUM WAGE

- The Contractor shall adhere to "The national minimum wage determined by the Minister in accordance with the National Minimum Wage Act (NMWA)", and yearly pronounced increases for duration of contract.

C3.7 TEMPORARY WORKS

- All temporary work to comply with the Construction Health and safety Act (Act 85 of 1993) and its regulations.

C3.8 EMPLOYER'S DESIGN

N/A

C3.9 DESIGN BRIEF

N/A

C3.10 DRAWINGS

LIST OF DRAWINGS FOR WHICH REFERENCES ARE MADE IN THE BILLS OF QUANTITIES:

All drawings applicable are included as part of the drawings section

JOINERY FITTINGS, WINDOWS, DOORS, ETC.

5.1. C3.11 OHS SPECIFICATION



PROJECT SPECIFIC OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

Issued in terms of the Occupational Health and Safety Act, 1993
Construction regulations 2014

EASTERN CAPE DEPARTMENT OF HEALTH

PROJECT TITLE	Cecilia Makiwane Hospital: Phase 1 - Infrastructure Improvements, alterations, and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients including external works.
BID NO	
LOCATION	3235 – Cecilia Makiwane Hospital

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PROJECT SPECIFIC OCCUPATIONAL HEALTH AND SAFETY SPECIFICATION

LIST OF ABBREVIATIONS

AIA	Approved Inspection Authority
BoQ	Bill of Quantities
CC	Compensation Commissioner
CHS	Construction Health and Safety
CHSA	Construction Health and Safety Agent
CHSO	Construction Health and Safety Officer
CR	Construction Regulations (Gazette 10113 of 07/02/2014)
ECDOH	Eastern Cape Department of Health
DMR	Driven Machinery Regulations
DoL	Department of Labour
FEMA	Federated Employers Mutual Association
GAR	General Administration Regulations
GSR	General Safety Regulations
HCSR	Hazardous Chemical Substances Regulations
HIRA	Hazard Identification Risk Assessment
H&S	Health and Safety
ER	Engineer's Representative
LI	Labour Intensive
OH	Occupational Health
OHS	Occupational Health and Safety
OHSA	Occupational Health and Safety Act No. 85 of 1993 (as amended)
OHSS	Occupational Health and Safety Specification
PA	Principal Agent
PSHSS	Project Specific Health and Safety Specification
PC	Principal Contractor
PPE	Personal Protective Equipment
SANS	South African National Standards (Authority)
SDS	Safety Data Sheet
SMME	Small, Micro, Medium Enterprise
SWP	Safe Work Procedure
PA	Principal Agent
PSP	Professional Service Provider
CP	Cerebral Palsy
CMH	Cecilia Makiwane Hospital

DEFINITIONS

The definitions used will be those set out in the Regulation Gazette No 84 of 2014 7 February 2014 with the following additions:

Client: Eastern Cape Department of Health

Construction Health and Safety Agent:

A competent person appointed by the Client to carry out the duties of the Client in respect of Occupational Health and Safety on the project in terms of Regulation 5 sub Regs (5) and / or (6)

Designer: Means a competent person appointed by the Client as Agent to design, supervise and monitor construction on their behalf.

*Health and Safety Specification
Cecilia Makiwane Hospital Phase 1*

Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients including external works.

Hazard: Source of exposure to danger

Hazard Identification and Risk Assessment (HIRA) and Risk Control:

Means a documented plan, which identifies hazards, assesses the risks and details the control measures and safe working procedures which are to be used to mitigate and control the occurrence of hazards and risks during construction or operation phases.

Health and Safety Agent:

Means any person who acts as a representative for the Client in managing the overall health and safety work as their responsible person.

Health and Safety Plan:

Means a documented plan which answers to the Site-specific Health and Safety Specification; including all the supporting documentation that indicate how the Principal Contractor or Contractor plans to manage H&S for the duration of the Contract.

Induction Training:

Means once off introductory training on general health and safety issues given to all employees and visitors to the site before commencement of work on site.

Principal Agent:

Means a competent person appointed by the Client to design, supervise and monitor the construction on their behalf.

Risk: Means the probability or likelihood that a hazard can result in injury or damage.

Regulation/s:

Shall mean the relevant regulation/s promulgated in terms of the Occupational Health and Safety Act, No. 85 of 1993.

Site:

Means the area in the possession of the Principal Contractor for the construction of the works. Where there is no demarcated boundary it will include all adjacent areas, which are reasonably required for the activities for the Principal Contractor and approved for such use by the Designer.

The Act:

Means, unless the context indicates otherwise, the Occupational Health and Safety Act, No. 85 of 1993 and Regulations promulgated thereunder, as amended.

Workplace means any premises or place where a person performs work.

KEY REFERENCES

Occupational Health and Safety Act No. 85 of 1993 and Regulations (as amended)
Compensation for Injury and Occupational Diseases Act No. 100 of 1993 (as amended)
The GCC 3rd Edition 2015
Construction Specifications & Standards 6.0 for Southern Africa. Hans Wegelin 6th Edition 2010
SANS Code 10400
SANS10085
Compensation for Injury and Occupational Diseases Act No. 100 of 1993 (as amended)
Risk Adjusted Strategy Regulation- issued by the Department of Cooperative Governance
Asbestos Regulations 2001 – as amended in 2003

SCOPE OF WORK:

DESCRIPTION OF THE WORKS:

The following works to be carried out at the Cecilia Makiwane Hospital site in Mdantsane, East London:

An existing building (the old OPD building in the old part of the hospital) was identified as suitable for upgrading for this purpose.

The following services will be rendered at the Cerebral Palsy Centre of Excellence:

- Social Workers
- Dietetics
- Physiotherapy
- Psychology
- Speech Therapy
- Audiology
- Occupational Therapy
- Ancillary Spaces

The layout of the proposed space is quite well-suited to the CP Rehab function due to the nature of the rooms and the wide corridors. As stated above, the space was previously used as an OPD and has numerous consulting spaces, waiting areas and ablutions for patients and staff alike. However, the internal layout will be modified to suite the new requirements for treating patients with CP and be compliant with current norms and standards.

The scope of work will include full renovation of the existing space:

- Replacing roof sheeting and rainwater goods, include new insulation.
- Remedial work to structural roof members.
- Remedial work to clerestory windows. Replace all glazing.
- All new Mechanical and Electrical services.
- Remedial work to ceilings.
- Plumbing and drainage.
- All internal finishes will be replaced – new floor finishes, new sanitary fittings and fixtures, new joinery fittings, new doors, painting of walls, tiling where necessary.
- Asbestos Removal – refer to section 5.13.

Block H: Existing Block H in order to accommodate Ophthalmology Services

Block H was established as a donation by a consortium led by Siemens to increase bed capacity for the admission of Covid-19 positive patients. It was utilized in 2021. Following the drop in patients requiring admission, hospital management identified Block H to be suitable to be repurposed for the Ophthalmology Department at CMH.

Block H is not a traditional brick structure but was constructed by Gridnic, making use of their Insulated Panels to build this original 100 bed field hospital in 3 months. It included ER's, doctors' quarters, kitchens, ablutions and offices. It has a concrete floor and exposed services (no ceiling void).

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- Two eye theatres, with autoclave area, sluice area, linen area, change rooms for doctors, pre and post operative areas.
- Wards – 50 beds in total, which will include male, female, paediatric, isolation rooms and high care beds.
- Eye pharmacy
- Staff areas, including meeting room, lounges, tea kitchens, on-call rooms and general ablutions.
- Outpatient Clinic, making allowance for 100 patients and will include consulting rooms, special investigation rooms, procedure room, offices and storerooms.

Existing fixtures and fittings will be used where they are as far as possible but new sanitaryware, joinery and ironmongery will be required where planning had to be amended.

The building is provided with excellent back-up power supply and general M&E services, including medical gas. However, some additional services will be required due to the addition of the two eye theatres.

The entire ward will require new vinyl floor finish and in certain areas a new ceiling will be required.

1. PREAMBLE

Each year fatalities, serious injuries and poor attitudes of Contractors mar (spoil) the reputation of the Construction Industry. The Eastern Cape Department of Health has a responsibility to limit its risk by ensuring a zero tolerance and better practice approach to Contractors and those affiliated to a particular project. Thus a high premium is placed on the health and safety (H&S) of Eastern Cape Department of Health stakeholders, which include its employees, patients, professional service providers, public and its physical assets. The responsibilities that the Eastern Cape Department of Health and relevant stakeholders have toward its employees are captured in, but not limited to this document. The responsibilities stem from both moral, civil and a variety of legal obligations. The Principal Contractor is to take due cognisance of the above statement.

Eastern Cape Department of Health, as the Client and where there is an appointed CHS Agent on its behalf, shall provide a project specific Health & Safety Specification (PSHSS) for Cecilia Makiwane Hospital and provide the Principal Contractor/s making a bid or appointed to perform construction work for the project, or parts thereof.

1.1 Purpose of the Project Specific Health and Safety Specification (PSHSS)

The PSHSS is a performance specification to ensure that the Client and any bodies that enter into formal agreements with the Client viz. Agents, Professional Service Consultants (Engineers, Quantity Surveyors and Architects), Principal Contractors and Contractors achieve an acceptable level of OHS performance. No advice, approval of any document required by the PSHSS, such as hazard identification and risk assessments, or any other form of communication from the Client shall be construed as acceptance by the Client of any obligation that absolves the Principal Contractor from

*Health and Safety Specification
Cecilia Makiwane Hospital Phase 1*

Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients including external works.

achieving the required level of performance and compliance with legal requirements. Furthermore, there is no acceptance of liability by the Client, which may result from the Principal Contractor failing to comply with the PSHSS, i.e. the Principal Contractor remains responsible for achieving the required performance levels.

A Mandatory Agreement in terms of Section 37.2 of the OHSA will be signed between parties prior to any works commencing.

The PSHSS highlights the aspects to be implemented over and above the minimum requirements of current legislation. Requirements may be changed should new risks or issues are identified that could not have been foreseen during the design phase of the project, or during the construction phase. Any new legislation or standards (legislated or determined by Eastern Cape Department of Health that are promulgated or accepted during the contract will automatically be applied.

It should be noted that this OHSS in no way relieves the Contractor of any of his responsibilities set out in the Act and Regulations.

1.2 Implementation of the Project Specific Occupational Health and Safety Specifications (PSHSS)

The project specific H&S specification (PSHSS) forms an integral part of the Contract, and PCs are required to make it an integral part of their Contracts with Contractors and Suppliers. A PSHSS will be available for each level of Contract and Contractor and must be complied with.

This specification must be read in conjunction with the OHSA, Regulations (as amended) and any other standards relating to work being done and ensure compliance thereto. The information relative to the scope of the project, the works etc. are detailed in the tender, are to be considered when developing the H&S plan and associated documentation. The summary of risks is included in Section 2 of the PSHSS.

The OHSA S.37.2 Mandatory Agreement must be fully completed by the PC, supplied by the Client. These documents shall be deemed to form part of the returnable Contract Documents.

No work may commence without written approval of the H&S plan by the CHS Agent, or the responsible person in Eastern Cape Department of Health as well as the approval of the Construction Work Permit from the Department of Employment and Labour.

Should there be design changes, or change in the scope of works, an amended PSHSS may be issued. Where amended PSHSS are issued, the PC will be required to ensure a resubmission of an amended H&S plan for approval.

Further to this, the PC must ensure that similar information must be provided as it applies to the works to all their Contractors, within 5 working days following notification thereof. Such design changes.

The CHS Agent will visit the project as deemed necessary by the Designer and the CHS Agent to ensure compliance and limit risk. All activities on the site and all appropriate documentation will be monitored and reported on to the Client and the Designer.

Non-conformances will be issued, and penalties or work stoppage will be issued where appropriate. Communication between the CHS Agent and the PC will be through the Designer (PA) (or Client's responsible person) as determined at the commencement of the project.

1.3 Requirements at Tender Stage

Tenderers are required to submit a project specific pre-tender H&S plan with their Tender submission.

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The documentation submitted will be used to assess the competence of the tenderer, as required in the CRs, therefore the information submitted needs to be complete and as close as possible to the final product.

Adequate pricing for H&S is required, and the appropriate section in the BoQ is to be completed. Failure to do so could result in the Tender being regarded as non-responsive.

The PC shall ensure adequate information is submitted as supporting documentation with his completed Tender. Such information will be assessed against the criteria listed and a score provided to the Bid Award Committee (BAC) for consideration. Failure to provide such information could render the tender application non-responsive.

A project specific H&S Plan in response to this PSHSS will be subject to approval by the CHS Agent. This must include all supporting documentation as required to verify the H&S system:

- A declaration to the effect that the Principal Contractor has the competence and necessary resources to carry out the work safely in compliance with the Occupational Health and Safety Act and its Regulations;
- A valid Letter of Good Standing;
- Detailed technical method statements for approval by the Designer and appropriate risk assessments and safe work procedures for approval by the CHS Agent or Client for all high-risk items.

Further method statements are to be submitted prior to, and during the project where changes or new work is required, and the approval of the Designer/Client is required before work on that aspect or activity can commence.

The CHS Officer is to be included in production planning sessions/meetings to ensure that the appropriate risk assessments, safe work procedures and communication required are available and completed timeously.

2. GENERAL REQUIREMENTS

2.1 Summary of Risks identified during Design.

The intention of the summary of findings from the baseline risk assessment is to highlight the residual risks identified during the design phase. The full design risk assessment can be found in the tender document.

The summary of risks provided is to point the contractor towards some risks he may not be aware of during tendering stage and while developing his formal risk assessments for the project.

The design risks and the management thereof should be included in the Principal Contractors (PC) risk assessments. Where there are other Contractors appointed to do work, the PC is to ensure that Contractors include such information in their risk assessments.

The summary is to be developed following the completion of the Design baseline risk assessment, and to include the residual risks as they apply to the project. The items noted are for information only and must be expanded on as required by the project.

- *Weather-Related;*
- *Equipment and Machinery;*
- *Chemical and Environmental;*
- *Traffic and Site Access;*
- *Subsurface Utility Conflicts;*
- *Wildlife and Insects;*

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- *Material Handling and Lifting;*
- *Personal Protective Equipment (PPE);*
- *Communication Hazards;*
- *Inadequate Training;*
- *Client and Public Relations;*
- *Infection Prevention Control;*
- *Patient and Visitor Awareness;*
- *Emergency Response Coordination;*
- *Patient Privacy and Confidentiality;*
- *Noise and Disturbance;*
- *Hospital-Specific Protocols;*
- *Emergency Medical Services (EMS) Access;*
- *Communication with Hospital Staff;*
- *Biological Risks;*
- *Risk to the Environment including dust management;*
- *Unknown and existing services;*
- *Electrical Equipment;*
- *High Pressure Equipment;*
- *Working at Heights;*
- *Scaffolding*
- *Excavations*
- *Concrete Work*
- *Hazardous Chemical Substances*
- *Ergonomics*
- *Lifting Equipment*
- *Traffic Accommodation*
- *Demolishing*
- *Waste Management*
- *Asbestos Management*

3. OCCUPATIONAL HEALTH & SAFETY MANAGEMENT

3.1 Structure and Organization of H&S Responsibilities

3.1.1 Application for a Construction Work Permit

The Client (ECDOH) appointed Health and Safety Agent must acquire a “Construction Work Permit” from the Department of Labour Office.

Work may not commence without the “Application for a Permit to do Construction Work” form being completed by the Client and accepted by the Department of Labour. This includes, inter alia, the Contractor’s Health and safety Plan and relevant documentation as accepted by the Client.

It should be noted that this OHSS in no way relieves the Contractor of any of his responsibilities set out in the Act and Regulations.

The provincial director at the Department of Labour will issue the permit in writing to perform construction work within 30 days of receiving the construction work permit application and must assign a site-specific number for each construction site.

The contractor must ensure that the site-specific number issued by the Department of Labour must be conspicuously displayed at the main entrance to the site for which that number is assigned.

3.1.2 HEALTH AND SAFETY PLAN FRAMEWORK

The H&S aspects related to the project outlined in the previous sections are to be taken into account when drawing up the H&S Plan. The PC is required to demonstrate competence by providing an H&S system that will address the requirements of the project.

The current legislative requirements, SANS codes, SANS 10400 and any other standards that may guide practice are to be taken into consideration. The following aspects must be addressed in the H&S Plan, as they have been identified in section 2, as playing a role in reducing the overall risk of a particular activity, or section of the project. The CHS Agent may from time-to-time request additions or systems as they relate to the works or legislative requirements at the time.

The PC is to prepare a site layout drawing to indicate at least the following:

- The positions of site offices of all Contractors, toilets, drinking water and worker rest areas;
- Indicate the positions of emergency personnel and equipment (fire, first aiders, first aid posts);
- Protection of plant and pedestrians, indicate parking, and
- Storage areas (materials and equipment, waste etc.)
- Access and egress to site for deliveries and intended temporary traffic management,
- Emergency assembly point

Such layouts are to be updated regularly throughout the project.

3.2 Appointment of Competent Site Personnel

The CEO (OHSA S16.1) of the PC will take overall responsibility for the appointment of competent site staff for the duration of the project. Should the CEO not be personally involved in the project, the H&S responsibilities are to be delegated to the Site Agent (OHSA 16.2). Knowledge and training in H&S is required, and certificates indicating H&S training as well as experience to be included in CVs.

All other legal appointments are to be made with relevance to the type of work required and kept current with the project programme. The construction team is to ensure the appointed CHS Officer is kept up to date with all planned activities, to ensure all H&S requirements are met.

All construction/technical method statements are to be generated by senior site personnel, and the appropriate risk assessments developed therefrom in conjunction with the CHS Officer.

The Occupational Health and Safety Plan shall include the following, but is not limited to the following key appointments:

3.2.1 Construction Supervision

Competent Full-Time Construction Manager(s) (CR8.1) will be appointed to manage part or all of the works and have training and/or experience in the area of responsibility. All site supervisors must

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show evidence of appropriate training in H&S, and an understanding or training in areas of responsibility (i.e., risk assessments, method statements etc.).

Multiple competent Assistant Construction Manager(s) (CR8.2) may be appointed where justified by the scope and complexity of the works.

Curriculum Vitae (CVs) are to be submitted for approval by the Designer (PA) and/or Client. The Supervisor will be held responsible for the safety of working teams and subordinates, housekeeping and stacking and storage of materials.

If the Construction Manager (CR8.1) changes throughout the project. The Principal Contractor must ensure to provide the proposed Construction Manager CV and certificates for approval and then update the Annexure 2 and ensure that the appointment letter as well as proof of competency is available in the Health and Safety File.

3.2.2 Construction Health and Safety Officer

The PC will employ at least one competent, full-time CHS Officer (CR8.5) for the duration of the contract. The CHS Officer's CV is to be submitted for approval by the CHS Agent or the Client, at time of tender. The PC is to ensure adequate resources are provided in order to undertake all responsibilities (i.e. mobile phone, computer and internet access, vehicle etc.) Qualifications shall include at least Grade 12, Diploma in H&S qualifications or similar, with exposure to civil engineering and building that is appropriate given the level of project complexity preferably in an OHS capacity. He should also have undergone training in the Act and Regulations. In the case of a contract where contractors are employed, the CHS Officer must have a competence to evaluate the Contractors Health and Safety plans.

Proof of registration as a Construction Health and Safety Officer with SACPCMP must be supplied.

This person may not hold any other position on the site staff.

The site supervisor may not act as the CHS Officer.

The CHS Officer/s will be held responsible for all H&S on the project.

- Senior site staff and supervision, Contractors are to follow systems, instructions etc. given by the CHS Officer at all times;
- No new workers or Contractors may commence work without approval or following the H&S plan as submitted, and
- No inductions of Contractor staff until the H&S documentation is approved by the CHS Officer.
- The CHS Officer/s may not be removed or replaced without the approval of the CHS Agent, nor may the site be left unattended for more than 1 day without adequate, competent cover.

A monthly report of all H&S activities and incidents is required by the end of the first week of each month, or at a date agreed to by the CHS Agent/Client and the CHS Officer. An example of the monthly report is attached as an Annexure C.

The CHS Officer will be responsible for collating the H&S documentation at the close out of the project in electronic format. The PC is to ensure that all Contractors documentation follows the same requirements and closed out H&S documentation must be completed and be available with the close out of the main contract.

If the CHSO is replaced the Principal contractor is required to submit the following documentation for approval by the Client and appointed Pr. CHSA at least two weeks before as The Department of Employment and Labour will need to be notified regarding the changes:

1. Applicant CV
2. Applicant Competency
3. Valid SACPCMP Letter of Good standing

Failure to do so will be considered a serious offence and penalties /stoppage of site will apply.

3.3 Health and Safety Representatives and H&S meetings

H&S Representatives representing workers and Contractors are to be appointed following the startup of the project, irrespective of the number of workers on site. The appointed H&S Representatives are to be actively involved with H&S and will assist the CHS Officer and site management in meeting legislative duties.

The CHS Officer shall further ensure that H&S is discussed at all internal production or progress meetings. Issues arising from the CHS Agent audits are to be discussed, as well as all H&S related issues.

Minutes are to be kept for all H&S interventions and meetings.

Failure to do so will be deemed to be a moderate offence.

3.4 Appointment of Competent Contractors

The Principal Contractor is to ensure compliance with the Client's minimum standards and all legislative requirements. The same H&S standards required of the PC are to be applied to all Contractors. An index of all Contractors and Suppliers is to be on file and kept updated at all times. The PC is to ensure there is sufficient funding for H&S compliance by each Contractor.

The following minimum aspects are applicable to any Contractor appointed:

- The CHS Officer is to ensure a contractor's appointment and approval of H&S documentation at least seven (7) working days prior to commencing work.
- The contractor should take note of the required workload of the appointed CHSO in relation to the appointed SMME's.
- No Contractor may work under the PC's Compensation registration number. If required, the PC may assist SMMEs with their registration with the Compensation Commissioner. However, such Contractors will not be able to commence work until proof of registration or Letter of Good Standing has been received.
- No work may commence without Mandatory agreements between parties in place.

The following aspects are applicable to Suppliers or short-term works (surveying, repairs, servicing, deliveries etc). Cognisance is to be taken of the level of risk involved and the CHS Officer is to ensure the level of H&S documentation is appropriate:

- Signed Mandatory agreements in place.
- Valid Letter of Good Standing
- Method statements and risk assessments
- Available information relative to:
 - Load testing and registers for cranes or lifting devices.
 - Medical certificates of fitness
 - Safety data sheets (SDSs)

Failure to provide written approval of H&S documentation will be considered a serious offense, and could result in aspects of, or all the activities being stopped, and penalties implemented.

4. GENERAL RISK MANAGEMENT

4.1 Health Risks and Medical Surveillance

As some products use in the building work have not been identified, the PC is to ensure the CHS Officer and all supervision is responsible for ensuring the safe use of such products, and their inclusion into method statements and risk assessment. The appropriate SDSs are to be obtained for all products and used to develop the H&S documentation as they relate to the works.

Many of the processes may be labour intensive and ergonomic risks are to be noted. All workers (including Contractors) are to be included in the medical surveillance programme.

Workers will be exposed to biological risk, noise, dust, and physical risks from extended periods of work of a repetitive nature, materials specified and the general nature of the business.

Environmental monitoring results and risk assessments are to be made available to the occupational health professionals doing the medical surveillance. The use of occupational risk exposure profiling (OREPS) and job descriptions are to be used to determine specific exposures for management.

All permanent workers (including those of Contractors) are required to be in possession of a medical certificate of fitness issued by an Occupational Medical Practitioner prior to commencing work. Medical surveillance will commence at pre-employment. All workers (including Contractors) are required to be in possession of a medical certificate of fitness prior to commencing work. Annual medical surveillance is required (unless identified as being required more frequently), Arrangements for keeping medical records for the required time are to be noted. It is recommended that the PC has a medical surveillance plan. Full medical records are not to be placed in the H&S file. A procedure for managing the medical records which require safekeeping for prescribed periods are to be addressed. It should be noted that the time period for keeping medical records where asbestos is present is a period of 40 years. Given the potential health risks the following aspects are to be included in each medical surveillance intervention:

- Full medical, surgical and occupational history;
- Full physical examination of all systems; and
- Referral if required for the management of identified health issues that may affect the worker.

Specific testing for existing conditions and limitations relative to exposure could include, but are not limited to:

- Audiometry (hearing tests); and
- Any other tests identified as relevant from chemical or specifically identified risks of exposure.

No employee/ contract worker will be allowed on site without a valid medical certificate of fitness.

Failure to do so will be considered a serious offence.

5.1.1 General Environmental Conditions

Compliance with the Environmental Regulations (as amended), among others is required. Environmental monitoring of ventilation, lighting and dusts may be deemed to be required by the

Approved Inspection Authority used to measure the environment. Copies of the relevant reports and actions taken in respect of these are to be placed in the H&S file.

5.1.2 Noise and Dust Control and Risk

All plant from plant hire companies (suppliers) or that of the PC is to be compliant with the Noise Induced Hearing Loss Regulations. Plant identified that has not been tested and marked for noise emissions will result in having to be tested at the Contractors or PCs expense. Failure to do so within a reasonable time period will result in such plant being removed from site.

Audiometric testing of all workers is noted as required in the medical surveillance programme for all permanent workers prior to work commencing. Temporary labour working in identified noise areas will require testing if the noise levels are indicated on plant or through processes as greater than 85dB. Audiometry records are to be available in the H&S file.

Suitable SANS approved hearing protective equipment shall be issued and worn. Where several items of construction plant are in operation at or near to each other, the noise zone for the combined plant should be established and suitable hearing protective equipment used within this zone.

The PC must ensure to take note that the facility will be fully operational and take extra care and planning communicated to the hospital staff to ensure that noise and dust does not interfere with daily activities.

5.2 Emergency Procedures

An emergency plan and procedure that is appropriate to the risks is required prior to commencement on site. It is advised that the system should be simple and easy for any worker to follow. The plan may be adapted should new information or risks are identified.

The contractor will take into consideration the existing emergency plan and procedures of the existing facility. It must be noted that the Hospital Facility will be fully operational during construction works.

The procedure shall detail the response plan in relation to the works, and include at least (but are not limited to) the following key elements:

- Appointment of a competent emergency response co-ordinator
 - Fire;
 - Public injury, Motor vehicle accidents;
 - Falls from heights;
 - Serious injury to workers (medical or work-related); and
 - Any other major risks identified during risk assessments.

Drills to be conducted bi-monthly for the below:

- Fire drill.
- Bomb threat.
- Fall from Heights Rescue procedures.

The emergency plan is to ensure the inclusion of local service providers where possible. Such arrangements should be made with these persons prior to the commencement of the project. Local emergency telephone numbers must be displayed and made part of the emergency procedure.

- First aid
 - Extra gloves
 - Evacuation plans

The general principals of emergency management are to be applied as it applies to the hierarchy of control and management.

5.2.1 First Aiders and First Aid Equipment

At least 2 first aiders will be trained to Level 3. First aiders shall be available and accessible on site at all times and be able to work as a team when responding to any emergency on the project.

Contractors are expected to ensure compliance and provide/manage their own first aiders and equipment. The number of First aiders will be determined by the complexity and exposed risks of the project, not numbers of workers.

Appropriately stocked first aid kits, as per the GAR requirements, are to be available at all times to assure continual availability and access on site.

First aiders shall be available and accessible on site at all times and be able to work as a team when responding to any emergency on the project. The contractor is to ensure that the first aider forms part of the rescue planning emergency situations when working at heights.

5.2.2 Fires and Emergency Management

Attention to emergency planning and procedures is very important. The full emergency plan must form part of the supporting documentation with the H&S Plan. The CHS Agents approval of all emergency plans and procedures is required prior to commencement on site. It is advised that the system should be simple and easy for any worker to follow. The plan may be adapted should new information or risks are identified.

First aiders shall be available in each working team and be able to work as a team when responding to any emergency on the project.

The procedure shall detail the response plan in relation to the works, and include at least (but are not limited to) the following key elements:

Appointment of a competent emergency response co-ordinator and wardens;

- Lists of first aiders, and
- Requirement in terms of identified risks:
 - Fire;
 - Explosions;
 - Falls from heights, and
 - Motor vehicle accidents.
 - Biological risks: e.g., disease outbreaks

The emergency plan is to ensure the inclusion of local service providers where possible. Such arrangements should be made with these persons prior to the commencement of the project. The emergency plan is to include the risk of fire on site and related to any specific activities where gas, welding, cutting etc. occur.

Fire extinguishers will be appropriate for the risk and in sufficient numbers to deal with the type of fires that could occur. All mobile plants are to have appropriate, accessible fire extinguishers. Hot work permits are required for any such activities.

5.2.3 Incident Management and Compensation Claims

All incidents and accidents are to be investigated. All serious incidents involving any form of disabling injury or fatality are to be reported to the Designer (PA) /Client /CHS Agent immediately. This shall be

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confirmed in writing following the incident. Full details are to be included in each site meeting or when the Client visits site. A summary of incidents is to be included in the monthly report.

Any person who contracts an Occupational Disease will need to be reported to the Compensation Commissioner as an occupational disease where their work is to monitor and in contact with others. Such details are provided in the Compensation for Injuries and Diseases Act (COIDA).

Failure to comply with emergency provisions will be considered a serious offence, and the operation or project may be stopped if deemed inadequate for the work at the time of assessment or site inspection.

5.3 Personal Protective Equipment (PPE) and Clothing

The PC is to provide a procedure as an addendum to indicate how PPE is managed within the Company.

The wearing of the identified SANS approved PPE. The PC shall ensure that all workers (Including Contractors) are issued with and shall wear:

- Hard hats;
- Protective footwear;
- Dust Masks
- Hand Gloves
- Overalls that ensure worker visibility.
- Eye protection (if required)
- Hearing protection (when required)
- Reflective jackets (no bibs)
- Harnesses (working on heights)
- Respiratory protection (minimum of FFP2), and
- Any other necessary PPE identified from SDSs and/or risk assessments.

Adequate quantities of PPE shall be available. This shall include the necessary PPE for visitors. The procedures for managing PPE are to be in a formal procedure submitted with the H&S plan for approval.

Any person (including Client, Designers (PA) & PSP'S etc.) found on site without the necessary PPE will be removed from site until the PPE is supplied and worn.

Failure to comply will result in penalties being applied.

5.4 Occupational Health and Safety Signage

On-site H&S signage is required. Signage shall be posted up at fixed or temporary working areas, or other potential risk areas/operations. These signs shall be in accordance with the requirements of the General Safety Regulations or SANS requirements as amended. Signage is to be noted on the site drawings indicating where fixed/temporary signage is required.

It should be noted that the Hospital Facility will be fully operational during construction activities and the contractor to ensure sufficient separation.

Temporary signage is to include (but not be limited to) the following:

- Report to site office/ 'Warning: Construction Site – Keep out' or similar;
- Site office
- hard hat area or other PPE requirements noted;

- First aid box positions (including vehicles); and
- Fire extinguishers.
- Assembly Area

Signs shall be posted at areas of work on site indicating that a construction site is being entered and that persons should take note of H&S requirements.

Note should be taken that “omnibus” signs indicating that the entire site requires PPE should not be used. Any areas where PPE is mandatory must be separately signed.

The Principal Contractor must ensure that members of the that need to access the hospital will not be able to gain access to the construction area. It should be noted that the Hospital will be fully operational, and the construction area should be properly and securely barricaded at all times.

Failure to comply will result in penalties being applied.

5.5 Induction of Employees and Visitors, General H&S Training

A simple, formal induction programme is to be submitted as an addendum for approval with the H&S plan. Inductions must be carried out for all workers and visitors (including Client and PSP’s) to the site.

Pre-task training is required to ensure workers are familiar with the risks and H&S measures of the work or tasks to be done. Such training is to be done at least daily. Records of inductions and pre-task training are to be kept in the H&S file.

Any person found on site without proof of induction in the H&S File will be removed from site until the proof is supplied and, and a penalty issued per non-compliance.

5.6 Management of Plant and Equipment

Close control of plant and equipment is required, including that of Contractors. No Manmade and damaged equipment to be used on site, control of all equipment and plant is required. It should be noted that control measures should be implemented especially between the working areas and should at all times be separated from the existing facilities employees’ persons and vehicles.

Daily monitoring of all plant and equipment is required prior to commencing work. Full lists of hired and own plant are to be available at the CHS Agent’s/Client audit.

All daily inspection records are to be kept in the H&S file. Plant Hire and Haulage Contractors are to comply with the requirements where plant and equipment is brought onto site. Registers are not to be more than 1 week behind.

Only competent, fit plant operators are to be used and in possession of medical certificates of fitness. Any plant or slings used to lift plant or material require annual load testing by an AIA, and all certificates must have the testers LMI/E number. Operators are to be adequately trained and certified to operate mobile cranes or crane trucks. Certificates and registers are to be placed in the H&S file. Movement of plant in closures and in confined working areas is to be closely monitored and managed by the supervisors. The blind spots of plant are to be taken into account and workers and Contractors protected accordingly.

Failure to do so will be considered a serious offence.

5.7 Working at Heights

The appointment Fall protection planner to be approved prior to appointment. A fall protection and rescue plan is to be available and supplied as an addendum to the H&S plan. The Fall protection plan to be submitted for approval prior to working at heights. The fall protection plan must be appropriate for the project. Method statements, appropriate risk assessments, safe work procedures and training are to be available prior to work commencing.

Construction drawings shall be required for all temporary structures as they relate to the project. The drawings shall be accompanied by full calculations, design loads and any relevant test results as required by the SANS code and ensure adequate allowance for the development of appropriate documentation and training. All drawings are to be checked and signed by a competent structural engineer (registered with ECSA).

The focus for working at height shall include fall restraint systems where possible except during assembling or dismantling top components or where it is not deemed safe.

The relevant SANS codes are to be applied as they apply to the works and the project, such as:

- SANS 10085
- SANS 10333 (parts 1-3)

Should part of the works be contracted out, competent Contractors are to be appointed and submit documentation according to the project requirements. The PC is to note if such work is to be contracted to specialists in the H&S Plan. The plan is to be developed and work managed by a competent person for the duration of the project. The following aspects must be included:

- The public or users of buildings are to be protected at all times by way of hoarding, barricading or fencing;
- Notices to be posted;
- Restrictions or stoppage when weather conditions are deemed hazardous;
- Permit system for working at heights;
- Prevention of falling tools or equipment;
- Link to emergency plan regarding rescue.

All workers are to be in possession of valid certificates of fitness that extend for the duration of the works. Note the requirements in the section relating to medical surveillance.

Registers and all relevant documentation are to be placed in the H&S file.

Work will be stopped, and penalties applied to any work at heights that is not compliant.

5.8 Auditing

Frequency of external auditing by the CHS Agent or Client will be conducted every 30 Days to ensure that the contractors conform to the requirements of the Construction Regulations. The site will be inspected, and the documentation audited relative to the activities and H&S plan. The CHS Officer of the PC must accompany the Client, or the CHS Agent, on all audits and inspections.

The PC will ensure that all their Contractors are audited at a frequency determined by the CHS Agent. Audit frequency may be increased if Contractors are not performing adequately. Audit results will be acted upon, and non-conformances and penalties issued where deemed appropriate. The Client, Designer or CHS Agent may act or require further outcomes if non-compliances are noted, or unsafe acts are noted on site.

Internal audits are to include site conditions as well as ensuring H&S files are appropriate, and compliant. Comprehensive audit reports are to be made available, the format of the audit reports are to be acceptable by the CHS Agent.

The PC will be audited using a template as supplied in the tender document. The audit template will be adjusted from time to time relative to the activities on site. A similar process is to be used by the PC when auditing their Contractors on site. Compliance with legislative requirements and the systems provided by the PC to manage the H&S on site will be measured. Full compliance is required. Time limits for corrective actions will be set and must be adhered to.

Failure to address findings or non-conformances will be considered a serious offence.

5.9 Communication on Site

All H&S communication during the project between the CHS Agent and the PC will be done through the PA/Clerk of Works/Client and be in writing, including the issue and responses to non-conformances and H&S audit results.

Failure to address issues timeously will be considered a serious offence.

5.10 Care of Workers on Site: Access/Egress of Site / Welfare Facilities

Access

Contractor to ensure that Access control to be in place, hoardings erected to separate site from public. Extra hoarding to be in place to ensure the public and personnel are kept out of the construction site.

The Hospital Facility will be fully operational, and the contractor must ensure no unauthorised entry by the public, patients as well as employees of the hospital at any time.

Welfare Facilities

Adequate toilets, clean, safe drinking water and decent shelter must be afforded workers at all times. Toilets will be within reasonable distance of workers, or placed with each working team in safe, with reasonable privacy. Existing facilities may not be shared with existing users of the facility. No substances containing Formaldehyde may be used in Chemical Toilets.

Ablution facilities are an essential facility that must be available for workers across a site. Facilities are a high-risk area and increased cleaning regimes are required to be introduced. A policy on how this will be done is required, that will cover both portable and permanent facilities. The following are considerations, that include, *inter alia*:

- Portable toilets to be provided at a 1:30 ratio but be sanitized daily as per Occupational Health and Safety Measures in Workplaces or more frequently.
- Where there are more than 30 employees on site, facilities should be provided for different sex e.g., female and male toilets to be provided.
- Cleaners to continually clean and have a formal cleaning regime.
- Hand washing facilities (soap and water, paper towel) to be available where possible, and if not, to provide hand sanitizer.
- Induction training to educate to ensure all users are hand washing correctly.
- Flush toilets preferably 1:30 unless increased cleaning regime present.
- Restrict the number of people using toilet facilities at any one time e.g., use a welfare attendant.
- Wash hands before and after using the facilities.

- Enhance the cleaning regimes for toilet facilities particularly door handles, locks and the toilet flush.
- Portable toilets should be avoided wherever possible, but where in use these should be cleaned and emptied more frequently.
- Provide suitable and sufficient rubbish bins for hand towels with regular removal and disposal that need to be managed as hazardous waste.
- Introduce staggered start and finish times to reduce congestion and contact at all times.
- Consider increasing the number or size of facilities available on site if possible.

5.11 Discipline, Alcohol and Substance Abuse

All employees (management included) are to follow instructions given in the interest of H&S. Disciplinary action is to be imposed on those who do not follow such instructions or company rules or policies. Contractor to always follow hospital safety rules (Refer to 5.20) not to interfere with hospital activities.

No person is allowed to work or access site if under the influence of alcohol or other substances that could impact on their own or others safety. The PC is to have a drug and alcohol policy available to manage such instances.

These requirements are applicable to any employee of any organization providing services on site. Penalties may also be applied by the Client, OHS Agent or Engineer.

The contractor will ensure to adhere to the hospitals rules and policies at all times.

5.12 Electrical Equipment

In addition to the requirements of the Electrical Machinery Regulations and the General Machinery Regulations any electrical distribution board used for construction work shall be fitted with suitable earth leakage protection.

Contractor to provide a Certificate of Compliance for all temporal distribution boards.

Leads must be properly and firmly connected. Plugs and sockets shall be in good and safe condition. All electrical apparatus, other than electrical hand tools, shall have a physical "lock out" system which will prevent any operation other than that authorized by a supervisor. A "lock out" sign shall be displayed when the apparatus is not in use.

Method statements and safe work procedures will be required for all work involving electrical apparatus.

5.13 Asbestos

Refer to Asbestos Regulations 2001 – as amended in 2003.

Asbestos has been identified on the pipe lagging goods and windowsills and a full Asbestos Survey report will be issued to the successful bidder.

The removal of asbestos must be done by an asbestos approved Contractor. The H&S specification provided by the PC is to include as much information as possible relative to the requirements relating to asbestos. An asbestos removal plan must be approved by the Department of Labour as well as approval of all general information required of Contractors.

An Asbestos removal permit must be obtained before any removal works commence on site.

Contractor to ensure that all workers in the area where Asbestos is identified are to ensure workers wear the required PPE at all times.

Contractor to ensure that removal of any asbestos must be documented, and proof kept thereof in the Health and Safety File. Dumping certificates must be obtained for any asbestos removed from the site.

Failure to do so will be considered a serious offence.

5.14 Demolition

Care is to be taken during demolition of walls; a stability survey should be carried out by a competent person. All rubble to be disposed on a regular basis and at a controlled refuse site.

Demolition plan to be submitted by the Principal Contractor for approval before any demolition commences.

The Contractor must at all times take into account that the Hospital Facility will be fully operational during the emergency repairs. Extra care to be taken at all times.

Failure to do so will be considered a serious offence.

5.15 Barricading and Hoarding

It is the responsibility of the contractor to ensure to price correctly for barricading and hoarding as the construction site (each separate construction area) must be securely barricaded from the Hospital facilities to ensure that no public, hospital employees or patients can gain any access to the construction areas. Contractor to ensure that the barricading/ hording is maintained at all times as the hospital will be fully operational.

DANGER TAPE OR CANDY TAPE IS NOT PERMITTED TO BE USED ON SITE AS A MEANS OF DEMARCATION!

5.16 Traffic Management

The contractor to develop a comprehensive traffic management plan that includes:

A site-specific traffic flow diagram.

Identification of high-risk traffic areas or zones.

Strategies to minimize disruptions to normal hospital operations.

Measures to control vehicle and pedestrian movement around the work area.

Clear signage and demarcation of safe areas.

Procedures for managing temporary road closures or detours.

Provision for emergency vehicle access.

Plans for managing deliveries and contractor vehicles.

5.17 Temporary Works - Scaffolding, support work, formwork

Temporary works must be properly designed and signed off by a competent person. In these instances a competent person is defined as a Professional Engineer or Professional Technologist (registered with ECSA) who has sufficient experience in the design of the type of temporary work in question to be able to assess the design. The appropriate competent persons are to be appointed to manage and monitor such works to the satisfaction of the Engineer and CHS Agent. Records and registers are to be properly completed and kept in the H&S file. If temporary works are to be erected by a Contractor, this must be notified to the Designer/CHS Agent. All necessary calculations and drawings of temporary works must be kept on site and available to the PA and CHSA.

All scaffolding / temporary works support work must have design drawings that includes load bearing and approved by competent person.

5.18 Biological Hazards

It should be noted that while performing construction work at Cecelia Makiwane Hospital it is possible for construction workers to get into contact with biological risk. Coordination between contractor and hospital infection control shall be implemented to address any concerns relating to biological hazards. All workers entering the construction site must undergo training on the identification and handling of biological hazards prior to commencing work. Contractors shall apply appropriate health and safety measures including PPE and hygiene protocols as per the regulations for hazardous biological agents.

The baseline site HIRA should continue to acknowledge Viral Hazardous Biological diseases outbreak as a general Hazard. Should there be an outbreak the HBA Regulations will apply, and this may require additional controls like HIRA, method statements that address transmission prevention planning, PPE and signage.

5.19 Excavations

A procedure for managing excavations is to be provided as an addendum to the H&S plan describing how excavations are to be managed specifically excavations deeper than 1.5m.

Excavation method statements are to be approved by the Designer and associated risk assessments are required. Designs by competent persons are required where ground conditions are deemed to require shoring.

A competent person is to be appointed for managing all excavations. A permit system is to be available and used for all excavations. All equipment and ground conditions to be checked daily, and prior to work commencing.

Excavations should preferably not be open beyond what can be closed daily. Where excavations need to remain open, all excavations are to be properly protected. Adequate stakes with 1m high demarcation and berms/spoil are required to be a safe distance from the edge of the angle of repose.

Candy tape may not be used to demarcate excavations. Cognisance is required of the surrounding area and increased levels of protection are required where work is in communities, near schools and clinics.

Work will be stopped, and penalties applied to any work in excavations that is not compliant.

5.20 Safety Rules with respect to work to Health Care Facilities

- All persons on the premises shall obey the ECDoH & facilities' Health and Safety rules, procedures and practices.
- All work shall be carried out within normal working hours except certain essential works which may need to be carried out after hours or over weekends.
- Arrangements for such work to be agreed in advance between the Contractor and the facility.
- Emergency / Firefighting equipment belonging to the premises is not to be interfered with.
- Emergency Exits and Escape Routes, including Temporary Escapes Routes are not to be obstructed.
- No persons shall carry out or initiate an unsafe / unhygienic act or operation whilst on the premises.
- Workers are not to interfere with the duties of the hospital, its staff, patients or visitors.

*Health and Safety Specification
Cecilia Makiwane Hospital Phase 1*

Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients including external works.

- The Contractor shall maintain good housekeeping standards in the areas being worked on throughout the duration of the contract.
- The health facility reserves the right to search any person entering or leaving the health facility premises.
- All workers must wear proper identification labels at all times – The Contractor will be asked to remove persons without identification from the premises.
- The Contractor will not be permitted to use any tools or equipment belonging to the health facility.
- The Contractor is to ensure that noise is kept to a minimum so as not to unduly interfere with the functioning of the adjacent facilities.
- The Contractor is to ensure that dust from the works is properly contained so as not to cause problems with the normal functioning of the hospital facility activities.

6 Health and Safety File

The documentation submitted and approved following the awarding of the contract will be used to form the H&S file. The H&S file is required to be laid out in a logical manner, and documentation filed within the file is to be easily accessible.

The following completed information shall be included (but not be limited to) as part of the index:

- The PSHSS;
- The H&S Plan and the approval by Client;
- The Traffic Management and Approval by Client
- Appointment by Client;
- Mandatory agreement with Client;
- Construction Work Permit from the Department of Employment and Labour
- A record of all working drawings, calculations and design where applicable.
- Detailed list of Contractors with contact details, appointments, Mandatories etc.,
- H&S specifications issued;
- Record of Competencies (CVs) and appointments;
- Training Records;
- Permits;
- Method statements;
- Risk assessments;
- Safe work procedures;
- Emergency and injury management;
- Safety data sheets
- Medical surveillance records;
- Registers; and
- Records of audits, minutes etc.
- Plant lists
- Temporary electrical installations
- Employee records (who is on site)

7 Non - Conformances

Should, at any time, the works, or part of the works, be stopped due to unsafe acts or non-compliance with the Clients or PCs H&S Plan; neither the PC nor any other Contractor shall have a claim for extension of time or any other compensation.

The following constitute examples of the types of non-conformances that will attract penalties:

Minor: Penalty: R50/count	Medium: Penalty: R500/count and a non-conformance	Severe Penalty: R5000/count, a non-conformance and/or activity stoppage
Non-use of PPE supplied	Toilets not supplied or regularly serviced; lack of drinking water	Contractors working without Health and Safety Plan approval
Non-completion of registers for plant and equipment on site	Contractors not audited	Workers transported in contravention of the OHS plan or legal requirements
Lack of H&S signage at work areas	Working without training or the appropriate, approved H&S method statements	Invalid Letters of Good Standing
Tools and equipment identified in poor condition during inspections	Legal non-conformances identified during the previous audit and not addressed within the agreed time frame	Non-compliance with traffic accommodation requirements: layout or physical conditions
	No monthly OHS report at site meeting to report on	Any serious breach of legal requirements
	No certificates of fitness for workers as required	
	Working without approved method statements	

7.1 Failure to Comply with Provisions

Failure or refusal on the part of the PC or their Contractors to take the necessary steps to ensure the safety of workers and the general public in accordance with these specifications or as required by statutory authorities or ordered by the engineer, shall be sufficient cause for the engineer to apply penalties as follows:

- (i) A penalty as shown in the Table above shall be deducted for each and every occurrence of non-compliance with any of the requirements of the PSHSS.
- (ii) In addition, a time-related penalty of R500, 00 per hour over and above the fixed penalty may be deducted for non-compliance to rectify any non-conformance within the allowable time after a site instruction to this effect has been given by the Designer. The site instruction shall state the agreed time, which shall be the time in hours for reinstatement of the defects. Should the Contractor fail to adhere to this instruction, the time-related penalty shall be applied from the time the instruction was given.

8 Measurement and Payment

The payment items for Occupational Health & Safety are contained in the Bill of Quantities. The same rules are applicable in respect of the pricing of these items as for every other payment item. Attention is drawn to the Pricing Instructions in this document.

Item and Unit

C.01 Preparation of Contractor's Project Specific Health and Safety Plan. (Lump Sum (L.S))

The rate for this item must cover all expenses incurred in preparing the Contractor's project specific Health and Safety Plan as required by the Client's project specific Health and Safety Specification in this document.

C.02 Principal Contractor's initial obligations in respect of the Occupational Health and Safety Act and Construction Regulations. (Lump Sum (L.S))

The full amount will be paid in one instalment only when the Client's Agent has verified and approved the following:

- (a) The Principal Contractor has notified the Provincial Director of the Department of Labour in writing of the project, Annexure A to the Regulations.
- (b) The Principal Contractor has made the required initial Appointments of Employees and Contractors.
- (c) The Client has approved the Principal Contractor's project Health and Safety Plan.
- (d) The Principal Contractor has set up his Health and Safety File.

C.03 Principal Contractor's time related obligations in respect of the Occupational Health and Safety Act and Construction Regulations. (Month (Mth))

The amount shall represent full compensation for that part of the Principal Contractor's general obligations in terms of the Occupational Health and Safety Act and Regulations which are mainly a function of time. Payment will be made when the Client's Agent has verified the Principle Contractor's compliance as part of the audit. This will include the updating and administration of the Health and Safety file.

C.04 Provision of Personal Protective Equipment (PPE) as listed in the Bill of Quantities. (Number (No))

The rates for these items shall include for the procurement, delivery, storage, distribution and all other actions required for the supply of PPE to the employees of the Principle Contractor, full or part time, requiring them. Sub-Contractors are responsible for their own costs in this regard. Any items of PPE not included on the list will be paid for only after the Engineer has agreed to their acquisition.

Items listed will include, among others which may be noted, are hard hats, reflective vests, reflective bibs, high visibility overalls, protective foot wear, fall arrestor harness and tethers, gloves, ear muffs, earplugs and dust masks of appropriate type. Normal items such as standard overalls, waterproof clothing, gum boots and standard workshop safety equipment such as welding masks and goggles will not be paid for.

Payment will be based on the issues register for PPE as kept by the Construction Health and Safety Officer, backed up by paid invoices if requested.

C.05 Provision of part-time or Full Time Construction Health and Safety Officer, Construction Manager, Assistant Manager, Construction Supervisor

The Tender sum shall include for the cost of a Construction Health and Safety Officer, Construction Manager, Construction Supervisor on a fulltime basis, the amount tendered will be prorated according to the amount of time spent on the project.

C.06 Costs of Medical Surveillance (Unit (No))

This item shall cover all costs in involved in the obtaining of baseline medical examinations of temporary labour, including operators for mobile plant as contemplated in CR 21(d) (ii); for temporary workers and workers exposed to noises at or above the limits given in the Noise-induced Hearing Loss regulations, as stipulated.

Workers in the permanent employ of the Contractor will only be paid for if their certificates require updating.

C.06 a) Initial (baseline) medical examinations, including audiometric and lung function testing.

C.07 Induction Training (Unit (No))

This item shall cover all costs incurred for the health and safety inductions as set out on Regulation 7 of the Construction regulations and the proof of induction required. Payment will be made on the figures contained in the induction section of the Health and Safety File.

C.08 Provision of First Aid Boxes. (Unit (No))

The rate for this item shall cover all costs incurred in the provision and maintaining of first aid boxes as outlined in Paragraph 7 above.

C.09 Establishment of noise levels (Unit (No))

- a) This item shall cover all costs involved in the establishment of noise zones, including any workshops, in terms of Regulation 9 of the Noise-induced Hearing Loss Regulations. Where a zone has previously been established for a particular item of plant within the last two years, the test need not be repeated but must be kept valid for the duration of the Contract.

C.10 Submission of the Health and Safety File. (Lump Sum)

Expenditure under this item shall be made in accordance with the general conditions of contract.

This amount will be paid only once the Principal Contractor has met all his obligations in respect of the Occupational Health and Safety Act and the Construction Regulations and has submitted his Health and Safety File complete as envisaged on this specification to the Client's satisfaction. This must be done prior to the issue of a Certificate of Completion

The contractor shall include for all required OHS items as per the included OHS plan including any scaffolding that may be required when pricing this bill section.

ANNEXURE A CLOSE OUT REQUIREMENTS

The H&S files for the Principal Contractors and all Contractors require closure and handover to the Client at the completion of the project. The following list is an example of what should be included but is not exhaustive. The OHS Agent or the Client may require further information at the time of completion and the Principal Contractor is to ensure that all instructions are met. Documentation would include all records from the start of the project. Daily or monthly plant inspection records are not required unless they are related to an accident. All records to be in electronic format and submitted to the OHS agent for approval in adequately formatted lists and folders. Layout should be logical and in the same order as in the site files.

Health and Safety close out file requirements include:

- a) Client H&S Specification
- b) Principal Contractor's OHS Plan(s)
- c) Principal Contractors Policies
- d) Organograms
- e) Legal Appointments
- f) List of all employees employed on a permanent or contractual basis over the duration of the contract.
- g) Permit Application with the Department of Employment and Labour of commencement of work
- h) Letter of Good Standing
- i) Full files for all Contractors as well as their close out reports
 - List of Contractors
 - All employees employed on a permanent or contractual basis over the duration of the contract.
 - Letters of Approval of Contractors
 - Mandatary Agreements
 - Letters of Good Standing
 - Appointments
- j) Incident Records
- k) Non- Conformance records
- l) Agent's Audits
- m) Method Statements
- n) Risk assessments
- o) Safe work procedures
- p) Medical surveillance certificates of fitness. Medical records are to be kept according to the OH&S Act as amended.
- q) All drawings for temporary structures (suspended beams/scaffolds etc.)
- r) All operating manuals for any systems that require on-going maintenance.
- s) Copies of test results, policies and procedures for environmental monitoring (silica, noise, dusts etc.)

Defect and Liability Period

The H&S files are to be kept 'live' for the defect and liability period by the Principal Contractor, including those of their Contractors. Any work required during the defect and liability period will require an assessment of the H&S file by the OCHS Agent prior to any work commencing. A copy drawing records for the as-builts are to be placed on file by the Designers once complete.

**ANNEXURE B
NON-CONFORMANCES**

HEALTH AND SAFETY SITE INSPECTION NON-CONFORMANCE NO		
AGENT:		PROJECT:
Consultant:		Date and time:
Client		Area:
Contractor:		
ASPECTS NOTED:	COMMENTS:	COMPLETION REQUIRED BY (DATE):
	•	
	•	
	•	
	•	
	•	
PHOTOGRAPHIC EVIDENCE (if available):		
OTHER:		
The following penalties are to be applied:		
Signature of Designer		
Signature of CHS Officer/Site Agent		
Signature: of CHS Agent		

ANNEXURE C

CONTRACTORS MONTHLY HEALTH AND SAFETY REPORT

(To be submitted by the end of the first week of each month and be available with each audit)

CONTRACT NUMBER:		PROJECT NAME:	CONTRACT DETAILS:
1	GENERAL ACTIVITIES FOR THE MONTH		
	(detail each area of work)		
2	NUMBER OF WORKERS (permanent and local, contractors)		
3	TRAINING DONE (supplier, no of people, type)		
4	INCIDENTS / ACCIDENT (list number and details, attach reports)		
6	NON-CONFORMANCES (closed out or active)		
7	CONTRACTORS (list, approval status)		
8	AUDITS COMPLETED (internal and external)		
9	CRITICAL ISSUES		
10	GENERAL		

Health and Safety Officer: _____ Signature: _____

Date: _____

Construction Manager: _____ Signature: _____

Date: _____

SIGNING OF THE ORIGINAL DOCUMENT

We, the undersigned, accept this document as a stable work product to be placed under formal change control as described by the Procedure for Control of Documented Information.

ORIGINAL	Prepared by	Reviewed by	Approved by
Date: 24/11//2023	Lumcus Training and Consulting Signature: Pr. CHSA	BNM Architects Signature:	Department of Health Signature:

3235 – Cecilia Makiwane Hospital

Published: March 2003



Department of labour

Guide Asbestos Regulations 2001

Chief Directorate: Occupational Health and Safety

NO: OHC 1

FOREWORD

The purpose of this document is to provide guidance to all persons, employees and the public alike, who are responsible for or concerned with the control and prevention of exposure to asbestos in the working environment.

This guide does not replace the Asbestos Regulations of 2001. It is intended to give practical insight into the application of the Regulations. It should always be read in conjunction with the Asbestos Regulations and the Occupational Health and Safety Act of 1993.

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INTRODUCTION

The inhalation of airborne asbestos fibres can cause serious lung diseases including asbestosis, cancer of the lungs and mesothelioma. These diseases usually become apparent only some years after exposure to asbestos and sometimes not until 40 or more years after the first exposure. **Cigarette smokers who are occupationally exposed to asbestos exhibit a marked increase in the incidence of lung cancer when compared to non-smokers.**

Exposure to asbestos may result from:

- Inhalation
Asbestos can be breathed in as raw fibre or as dust that contains regulated fibres also known as respirable fibres. Inhalation is the most common source of exposure to asbestos.
- Ingestion
Asbestos can be swallowed in the dust form if it gets on hands, clothing, a beard or moustache. Asbestos fibres can also be taken into the body if food or beverage is contaminated with asbestos. Smoking contaminated cigarettes is particularly risky, because asbestos particles can be breathed in and swallowed.

The old Asbestos Regulations were repealed and the Asbestos Regulations, 2001 were published on 10 February 2002 in Government Gazette No. 23108 with the aim of protecting employees against the adverse effects of asbestos on human health.

The purpose of these guidance notes is to explain in simple language the provisions of the Asbestos Regulations 2001.

Asbestos is any asbestos mineral or any product containing asbestos.

Throughout this guide, the Act means the Occupational Health and Safety Act of 1993.

NB! A specific guideline relating to “demolition work” as defined in regulation 1 of the Asbestos Regulations 2001 is available from the office of the Chief Inspector.

Regulation 2: Scope of application

These regulations are intended to protect the health of any person who may be exposed to asbestos. (In or outside the workplace).

Regulation 3: Notification of asbestos work

Before starting on asbestos-related work, regardless of the extent of the work, every employer (or self-employed person) must write to the relevant provincial director and explain what kind of work is to be done.

Such work could include manufacturing processes during which asbestos fibres are mixed with other materials and the fabrication, installation or removal of asbestos containing materials.

Regulation 4: Exposure to asbestos

Employers and self-employed persons must not allow anybody to work in or to enter an environment in which they may be exposed to asbestos that will exceed the exposure limit for asbestos. The exposure limit is currently set at 0,2 fibres per milliliter of air averaged over a four-hour working period.

Employers must, by means of applying good occupational hygiene principles, keep the airborne asbestos concentration in the workplace at the lowest possible level, but definitely not in excess of the occupational exposure limit (OEL). Good occupational hygiene principles include the following:

- The design and layout of the workplace, engineering measures to control dust, good housekeeping, and good personal hygiene are the first line of defence;
- Administrative controls,

- Thorough training and supervision of employees; and
- The involvement of all employees in safety and health matters in the workplace.

In cases where the concentration of airborne asbestos fibres cannot be contained at or below the occupational exposure limit, employees must be issued with approved/homologated respiratory protective equipment (minimum P2 or FF2). However, this is the last line of defence and the employer must first be able to prove that there is no other reasonable way to reduce the airborne asbestos to below the OEL

Regulation 5: Information and Training

Education and training of any person who may be exposed to lead is of paramount importance, in order to assist employers and employees in reducing the risk of exposure to asbestos dust.

The employer must ensure that he obtains suitable information and training in order to train employees effectively. Alternatively obtain the services of a person who has the requisite competence.

Competence in relation to these regulations infers that the person has practical experience relating to the correct handling, hygiene and work practices relating to work with asbestos. Additionally the person must have a theoretical knowledge of the toxic effects of asbestos.

Education and training must be planned carefully and presented on commencement of employment, and at least annually thereafter.

It is of the utmost importance that health and safety representatives or committees are thoroughly trained and educated with regards to working with asbestos. This is to ensure that the health and safety representatives or committees are able to make informed decisions relating to their discretionary powers.

It is the duty of employers to ensure that all employees have thorough knowledge of the provisions of the Act and these regulations.

Regulation 6: Duties of persons who may be exposed

Employees or any other person exposed to asbestos has a moral and legal duty to comply with any lawful instruction and procedure (written or oral) given by or on behalf of employers. In addition, employees must comply with the requirements laid down by the Act and other applicable regulations.

Failure to do so could result in an increased risk to his health and safety and that of others and may lead to his prosecution.

These instructions and procedures may differ from one workplace to another because workplaces are not identical.

Regulation 7: Assessment of Potential Exposure

This regulation requires the employer to establish if any person is exposed or is likely to be exposed to asbestos dust at the workplace. Assessment is the first step in the process of collecting information in order to make decisions with regard to the risk to health of workers and measures necessary to control asbestos hazards.

The onus is on the employer (or self-employed person) to ensure that a proper assessment is conducted.

Who should conduct the assessment?

The person conducting the assessment should be conversant with the work environment, the processes relating to the asbestos work to be performed and the risks associated with asbestos exposure.

Assessments must be conducted in consultation with health and safety representatives or committee to ensure that their inputs are taken into considerations and ensure transparency.

This assessment is a complex scientific process and it is recommended that reference such as the SAIOH¹ is consulted.

Re-assessments

The re-assessment is intended to confirm the validity of the previous assessment and ascertain that the control measures have been implemented and are effective.

The re-assessment needs not repeat the previous assessment procedure but would be designed specifically to address a range of concerns outlined in this regulation.

Regulation 8: Air monitoring

The employer must introduce a formal measurement program to establish the airborne concentration of asbestos in a particular work place when there is a possibility that workers could be exposed to airborne asbestos in excess of half the OEL ($0.2/2 = 0,1$ regulated fibre).

Due to the highly technical nature of the air monitoring programme and the requirement that only specialised appointees may conduct such measurement, these guidelines do not go into specific details. As a general guideline, however:

- The employer must first inform the relevant health and safety representative or health and safety committee of the proposed monitoring and give them a reasonable opportunity to comment;
- The monitoring should be conducted by either an approved asbestos inspection authority² (AIA), or a person who is registered with the South African Institute of Occupational Hygienists (SAIOH) and whose ability to do the measurements is verified by the AIA.
- The AIA is accountable for the entire process of monitoring and takes full responsibility for the validity, accuracy and correctness of measurement results.
- The decision regarding the number and duration of samples lies with the AIA. The sampling strategy must, however, be representative of the exposure of all employees. If measurement of a representative employee shows that the exposure is above the OEL, then the exposure of all employees that will have the same exposure must be measured.
- Representative measurements must be done at least every 12 months.

(See Information Brochure No. 1 for Approved Inspection Authorities for Occupational Hygiene for more information - available from the DOL provincial office)

Regulation 9: Medical Surveillance

The need for medical surveillance and the nature thereof is based on both the risk assessment and air monitoring results.

The employer must ensure that an employee undergoes medical surveillance if:

- They are exposed or likely to be exposed to asbestos dust, which may exceed the OEL for asbestos; or
- The occupational medicine practitioner certifies that the relevant employee should be under medical surveillance.

Medical Surveillance should be conducted by an Occupational Medicine Practitioner (OMP) who taking into account the nature of the work and the risks associated with it, should draft a structured surveillance programme to include:

- Initial health evaluation (to be carried immediately or within 14 days of a person starting employment)
 - a) Medical and occupational history evaluation,
 - b) Medical examination and test which should include chest X-rays, pulmonary function testing and physical examination and

¹ SAIOH means the South African Institute for Occupational Hygiene

² An approved inspection authority approved to monitor asbestos is also known as an approved asbestos inspection authority. The two terms mean the same thing.

- c) Any other medical examination recommended by the OMP to determine the most appropriate work circumstances for the individual. For example the ability to wear a respirator and conditions that might aggravate a pre-existing medical disorders.
- Subsequent evaluation (be conducted at intervals not exceeding two years or at shorter intervals if specified by the occupational medicine practitioner) in which items (b) or (c) of the initial health evaluation should be repeated.

Employees certified unfit must not be allowed into the workplace where they may be exposed to asbestos dust. Where the health problem is as a result of exposure to asbestos in that workplace, the incident must be investigated and recorded in an Annexure 2 form as required by the General Administrative Regulations.

Regulation 10: Respirator zones

A respirator zone is an area where the concentration of regulated asbestos fibres in the air is, or is likely to be greater than the OEL for asbestos. No persons should be allowed to enter the area without wearing respiratory protective equipment and protective clothing.

Respirator zones must be clearly demarcated and identified to prevent accidental and chance, albeit brief, entry. Even if a person passes through the area or there is little work being conducted in that area, a respirator must be worn.

Floor markings or chevron tape are examples of demarcation where the area is not defined by walls. In addition, all access routes should be demarcated and identified by SABS symbolic warning signs that are clearly visible.

Respirator zones should only be regarded as a temporary control measure. The employer should therefore investigate the use of control measures other than respiratory protective equipment and protective clothing to reduce the airborne asbestos concentrations to below the OEL for asbestos. As a precaution asbestos removal operations should be regarded as respirator zone.

Regulation 11: Control of exposure to asbestos

Where the assessment, air monitoring and medical surveillance identify potential exposure, control measures should be implemented. The hierarchy of control starts with avoiding the use of asbestos, followed by engineering measures to limit the creation of asbestos dust at source (once the dust become airborne it is difficult and expensive to control). Personal protective equipment is used only as a last resort and for emergency purposes.

The control measures should aim at reducing the exposure to far below the OEL as is reasonable practicable. The following measures can be used to control the exposure:

- Using a substitute for asbestos;
- Phasing out of asbestos;
- Limiting the number of employees who will be exposed or may be exposed;
- Limiting the period during which an employee will be exposed or may be exposed;
- Limiting the amount of asbestos fibres which may contaminate the working environment;
- Introducing engineering measures for the control of exposure, including the following:
 - a) Process separation, automation or enclosure;
 - b) Bonding of asbestos fibres with other material to prevent the release of asbestos fibres;
 - c) Installation of local extraction ventilation systems to processes, equipment or tools for the control of emissions of airborne asbestos fibres;
 - d) Use of wet methods where appropriate;
 - e) Separate workplaces for carrying out different processes; and
 - f) An indicator to enable early corrective action to be taken.
- Introducing appropriate work procedures which an employee must follow where asbestos materials are used, processed, handled or stored which could give rise to the exposure of an employee, and those procedures shall include written instructions to ensure that:
 - g) Asbestos is safely handled, used and disposed of;

The condition of the material and the risk associated with it must be assessed and a management plan developed. Any employee likely to be exposed must be fully informed of the risk, procedures and work practices necessary to prevent exposure.

Where a control procedure for asbestos involves removal this may qualify as demolition, in which case regulation 21 applies (refer to demolition guideline)

Regulation 15: Asbestos cement sheeting and related products

Employers who work with asbestos cement products, especially roof sheets, must take steps to avoid general accidents since asbestos cement sheeting may not withstand the weight of persons and tools.

The employer should develop a safe work procedure to prevent the release of asbestos into the environment. This procedure should include the use of hand or power tools that will not generate unnecessary dust. Operators who cut asbestos-cement products must wear an approved respirator.

Ideally, new asbestos cement products should be painted or otherwise coated to prevent release of fibre and inhibit the growth of lichen or moss. It is not the intention of these regulations to encourage the unnecessary cleaning of existing roofs and structures. Although some people may wish to clean and repaint for aesthetic reason it is not technically necessary in terms of this regulation.

