

PROVINCIAL ADMINISTRATION OF KWAZULU-NATAL DEPARTMENT OF PUBLIC WORKS



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

BILLS OF QUANTITIES

with GCC for Construction Works - Second Edition 2010

CONTRACTUAL SECTION

ONE VOLUME APPROACH

SECTION 2

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

Engineer/Principal Agent

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Employer:

Head: Public Works
KZN Department of Public Works
Private Bag X 9041
PIETERMARITZBURG
3200
Tel Number: 033 - 355 5500

Region:

Head Public Works: Operations
KZN Department of Public Works
Private Bag X 9041
Pietermaritzburg
3200
Tel Number: 033 - 355 5500

Tender Number: ZNTU04138W

CIDB Grading: 7GB or higher

ECDP Number:

Project Code: 070638

Document Date: 12/09/2023

Contracting Party: _____

CIDB Registration number: _____

Central Suppliers Database Registration Number: _____

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

THE TENDER

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IMPORTANT NOTICE TO TENDERERS

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

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

No alternative Tenders will be accepted.

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

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



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

THE CONTRACT



KWAZULU-NATAL PROVINCE
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Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

C1 - AGREEMENT AND CONTRACT DATA



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

FORM OF OFFER AND ACCEPTANCE

FORM OF OFFER AND ACCEPTANCE

Tender No - ZNTU04138W



KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

C.1.1 - FORM OF OFFER AND ACCEPTANCE

THE OFFER AND ACCEPTANCE FORM T2.21 IS BOUND INTO **SECTION 1** (See end of Returnable Documents) OF THIS DOCUMENT AS PART OF THE RETURNABLE DOCUMENTS. ONCE A CONTRACT IS CONCLUDED WITH A SUCCESSFUL TENDERER, THIS PAGE WILL BE REPLACED WITH THE FILLED AND SIGNED OFFER AND SIGN ACCEPTANCE BY THE EMPLOYER AND IT WILL BECOME PART OF THE CONTRACT.

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



KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

C1.2 - CONTRACT DATA

C 1.2 CONTRACT DATA: with GCC for Construction Works - Second Edition 2010	
CONTRACT DATA FOR:	
Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area	
Tender no:	ZNTU04138W
	The General Conditions of Contract are the clauses contained in the General Conditions of Contract (2010) (Second Edition) published by the South African Institution of Civil Engineering. Copies of these conditions of contract may be obtained through most regional offices of the South African Institution of Civil Engineering, telephone number 011 805 5947 or by visiting their website at www.saice.org.za.
	CONTRACT SPECIFIC DATA The following contract specific data are applicable to this contract:
	CONTRACT VARIABLES This schedule contains all variables specific to this document and is divided into pre-tender and post-tender categories. The pre-tender category must be completed in full and included in the tender documents. Both the pre-tender and post-tender categories form part of this agreement . Spaces requiring information must be filled in, shown as 'not applicable' or deleted <u>but not left blank</u> . Where choices are offered, the non-applicable items are to be deleted. Where insufficient space is provided the information should be annexed hereto and cross referenced to the applicable clause of the schedule. Key cross reference clauses are italicised in [] brackets. The Engineer/Principal Agent, in accordance with Clause 1.1.1.16, shall obtain the specific approval from the Employer before executing any of his functions according to the "Conditions under which Consultants are appointed", or in the event where an employee of the Employer represents the Employer, the relevant General Delegations applicable at the time of executing his/her duties as described in Clause 3.1.2.
Part 1: CONTRACT DATA PROVIDED BY THE EMPLOYER:	
	PRE-TENDER INFORMATION
	CONTRACTING AND OTHER PARTIES
[1.1.1.15]	Employer: Head: Public Works (KZN Department of Public Works: Province of KwaZulu-Natal) Postal address: Private Bag X 9041 PIETERMARITZBURG 3200 Tel: 033 - 355 5604 Fax: 033 - 355 5500
[1.2.1.2]	Physical address: 191 Prince Alfred Street PIETERMARITZBURG 3200
[1.1.1.16]	Employers Agent 1 Ukuza Consulting (Pty) Ltd Agent's service: Architect Postal address: P.O. Box 2274 Westville 3630 Tel: 031 - 265 0444 Fax: 086 208 0491
	Employers Agent 2 Ukuza Consulting (Pty) Ltd Agent's service: Quantity Surveyor Postal address: P.O. Box 2274 Westville 3630 Tel: 031 - 265 0444 Fax: 086 208 0491
	Employers Agent 3 LSC Brunette cc Agent's service: Civil / Structural Engineer Postal address: P.O. Box 37015 Overport 4067 Tel: 031 - 266 8118 Fax: 031 - 266 8863
	Employers Agent 4 ADQ Engineering Projects Agent's service: Mechanical Engineer Postal address: Postnet Suite #89, P.O. Box X108 Centurion 0046 Tel: 012 - 030 0355 Fax: 086 410 9429