Dry brushing, scraping, sanding and abrasion cleaning techniques are not allowed. Roof cleaning with a high-pressure water jet is allowed but only in conjunction with a profiled hood that prevents the dispersal of contaminated water. Water polluted with asbestos must be filtered and the residue disposed of safely.

Regulation 16: Records

The benefit of keeping records as specified in the regulation are as follows:

- There is a long time period between initial exposure and the development of asbestos related disease
- Protects both employer and employees

Thorough, complete and up to date records should therefore be kept of:

- Medical surveillance for a minimum period of 40 years;
- Maintenance of control measures for a period of 3 years;
- Asbestos inventory for minimum period of 40 years;
- Training given to employee in terms of Asbestos Regulations for as long as the employee remains employed at the workplace in which he or she is being exposed to asbestos dust; and
- Assessments and air monitoring for a period of 40 years.

Records should be made available as follows: To the

- inspectors from the Department of Labour:- All records that an employer is required to keep, excluding personal medical records. Personal medical records may only be made available to the inspector with the written consent of the employee concerned);
- the employee personal occupational health practitioner:- The personal medical records, when called for in writing by the employee concern; and
- health and safety representatives and committees:- Records of assessments, asbestos inventory and air monitoring.

Regulation 17: Personal protective equipment and facilities

Employers must provide effective personal protective equipment and facilities free of charge. The equipment must also be properly selected, maintained, cleaned, undamaged and properly used. Some manufacturers of respirators give specific instructions in this regard.

Personal Protective Clothing

All employees who are exposed to asbestos dust must be provided with protective clothing.

Respiratory Protective Equipment

All employees in respirator zones, and any other employees who by the nature of their work may be exposed to greater than the OEL for asbestos, must be provided with respirators.

Only respirators that have been approved/homologated by the South African Bureau of Standard (SABS) may be used. When selecting a respirator, the following must be kept in mind:

- The concentration of asbestos fibre;
- The duration of exposure;
- The exposure limit for the asbestos; and
- The safety factor of the respirator.

Respirators can spread contagious diseases. It is advisable to provide respirators for personal use by specific employees. But, if respirators are used in turn by more than one employee, they must be cleaned and disinfected according to the manufacturer's instructions after every use.

No employee should be allowed to remove personal protective clothing and respirators from workplace. This is to prevent asbestos dust being spread to private households.

Personal protective clothing and respiratory protective equipment may only be removed from the premises for repair or washing under controlled conditions. The employer or self-employed person has a responsibility to ensure that when contaminated personal protective equipment is sent off the premises to a contractor for cleaning, that:

- Equipment is packed in impermeable containers;
- The container is tightly sealed;
- The container is clearly marked to indicate that it contains asbestos; and
- The contractor is fully informed of the following:
 - a) The requirements of these regulations; and
 - b) Precautions to be taken for handling the asbestos contaminated equipment.

This requirement also put the responsibility on the employer to train the contractor on the danger of exposure to asbestos dust.

When the contaminated equipment is removed from the workplace it must not pose a danger to employees or the public.

Cleaning And Storage Of Personal Protective Equipment

All cleaned personal protective equipment must be stored in a place or container where it will be safe from asbestos contamination and damage.

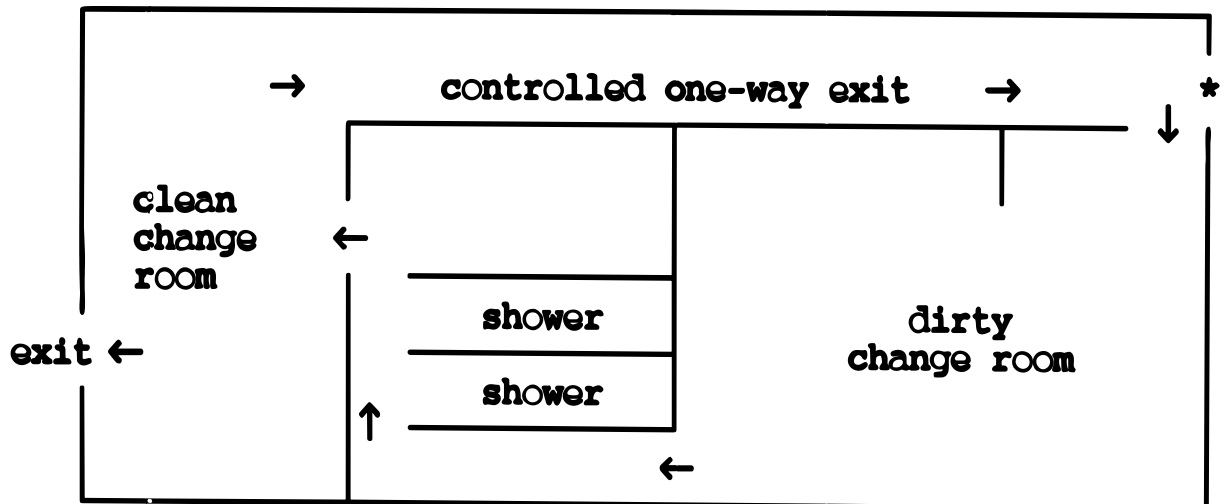
Separate storage facilities must be provided for used personal protective equipment and personal property of employees. Typically, such equipment consists of lockers or any similar type of repository.

The wash and change room facilities must consist of at least the following:

- A clean change room

This is a room where employees take off their own clothes and put on clean protective clothing and equipment. In this room, facilities must also be provided for the protection of clean protective equipment as well as private clothes.

- Showers and washing facilities
No employee may enter a *clean* change room from an asbestos area or respirator zone without showering. The showers should preferably have cold and hot water mixed, in other words, coming out of the same tap, and be activated immediately when a person passes under it. Soap should also be provided for each employee.
- A dirty change room
All asbestos-contaminated protective clothing and equipment must be removed and left in this room. Facilities for the protection and removal of protective equipment and clothing must also be provided.



* to or from asbestos contaminated area or respirator zone

Regulation 18: Maintenance of control measures

It is essential to ensure that all control equipment and facilities are kept in good order.

Engineering controls should be tested and examined at intervals not exceeding 24 months by an approved inspection authority approved for that purpose.

Regulation 19: Labelling, packaging, transportation and storage

Asbestos can be spread by air, water and human activity. For this reason, all asbestos that has the potential to contaminate, must be:

- Controlled in such a manner that it does not release fibres;
- Kept in containers or a similar suitable manner of containment that makes it difficult to be spread to other areas of the workplace or to other premises; by wind or by water; and
- Contained during transport and clearly labelled (In the form of Annexure 1).

The manner of containment or the kinds of containers to be used will depend on the kind of material being packaged, transported or stored.

Regulation 20: Disposal of Asbestos Waste

Asbestos waste has a potential to pollute the environment and pose a health risk to human health. Therefore, industry must strive to attain maximum reclamation and recycling of asbestos waste. However, asbestos waste must not be used in products that normally do not contain asbestos.

If asbestos waste is not used for reclamation or recycling, the employer must have it dumped safely by ensuring that:

- Asbestos dust is not released during transportation to the dumping ground. Instead, use tightly sealing containers;
- Asbestos waste is dumped on dumping sites specifically approved for asbestos waste in terms of the Environmental Conservation Act, 1989(Act No. 73 of 1989) and the National Environmental Management Act, 1998 (Act No. 107 of 1998);
- All employees who are involved in the transportation and dumping of asbestos waste are provided with the required respirators and protective clothing and they are properly trained in the procedure to be followed in the event of spillage or similar emergency or situation that could arise by accident;
- All equipment is thoroughly cleaned after dumping. This includes vehicles and protective clothing;
- All incidental spillage of asbestos waste be cleaned up immediately. The driver of the vehicle carrying asbestos waste must have the necessary training and be conversant with the instructions to handle such cases; and
- Contractors, and owners of dumping grounds where asbestos waste is disposed, must also comply with the provisions of this regulation. No waste should be left uncovered at the end of a workday.

Regulation 21: Demolition

The regulations thus far dealt with asbestos work under fairly routine circumstances. The regulation entitled demolition deals with work with asbestos under specialized circumstances. The legislator cannot provide for such non-routine situations and therefore the employer must provide his own procedures.

These procedures are submitted in the form of a plan of work to the AIA for approval. The plan of work becomes an independent document and supplements specific requirements of the Asbestos Regulations. These plans of work may adopt different exposure limits, monitoring procedures, methods of control and any other aspect which the AIA decides is appropriate for the carrying out of the particular 'demolition work' that is approved by the AIA. The procedures contained in the plan of work approved by the AIA are legally enforceable.

Please refer to guidance note no: OHC 5 entitled 'Asbestos demolition work'. This guidance note specifically provides details that need to be included in the plan of work.

Regulation 22: Prohibition

This regulation prohibits:

- The use of compressed air to clean the workplace. This method of cleaning creates a danger because asbestos dust becomes airborne and it has the potential to increase the exposure levels and also contaminate other workplaces or environment. Instead, use vacuum-cleaning equipment, or sprinkle the dust with water or wet sawdust before sweeping or removing it.
- Smoking, eating and drinking, and the keeping of foodstuffs or beverages in zoned areas. Because asbestos can enter the body through the digestive tract, this prohibition, as well as any other matters regarding personal hygiene in zoned areas must be given priority.
- Applying asbestos by spraying or similar methods.

5.2. C3.12 BASELINE RISK ASSESSMENT

BASELINE RISK ASSESSMENT

Cecilia Makiwane Hospital: Phase 1 - Infrastructure Improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients including external works.



The base line risk assessment is to highlight hazards emanating from project risks identified.

Risk Rating multiplier: Low = 1; Medium = 2; High = 3

Low	Med	High
1	4	12
2	6	18
3	8	27

Note, this HIRA is a guide only and does not cover all risks. It must be read in conjunction with the Site Specific OHS Specification in the contract document. The contractor must supply a full risk assessment for all activities on site.

Residual risk

Operation	Hazard	Design Risks identified as present	Likely consequences of an incident	Frequency of Exposure	Probability of harm	Risk rating and risk category	Describe the obvious control measures to be part of design	Likely consequences of an accident	Frequency of Exposure	Probability of harm	Risk rating and risk category	Accountability
1 Weather-Related:	Extreme weather conditions (e.g., thunderstorms, extreme heat, cold, or precipitation). High winds.	Health risks, exposure-related illnesses, or accidents due to adverse weather. Falling from roof/scaffolding during high winds.	1	1	2	2	Monitor weather forecasts and take necessary precautions. Provide suitable clothing and gear for extreme conditions. Have designated shelter areas during storms.	1	1	2	2	Contractor, Construction Manager, CHSO
2 Chemical and Environmental:	Exposure to hazardous chemicals, pollutants, or contaminated soil.	Health risks, chemical exposure, or environmental contamination.	1	1	2	2	Identify and handle hazardous materials safely. Use appropriate personal protective equipment (PPE). Implement proper waste disposal procedures.	1	1	2	2	Contractor, Construction Manager, CHSO
3 Traffic and Site Access:	Traffic hazards when entering the hospital premises. Disruptions to EMS routes as well as visitors and hospital staff.	Injury or accidents involving vehicles. Obstruction to hospital entrance and routes.	2	2	3	12	Establish clear signage and traffic control measures. Use flaggers or barriers to direct traffic away from work areas. Follow established road safety procedures.	1	1	3	3	Contractor, Construction Manager, CHSO

4	Subsurface Utility Conflicts:	Encountering unexpected services.	Damage to existing services.	1	2	3	6	Coordinate with utility companies to identify and mark utilities. Train personnel to recognize utility markings and respond accordingly.	1	1	3	3	Contractor, Construction Manager, CHSO
5	Wildlife and Insects:	Exposure to wildlife or insect bites/stings in outdoor environments.	Allergic reactions, bites, or stings.	1	2	3	6	Provide insect repellent and protective clothing. - Educate Contractors about local wildlife and safe interactions. - Establish protocols for dealing with encounters (e.g., snakes or venomous insects).	1	1	3	3	Contractor, Construction Manager, CHSO
6	Material Handling and Lifting:	Manual handling of heavy equipment or drilling tools.	Musculoskeletal injuries due to improper lifting or handling techniques.	1	2	2	4	Provide training in proper lifting techniques. - Use mechanical aids for lifting when feasible. - Rotate tasks and schedule breaks to prevent overexertion.	1	1	2	2	Contractor, Construction Manager, CHSO
7	Personal Protective Equipment (PPE):	Inadequate or improper use of PPE.	Reduced protection from workplace hazards.	2	2	2	8	Provide appropriate PPE for specific tasks. - Conduct regular PPE inspections and ensure correct usage. - Enforce compliance with PPE requirements.	1	1	2	2	Contractor, Construction Manager, CHSO
8	Communication Hazards:	Lack of communication or unclear instructions during activities.	Misunderstandings leading to accidents or errors.	1	2	2	4	Establish clear communication channels and protocols. - Conduct safety briefings and ensure all team members understand instructions. - Encourage open communication and reporting of safety concerns.	1	1	2	2	Contractor, Construction Manager, CHSO
9	Inadequate Training:	Insufficient training in techniques, safety procedures, or equipment use.	Inefficient work processes, unsafe practices, or accidents.	1	2	2	4	Provide comprehensive training for all Contractors. - Ensure workers are competent to perform their assigned tasks. - Offer ongoing training and updates as needed.	1	1	2	2	Contractor, Construction Manager, CHSO
10	Client and Public Relations:	Managing interactions with clients, property owners, or the public.	Miscommunications, conflicts, or disputes.	1	2	2	4	Establish clear lines of communication with clients and stakeholders. - Address concerns and conflicts promptly and professionally. - Document agreements and communication with clients and stakeholders.	1	1	2	2	Contractor, Construction Manager, CHSO

11	Hazardous Biological Agent:	Potential exposure to infectious agents in a hospital environment.	Transmission of infections to Contractors or hospital occupants.	2	2	3	12	Adhere to hospital infection control protocols. Wear appropriate PPE, including gloves and masks when entering hospital facilities. Maintain strict hygiene practices, including handwashing and sanitization.	1	1	2	2	Contractor, Construction Manager, CHSO
12	Unknown Existing services:	Overhead or existing services.	Can lead to leaks, fires, explosions, or electric shocks.	1	1	3	3	Safe Work practices.	1	1	2	2	Contractor, Construction Manager, CHSO
13	Dust and Air Quality:	Dust and particulate matter generated by investigation and cleaning.	Air quality degradation and potential respiratory health issues for patients and staff.	1	1	2	2	Implement dust control measures, including water spraying and dust barriers. - Monitor air quality and use air filtration systems where necessary. - Schedule activities that generate dust during low-occupancy times.	1	1	1	1	Contractor, Construction Manager, CHSO
14	Patient safety including staff and Visitors:	Presence of patients, visitors, and staff in the hospital.	Disturbance to hospital operations, privacy concerns, or accidents involving hospital occupants.	2	2	2	8	Clearly communicate the purpose and duration of construction activities to hospital staff. Implement safety barriers or signage to direct people away from work areas. Minimize disruptions to hospital operations as much as possible.	1	1	2	2	Contractor, Construction Manager, CHSO
15	Emergency Response Coordination:	The potential for emergencies within the hospital investigation and cleaning.	Delayed emergency response or confusion during an emergency situation.	2	2	3	12	Coordinate emergency response procedures with hospital administration. Ensure Contractors are familiar with hospital evacuation and emergency protocols. Maintain clear communication channels with hospital security and emergency response teams.	1	1	3	3	Contractor, Construction Manager, CHSO
16	Patient Privacy and Confidentiality:	Investigation and Cleaning contractor having access to patient information or sensitive areas.	Breach of patient privacy or violation of healthcare regulations.	2	2	2	8	Limit access to patient areas to only essential personnel. Ensure all Contractors sign confidentiality agreements. Observe patient privacy rules and HIPAA regulations.	1	1	2	2	Contractor, Construction Manager, CHSO
17	Noise and Disturbance:	Noise generated by cleaning and investigation activities affecting patient comfort and recovery.	Increased stress levels among patients and staff.	1	2	2	4	Schedule noisy activities during non-peak hours or low-occupancy times. Use noise-reducing equipment or barriers. Communicate with hospital administration to minimize disruptions.	1	1	2	2	Contractor, Construction Manager, CHSO
18	Hospital-Specific Protocols:	Lack of familiarity with hospital-specific safety protocols and procedures.	Failure to comply with hospital rules, leading to incidents or accidents.	1	2	2	4	Collaborate closely with hospital safety officers. Attend hospital orientation and safety training as required. Adhere to all hospital-specific safety guidelines and policies.	1	1	2	2	Contractor, Construction Manager, CHSO

19	Emergency Medical Services (EMS) Access:	Potential obstruction of EMS access routes due to construction activities.	Delayed medical response in case of emergencies.	1	2	2	4	Coordinate with hospital administration to identify and maintain clear EMS access routes. Ensure all construction equipment and materials are stored in designated areas that do not block access routes.	1	1	2	2	Contractor, Construction Manager, CHSO
20	Communication with Hospital Staff:	Miscommunication or misunderstanding between Contractors and hospital staff.	Errors, conflicts, or disruptions in hospital operations.	1	2	2	4	Establish a clear point of contact within the hospital for communication and issue resolution. Hold regular meetings with hospital staff to review progress and address concerns.	1	1	2	2	Contractor, Construction Manager, CHSO
21	Working at Heights:	Scaffolding not properly erected.	Scaffold collapse.	2	3	3	27	To be done by competent persons. Method statements. To be done according to the Design drawings that includes load bearing and approved by competent person.	3	2	2	12	Contractor, Scaffold Erector, Scaffold inspector
		Scaffolding not properly erected.	Fall from height / Falling Object.	2	3	3	27	Competent erectors and inspectors. Method statements. To be done according to the Design drawings that includes load bearing and approved by competent person Contractor to price correctly for this section. Fall Protection plan and rescue plan to be done by a registered Fall Protection Planner.	3	2	2	12	Contractor, Scaffold Erector, Scaffold inspector
		Use of ladders.	Persons / objects falling.	2	3	3	18	Worker training Experienced staff by site staff and P A. Competent Inspection. Method statements. Ladder to be according to General Safety Regulations 13a.	2	2	2	8	Contractor, Scaffold Erector, Scaffold inspector
		Use of fall arrest equipment.	Persons / objects falling / injury / death.	2	3	3	18	Ensure workers are trained and competent. Anchorage point and secure anchor or lifeline (to be discussed and approved by the structural engineer prior to work commencing). Fall Protection and Rescue plan to be developed by Fall Protection Planner. Inspection of equipment. Method statements.	2	2	2	8	Contractor, Fall Protection Planner.

22	Use of electrical equipment:	Contact with electricity.	Electric shock.	3	2	3	12	Ensure all connections secure, no breaks in cable. Proper routing of cables on site. Certificate of Compliance for electrical supply.	3	2	1	6	Contractor, Construction Manager, CHSO, Electrical Supervisor
23	Barricading / Hoarding	Construction site - Barricading / Demarcating / Hoarding	Interaction with existing hospital activities / personal and general public /	3	3	3	27	Extra special care and planning and communication between the contractor and hospital staff where working in close vicinity to ICU and operating theatres. A solid hoarding structure to be above ceiling height to be considered. The contractor is to ensure to price correctly for barricading and hoarding to ensure sufficient barricading around each construction area.	3	2	2	12	Contractor, Construction Manager, CHSO
24	Demolishing	Breakdown structure	Break wall from top to bottom. Injury to all body parts can occur	3	3	3	27	Regular inspection and evaluation of the working area prior to work. Employees to be trained and regular tool box talks to be conducted.	3	2	2	12	Contractor, Construction Manager, CHSO, Demolition Supervisor
		Dust	Inhaling of dust causing sinus and other respiratory illnesses	3	2	3	18	Correct PPE, Daily checklists and Tool Box Talks must be done. Communication with the hospital to ensure minimum dust exposure during working hours.	3	2	2	12	
		Working Area	Loose bricks laying around, Workers can fall over bricks - Injuries to all body part can occur	3	2	3	18	Ensure competent operators to position machine correctly to ensure maximum usage are any one lift / Method statements/ Risk Assessments/Safe Work Procedures Tool Box Talks	3	2	2	12	
25	Asbestos Management	Asbestos Removal	Potential to pollute the environment and pose a health risk to human health	3	3	3	27	All pieces of broken asbestos fibre cement roof sheeting, gutters and downpipes, fascia and barge boards, roof sheeting, rainwater goods, safely stored for disposal at the nearest hazardous waste site. Removal of all waste at regular intervals by an accredited Asbestos Removal Company.	2	2	2	8	Contractor, Construction Manager, CHSO / Accredited Asbestos Removal Company
								All Employees to wear the correct PPE when working in close proximity to areas containing Asbestos					Contractor, Construction Manager, CHSO
26	Excavations	Plant & Manual	Injury or death to employees, Public and personnel. Damage to the existing fauna and flora.	3	2	3	18	Excavation barricaded/shored as required. Proper supervision. Toolbox talks to workers to ensure understanding of the heritage of the site	3	2	2	12	Contractor, Construction Manager, CHSO, Excavation Supervisor

5.3. PART C4 SITE INFORMATION

C4.1 SITE INFORMATION

Bid Description:	Cecilia Makiwane Hospital - Phase 1: Infrastructure improvements, alterations and additions to existing buildings to accommodate the Rehab Centre of excellence for treatment of Cerebral Palsy patients & existing Block H in order to accommodate Ophthalmology Services, including External Works (Mdantsane, Amathole Health District)
Project Number:	SCMU3-23/24-0751-HO

GENERAL

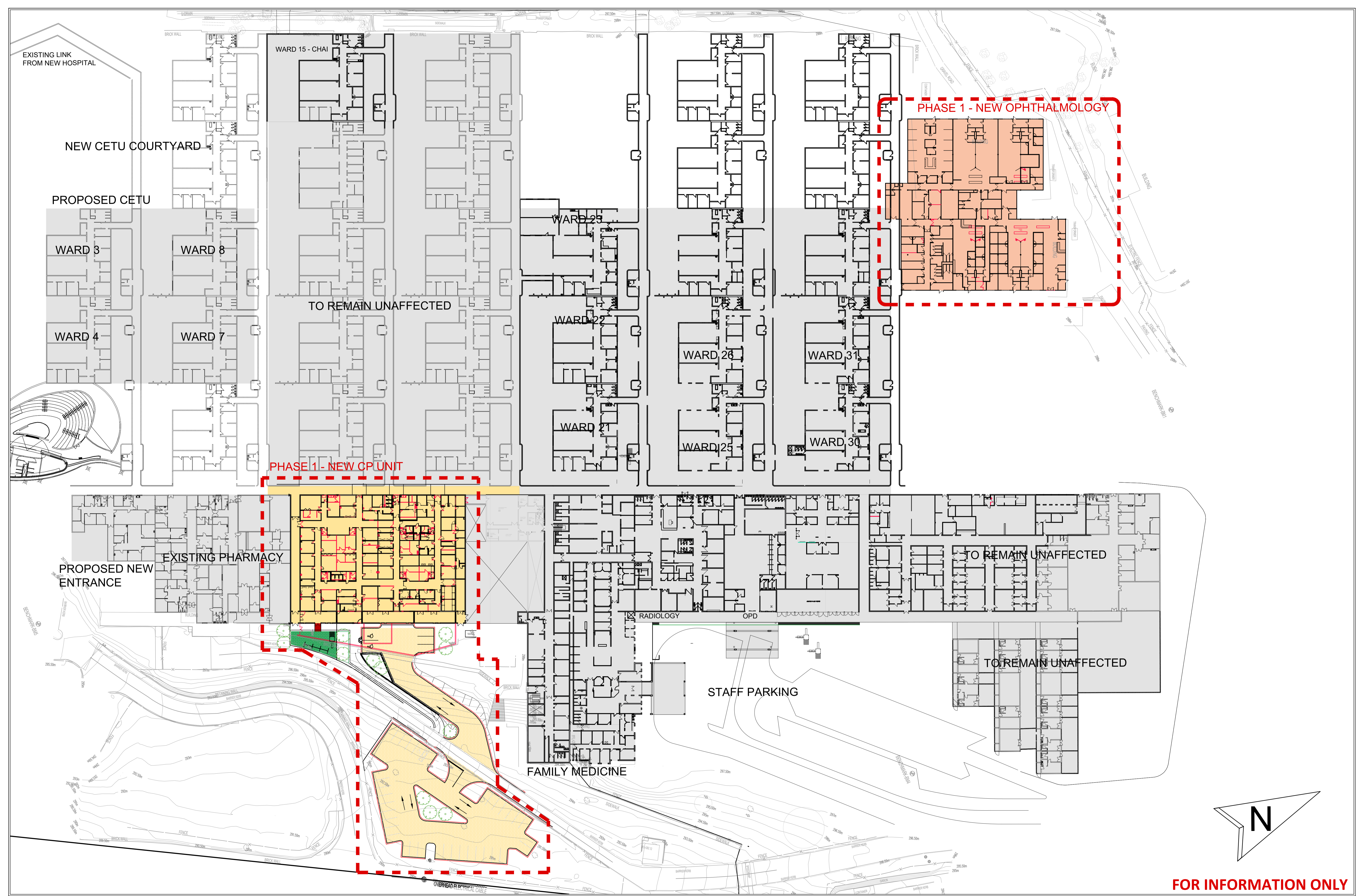
Prospective bidders to familiarize themselves with the locality, access, any other “restrictions” (Refer to Scope of Works C3)

Cecilia Makiwane Hospital

Address : Billie Road, Mdantsane Unit 4, Mdantsane
Coordinate : -32.5537, 27.4442

GEOTECHNICAL INVESTIGATION REPORT

N/A



FOR INFORMATION ONLY

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client

 Province of the
EASTERN CAPE
 HEALTH

project details
 SCMU3-22/23-0120-HO:
 Cecilia Makiwane Hospital

project number
 BNM REF: 3235
 CAD

revisions		
date	rev	description

The contractor is to verify all dimensions on site before commencing any part of the work. Errors, discrepancies or omissions are to be reported for clarification.

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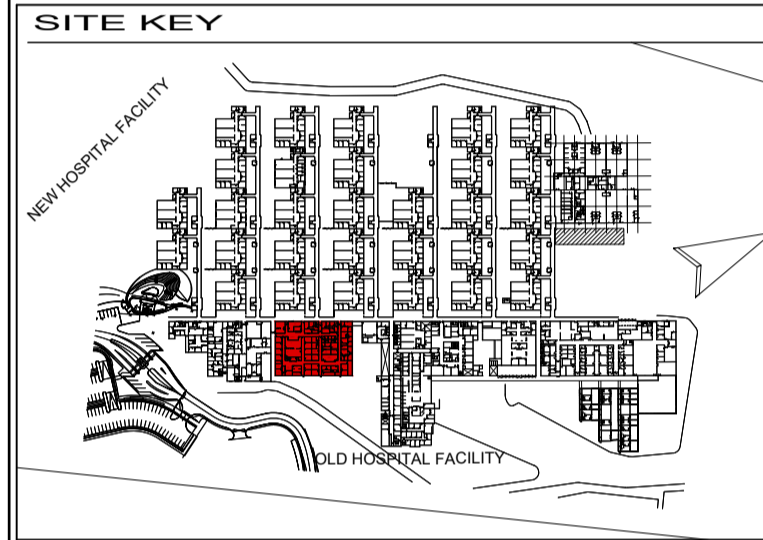
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drawing number	rev
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Proposed Phase 1	



**CP UNIT
DEMOLITION PLAN**
SCALE 1:100

general notes



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notes
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revisions	date	rev	description

structural engineer mechanical engineer
electrical engineer

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Province of the EASTERN CAPE HEALTH

project number
BNM REF: 3235

drawing name
CP Unit - Demolition plan

project details
SCMU3-22/23-0120-HO:
Cecilia Makiwane Hospital

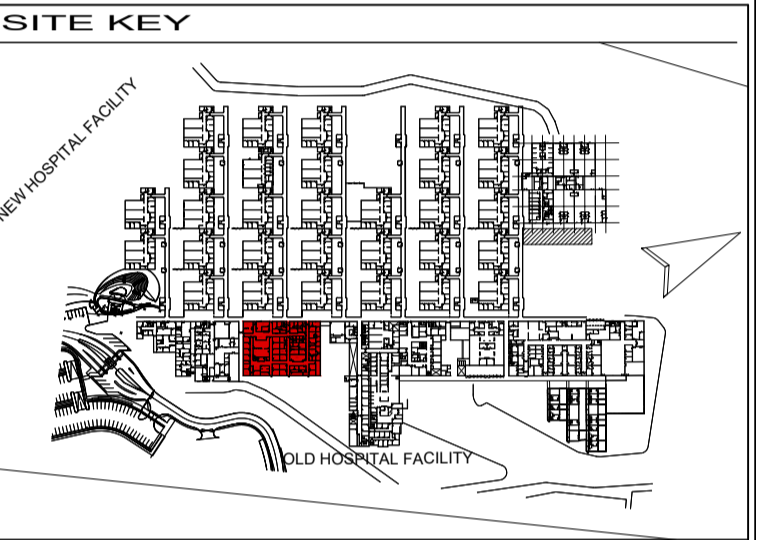
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**CP UNIT
DIMENSION PLAN**
SCALE 1:100



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notes
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electrical engineer

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project number
BNM REF: 3235

drawing name
CP Unit - Dimension plan

project details
SCMU3-22/23-0120-HO:
Cecilia Makiwane Hospital

drawing number	revision		
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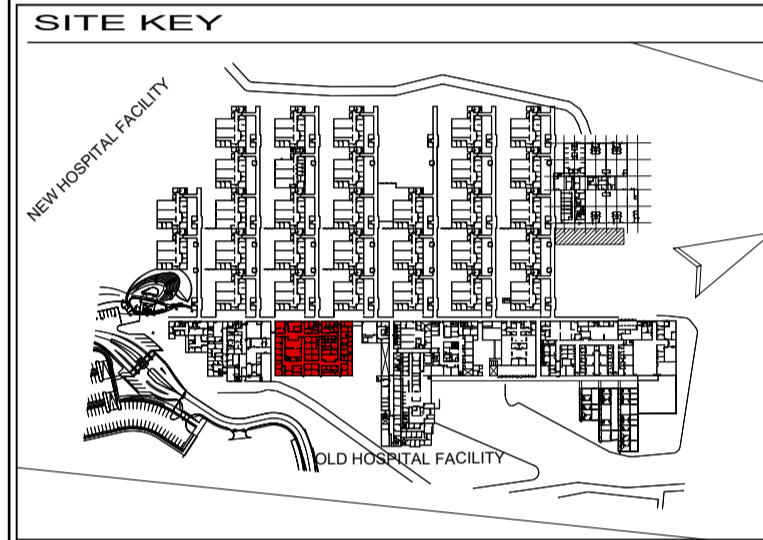
FOR INFORMATION ONLY



CP UNIT
DRAINAGE AND SANITARY PLAN
 SCALE 1:100

general notes

Notes regarding the project, including site key information and general contractor instructions. The site key shows the location of the CP Unit within the overall hospital facility layout.



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notes
 The contractor is to verify all dimensions on site before commencing any part of the work. Errors, discrepancies or omissions are to be reported for clarification.

revisions	date	rev	description

structural engineer mechanical engineer
 electrical engineer

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project number
 BNM REF: 3235

drawing name
 CP Unit - Drainage & Sanitary

project details
 SCM03-22/23-0120-HO:
 Cecilia Makiwane Hospital

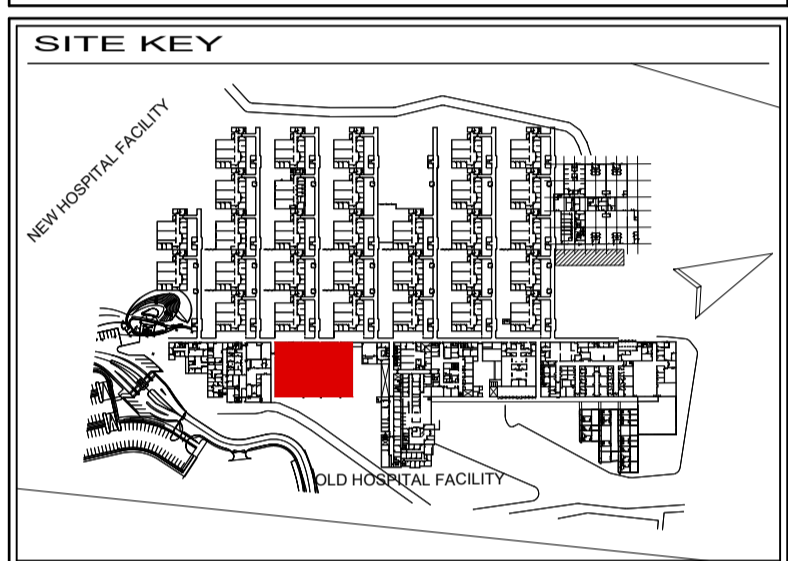
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drawn	checked	scale	date
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registered owner signature architects signature



- general notes**
- KEY**
- ECOsurface: 3.2mm Thick recycled tire rubber flooring with EPDM multi-coloured flecks, colour: Asphalt Jungle 2513, Install as per approved manufacturer's specification. Sealed after installation.
 - FLOORWORX Sphera Element MS123 - Whisper Grey - 2.5mm thick non-directional vinyl sheeting.
 - FLOORWORX Superflex MS123 - Whisper Grey - 2.5mm thick directional vinyl sheeting. NB. Direction noted on plan.
 - FLOORWORX Superflex MS122 - Ash Grey - 2.5mm thick directional vinyl sheeting. NB. Direction noted on plan.
 - FLOORWORX Surestep Safety Vinyl 85022 (R12) 2.5mm thick vinyl sheeting.
 - Stonclad UT as a 5mm high impact, thermal shock and chemical resistant self-priming polyurethane urea mortar and seal with Stonkote HT4 - colour Sage
 - FORBO Modulup 19dB 4380212 Rustik Oak loose lay acoustic vinyl sheeting.
 - FORBO Modulup 19dB 4330208 Code Zero I Lime loose lay acoustic vinyl sheeting.
 - FLOORWORX Surestep Safety Vinyl 85022 Dark Wenge (R10) 2.5mm thick vinyl sheeting.
 - Easigrass EASI-PLAY artificial grass surface, laid on compacted / condensed platform surface with 30mm sand blinding layer, fixed as per manufacturers specification
 - 19mm Stone GRAVEL infill



CAD
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notes
 The contractor is to verify all dimensions on site before commencing any part of the work. Errors, discrepancies or omissions are to be reported for clarification.

revisions	date	rev	description

structural engineer mechanical engineer
 electrical engineer

BNM ARCHITECTS PROJECT MANAGERS

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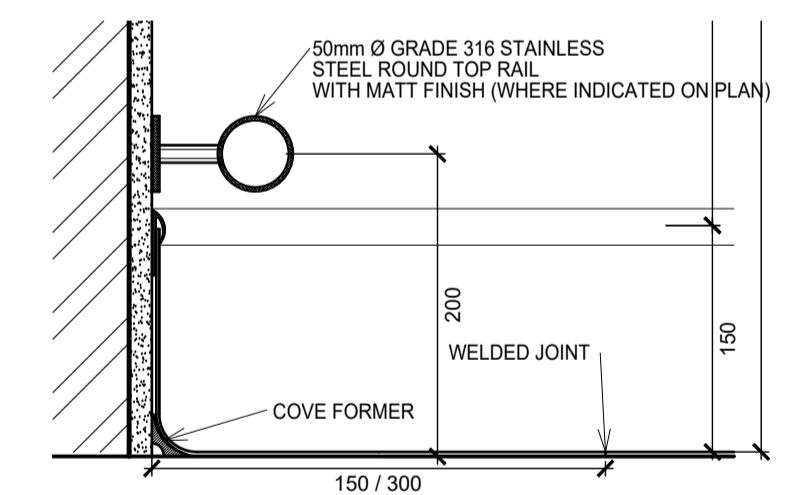
project number
BNM REF: 3235

drawing name
CP Unit - Floor finish plan

project details
**SCMU3-22/23-0120-HO:
 Cecilia Makiwane Hospital**

drawing number	revision		
3235_CP_105	1		
drawn	checked	scale	date
AS	Aninda Swart SACAP 7061 PROF. ARCH.	1:100	21-09-2023

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FLOOR BORDER / SKIRTING DETAIL
 SCALE 1:5

NOTE: 300mm BORDER, SKIRTING AND FLOORING SPECIFICATION TO MATCH TO ALL ROOMS. WELDED JOINT TO MATCH FLOORING AS PER MANUFACTURER. COVE FORMER AND CAPPING TO MATCH AS PER MANUFACTURER SPECIFICATION.

NOTE: Area of flooring with custom pattern as per specification on plan

MARMOLEUM Modular 2.5mm thick vinyl tiles, 1000x250 or 500x500 format - in custom pattern - detail to follow
 Measurement of flooring to allow extra over for pattern cutting and wastage

FOR INFORMATION ONLY

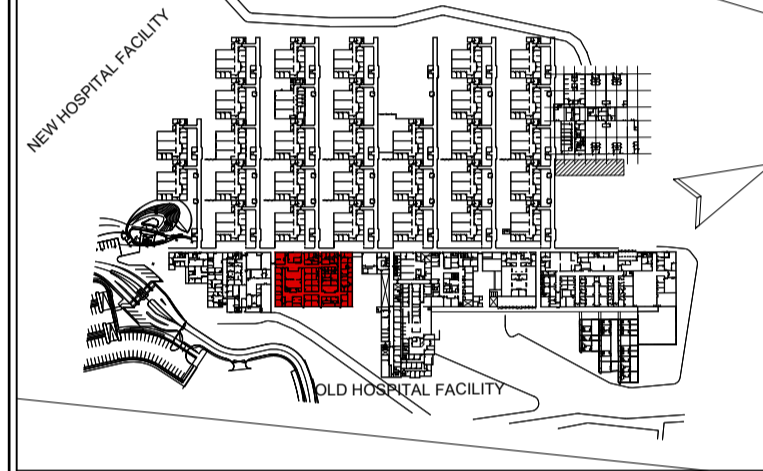


**CP UNIT
JOINERY PLAN**
SCALE 1:100

general notes

Notes section containing general project information and instructions.

SITE KEY



CAD
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electrical engineer

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client
Province of the EASTERN CAPE HEALTH

project number
BNM REF: 3235

drawing name
CP Unit - Joinery plan

project details
SCMU3-22/23-0120-HO:
Cecilia Makiwane Hospital

drawing number **revision**
3235_CP_106 -

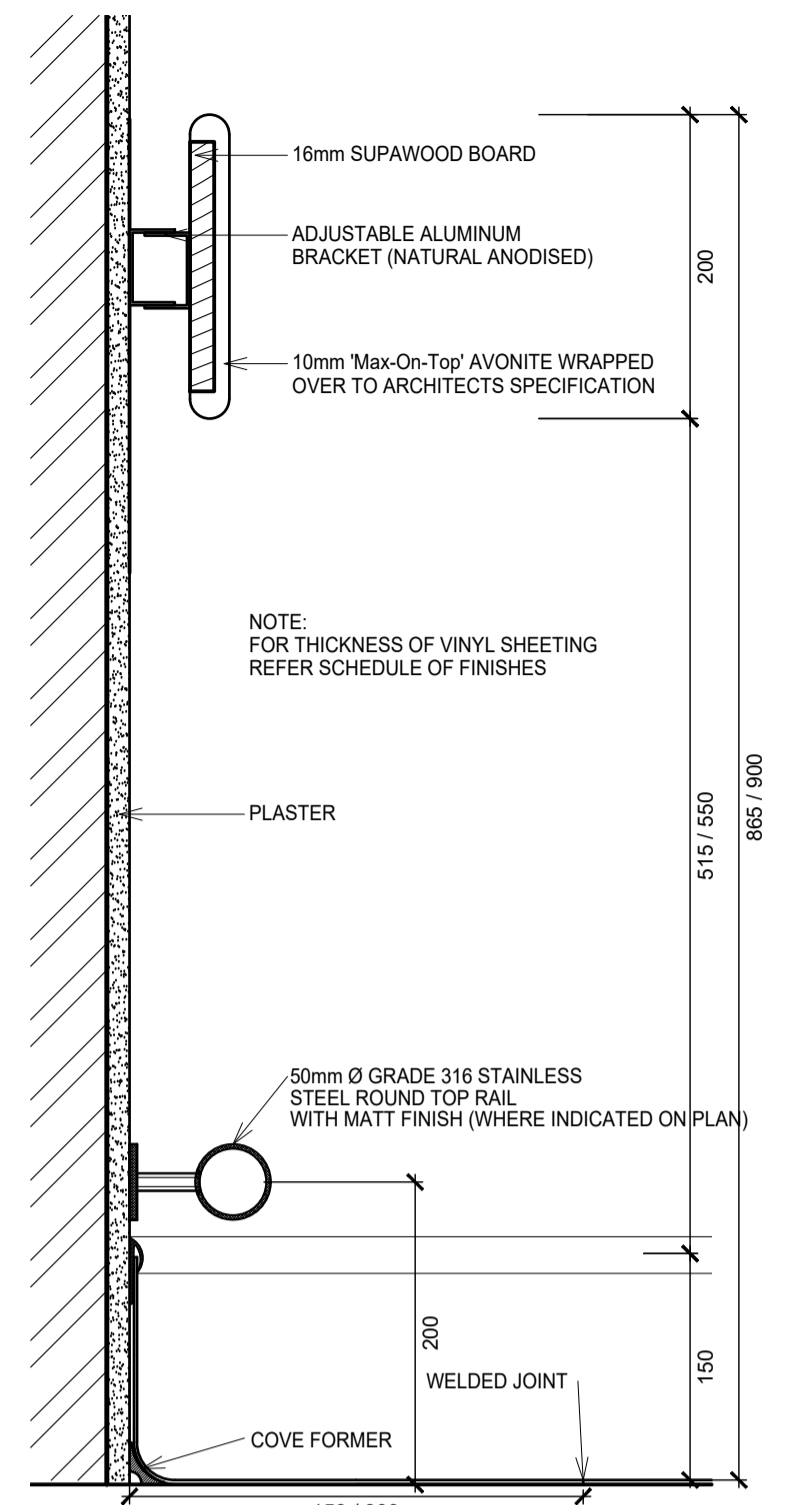
drawn	checked	scale	date
AS	Arinda Swart SACAP 7061 PROF. ARCH.	1:100	17-08-2023

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FOR INFORMATION ONLY



CP UNIT
FURNITURE AND BUMP RAIL LAYOUT
SCALE 1:100



BUMP RAIL DETAIL 1
SCALE 1:5

FURNITURE LEGEND

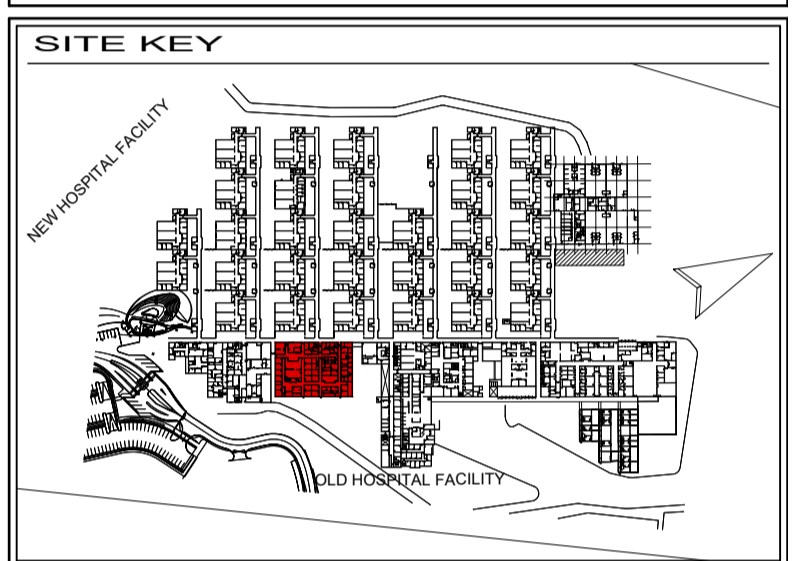
NOTE:
Refer to school furniture specification for full description of product as per the department of education

STORAGE	DESKS
S1 400 x 550 x 590mm four drawer mobile pedestal in white	D1 1400x700x725mm high desk.
T1 Size: 1800mm ØX 750mm high round table	C1 CHAIRS OFFICE AND RECEPTION High back swivel & tilt chair with 5-star base
T2 Size: 2700X1500X722mm high board table	C2 STAFF ROOM AND GROUP THERAPY Stackable chair in fibreglass reinforced polypropylenes
T3 Size: 1370x685mm staff room table	C3 WAITING AREA CHAIRS 3 Seat & back in steel with perforated detail with steel arms and legs.
OTHER	C4 PATIENT CHAIR Upholstered side chair with arms
O1 1400mm high X 1000mm wide single sided panel with linbins	C5 BOARDROOM CHAIR Upholstered side chair with arms
O2 Examination couch with step	O6 DOUBLE SEAT COUCH 1620x800mm Upholstered double seated couch
O3 Waste/paper bin	O7 SINGLE SEAT COUCH 720X800mm Upholstered single seat couch
O4 Wheelchair scale	O8 Stadiometer
O5 Wheelchair	O9 change plinth
O6 Wheelchair	O10 Wheelie bin

general notes

ACCESSORIES LEGEND:

WB 1	1200 X 2400mm White Board magnetically receptive steel surface, aluminium and plastic frame, wall mounted.
WB 2	1200 X 900mm White Board magnetically receptive steel surface, aluminium and plastic frame, wall mounted.
PB 1	1200 X 2400mm felt surface pinning board with aluminium and plastic frame, wall mounted. Colour: grey
PB 2	1200 X 900mm felt surface pinning board with aluminium and plastic frame, wall mounted. Colour: grey
DC 1	1200X900mm wall mounted pinning board display case with aluminium frame and plastic corners, 4mm toughened glass sliding door, lockable.
DC 2	900X600mm wall mounted pinning board display case with aluminium frame and plastic corners, 4mm toughened glass hinged door, lockable.
PS 1	2100X1600mm 4:3 pull down projector screen



CAD

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revisions

date	rev	description

structural engineer	mechanical engineer
	electrical engineer

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client
Province of the EASTERN CAPE HEALTH

project number
BNM REF: 3235

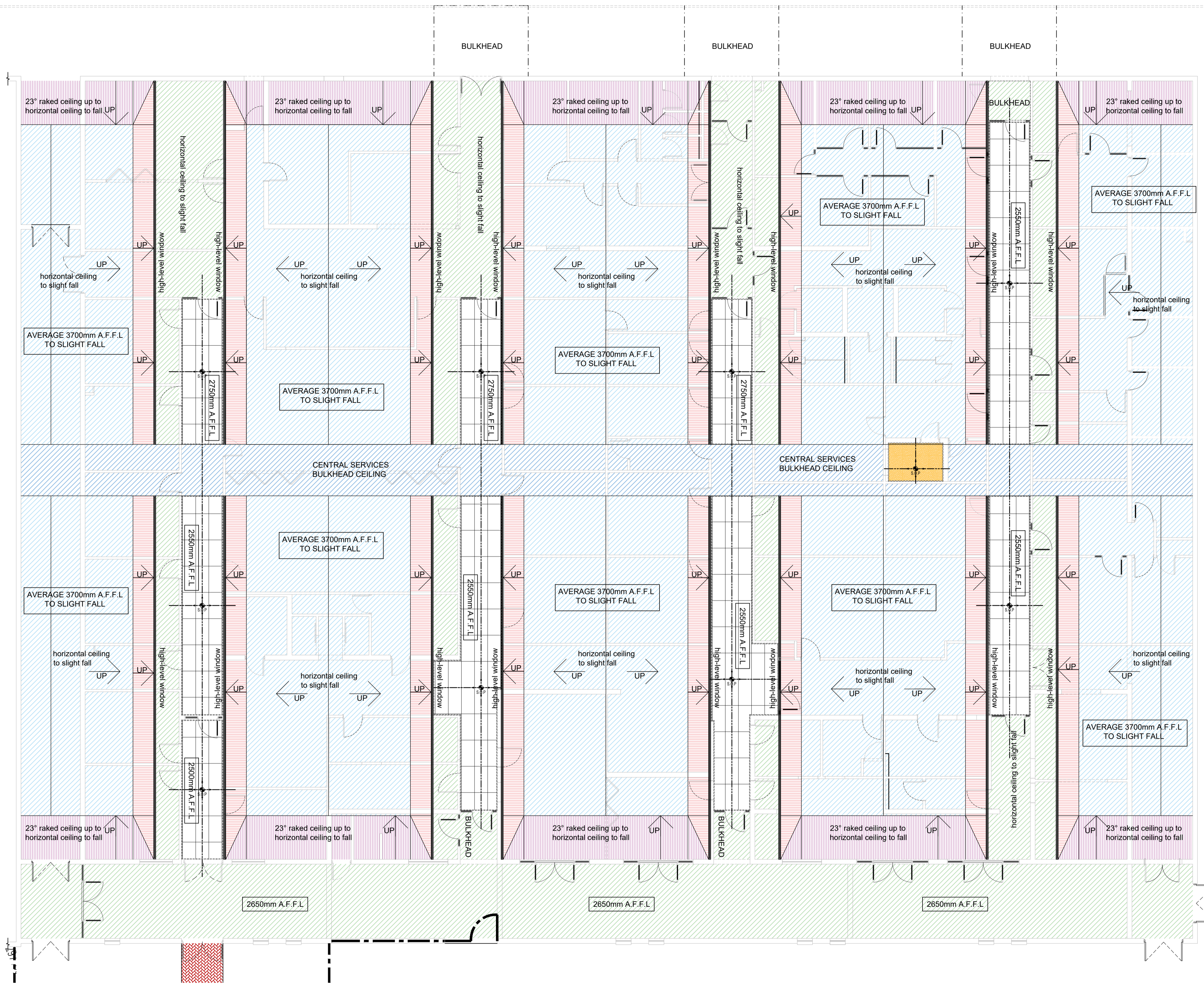
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Furniture and Bumprail

project details
SCMU3-22/23-0120-HO:
Cecilia Makiwane Hospital

drawing number	revision		
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drawn	checked	scale	date
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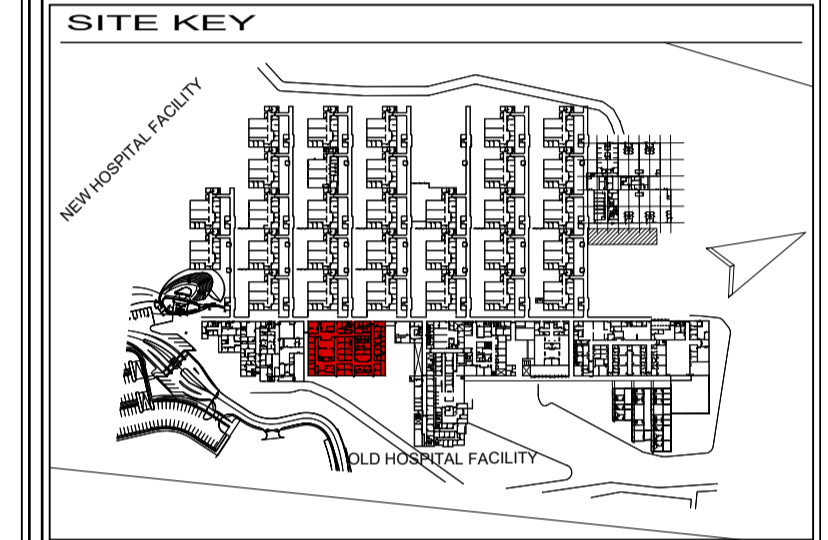


CP UNIT
CEILING LAYOUT
SCALE 1:100

LEGEND	
	NEW ACOUSTIC CEILING PANELS FIXED TO NEW SUSPENDED CEILING FRAME
	1200x600mm VINYL CLAD CEILING TILES SIZE PER SCHEDULE OF FINISHES
	SHADOW LINE
	BULKHEAD 9.5mm THICK NUTEC FIBRE CEMENT BULKHEAD FIXED TO SUSPENDED CEILING FRAME, ALL SKIMMED, WITH ALUMINIUM SHADOWLINE CORNICE ALL ROUND
	EXISTING 23° RAKED GYPSUM CEILING BOARDS FIXED TO EXISTING ROOF STRUCTURE, ALL SKIMMED, WITH TIMBER CORNICE ALL ROUND, PAINTED
	EXISTING 40° RAKED GYPSUM CEILING BOARDS FIXED TO EXISTING ROOF STRUCTURE, ALL SKIMMED, WITH TIMBER CORNICE ALL ROUND, PAINTED
	EXISTING HORIZONTAL GYPSUM CEILING BOARDS FIXED TO EXISTING ROOF STRUCTURE, ALL SKIMMED, WITH TIMBER CORNICE ALL ROUND, PAINTED
	EXISTING HORIZONTAL CENTRAL SERVICES BULKHEAD GYPSUM CEILING BOARDS FIXED TO EXISTING ROOF STRUCTURE, ALL SKIMMED, WITH TIMBER CORNICE ALL ROUND, PAINTED

general notes

NEW 9.5mm THICK NUTEC FIBRE CEMENT CEILING BOARDS FIXED TO EXISTING SUSPENDED CEILING FRAME, ALL SKIMMED, WITH TIMBER CORNICE ALL ROUND, PAINTED



CAD
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structural engineer mechanical engineer
electrical engineer

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postal address po box 12376, centrail, port elizabeth, 6006

client
Province of the EASTERN CAPE HEALTH

project number
BNM REF: 3235

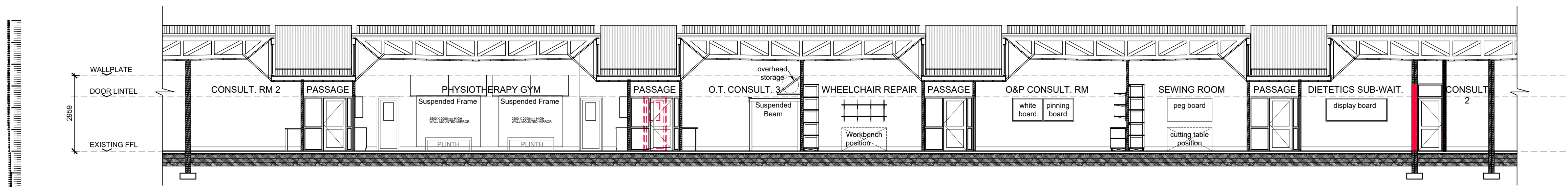
drawing name
CP Unit - Ceiling plan

project details
SCMU3-22/23-0120-HO:
Cecilia Makiwane Hospital

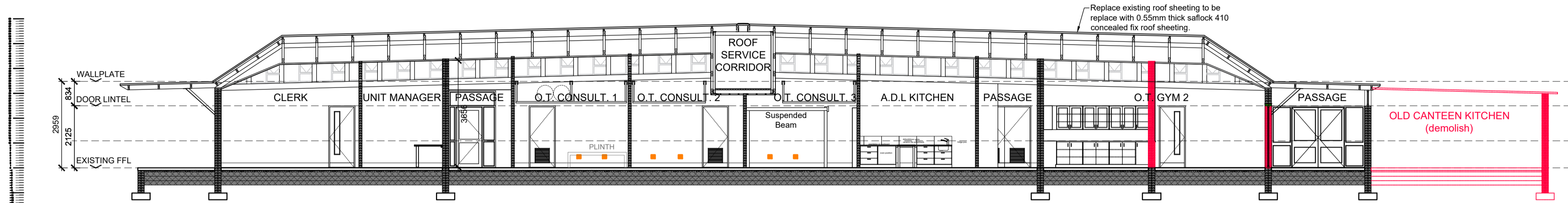
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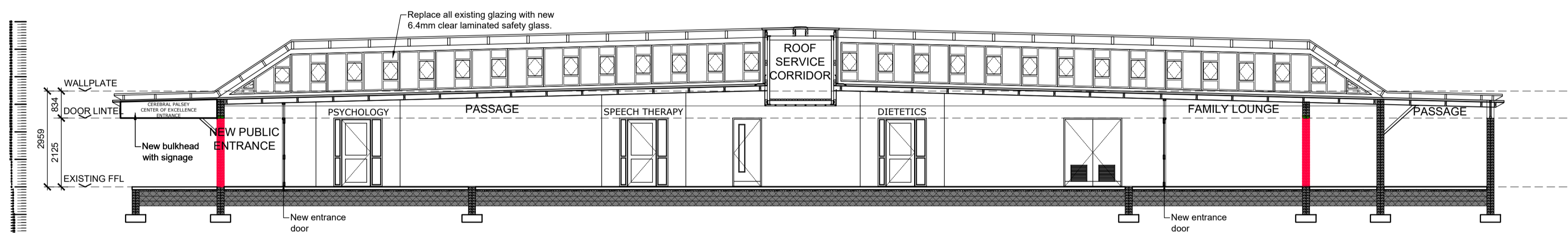
FOR INFORMATION ONLY



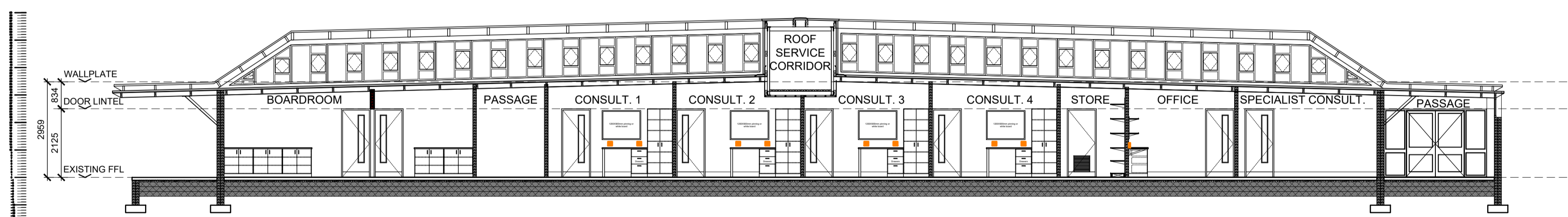
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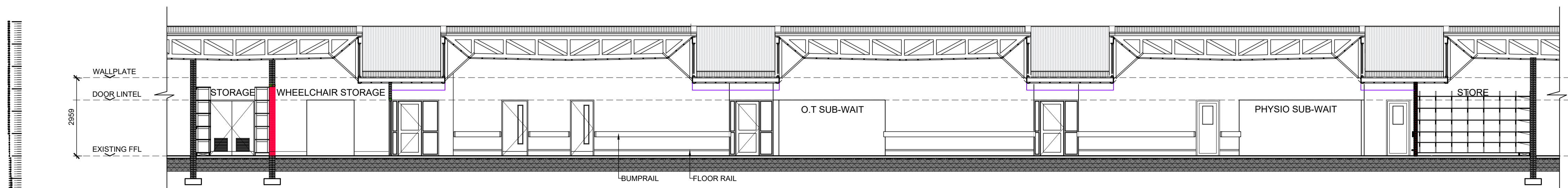
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CP UNIT SECTION CC
SCALE 1:100

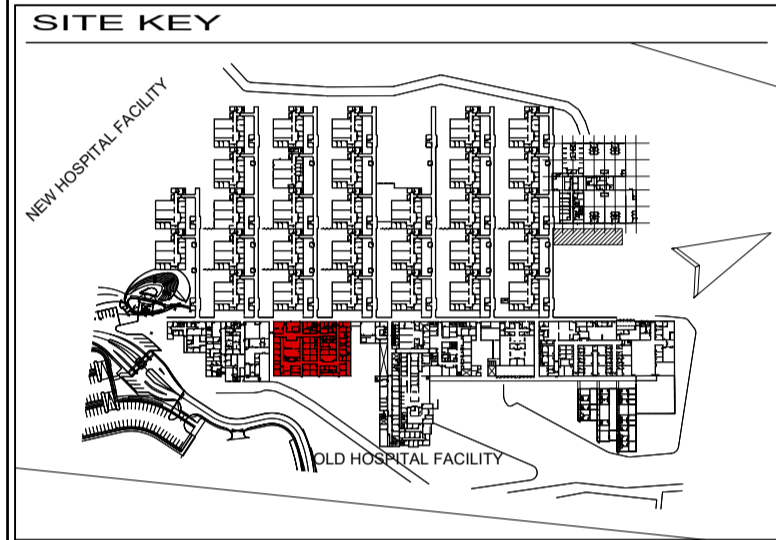


CP UNIT SECTION DD
SCALE 1:100



CP UNIT SECTION EE
SCALE 1:100

general notes



CAD
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structural engineer mechanical engineer
electrical engineer

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client
Province of the EASTERN CAPE HEALTH

project number
BNM REF: 3235

drawing name
CP Unit - Sections AA, BB & CC

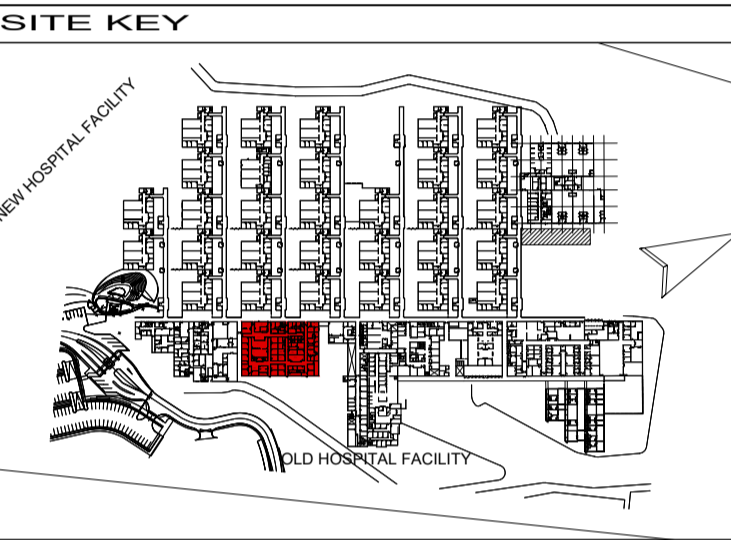
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SCMU3-22/23-0120-HO:
Cecilia Makiwane Hospital

drawing number	revision		
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drawn	checked	scale	date
W.C. M.E.	Arinda Swart SACAP 7061 PROF. ARCH.	1:100	26-07-2023

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FOR INFORMATION ONLY

general notes



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Hospital\09_CAD

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electrical engineer

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project number
BNM REF: 3235

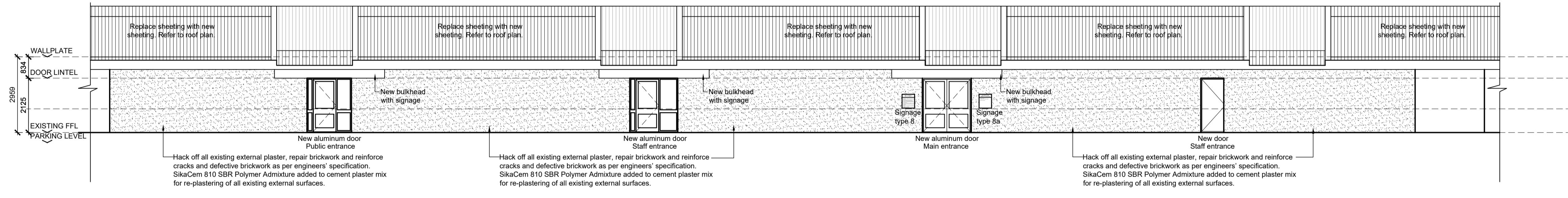
drawing name
CP Unit - Elevations

project details
**SCMU3-22/23-0120-HO:
Cecilia Makiwane Hospital**

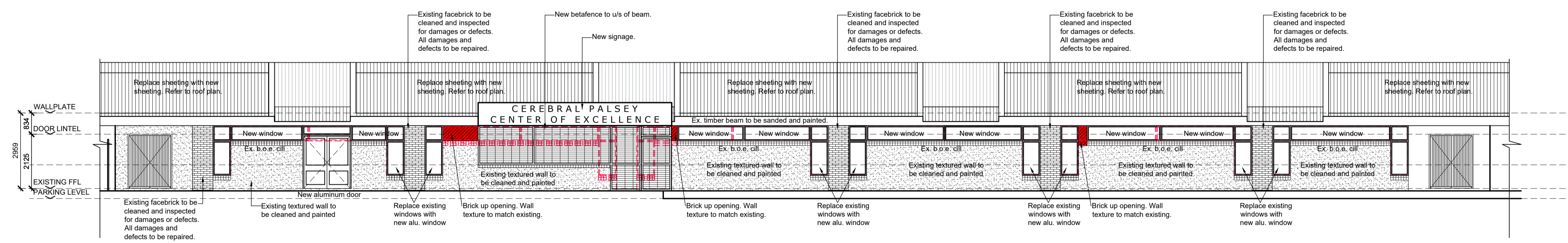
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registered owner signature architects signature

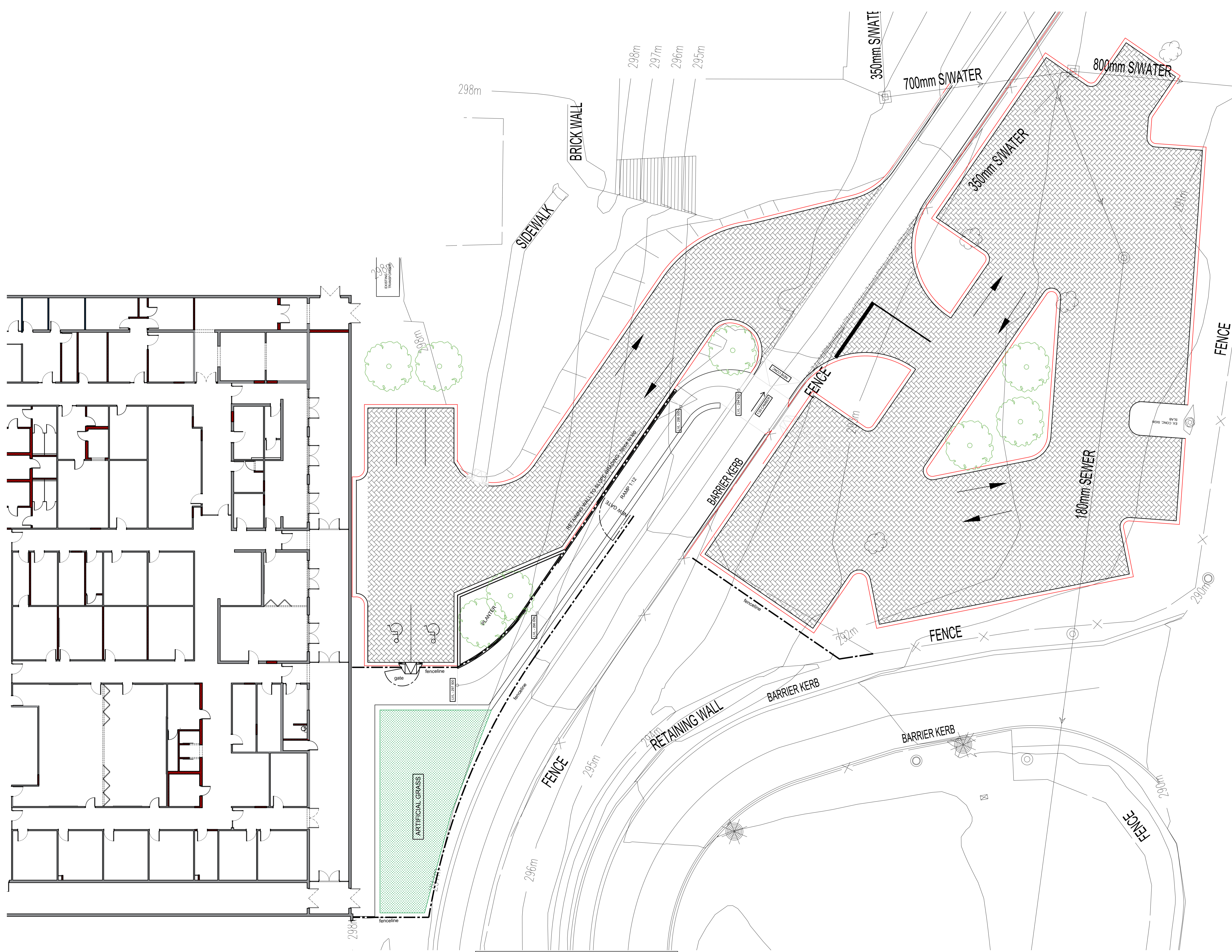


**CP UNIT
NORTH WEST ELEVATION**
SCALE 1:100



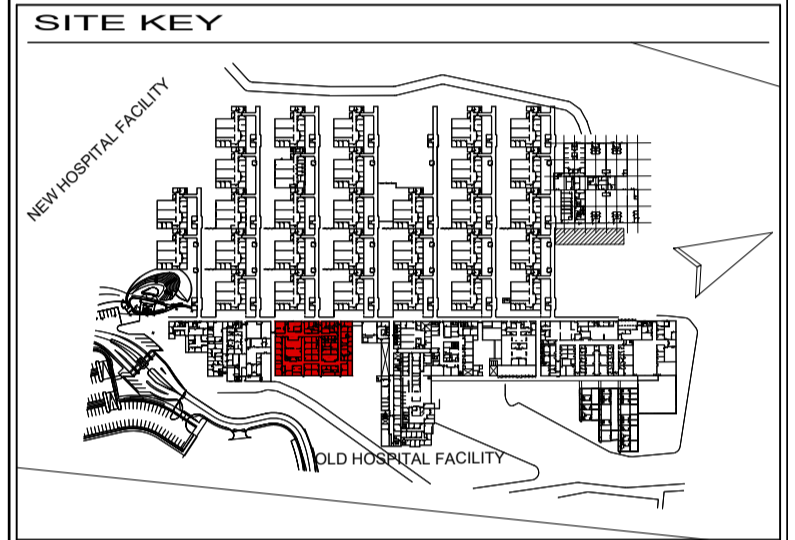
**CP UNIT
SOUTH EAST ELEVATION**
SCALE 1:100

FOR INFORMATION ONLY



**CP UNIT
SITE / PARKING PLAN**
SCALE 1:200

general notes



CAD
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electrical engineer

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client
Province of the EASTERN CAPE HEALTH

project number
BNM REF: 3235

drawing name
CP Unit - Site / Parking Plan

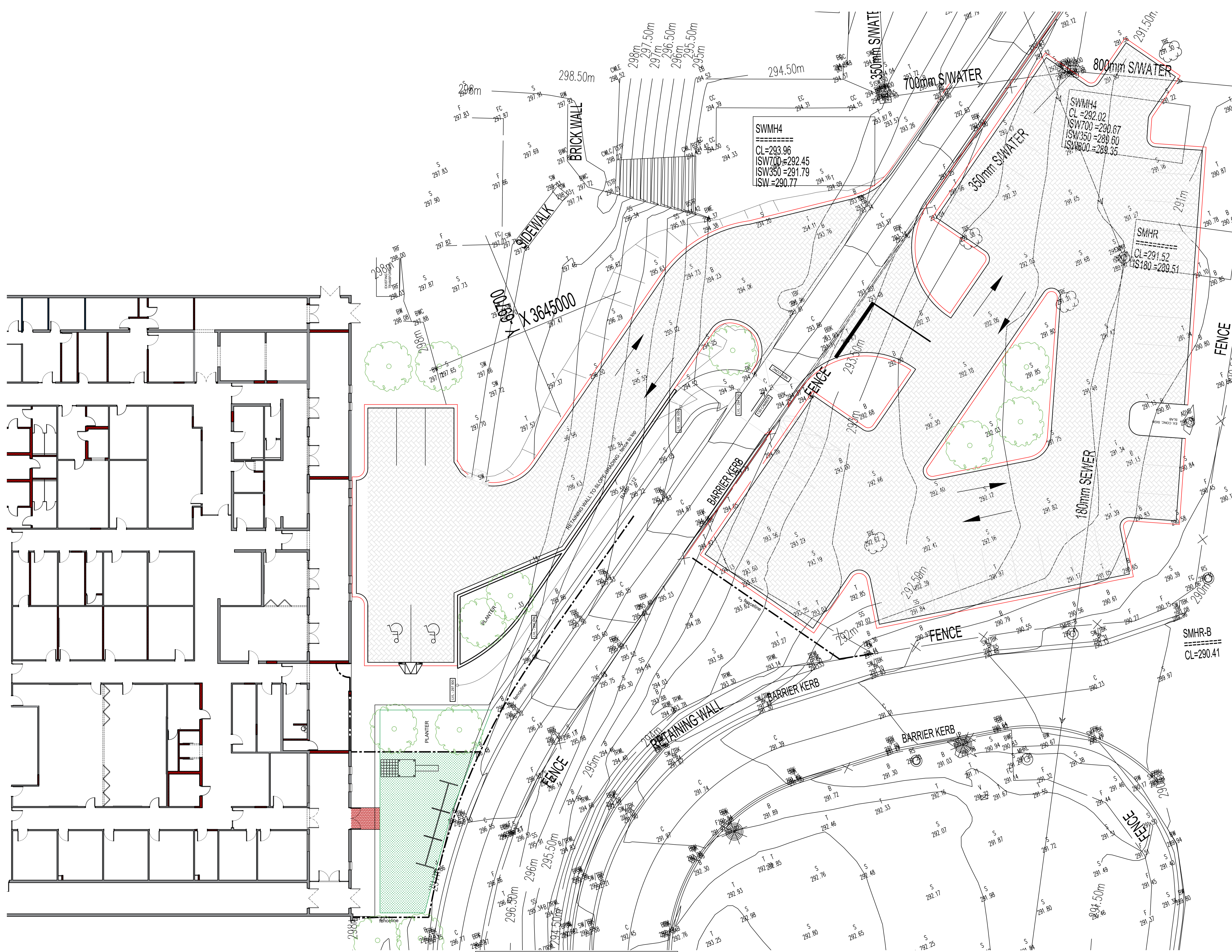
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**SCMU3-22/23-0120-HO:
Cecilia Makiwane Hospital**

drawing number	revision
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drawn	checked	scale	date
AS	Arinda Swart SACAP 7061 PROF. ARCH.	1:100	06-12-2023

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FOR INFORMATION ONLY



**CP UNIT
SITE / PARKING PLAN**
SCALE 1:200

general notes

SITE KEY

CAD
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drawing name
CP Unit - Site / Parking Plan

project details
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Cecilia Makiwane Hospital

drawing number	revision
3235_CP_100	-

drawn	checked	scale	date
AS	Aninda Swart SACAP 7061 PROF. ARCH.	1:100	06-12-2023

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FOR INFORMATION ONLY

OFFICE Room No.20
9m²

OFFICE Room No.21
9m²

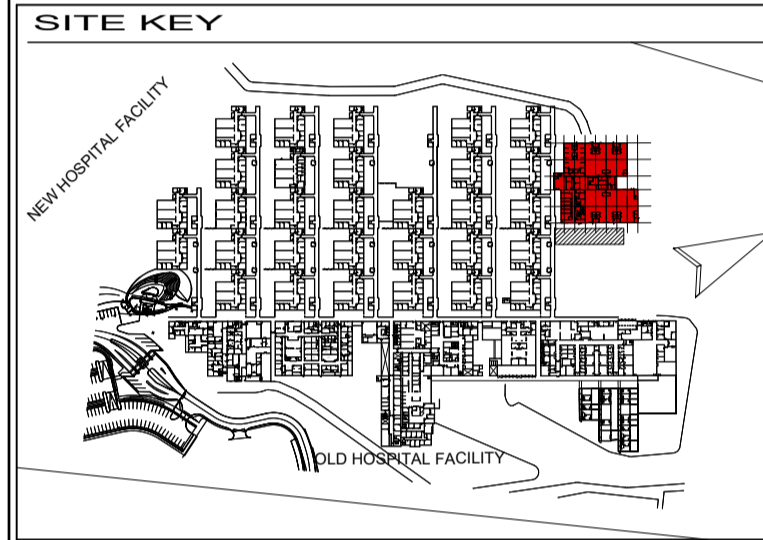
OFFICE Room No.19
9m²

OFFICE Room No.20
9m²

OFFICE Room No.21
9m²



general notes



CAD
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Hospital09_CAD

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electrical engineer

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project number
BNM REF: 3235

drawing name
Block H - Ophthalmology

project details
**SCMU3-22/23-0120-HO:
Cecilia Makiwane Hospital
AS-BUILT PLAN**

drawing number	revision
3235_OPT_001	

drawn	checked	scale	date
AS	Arinda Swart SACAP 7061 PROF. ARCH.	1:100	13-11-2023

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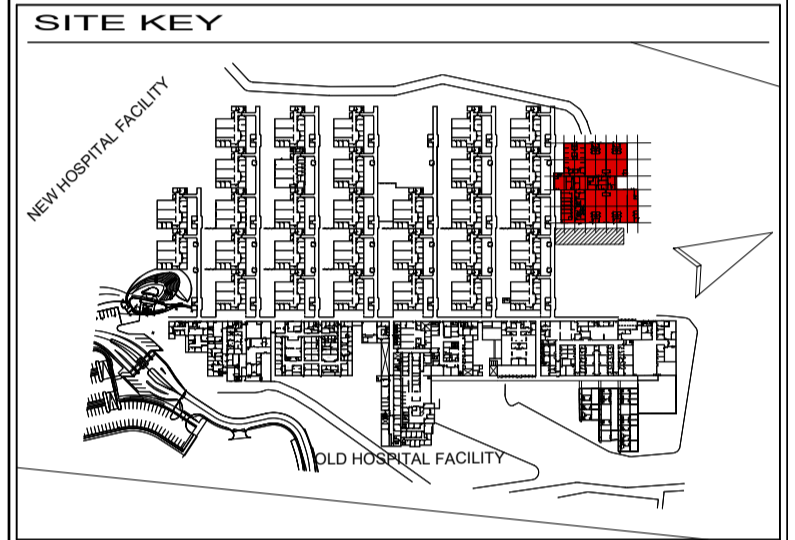


FURNITURE LEGEND

STORAGE		DESKS	
S1	400 x 550 x 590mm four drawer mobile pedestal in white	D1	1400x700x725mm high desk.
TABLES		CHAIRS	
T1	Size: 1800mm ØX 750mm high round table	C1	OFFICE AND RECEPTION High back swivel & tilt chair with 5-star base
T2	Size: 2700X1500X722mm high board table	C2	STAFF ROOM AND GROUP THERAPY Stackable chair in fibreglass reinforced polypropylenes
T3	Size: 1370X685mm staff room table	C3	WAITING AREA CHAIRS 3 Seat & back in steel with perforated detail with steel arms and legs.
OTHER		C4	PATIENT CHAIR Upholstered side chair with arms
O1	1400mm high X 1000mm wide single sided panel with linbins	C5	LOUNGER CHAIR Upholstered side chair with arms
O2	Examination couch with step	C6	DOUBLE SEAT COUCH 1620x800mm Upholstered double seated couch
O3	Waste/paper bin	C7	SINGLE SEAT COUCH 720x900mm Upholstered single seat couch
O4	Wheelchair scale		
O6	4-seater table only		
O7	Boardroom Table		
O8	Wheeler bin		

ACCESSORIES LEGEND:

WB 1	
WB 2	
PB 1	1200 X 2400mm felt surface pinning board with aluminum and plastic frame, wall mounted. Colour: grey
PB 2	1200 X 900mm felt surface pinning board with aluminum and plastic frame, wall mounted. Colour: grey
DC 1	1200X900mm wall mounted pinning board display case with aluminum frame and plastic corners, 4mm toughened glass sliding doors, lockable
DC 2	900X600mm wall mounted pinning board display case with aluminum frame and plastic corners, 4mm toughened glass hinged door, lockable.
PS 1	



CAD
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project number
 BNM REF: 3235

drawing name
 KEY PLAN

project details
 SCMU3-22/23-0120-HO:
 Cecilia Makiwane Hospital

drawing number **revision**

3235_OPT_001

drawn	checked	scale	date
AS	Arinda Swart SACAP 7061 PROF. ARCH.	1:100	13-11-2023

registered owner signature architects signature

FOR INFORMATION ONLY

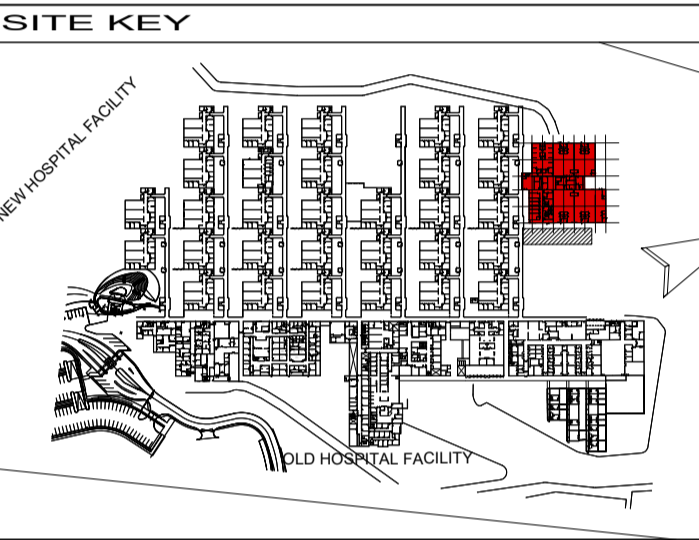


general notes

CEILING LEGEND

1200x600mm VINYL CLAD
CEILING TILES SIZE PER
SCHEDULE OF FINISHES

SHADOW LINE



CAD

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electrical engineer

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project number

BNM REF: 3235

drawing name

KEY PLAN

project details

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Cecilia Makiwane Hospital

drawing number **revision**

3235_OPT_001

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registered owner signature architects signature

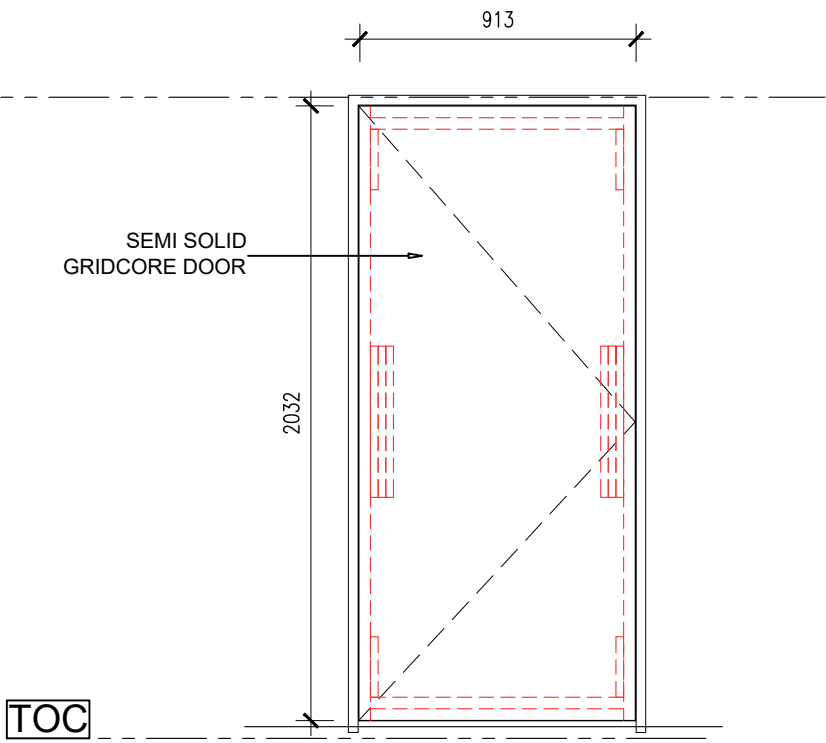
ROOF SHEETING: 8MM ALUMINUM-ZINC AZ200 ROOF SHEETING ON ENGINEERED STEEL STRUCTURE. 100X50X20X2 GMS CHANNEL PURLINS SET AT HEIGHTS TO FALL AT MAX 1500MM SPACING. IN 175X50X20X2 GMS CHANNEL FRAME BOLTED IN CORNER WITH GALVANIZED SLOTTED BRACKETS. ON 76X1.6 GMS SQUARE TUBE FIXED IN CORNERS. CANOPY 2700MM HIGH FROM NGL. CAST INTO 450X450X600MM DEEP CONCRETE FOOTING BASE (POSTS TO BE SET ON COMPACTED SAND BEDDING BELOW TO ALLOW DRAINAGE)

Rev:	Date:	By:	Description:
-	2023-11-14	WC	ISSUED FOR MEASURE

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USL 102 125



A. DOOR

DOOR TYPE SPECIFICATIONS

913 X 2032 X 44mm THICK SEMI SOLID COMPOSITE BOARD GRIDCORE DOOR CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH SLIGHTLY ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME.

S.A.B.S:

EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY
PERFORMANCE CLASS: SUITABLE FOR MEDIUM DUTY DRY INTERIOR APPLICATIONS (MD-DI)

MASS:

APPROXIMATELY 21KG PER DOOR LEAF

FINISH:

TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.

IRONMONG SET

REFER TO THE LATEST IRONMONGERY SCHEDULE

B. FRAME

FRAME TYPE

NEW STAINLESS STEEL DOOR FRAME.

HINGES:

1 ½ PAIRS TWO BALL BEARING BUTT HINGES FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS. FRAME MANUFACTURER TO PROVIDE RECESSES IN FRAME TO ALLOW HINGE TO BE FLUSH WITH FRAME.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES
TYPE DT01

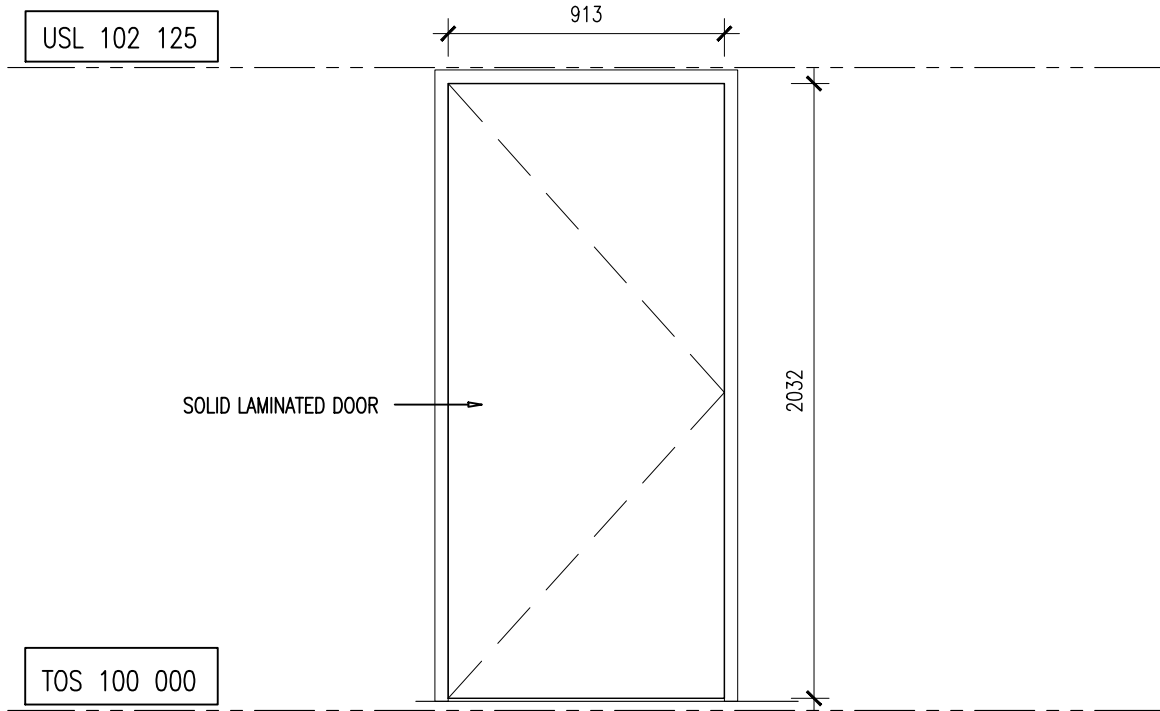
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Drawing No.: 3235_DS01 Revision: -

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A. DOOR

DOOR TYPE SPECIFICATIONS

913 X 2032 X 44mm THICK SOLID LAMINATED DOOR CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH SLIGHTLY ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME.

S.A.B.S:

EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY
PERFORMANCE CLASS: SUITABLE FOR MEDIUM DUTY DRY INTERIOR APPLICATIONS (MD-DI)

MASS:

APPROXIMATELY 34KG PER DOOR LEAF

FINISH:

TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.

IRONMONG SET

REFER TO THE LATEST IRONMONGERY SCHEDULE

B. FRAME

FRAME TYPE

NEW STAINLESS STEEL DOOR FRAME

HINGES:

1 ½ PAIRS TWO BALL BEARING BUTT HINGES FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS. FRAME MANUFACTURER TO PROVIDE RECESSES IN FRAME TO ALLOW HINGE TO BE FLUSH WITH FRAME.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES
TYPE DT02

Scale: 1:25 Date: 2023-11-14 Drawn: WC

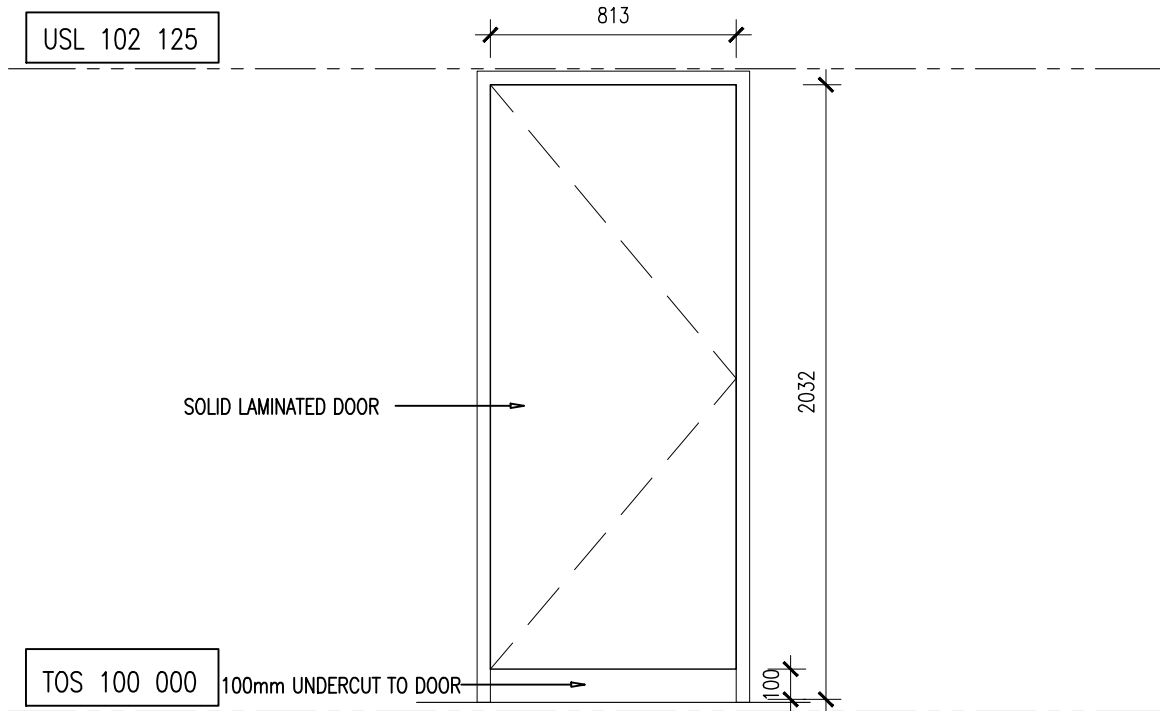
Drawing No.: 3235_DS02 Revision: -



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A. DOOR	DOOR TYPE SPECIFICATIONS	913 X 2032 X 44mm THICK SOLID LAMINATED DOOR CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH SLIGHTLY ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME.
	S.A.B.S:	REQUIREMENTS: ALLOW FOR 100mm UNDERCUT TO BOTTOM OF DOOR.
	MASS:	EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY PERFORMANCE CLASS: SUITABLE FOR MEDIUM DUTY DRY INTERIOR APPLICATIONS (MD-DI)
	FINISH:	APPROXIMATELY 34KG PER DOOR LEAF TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.
	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
B. FRAME	FRAME TYPE	NEW STAINLESS STEEL DOOR FRAME
	HINGES:	1 ½ PAIRS DORMA DBB-SS-009 TWO BALL BEARING BUTT HINGES FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS. FRAME MANUFACTURER TO PROVIDE RECESSES IN FRAME TO ALLOW HINGE TO BE FLUSH WITH FRAME.

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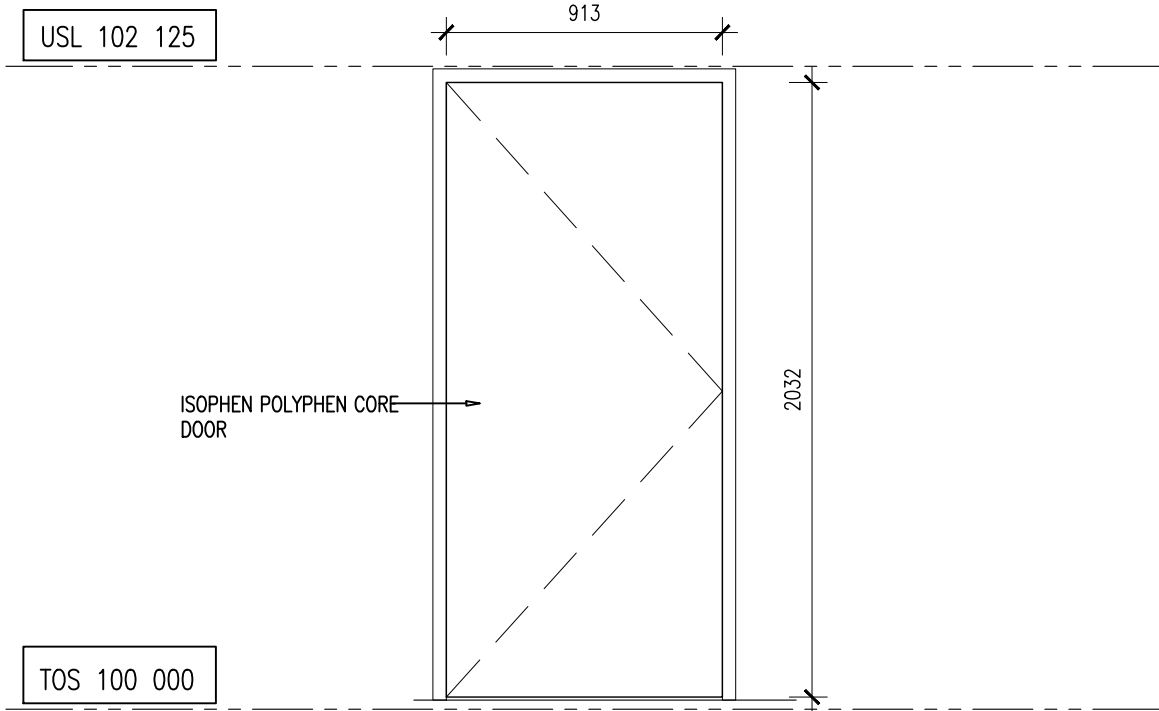
Client: DEPARTMENT OF HEALTH
 Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS
 Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES TYPE DT02a
 Scale: 1:25 Date: 2023-11-14 Drawn: WC
 Drawing No.: 3235_DS02a Revision: -

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A. DOOR

DOOR TYPE SPECIFICATIONS

913 X 2032 X 38mm THICK ISOPHEN DOOR CONSTRUCTED FROM 37mm 42kg/m³ POLYPHEN CORE WITH CHROMODEK 0.58MM CLADDEN PANEL BOTH SIDES, FINISH POWDER COATED, CAPPED WITH NATURAL ANODIZED ALUMINIUM EDGES ALL AROUND. PURPOSE MADE TO SUITE DOOR FRAME.

S.A.B.S:

EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY
PERFORMANCE CLASS: SUITABLE FOR MEDIUM DUTY DRY INTERIOR APPLICATIONS (MD-DI)

MASS:

APPROXIMATELY 34KG PER DOOR LEAF

FINISH:

POWDER COATED FROST WHITE

IRONMONG SET

REFER TO THE LATEST IRONMONGERY SCHEDULE

B. FRAME

FRAME TYPE

NEW ANODIZED ALUMINIUM DOOR FRAME

HINGES:

1 ½ PAIRS TWO BALL BEARING BUTT HINGES FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS. FRAME MANUFACTURER TO PROVIDE RECESSES IN FRAME TO ALLOW HINGE TO BE FLUSH WITH FRAME.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES
TYPE DT02b

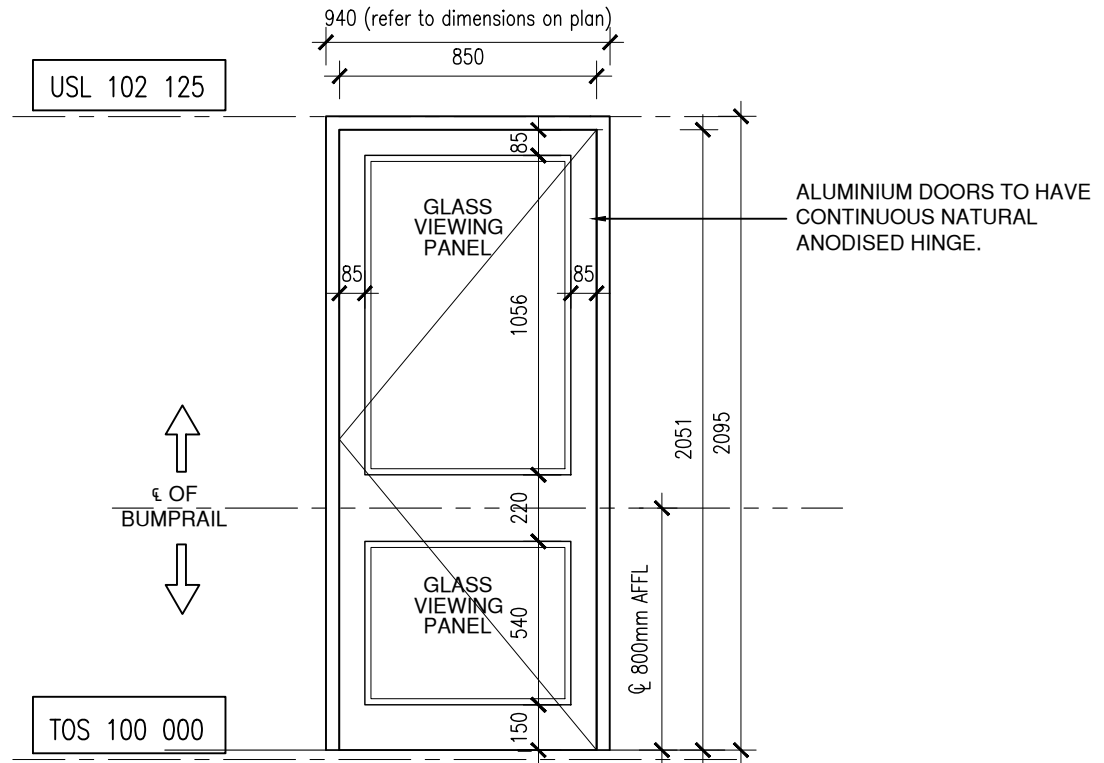
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Drawing No.: 3235_DS02b Revision: -

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A. DOOR	DOOR TYPE SPECIFICATIONS	850 X 2050 ALUMINIUM SINGLE DOOR WITH GLAZED PANELS AS INDICATED. (1) SUBCONTRACTORS ARE RESPONSIBLE FOR THE STRUCTURAL DESIGN OF ALL UNITS AND WATER TESTS ON UNITS (ALL AS PER SABS AND AAAMSA REQUIREMENTS) (2) SUBCONTRACTORS ARE RESPONSIBLE IS TO ALLOW FOR ALL NECESSARY TOLERANCES AND FOR ALL SEALERS AROUND ALL UNITS AT JUNCTIONS TO WALLS SILLS ETC. (3) CONTRACTOR TO ALLOW FOR ALL NECESSARY CUT-OUTS FOR LOCKS AND DOOR MONITORING MECHANISMS ETC (4) SUBCONTRACTORS CAN USE THEIR OWN SECTIONS BUT ARE REQUIRED TO SUBMIT ALL SABS AND AAAMSA TEST RESULTS PRIOR TO MANUFACTURE AND TO GET ARCHITECTS APPROVAL. (5) ALL OPENING WINDOWS AND DOORS TO BE FITTED WITH DUST SEALS TO ARCHITECTS APPROVAL.
	GLAZING	
	S.A.B.S:	ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	NATURAL ANODIZED
B. FRAME	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
	FRAME TYPE	ALUMINIUM – NATURAL ANODIZED – DOOR FRAME, AS PER MANUFACTURER
	HINGES:	1x HEAVY DUTY CONTINUOUS GEARED HINGES FIXED TO FRAME AND DOOR WITH STAINLESS STEEL POP RIVETS AS PER MANUFACTURER.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES TYPE DT03

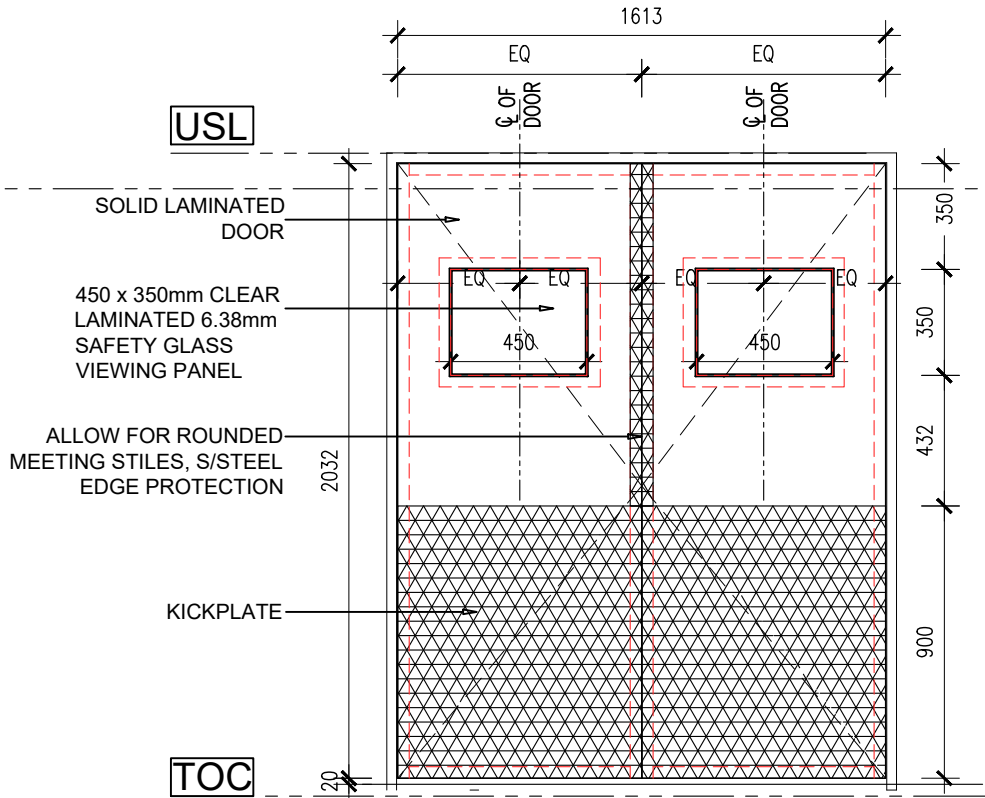
Scale: 1:25 Date: 2023-11-14 Drawn: WC

Drawing No.: 3235_DS03 Revision: -

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-	2023-11-14	WC	ISSUED FOR MEASURE

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A. DOOR	DOOR TYPE SPECIFICATIONS	2X (813 X 2032 X 44mm) THICK SOLID LAMINATED DOOR CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME. REQUIREMENTS: (1) ALLOW FOR 450x350mm CUT OUT FOR VIEWING PANELS (2) 900mm HIGH, 1,6mm THICK SATIN FINISHED GRADE 18/8 STAINLESS STEEL KICK PLATE GLUED AND COUNTERSUNK HOLED FOR AND SCREWED TO DOOR AT 150MM CENTRES AROUND EDGES WITH COUNTERSUNK HEADED STAINLESS STEEL SCREWS TO <u>ONE SIDE OF DOOR</u> (3) ALLOW FOR ROUNDED MEETING STILES
	GLAZING	EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY PERFORMANCE CLASS: SUITABLE FOR HEAVY DUTY DRY INTERIOR APPLICATIONS (HD-DI) ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL
	S.A.B.S:	APPROXIMATELY 34KG PER DOOR LEAF
	MASS:	TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.
	FINISH:	REFER TO THE LATEST IRONMONGERY SCHEDULE
B. FRAME	IRONMONG SET	NEW STAINLESS STEEL DOOR FRAME.
	FRAME TYPE	1 ½ PAIRS HEAVY DUTY GALVANIZED STEEL T-HINGES FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS. FRAME MANUFACTURER TO PROVIDE RECESSES IN FRAME TO ALLOW HINGE TO BE FLUSH WITH FRAME.
	HINGES:	

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES
TYPE DT04

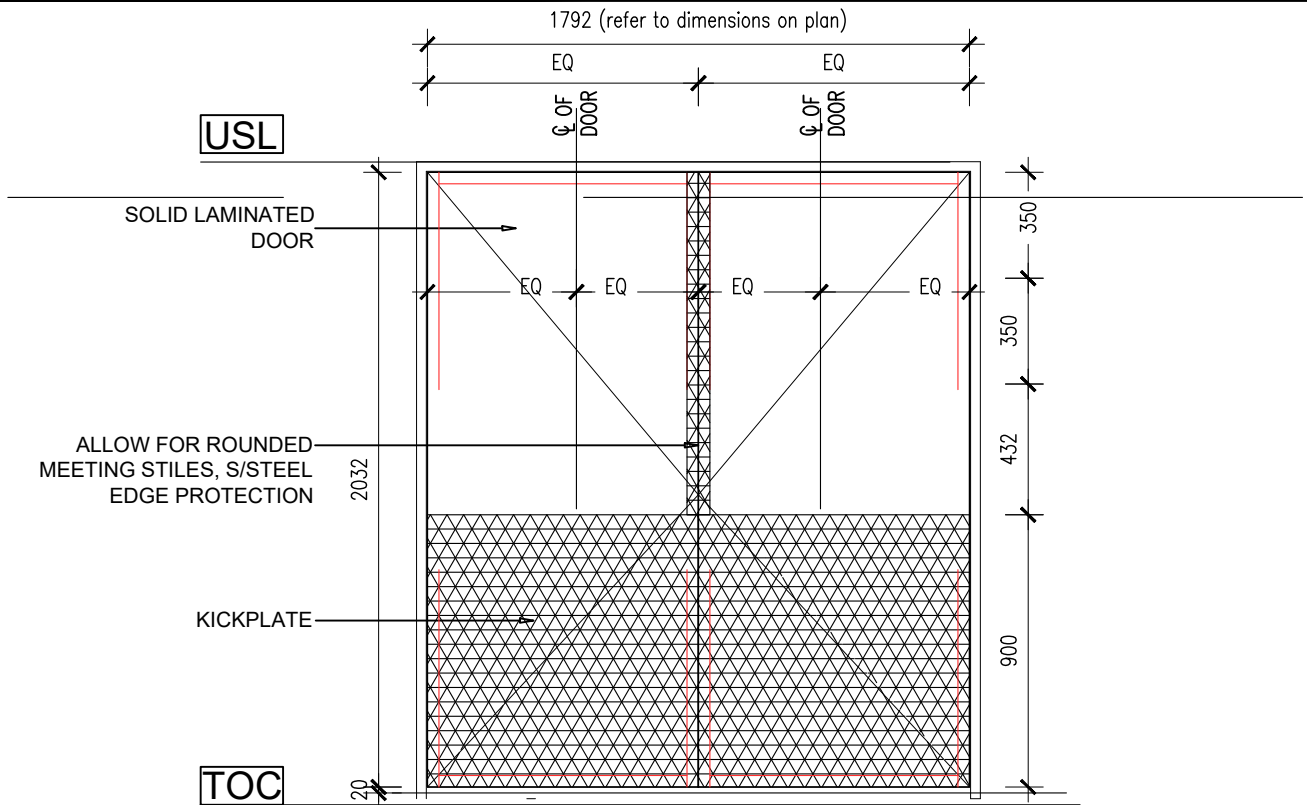
Scale: 1:25 Date: 2023-11-14 Drawn: WC

Drawing No.: 3235_DS04 Revision: -

Rev:	Date:	By:	Description:
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A. DOOR	DOOR TYPE SPECIFICATIONS	2X (895 X 2032 X 44mm) THICK SOLID LAMINATED DOOR CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME. REQUIREMENTS: (1) 900mm HIGH, 1,6mm THICK SATIN FINISHED GRADE 18/8 STAINLESS STEEL KICK PLATE GLUED AND COUNTERSUNK HOLED FOR AND SCREWED TO DOOR AT 150MM CENTRES AROUND EDGES WITH COUNTERSUNK HEADED STAINLESS STEEL SCREWS TO <u>ONE SIDE OF DOOR</u> (2) ALLOW FOR ROUNDED MEETING STILES
	GLAZING	
	S.A.B.S:	EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY PERFORMANCE CLASS: SUITABLE FOR HEAVY DUTY DRY INTERIOR APPLICATIONS (HD-DI)
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
B. FRAME	FINISH:	TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.
	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
	FRAME TYPE	NEW STAINLESS STEEL DOOR FRAME.
	HINGES:	1 ½ PAIRS HEAVY DUTY GALVANIZED STEEL T-HINGES FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS. FRAME MANUFACTURER TO PROVIDE RECESSES IN FRAME TO ALLOW HINGE TO BE FLUSH WITH FRAME.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES
TYPE DT05

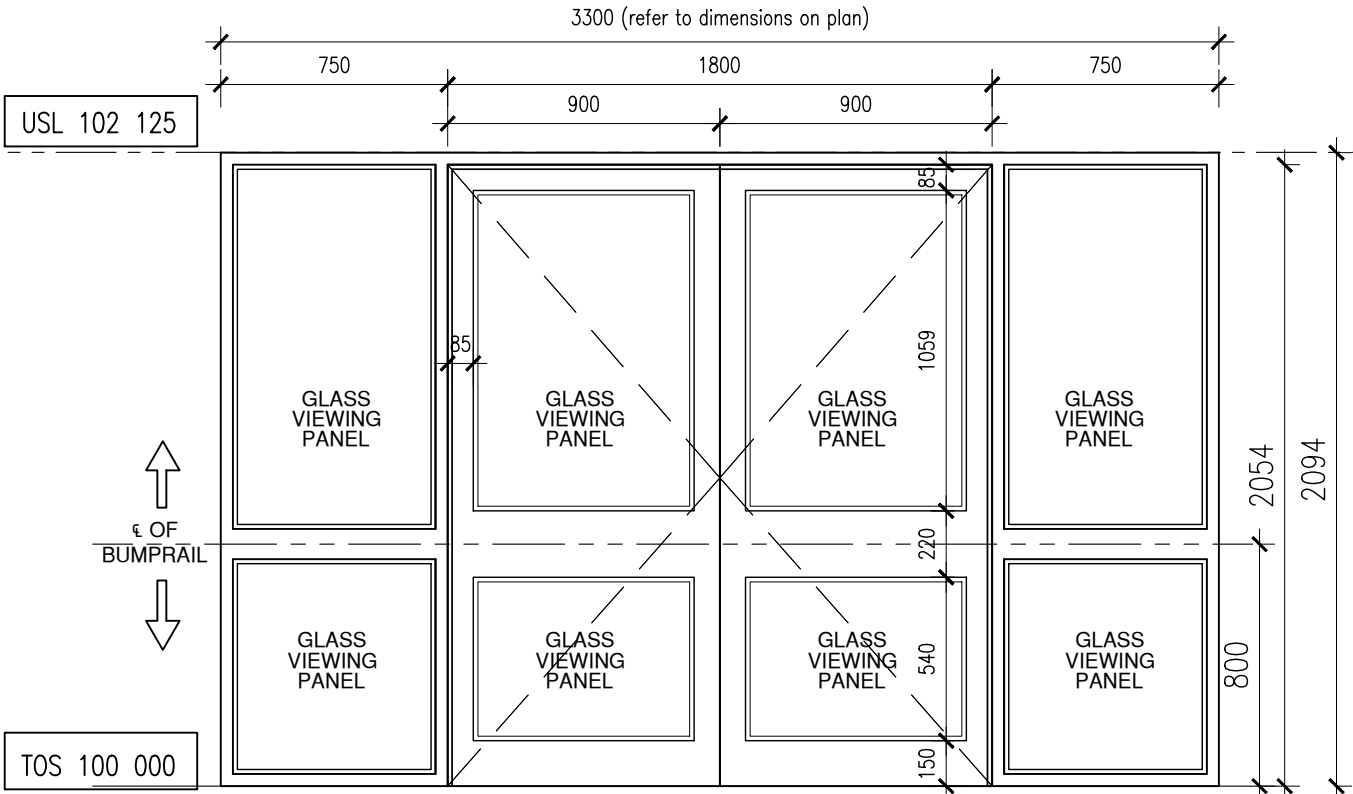
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A. DOOR	DOOR TYPE SPECIFICATIONS	<p>2x (900 X 2055MM) ALUMINIUM SINGLE DOOR WITH GLAZED PANELS AS INDICATED.</p> <ol style="list-style-type: none"> (1) SUBCONTRACTORS ARE RESPONSIBLE FOR THE STRUCTURAL DESIGN OF ALL UNITS AND WATER TESTS ON UNITS (ALL AS PER SABS AND AAAMSA REQUIREMENTS) (2) SUBCONTRACTORS ARE RESPONSIBLE IS TO ALLOW FOR ALL NECESSARY TOLERANCES AND FOR ALL SEALERS AROUND ALL UNITS AT JUNCTIONS TO WALLS SILLS ETC. (3) CONTRACTOR TO ALLOW FOR ALL NECESSARY CUT-OUTS FOR LOCKS AND DOOR MONITORING MECHANISMS ETC (4) SUBCONTRACTORS CAN USE THEIR OWN SECTIONS BUT ARE REQUIRED TO SUBMIT ALL SABS AND AAAMSA TEST RESULTS PRIOR TO MANUFACTURE AND TO GET ARCHITECTS APPROVAL. (5) ALL OPENING WINDOWS AND DOORS TO BE FITTED WITH DUST SEALS TO ARCHITECTS APPROVAL.
	S.A.B.S: GLAZING	<p>ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL</p> <p>ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)</p>
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	ALUMINIUM – NATURAL ANODIZED
B. FRAME	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
	FRAME TYPE	ALUMINIUM – NATURAL ANODIZED – DOOR FRAME, AS PER MANUFACTURER
	HINGES:	1 PAIRS HEAVY DUTY CONTINUOUS GEARED HINGES FIXED TO FRAME AND DOOR WITH STAINLESS STEEL POP RIVETS AS PER MANUFACTURER.

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Client: DEPARTMENT OF HEALTH
 Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS
 Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

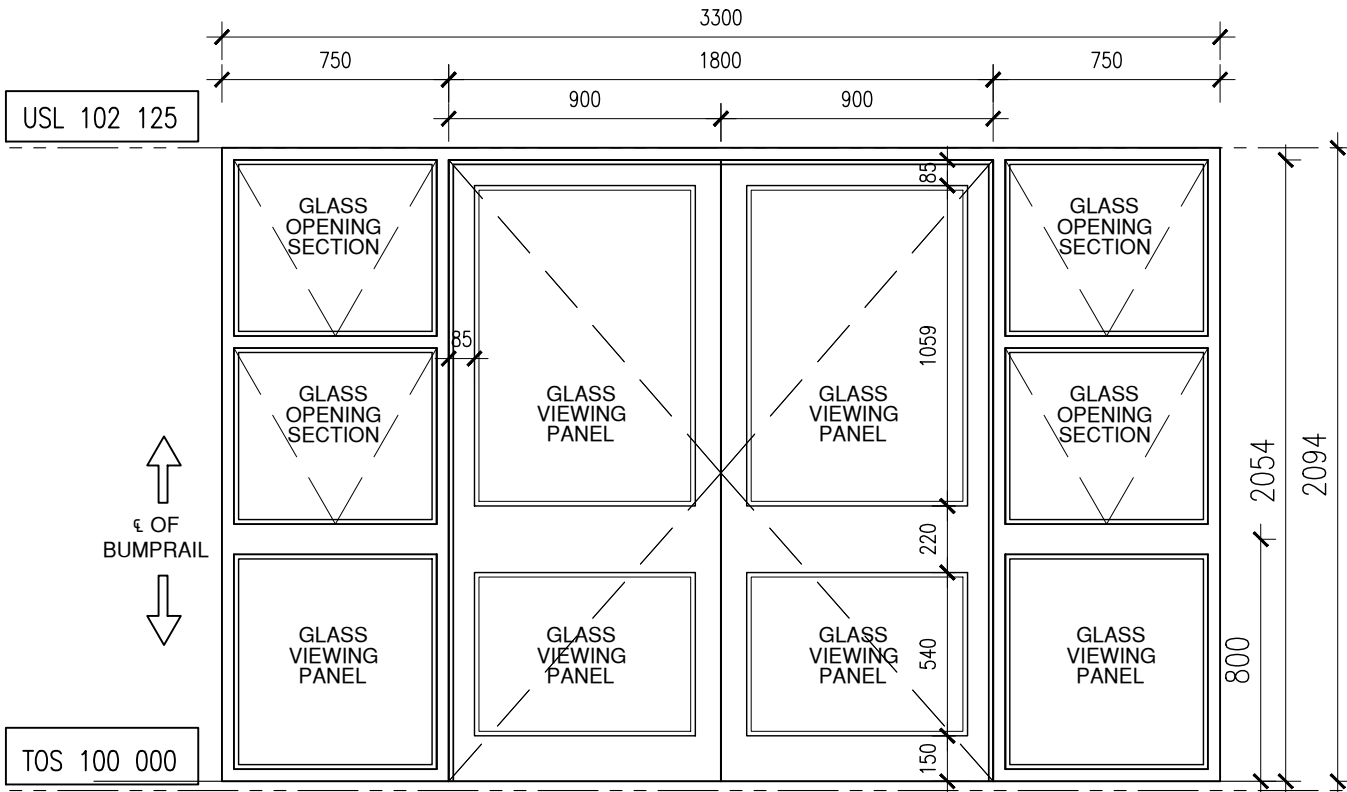
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 Scale: 1:25 Date: 2023-11-14 Drawn: ME
 Drawing No.: 3235_DS06 Revision: -



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A. DOOR	DOOR TYPE SPECIFICATIONS	1800 X 2055 ALUMINIUM DOUBLE DOOR WITH TOP HUNG WINDOWS, SIDE GLAZED PANELS AS INDICATED. (1) SUBCONTRACTORS ARE RESPONSIBLE FOR THE STRUCTURAL DESIGN OF ALL UNITS AND WATER TESTS ON UNITS (ALL AS PER SABS AND AAAMSA REQUIREMENTS) (2) SUBCONTRACTORS ARE RESPONSIBLE IS TO ALLOW FOR ALL NECESSARY TOLERANCES AND FOR ALL SEALERS AROUND ALL UNITS AT JUNCTIONS TO WALLS SILLS ETC. (3) CONTRACTOR TO ALLOW FOR ALL NECESSARY CUT-OUTS FOR LOCKS AND DOOR MONITORING MECHANISMS ETC (4) SUBCONTRACTORS CAN USE THEIR OWN SECTIONS BUT ARE REQUIRED TO SUBMIT ALL SABS AND AAAMSA TEST RESULTS PRIOR TO MANUFACTURE AND TO GET ARCHITECTS APPROVAL. (5) ALL OPENING WINDOWS AND DOORS TO BE FITTED WITH DUST SEALS TO ARCHITECTS APPROVAL.
	S.A.B.S: GLAZING	ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	NATURAL ANODIZED
	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
B. FRAME	FRAME TYPE	ALUMINIUM – NATURAL ANODIZED – DOOR FRAME, AS PER MANUFACTURER
	HINGES:	1 PAIR HEAVY DUTY NATURAL ANODIZED CONTINUOUS HINGE FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS.

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Client: DEPARTMENT OF HEALTH
 Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS
 Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

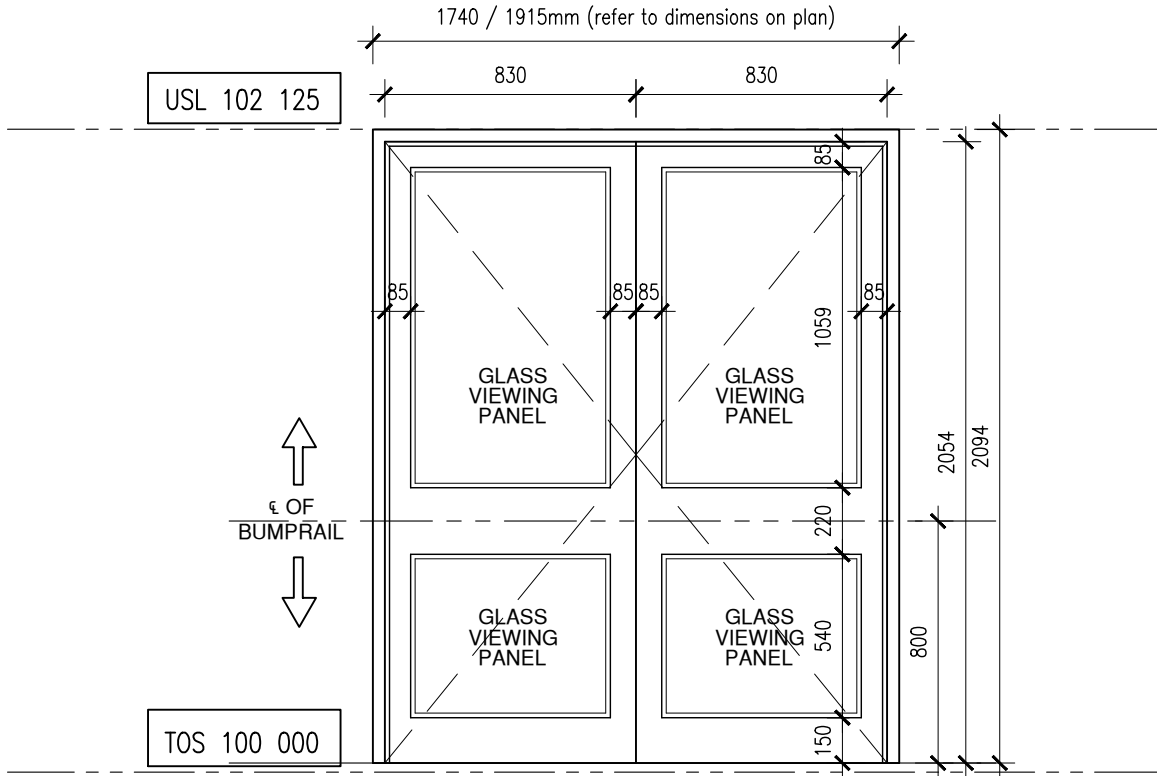
Drawing Title: DOOR TYPES TYPE DT06a
 Scale: 1:25 Date: 2023-11-14 Drawn: ME
 Drawing No.: 3235_DS06a Revision: -



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A. DOOR	DOOR TYPE SPECIFICATIONS	2x (900 X 2055MM) ALUMINIUM SINGLE DOOR WITH GLAZED PANELS AS INDICATED. (1) SUBCONTRACTORS ARE RESPONSIBLE FOR THE STRUCTURAL DESIGN OF ALL UNITS AND WATER TESTS ON UNITS (ALL AS PER SABS AND AAAMSA REQUIREMENTS) (2) SUBCONTRACTORS ARE RESPONSIBLE IS TO ALLOW FOR ALL NECESSARY TOLERANCES AND FOR ALL SEALERS AROUND ALL UNITS AT JUNCTIONS TO WALLS SILLS ETC. (3) CONTRACTOR TO ALLOW FOR ALL NECESSARY CUT-OUTS FOR LOCKS AND DOOR MONITORING MECHANISMS ETC (4) SUBCONTRACTORS CAN USE THEIR OWN SECTIONS BUT ARE REQUIRED TO SUBMIT ALL SABS AND AAAMSA TEST RESULTS PRIOR TO MANUFACTURE AND TO GET ARCHITECTS APPROVAL. (5) ALL OPENING WINDOWS AND DOORS TO BE FITTED WITH DUST SEALS TO ARCHITECTS APPROVAL.
	S.A.B.S: GLAZING	ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	ALUMINIUM – NATURAL ANODIZED
	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
B. FRAME	FRAME TYPE	ALUMINIUM – NATURAL ANODIZED – DOOR FRAME, AS PER MANUFACTURER
	HINGES:	1 PAIRS HEAVY DUTY CONTINUOUS GEARED HINGES FIXED TO FRAME AND DOOR WITH STAINLESS STEEL POP RIVETS AS PER MANUFACTURER.

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 ARCHITECTS PROJECT MANAGERS
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Client: DEPARTMENT OF HEALTH
 Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS
 Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

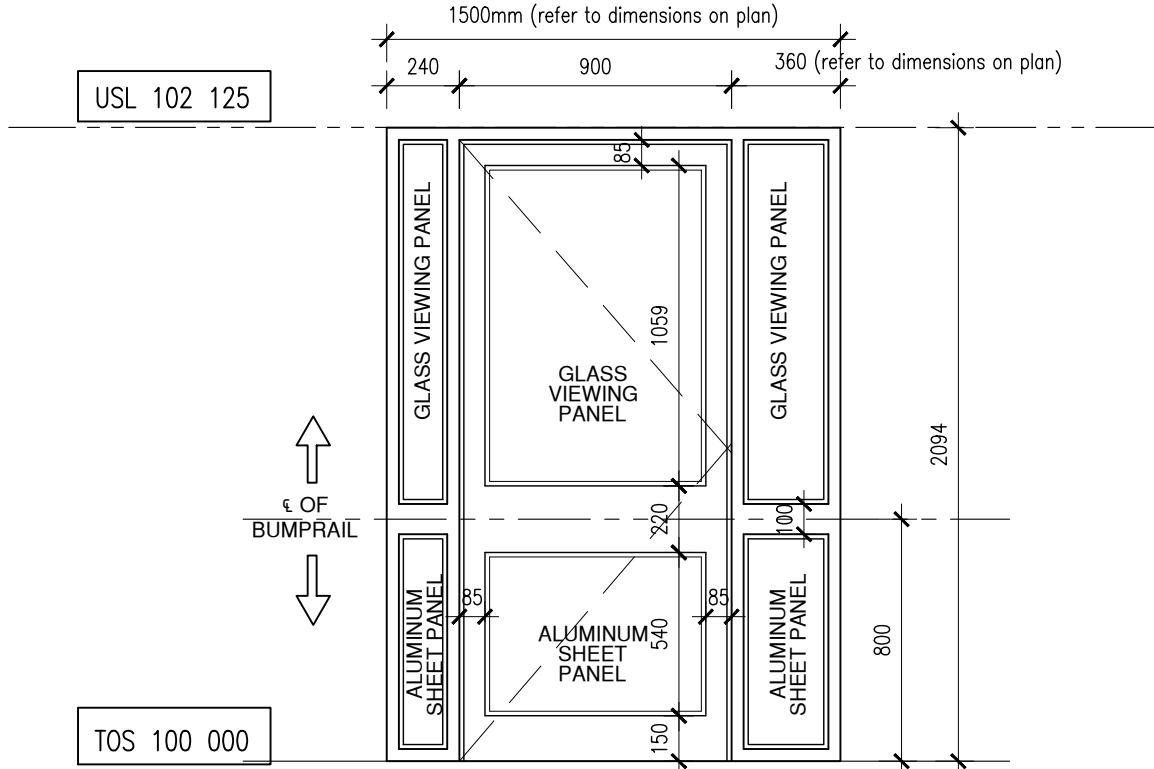
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 Scale: 1:25 Date: 2023-11-14 Drawn: ME
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A. DOOR

DOOR TYPE SPECIFICATIONS	<p>900 X 2055 ALUMINIUM SINGLE DOOR WITH GLAZED PANELS AS INDICATED.</p> <ol style="list-style-type: none"> (1) SUBCONTRACTORS ARE RESPONSIBLE FOR THE STRUCTURAL DESIGN OF ALL UNITS AND WATER TESTS ON UNITS (ALL AS PER SABS AND AAAMSA REQUIREMENTS) (2) SUBCONTRACTORS ARE RESPONSIBLE IS TO ALLOW FOR ALL NECESSARY TOLERANCES AND FOR ALL SEALERS AROUND ALL UNITS AT JUNCTIONS TO WALLS SILLS ETC. (3) CONTRACTOR TO ALLOW FOR ALL NECESSARY CUT-OUTS FOR LOCKS AND DOOR MONITORING MECHANISMS ETC (4) SUBCONTRACTORS CAN USE THEIR OWN SECTIONS BUT ARE REQUIRED TO SUBMIT ALL SABS AND AAAMSA TEST RESULTS PRIOR TO MANUFACTURE AND TO GET ARCHITECTS APPROVAL. (5) ALL OPENING WINDOWS AND DOORS TO BE FITTED WITH DUST SEALS TO ARCHITECTS APPROVAL.
---------------------------------	---

S.A.B.S: GLAZING	<p>ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)</p>
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MASS:	APPROXIMATELY 34KG PER DOOR LEAF
--------------	----------------------------------

FINISH:	ALUMINIUM – NATURAL ANODIZED
----------------	------------------------------

IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
---------------------	--

B. FRAME

FRAME TYPE	ALUMINIUM – NATURAL ANODIZED – DOOR FRAME, AS PER MANUFACTURER
-------------------	--

HINGES:	1x HEAVY DUTY CONTINUOUS GEARED HINGES FIXED TO FRAME AND DOOR WITH STAINLESS STEEL POP RIVETS AS PER MANUFACTURER.
----------------	---

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Client: DEPARTMENT OF HEALTH
 Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS
 Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

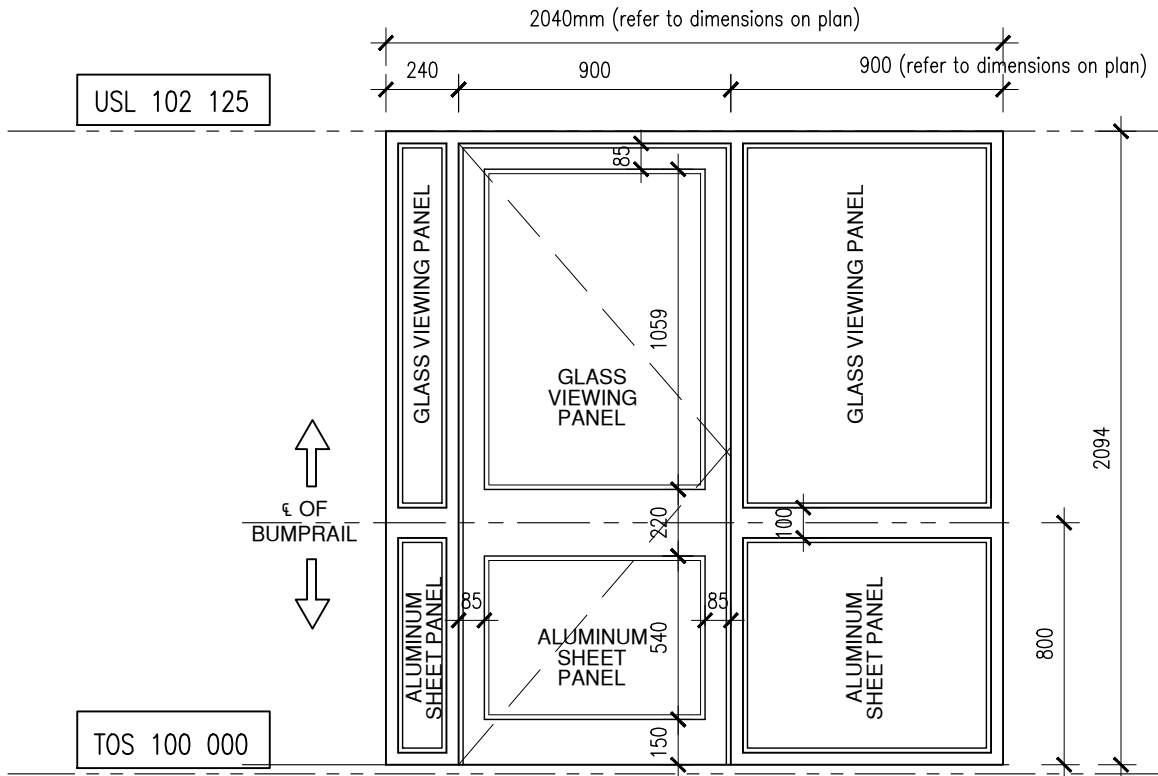
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Rev:	Date:	By:	Description:
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A. DOOR	DOOR TYPE SPECIFICATIONS	900 X 2055 ALUMINIUM SINGLE DOOR WITH GLAZED PANELS AS INDICATED. (1) SUBCONTRACTORS ARE RESPONSIBLE FOR THE STRUCTURAL DESIGN OF ALL UNITS AND WATER TESTS ON UNITS (ALL AS PER SABS AND AAAMSA REQUIREMENTS) (2) SUBCONTRACTORS ARE RESPONSIBLE IS TO ALLOW FOR ALL NECESSARY TOLERANCES AND FOR ALL SEALERS AROUND ALL UNITS AT JUNCTIONS TO WALLS SILLS ETC. (3) CONTRACTOR TO ALLOW FOR ALL NECESSARY CUT-OUTS FOR LOCKS AND DOOR MONITORING MECHANISMS ETC (4) SUBCONTRACTORS CAN USE THEIR OWN SECTIONS BUT ARE REQUIRED TO SUBMIT ALL SABS AND AAAMSA TEST RESULTS PRIOR TO MANUFACTURE AND TO GET ARCHITECTS APPROVAL. (5) ALL OPENING WINDOWS AND DOORS TO BE FITTED WITH DUST SEALS TO ARCHITECTS APPROVAL.
	S.A.B.S: GLAZING	ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	ALUMINIUM – NATURAL ANODIZED
	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
B. FRAME	FRAME TYPE	ALUMINIUM – NATURAL ANODIZED – DOOR FRAME, AS PER MANUFACTURER
	HINGES:	1x HEAVY DUTY CONTINUOUS GEARED HINGES FIXED TO FRAME AND DOOR WITH STAINLESS STEEL POP RIVETS AS PER MANUFACTURER.