	Employers Agent 5 ADQ Engineering Projects Agent's service: Fire Engineer Postal address: Postnet Suite #89, P.O. Box X108 Centurion 0046 Tel: insert 012 - 030 0355 Fax: 086 410 9429	
	Employers Agent 6 Ibaya Consulting Engineers Agent's service: Electrical Engineer Postal address: P.O. Box 1692, Wandsbeck 3631 Westville 3629 Tel: insert 031 - 266 7332 Fax: 031 - 266 7340	
PART 1: DATA PROVIDED BY THE EMPLOYER		
[1.1.1.13]	Defects Liability Period The defects liability period is: A time measured from the date of the Certificate of Completion. Defects Liability Period is 12 Months for the whole of the Works	
Latent Defect Period		
[5.16.3]	The latent defect period is: 5 years after the Final Approval Certificate	
Documentation required before Commencement of the Works:		
[5.3.1]	The documentation required before commencement with the Works execution are;	
[4.3]	Health and Safety Plan	The Contractor shall deliver his Health and Safety Plan of the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
[5.6]	Initial Programme	The Contractor shall deliver his programme of work within 10 calendar days after notice from the Employer, prior to the Commencement Date.
[6.2]	Guarantee	The Contractor shall deliver his chosen Guarantee (security) for this Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
[8.6]	Insurance	The Contractor shall deliver his insurance for the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Cash flow by contractor	The Contractor shall deliver his Cash flow for the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Priced Bill of Quantity	The Contractor shall deliver his Priced Bill of Quantity within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Programme	The Contractor is required to submit his Programme of Works in terms of Clause 5.6.1 and 5.3.1 and the Principal Agent is required to approve this within 7 days in terms of Clause 5.6.3
	Other requirements	
[5.3.2]	The time to submit the documentation required before commencement with Works execution is: 14 calendar days	
	Non-Working days	
[5.8.1]	Non-Working days	Sundays
	Special non- working days	All Nationally Recognized Public Holidays and the year end break
[5.8.1]	First Year end break - commences	16 December 2023
	ends on	8 January 2024
	Second Year end break - commences	16 December 2024
	ends on	13 January 2025
	Third Year end break - commences	16 December 2025
	ends on	12 January 2026
	Fourth Year end break - commences	N/A
	ends on	N/A
	Engineer/Principal Agent to consult with Employer	
[3.1.3]	The Engineer shall obtain the specific approval from the Employer before executing any of his functions according to the "Conditions under which Consultants are appointed", or in the event where an employee of the Employer represents the Employer, the relevant General Delegations applicable at the time of executing his/her duties.	
	Security	
[6.2.1]	The time to deliver the deed of guarantee is Prior to site hand over in terms of clause 5.3.1 and 5.3.2.	
[6.2.1]	Please see CONTRACT DATA - below to select Guarantee Option	
	Commencement Date	
	Commencement date means the date of Site Hand over that should not occur prior to the tenderer receiving one fully signed copy of the Offer and Acceptance in terms of the Form of Offer and Acceptance.	

	<p>The Agreement comes into effect on the date when; The tenderer <u>receives one fully completed original copy of this document</u>, including the Schedule of Deviations (if any)</p> <p>The <u>agreement</u> ("this document") consists of; 1. Agreement and Conditions of Contract. 2. Form of Offer and Acceptance. 3. Contract Data. 4. Scope of Works. 5. Site Information. 6. Drawings & documents referred to in the 1 to 4 above.</p> <p>(See Form of Offer and Acceptance)</p>												
[5.3.1]	The contractor shall commence executing the Works within 7 calendar days from the Commencement Date.												
[5.4.1]	Possession of the site will be given within 10 calendar days after the contractor has fulfilled the conditions (4.3, 5.6, 6.2, 8.6) and received the notification from the Employer of Site Hand Over where the contractor will receive one <u>fully signed</u> copy of the Form of Offer and Acceptance from the employer .												
[5.6.1]	The Contractor shall deliver his programme of work within 10 calendar days after notice from the Employer, prior to the Commencement Date.												
	CONTRACT DETAILS												
[1.1.1.33]	Works description: Refer to document C3 – Scope of Work.												
[1.1.1.30]	Site description: Refer to document C4 – Site Information.												
	Specific options that are applicable to a State organ only Where so :												
[6.10.6.2]	<p>1) Interest rate legislation: (a) in respect of interest owed <u>by</u> the employer, the interest rate as determined by the Minister of Justice and Constitutional Development from time to time, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No. 55 of 1975), will apply; and (b) in respect of interest owed <u>to</u> the employer, the interest rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply</p> <p>2) Lateral support insurance to be effected by the contractor: <table border="1" style="float: right;"><tr><td>Yes</td><td>No</td><td>X</td></tr></table></p> <p>3) Payment will be made for materials and goods <table border="1" style="float: right;"><tr><td>Yes</td><td>X</td><td>No</td></tr></table></p> <p>4) Dispute resolution by litigation <table border="1" style="float: right;"><tr><td>Yes</td><td>No</td><td>X</td></tr></table></p> <p>5) Extended defects liability period applicable to the following elements: <table border="1" style="float: right;"><tr><td colspan="3">Work as a whole</td></tr></table></p>	Yes	No	X	Yes	X	No	Yes	No	X	Work as a whole		
Yes	No	X											
Yes	X	No											
Yes	No	X											
Work as a whole													
[8.6.1.1.2]	The Value of material, supplied by the Employer, and not included in the Contract Price, is: <table border="1" style="float: right;"><tr><td>R0,00</td></tr></table>	R0,00											
R0,00													
[8.6.1.1.3]	The amount to cover Professional Fees, not included in the Contract Price, for repairing damage and loss to be included in the insurance: 30% of the Contract Price												
[8.6.1.3]	The limit for indemnity for liable insurance is: <table border="1" style="float: right;"><tr><td>R20 million</td></tr></table>	R20 million											
R20 million													
[6.5.1.2.3]	The percentage allowance to cover overhead charges for contractor and subcontractors, is: <table border="1" style="float: right;"><tr><td>33,30%</td></tr></table>	33,30%											
33,30%													
[1.1.1.14]	Practical Completion Date The Practical Completion date is: 24 Calendar Months from date of Site Handover												
	For the works as a whole: The whole of the works shall be completed within: <table border="1" style="float: right;"><tr><td>24</td><td>Months (which shall be deemed to include all Non – Working Days, Special Non – Working Days and the year-end Builders Annual Industry Holiday Periods).</td></tr></table>	24	Months (which shall be deemed to include all Non – Working Days, Special Non – Working Days and the year-end Builders Annual Industry Holiday Periods).										
24	Months (which shall be deemed to include all Non – Working Days, Special Non – Working Days and the year-end Builders Annual Industry Holiday Periods).												
[5.5.1]	The date for practical completion shall be <table border="1" style="float: right;"><tr><td>24 Months after date of site handover</td></tr></table>	24 Months after date of site handover											
24 Months after date of site handover													
[5.13.1]	The penalty per calendar day shall be : <table border="1" style="float: right;"><tr><td>0.04% of the Contract Price, rounded to the nearest R10</td></tr></table>	0.04% of the Contract Price, rounded to the nearest R10											
0.04% of the Contract Price, rounded to the nearest R10													
	For the works in sections: The date for practical completion from the commencement date and the penalty per calendar day :												
[5.5.1]	Portion 1: N/A												
[5.13.1]	0.04% of the Contract Price, rounded to the nearest R10												
[5.5.1]	Portion 2: N/A												
[5.13.1]	0.04% of the Contract Price, rounded to the nearest R10												
[5.5.1]	Portion 3: N/A												
[5.13.1]	0.04% of the Contract Price, rounded to the nearest R10												
[5.5.1]	Portion 4: N/A												
[5.13.1]	0.04% of the Contract Price, rounded to the nearest R10												
[5.5.1]	Portion 5: N/A												
[5.13.1]	0.04% of the Contract Price, rounded to the nearest R10												
[5.5.1]	Portion 6: N/A												
[5.13.1]	0.04% of the Contract Price, rounded to the nearest R10												
[1.3.2]	The law applicable to this agreement shall be that of the: Republic of South Africa												
[6.10.1.5]	The percentage advance on materials not yet built into the Permanent Works is: <table border="1" style="float: right;"><tr><td>80,00%</td></tr></table>	80,00%											
80,00%													