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Client: DEPARTMENT OF HEALTH
 Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS
 Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

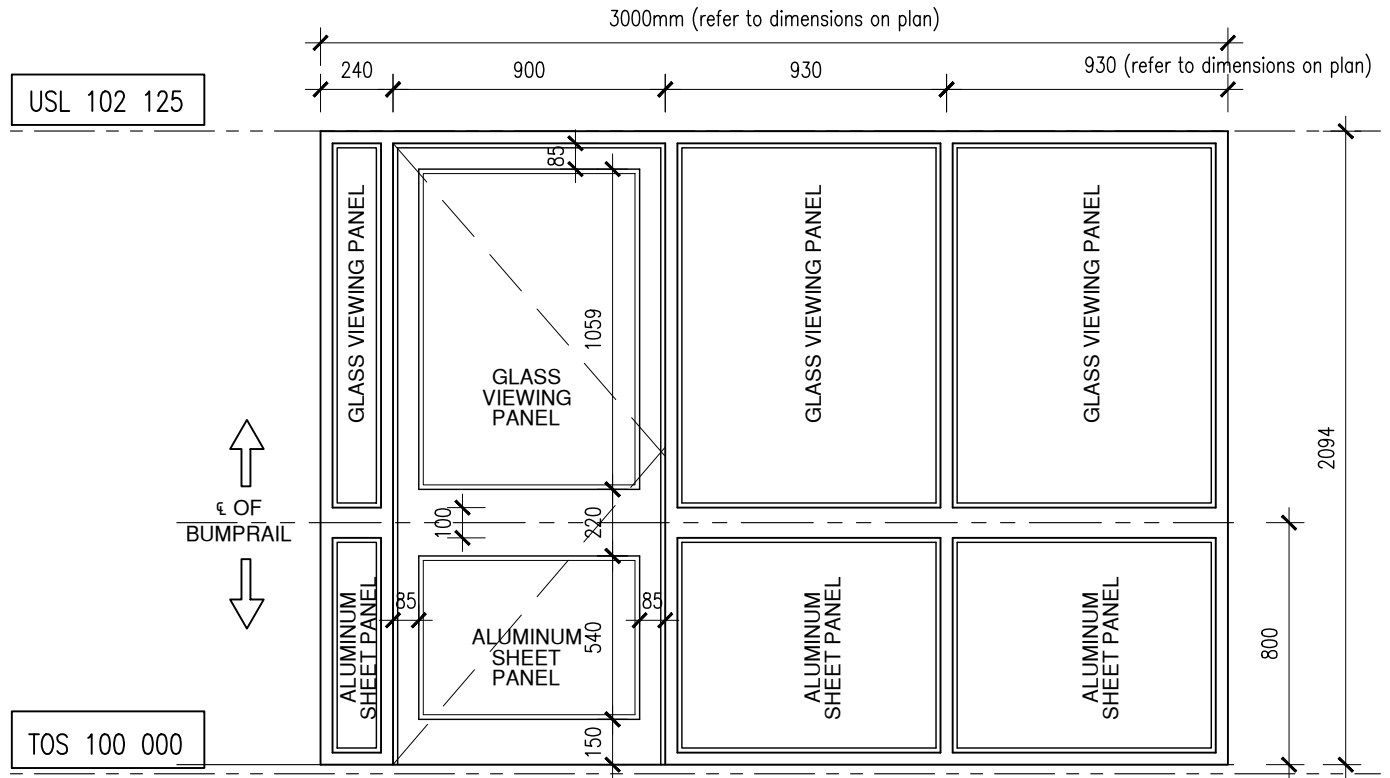
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 Scale: 1:25 Date: 2023-11-14 Drawn: ME
 Drawing No.: 3235_DS08a Revision: -



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A. DOOR	DOOR TYPE SPECIFICATIONS	<p>900 X 2055 ALUMINIUM SINGLE DOOR WITH GLAZED PANELS AS INDICATED.</p> <ol style="list-style-type: none"> (1) SUBCONTRACTORS ARE RESPONSIBLE FOR THE STRUCTURAL DESIGN OF ALL UNITS AND WATER TESTS ON UNITS (ALL AS PER SABS AND AAAMSA REQUIREMENTS) (2) SUBCONTRACTORS ARE RESPONSIBLE IS TO ALLOW FOR ALL NECESSARY TOLERANCES AND FOR ALL SEALERS AROUND ALL UNITS AT JUNCTIONS TO WALLS SILLS ETC. (3) CONTRACTOR TO ALLOW FOR ALL NECESSARY CUT-OUTS FOR LOCKS AND DOOR MONITORING MECHANISMS ETC (4) SUBCONTRACTORS CAN USE THEIR OWN SECTIONS BUT ARE REQUIRED TO SUBMIT ALL SABS AND AAAMSA TEST RESULTS PRIOR TO MANUFACTURE AND TO GET ARCHITECTS APPROVAL. (5) ALL OPENING WINDOWS AND DOORS TO BE FITTED WITH DUST SEALS TO ARCHITECTS APPROVAL.
	S.A.B.S: GLAZING	<p>ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)</p>
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	ALUMINIUM – NATURAL ANODIZED
	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
B. FRAME	FRAME TYPE	ALUMINIUM – NATURAL ANODIZED – DOOR FRAME, AS PER MANUFACTURER
	HINGES:	1x HEAVY DUTY CONTINUOUS GEARED HINGES FIXED TO FRAME AND DOOR WITH STAINLESS STEEL POP RIVETS AS PER MANUFACTURER.

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Client: DEPARTMENT OF HEALTH
 Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS
 Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

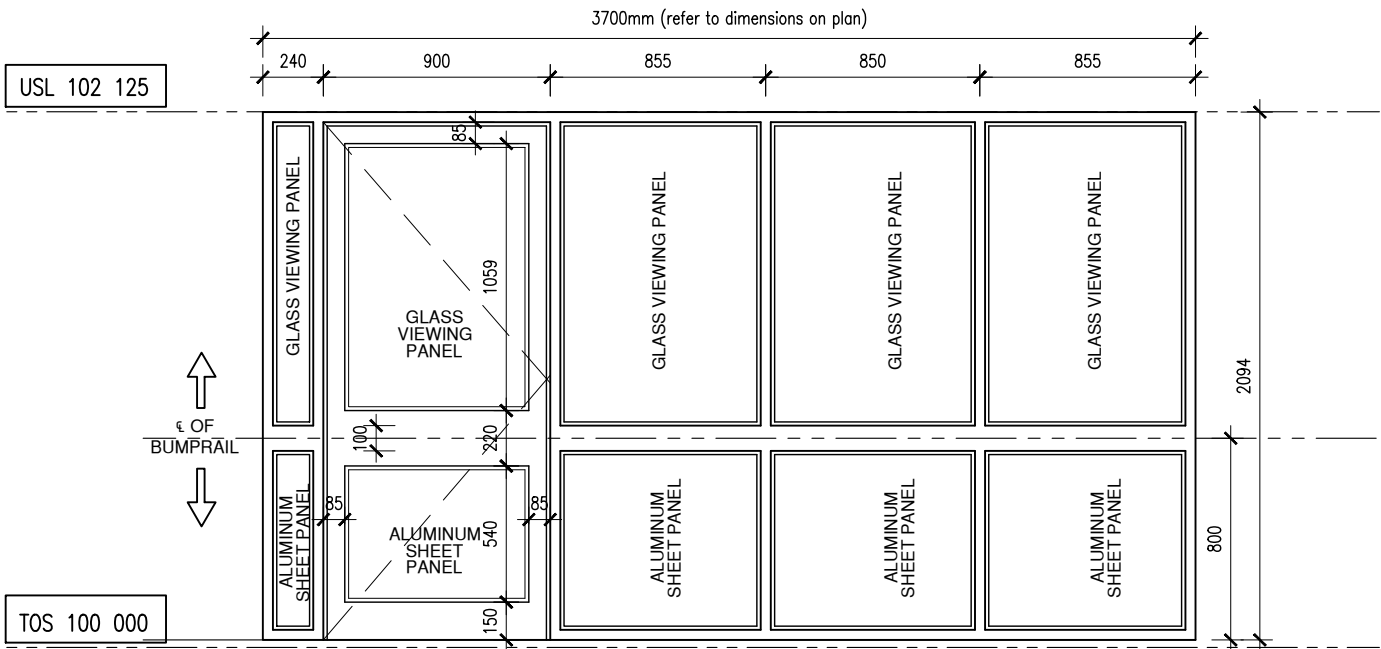
Drawing Title: DOOR TYPES TYPE DT08b
 Scale: 1:25 Date: 2023-11-14 Drawn: ME
 Drawing No.: 3235_DS08b Revision: -



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A. DOOR	DOOR TYPE SPECIFICATIONS	<p>900 X 2055 ALUMINIUM SINGLE DOOR WITH GLAZED PANELS AS INDICATED.</p> <ol style="list-style-type: none"> (1) SUBCONTRACTORS ARE RESPONSIBLE FOR THE STRUCTURAL DESIGN OF ALL UNITS AND WATER TESTS ON UNITS (ALL AS PER SABS AND AAAMSA REQUIREMENTS) (2) SUBCONTRACTORS ARE RESPONSIBLE IS TO ALLOW FOR ALL NECESSARY TOLERANCES AND FOR ALL SEALERS AROUND ALL UNITS AT JUNCTIONS TO WALLS SILLS ETC. (3) CONTRACTOR TO ALLOW FOR ALL NECESSARY CUT-OUTS FOR LOCKS AND DOOR MONITORING MECHANISMS ETC (4) SUBCONTRACTORS CAN USE THEIR OWN SECTIONS BUT ARE REQUIRED TO SUBMIT ALL SABS AND AAAMSA TEST RESULTS PRIOR TO MANUFACTURE AND TO GET ARCHITECTS APPROVAL. (5) ALL OPENING WINDOWS AND DOORS TO BE FITTED WITH DUST SEALS TO ARCHITECTS APPROVAL.
	S.A.B.S: GLAZING	<p>ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS.</p> <p>ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL</p> <p>ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)</p>
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	ALUMINIUM – NATURAL ANODIZED
	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
B. FRAME	FRAME TYPE	ALUMINIUM – NATURAL ANODIZED – DOOR FRAME, AS PER MANUFACTURER
	HINGES:	1x HEAVY DUTY CONTINUOUS GEARED HINGES FIXED TO FRAME AND DOOR WITH STAINLESS STEEL POP RIVETS AS PER MANUFACTURER.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES TYPE DT08c

Scale: 1:25 Date: 2023-11-14 Drawn: ME

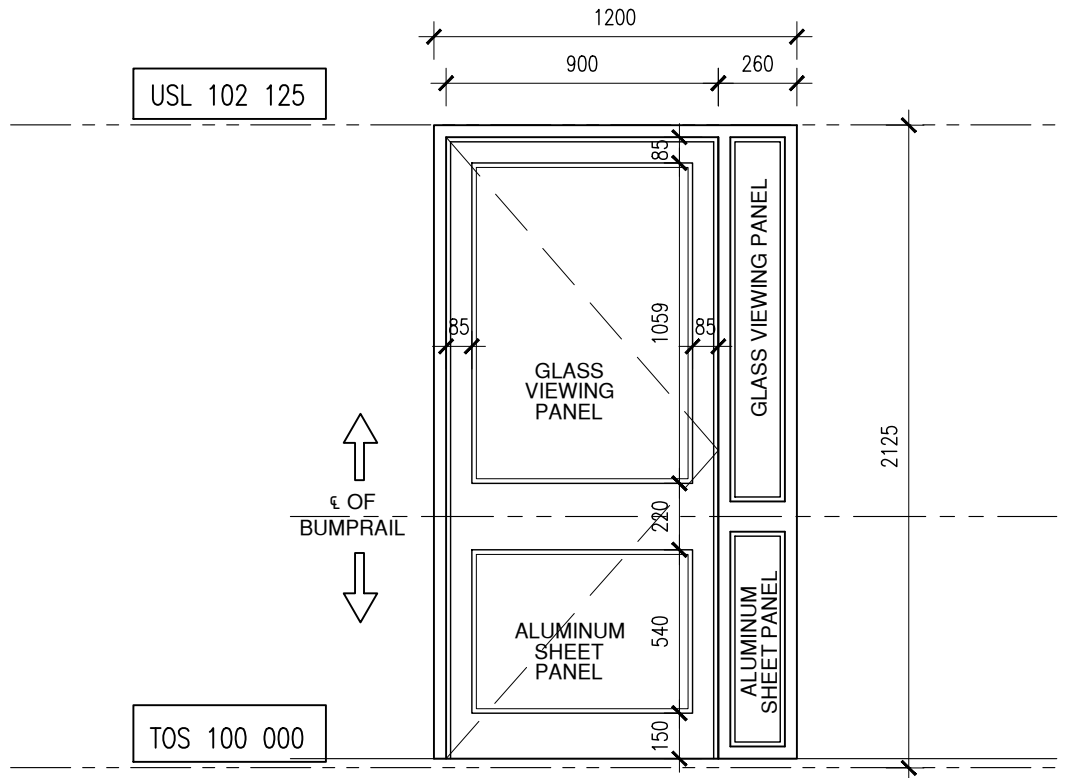
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A. DOOR	DOOR TYPE SPECIFICATIONS	<p>900 X 2055 ALUMINIUM SINGLE DOOR WITH GLAZED PANELS AS INDICATED.</p> <ol style="list-style-type: none"> (1) SUBCONTRACTORS ARE RESPONSIBLE FOR THE STRUCTURAL DESIGN OF ALL UNITS AND WATER TESTS ON UNITS (ALL AS PER SABS AND AAAMSA REQUIREMENTS) (2) SUBCONTRACTORS ARE RESPONSIBLE IS TO ALLOW FOR ALL NECESSARY TOLERANCES AND FOR ALL SEALERS AROUND ALL UNITS AT JUNCTIONS TO WALLS SILLS ETC. (3) CONTRACTOR TO ALLOW FOR ALL NECESSARY CUT-OUTS FOR LOCKS AND DOOR MONITORING MECHANISMS ETC (4) SUBCONTRACTORS CAN USE THEIR OWN SECTIONS BUT ARE REQUIRED TO SUBMIT ALL SABS AND AAAMSA TEST RESULTS PRIOR TO MANUFACTURE AND TO GET ARCHITECTS APPROVAL. (5) ALL OPENING WINDOWS AND DOORS TO BE FITTED WITH DUST SEALS TO ARCHITECTS APPROVAL.
	S.A.B.S: GLAZING	<p>ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)</p>
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	ALUMINIUM – NATURAL ANODIZED
	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
B. FRAME	FRAME TYPE	ALUMINIUM – NATURAL ANODIZED – DOOR FRAME, AS PER MANUFACTURER
	HINGES:	1x HEAVY DUTY CONTINUOUS GEARED HINGES FIXED TO FRAME AND DOOR WITH STAINLESS STEEL POP RIVETS AS PER MANUFACTURER.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES TYPE DT09

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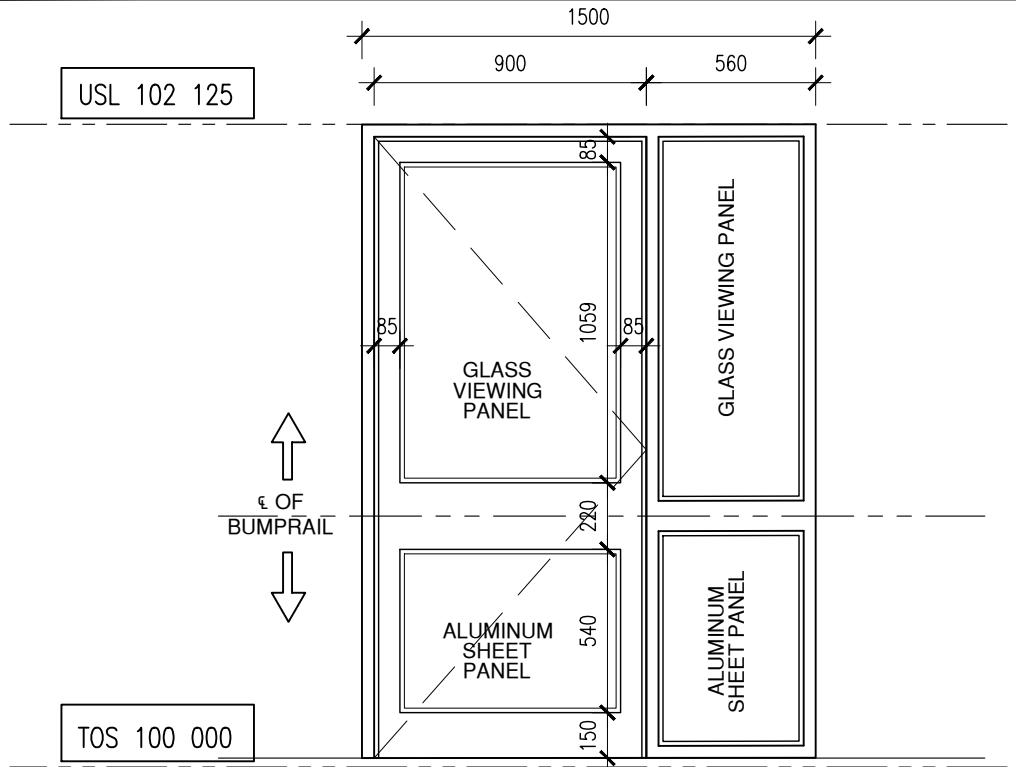
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A. DOOR

DOOR TYPE SPECIFICATIONS

- 900 X 2055 ALUMINIUM SINGLE DOOR WITH GLAZED PANELS AS INDICATED.
- (1) SUBCONTRACTORS ARE RESPONSIBLE FOR THE STRUCTURAL DESIGN OF ALL UNITS AND WATER TESTS ON UNITS (ALL AS PER SABS AND AAAMSA REQUIREMENTS)
 - (2) SUBCONTRACTORS ARE RESPONSIBLE IS TO ALLOW FOR ALL NECESSARY TOLERANCES AND FOR ALL SEALERS AROUND ALL UNITS AT JUNCTIONS TO WALLS SILLS ETC.
 - (3) CONTRACTOR TO ALLOW FOR ALL NECESSARY CUT-OUTS FOR LOCKS AND DOOR MONITORING MECHANISMS ETC
 - (4) SUBCONTRACTORS CAN USE THEIR OWN SECTIONS BUT ARE REQUIRED TO SUBMIT ALL SABS AND AAAMSA TEST RESULTS PRIOR TO MANUFACTURE AND TO GET ARCHITECTS APPROVAL.
 - (5) ALL OPENING WINDOWS AND DOORS TO BE FITTED WITH DUST SEALS TO ARCHITECTS APPROVAL.

S.A.B.S: GLAZING

ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL
ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)

MASS:

APPROXIMATELY 34KG PER DOOR LEAF

FINISH:

ALUMINIUM – NATURAL ANODIZED

IRONMONG SET

REFER TO THE LATEST IRONMONGERY SCHEDULE

B. FRAME

FRAME TYPE

ALUMINIUM – NATURAL ANODIZED – DOOR FRAME, AS PER MANUFACTURER

HINGES:

1x HEAVY DUTY CONTINUOUS GEARED HINGES FIXED TO FRAME AND DOOR WITH STAINLESS STEEL POP RIVETS AS PER MANUFACTURER.

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 postal address po box 12376, central, port elizabeth, 6006

Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES TYPE DT09a

Scale: 1:25 Date: 2023-11-14 Drawn: ME

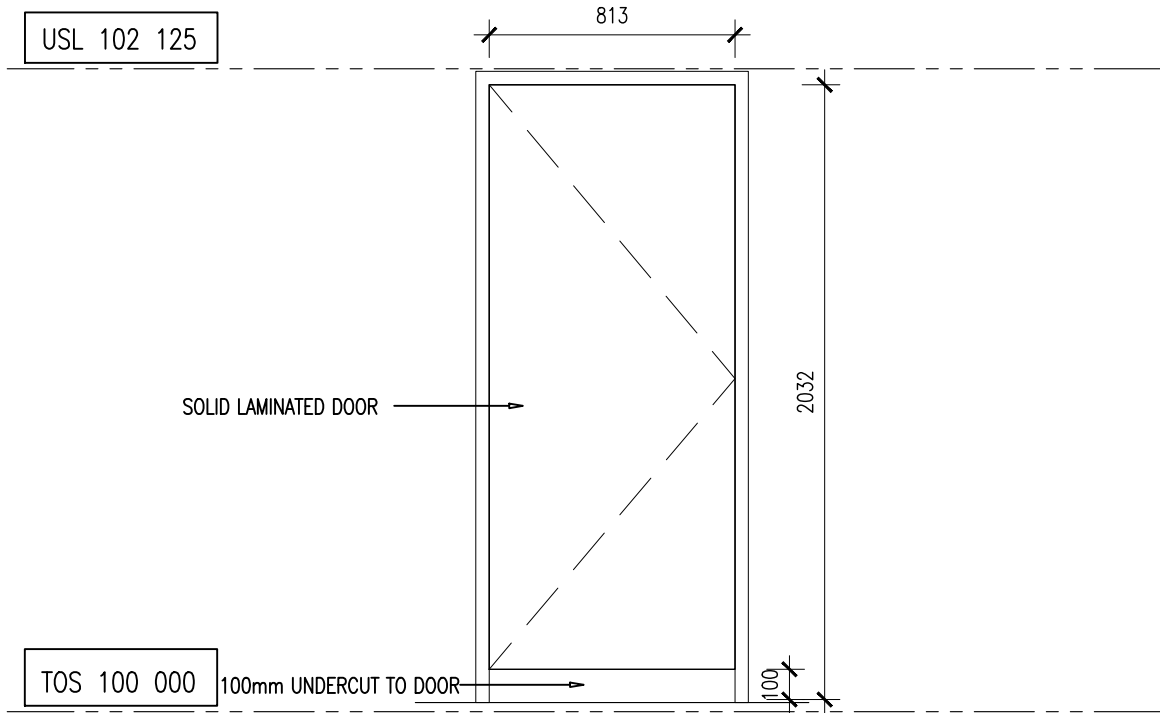
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A. DOOR

DOOR TYPE SPECIFICATIONS

813 X 2032 X 44mm THICK SOLID LAMINATED DOOR CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH SLIGHTLY ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME.

REQUIREMENTS:
ALLOW FOR 100mm UNDERCUT TO BOTTOM OF DOOR.

S.A.B.S:

EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY
PERFORMANCE CLASS: SUITABLE FOR MEDIUM DUTY DRY INTERIOR APPLICATIONS (MD-DI)

MASS:

APPROXIMATELY 34KG PER DOOR LEAF

FINISH:

TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.

IRONMONG SET

REFER TO THE LATEST IRONMONGERY SCHEDULE

B. FRAME

FRAME TYPE

NEW STAINLESS STEEL DOOR FRAME

HINGES:

1 ½ PAIRS TWO BALL BEARING BUTT HINGES FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS. FRAME MANUFACTURER TO PROVIDE RECESSES IN FRAME TO ALLOW HINGE TO BE FLUSH WITH FRAME.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES
TYPE DT10

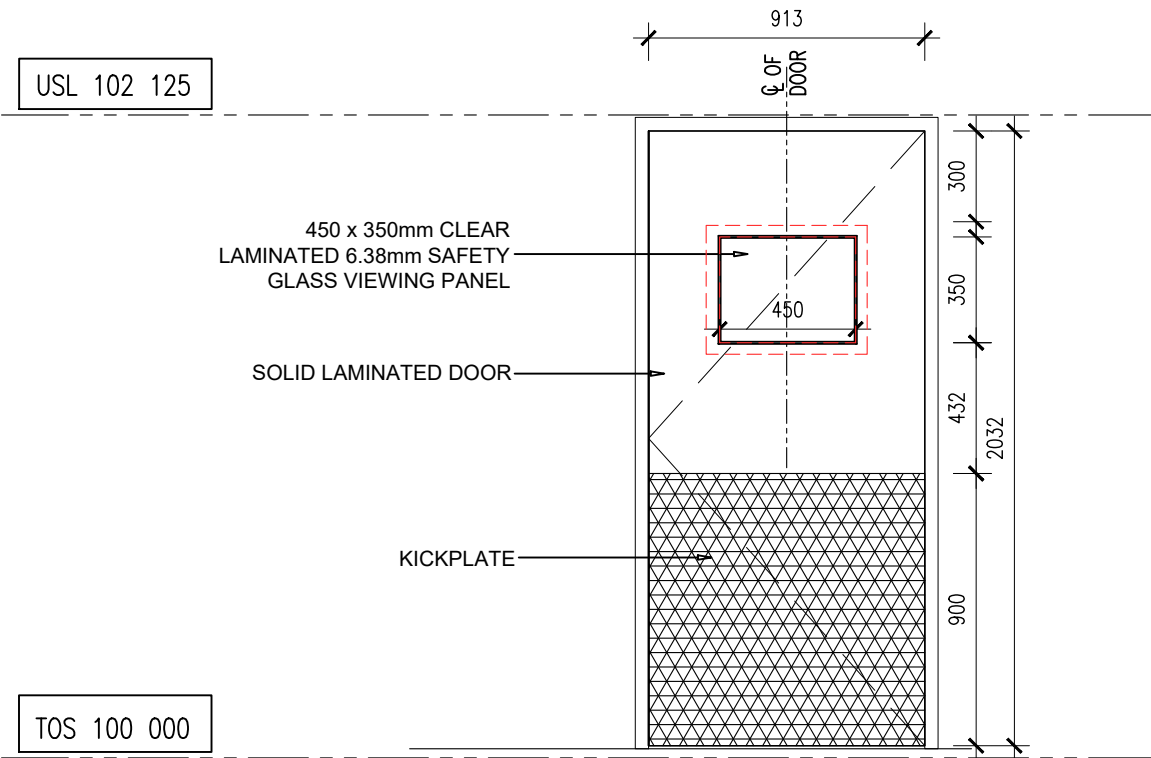
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Drawing No.: 3235_DS10 Revision: -

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A. DOOR	DOOR TYPE SPECIFICATIONS	913 X 2032 X 44mm THICK SOLID LAMINATED DOOR CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH SLIGHTLY ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME. REQUIREMENTS: (1) ALLOW FOR 450x350mm CUT OUT FOR VIEWING PANEL (2) 900mm HIGH, 1,6mm THICK SATIN FINISHED GRADE 18/8 STAINLESS STEEL KICK PLATE GLUED AND COUNTERSUNK HOLED FOR AND SCREWED TO DOOR AT 150MM CENTRES AROUND EDGES WITH COUNTERSUNK HEADED STAINLESS STEEL SCREWS TO <u>ONE SIDE OF DOOR</u>
	S.A.B.S:	EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY PERFORMANCE CLASS: SUITABLE FOR HEAVY DUTY DRY INTERIOR APPLICATIONS (HD-DI)
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.
	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
B. FRAME	FRAME TYPE	NEW STAINLESS STEEL DOOR FRAME
	HINGES:	1 ½ PAIRS TWO BALL BEARING BUTT HINGES FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS. FRAME MANUFACTURER TO PROVIDE RECESSES IN FRAME TO ALLOW HINGE TO BE FLUSH WITH FRAME.

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 Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS
 Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

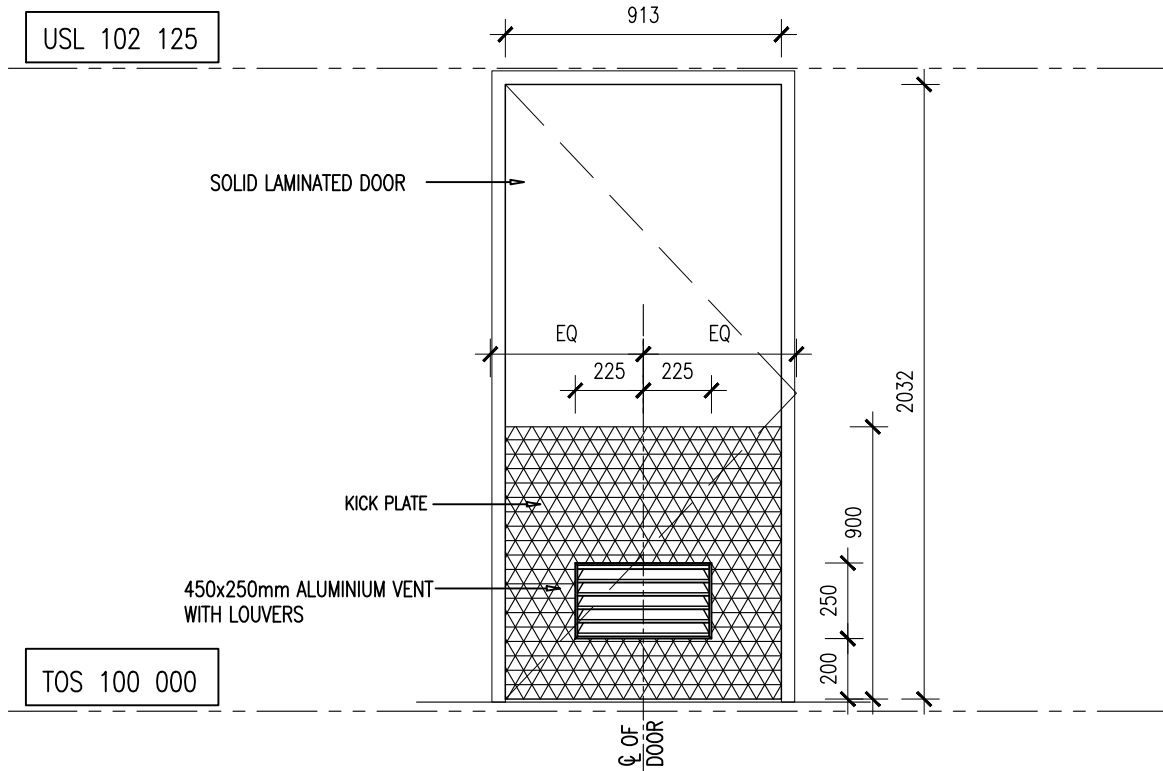
Drawing Title: DOOR TYPES TYPE DT11
 Scale: 1:25 Date: 2023-11-14 Drawn: WC
 Drawing No.: 3235_DS11 Revision: -



Rev:	Date:	By:	Description:
-	2023-11-14	WC	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

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A. DOOR

DOOR TYPE SPECIFICATIONS

913 X 2032 X 44mm THICK SOLID LAMINATED DOOR CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH SLIGHTLY ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME.

REQUIREMENTS:

- (1) ALLOW FOR 450x280mm CUT OUT FOR VENT
- (2) 900mm HIGH, 1,6mm THICK SATIN FINISHED GRADE 18/8 STAINLESS STEEL KICK PLATE GLUED AND COUNTERSUNK HOLED FOR AND SCREWED TO DOOR AT 150MM CENTRES AROUND EDGES WITH COUNTERSUNK HEADED STAINLESS STEEL SCREWS TO ONE SIDE OF DOOR.

S.A.B.S:

EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY

PERFORMANCE CLASS: SUITABLE FOR HEAVY DUTY DRY INTERIOR APPLICATIONS (HD-DI)

MASS:

APPROXIMATELY 34KG PER DOOR LEAF

FINISH:

TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.

IRONMONG SET

REFER TO THE LATEST IRONMONGERY SCHEDULE

B. FRAME

FRAME TYPE

NEW STAINLESS STEEL DOOR FRAME

HINGES:

1 ½ PAIRS TWO BALL BEARING BUTT HINGES FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS. FRAME MANUFACTURER TO PROVIDE RECESSES IN FRAME TO ALLOW HINGE TO BE FLUSH WITH FRAME.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES
 TYPE DT12

Scale: 1:25 Date: 2023-11-14 Drawn: WC

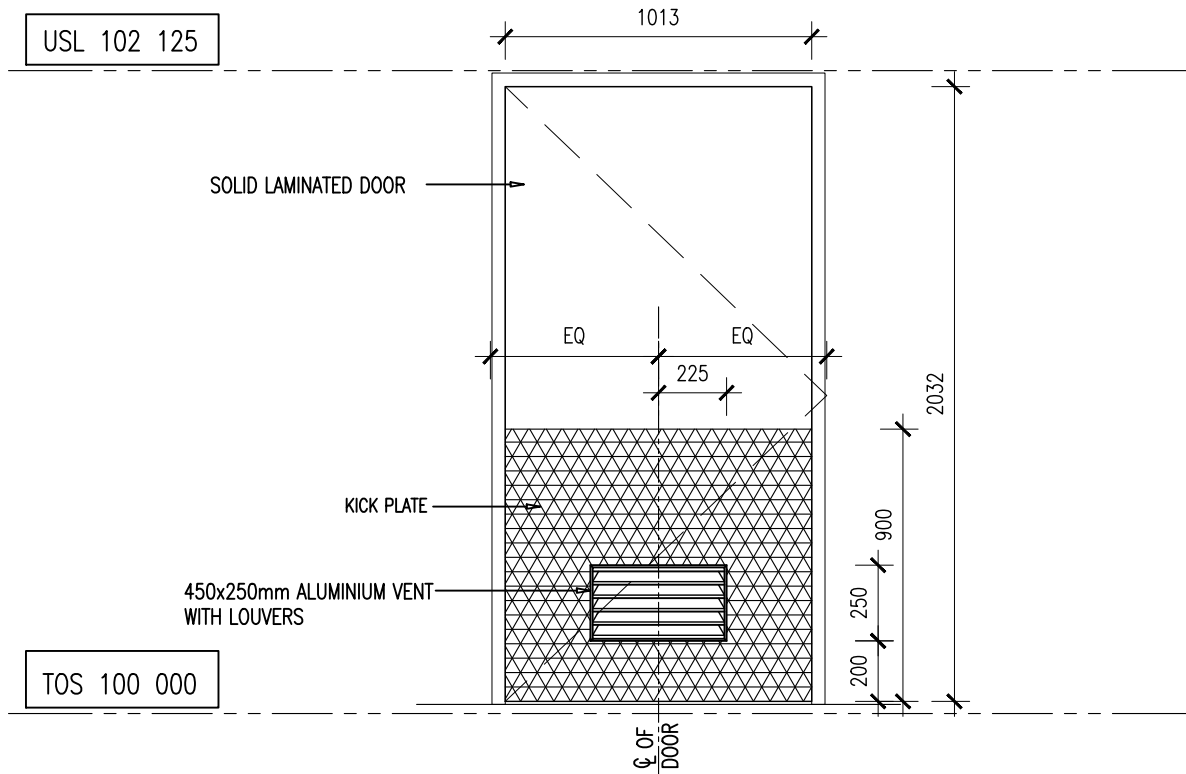
Drawing No.: 3235_DS12 Revision: -



Rev:	Date:	By:	Description:
-	2023-11-14	WC	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

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A. DOOR

DOOR TYPE SPECIFICATIONS

1013 X 2032 X 44mm THICK SOLID LAMINATED DOOR CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH SLIGHTLY ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME.

REQUIREMENTS:

- (1) ALLOW FOR 450x280mm CUT OUT FOR VENT
- (2) 900mm HIGH, 1,6mm THICK SATIN FINISHED GRADE 18/8 STAINLESS STEEL KICK PLATE GLUED AND COUNTERSUNK HOLED FOR AND SCREWED TO DOOR AT 150MM CENTRES AROUND EDGES WITH COUNTERSUNK HEADED STAINLESS STEEL SCREWS TO ONE SIDE OF DOOR.

S.A.B.S:

EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY

PERFORMANCE CLASS: SUITABLE FOR HEAVY DUTY DRY INTERIOR APPLICATIONS (HD-DI)

MASS:

APPROXIMATELY 34KG PER DOOR LEAF

FINISH:

TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.

IRONMONG SET

REFER TO THE LATEST IRONMONGERY SCHEDULE

B. FRAME

FRAME TYPE

NEW STAINLESS STEEL DOOR FRAME

HINGES:

1 ½ PAIRS TWO BALL BEARING BUTT HINGES FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS. FRAME MANUFACTURER TO PROVIDE RECESSES IN FRAME TO ALLOW HINGE TO BE FLUSH WITH FRAME.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES
 TYPE DT12a

Scale: 1:25 Date: 2023-11-14 Drawn: WC

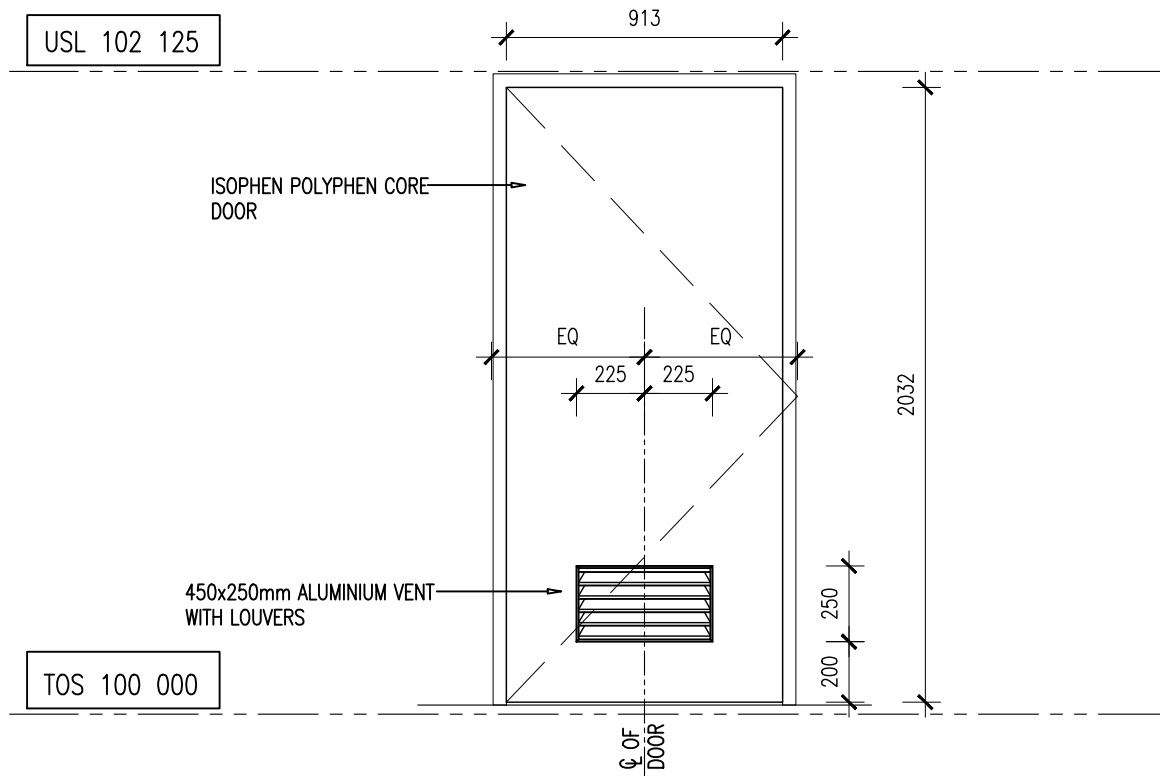
Drawing No.: 3235_DS12a Revision: -



Rev:	Date:	By:	Description:
-	2023-11-14	WC	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

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A. DOOR

DOOR TYPE SPECIFICATIONS

913 X 2032 X 38mm THICK ISOPHEN DOOR CONSTRUCTED FROM 37mm 42kg/m³ POLYPHEN CORE WITH CHROMODEK 0.58MM CLADDEN PANEL BOTH SIDES, FINISH POWDER COATED, CAPPED WITH NATURAL ANODIZED ALUMINIUM EDGES ALL AROUND. PURPOSE MADE TO SUITE DOOR FRAME.

REQUIREMENTS:

- (1) ALLOW FOR 450x280mm CUT OUT FOR VENT

S.A.B.S:

EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY

PERFORMANCE CLASS: SUITABLE FOR HEAVY DUTY DRY INTERIOR APPLICATIONS (HD-DI)

MASS:

APPROXIMATELY 34KG PER DOOR LEAF

FINISH:

POWDER COATED FROST WHITE

IRONMONG SET

REFER TO THE LATEST IRONMONGERY SCHEDULE

B. FRAME

FRAME TYPE

NEW ANODIZED ALUMINIUM DOOR FRAME

HINGES:

1 ½ PAIRS TWO BALL BEARING BUTT HINGES FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS. FRAME MANUFACTURER TO PROVIDE RECESSES IN FRAME TO ALLOW HINGE TO BE FLUSH WITH FRAME.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES
TYPE DT12b

Scale: 1:25 Date: 2023-11-14 Drawn: WC

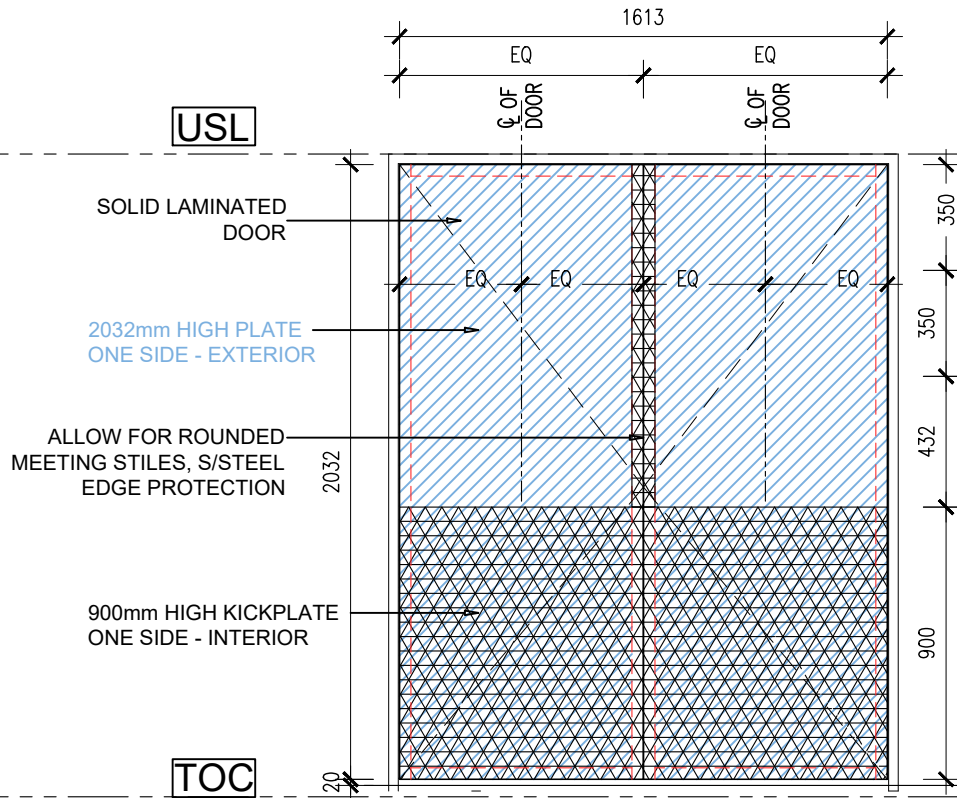
Drawing No.: 3235_DS12b Revision: -



Rev:	Date:	By:	Description:
-	2023-11-14	WC	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

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A. DOOR	DOOR TYPE SPECIFICATIONS	2X (813 X 2032 X 44mm) THICK SOLID LAMINATED DOOR CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME. REQUIREMENTS: (1) 900mm HIGH, 1,6mm THICK SATIN FINISHED GRADE 18/8 STAINLESS STEEL KICK PLATE GLUED AND COUNTERSUNK HOLED FOR AND SCREWED TO DOOR AT 150MM CENTRES AROUND EDGES WITH COUNTERSUNK HEADED STAINLESS STEEL SCREWS TO ONE SIDE OF DOOR – INTERIOR (2) 2032mm HIGH, 1mm THICK GALVANIZED STEEL PLATE GLUED AND COUNTERSUNK HOLED FOR AND SCREWED TO DOOR AT 150MM CENTRES AROUND EDGES WITH COUNTERSUNK HEADED GALVANIZED SCREWS TO ONE SIDE OF DOOR – EXTERIOR. STEEL TO BE PAINTED (3) ALLOW FOR ROUNDED MEETING STILES
	GLAZING	
	S.A.B.S:	EXPOSURE CLASS: CLASS 1 (EXTERIOR) CONSTANTLY EXPOSED TO UNPROTECTED OPEN-AIR CONDITIONS PERFORMANCE CLASS: SUITABLE FOR HEAVY DUTY CLASS 1 EXTERIOR APPLICATIONS (HD-CLASS 1 EXT)
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	TWO COATS PAINT APPLIED AS PER PAINT SPEC – GALVANIZED STEEL.
B. FRAME	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
	FRAME TYPE	NEW STAINLESS STEEL DOOR FRAME
	HINGES:	1 PAIR HEAVY DUTY NATURAL ANODIZED CONTINUOUS HINGE FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES
TYPE DT13

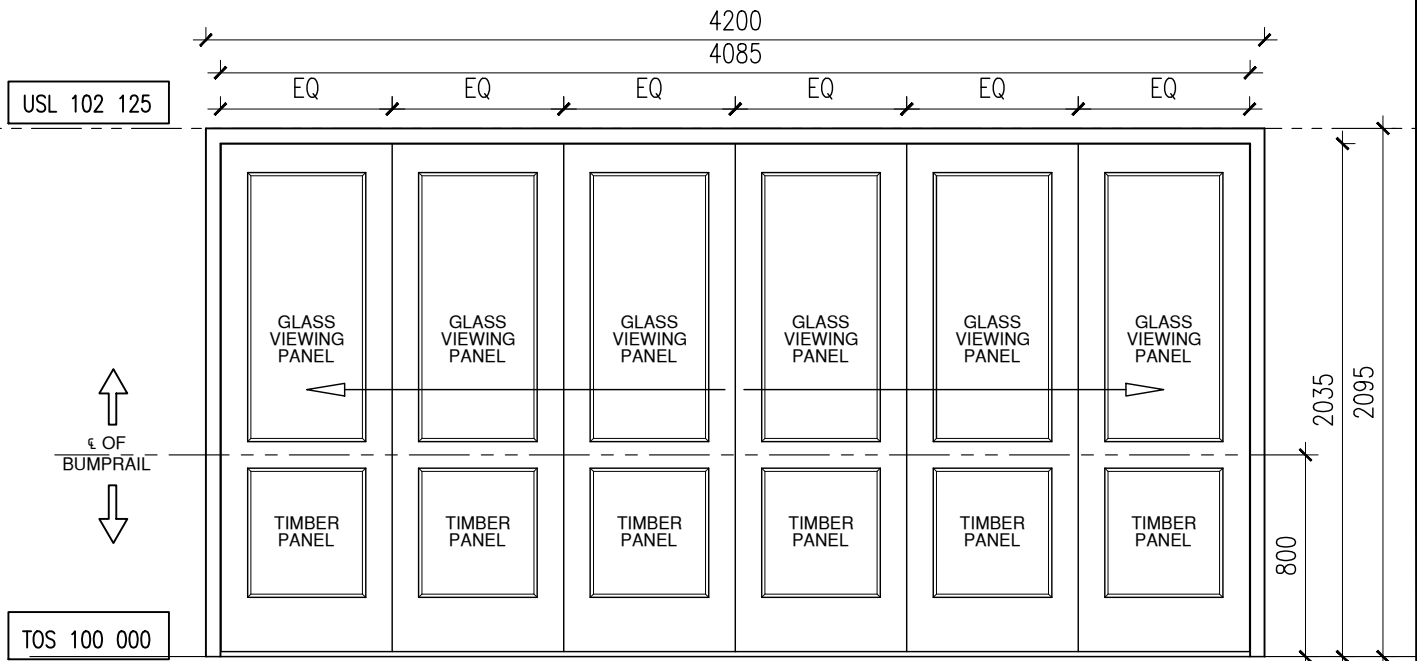
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Drawing No.: 3235_DS13 Revision: -

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A. DOOR	DOOR TYPE SPECIFICATIONS	6 X (680 X 2032 X 44mm) THICK SOLID LAMINATED BI-FOLD-A-SIDE DOOR WITH GLAZED PANELS AS INDICATED CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH SLIGHTLY ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME.
	S.A.B.S:	EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY PERFORMANCE CLASS: SUITABLE FOR MEDIUM DUTY DRY INTERIOR APPLICATIONS (MD-DI) ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.
B. FRAME	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
	FRAME TYPE	69X107MM REBATED SOLID MERANTI HARDWOOD DOOR FRAME. TOP AND BOTTOM GUIDE RAILS AS PER MANUFACTURER.
	HINGES:	3 PAIR HEAVY DUTY NATURAL ANODIZED CONTINUOUS HINGE FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES TYPE DT15

Scale: 1:25 Date: 2023-11-14 Drawn: ME

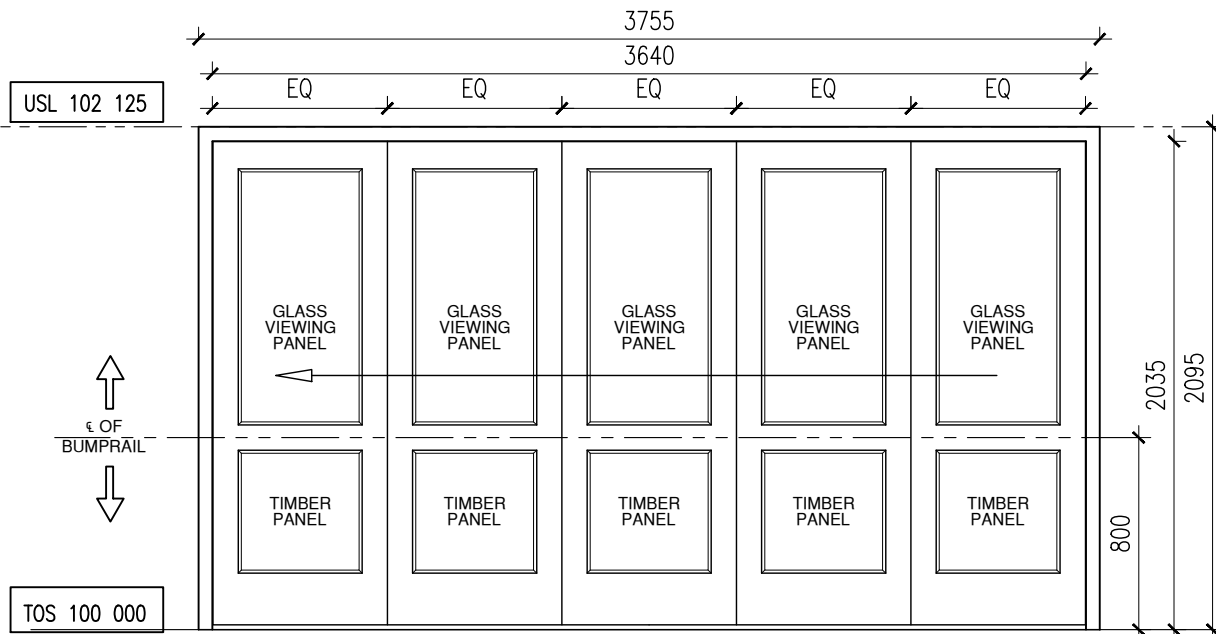
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Rev:	Date:	By:	Description:
-	2023-11-14	ME	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

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A. DOOR	DOOR TYPE SPECIFICATIONS	6 X (680 X 2032 X 44mm) THICK SOLID LAMINATED BI-FOLD-A-SIDE DOOR WITH GLAZED PANELS AS INDICATED CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH SLIGHTLY ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME.
	S.A.B.S:	EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY PERFORMANCE CLASS: SUITABLE FOR MEDIUM DUTY DRY INTERIOR APPLICATIONS (MD-DI) ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)
	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.
B. FRAME	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
	FRAME TYPE	69X107MM REBATED SOLID MERANTI HARDWOOD DOOR FRAME. TOP AND BOTTOM GUIDE RAILS AS PER MANUFACTURER.
	HINGES:	1 ½ PAIR HEAVY DUTY NATURAL ANODIZED CONTINUOUS HINGE FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
Township: MDANTSANE, EAST LONDON

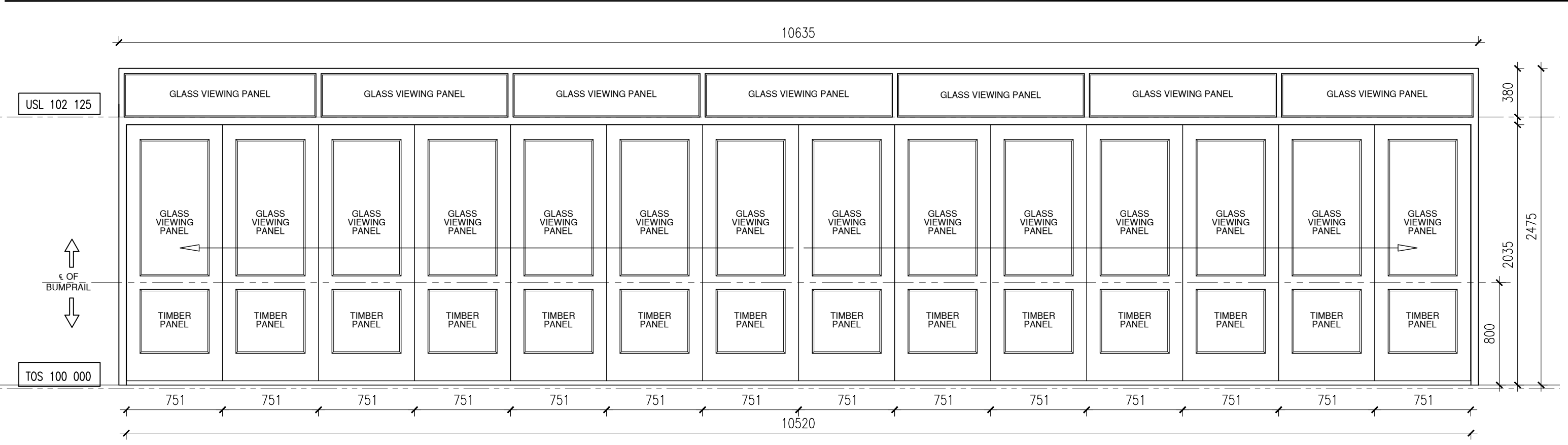
Drawing Title: DOOR TYPES
TYPE DT15a

Scale: 1:25 Date: 2023-11-14 Drawn: ME

Drawing No.: 3235_DS15a Revision: -

Rev.	Date:	By:	Description:
-	2023-11-14	ME	ISSUED FOR MEASURE

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A. DOOR	DOOR TYPE SPECIFICATIONS	6 X (680 X 2032 X 44mm) THICK SOLID LAMINATED BI-FOLD-A-SIDE DOOR WITH GLAZED PANELS AS INDICATED CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH SLIGHTLY ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME.
	S.A.B.S:	EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY PERFORMANCE CLASS: SUITABLE FOR MEDIUM DUTY DRY INTERIOR APPLICATIONS (MD-DI) ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)
B. FRAME	MASS:	APPROXIMATELY 34KG PER DOOR LEAF
	FINISH:	TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.
	IRONMONG SET	REFER TO THE LATEST IRONMONGERY SCHEDULE
	FRAME TYPE	69X107MM REBATED SOLID MERANTI HARDWOOD DOOR FRAME. TOP AND BOTTOM GUIDE RAILS AS PER MANUFACTURER.
	HINGES:	7 PAIR HEAVY DUTY NATURAL ANODIZED CONTINUOUS HINGE FLUSH FIXED TO FRAME WITH STAINLESS STEEL POP RIVETS.

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Client: DEPARTMENT OF HEALTH
Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS
Stand No.: 1506
Township: MDANTSANE, EAST LONDON

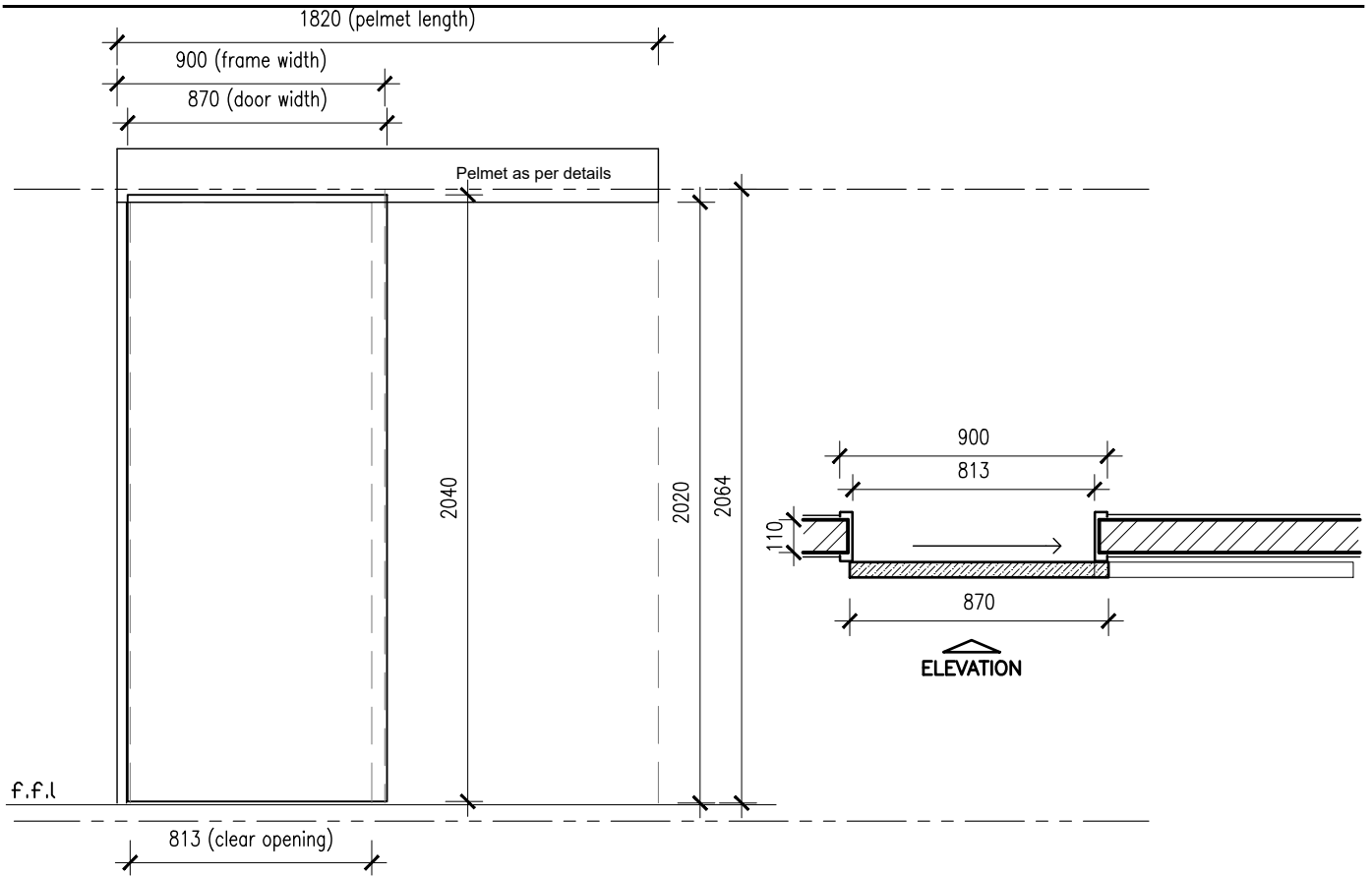


Drawing Title:	DOOR TYPES TYPE DT15b
Scale:	1:25
Date:	2023-11-14
Drawn:	ME
Drawing No.:	3235_DS15b
Revision:	-

Rev:	Date:	By:	Description:
-	2023-11-14	ME	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

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A. DOOR	DOOR TYPE SPECIFICATIONS	813 X 2032 X 44mm THICK SEMI SOLID COMPOSITE BOARD GRIDCORE DOOR CONSTRUCTED FROM KILN DRIED FRAME WITH DOUBLE TOP RAIL TO SUITE A DOOR CLOSURE AND BOTTOM RAILS WITH LOCK BLOCKS AND HINGE BLOCKS ON BOTH SIDES, PAINTED SURFACE FINISH BOTH SIDES FLUSH PANEL DOOR, WITH 6mm TIMBER EDGES ALL AROUND, WITH SLIGHTLY ROUNDED ARRIS. PURPOSE MADE TO SUITE DOOR FRAME.
	S.A.B.S:	EXPOSURE CLASS: CLASS 4 (DRY INTERIORS) EXPOSED TO DRY SHELTERED (INDOOR) CONDITIONS ONLY PERFORMANCE CLASS: SUITABLE FOR MEDIUM DUTY DRY INTERIOR APPLICATIONS (MD-DI)
	MASS:	APPROXIMATELY 21KG PER DOOR LEAF
	FINISH:	TO BE SANDED SMOOTH AND TWO COATS PAINT APPLIED.
	IRONMONG SET	"Hillaldam" SLIDING DOOR SYSTEM FOR INTERIOR DOORS. ALUMINIUM FLUSH PULL, ANODISED.
B. FRAME	FRAME TYPE	NEW STAINLESS STEEL DOOR FRAME
	HINGES:	1:25

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: 1506
 Township: MDANTSANE, EAST LONDON

Drawing Title: DOOR TYPES
 TYPE DT16

Scale: 1:25 Date: 2023-11-14 Drawn: ME

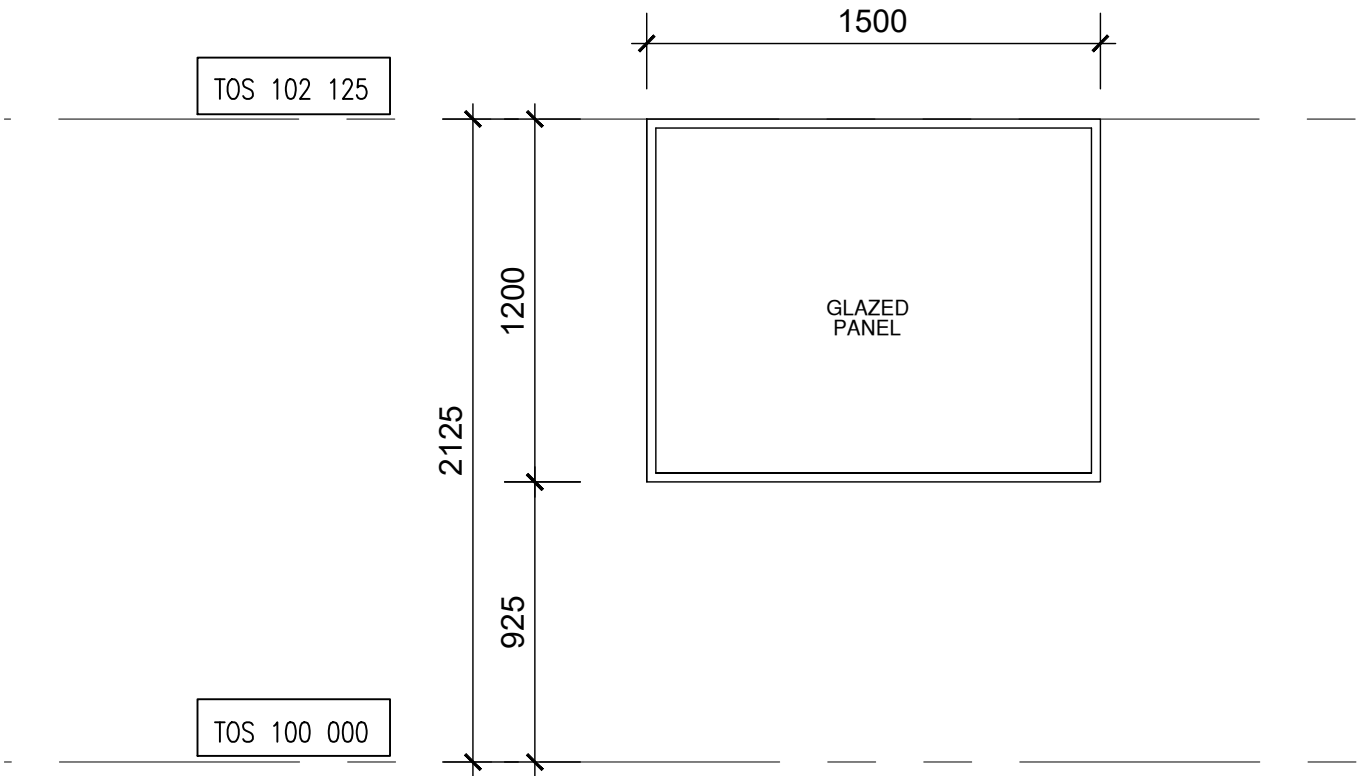
Drawing No.: 3235_DS16 Revision: -



Rev:	Date:	By:	Description:
-	2023-10-30	WC	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

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FRAME

DESCRIPTION: ALUMINIUM CASEMENT WINDOWS WITH FIXED PANE. EXTRUDED FROM 6063T6 ALUMINIUM ALLOY WITH A MIN. WALL THICKNESS OF 1.6mm. FRAME DEPTH 28mm OVERALL AND 76mm AGAINST MASONRY OPENINGS. SYSTEM SHALL MEET OR EXCEED THE REQUIREMENTS OF AAAMSA AND THE DESIGN LOADING DETERMINATION BY SABS 0160.

FINISH: 25µm NATURAL ANODISED COATING (FOR ARCHITECTURAL APPLICATIONS), SUPPLIED BY A MANUFACTURER COMPLYING WITH SANS 999:201. FRAMES TO BE S.A.B.S APPROVED

GLAZING

DESCRIPTION: ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)

IRONMONGERY

GENERAL: N/A

BURGLAR BARS: N/A

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
Township: MDANTSANE, EAST LONDON

Drawing Title: WINDOW TYPES
TYPE VP01

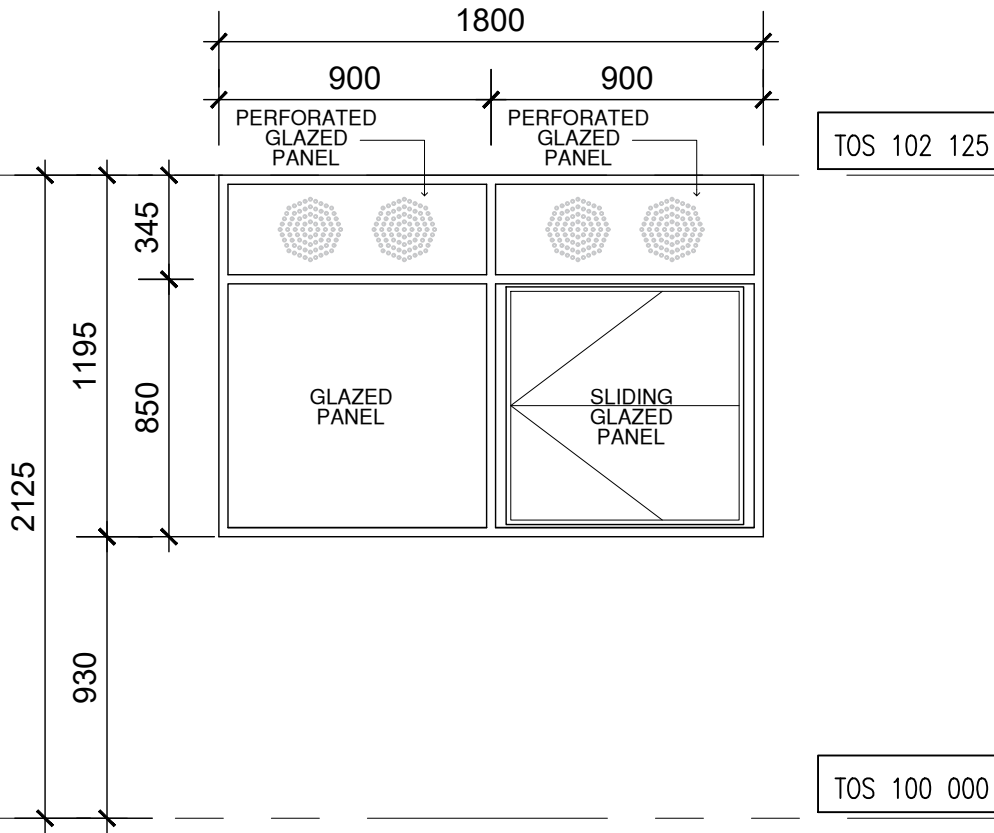
Scale: N/A Date: 2023-11-15 Drawn: WC

Drawing No.: 3235_VP01 Revision -

Rev:	Date:	By:	Description:
-	2023-10-30	WC	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

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FRAME

DESCRIPTION: ALUMINIUM CASEMENT WINDOWS WITH FIXED PANE. EXTRUDED FROM 6063T6 ALUMINIUM ALLOY WITH A MIN. WALL THICKNESS OF 1.6mm. FRAME DEPTH 28mm OVERALL AND 76mm AGAINST MASONRY OPENINGS. SYSTEM SHALL MEET OR EXCEED THE REQUIREMENTS OF AAAMSA AND THE DESIGN LOADING DETERMINATION BY SABS 0160.

FINISH: 25µm NATURAL ANODISED COATING (FOR ARCHITECTURAL APPLICATIONS), SUPPLIED BY A MANUFACTURER COMPLYING WITH SANS 999:201. FRAMES TO BE S.A.B.S APPROVED

GLAZING

DESCRIPTION: ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)

IRONMONGERY

GENERAL: SLIDING GUIDES AND MECHANISM AND NYLON GRIP HANDLE WITH LOCK CLIP AS REQUIRED FOR GLAZED SLIDING PANEL

BURGLAR BARS: N/A

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
Township: MDANTSANE, EAST LONDON

Drawing Title: WINDOW TYPES
 TYPE VP02

Scale: N/A **Date:** 2023-10-30 **Drawn:** WC

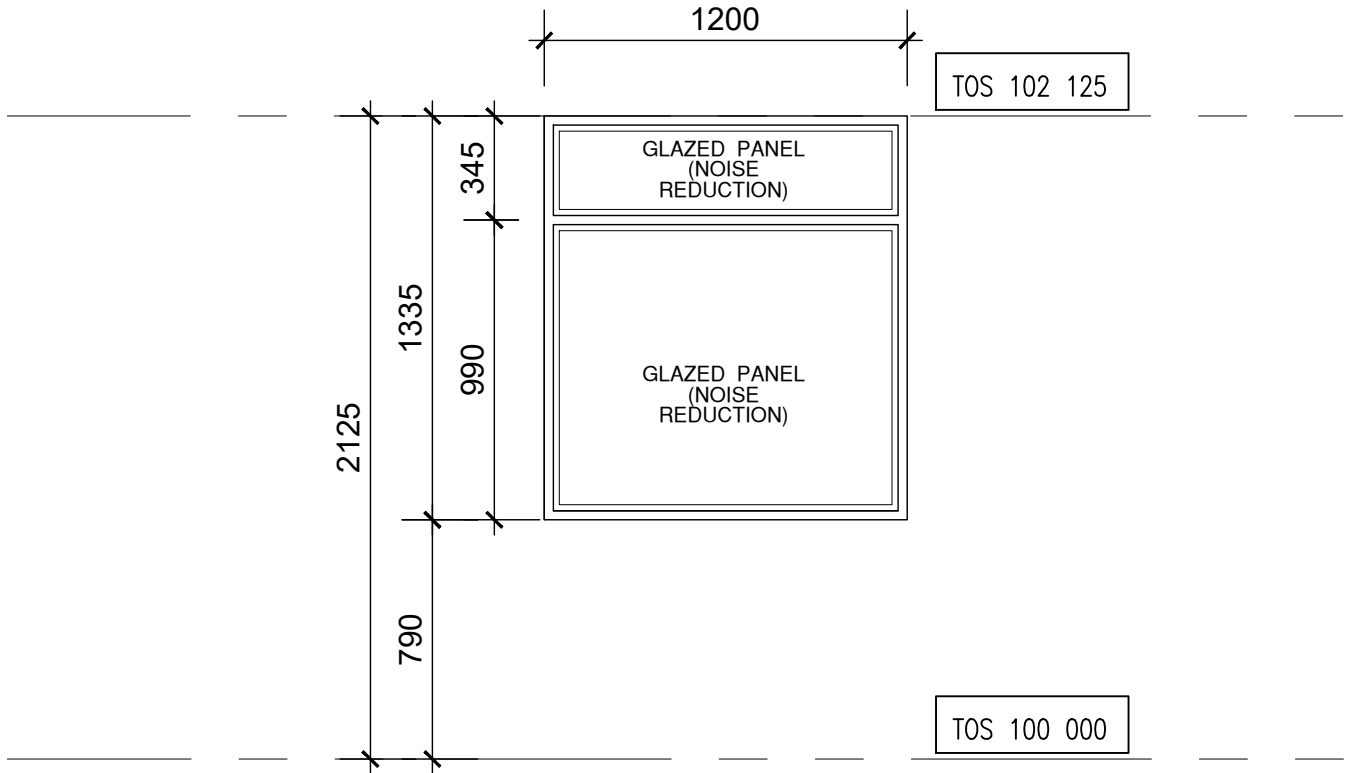
Drawing No.: 3234_VP02 **Revision:** -

Rev:	Date:	By:	Description:
-	2023-10-30	WC	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

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FRAME

DESCRIPTION: ALUMINIUM CASEMENT WINDOWS WITH FIXED PANE. EXTRUDED FROM 6063T6 ALUMINIUM ALLOY WITH A MIN. WALL THICKNESS OF 1.6mm. FRAME DEPTH 44mm OVERALL FOR DOUBLE GLAZED APPLICATION AND 76mm AGAINST MASONRY OPENINGS. SYSTEM SHALL MEET OR EXCEED THE REQUIREMENTS OF AAAMSA AND THE DESIGN LOADING DETERMINATION BY SABS 0160.

FINISH: 25µm NATURAL ANODISED COATING (FOR ARCHITECTURAL APPLICATIONS), SUPPLIED BY A MANUFACTURER COMPLYING WITH SANS 999:201. FRAMES TO BE S.A.B.S APPROVED

GLAZING

DESCRIPTION: ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.5mm LAMINATED GLASS - **NOTE - 2X GLAZING PANELS WITH 12mm DESICCANT SPACER FOR SOUND INSULATION TO GLAZING PERIMETER - SOUNDPRUFE GLAZING OR SIMILAR APPROVED.** ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING BE DONE IN STRICT ACCORDANCE SABS 0137.

IRONMONGERY

GENERAL: N/A

BURGLAR BARS: N/A

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: WINDOW TYPES
 TYPE VP03

Scale: N/A Date: 2023-10-30 Drawn: WC

Drawing No.: 3234_VP03 Revision: -

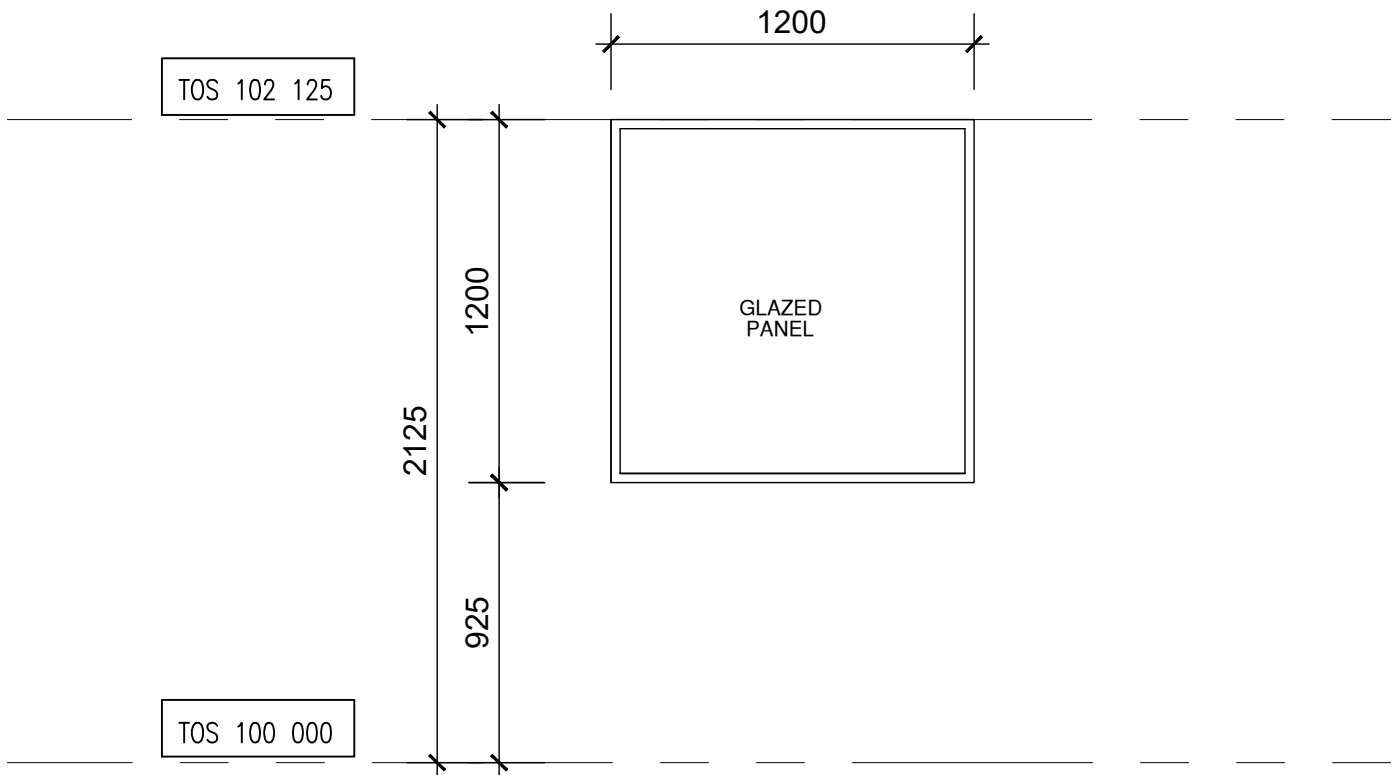


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Rev:	Date:	By:	Description:

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FRAME

DESCRIPTION: ALUMINIUM CASEMENT WINDOWS WITH FIXED PANE. EXTRUDED FROM 6063T6 ALUMINIUM ALLOY WITH A MIN. WALL THICKNESS OF 1.6mm. FRAME DEPTH 28mm OVERALL AND 76mm AGAINST MASONRY OPENINGS. SYSTEM SHALL MEET OR EXCEED THE REQUIREMENTS OF AAAMSA AND THE DESIGN LOADING DETERMINATION BY SABS 0160.

FINISH: 25µm NATURAL ANODISED COATING (FOR ARCHITECTURAL APPLICATIONS), SUPPLIED BY A MANUFACTURER COMPLYING WITH SANS 999:201.
FRAMES TO BE S.A.B.S APPROVED

GLAZING

DESCRIPTION: ALL GLASS TO BE IN ACCORDANCE WITH SABS 0400 PART N. 6.38mm LAMINATED GLASS. ALL SAFETY GLASS MATERIALS (INDIVIDUAL PANES) ARE TO BE PERMANENTLY MARKED AND ALL MARKS TO BE VISIBLE AFTER GLAZING, TO ARCHITECTS APPROVAL ALL GLAZING IS TO BE DONE IN STRICT ACCORDANCE WITH ALL SABS 0137 (REFER TO SAGGA AND AAAMSA GENERAL SPECIFICATIONS AND SELECTION GUIDES)

IRONMONGERY

GENERAL: N/A

BURGLAR BARS: N/A

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
Township: MDANTSANE, EAST LONDON

Drawing Title: WINDOW TYPES
TYPE VP04

Scale: N/A Date: 2023-10-30 Drawn: WC

Drawing No.: 3234_VP04 Revision -



Architect's Ref: 3235/SCH/JD

JOINERY DETAILS

FOR

SCMU3-22/23-0120-HO:
CECILIA MAKIWANE HOSPITAL
CEREBRAL PALSY CENTRE OF
EXCELLENCE

15 November 2023



ISSUED FOR INFORMATION

Rev:	Date:	By:	Description:
-	2023-11-06	WC	ISSUED FOR MEASURE

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general notes

- All drawers, cupboard doors & fixed panels to be 16mm thick 'Max-on-top' High Pressure Laminate (color to architect) with matt surface finish as per spec. on detail, comprising single layer of melamine-impregnated decorative paper, fused under heat and pressure to both sides of a smooth surface particleboard substrate, manufactured in accordance with SANS ISO 1763:1998 and constructed in accordance with the drawings, all with 2mm high impact edging to match color.
- Countertops: 32mm / 40mm 'Max-on-top' High Pressure Laminate on composite particleboard substrate, width as per detail with one edge to have 3mm radius edge (unless otherwise specified on drawing) Colour to be confirmed by architect.
- Wet areas Countertops: 32mm / 40mm Granite countertop, width as per detail with one edge to have 3mm radius edge (unless otherwise specified on drawing) Colour to be confirmed by architect.
- All internal (non exposed) shelves to be of white 'Max-on-top' High Pressure Laminate with 2mm high impact edging, color to match board. Exposed shelving / cupboard faces to match cupboard doors.
- All shelving to be adjustable.
- All doors to be fixed with Clip top 107° hinges and accessories - 3 hinges per door.
- All drawers to be fitted with 35mm high x 450mm long ball bearing, side mounted runners (20kg bearing capacity).
- 16mm BISONLAM SUPER WHITE board backing to fitting.
- Skirting: Vinyl sheeting wrapped up bearer.
- All bases to be of solid SA Pine, treated for moisture resistance. Refer to Paint Specification
- White silicone to be applied between worktops / sinks and walls / tiles.
- All internal cutouts to accommodate pipes to be cut neat & square / rectangular / circular and to be closed up with 4mm white faced MASONITE board cut to shape around pipe.
- Countersink all screw heads and cover with plastic screw end caps : color to match surface.
- 160mm long hollow stainless steel Barrel handle.
- 1 row of 600X300mm ceramic splashback above sinks and countertop.
- 69x22mm S.A.Pine support batten fixed to backing with 38x6.3mm countersunk self-tapping screws @ 450mm centers.
- 22mm S.A.Laminated pine shelving 300mm deep on 69x22mm S.A. Pine framework @ centers as shown.
- All shelving to be fixed.
- Skirting: Wrap vinyl sheeting up base of cupboard.
- All bases to be of solid SA Pine, treated for moisture resistance. Refer to Paint Specification
- Prepare, stop and apply one (1) coat Woodcoat Suede Matt varnish diluted 20% with Mineral Turpentine, followed by two (2) coats undiluted Woodcoat Suede Matt varnish. Lightly sand and wipe down between all coats.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY GEN. NOTES

Scale: NA Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_GEN NOTES Revision: -

Rev:	Date:	By:	Description:
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Rev:	Date:	By:	Description:

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TYPE JD A1

White epoxy coated adjustable steel shelving brackets for wooden shelves

30 x 15mm white epoxy coated steel wall bands @ 500mm c/c.

16mm 'Max-on-top' HPL faced board (matt finish) shelf with 2mm pvc high impact edging all round.

94x32mm SA Pine bearer. Vinyl sheeting wrapped up bearer.

94x32mm SA Pine bearers @ approx. 500mm ccs. All primed with one coat pink wood primer to all surface prior to fixing.

450

400mm centers

400mm centers

400mm centers

400mm centers

400mm centers

94

2190mm wallband

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD A1

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD01 Revision: -

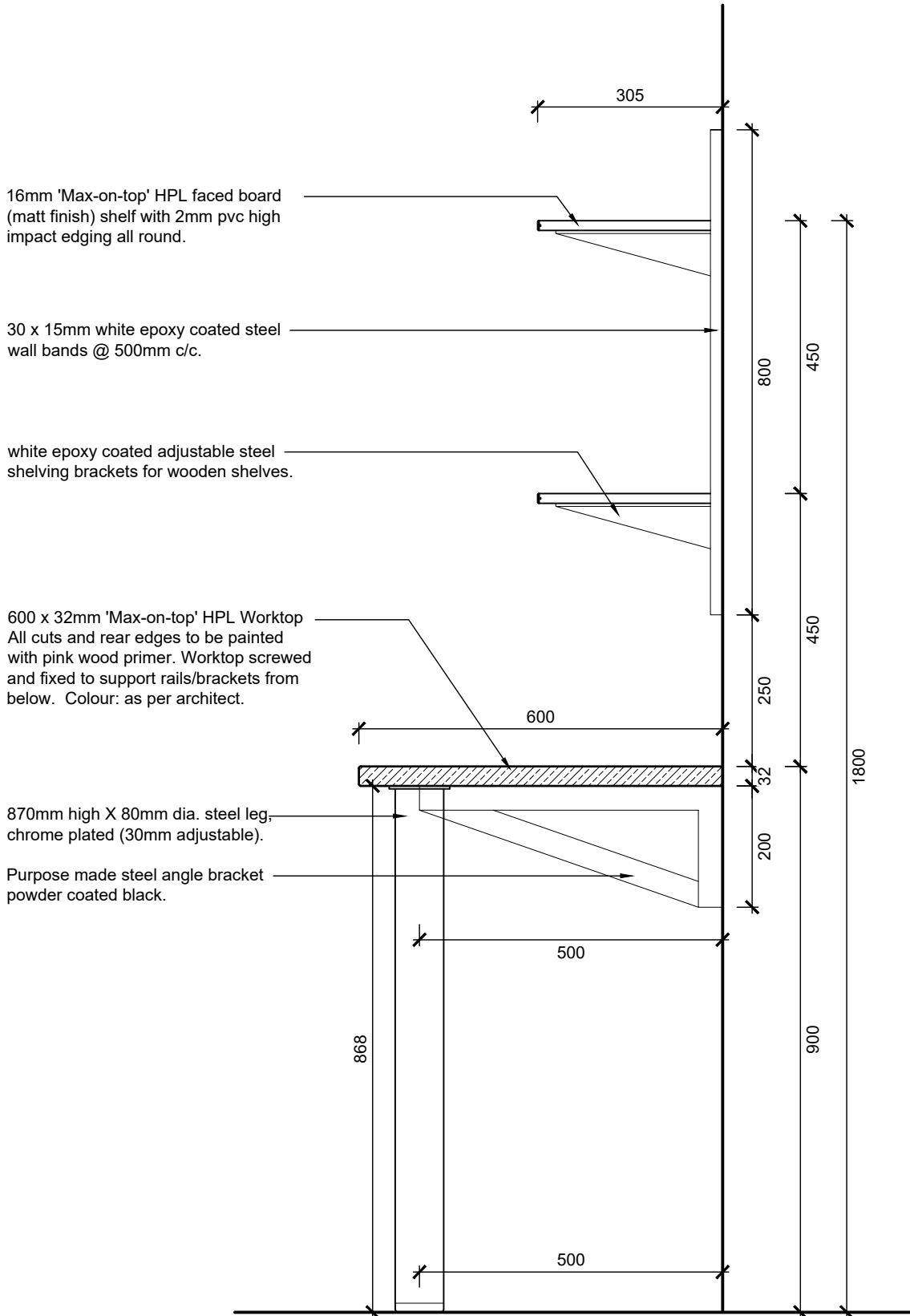
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TYPE JD A2



16mm 'Max-on-top' HPL faced board (matt finish) shelf with 2mm pvc high impact edging all round.

30 x 15mm white epoxy coated steel wall bands @ 500mm c/c.

white epoxy coated adjustable steel shelving brackets for wooden shelves.

600 x 32mm 'Max-on-top' HPL Worktop
All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below. Colour: as per architect.

870mm high X 80mm dia. steel leg, chrome plated (30mm adjustable).

Purpose made steel angle bracket powder coated black.

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD A2

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD02 Revision: -

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TYPE JD A3

69x22mm S.A.Pine support batten fixed to wall with 75x6mm masonry screws & plugged @ 450mm centres.

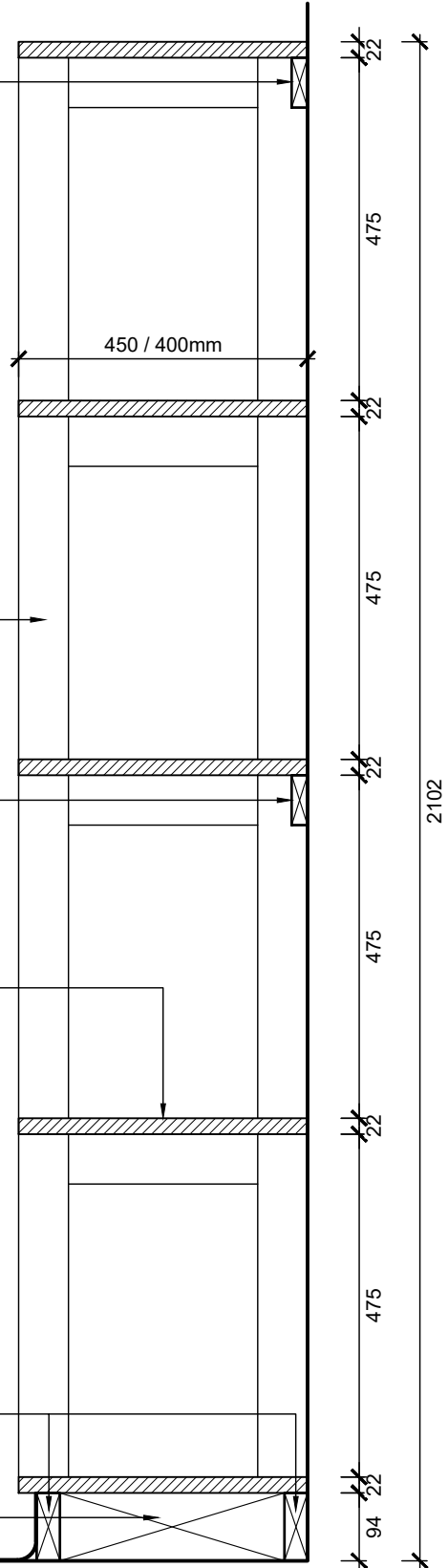
69x22mm S.A.Pine support batten fixed to backing with 38x 6.3mm countersunk selftapping screws @ 600mm centres.

69x22mm S.A.Pine support batten fixed to wall with 75x6mm masonry screws & plugged @ 450mm centres.

22mm thick laminated SA Pine shelves. Clear varnish.

94x32mm SA Pine bearer. Vinyl sheeting wrapped up bearer.

94x32mm SA Pine bearers @ approx. 500mm ccs. All primed with one coat pink wood primer to all surface prior to fixing.

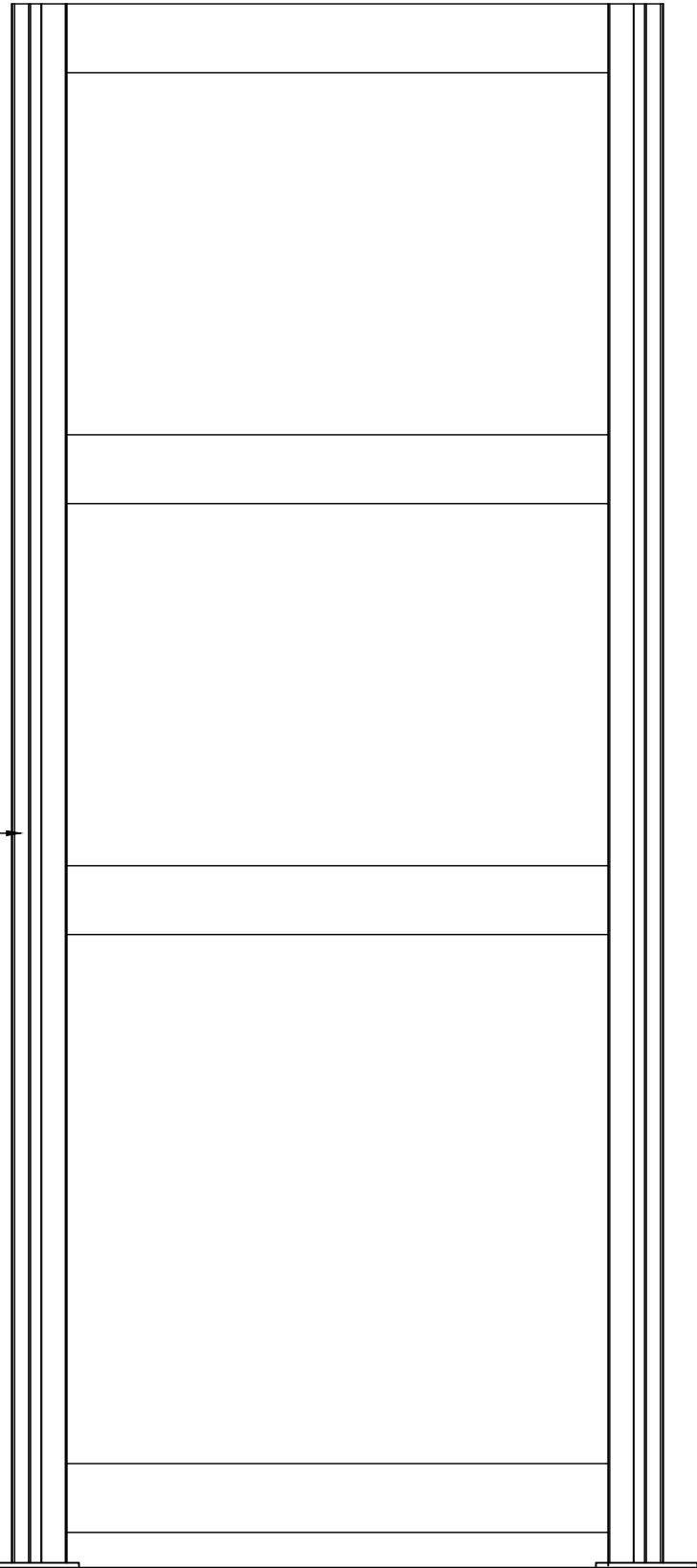


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TYPE JD A4



4 tier Medium duty steel racking system with steel shelves as per 'Ryco Racking' or equally approved.

N.T.S

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD A4

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD04 Revision: -

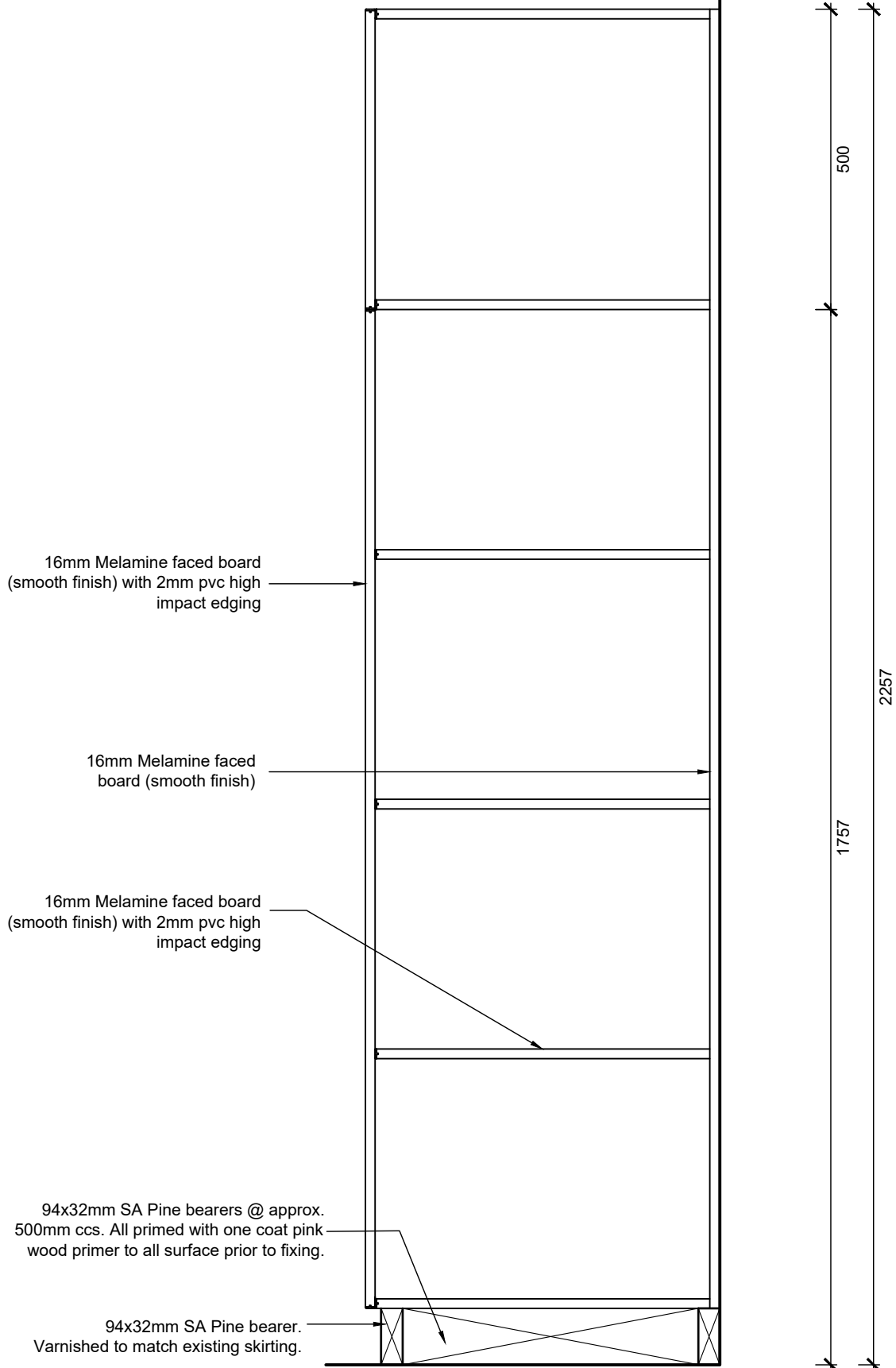
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TYPE JD A5



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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD A5

Scale: 1:10 Date: 2023-11-06 Drawn: WC

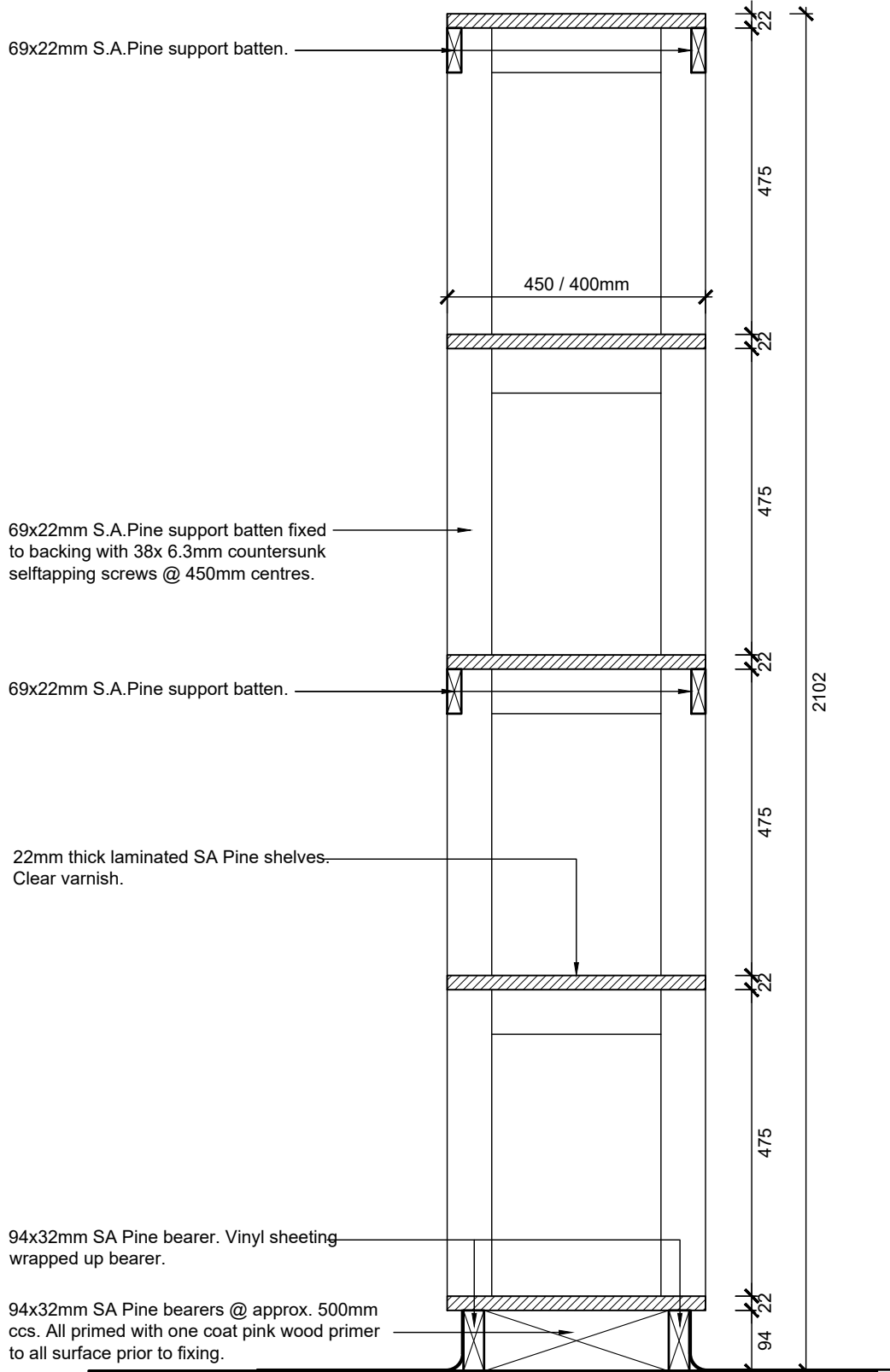
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-	2023-11-06	WC	ISSUED FOR MEASURE

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TYPE JD A6



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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD A6

Scale: 1:10 Date: 2023-11-06 Drawn: WC

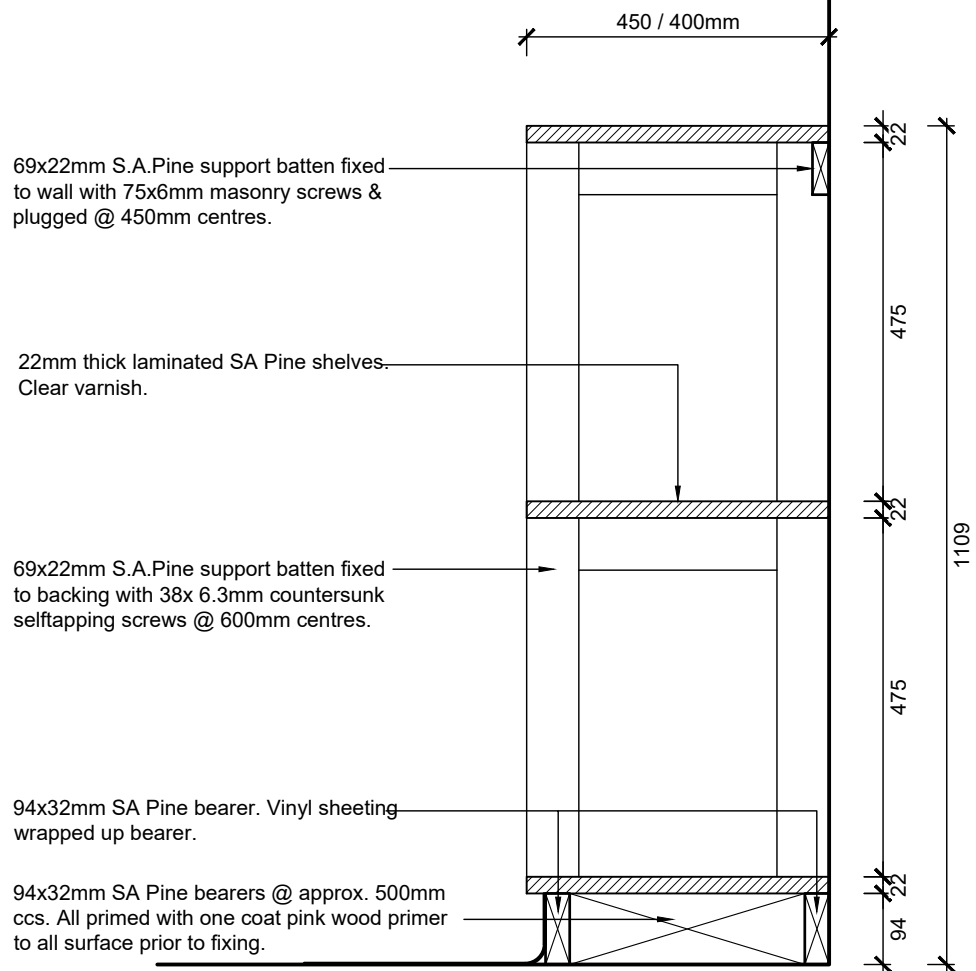
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TYPE JD A7



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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD A7

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD07 Revision: -

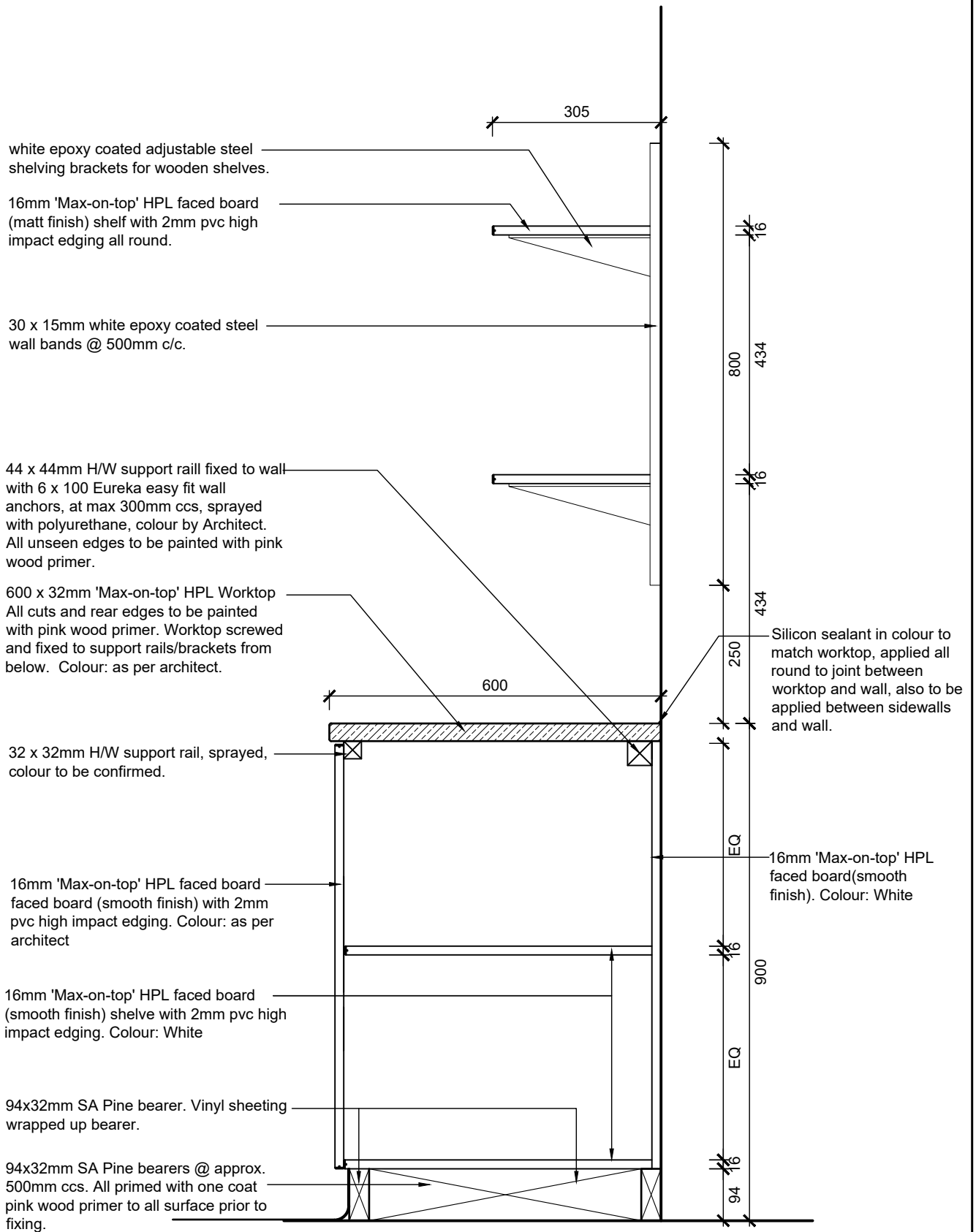
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TYPE JD B1



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Province of
EASTERN CAPE
HEALTH

Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
TYPE JD B1

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD08 Revision: -

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TYPE JD B2

4mm glass panel

16mm 'Max-on-top' HPL faced board (matt finish) shelf with 2mm pvc high impact edging all round.

16mm 'Max-on-top' HPL faced board (smooth finish) shelves with 2mm pvc high impact edging. Colour: White

44 x 44mm H/W support rail fixed to wall with 6 x 100 Eureka easy fit wall anchors, at max 300mm ccs, sprayed with polyurethane, colour by Architect. All unseen edges to be painted with pink wood primer.

600 x 32mm 'Max-on-top' HPL Worktop All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below. Colour: as per architect.

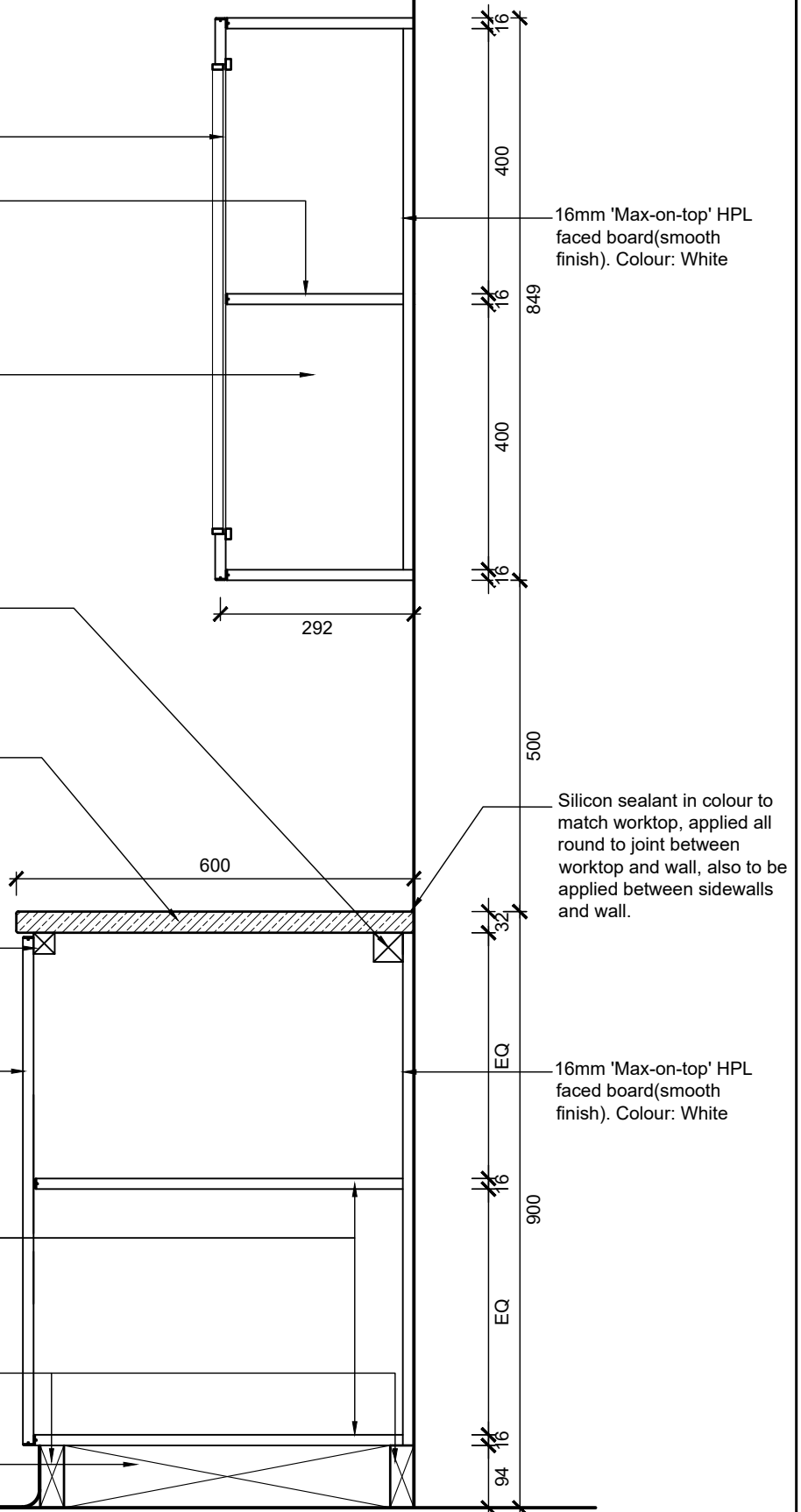
32 x 32mm H/W support rail, sprayed, colour to be confirmed.

16mm 'Max-on-top' HPL faced board (smooth finish) with 2mm pvc high impact edging. Colour: as per architect

16mm 'Max-on-top' HPL faced board (smooth finish) shelves with 2mm pvc high impact edging. Colour: White

94x32mm SA Pine bearer. Vinyl sheeting wrapped up bearer.

94x32mm SA Pine bearers @ approx. 500mm ccs. All primed with one coat pink wood primer to all surface prior to fixing.



16mm 'Max-on-top' HPL faced board (smooth finish). Colour: White

Silicon sealant in colour to match worktop, applied all round to joint between worktop and wall, also to be applied between sidewalls and wall.

16mm 'Max-on-top' HPL faced board (smooth finish). Colour: White

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD B2

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD09 Revision: -

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-	2023-11-06	WC	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

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TYPE JD B3

44 x 44mm H/W support rail fixed to wall with 6 x 100 Eureka easy fit wall anchors, at max 300mm ccs, sprayed with polyurethane, colour by Architect. All unseen edges to be painted with pink wood primer.

600 x 32mm 'Max-on-top' HPL Worktop All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below. Colour: as per architect.

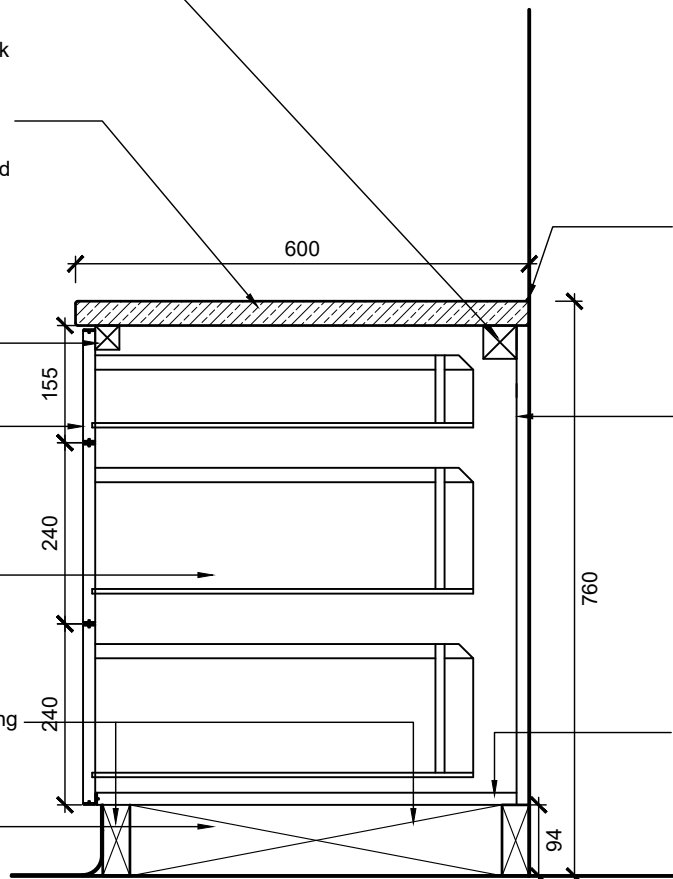
32 x 32mm H/W support rail, sprayed, colour to be confirmed.

16mm 'Max-on-top' HPL faced board faced board (smooth finish) with 2mm pvc high impact edging. Colour: as per architect

35mm high x 450mm long ball bearing, side mounted runners (20kg bearing capacity)

94x32mm SA Pine bearer. Vinyl sheeting wrapped up bearer.

94x32mm SA Pine bearers @ approx. 500mm ccs. All primed with one coat pink wood primer to all surface prior to fixing.



Silicon sealant in colour to match worktop, applied all round to joint between worktop and wall, also to be applied between sidewalls and wall.

16mm 'Max-on-top' HPL faced board (smooth finish). Colour: White

16mm 'Max-on-top' HPL faced board (smooth finish) shelf with 2mm pvc high impact edging. Colour: White

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD B3

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD10 Revision: -

Rev:	Date:	By:	Description:
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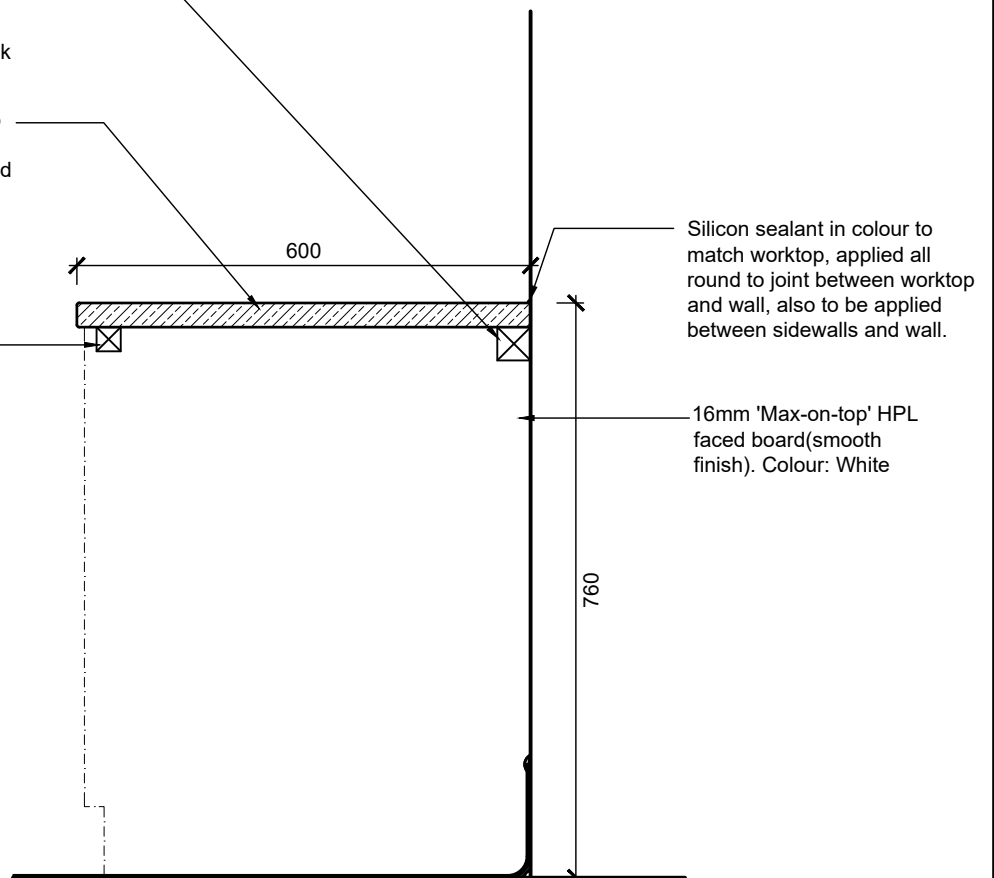
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TYPE JD B4

44 x 44mm H/W support rail fixed to wall with 6 x 100 Eureka easy fit wall anchors, at max 300mm ccs, sprayed with polyurethane, colour by Architect. All unseen edges to be painted with pink wood primer.

600 x 32mm 'Max-on-top' HPL Worktop All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below. Colour: as per architect.

32 x 32mm H/W support rail, sprayed, colour to be confirmed.



Silicon sealant in colour to match worktop, applied all round to joint between worktop and wall, also to be applied between sidewalls and wall.

16mm 'Max-on-top' HPL faced board (smooth finish). Colour: White

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD B4

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD11 Revision: -

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TYPE JD B5

44 x 44mm H/W support rail fixed to wall with 6 x 100 Eureka easy fit wall anchors, at max 300mm ccs, sprayed with polyurethane, colour by Architect. All unseen edges to be painted with pink wood primer.

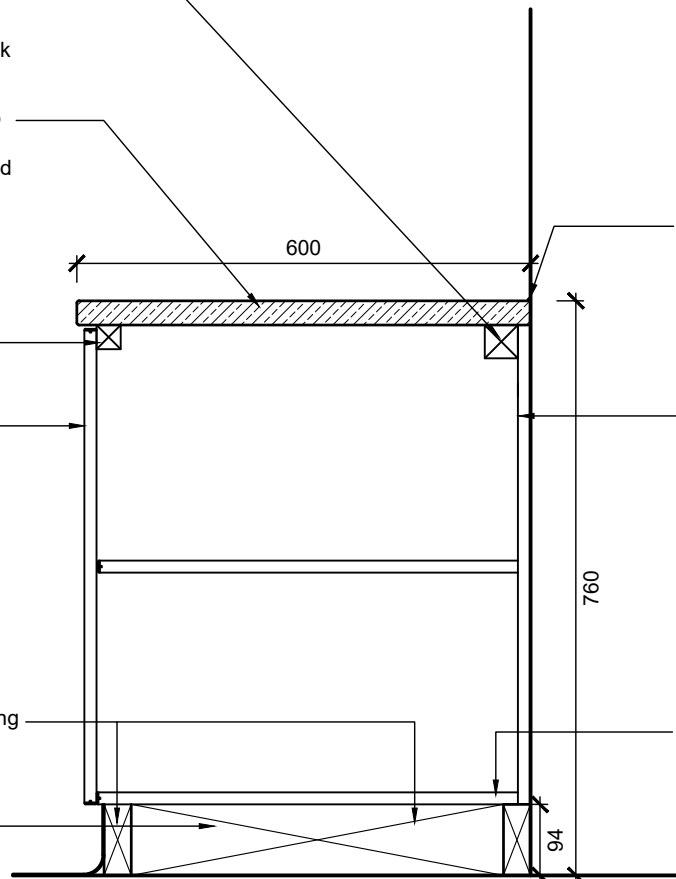
600 x 32mm 'Max-on-top' HPL Worktop All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below. Colour: as per architect.

32 x 32mm H/W support rail, sprayed, colour to be confirmed.

16mm 'Max-on-top' HPL faced board faced board (smooth finish) with 2mm pvc high impact edging. Colour: as per architect

94x32mm SA Pine bearer. Vinyl sheeting wrapped up bearer.

94x32mm SA Pine bearers @ approx. 500mm ccs. All primed with one coat pink wood primer to all surface prior to fixing.



Silicon sealant in colour to match worktop, applied all round to joint between worktop and wall, also to be applied between sidewalls and wall.

16mm 'Max-on-top' HPL faced board (smooth finish). Colour: White

16mm 'Max-on-top' HPL faced board (smooth finish) shelve with 2mm pvc high impact edging. Colour: White

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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD B5

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD12 Revision: -

Rev:	Date:	By:	Description:
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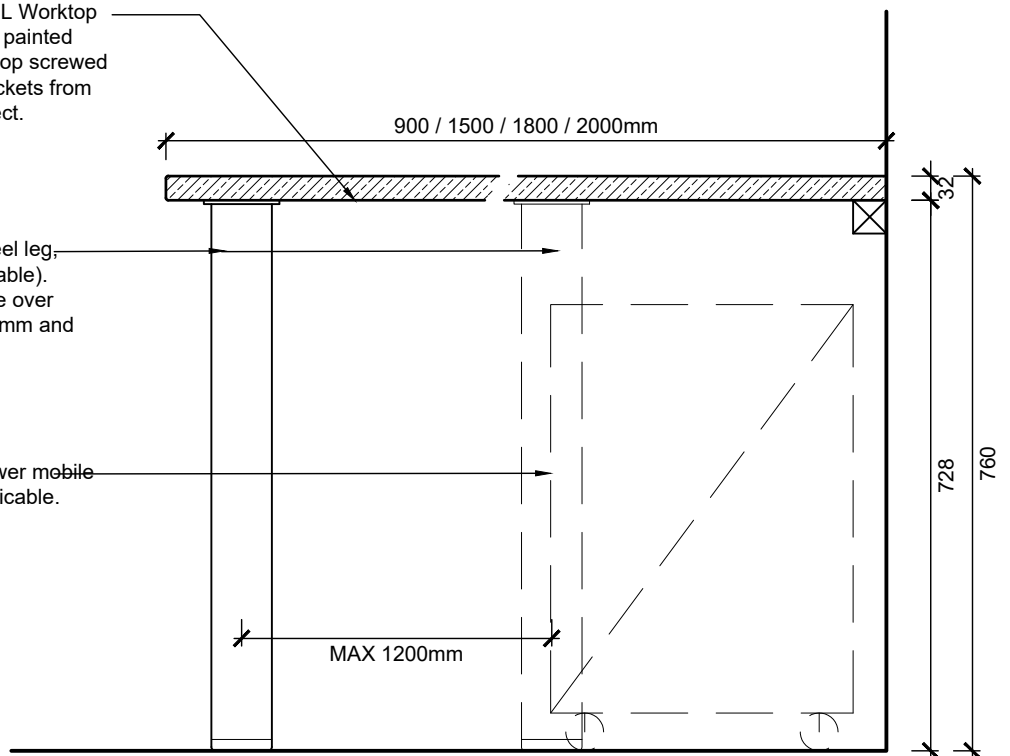
TYPE JD B6

44 x 44mm H/W support rail fixed to wall with 6 x 100 Eureka easy fit wall anchors, at max 300mm ccs, sprayed with polyurethane, colour by Architect. All unseen edges to be painted with pink wood primer.

600 x 32mm 'Max-on-top' HPL Worktop
All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below. Colour: as per architect.

710mm high X 80mm dia. steel leg, chrome plated (30mm adjustable). Additional support legs centre over length for desk worktop 1500mm and over, at max 1200mm.

400 x 550 x 590mm four drawer mobile pedestal in white, where applicable.



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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD B6

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD13 Revision: -

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TYPE JD B7

44 x 44mm H/W support rail fixed to wall with 6 x 100 Eureka easy fit wall anchors, at max 300mm ccs, sprayed with polyurethane, colour by Architect. All unseen edges to be painted with pink wood primer.

600 x 32mm 'Max-on-top' HPL Worktop All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below. Colour: as per architect.

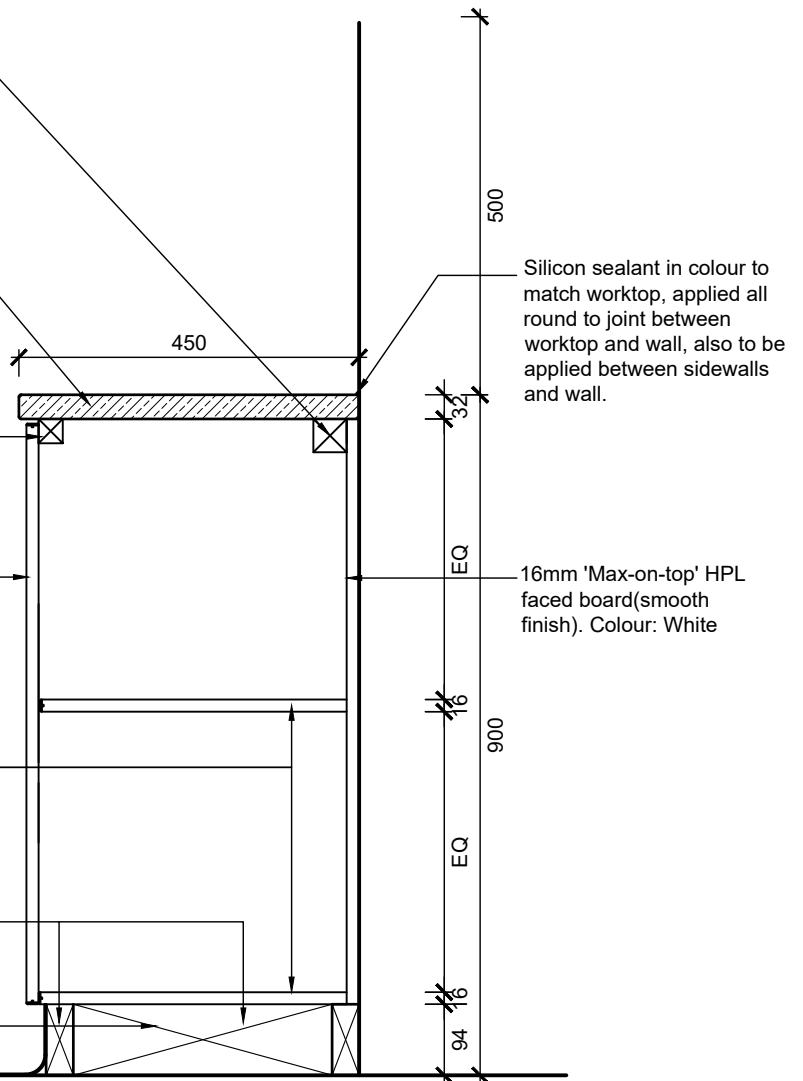
32 x 32mm H/W support rail, sprayed, colour to be confirmed.

16mm 'Max-on-top' HPL faced board faced board (smooth finish) with 2mm pvc high impact edging. Colour: as per architect

16mm 'Max-on-top' HPL faced board (smooth finish) shelf with 2mm pvc high impact edging. Colour: White

94x32mm SA Pine bearer. Vinyl sheeting wrapped up bearer.

94x32mm SA Pine bearers @ approx. 500mm ccs. All primed with one coat pink wood primer to all surface prior to fixing.



Silicon sealant in colour to match worktop, applied all round to joint between worktop and wall, also to be applied between sidewalls and wall.

16mm 'Max-on-top' HPL faced board (smooth finish). Colour: White

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Stand No.: ??
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Drawing Title: JOINERY TYPES
 TYPE JD B7

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD14 Revision: -

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TYPE JD B8

44 x 44mm H/W support rail fixed to wall with 6 x 100 Eureka easy fit wall anchors, at max 300mm ccs, sprayed with polyurethane, colour by Architect. All unseen edges to be painted with pink wood primer.

600 x 32mm 'Max-on-top' HPL Worktop All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below. Colour: as per architect.

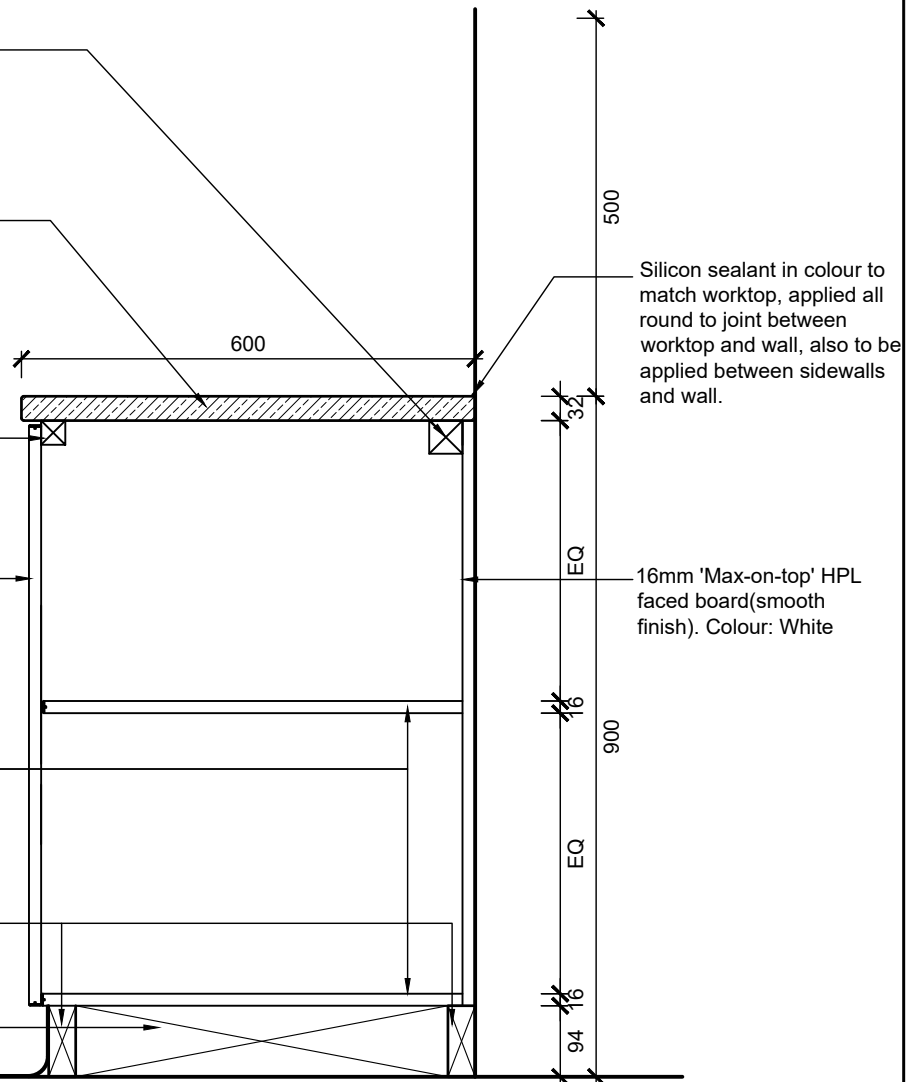
32 x 32mm H/W support rail, sprayed, colour to be confirmed.

16mm 'Max-on-top' HPL faced board faced board (smooth finish) with 2mm pvc high impact edging. Colour: as per architect

16mm 'Max-on-top' HPL faced board (smooth finish) shelve with 2mm pvc high impact edging. Colour: White

94x32mm SA Pine bearer. Vinyl sheeting wrapped up bearer.

94x32mm SA Pine bearers @ approx. 500mm ccs. All primed with one coat pink wood primer to all surface prior to fixing.



Silicon sealant in colour to match worktop, applied all round to joint between worktop and wall, also to be applied between sidewalls and wall.