[6.10.3]	<p>Percentage retention on amounts due to contractor is: The Percentage retention is 10%. The only security required by the Employer will be such as selected by the Contractor on the Form of Offer and Acceptance and Part 2: CONTRACT DATA PROVIDED BY THE CONTRACTOR, point 2 - Documents, of the Contract Data.</p> <p>Maximum retention is: 10,00% of the Contract Price</p>
[6.8.1] [6.8.2] [6.8.3] [6.8.2] [6.8.3]	<p>Notwithstanding anything to the contrary contained in the General conditions of Contract and Preliminaries, this contract could only, when the <u>construction period exceeds 6 months and the contract exceeds R1.000.000.00</u>, be subject to a Contract Price Adjustment Factor.</p> <p>Clause 6.8.2 the last part of the sentence saying "calculated according to the formula and the conditions set out in the Contract Price Adjustment Schedule." must be replaced by "calculated according to the Contract Price Adjustment Provisions (CPAP) Indices Application Manual for use with P0151 indices (Revised 1 January 2013)" as published by Statistics South Africa. The Contract Price Adjustment Provision (CPAP) will be subject to the most recently released indices by Statistic South Africa. Tenderers are advised that with reference to Clause 3.4.6 of the Contract Price Adjustment Provisions (CPAP) Indices Applications Manual, the Head: Public Works will not accept the submission by Tenderers of lists of additional items."</p> <p>Where this contract is a Lump Sum contract, the contract will only be subject to Contract Price Adjustment Provisions (CPAP)(Revised 1 January 2013) where the contract period equals or exceeds 6 calendar months. The applicable work group shall be WG 180 for domestic buildings or WG 181 for commercial and industrial buildings only.</p>
[5.14.5]	<p>The following clause must be added to clause 5.14.5:</p> <p>[5.14.5.6] The employers agent shall submit the final account within 3 calendar months to the principal agent.</p>
[10.5] [10.5.3] [10.9.1]	<p>The determinations of disputes shall be by ARBITRATION ONLY.</p> <p>The number of Adjudication Board Members to be appointed is: One</p> <p>Replace the last part of the clause with the following: "...on the application of either party, by the Chairman, or his nominee of the Association of Arbitrators."</p>
	<p>Where CPAP is applicable, the contract sum will be adjusted in accordance with the Contract Price Adjustment Provisions (CPAP) as set out in the CPAP Indices Application Manual as published by Statistics South Africa, dated 1 January 2013 and any amendments thereto:</p> <ol style="list-style-type: none"> 1) Glass etc. measured in specialist section Metalwork, will be adjusted in terms of the index for that work group unless specifically stated otherwise in the bills of quantities. 2) In case of uninterruptible power supplies, elevators, escalators and hoists, generating sets, motor-alternator sets and intercommunication systems shall be adjusted in accordance with Work Group 170. 3) Further to clause 3.4.6 of the CPAP Indices Application Manual, the listing of additional items for exclusion by Tenderer's, will not be permitted. <p>Alternative Indices: Not Applicable</p> <p>Details of changes made to the General Conditions of Contract for construction works (2010) Second Edition</p>
[1.1]	<p>Clause</p> <p>[1.1.1.5] COMMENCEMENT DATE – means the actual date of Site Hand over that should not occur prior to the Tenderer receiving one fully signed copy of the Offer and Acceptance in terms of the Form of Offer and Acceptance.</p> <p>[5.12.2.2] ABNORMAL CLIMATIC CONDITIONS - means conditions over and above what could reasonably be expected for the specific locality where the Works are being executed and include inter alia excessive rain, heat, cold, wind and any other climatic condition that would not normally be experienced during the season that the Works are executed in that area. The South African Weather Service's (http://www.weathersa.co.za) 10 year average climatic conditions statistics would be what could be reasonably expected for the specific locality where the Works are executed.</p> <p>[6.2.1] CONSTRUCTION GUARANTEE – means an on demand guarantee at call obtained by the contractor from an institution approved by the employer in terms of the employer's construction guarantee form as selected in the Offer and Acceptance Form and the contract data.</p> <p>CONSTRUCTION PERIOD – means the period commencing on the commencement date and ending on the date of due completion date. This period will be deemed to commence on actual site hand over date to the contractor and end on the date of practical completion and shall include all annual industrial holiday periods, Sundays and public holidays.</p> <p>CORRUPT PRACTICE – means the offer, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.</p> <p>FINAL ACCOUNT - The document prepared by the principal agent, which reflects the contract value of the works at final approval or termination.</p> <p>FRAUDULENT PRACTICE – means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of any tenderer and includes collusive practise among tenderers (prior to or after the tender submission) designed to establish tender prices at artificial non-competitive levels and to deprive the tenderer of the benefits of free and open competition.</p>
	<p>INTEREST – the interest rates applicable on this contract, whether specifically indicated in the relevant clauses or not, will be in terms of the legislation of the Republic of South Africa, and in particular:</p> <ol style="list-style-type: none"> (a) in respect of interest owed by the employer, the interest rate as determined by the Minister of Justice and Constitutional Development from time to time, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No. 55 of 1975), will apply; and (b) in respect of interest owed to the employer, the interest rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply
	<p>[1.1.1.16] ENGINEER/PRINCIPAL AGENT – means the person or entity appointed by the Employer and named in the Contract Data as the Engineer /Principal Agent to act as agent of the Employer. In the event of an Engineer/Principal Agent not being appointed, then all the duties and obligations of an Engineer/Principal Agent as detailed in the Contract shall be fulfilled by a representative of the Employer as named in the Contract Data. (Hereafter referred to as Engineer)</p> <p>[1.1.1.21] GENERAL ITEMS - or preliminaries means items stipulated in the Pricing Data relating to general obligations, site services, facilities and/or items that cover elements of the cost of the work which are not considered as proportional to the quantities of the Permanent Works.</p>
[4.4.1]	<p>Add the following to the clause 4.4.1: "The Contract shall only use subcontractors who are duly registered with the CIDB and who has an ACTIVE status at the time of submitting the tender"</p>
[6.2.1]	<p>Refer to Offer and Acceptance form for the various options that the contractor may choose from in providing a form of Guarantee under "GUARATEE OPTIONS".</p>

	<p>[6.10.6.2] Replace "at the prime overdraft rate, as charged by the Contractor's Bank," with "...at the interest rate as determined by the Minister of Justice and Constitutional Development from time to time, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No. 55 of 1975)."</p> <p>Omit "...on all overdue payments from the date on which the same should have been paid..." and replace with "only after 30 calendar days from receiving written notice from the Contractor that the amount is overdue..."</p>
<p>[5.12.3]</p> <p>[5.14.5.1]</p> <p>[5.16.4]</p> <p>[6.2.2]</p> <p>[6.2.3]</p> <p>[9.3.2.2]</p>	<p>SPECIAL CONDITIONS OF CONTRACT</p> <p>Omit clause 5.12.3 and add the following:</p> <p>"5.12.3. If an extension of time is granted, the Contractor shall be paid such additional time-related General Items, including for special non-working days, if applicable as are appropriate regarding to any other compensation which may already have been granted in respect of the circumstances concerned. The reasons for extension of time that would invoke payment of time related General Items are inter alia;</p> <p>5.12.3.1 Failure to give possession of the site to the contractor.</p> <p>5.12.3.2 Making good physical loss and repairing damage to the works where the contractor is not at risk.</p> <p>5.12.3.3 Contract instructions not occasioned by default by the contractor.</p> <p>5.12.3.4 Failure to issue construction information timeously or the late issue of a contract instruction following a request from the contractor.</p> <p>5.12.3.5 Late acceptance by the principal agent of a design undertaken by a selected subcontractor where the contractor's obligations have been met.</p> <p>5.12.3.6 Suspension or cancellation termination invoked by a nominated or selected n/s subcontractor due to default by the employer or the principal agent.</p> <p>5.12.3.7 Insolvency of a nominated subcontractor.</p> <p>5.12.3.8 A direct contractor.</p> <p>5.12.3.9 Opening up and testing of work and materials and goods where such work is according to in accordance with the contract documents.</p> <p>5.12.3.10 The execution of additional work for which the quantity included in the bills of quantities is not sufficiently accurate.</p> <p>5.12.3.11 Late or failure to supply materials and goods for which the employer is responsible.</p> <p>5.12.3.12 Suspension of the works."</p> <p>Omit entire clause 5.14.5.1</p> <p>Add the following new clause "5.16.4. Upon the issue of a Final Approval Certificate, unless otherwise provided in the Contract:</p> <p>5.16.4.1. The performance Guarantee (if any) shall be returned within 14 days to the guarantor in terms of Clause 7."</p> <p>Replace the following "...it shall be deemed that the Contractor has selected a security of ten percent retention of the value of the Works." with "...it shall be deemed that the Contractor has selected a security of a bank or insurance guarantee of 5% of the value of the Works and a payment reduction of 5% of the value certified in the payment certificate excluding value added tax."</p> <p>Add to clause 6.2.3 the following "The Contractor shall provide proof of paid-up premium payments to accompany his payment certificate as proof that his performance guarantee has not expired yet. The Contractor will not receive payment without proof of the validity of their performance guarantee."</p> <p>Omit "without prejudice to the exercise of any lien the Contractor may have acquired over the Employer's property."</p> <p>Duties and functions of the Engineer requiring the specific approval of the Employer BEFORE execution of any part of these duties are as follows:</p> <p>(a) Determinations of contractors claims for extension of time (revision of the contract completion date). All claims for extension of time shall be submitted by the Engineer, together with the Engineer's recommendations, to the Employer for determination. Omit "Engineer" in clause 42.2 and replace with "Employer".</p> <p>(b) Drawings, instructions or communications of any kind requiring variations of the works and involving EXTRA's shall NOT be given effect by the Contractor UNTIL BOTH the "Official Variation Order" and the "Financial Request for Variation Order and Additional Funds" form, as issued by the Department of Public Works, have been approved and signed by the Employer.</p> <p>(c) Insurance policies to be approved by the Employer within 21 days of the date of the Commencement of the Works.</p> <p>(d) Any notice of disagreement raised by the Contractor or written Dispute Notice given by the Contractor to the Engineer shall be submitted by the Engineer, together with the Engineer's recommendations, to the Employer for determination.</p> <p>(e) The issue of the certificate of practical completion, certificate of completion and the final approval certificate shall be signed and submitted by the Engineer, to the Employer for final approval and signature. The certificates shall not be considered as officially issued until signed by the Employer.</p> <p>MANAGING PROJECT DURATION</p> <p>(a) The Contractor shall co-ordinate his programme with all other contractors whose work may precede or be executed simultaneously to his own. The Contractor will be called upon to plan and control the project using the Project Evaluation and Review Technique (PERT) or other approved Critical Path Method (CPM) network analysis of his events and activities and those of the sub-contractors in his employ and must co-ordinate his planning with any other contractor employed on the project. A fortnightly project control report will be expected from the Contractor in writing, evaluating any gains or delays against the critical path and he should allow for all costs involved in planning reviewing and updating the programme to the satisfaction of the Principal Agent against this item.</p> <p>(b) Activity-and total float shall belong to the Employer.</p> <p>(c) The Contractor shall deliver his programme of work within 10 calendar days after notice from the Employer, prior to the Commencement Date.</p> <p>It is a condition of this contract that, the contractor submit to the Engineer/principal agent a detailed CPM Programme which shall be to the approval of the Engineer/principal agent. In this regard tenderers are advised to consult with the Engineer/Principal Agent as to the format and requirements of the programme as no claim whatsoever will be entertained should the programme fail to meet the requirements of the Engineer/Principal Agent. Failure to submit the programme within the stipulated time may result in the contractor being held in breach of contract.</p> <p>The approved programme will form the basis of time management of the project and extension of time will not be guaranteed unless the Contractor has strictly complied with this provision.</p> <p>The programme shall make allowance for rain and the number of rain days allowed within the critical path shall be on the provisions of the clause dealing with inclement weather and claiming for delays in performance in this bill.</p> <p>Allowance for the above must be made under this item as no claims for failing to comply with this precondition will later be entertained.</p> <p>INCLEMENT WEATHER AND CLAIMS FOR DELAYS IN PERFORMANCE</p> <p>(a) The Contract Sum includes a monthly allowance of 3 working days inclement weather during which rainfall exceeds 10mm per day for months as indicated in the Scope of Works. These days shall be reflected on the critical path of the Contractor's programme as specified in MANAGING PROJECT DURATION above.</p> <p>(b) Claims for delays in performance due to inclement weather shall be calculated separately for each calendar month and for the project as a whole. Delays or gains to the critical path shall be reflected in all revisions of the programme. An extension of time will only be granted where the following conditions are met:</p> <p>(i) The criteria to be used for WORK stoppages shall be for safety hazards or poor quality of work.</p> <p>(ii) The Employer's site representative or the Employer's Principal Agent, if the site representative is not available shall be notified when the Contractor stops the work and intends to claim performance delays. The Employer representative shall inspect the situation together with the Contractor and give an immediate decision.</p> <p>1. The stoppage claimed must cause a delay in the Completion Date of work. If the critical activities can proceed and a non-critical activity is delayed due to inclement weather no claims for delay shall be granted.</p> <p>2. No claims for stoppages less than 2(two) hours per day shall be considered.</p> <p>3. Claims granted for more than 2 (two) hours, but less than 10 (ten) hour (lunch included) day, shall be added together and expressed as full days.</p> <p>4. All claims shall be submitted in writing to the Principal Agent within one working day of the actual stoppage.</p>