16mm 'Max-on-top' HPL faced board (smooth finish). Colour: White

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Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD B8

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD15 Revision: -

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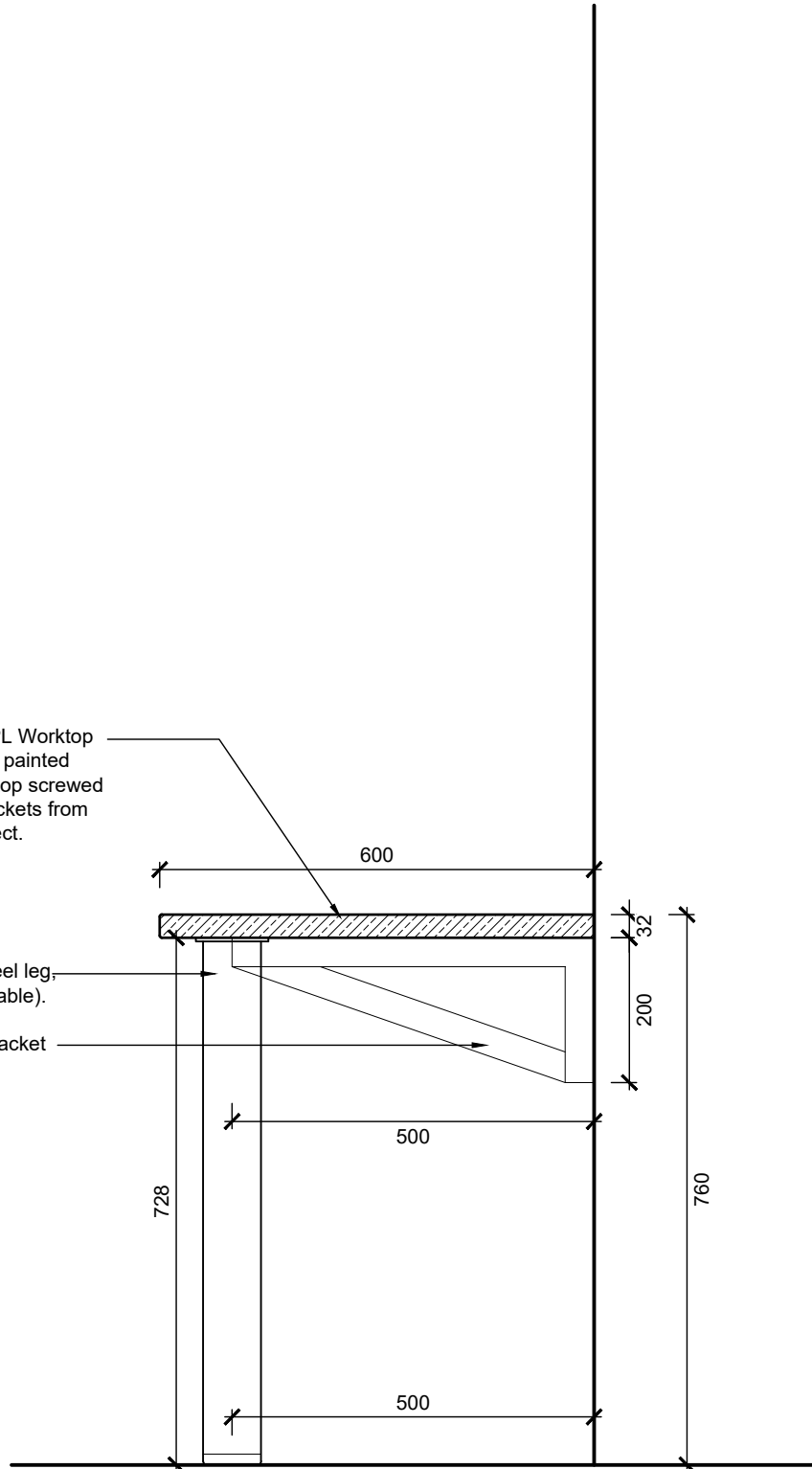
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TYPE JD B9

600 x 32mm 'Max-on-top' HPL Worktop
All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below. Colour: as per architect.

870mm high X 80mm dia. steel leg, chrome plated (30mm adjustable).

Purpose made steel angle bracket powder coated black.



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Stand No.: ??
Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
TYPE JD B9

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD16 Revision -

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TYPE JD B10

16mm 'Max-on-top' HPL faced board (matt finish) shelf with 2mm pvc high impact edging all round.

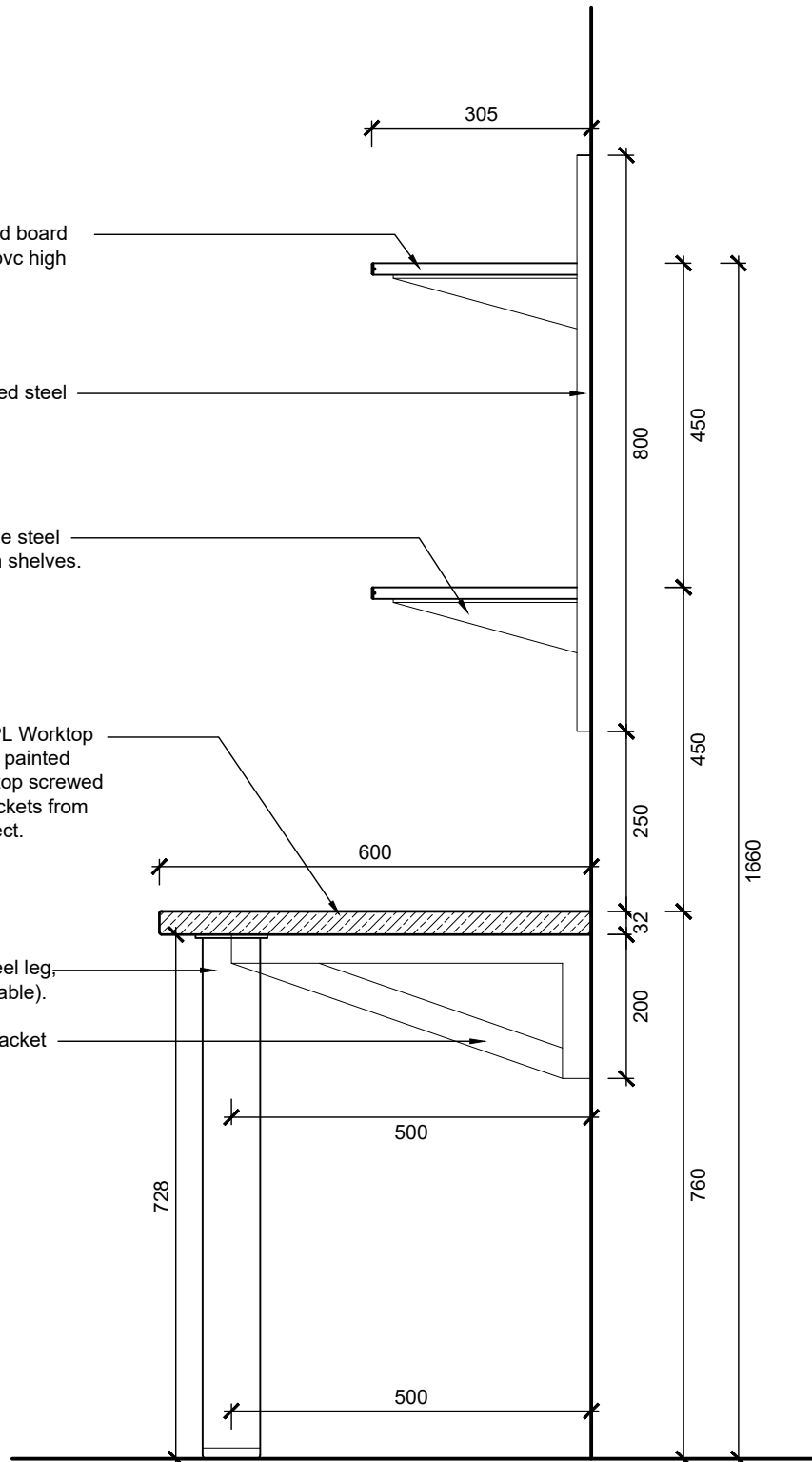
30 x 15mm white epoxy coated steel wall bands @ 500mm c/c.

white epoxy coated adjustable steel shelving brackets for wooden shelves.

600 x 32mm 'Max-on-top' HPL Worktop
All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below. Colour: as per architect.

710mm high X 80mm dia. steel leg, chrome plated (30mm adjustable).

Purpose made steel angle bracket powder coated black.



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Drawing Title: JOINERY TYPES
 TYPE JD B10

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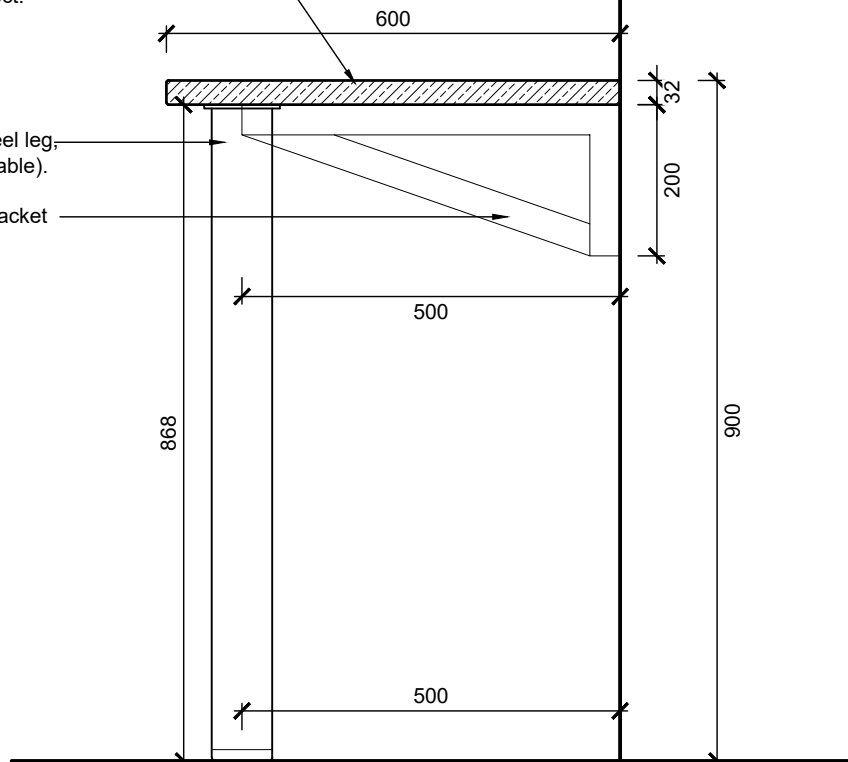
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TYPE JD B11

600 x 32mm 'Max-on-top' HPL Worktop
All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below. Colour: as per architect.

870mm high X 80mm dia. steel leg, chrome plated (30mm adjustable).

Purpose made steel angle bracket powder coated black.



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Stand No.: ??
Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
TYPE JD B11

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Drawing No.: 3235_JD18 Revision: -

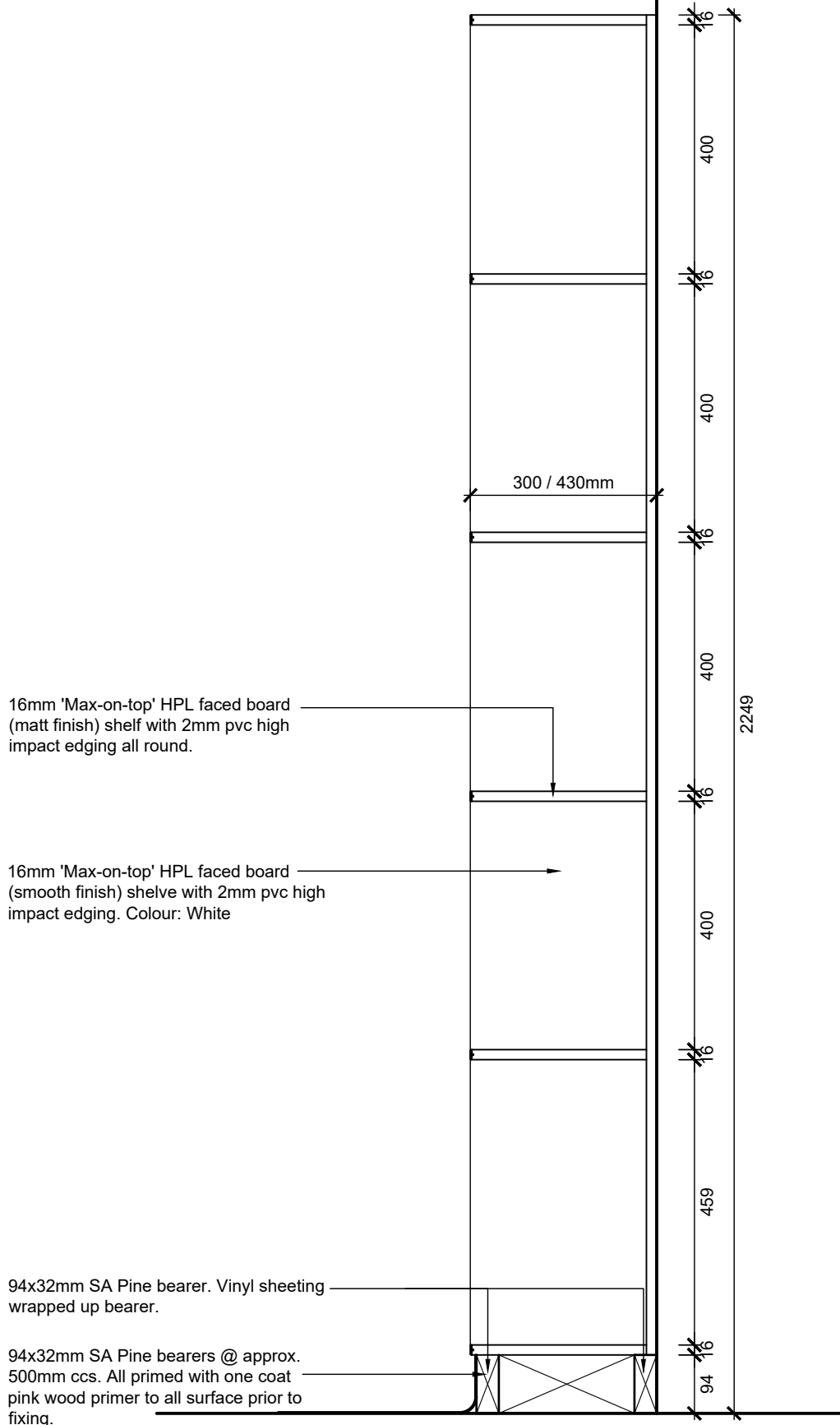
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TYPE JD B12



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Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
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Drawing Title: JOINERY TYPES
 TYPE JD B12

Scale: 1:10 Date: 2023-11-06 Drawn: WC

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TYPE JD B13

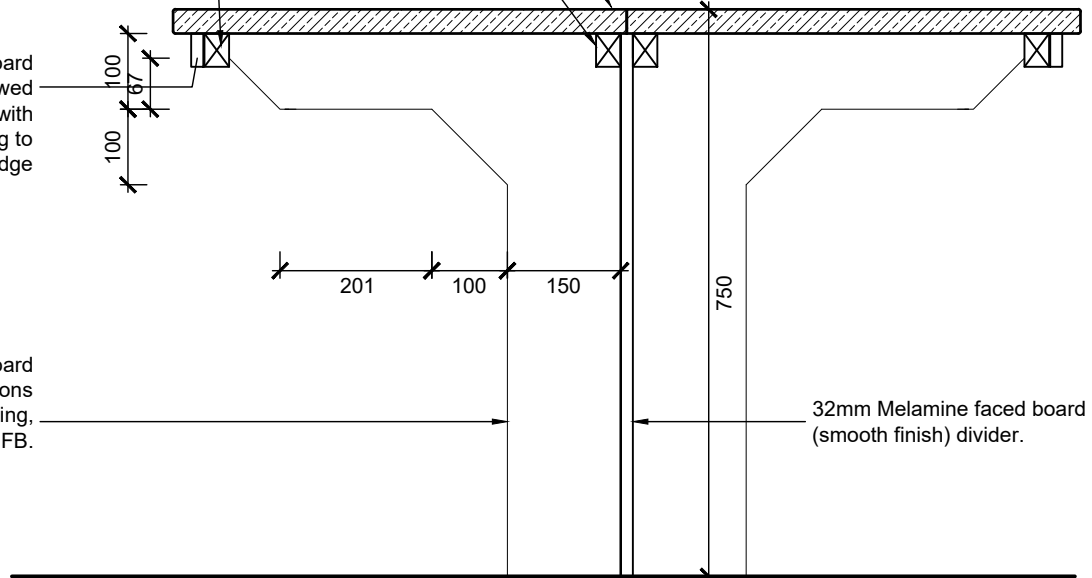
600 x 32mm 180° Postform Worktop with brown backer and seal. Colour **Storm 423 (Formica)**. All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below.

44 x 32mm H/W support rails, sprayed with polyurethane, colour by Architect. All unseen edges to be painted with pink wood primer.

16mm Melamine faced board (smooth finish) cover strip (screwed to support rail from back of rail) with 2mm pvc high impact edging to bottom edge

32mm Melamine faced board (smooth finish) support divisions with 2mm pvc high impact edging, colour to match MFB.

32mm Melamine faced board (smooth finish) divider.



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 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD B13

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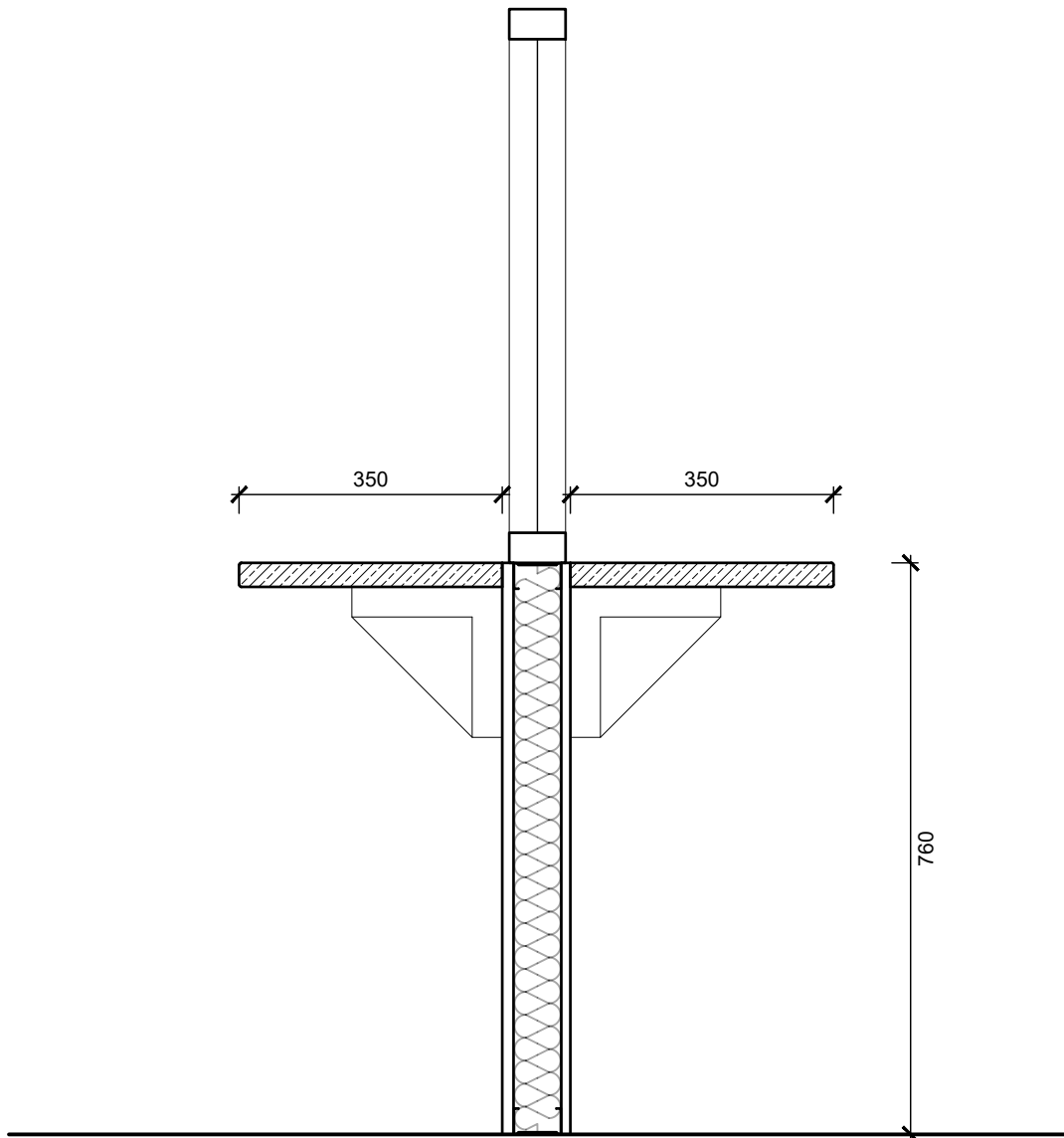
Drawing No.: 3235_JD20 Revision: -

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TYPE JD B14



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Drawing Title: JOINERY TYPES
 TYPE JD B14

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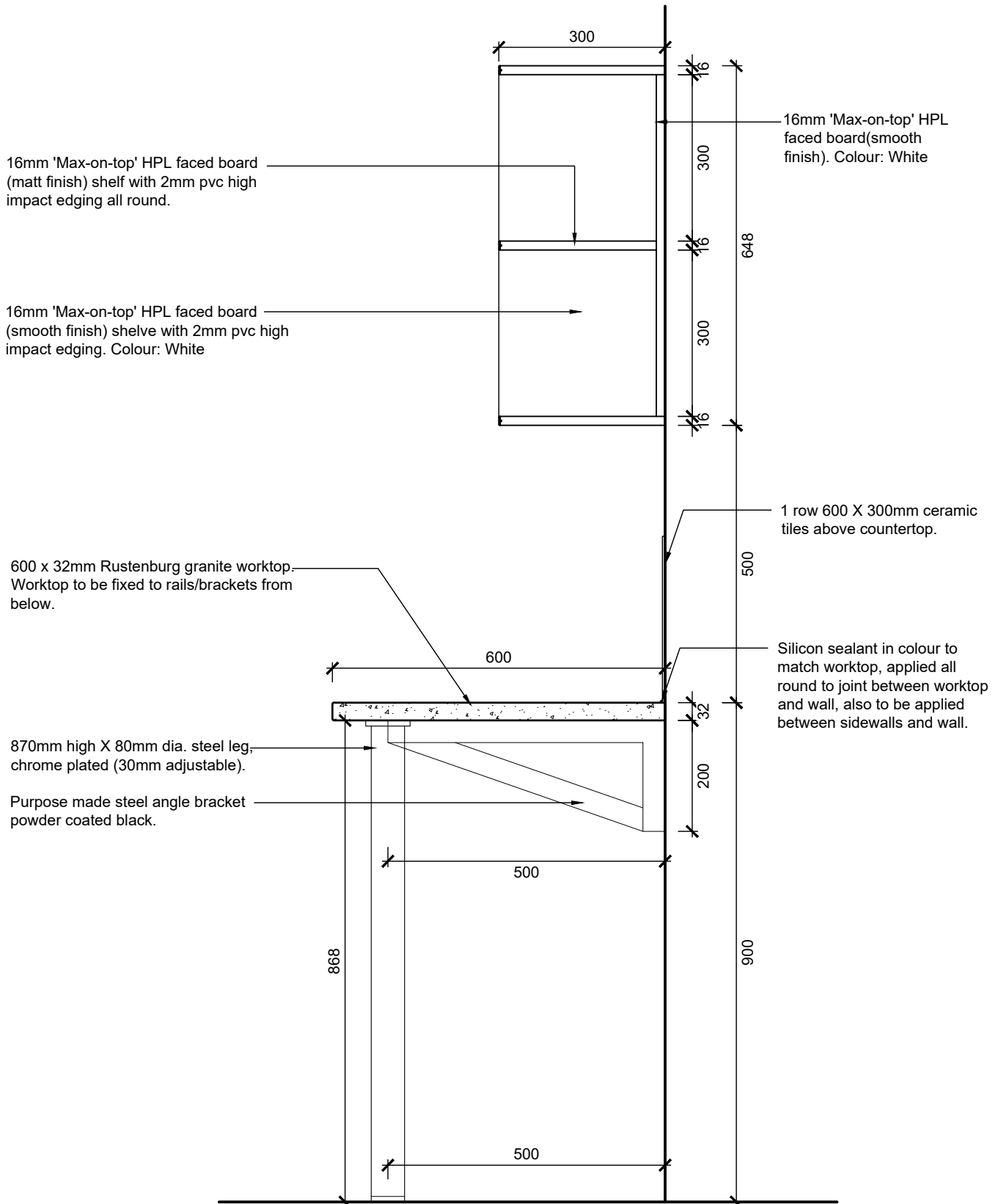
Drawing No.: 3235_JD21 Revision: -

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TYPE JD C1



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Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD C1

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD22 Revision: -

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TYPE JD C2

16mm 'Max-on-top' HPL faced board (matt finish) shelf with 2mm pvc high impact edging all round.

16mm 'Max-on-top' HPL faced board (smooth finish) shelves with 2mm pvc high impact edging. Colour: White

Sink or basin cut-out. refer to for specification in sanitary schedule.

600 x 32mm Rustenburg granite worktop. Worktop to be fixed to rails/brackets from below.

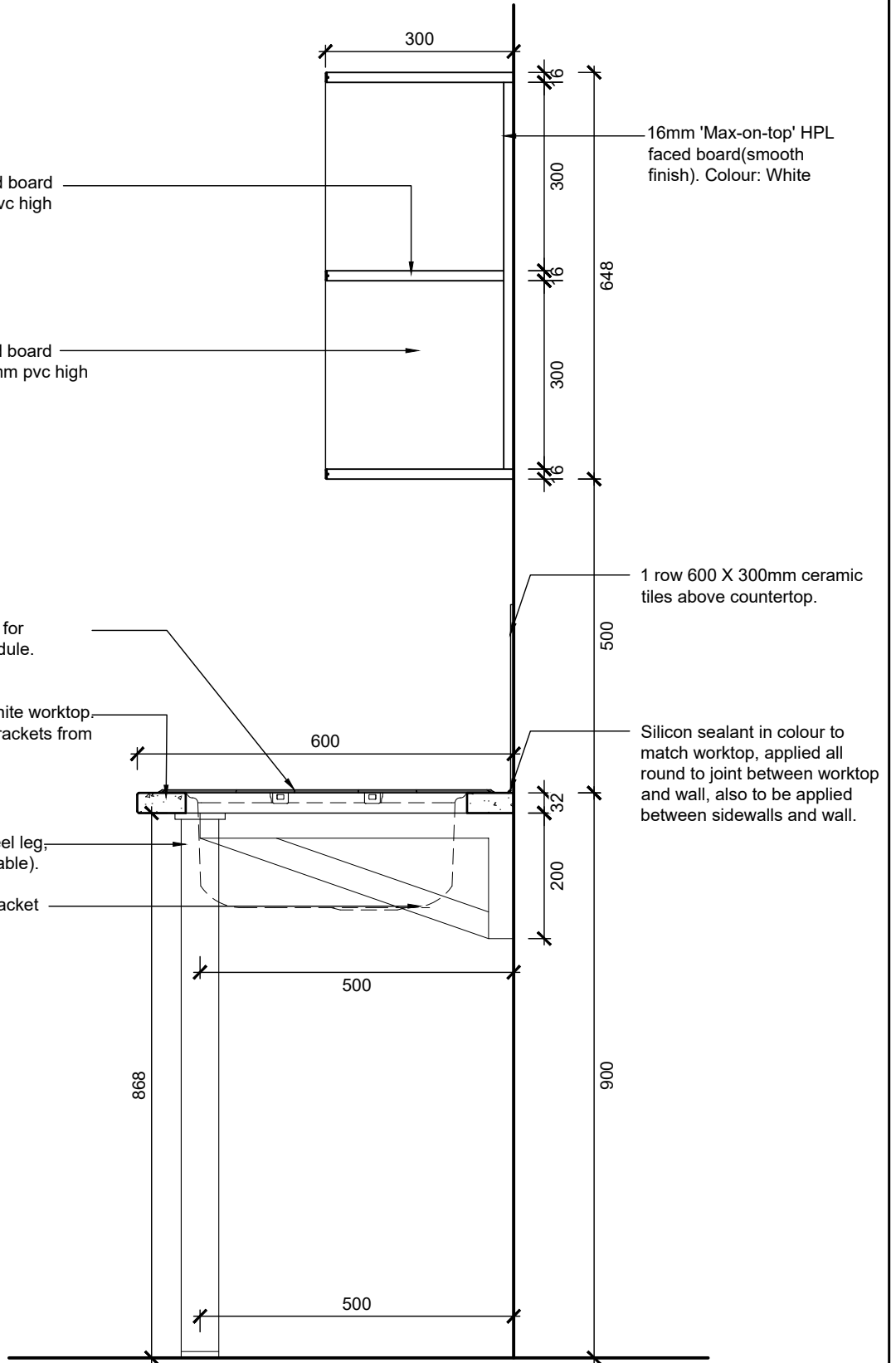
870mm high X 80mm dia. steel leg, chrome plated (30mm adjustable).

Purpose made steel angle bracket powder coated black.

16mm 'Max-on-top' HPL faced board (smooth finish). Colour: White

1 row 600 X 300mm ceramic tiles above countertop.

Silicon sealant in colour to match worktop, applied all round to joint between worktop and wall, also to be applied between sidewalls and wall.



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Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD C2

Scale: 1:10 Date: 2023-11-06 Drawn: WC

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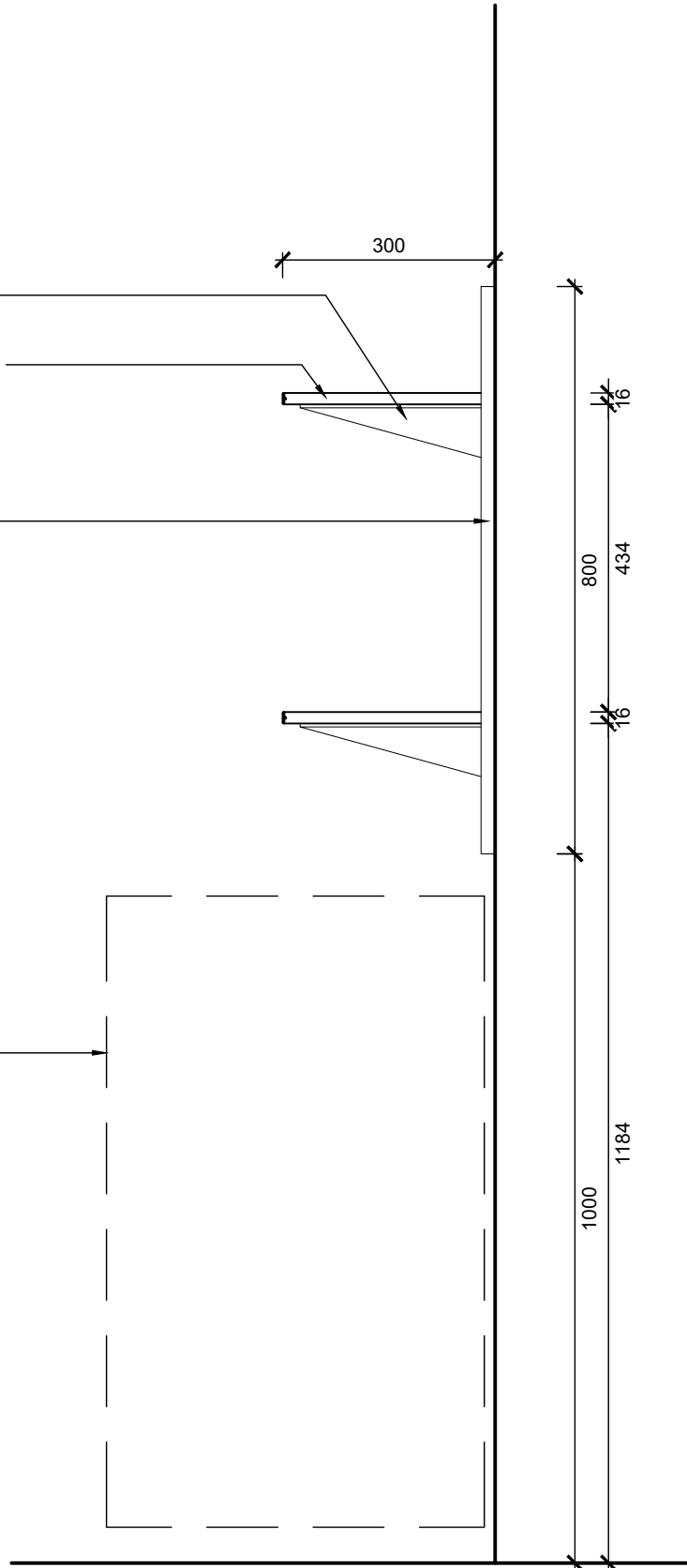
TYPE JD C3

white epoxy coated adjustable steel shelving brackets for wooden shelves.

16mm 'Max-on-top' HPL faced board (matt finish) shelf with 2mm pvc high impact edging all round.

30 x 15mm white epoxy coated steel wall bands @ 500mm c/c.

Loose furniture position



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Client: DEPARTMENT OF HEALTH

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Stand No.: ??
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Drawing Title: JOINERY TYPES
 TYPE JD C3

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TYPE JD C4

Sink cut-out. refer to for specification in sanitary schedule.

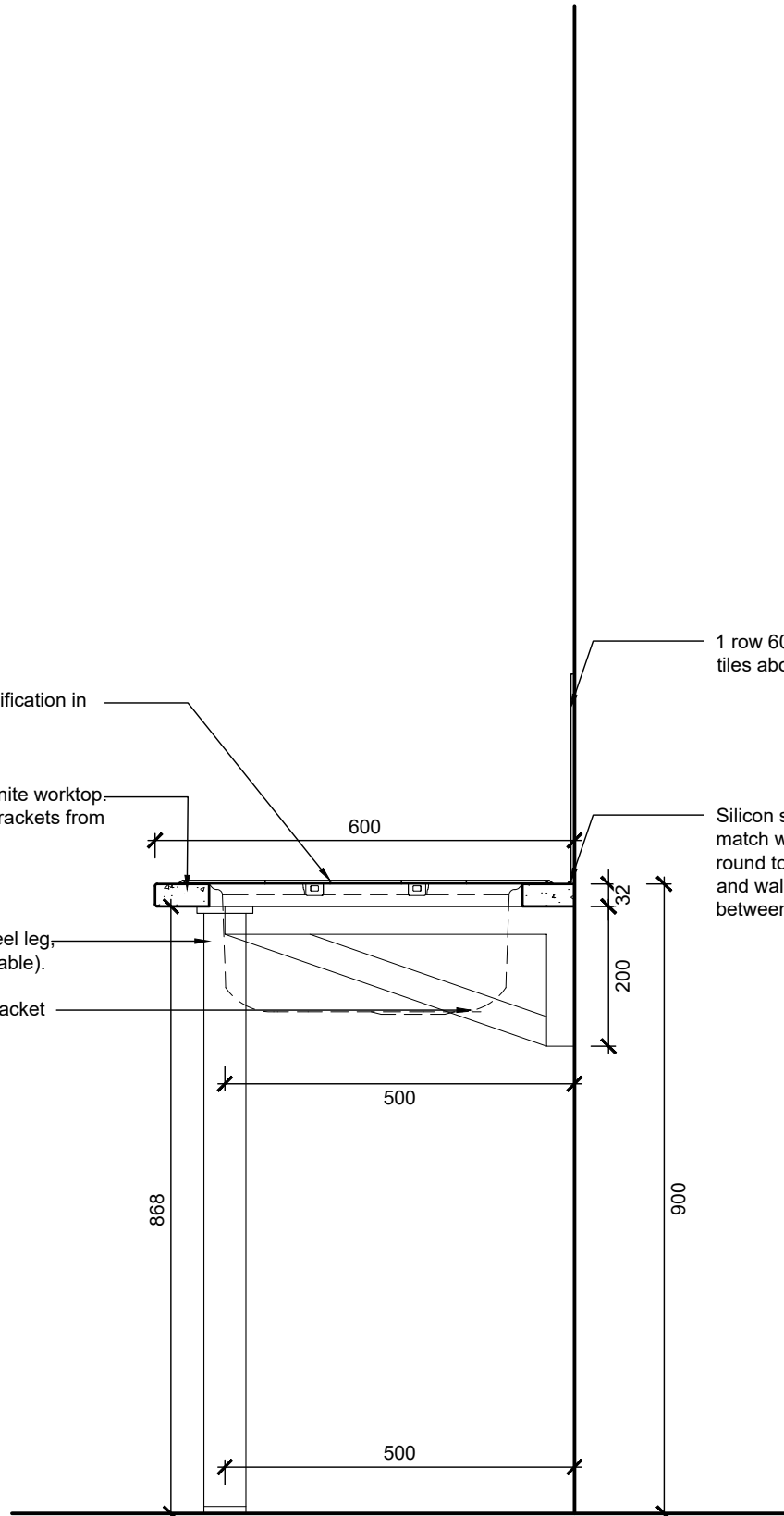
600 x 32mm Rustenburg granite worktop. Worktop to be fixed to rails/brackets from below.

870mm high X 80mm dia. steel leg, chrome plated (30mm adjustable).

Purpose made steel angle bracket powder coated black.

1 row 600 X 300mm ceramic tiles above countertop.

Silicon sealant in colour to match worktop, applied all round to joint between worktop and wall, also to be applied between sidewalls and wall.



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Stand No.: ??
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Drawing Title: JOINERY TYPES
 TYPE JD C4

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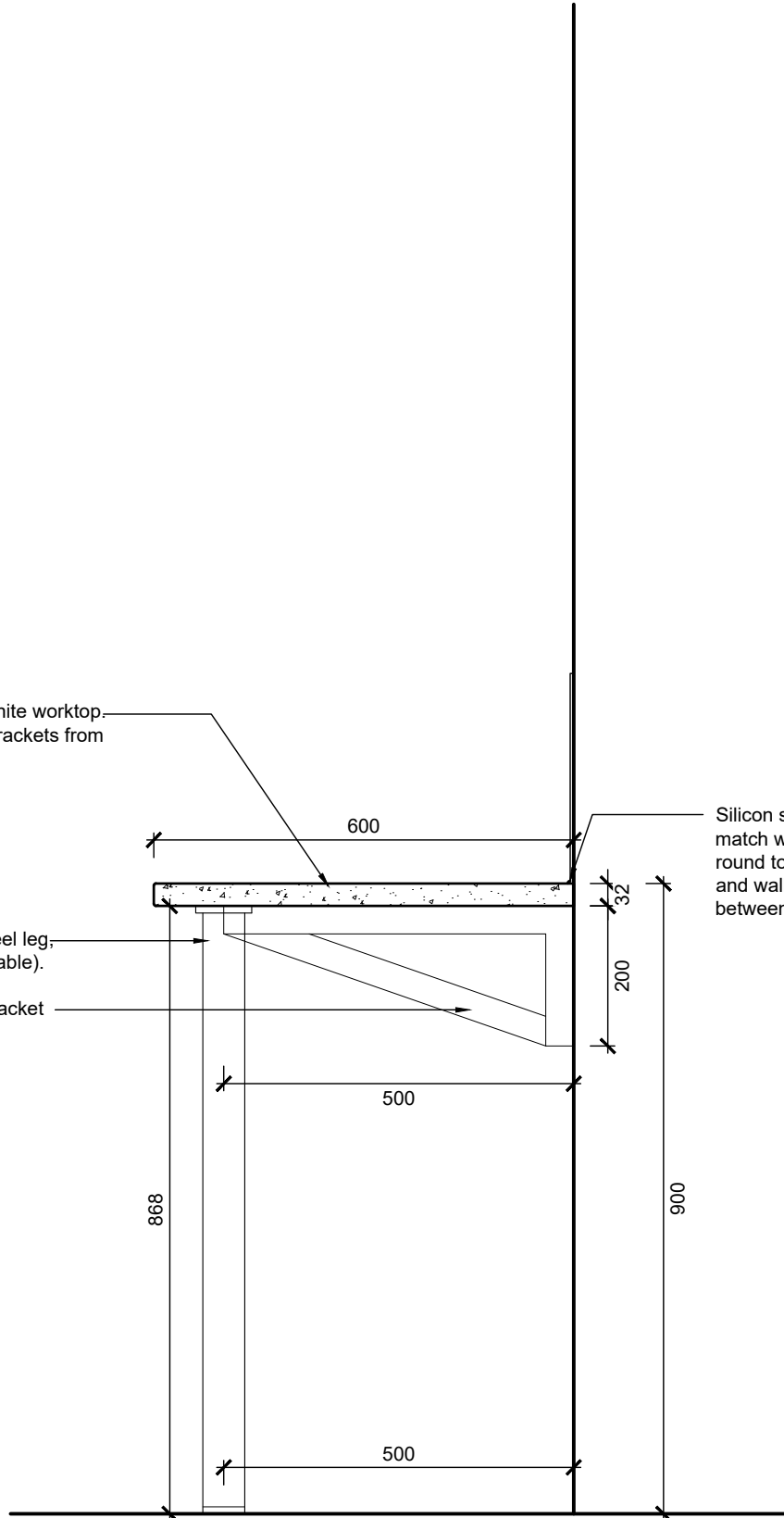
TYPE JD C5

600 x 32mm Rustenburg granite worktop.
Worktop to be fixed to rails/brackets from below.

870mm high X 80mm dia. steel leg, chrome plated (30mm adjustable).

Purpose made steel angle bracket powder coated black.

Silicon sealant in colour to match worktop, applied all round to joint between worktop and wall, also to be applied between sidewalls and wall.



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Client: DEPARTMENT OF HEALTH

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TYPE JD C5

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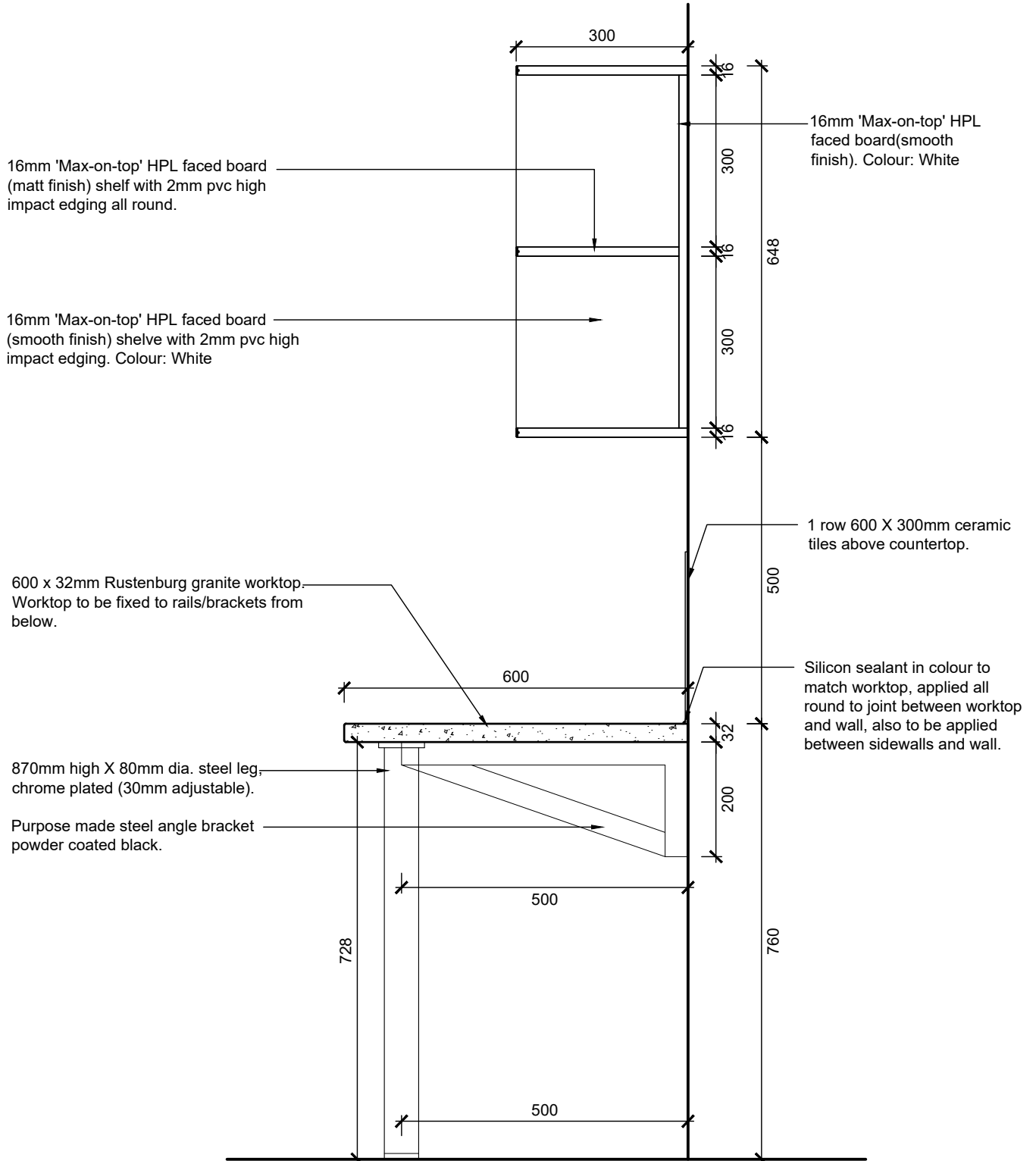
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TYPE JD C6



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 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD C6

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD27 Revision: -

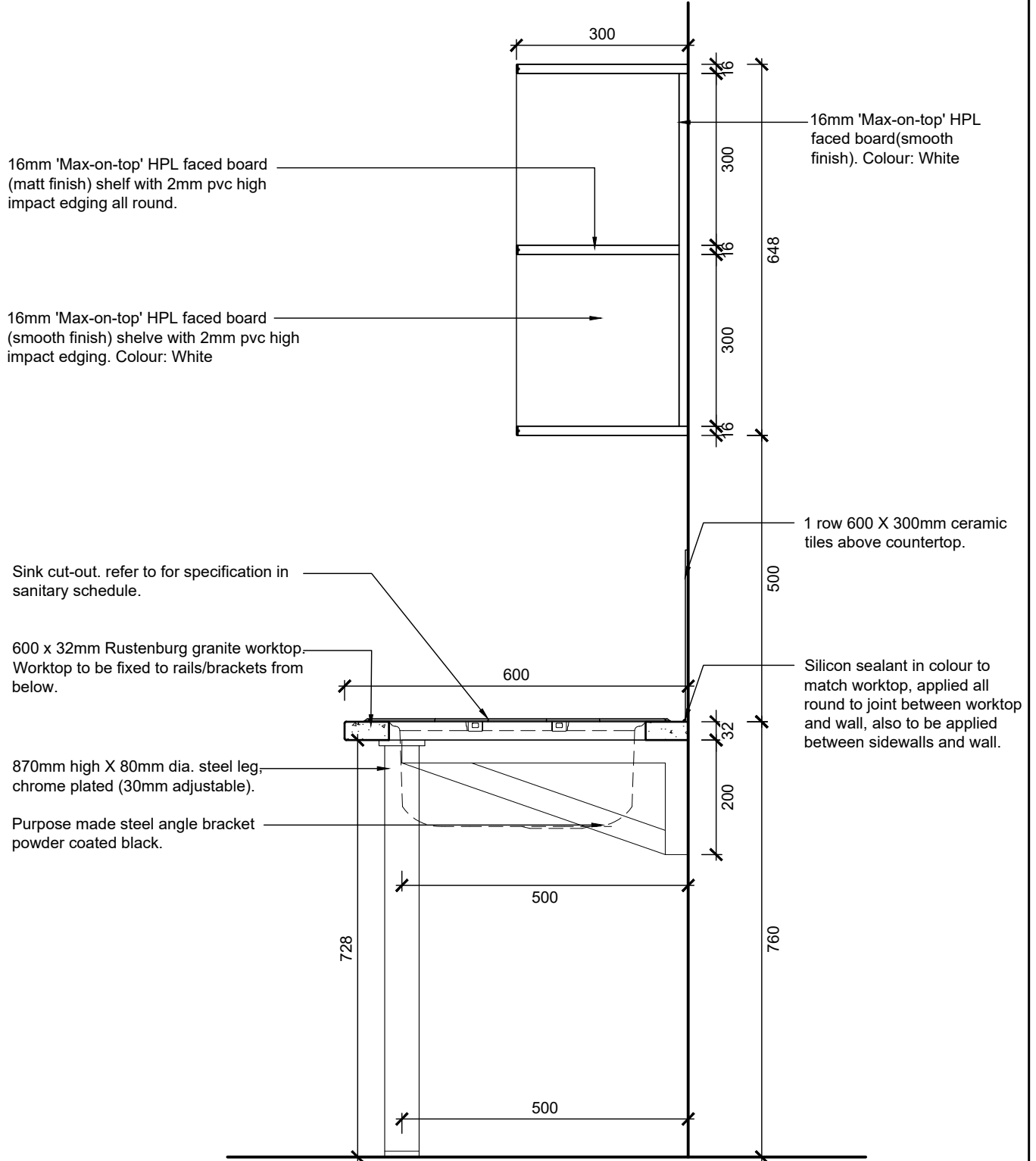
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All dimensions to be checked on site before any work is put in hand. Refer any discrepancies to the architect.

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TYPE JD C7



BNM ARCHITECTS PROJECT MANAGERS
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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD C7

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD28 Revision: -

Rev.:	Date:	By:	Description:
-	2023-11-06	WC	ISSUED FOR MEASURE

Rev.:	Date:	By:	Description:

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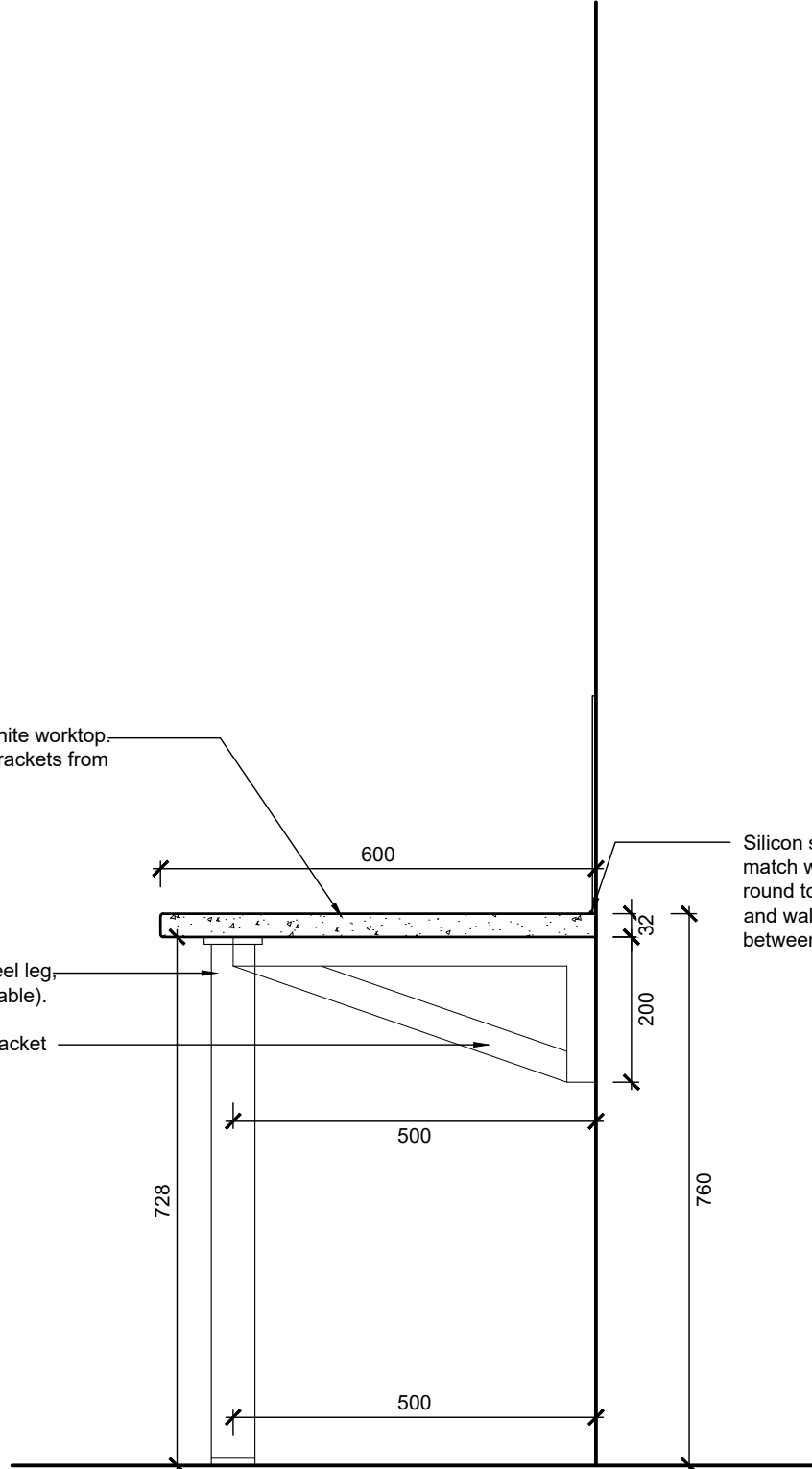
TYPE JD C8

600 x 32mm Rustenburg granite worktop.
Worktop to be fixed to rails/brackets from below.

870mm high X 80mm dia. steel leg,
chrome plated (30mm adjustable).

Purpose made steel angle bracket
powder coated black.

Silicon sealant in colour to match worktop, applied all round to joint between worktop and wall, also to be applied between sidewalls and wall.



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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
TYPE JD C8

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD29 Revision: -

Rev:	Date:	By:	Description:
-	2023-11-06	WC	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

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TYPE JD C9

44 x 32mm H/W support rail fixed to wall with 6 x 100 Eureka easy fit wall anchors, at max 300mm ccs, sprayed with polyurethane, colour by Architect. All unseen edges to be painted with pink wood primer.

32mm 90° Postform Worktop with brown backer and seal. All cuts and rear edges to be painted with pink wood primer. Worktop screwed and fixed to support rails/brackets from below.

44 x 19mm H/W support packer piece.

60 x 16mm Melamine faced board stop rail with 2mm pvc high impact edging along the front (colour to match door), and conventionally edged to the back, screw fixed to underside of postform worktop

Drop-on sink as per sanitary schedule.

16mm Melamine faced board (smooth finish) rear lining (white).

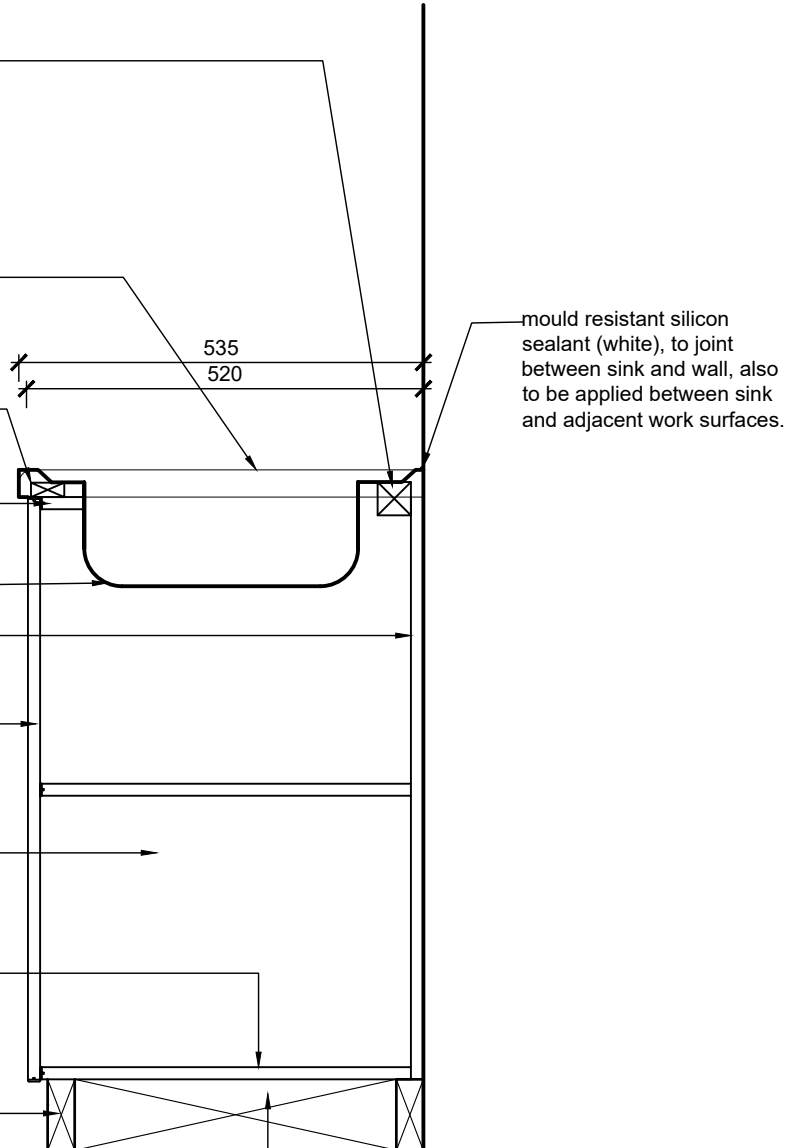
16mm melamine faced board (smooth finish) with 2mm pvc high impact edging

16mm Melamine faced board (smooth finish) side wall with 2mm pvc high impact edging, extended 16mm proud of bottom shelf so that piano hinge hung doors are flush. Note: side walls extended down to bottom of bottom shelf.

16mm Melamine faced board (smooth finish) with 2mm pvc high impact edging

94x32mm SA Pine bearer. Varnished to match existing skirting.

94x32mm SA Pine bearers @ approx. 500mm ccs. All primed with one coat pink wood primer to all surface prior to fixing.



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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD C9

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD30 Revision: -

Rev.:	Date:	By:	Description:
-	2023-11-06	WC	ISSUED FOR MEASURE

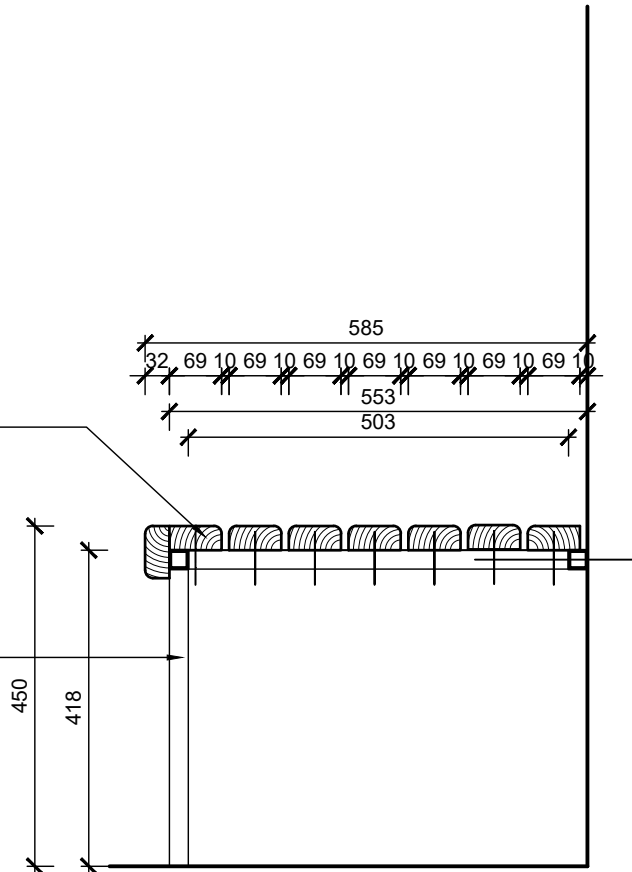
Rev.:	Date:	By:	Description:

All dimensions to be checked on site before any work is put in hand. Refer any discrepancies to the architect.
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TYPE JD C10

69x32mm H/W slats with rounded 6mm arris ends fixed with self tapping screws counter-sunk, plugged and pelleted to galvanised steel section. Slats to be polyurethane varnished for use in wet areas.

25x25x2mm gms box frame welded, Powder coated White at approx. 800mm c/c



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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD C10

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD31 Revision -

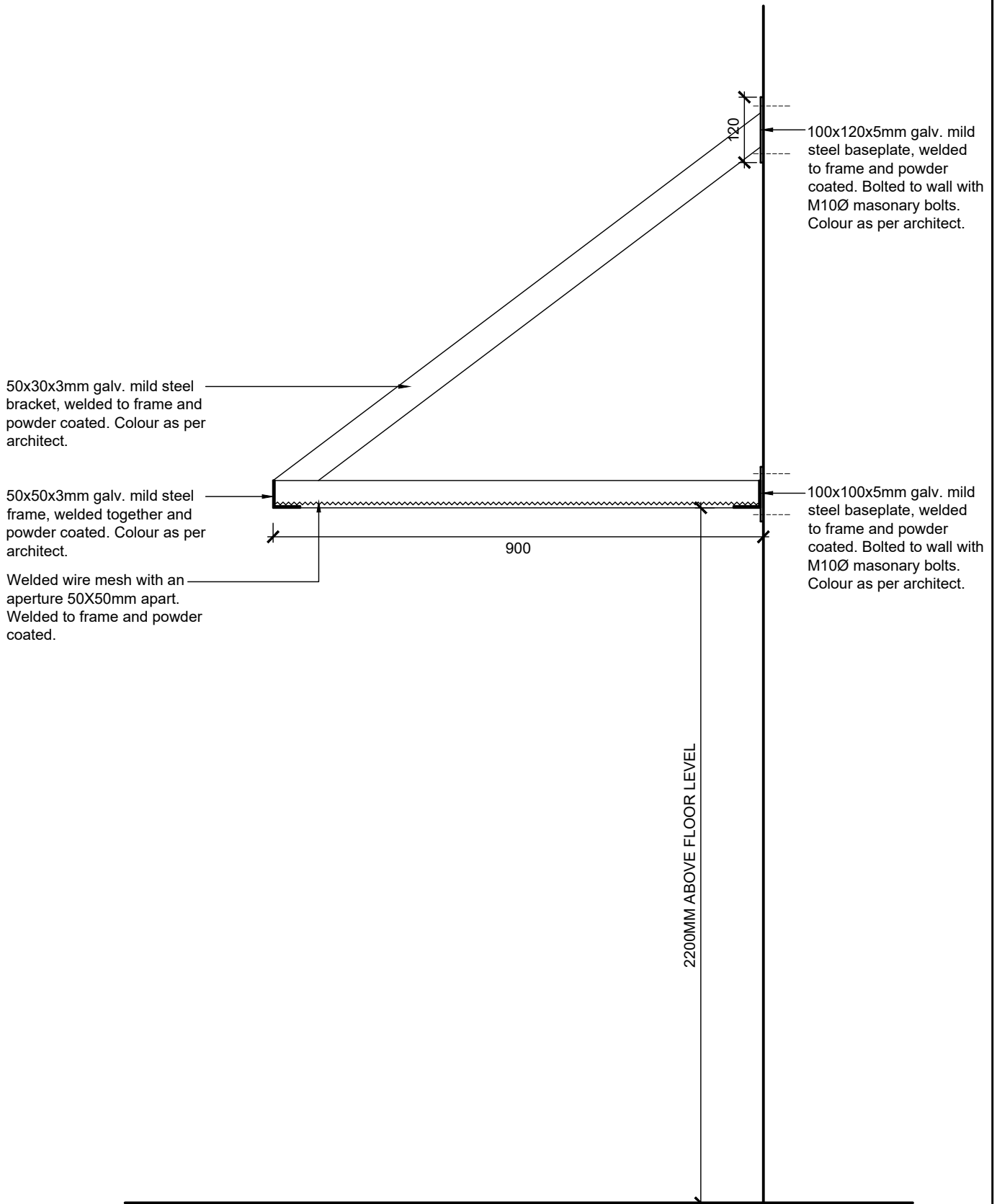
Rev:	Date:	By:	Description:
-	2023-11-06	WC	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

All dimensions to be checked on site before any work is put in hand. Refer any discrepancies to the architect.

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TYPE JD D1



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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

Drawing Title: JOINERY TYPES
 TYPE JD D1

Scale: 1:10 Date: 2023-11-06 Drawn: WC

Drawing No.: 3235_JD32 Revision: -

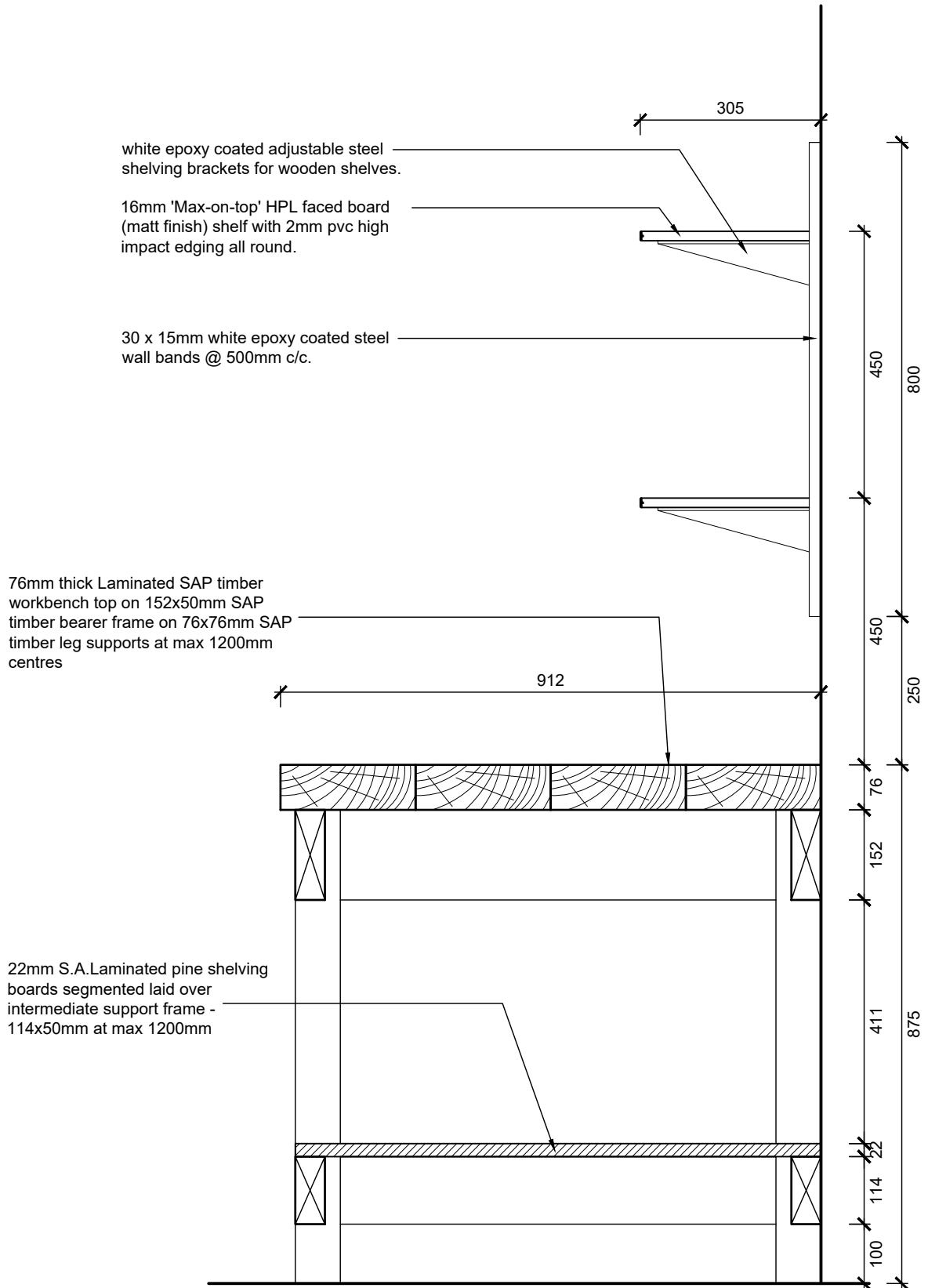
Rev:	Date:	By:	Description:
-	2023-11-06	WC	ISSUED FOR MEASURE

Rev:	Date:	By:	Description:

All dimensions to be checked on site before any work is put in hand. Refer any discrepancies to the architect.

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TYPE JD D2



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Client: DEPARTMENT OF HEALTH

Project: CECILIA MAKIWANE HOSPITAL ALTERATIONS AND ADDITIONS

Stand No.: ??
 Township: MDANTSANE, EAST LONDON

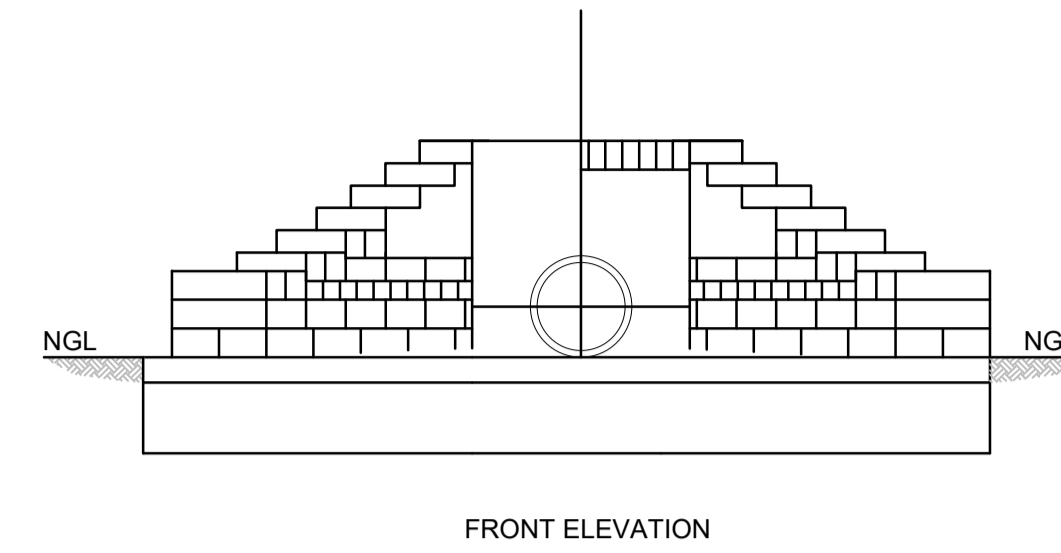
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 TYPE JD D2

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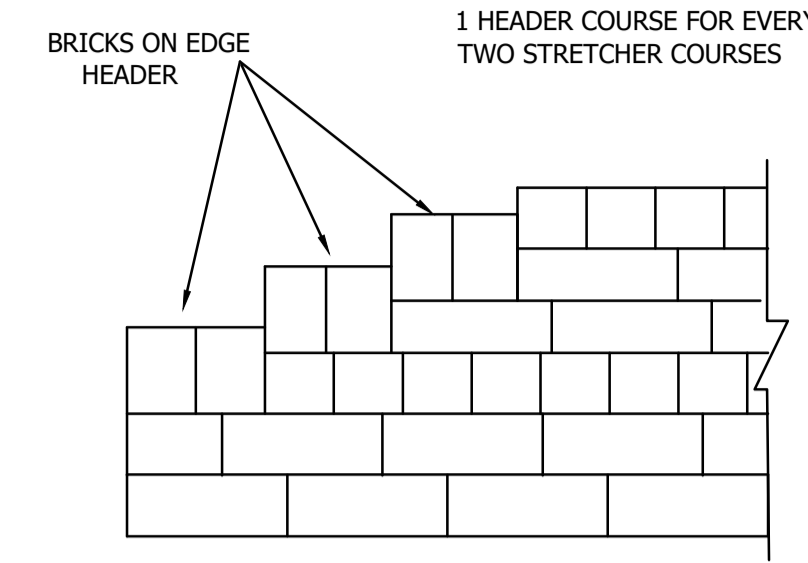
Drawing No.: 3235_JD33 Revision: -

DIMENSIONS FOR SETTING OUT PURPOSES (mm)

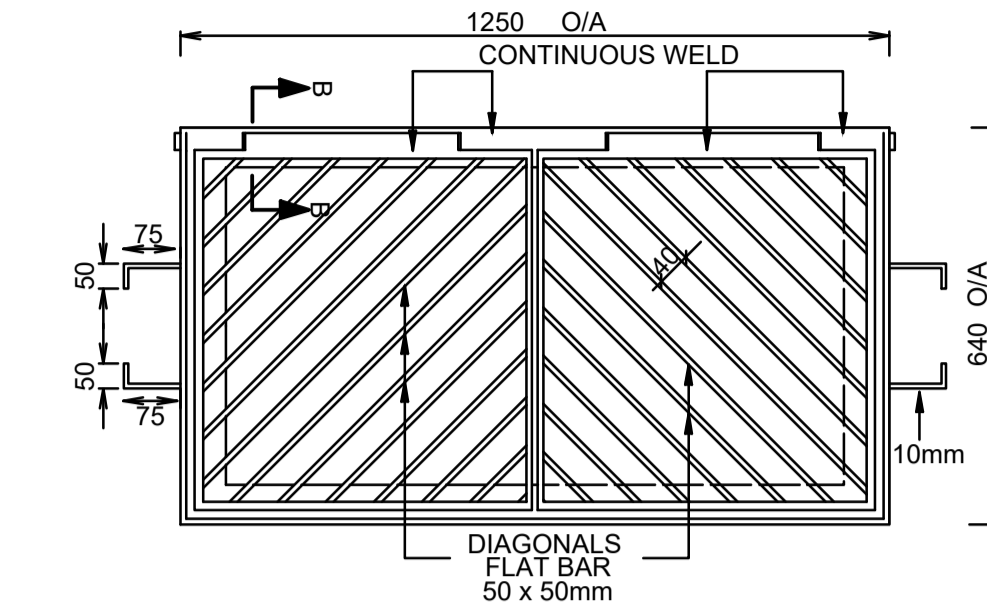
NOMINAL DIAMETER	X	Y	Z	W	V	H	h
300	1045	1235	455	280	840	710	285
375	1190	1365	500	325	970	795	285
450	1340	1495	545	370	1100	880	285
525	1340	1535	585	410	1140	965	370
600	1485	1660	625	450	1265	1050	370



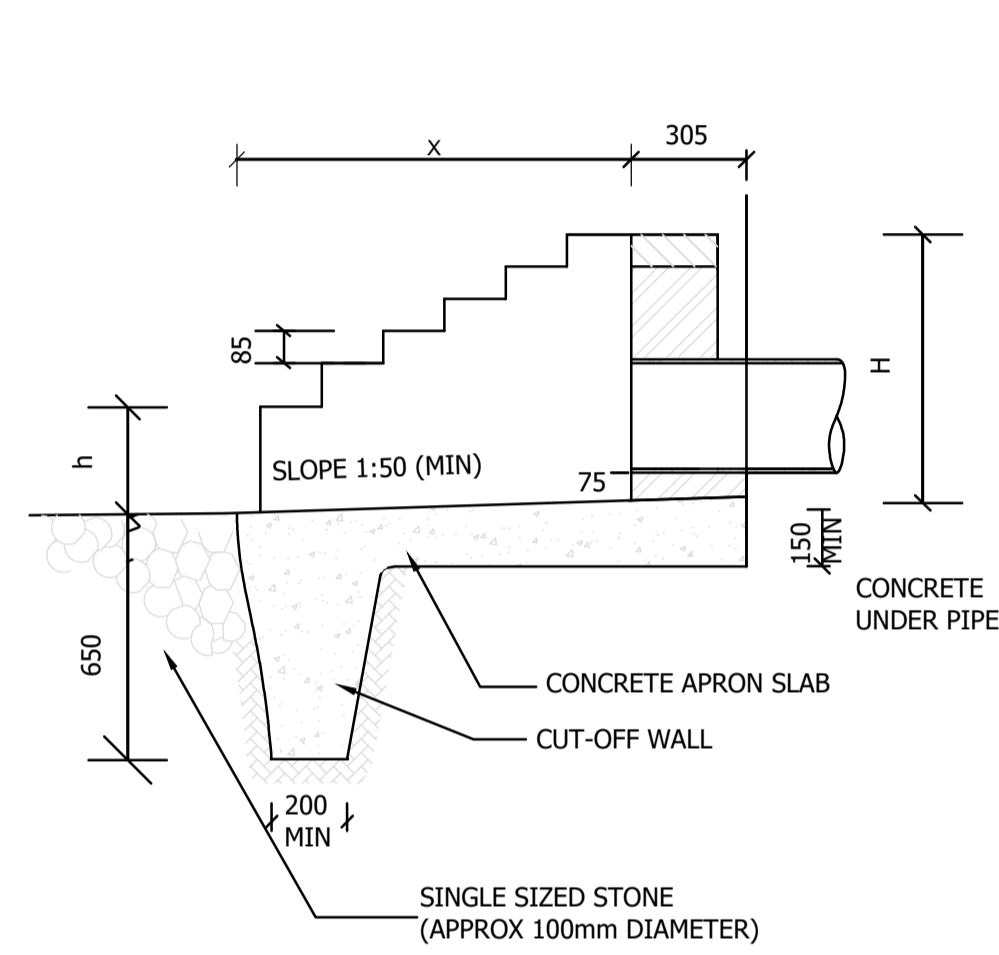
FRONT ELEVATION



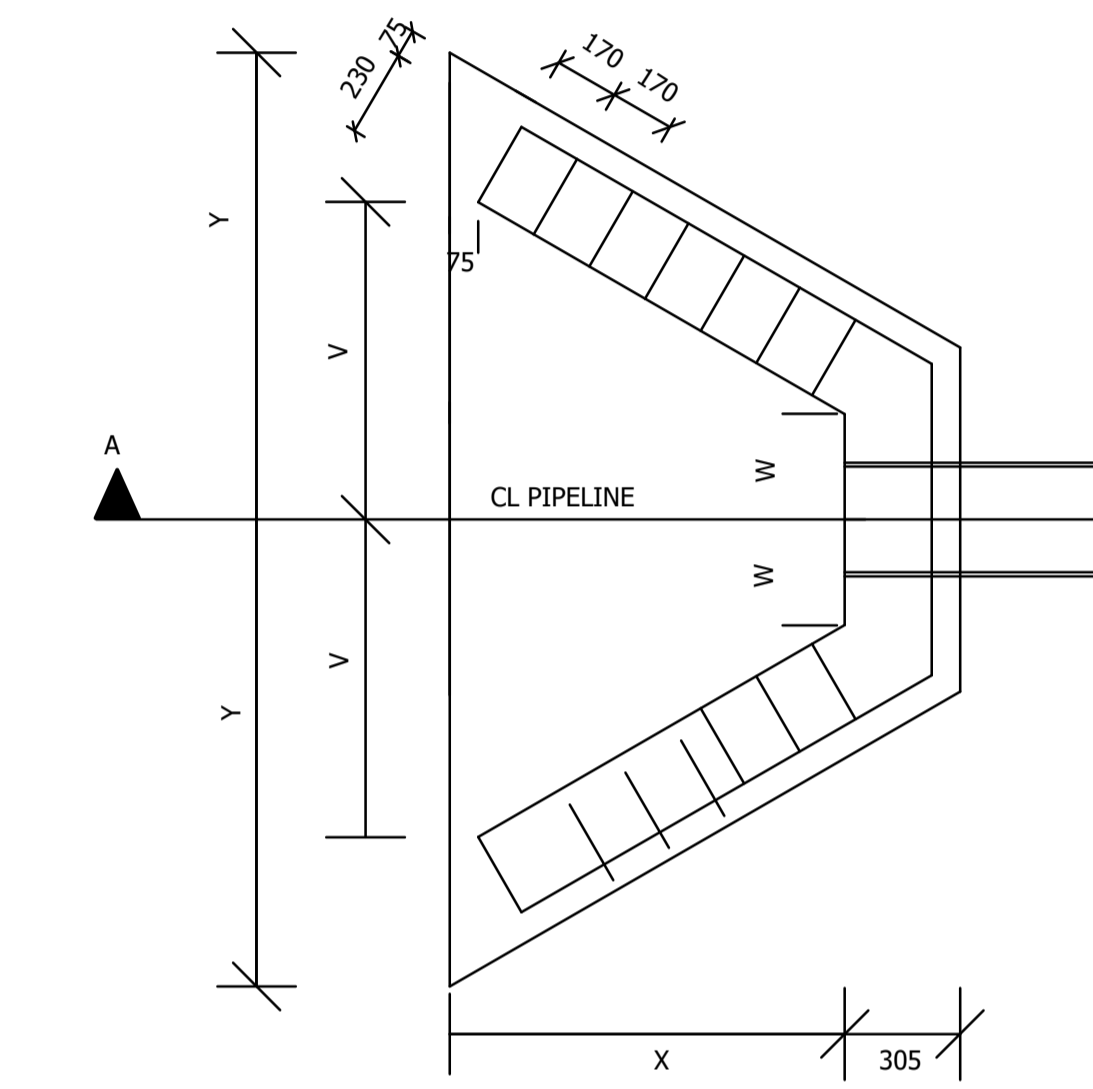
DETAIL OF STEPPED BRICKWORK



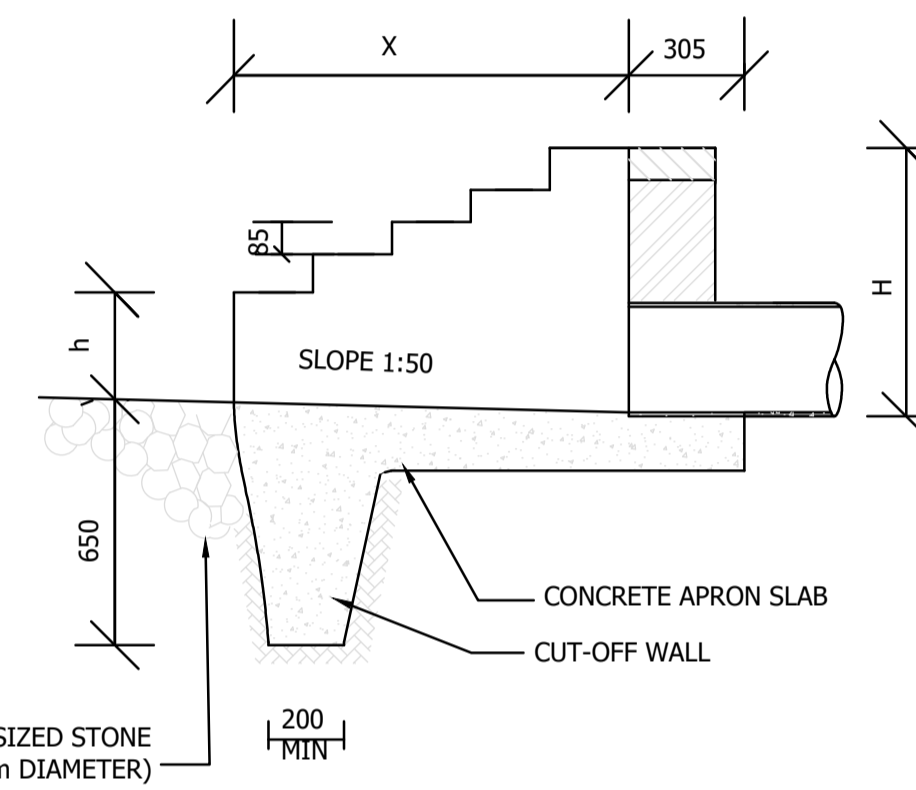
FRAME ASSEMBLY DETAIL AS PER PSLE 2/2
SCALE 1:10



SECTION A-A
OUTLET

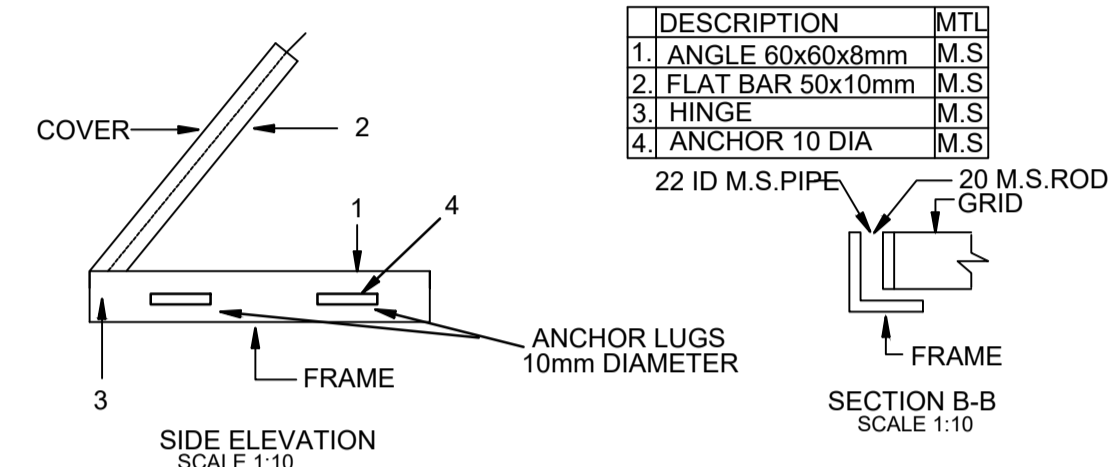


BRICK INLET/OUTLET STRUCTURE
PLAN

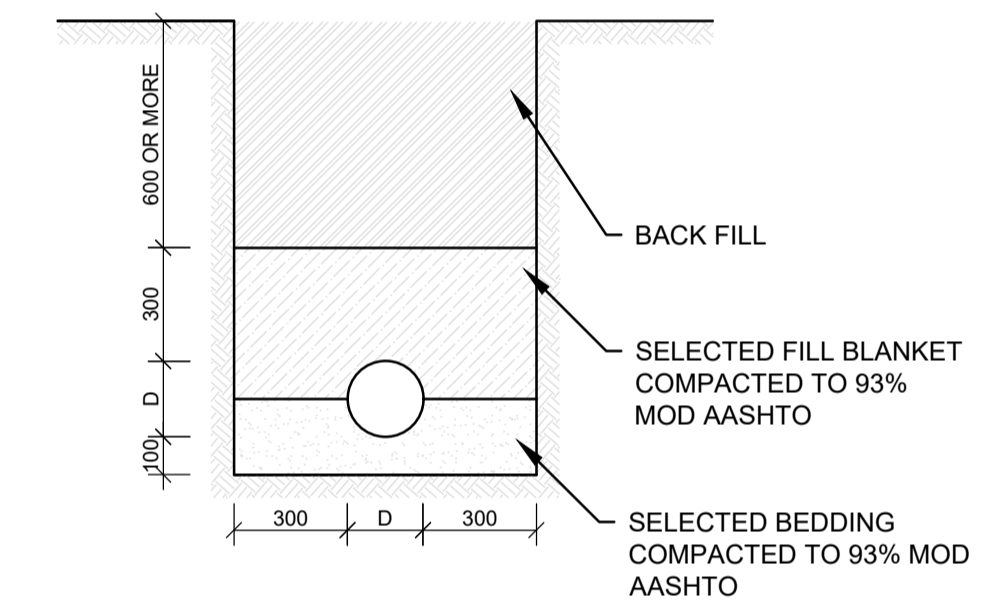


SECTION A-A
INLET

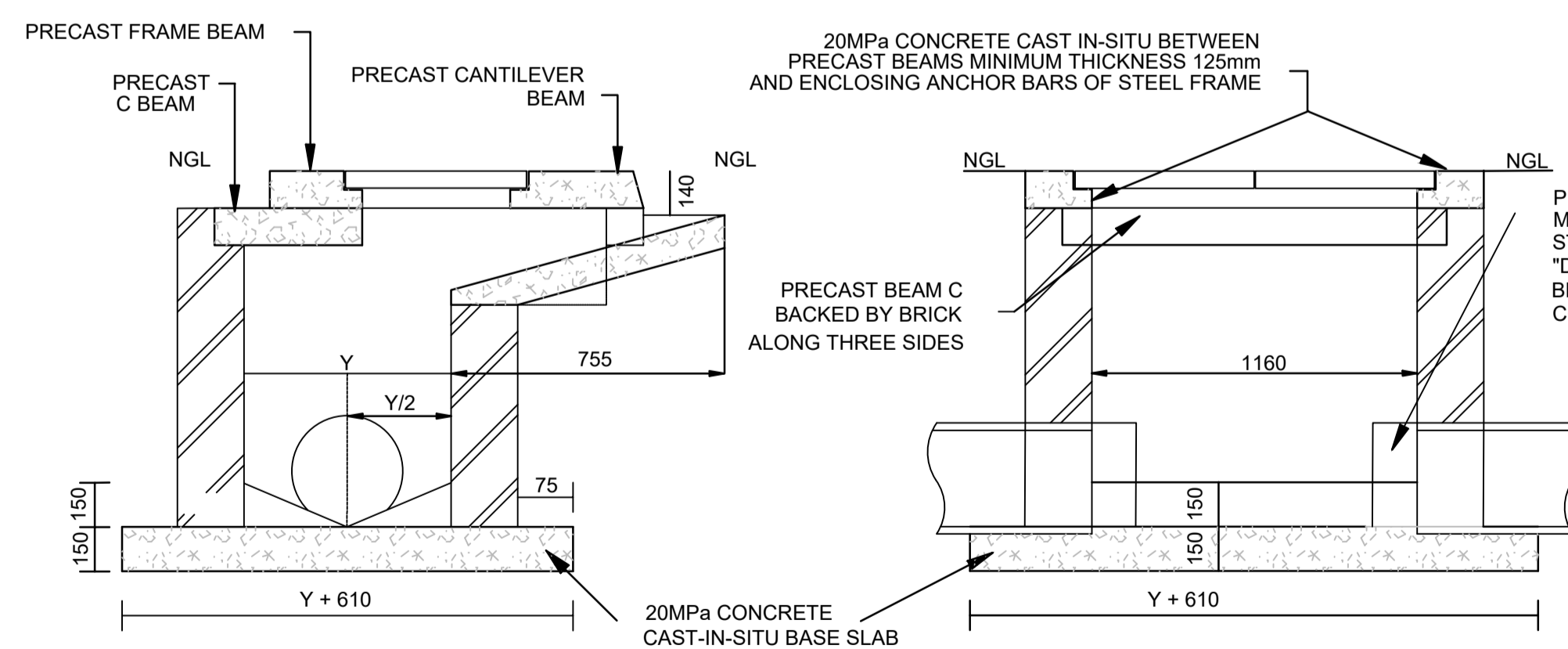
HEADWALL DETAILS
SCALE 1:20



1. ALL WELDS TO BE 6mm FILLETS CONTINUOUS. NO SPOT WELDING WILL BE ALLOWED.
2. ASSEMBLY TO BE HOT DIPPED GALVANISED TO S.A.B.S. 763 (1988).
3. BOTTOM OF COVER TO SEAT FIRMLY ON FRAME. ANY COVERS NOT SEATING ON FRAME WILL BE REJECTED.
4. HINGE DETAILS AS PER SAMPLE AVAILABLE. VARIATIONS IN HINGE PIPE AND ROD DIAMETER OR ALTERNATIVE HINGE ASSEMBLY WILL BE ACCEPTED IF STRENGTH IS NOT COMPROMISED AND SUBJECT TO APPROVAL BY THE ROADS AND STORMWATER ENGINEER.
5. SAMPLE MAY BE INSPECTED AT ROADS & STORMWATER DIVISION.

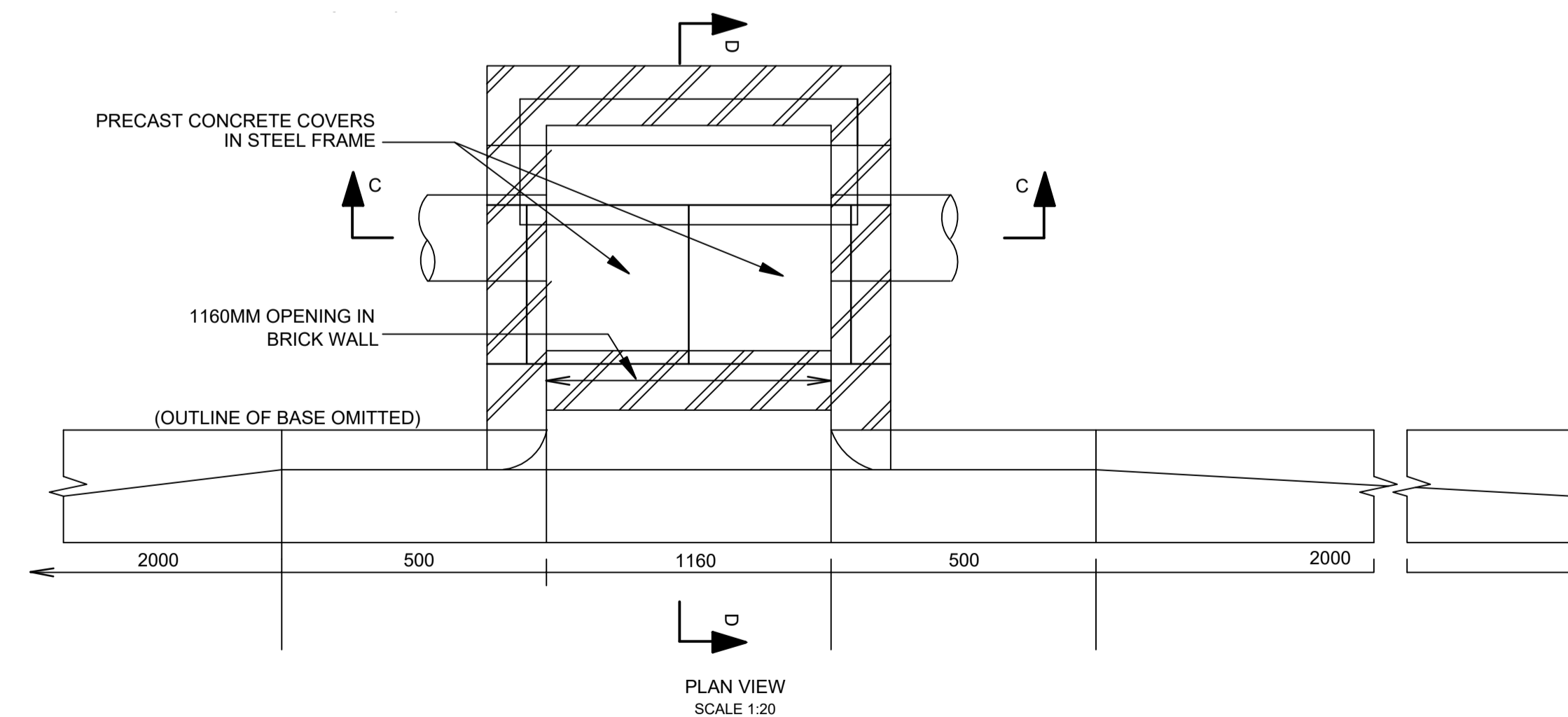


TYPICAL BEDDING DETAIL
SCALE 1:20



SECTION D-D
SCALE 1:20

SECTION C-C
SCALE 1:20



PLAN VIEW
SCALE 1:20

- NOTES:
1. BEAM C TO BE FLUSH WITH INSIDE FACE OF FRAME BEAM AND BEAR A MIN. OF 90mm ON WALLS. USE ADDITIONAL BEAM C TO SUPPORT ORIGINAL BEAM WHEN 'Y' IS GREATER THAN 930mm.
 2. TOP OF COVER TO BE SET TO FINAL GROUND LEVELS AND SLOPE.
 3. CROSSFALL IN CHANNEL CHANGES UNIFORMLY OVER THE 2m AND 0.5m TRANSITIONS.
 4. STRUCTURE TO BE BRACED WHILST COMPACTING ADJACENT ROAD LAYERS.
 5. 230mm BRICKWORK LAID IN BOND OF 2 STRETCHERS & 1 HEADER COURSE, UNPLASTERED WITH FLUSH JOINTS.
 6. FOR DIMENSION Y SEE TABLE ON PSLE1.
 7. FOR DETAILS OF INLET SEE DRWG PSLE4/2.


FOR INFORMATION

Rev/Date	Description	Initials
1 / SEPT 2023	ISSUED FOR INFORMATION	LM

Drawing notes


1. FINAL RECORD DRAWING AND STRUCTURE PENDING GEOLOGICAL INVESTIGATION AND ENGINEERING SURVEY RESULTS. LAYERS AND GEOMETRY ON THIS DRAWING REMAINS PROVISIONAL.
2. POSITIONS OF EXISTING SERVICES ARE APPROXIMATE AND ACTUAL POSITIONS AND LEVELS MUST BE DETERMINED ON SITE BY CONTRACTORS BEFORE WORK COMMENCES.
3. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE MAIN JOB SPECIFICATIONS AND PROJECT SPECIFICATIONS.
4. NO WORK TO COMMENCE OUTSIDE THE CONSTRUCTION LIMITS. ENGINEER MAY RESTRICT WORK STOPPAGE SHOULD ANY ACTIVITY COMMENCE OUTSIDE THE CONSTRUCTION LIMITS.
5. A COMPLETE SET OF DRAWINGS TO BE AVAILABLE ON SITE AT ALL TIMES.
6. ENGINEERING AND NOT BE SCALE OF DRAWING. ANY DISCREPANCIES OR MISSING DIMENSIONS WILL BE CORRECTED IN WRITING BY THE ENGINEER.
7. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LOCATIONS OF ALL SERVICES AND UTILITIES PRIOR TO ANY CONSTRUCTION WORK.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITIES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITIES.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITIES.
11. ALL LEVELS IN METERS AND REFERRED TO M.S.L.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL AUTHORITIES.
13. TOPSOIL TO BE REMOVED TO A MINIMUM DEPTH OF 150mm, STOCKPILED AND MAINTAINED FOR THE DURATION OF THE WORKS.
14. ALL EXISTING SERVICES TO BE IDENTIFIED AND PROTECTED WITH SUFFICIENT WARNING SIGNS AND BARRIERS AS PER PROJECT SPECIFICATIONS.
15. EXISTING TREES WITHIN THE SITE SHALL BE SURVEYED, CO-ORDINATED OF THE TREE POSITIONS WILL NEED TO BE PROVIDED TO THE ENGINEER, WHO WILL INSTRUCT THE CONTRACTOR TO PROTECT ALL TREES THAT SURVIVE THE ENGINEERING WORKS.

Service authority approval			
Position	Name	Date	Signature

Client(s)

 Department: Health
 REPUBLIC OF SOUTH AFRICA
 Signature: _____ Date: _____
 Client Drawing No.: _____

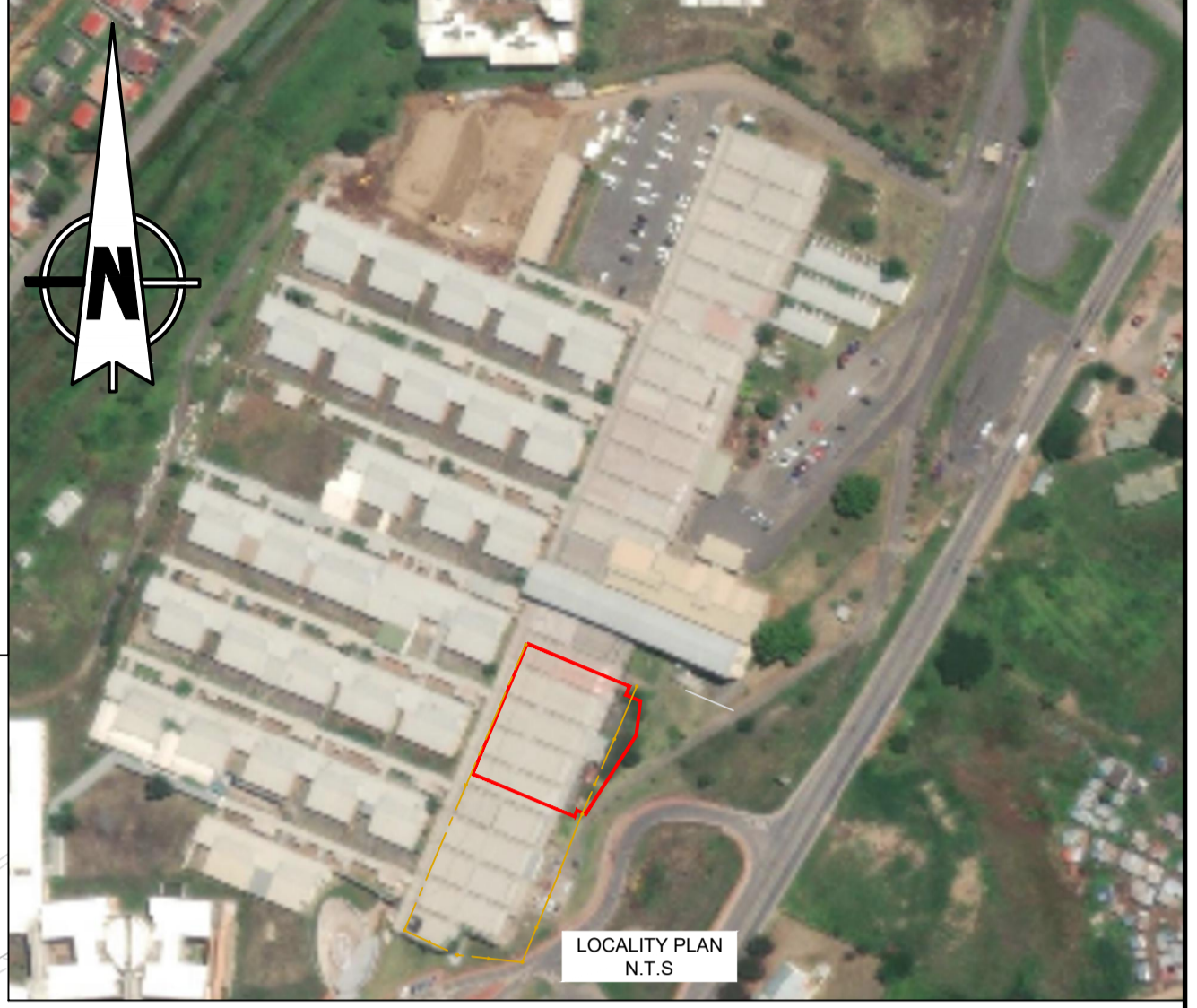
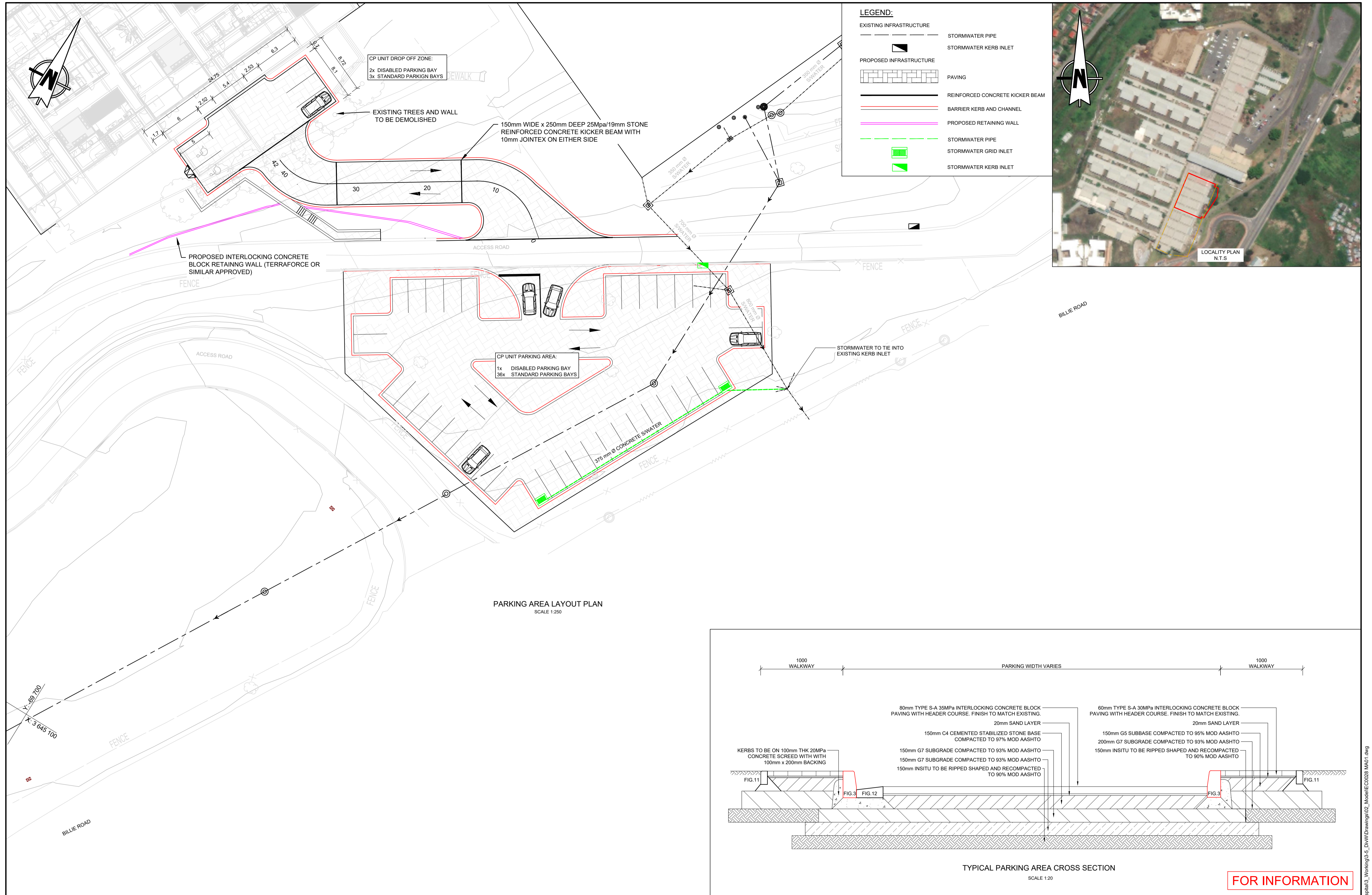
Project title
CECILIA MAKIWANE HOSPITAL: CP UNIT

Drawing title
CIVIL SERVICES: STORMWATER DETAILS


 Member of the Surbana Jurong Group

Process	Name	Date	Signature
Designed	L.MANYISA		
Checked	D.SHARP		
Verified	J.KAMPAN		
Drawn	J.KAMPAN		
Checked	J.KAMPAN		

SMC Drawing No.: _____ Rev 0 Sht 1
 EC0028-CMH-RDS-DT-013 Or 1



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0	SEPT 2023	ISSUED FOR INFORMATION	LM
1	DEC 2023	DROP OFF ZONE UPDATE	LM

Rev	Date	Description	Initials
0	SEPT 2023	ISSUED FOR INFORMATION	LM
1	DEC 2023	DROP OFF ZONE UPDATE	LM

Position	Name	Date	Signature

Client(s)

 Department of Health
 REPUBLIC OF SOUTH AFRICA
 Signature: _____ Date: _____
 Client Drawing No.: _____ Sht _____ of _____

Project title
CECILIA MAKIWANE HOSPITAL: CP UNIT

Drawing title
CIVIL SERVICES: ROADS & STW LAYOUT
 Scale: AS SHOWN
 Paper Size: A1

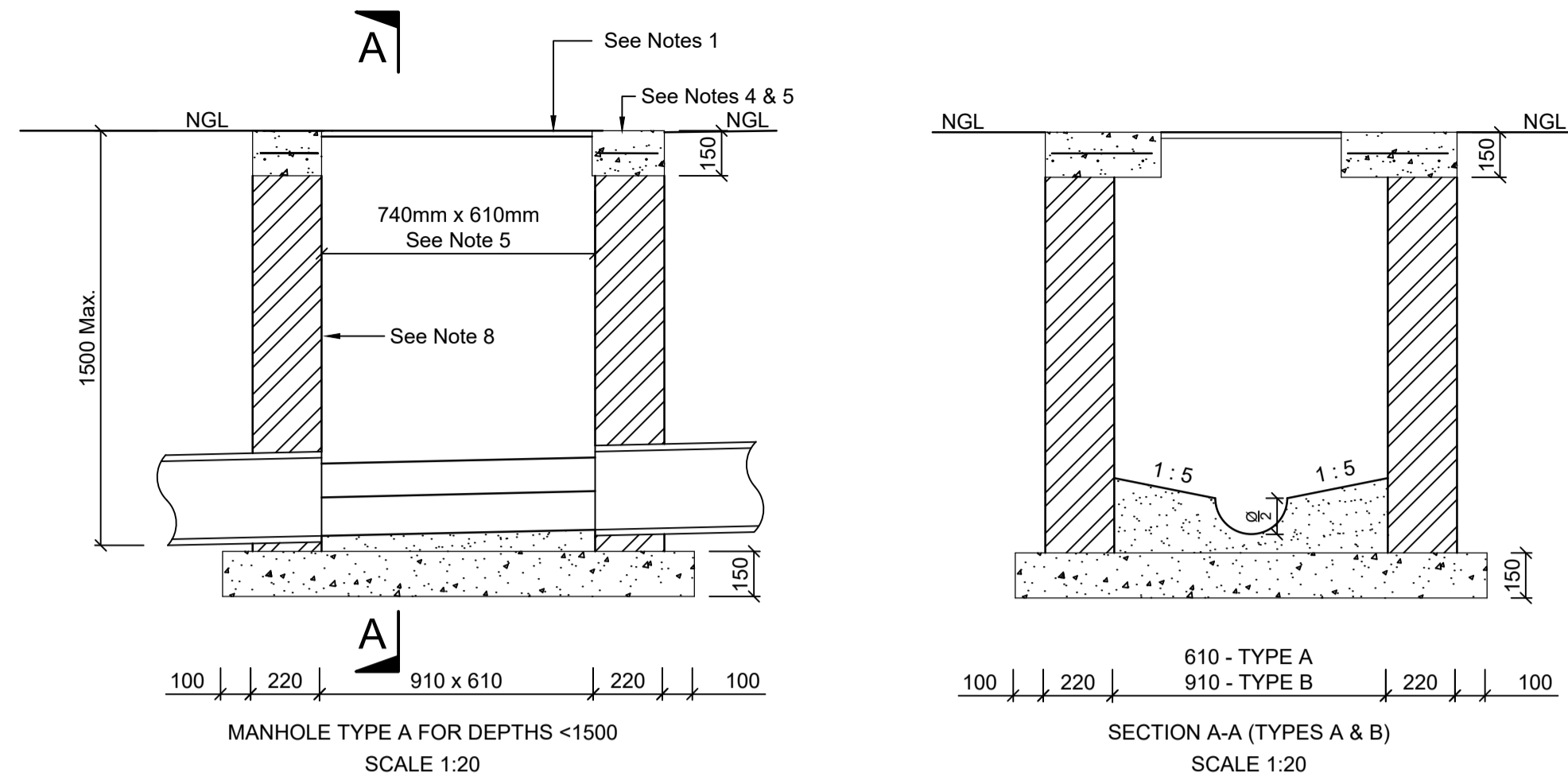
Member of the Surbana Jurong Group

 Signature: _____ PR _____ Date: _____

Process Name Date Signature
 Designed: D.SHARP
 Checked: J.KAMPFMAN
 Verified: J.KAMPFMAN
 Drawn: D.SHARP
 Checked: J.KAMPFMAN
 SMC Drawing No.: EC0028-CMH-RDS-GA-010 Rev 1 Sht 1 of 1

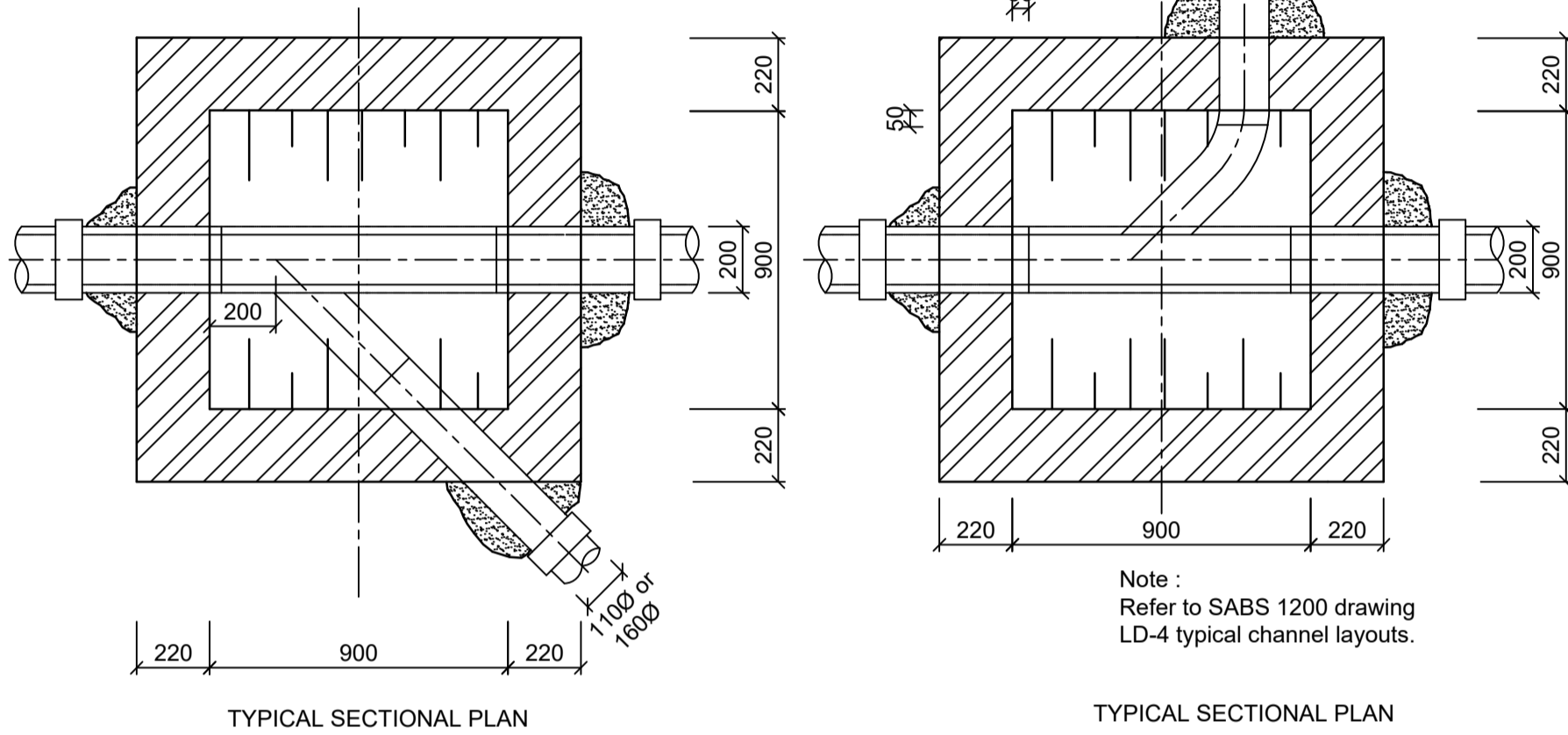
FOR INFORMATION

P:\EC0028-Cecilia Makiwane Hospital\3_5_Dr\Drawings\02_Mech\EC0028_MAO1.dwg



NOTES:

- Manhole cover to be 600 x 900mm cast iron cover and frame.
- "Calcimite" step irons to be provided in manholes >1.5m deep.
- Step irons to be staggered at 300mm crs vertically and 200mm crs horizontally. Starting 500mm below cover level.
- All cover slabs to be reinforced with r12 bars at 150 crs both ways with 30mm cover to bottom of slab.
- Opening in cover slabs to be offset to one corner.
- Benching to be min. 20mm thick using 1:3 cement mortar.
- All concrete to be 25 MPa.
- All manholes to be plastered internally.
- Manholes to be constructed from engineering bricks (SABS1200LE) and laid in english bond.
- Internal walls of manholes which are opposite to drop inlets, with pipe diameters of 300mm or greater, are to be plastered 20mm thick, and mesh reinforced to the overt level of the inlet pipe to the base of the manhole.
- For EPWP Projects, bricks manufactured on site are acceptable if constructed to engineering grade SABS 227 or concrete masonry complying with the requirements of SABS 1215 nominal compressive strength of 14MPa solid units.

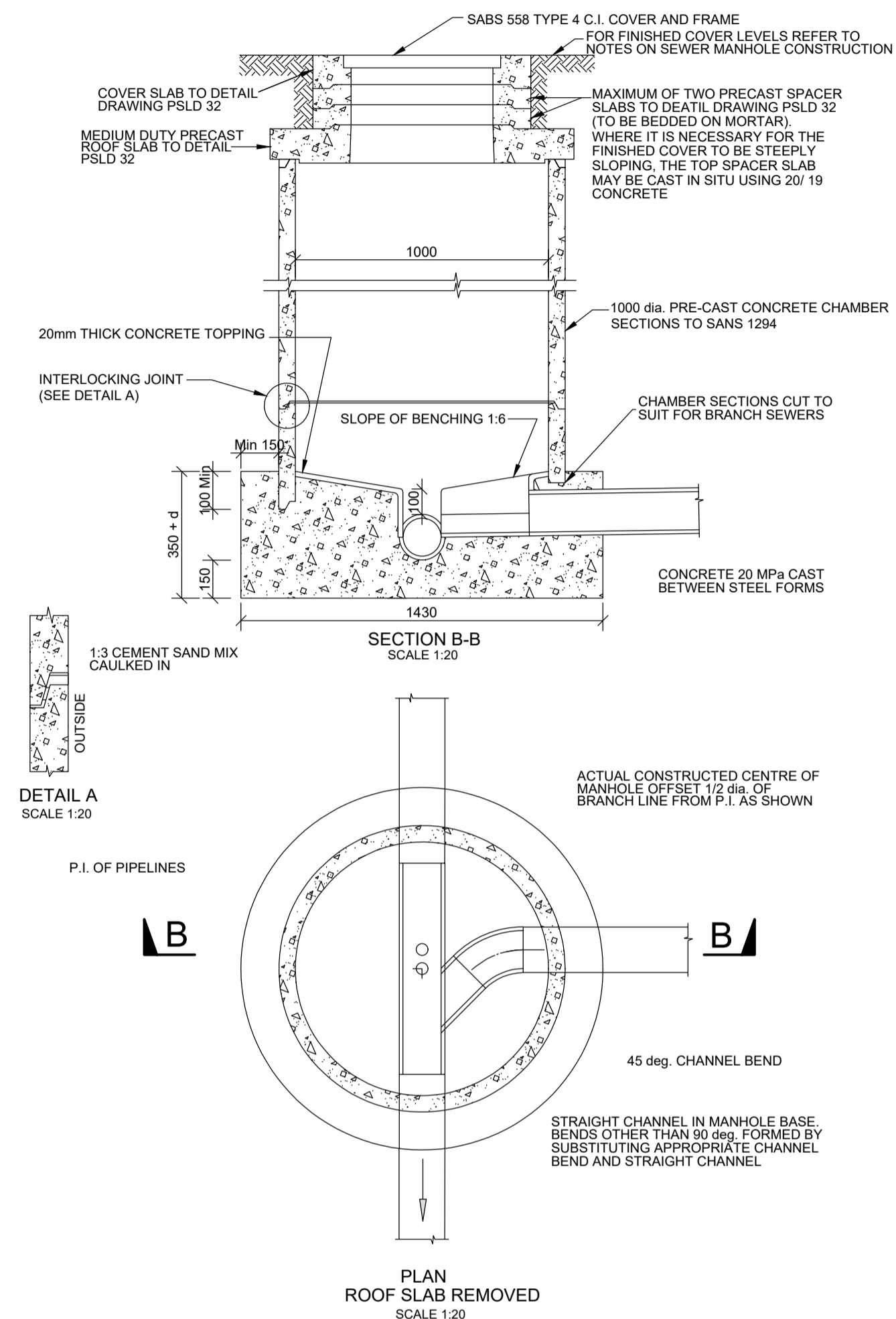


TYPICAL SECTIONAL PLAN

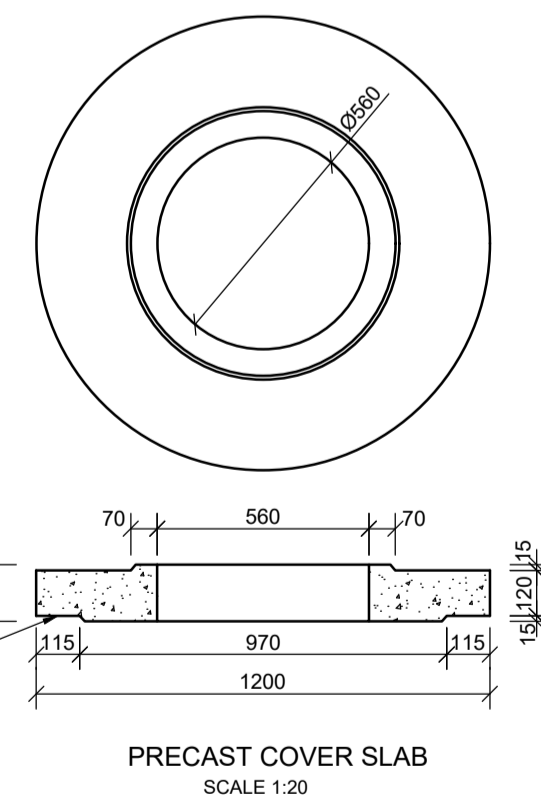
BRICK MANHOLE DETAIL SCALE 1:20

TYPICAL SECTIONAL PLAN

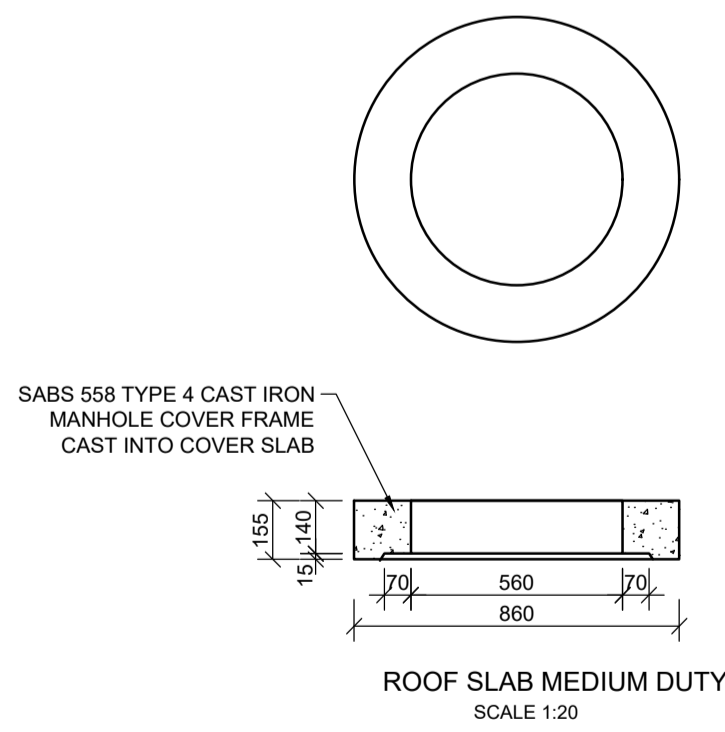
Note: Refer to SABS 1200 drawing LD-4 typical channel layouts.



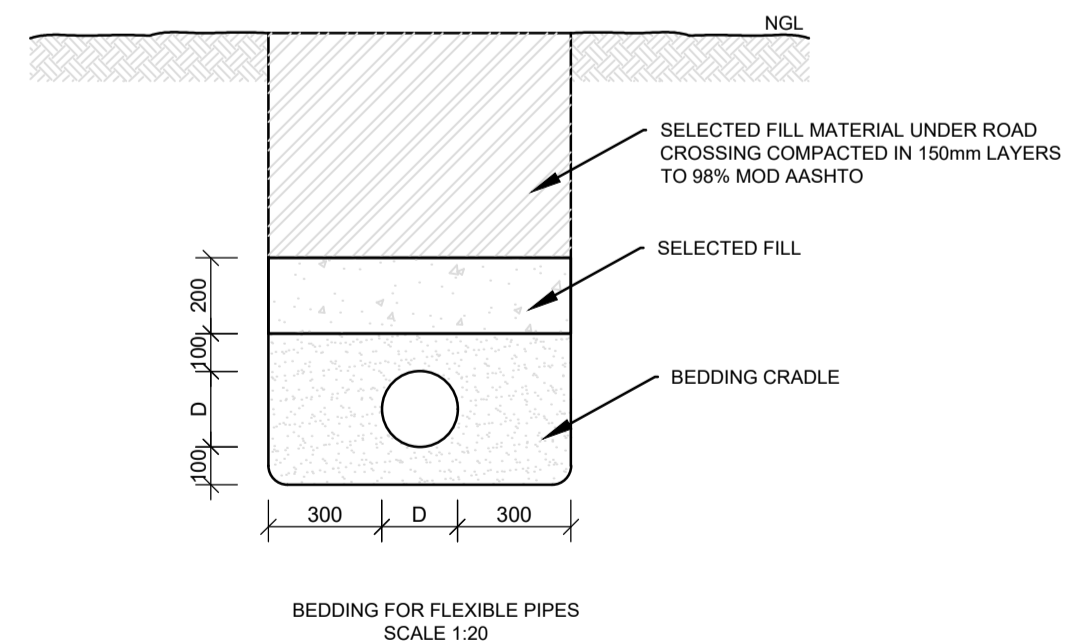
PLAN ROOF SLAB REMOVED SCALE 1:20



PRECAST COVER SLAB SCALE 1:20



ROOF SLAB MEDIUM DUTY SCALE 1:20



BEDDING FOR FLEXIBLE PIPES SCALE 1:20

FOR INFORMATION

Rev	Date	Description	Initials
1	SEPT 2023	ISSUED FOR INFORMATION	LM

Drawing notes	
1.	FINAL ROAD DESIGN AND STRUCTURE FEMING GEOTECHNICAL INVESTIGATION AND ENGINEERING SURVEY RESULTS, LAYERS AND GEOMETRY ON THIS DRAWING BEING INDICATED.
2.	POSITIONS OF EXISTING SERVICES ARE APPROXIMATE AND ACTUAL POSITIONS AND LEVELS MUST BE DETERMINED ON SITE BY CONTRACTORS BEFORE WORK COMMENCES.
3.	NO WORK TO COMMENCE OUTSIDE THE CONSTRUCTION LIMITS. ENGINEER MAY PROTECT WORK SPOTS AT ANY ACTIVITY COMMENCED OUTSIDE THE CONSTRUCTION LIMITS.
4.	ALL SERVICES TO BE RECONSTRUCTED IN ACCORDANCE WITH THE SAME USE SPECIFICATIONS AND PROJECT SPECIFICATIONS.
5.	A COMPLETE SET OF DIMENSIONS TO BE AVAILABLE ON SITE AT ALL TIMES.
6.	DISCREPANCIES MUST BE REPORTED TO THE ENGINEER IMMEDIATELY UPON IDENTIFICATION OF DISCREPANCIES OR MISSING DIMENSIONS WILL BE CORRECTED IN WRITING BY THE ENGINEER.
7.	THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL RELEVANT AUTHORITIES.
8.	THE CONTRACTOR TO COMPLY WITH ALL DOCUMENTARY EVIDENCE OF ALL THE EXISTING SERVICES DETAIL IN CLOSE PROXIMITY TO THE MAIN EARTHWORKS.
9.	ALL LEVELS IN THIS DRAWING ARE REFERRED TO THE DATUM.
10.	ALL LEVELS IN THIS DRAWING ARE REFERRED TO THE DATUM.
11.	TOPSOIL TO BE REMOVED TO A MINIMUM DEPTH OF 100mm, STOCKPILED AND MAINTAINED FOR THE DURATION OF THE WORK.
12.	ALL EXISTING SERVICES TO BE IDENTIFIED AND PROTECTED WITH THE SAME OR SIMILAR DIVISION CONTROL BLANKETS AS PER PROJECT SPECIFICATIONS.
13.	BEFORE THESE SERVICES ARE EXPOSED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL RELEVANT AUTHORITIES.
14.	THE CONTRACTOR TO REMOVE ALL TRACES THAT IMPACT THE ENGINEERING WORKS.

Service authority approval			
Position	Name	Date	Signature

Client(s)	Department of Health REPUBLIC OF SOUTH AFRICA
Signature	
Date	
Client Drawing No.:	
Sht	
Of	

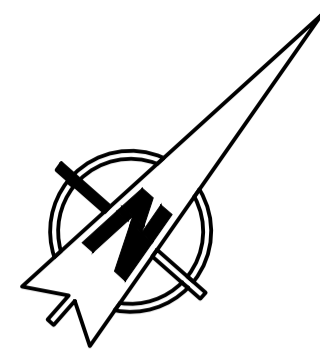
Project title	CECILIA MAKIWANE HOSPITAL: CP UNIT
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Drawing title	CIVIL SERVICES: SEWER DETAILS
Scale:	1:20
Paper Size:	A1

Signature		Date	
PR			

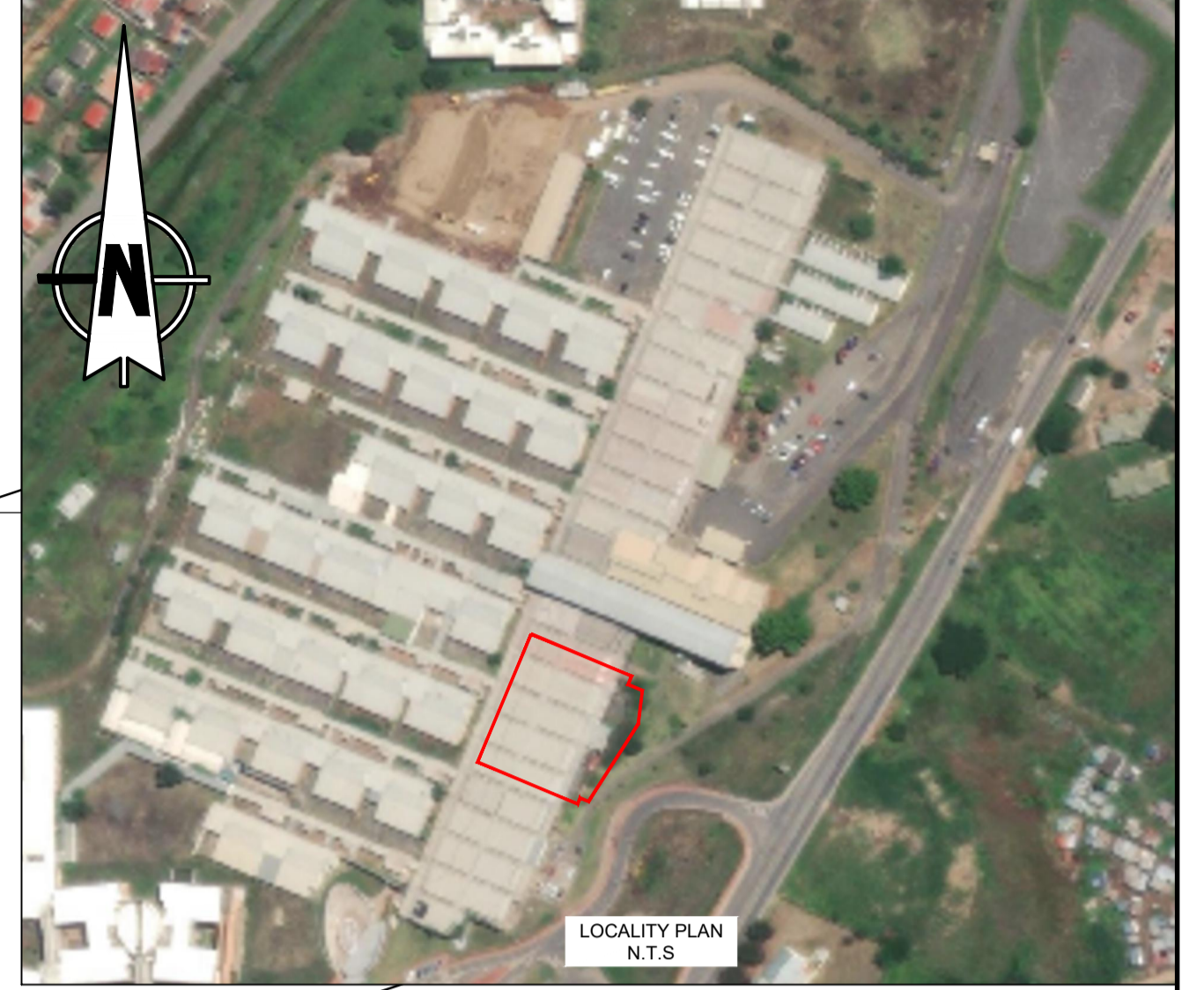
Name	Date	Signature
Designed		
Checked		
Verified		
Drawn		
Checked		

SMC Drawing No.:	Rev 0	Sht 1
EC0028-CMH-SEW-DT-022		Of 1



LEGEND:

⊙	EXISTING SEWER MANHOLE
---	EXISTING SEWER PIPE
---	PROPOSED 160 mm Ø CLASS 34 SEWER PIPE
○	PROPOSED 1000 mm Ø CONCRETE SEWER MANHOLE



FOR INFORMATION

Amendments	
Rev	Date
1	DEC 2023
2	SEPT 2023

Rev	Date	Description	Initials
1	DEC 2023	REVISED SEWER RETICULATION	LM
2	SEPT 2023	ISSUED FOR INFORMATION	LM

Drawing notes			
1.	FINAL PROPOSED TO AND STRUCTURE PENDING GEOTECHNICAL INVESTIGATION AND ENGINEERING SURVEY RESULTS, LAYERSWORK AND GEOMETRY ON THIS DRAWING/ISSUE MANHOLE.		
2.	POSITIONS OF EXISTING SERVICES ARE APPROXIMATE AND ACTUAL POSITIONS AND LEVELS MUST BE DETERMINED ON SITE BY CONTRACTORS BEFORE WORK COMMENCES.		
3.	ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE LATEST SANS SPECIFICATIONS AND PROJECT SPECIFICATIONS.		
4.	NO WORK TO COMMENCE OUTSIDE THE CONSTRUCTION LIMITS. ENGINEERS MAY INSTRUCT WORK STOPPAGE SHOULD ANY ACTIVITY COMMENCE OUTSIDE THE CONSTRUCTION LIMITS.		
5.	ALL MATERIAL TO BE APPROVED BY ENGINEER PRIOR TO INSTALLATION.		
6.	A COMPLETE SET OF DRAWINGS TO BE AVAILABLE ON SITE AT ALL TIMES.		
7.	THE CONTRACTOR SHALL HAVE ALL THE NECESSARY SKILLED PERSONNEL PRIOR TO ANY CONSTRUCTION WORK.		
8.	THE CONTRACTOR TO CONSULT A REGISTERED ENGINEER FOR ALL THE EXISTING SERVICES LOCATED IN CLOSE PROXIMITY TO THE S&L EARTHWORKS.		
9.	CONTRACTOR TO VERIFY ALL LEVELS OF ALL EXISTING PIPES AND MANHOLES AT WHICH CONNECTIONS ARE REQUIRED AND REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO ANY CONSTRUCTION.		
10.	TOPSOIL TO BE RELOCATED TO A MINIMUM DEPTH OF 100mm, STOCKPILED AND MAINTAINED FOR THE DURATION OF THE WORKS.		
11.	ALL CIVIL AND UTILITIES WORKS TO BE PROTECTED WITH THE GRADE BY AN APPROPRIATE CONTROL BARRELS AS PER PROJECT SPECIFICATIONS.		
12.	EXISTING TRAILS WITHIN THE SITE SHALL BE SURVEYED, CO-ORDINATES OF THE TRAIL PORTIONS WILL NEED TO BE PROVIDED TO THE ENGINEER, WHO WILL INSTRUCT THE CONTRACTOR TO BRIDGE ALL TRAILS THAT IMPACT THE ENGINEERING WORKS.		