	<div>5. The total delay in performance granted to the Contractor expressed in days shall be added to the contractual Completion Date of each section of the Works. The contractual penalty clause shall only come into effect after this newly arrived date.</div> <div>6. Total delays (in hours) will be rounded up or down to the nearest integer for the calculation of Working Days. The total hours (including lunch) per Working Day shall be 10 unless otherwise indicated on the Contractor's programme.</div> <div>7. Where the programmed delays for inclement weather exceed the actual delays incurred the Completion Date(s) will not be adjusted.</div> <div>8. Where the project includes builder's holidays the programmed durations for inclement weather shall be adjusted pro-rate to the actual Working Days.</div> <div>9. The total of all monthly delays due to inclement weather shall be calculated in accordance with the example given below:</div> <div><table><tr><th colspan="2" rowspan="2">Description</th><th colspan="5">Months</th><th rowspan="2">Total</th></tr><tr><th>Sept</th><th>Oct</th><th>Nov</th><th>Dec</th><th>Jan</th></tr><tr><th></th><th>Hours</th><th>Hours</th><th>Hours</th><th>Hours</th><th>Hours</th><th>Hours</th></tr><tr><td>Programmed</td><td>Rain days</td><td>0</td><td>30</td><td>30</td><td>15</td><td>15</td><td>90</td></tr><tr><td>Actual</td><td>Rain days</td><td>16</td><td>22</td><td>35</td><td>15</td><td>18</td><td>106</td></tr><tr><td>Difference</td><td></td><td>-16</td><td>8</td><td>-5</td><td>0</td><td>-3</td><td>-16</td></tr><tr><td colspan="7"></td><td>Estimated Extension of time - in working days</td><td>2</td></tr></table></div> <div>8 hrs/day*</div> <div>See point 5.2 in the Scope of Works for the specific days the tenderer must allow for in this contract.</div>	Description		Months					Total	Sept	Oct	Nov	Dec	Jan		Hours	Hours	Hours	Hours	Hours	Hours	Programmed	Rain days	0	30	30	15	15	90	Actual	Rain days	16	22	35	15	18	106	Difference		-16	8	-5	0	-3	-16								Estimated Extension of time - in working days	2
Description				Months						Total																																												
		Sept	Oct	Nov	Dec	Jan																																																
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							Estimated Extension of time - in working days	2																																														
Tender no:	ZNTU04138W	Part 2: CONTRACT DATA PROVIDED BY THE CONTRACTOR:																																																				
	POST-TENDER INFORMATION																																																					
	Note: All information for this section requires consultation with the Contractor. The Engineer/Principal Agent shall not pre-select any of the alternatives available to the Contractor.																																																					
	1 CONTRACT DETAILS																																																					
[1.1.1.9]	Contractor Name:																																																					
[1.2.1.2]	Postal address:																																																					
																																																					