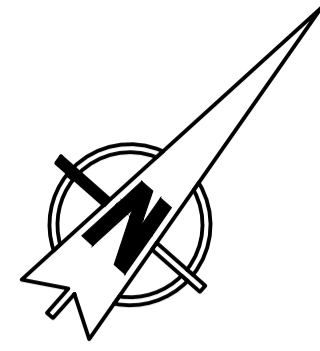
Service authority approval			
Position	Name	Date	Signature

Client(s)	
health Department of Health REPUBLIC OF SOUTH AFRICA	
Signature _____	Date _____
Client Drawing No.: _____	Sht _____ of _____

Project title	
CECILIA MAKIWANE HOSPITAL: CP UNIT	
CIVIL SERVICES: SEWER RETICULATION	
Scale: 1:500	Paper Size: A1

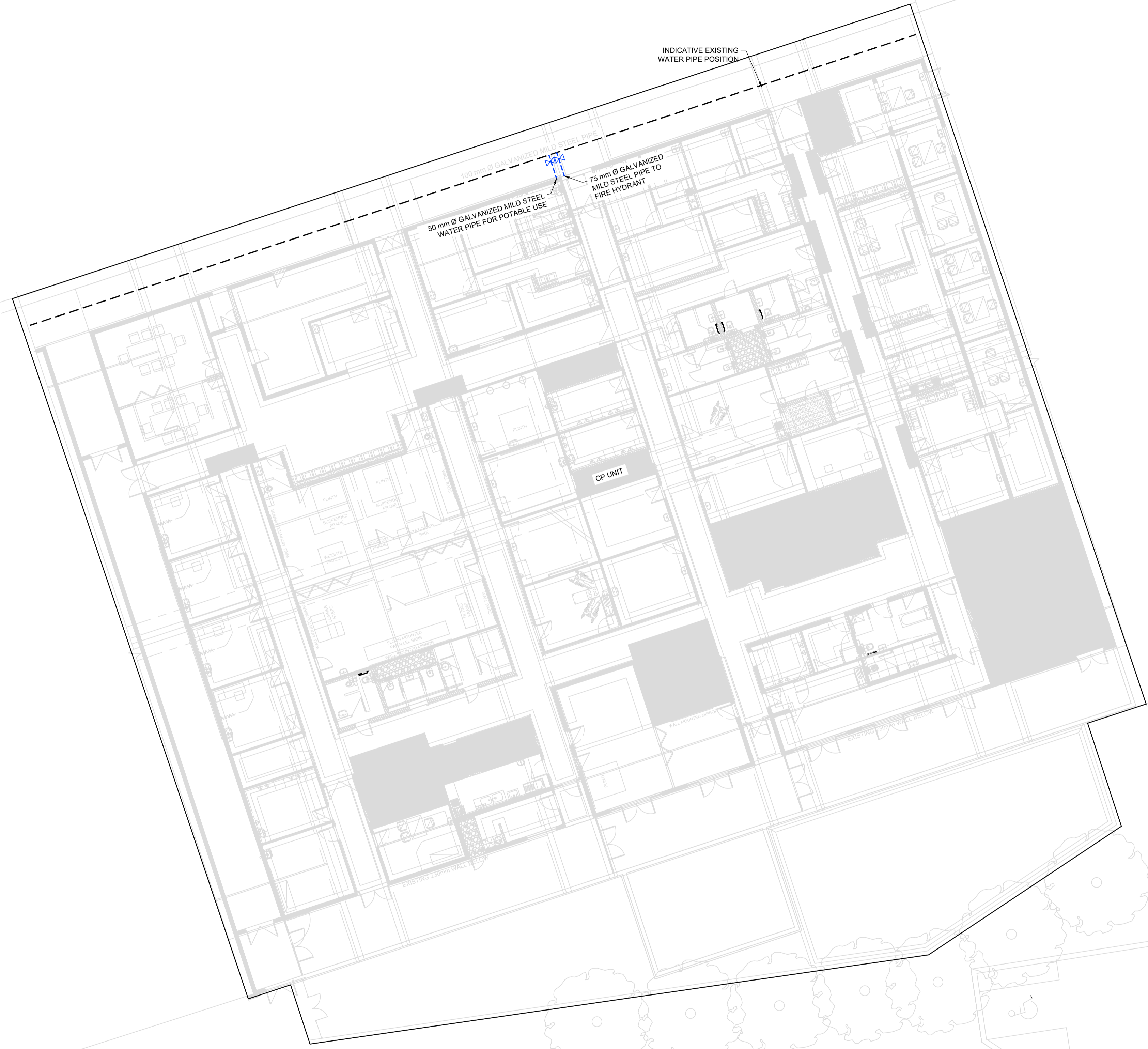
Drawing title	
SMC Member of the Surbana Jurong Group	
Signature _____	PR _____ Date _____

Process			
Name	Date	Signature	
Designed	L.MANYISA		
Checked	D.SHARP		
Verified	J.KAMPMAN		
Drawn	L.MANYISA		
Checked	J.KAMPMAN		
SMC Drawing No.: EC0028-CMH-SEW-GA-020		Rev 1	Sht 1 of 1



LEGEND:

---	EXISTING INFRASTRUCTURE
---	EXISTING WATER PIPE
---	PROPOSED INFRASTRUCTURE
⊗	PROPOSED ISOLATION VALVE
---	PROPOSED WATER PIPE



FOR INFORMATION

Rev	Date	Description	Initials
1	SEPT 2023	ISSUED FOR INFORMATION	L.M.

Drawing notes

- FINAL SOUP-TO-SOUP AND STRUCTURE PERMITS, GEOTECHNICAL, INVESTIGATION AND ENGINEERING SURVEY RESULTS, LAYERS AND GEOMETRY ON THIS DRAWING MUST BE VERIFIED.
- POSITIONS OF EXISTING SERVICES ARE APPROXIMATE AND ACTUAL POSITIONS AND LEVELS MUST BE DETERMINED ON SITE BY CONTRACTORS BEFORE WORK COMMENCES.
- ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE SAWS (SEE SPECIFICATIONS AND PROJECT PREPARATIONS).
- NO WORK TO COMMENCE OUTSIDE THE CONSTRUCTION LIMITS. ENGINEERS MAY INSTRUCT WORK STOPPAGE SHOULD ANY ACTIVITY COMMENCE OUTSIDE THE CONSTRUCTION LIMITS.
- ALL MATERIALS TO BE APPROVED BY ENGINEER PRIOR TO INSTALLATION.
- A COMPLETE SET OF DRAWINGS TO BE AVAILABLE ON SITE AT ALL TIMES.
- THE CONTRACTOR SHALL MAINTAIN ALL THE NECESSARY MATERIALS IN PLACE PRIOR TO ANY CONSTRUCTION WORK.
- THE CONTRACTOR TO COMPLETE A DOCUMENTARY EVIDENCE OF ALL THE EXISTING SERVICES LOCATED IN CLOSE PROXIMITY TO THE BULK CARRIAGES.
- CONNECTIONS TO BE MADE IN ACCORDANCE WITH THE SAWS (SEE SPECIFICATIONS AND PROJECT PREPARATIONS).
- ALL LEVELS IN NOTES AND REFER TO THE CONSTRUCTION TO BE MADE IN ACCORDANCE WITH THE SAWS (SEE SPECIFICATIONS AND PROJECT PREPARATIONS).
- CONNECTIONS TO BE MADE IN ACCORDANCE WITH THE SAWS (SEE SPECIFICATIONS AND PROJECT PREPARATIONS).
- WORKING TO BE PROVIDED TO A MINIMUM DEPTH OF 100mm, STOCKPILED AND MAINTAINED FOR THE DURATION OF THE WORK.
- ALL EXISTING SERVICES TO BE IDENTIFIED AND PROTECTED WITH A SIGNATURE OR MARK AS BEING EXISTING. SIGNATURE TO BE ALL PROJECT SPECIFICATIONS.
- EXISTING TRAILS WITHIN THE SITE SHALL BE SURVEYED. COORDINATES OF THE TREE POSITIONS WILL NEED TO BE PROVIDED TO THE ENGINEER, WHO WILL INSTRUCT THE CONTRACTOR TO REMOVE ALL TREES THAT IMPACT THE ENGINEERING WORKS.

Service authority approval

Position	Name	Date	Signature

Client(s)

Province of the EASTERN CAPE HEALTH

Signature _____ Date _____

Client Drawing No.: _____ Sht _____ Of _____

Project title

CECILIA MAKIWANE HOSPITAL: CP UNIT

Drawing title

CIVIL SERVICES: WATER RETICULATION

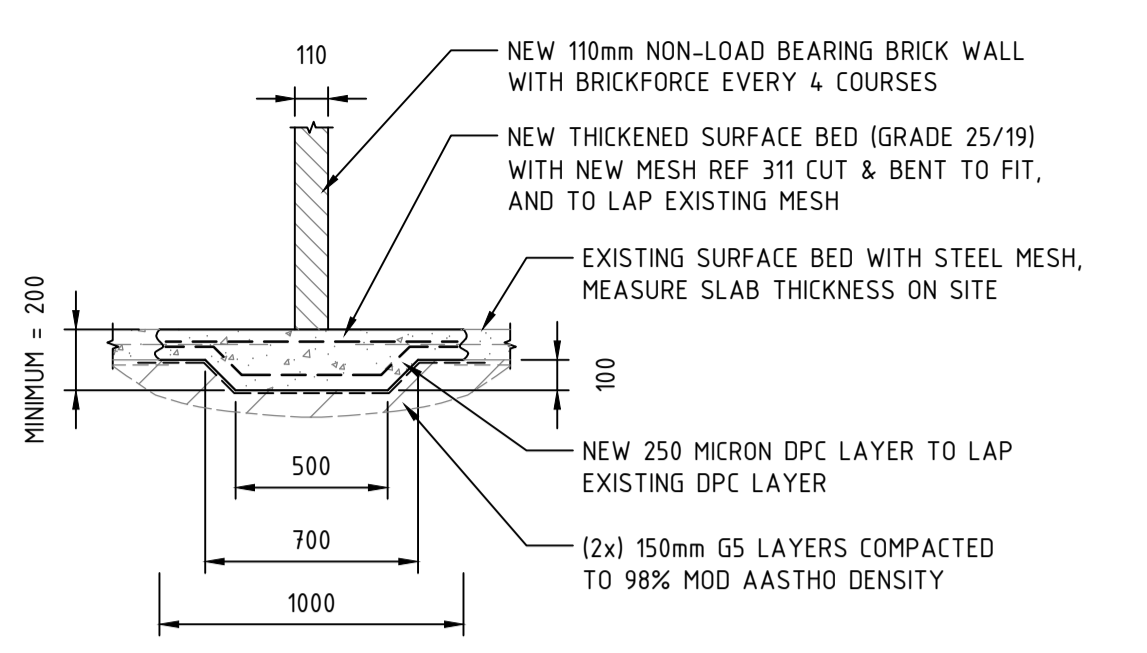
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Member of the Surbana Jurong Group

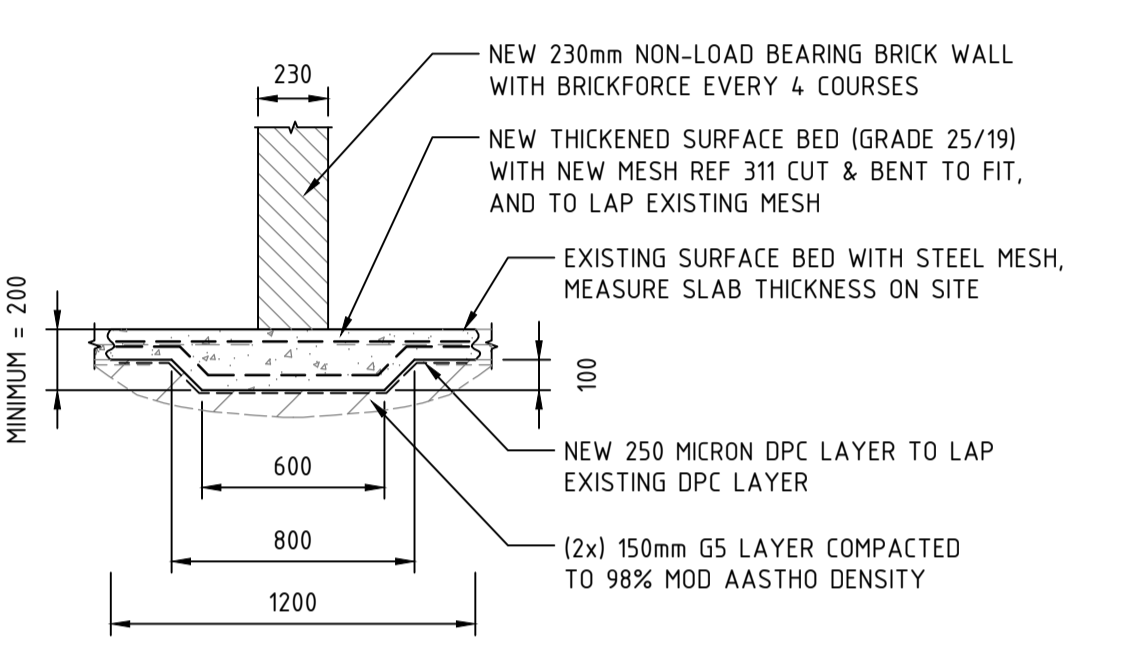
Signature _____ PR _____ Date _____

Process	Name	Date	Signature
Designed	L.MANYISA		
Checked	D.SHARP		
Verified	J.KAMPFMAN		
Drawn	L.MANYISA		
Checked	J.KAMPFMAN		

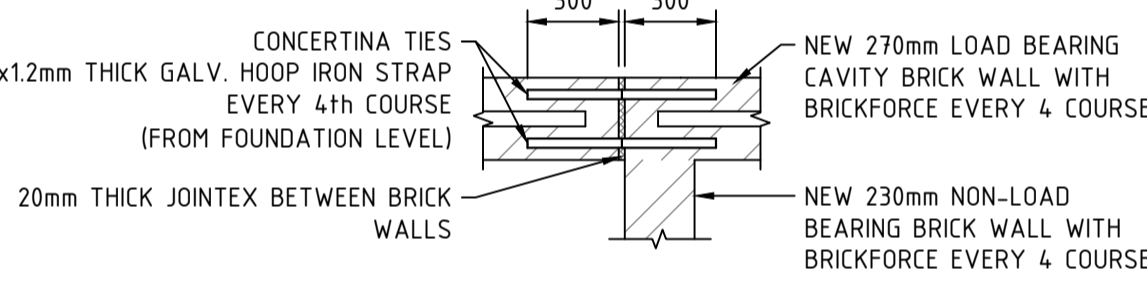
SMC Drawing No.: _____ Rev 0 Sht 1
EC0028-CMH-WAT-GA-030 Of 1



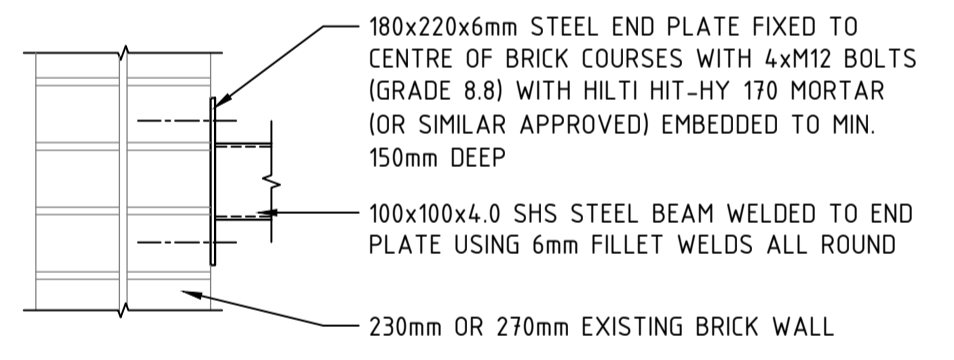
TYPICAL 110mm NON-LOAD BEARING BRICK WALL THICKENED SURFACE BED SECTION: TYPE 1
SCALE 1:25



TYPICAL 230mm NON-LOAD BEARING BRICK WALL THICKENED SURFACE BED SECTION: TYPE 2
SCALE 1:25



DETAIL A
CONTROL JOINT (C.J.)
PLAN
SCALE 1:25



DETAIL B
SECTION
SCALE 1:10

NOTE: FOR ALL JOINTS, FINISHES AND WATERPROOFING DETAILS REFER TO ARCHITECTS DRAWINGS

LINTEL LENGTH	MINIMUM BEARING EACH END	MIN.No BRICK COURSES ABOVE LINTEL
900-1500	150	3
1500-3000	230	4
3000-3900	230	5
3900-5400	300	6

PRESTRESSED CONCRETE LINTELS TO BE IN ACCORDANCE WITH SABS 1504.

TYPICAL LINTEL DETAILS FOR WINDOW/DOOR OPENINGS
SECTION
SCALE 1:10

NOTE: FOR ALL JOINTS, FINISHES AND WATERPROOFING DETAILS REFER TO ARCHITECTS DRAWINGS

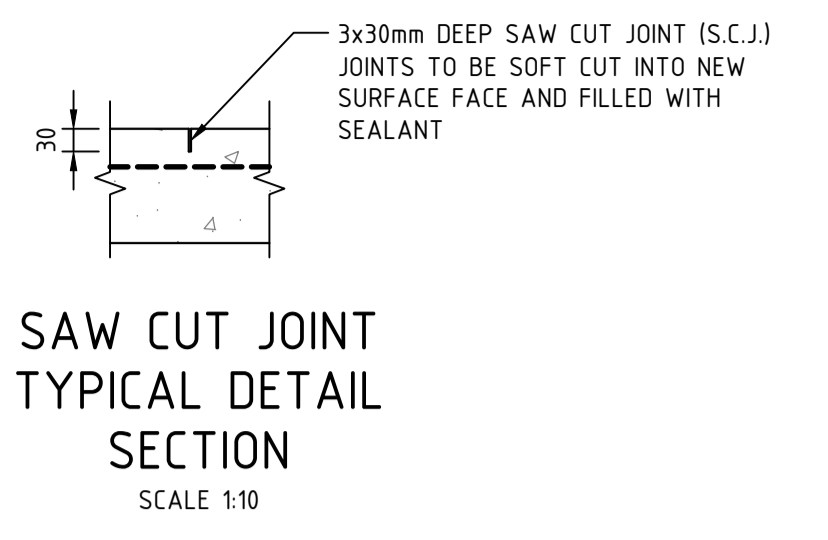
LINTEL LENGTH	MINIMUM BEARING EACH END	MIN.No BRICK COURSES ABOVE LINTEL
900-1500	150	3
1500-3000	230	4
3000-3900	230	5
3900-5400	300	6

PRESTRESSED CONCRETE LINTELS TO BE IN ACCORDANCE WITH SABS 1504.

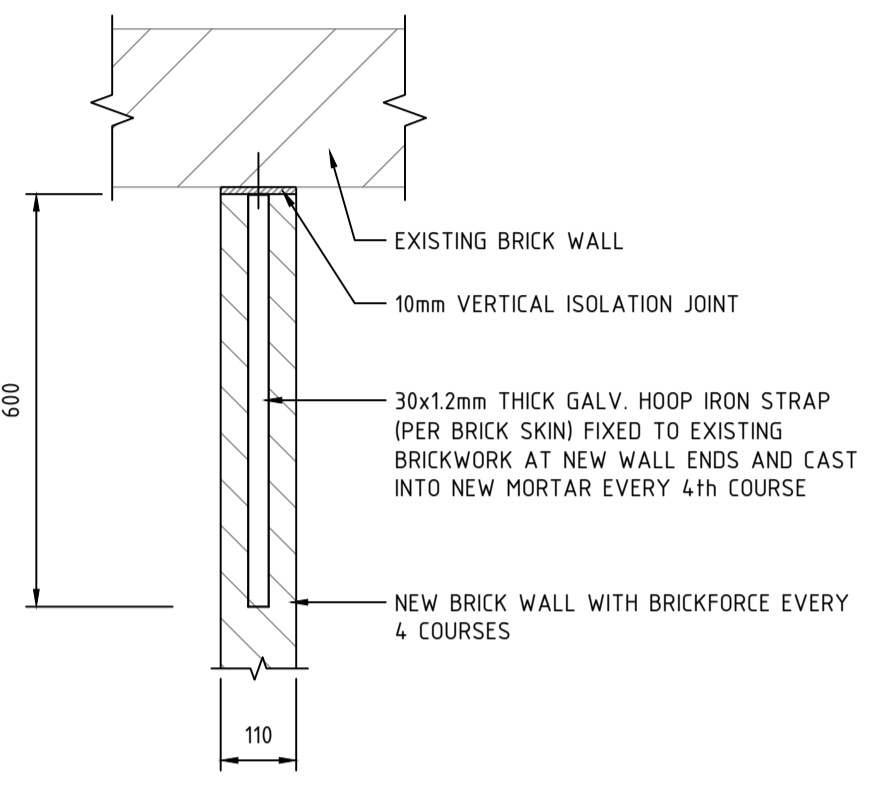
NOTE: FOR ALL JOINTS, FINISHES AND WATERPROOFING DETAILS REFER TO ARCHITECTS DRAWINGS

LINTEL LENGTH	MINIMUM BEARING EACH END	MIN.No BRICK COURSES ABOVE LINTEL
900-1500	150	3
1500-3000	230	4
3000-3900	230	5
3900-5400	300	6

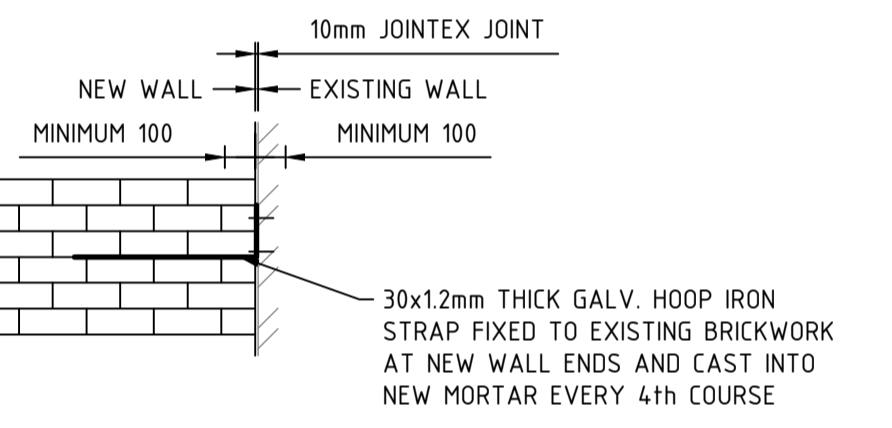
PRESTRESSED CONCRETE LINTELS TO BE IN ACCORDANCE WITH SABS 1504.



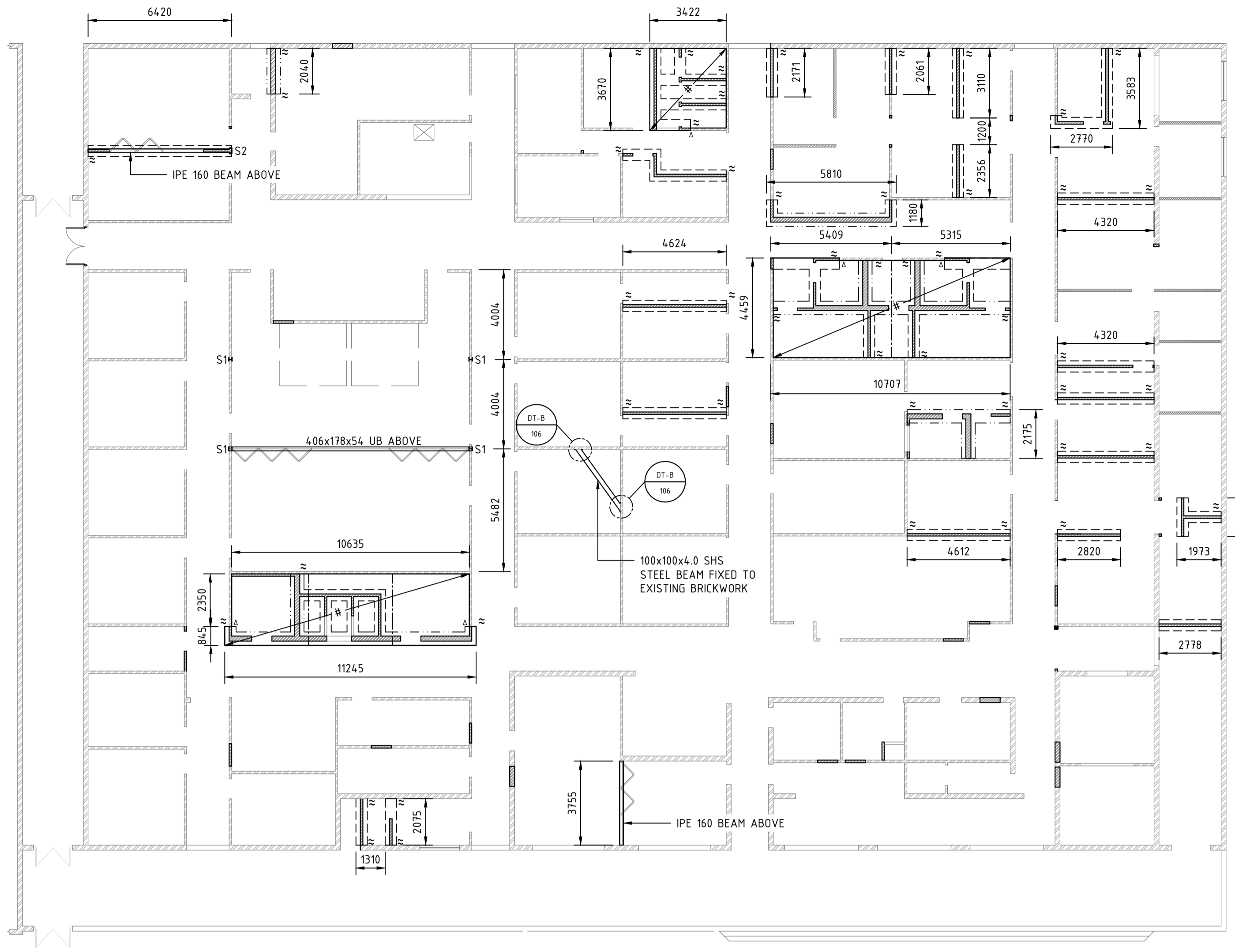
SAW CUT JOINT
TYPICAL DETAIL
SECTION
SCALE 1:10



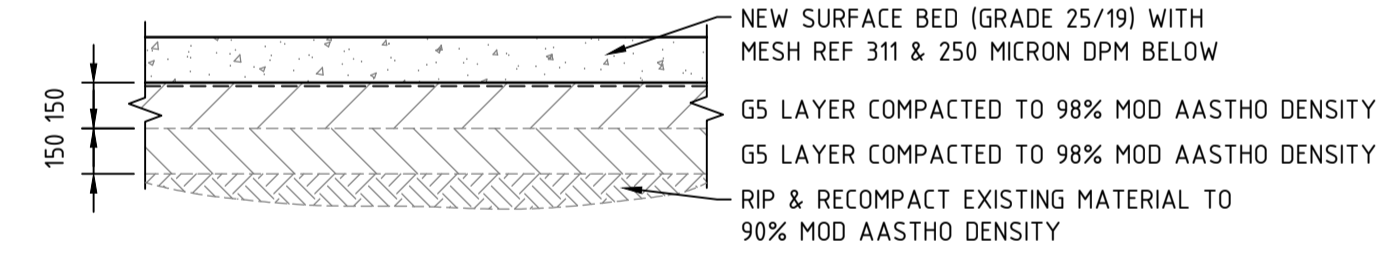
FIXING NEW WALL TO EXISTING
PLAN
SCALE 1:10



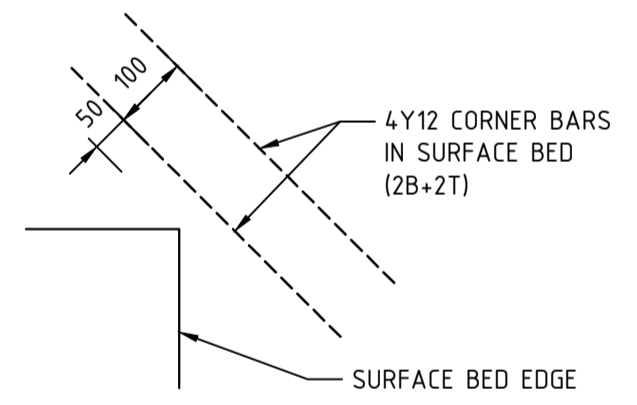
FIXING NEW WALL TO EXISTING
ELEVATION
SCALE 1:25



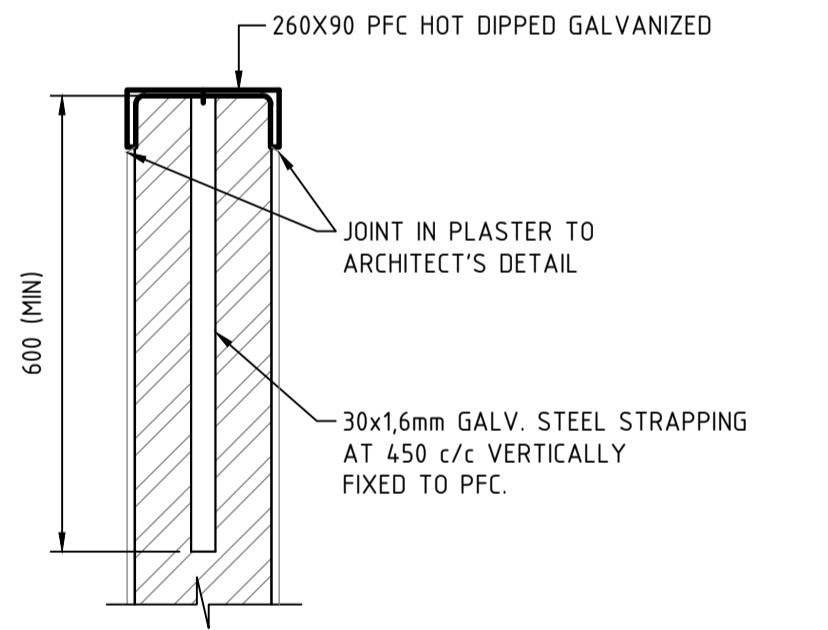
SURFACE BED LAYOUT
SCALE 1:150



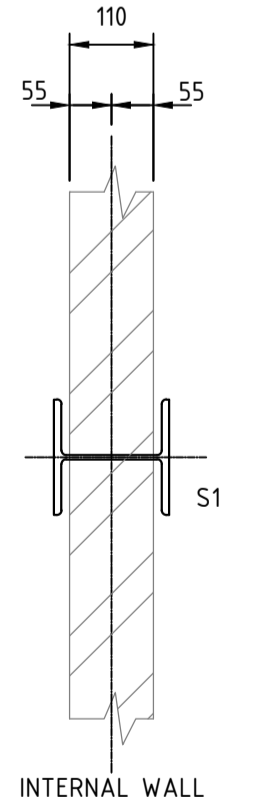
TYPICAL LAYER WORKS UNDER SURFACE BED
SECTION
SCALE 1:25



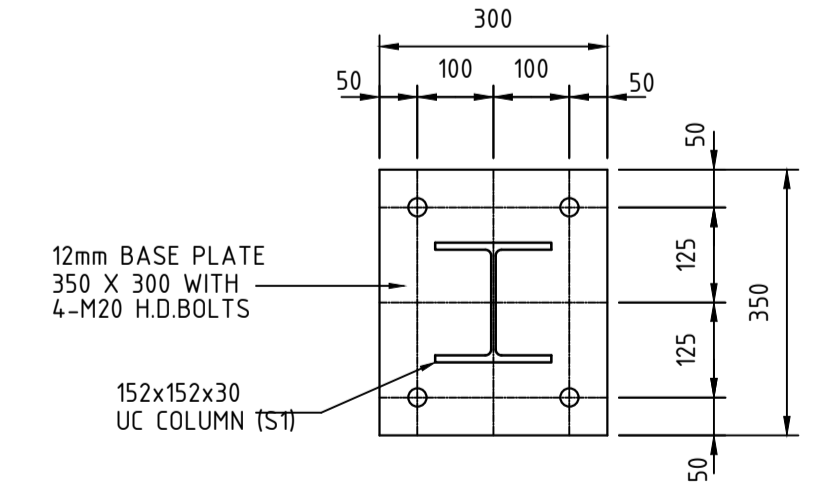
CORNER BARS (Δ)
TYPICAL DETAIL
PLAN
SCALE 1:10



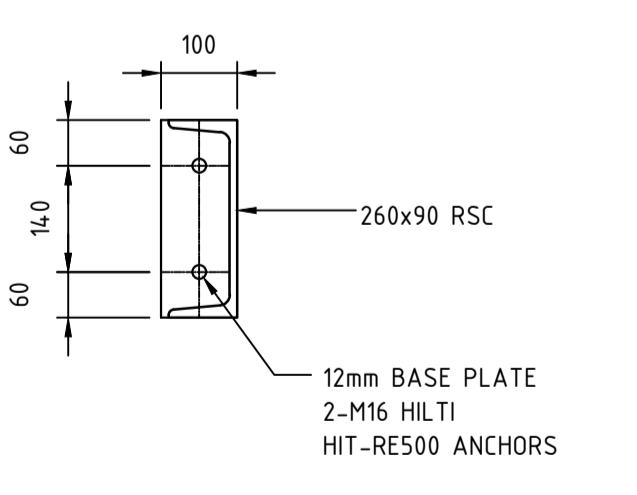
UC COLUMN (S2)
SCALE 1:10



UC COLUMN (S1)
SCALE 1:10



BASE PLATE DETAILS (S1)
SCALE 1:10



BASE PLATE DETAILS (S2)
SCALE 1:10

- GENERAL NOTES:
- REFER TO DRAWINGS EC0027-DNH-STR-DRW-001, 002, 003 FOR GENERAL NOTES & SPECIFICATIONS
 - GEOTECHNICAL INFORMATION IS OUTSTANDING AND THEREFORE ALL FOUNDATIONS AND LAYER WORKS SHOWN ARE PRELIMINARY.
 - FOUNDATION SIZES & DEPTHS BELOW NGL TO BE CONFIRMED AFTER GEOTECHNICAL INFORMATION IS RECEIVED.
 - DRAWING TO BE READ IN CONJUNCTION WITH ARCHITECT'S DRAWING.
 - ALL STRUCTURAL STEEL MEMBERS TO BE HOT DIPPED GALVANIZED.
 - LINTELS TO BE INSTALLED WHERE NEW OPENINGS (WINDOW/ DOOR) IN WALLS ARE BEING INTRODUCED

COLUMN SCHEDULE

FOUNDATION No.	DESCRIPTION
S1	152x152x30 UNIVERSAL COLUMN STIFFENER
S2	260x90 RSC

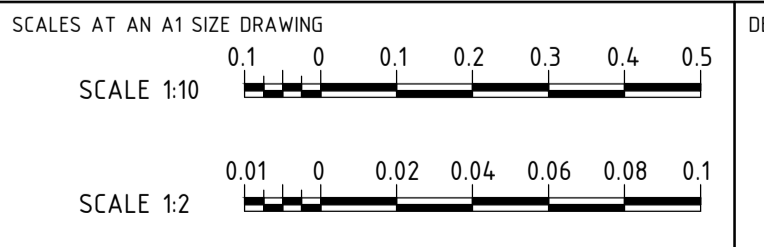
- LEGEND
- NEW LOAD BEARING BRICKWORK
 - NEW NON-LOAD BEARING BRICKWORK
 - EXISTING BRICKWORK
 - FIXING NEW WALL TO EXISTING
 - THICKENED SURFACE BED TYPE 1 (110mm WALL)
 - THICKENED SURFACE BED TYPE 2 (230mm WALL)
 - NEW 150mm SURFACE BED (GRADE 25/19) WITH MESH REF 311
 - SAW CUT JOINTS IN SURFACE BED
 - CORNER BARS IN SURFACE BED

FOR INFORMATION

REV	DATE	AMENDMENT / REVISION DESCRIPTION	MWR No.	APPROVAL	DRAWING APPROVED
A	27/09/2023	ISSUED FOR INFORMATION			

ENGINEER :
PR ENG No. :
SIGNATURE :

TITLE	NAME
DRAFTER	S.GIRD
DRAFTING CHECK	A.SIBIYA
DESIGNER	S.GIRD
DESIGN CHECK	A.SIBIYA
PROJECT MANAGER	J.KAMPMAN
PROJECT DIRECTOR	J.KAMPMAN



DESIGNER

SMEC South Africa
Member of the Surbana Jurong Group

SABS
ISO 9001

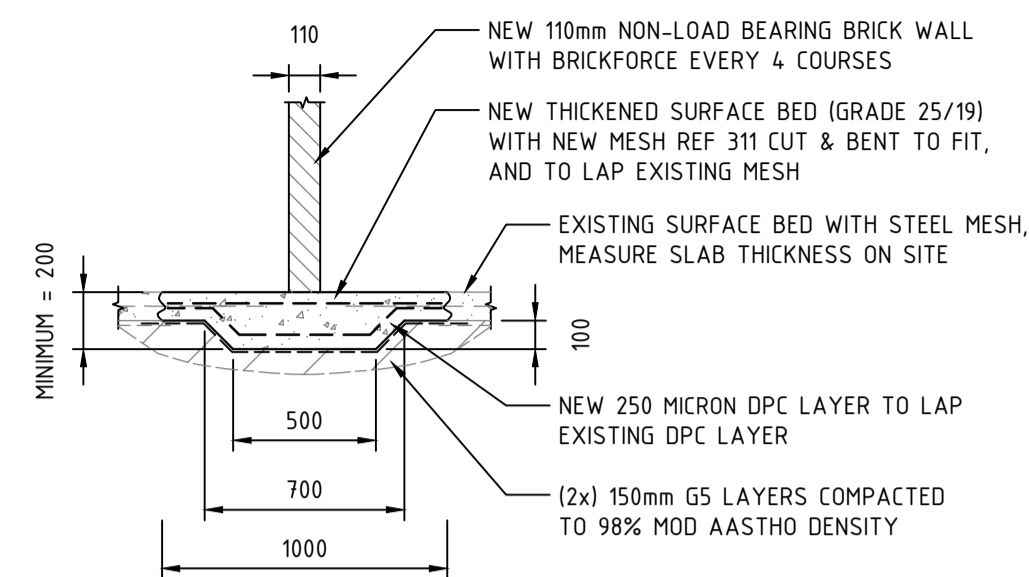
SMEC PROJECT No EC0028

CLIENT

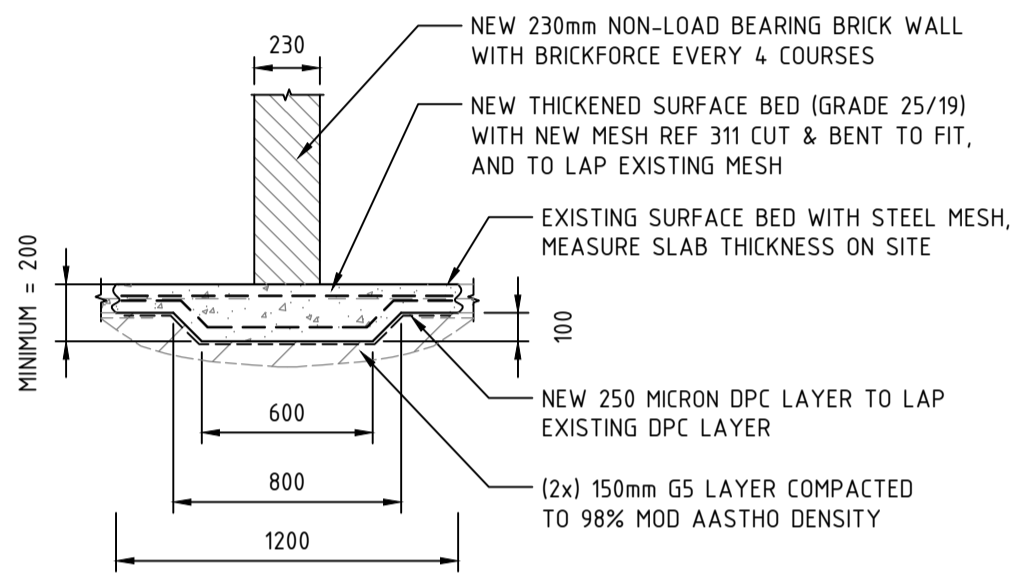
Province of the
EASTERN CAPE
HEALTH

EASTERN CAPE DEPARTMENT OF HEALTH
CECILIA MAKIWANE HOSPITAL
CEREBRAL PALSY (CP) UNIT
SURFACE BED LAYOUT & DETAILS
STRUCTURAL DRAWING

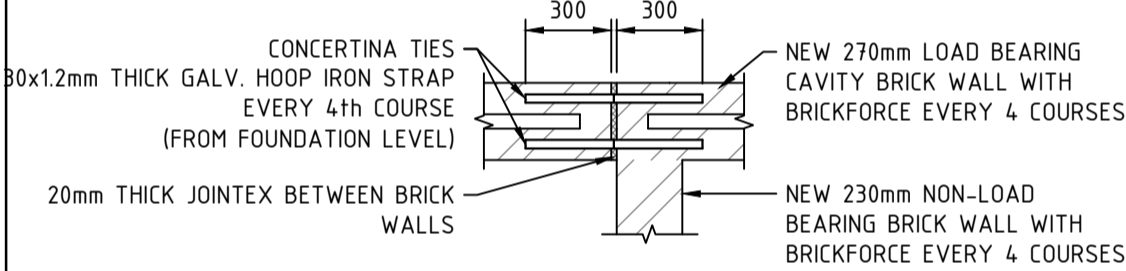
PHASE	DRAWING TYPE	DRAWING NUMBER	REVISION
1	DRW	106	A



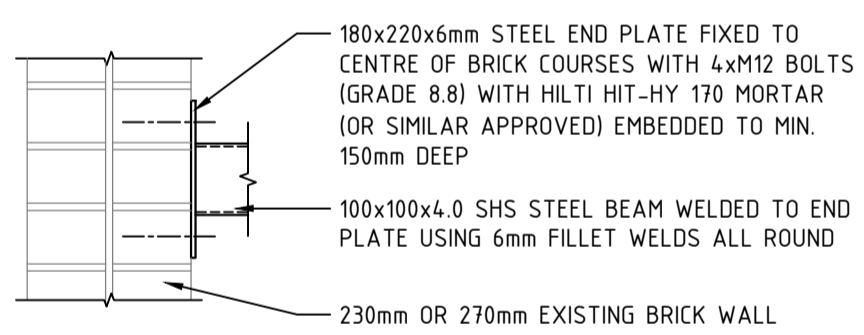
TYPICAL 110mm NON-LOAD BEARING BRICK WALL THICKENED SURFACE BED SECTION: TYPE 1
SCALE 1:25



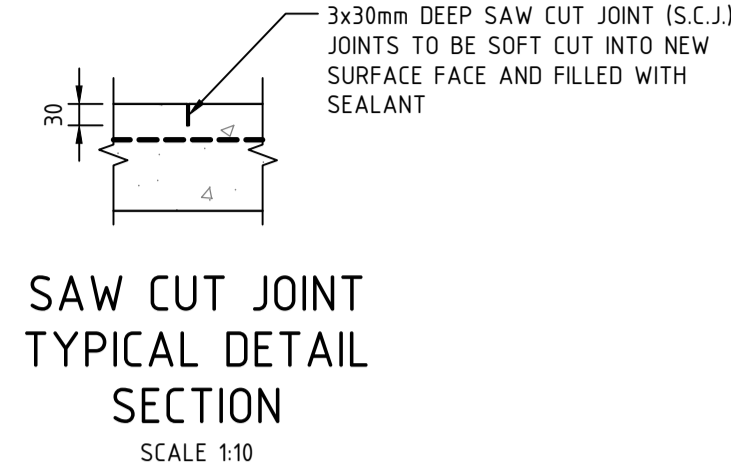
TYPICAL 230mm NON-LOAD BEARING BRICK WALL THICKENED SURFACE BED SECTION: TYPE 2
SCALE 1:25



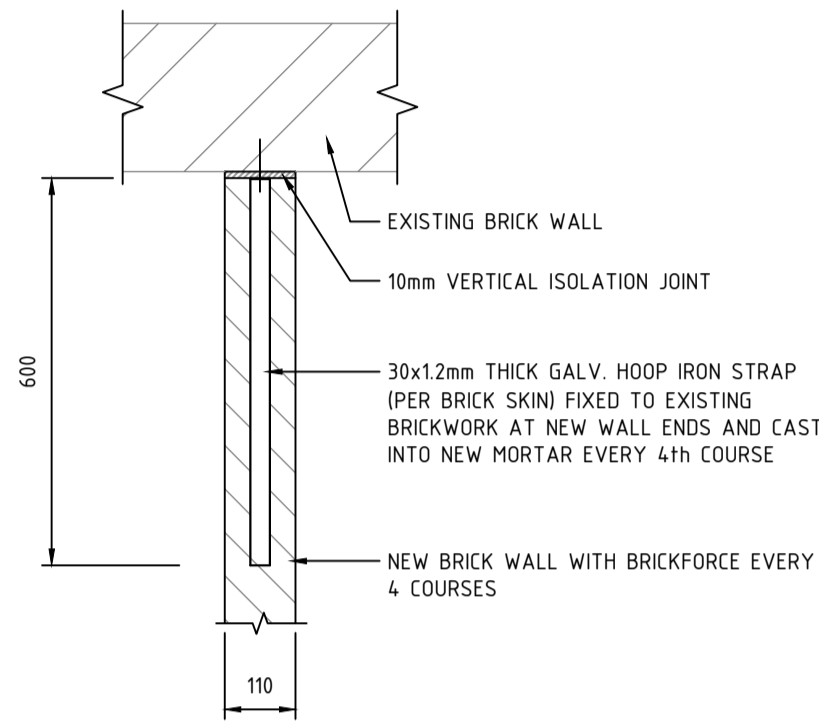
DETAIL A
CONTROL JOINT (C.J.)
PLAN
SCALE 1:25



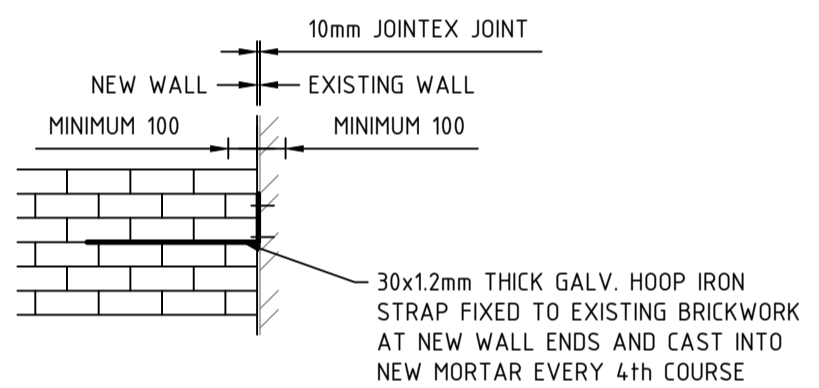
DETAIL B
SECTION
SCALE 1:10



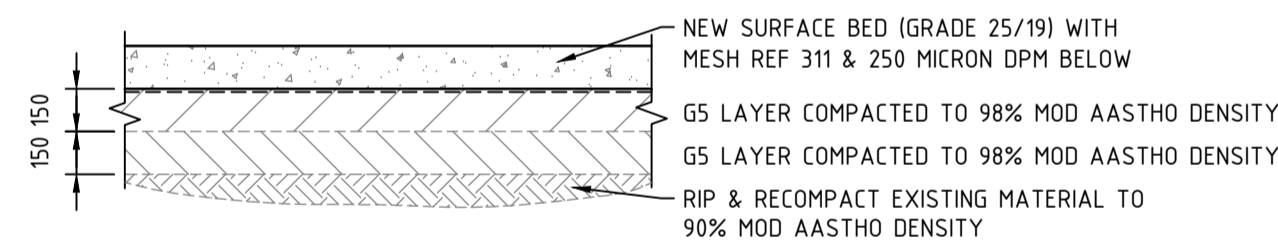
SAW CUT JOINT
TYPICAL DETAIL
SECTION
SCALE 1:10



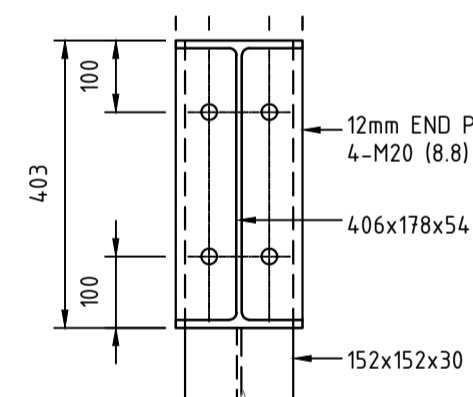
FIXING NEW WALL TO EXISTING
PLAN
SCALE 1:10



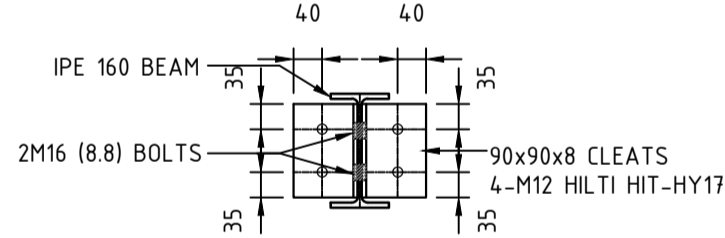
FIXING NEW WALL TO EXISTING
ELEVATION
SCALE 1:25



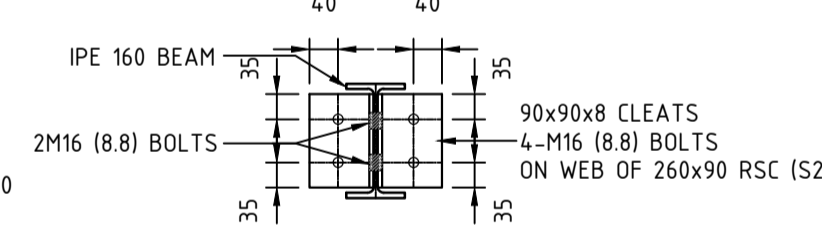
TYPICAL LAYER WORKS UNDER SURFACE BED
SECTION
SCALE 1:25



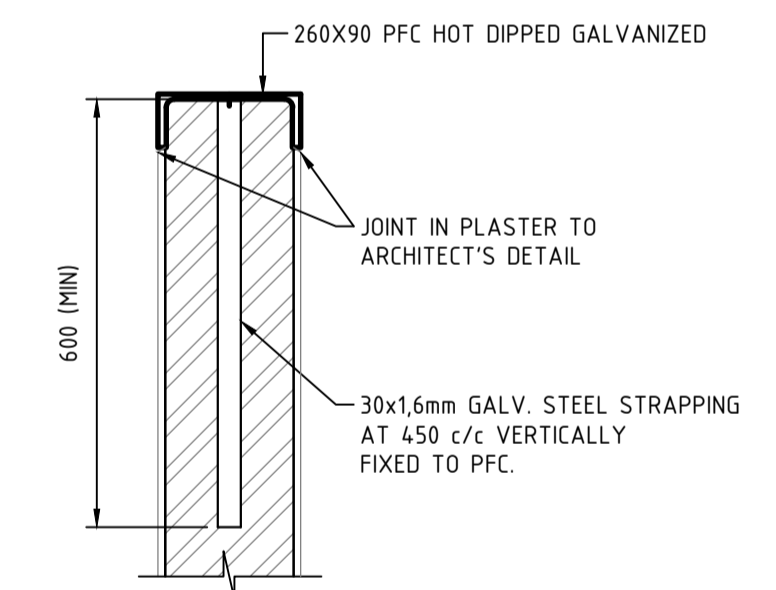
CONNECTION DETAIL C
SCALE 1:10



IPE 160 BRICK WALL
CONNECTION DETAIL D
SCALE 1:10



IPE 160
CONNECTION DETAIL E
SCALE 1:10



UC COLUMN (S2)
SCALE 1:10

NOTE: FOR ALL JOINTS, FINISHES AND WATERPROOFING DETAILS REFER TO ARCHITECTS DRAWINGS

LINTEL LENGTH	LINTEL EDGE BEARING	
	MINIMUM BEARING EACH END	MIN No BRICK COURSES ABOVE LINTEL
900-1500	150	3
1500-3000	230	4
3000-3900	230	5
3900-5400	300	6

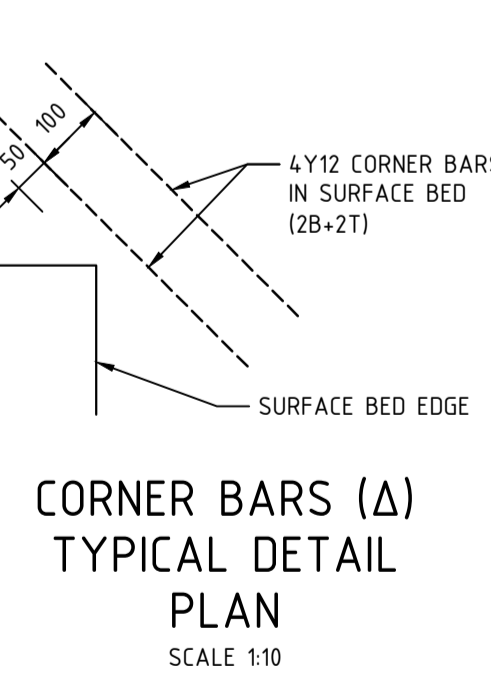
NOTE: FOR ALL JOINTS, FINISHES AND WATERPROOFING DETAILS REFER TO ARCHITECTS DRAWINGS

LINTEL LENGTH	LINTEL EDGE BEARING	
	MINIMUM BEARING EACH END	MIN No BRICK COURSES ABOVE LINTEL
900-1500	150	3
1500-3000	230	4
3000-3900	230	5
3900-5400	300	6

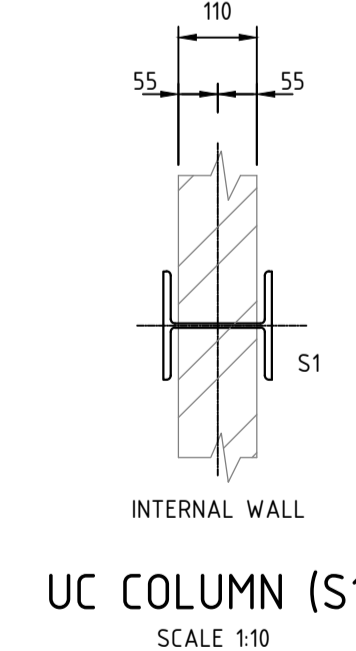
NOTE: FOR ALL JOINTS, FINISHES AND WATERPROOFING DETAILS REFER TO ARCHITECTS DRAWINGS

LINTEL LENGTH	LINTEL EDGE BEARING	
	MINIMUM BEARING EACH END	MIN No BRICK COURSES ABOVE LINTEL
900-1500	150	3
1500-3000	230	4
3000-3900	230	5
3900-5400	300	6

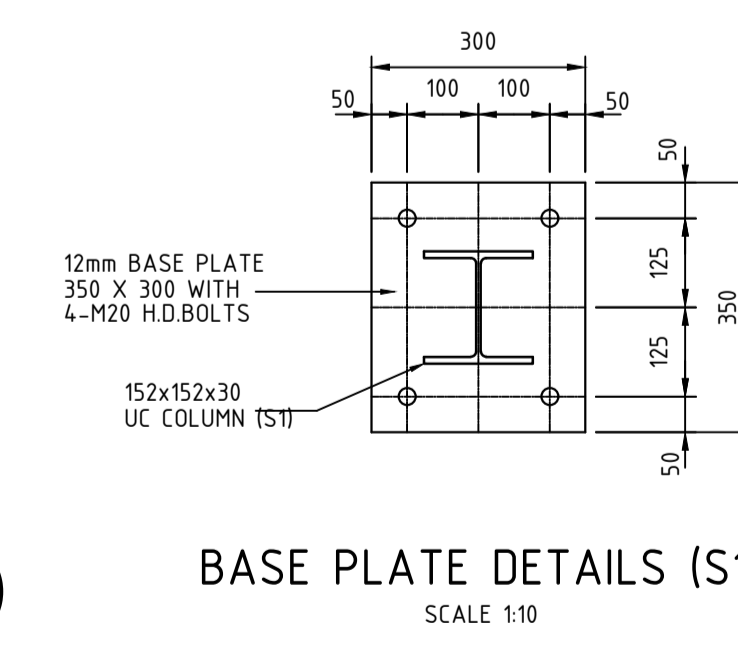
TYPICAL LINTEL DETAILS FOR WINDOW/DOOR OPENINGS
SECTION
SCALE 1:10



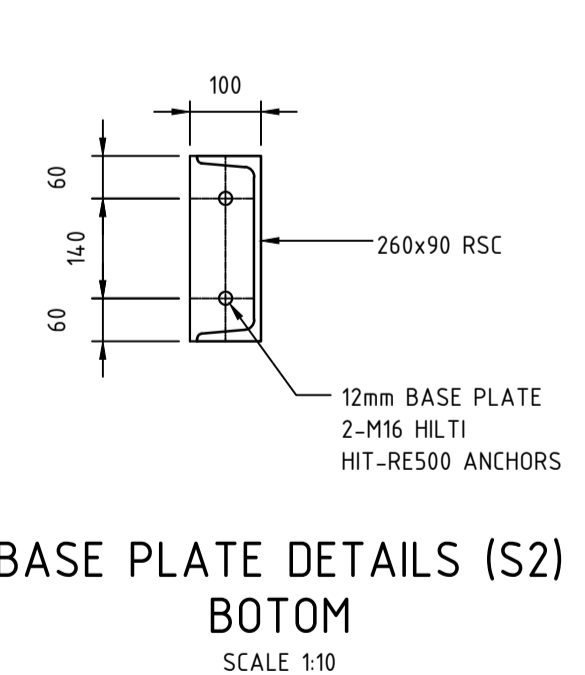
CORNER BARS (Δ)
TYPICAL DETAIL
PLAN
SCALE 1:10



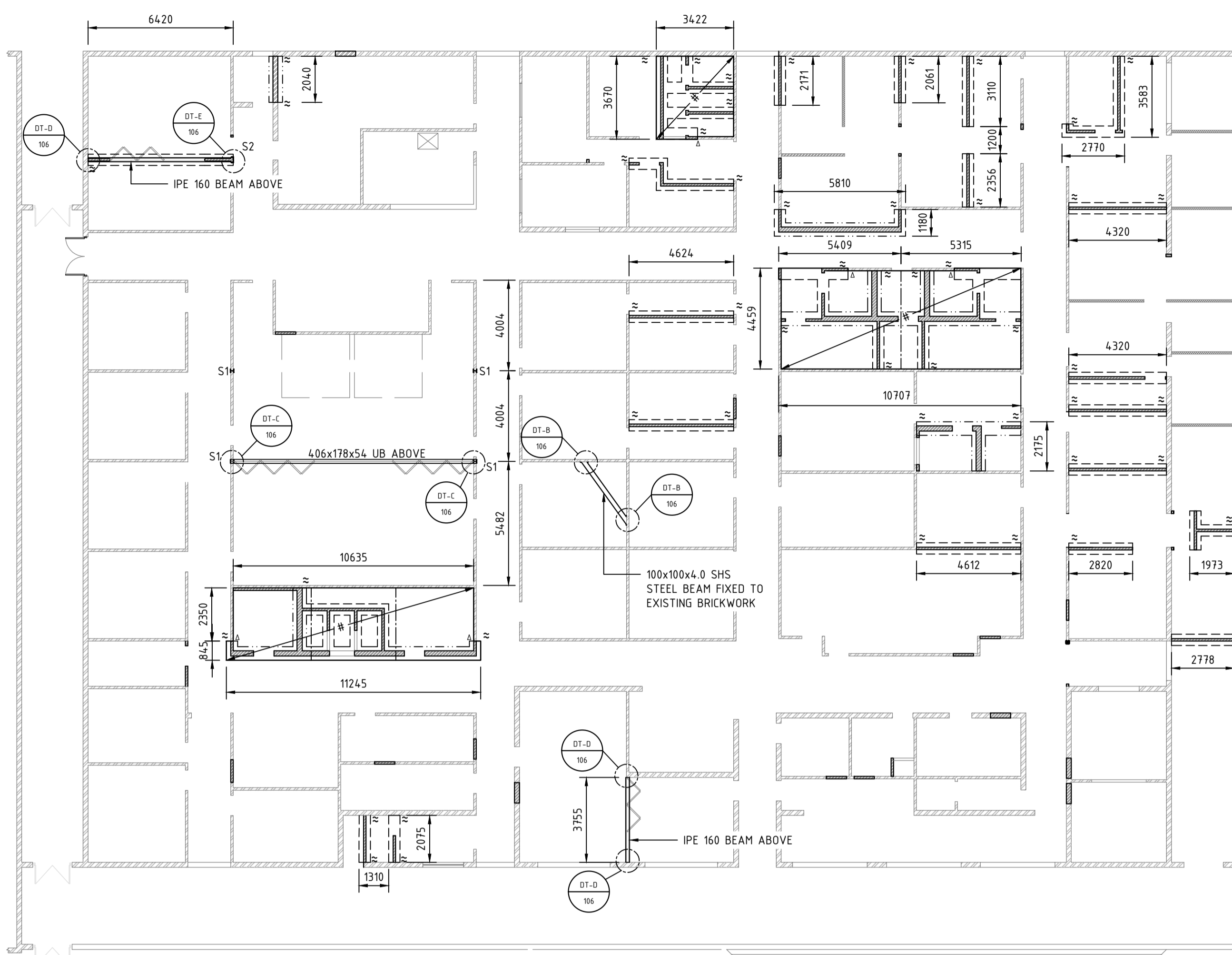
UC COLUMN (S1)
SCALE 1:10



BASE PLATE DETAILS (S1)
SCALE 1:10



BASE PLATE DETAILS (S2)
BOTOM
SCALE 1:10



SURFACE BED LAYOUT
SCALE 1:150

- GENERAL NOTES:
- REFER TO DRAWINGS EC0027-DNH-STR-DRW-001, 002, 003 FOR GENERAL NOTES & SPECIFICATIONS. GEOTECHNICAL INFORMATION IS OUTSTANDING AND THEREFORE ALL FOUNDATIONS AND LAYER WORKS SHOWN ARE PRELIMINARY.
 - FOUNDATION SIZES & DEPTHS BELOW NGL TO BE CONFIRMED AFTER GEOTECHNICAL INFORMATION IS RECEIVED.
 - DRAWING TO BE READ IN CONJUNCTION WITH ARCHITECT'S DRAWING.
 - ALL STRUCTURAL STEEL MEMBERS TO BE HOT DIPPED GALVANIZED.
 - LINTELS TO BE INSTALLED WHERE NEW OPENINGS (WINDOW/ DOOR) IN WALLS ARE BEING INTRODUCED

COLUMN SCHEDULE	
FOUNDATION No.	DESCRIPTION
S1	152x152x30 UNIVERSAL COLUMN STIFFENER
S2	260x90 RSC

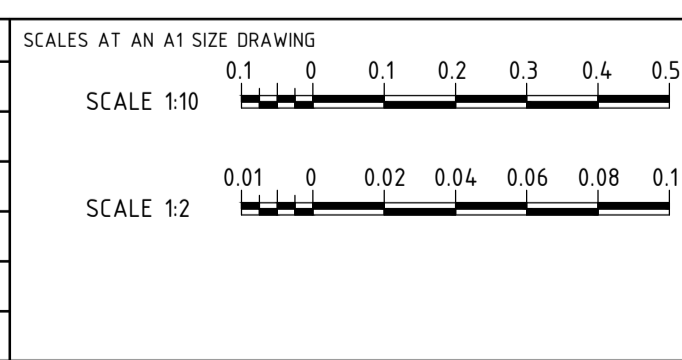
- LEGEND
- NEW LOAD BEARING BRICKWORK
 - NEW NON-LOAD BEARING BRICKWORK
 - EXISTING BRICKWORK
 - FIXING NEW WALL TO EXISTING
 - THICKENED SURFACE BED TYPE 1 (110mm WALL)
 - THICKENED SURFACE BED TYPE 2 (230mm WALL)
 - NEW 150mm SURFACE BED (GRADE 25/19) WITH MESH REF 311
 - SAW CUT JOINTS IN SURFACE BED
 - CORNER BARS IN SURFACE BED

FOR INFORMATION

REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	DRAWING APPROVED
A	27/09/2023	ISSUED FOR INFORMATION			
B	06/12/2023	ADDITIONAL STRUCTURAL STEEL CONNECTIONS			

ENGINEER :
PR ENG No. :
SIGNATURE :

TITLE	NAME
DRAFTER	S.GIRD
DRAFTING CHECK	A.SIBIYA
DESIGNER	S.GIRD
DESIGN CHECK	A.SIBIYA
PROJECT MANAGER	JKAMPMAN
PROJECT DIRECTOR	JKAMPMAN



DESIGNER

SMC PROJECT No EC0028

CLIENT

Province of the EASTERN CAPE HEALTH

EASTERN CAPE DEPARTMENT OF HEALTH CECILIA MAKIwane HOSPITAL CEREBRAL PALSY (CP) UNIT SURFACE BED LAYOUT & DETAILS STRUCTURAL DRAWING			
PHASE 1	DRAWING TYPE DRW	DRAWING NUMBER 106	REVISION B