																																																					
	Tel no Fax no																																																					
	Tax / VAT Registration No: e-mail																																																					
	Physical address:																																																					
																																																					
																																																					
[1.1.1.10]	The accepted contract price inclusive of tax is R :																																																					
	[Amount in words]																																																					
	Payment Of Preliminaries (Clause 6.7, 6.8, 6.10 and 6.11)																																																					
	The preliminaries amounts shall be paid in terms of:				*Alternative A	Yes																																																
					**Alternative B	N/A																																																
	* Assessed by the Engineer/Principal Agent as an amount prorated to the value of the Work duly executed in the same ratio as the Preliminaries bears to the Contract Price excluding VAT, Preliminary amount, Contingencies and any CPAP.																																																					
	** Calculated from the priced Bill of Quantity/Lump Sum document. The Contractor and the Engineer/Principal Agent shall agree on a division of the priced Preliminaries items into: initial establishment charge, monthly charge and final disestablishment charge.																																																					
	If the Contractor and the Engineer/Principal Agent can not agree, within 10 Working Days from the Commencement Date, on such a division then the Engineer/Principal Agent shall make a division of the Preliminaries to be incorporated in the valuations for each monthly payment certificate as follows;																																																					
	10% of the General Items/Preliminaries amount shall not be varied																																																					
	15% of the General Items/Preliminaries shall only be varied in proportion of the Contract Price to the Contract Sum																																																					
	75% of the General Items/Preliminaries shall be varied in proportion to the revised Construction Period compared with the initial Construction Period.																																																					
	Adjustment of Preliminaries (Clause 6.7, 6.8, 6.10 and 6.11)																																																					
Alternative A	For the adjustment of Preliminaries both the Contract Sum and the Contract Value (including tax) shall exclude the amount of Preliminaries, all Contingency Sum(s) and any provision for Cost Price Adjustment Provisions:-																																																					
	- An amount which shall not be varied.																																																					
	- An amount varied in proportion to the contract value as compared to the Contract Sum.																																																					
	- An amount varied in proportion to the Construction Period as compared to the initial Construction Period (excluding revisions to the Construction Period to which the Contractor is not entitled) to adjustment of the Contract Value in terms of the agreement.																																																					
	The Contractor shall provide a breakdown of charges (including tax) within 15 working days of the date of acceptance of tender and, where applicable, an apportionment of Preliminaries per section																																																					
	If the Contractor and the Principal Agent cannot agree, within ten (10) Working Days from the Commencement Date, on such a division then the Principal Agent shall make a division of the Preliminaries to be incorporated in the valuations for each monthly payment certificate as follows;																																																					
	10% of the amount shall not be varied																																																					
	15% varied in proportion of the Contract Value to the Contract Sum																																																					
	75% varied in proportion to the revised Construction period compared with the initial Construction Period																																																					
	Sectional Completion : Subdivision of Preliminaries Costs																																																					
	For the adjustment of preliminaries for sections of the work the value of fixed, value, and time related amounts of the preliminaries for each section is required. The contractor is to provide such information within fifteen (15) working days of taking possession of the site, failing which the categorised preliminaries amounts shall be prorated to the value of each section.																																																					
	The above shall apply equally for projects where sectional completion was not contemplated at tender stage but subsequently occurred on an ad hoc basis during construction of the works as agreed between the client and the employer. The original priced categorised amounts for fixed, value, and time related amounts shall be prorated to the value of each section.																																																					

	<p>When an extension of time has been granted in terms of the GCC and the preliminaries require to be adjusted accordingly, the pertinent sectional (subdivided) categorised preliminaries amounts shall be utilised, where applicable and not the overall preliminary amounts.</p> <p>Where sectional completion is required in terms of the agreement, the Contractor shall provide the Principal Agent with the division of the above categorized amounts into sections. Should the Contractor fail to provide such information within the period stipulated the categorized amounts shall be prorated to the value of each section.</p> <p style="text-align: right;"><input type="button" value="YES"/> yes / no</p> <p>or</p>								
Alternative B	<p>The Contractor shall within 15 working days of the date of possession of the site provide the Principal Agent with a detailed breakdown of Preliminaries amounts for the works as a whole, or per section where applicable, including administrative and supervisory staff charges and for the use of construction equipment in terms of the programme.</p> <p style="text-align: right;"><input type="button" value="NO"/> yes / no</p> <p>The contractor is informed that only option 'A' shall apply</p>								
2	DOCUMENTS								
	<p>Contract documents marked and annexed hereto:</p> <p>Priced Bills of Quantities: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Lump Sum document: : Yes <input type="checkbox"/> No <input checked="" type="checkbox"/></p> <p>Guarantee Options:</p> <p>Not applicable</p> <p>2.2 DESIGN BRIEF</p> <p>Not applicable <input type="button" value="No"/> YES or NO</p> <p>2.3 DRAWINGS <input type="button" value="Yes"/> YES or NO</p> <p>See list of drawings/Annexure's attached to this document. <input type="button" value="Yes"/> YES or NO</p> <p>2.4 DESIGN PROCEDURES <input type="button" value="No"/> YES or NO</p> <p>Not applicable</p> <p>Contract drawings: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Other documents:</p>								
	<p>Waiver of the Contractors lien or right of continuing possession is required. <input type="button" value="YES"/></p> <p>GUARANTEE OPTIONS</p>								
	<p>The Tenderer agrees to provide a bank or insurance guarantee in accordance with clause 6.2.3 of the Conditions of the GCC2010 Contract within the period stated in the Contract Data. This guarantee shall be for a sum equal to an amount stated in the Contract Data.</p> <p>Guarantees submitted must be issued by either an insurance company duly registered in terms of the Insurance Act (Long Term Insurance Act No 52 of 1998 or Short Term Insurance Act No 53 of 1998) or by a bank duly registered in terms of the Banks Act No 94 of 1990, on the pro-forma referred to above. No alterations or amendments of the wording of the pro-forma will be accepted.</p> <p>(a) the tenderer accepts that in respect of contracts up to R1 million, a payment reduction of 5% of the contact value will be applicable and will be reduced by the Employer in terms of the applicable conditions of contract.</p> <p>(b) in respect of contracts above R1 million, the Tenderer offers to provide security as indicated below: select one option</p> <table border="1"> <tr> <td>(i) cash deposit of 10 % of the Contract Price</td><td></td></tr> <tr> <td>(ii) bank or insurance Performance Guarantee of 10 % of the Contract Price</td><td></td></tr> <tr> <td>(iii) cash deposit of 5% of the Contract Price and a payment reduction of 5% of the value certified in the payment certificate (excluding VAT)</td><td></td></tr> <tr> <td>(iv) bank or insurance guarantee of 5% of the Contract Price and a payment reduction of 5% of the value certified in the payment certificate (excluding VAT)</td><td></td></tr> </table> <p>NOTE: Where the Tenderer has not selected one of the guarantee options above, the default option will be as if the Tenderer has selected a security of a bank or insurance guarantee of 5% of the value of the Works and a payment reduction of 5% of the value certified in the payment certificate excluding value added tax. - See GCC2010 clause 6.2.2 as amended in Contract Data.</p>	(i) cash deposit of 10 % of the Contract Price		(ii) bank or insurance Performance Guarantee of 10 % of the Contract Price		(iii) cash deposit of 5% of the Contract Price and a payment reduction of 5% of the value certified in the payment certificate (excluding VAT)		(iv) bank or insurance guarantee of 5% of the Contract Price and a payment reduction of 5% of the value certified in the payment certificate (excluding VAT)	
(i) cash deposit of 10 % of the Contract Price									
(ii) bank or insurance Performance Guarantee of 10 % of the Contract Price									
(iii) cash deposit of 5% of the Contract Price and a payment reduction of 5% of the value certified in the payment certificate (excluding VAT)									
(iv) bank or insurance guarantee of 5% of the Contract Price and a payment reduction of 5% of the value certified in the payment certificate (excluding VAT)									

3 SIGNATURES OF THE CONTRACTING PARTIES	
	Thus done and signed at.....onof.....20.....
	Name of signatory _____ for and behalf of the Employer who by signature hereof _____
	Capacity of signatory _____ as Witness. _____
	Thus done and signed at.....onof.....20.....
	Name of signatory _____ for and behalf of the Contractor who by signature hereof _____
	Capacity of signatory _____ as Witness. _____



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

C1.3 - FORM OF GUARANTEE

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

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

ON DEMAND PERFORMANCE GUARANTEE

Tender Number ZNTU04138W

Project Code 070638

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

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means: _____

Physical Address: _____

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

"Contractor" means: _____

"Engineer" means: _____

"Works" means: **Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area**

"Site" means: _____

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

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

Amount in Words: _____

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

Amount in Words: _____

"Expiry Date" means: _____

CONTRACT DETAILS

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

PERFORMANCE GUARANTEE

- 1 The Guarantor's liability shall be limited to the amount of the Guaranteed Sum.
- 2 The Guarantor's period of liability shall be from and including the date of issue of this Performance Guarantee and up to and including the Expiry Date or the date of issue by the Engineer of the Certificate of Completion of the Works or the date of payment in full of the Guaranteed Sum, whichever occurs first. The Engineer and/or the Employer shall advise the Guarantor in writing of the date on which the Certificate of Completion of the Works has been issued.
- 3 The Guarantor hereby acknowledges that:
 - 3,1 any reference in this Performance Guarantee to the Contract is made for the purpose of convenience and shall not be construed as any intention whatsoever to create an accessory obligation or any intention whatsoever to create a suretyship;
 - 3,2 its obligation under the Performance Guarantee is restricted to the payment of money.
- 4 Subject to the Guarantor's maximum liability referred to in 1, the Guarantor hereby undertakes to pay the Employer the sum certified upon receipt of the documents identified in 4.1 to 4.3:
 - 4,1 A copy of a first written demand issued by the Employer to the Contractor stating that payment of a sum certified by the Engineer in an Interim or Final Payment Certificate has not been made in terms of the Contract and failing such payment within seven (7) calendar days, the Employer intends to call upon the Guarantor to make payment in terms of 4.2;
 - 4,2 A first written demand issued by the Employer to the Guarantor at the Guarantor's physical address with a copy to the Contractor stating that a period of seven (7) days has elapsed since the first written demand in terms of 4.1 and the sum certified has still not been paid;
 - 4,3 A copy of the aforesaid payment certificate which entitles the Employer to receive payment in terms of the Contract of the sum Certified in 4.
- 5 Subject to the Guarantor's maximum liability referred to in 1, the Guarantor undertakes to pay to the Employer the Guaranteed Sum or the full outstanding balance upon receipt of a first written demand from the employer to the Guarantor at the Guarantor's physical address calling up this Performance Guarantee, such demand stating that:
 - 5,1 the Contract has been terminated due to the Contractor's default and that this Performance Guarantee is called up in terms of 5; or
 - 5,2 a provisional or final sequestration or liquidation court order has been granted against the Contractor and that the Performance Guarantee is called up in terms of 5; and
 - 5,3 the aforesaid written demand is accompanied by a copy of the notice of termination and/or the provisional/final sequestration and/or the provisional liquidation court order.
- 6 It is recorded that the aggregate amount of payments required to be made by the Guarantor in terms of 4 and 5 shall not exceed the Guarantor's maximum liability in terms of 1.
- 7 Where the Guarantor has made payments in terms of 5, the Employer shall upon the date of issue of the Final Payment Certificate submit an expense account to the Guarantor showing how all monies received in terms of this Payment Guarantee have been expended and shall refund to the Guarantor any resulting surplus. All monies refunded to the Guarantor in terms of this Performance Guarantee shall bear interest at the prime overdraft rate of the Employer's bank compounded monthly and calculated from the date payment was made by the Guarantor to the Employer until the date of refund.
- 8 Payment by the Guarantor in terms of 4 or 5 shall be made with seven (7) calendar days upon receipt of the first written demand to the Guarantor.
- 9 Payment by the Guarantor in terms of 5 will only be made against the return of the original Performance Guarantee by the Employer.

- 10 The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
- 11 The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
- 12 This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.
- 13 This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.
- 14 Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Court Act No 32 of 1944, as amended, to this jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at

Date

Guarantor's signatory (1)

Capacity

Guarantor's signatory (2)

Capacity

Witness signatory (1)

Witness signatory (2)



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

PART C2 - PRICING DATA

C2.1 PRICING INSTRUCTIONS

GCC FOR CONSTRUCTION WORKS (Second Edition 2010)

Project title:	Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area		
Tender no:	ZNTU04138W	Project Code:	070638

C2.1 Pricing Instructions

	<p>Where any item is not relevant to this specific contract, such item is marked N/A (signifying "not applicable")</p> <p>The adjustment of the preliminaries each item priced is to be allocated to one or more of the three categories by insertion of "F", "V", "T" as the case may be against the price in the "rate" column immediately preceding the "amount" column, where "F" denotes a fixed amount (amount not varied), "V" denotes an amount variable in proportion to value and "T" denotes an amount variable in proportion to time.</p>
1	<p>MASSES AND MEASURING UNITS</p> <p>These shall be in accordance with the Measuring Units and National Measuring Standards Act No. 76 of 1973 and amendments thereto.</p> <p>The pages of each of these documents are numbered consecutively and before the Tenderer submits his tender he should check the number of pages, and if any are found missing or duplicated, or the figures or writing indistinct, or the documents contain any obvious error, he should apply to the Head : Public Works AT ONCE and have same rectified as no liability whatsoever will be admitted by the Administration in respect of errors in Tender due to the foregoing.</p>
2	<p>PRICES FOR VARIATIONS</p> <p>Where prices or quotations for variations are submitted by the Contractor during the currency of the Contract, it is to be clearly understood that these are for the purpose of consideration by the Head : Public Works and that there is no assumption of acceptance. The Contractor will be notified of acceptance of prices or quotations either by insertion of the amount on the variation order or by written intimation.</p>
3	<p>SCALE</p> <p>The scale to which the Drawings are made is only to be made use of when no figured dimensions are given either on the Drawings or in the tender documents and the figured dimensions are always to be followed though they may not coincide with the scale of the Drawings, but dimensions where possible are to be taken from the buildings.</p>
4	<p>PROVISIONAL ITEMS</p> <p>All items described as "Provisional" shall be used as directed by the Employer and measured and valued or paid for.</p> <p>No work for which "Provisional" items are allowed shall be commenced without written instructions from the Head : Public Works.</p>

5	<p>TIMELY ORDERING OF MATERIALS</p> <p>The Contractor is warned to place all orders for materials or special articles as early as possible, as he will be held solely responsible for any delay in the delivery of such goods.</p> <p>Nevertheless this tender is conditional upon no liability being attached to the Contractor if delivery of materials is rendered impossible by reason of any act of the Government.</p>
6	<p>ELECTRICAL LIGHTING, POWER AND WATER</p> <p>The Contractor shall provide any artificial lighting which may be necessary or required for the proper execution of the works, and provide electric power and water required by all Sub-Contractors, Nominated Sub-Contractors and Sub-Contractors appointed directly by the Employer.</p> <p>The Contractor shall give all notices and pay all fees in connection with temporary electrical and water connections and shall connect temporary Electrical and Water meters for and pay for all current and water consumed.</p> <p>Tenderers are advised that the permanent light fittings and water points of any kind installed in the Works are not to be used to provide temporary lighting and supplement water requirements for construction purposes.</p>
7	<p>IMPORT PERMITS, DUTIES AND SURCHARGES.</p> <p>All tenders by means of which imported products are being called for, must use the rate of exchange 14 days prior to the closing date indicated in the tender documents. If this day falls on a weekend or public holiday, the next working day must be used.</p> <p>Furthermore, Tenderers must submit documentary proof (in the form of a certified copy) from their bank or legally recognised financial institution, clearly indicating what the rate of exchange was 14 days prior to the closing date, as mentioned above.</p> <p>Together with this, the Tenderer must confirm that the tender price relating to an imported product, was based on the rate of exchange 14 days prior to the closing date as mentioned above.</p>
8	<p>STANDARD SYSTEM OF MEASUREMENT WHERE BILLS OF QUANTITIES FORM PART OF THE TENDER DOCUMENTS</p> <p>The work executed under this Contract has been measured in accordance with the;</p> <p style="text-align: center;">Standard System of Measuring Builders Work (7th Edition)</p> <p>including all amendments unless descriptions of items indicate a deviation and it shall be understood that the system of measurement which is herein adopted is the only system of measurement which will be recognised in connection with this contract. Any contradictions to this system of measurement contained in the "Model Preambles for Trades 2008" shall be disregarded (unless same have been accommodated in the system of measurement) but applicable rates shall be included for all requirements stated and not measured separately in compliance with this system.</p>
9	<p>PRICING OF ROCK EXCAVATIONS</p> <p>It is a condition of this tender that should the tenderer elect to price the Rock Excavation included in this tender, the rates must be market related and should be identically priced for the same classification of excavations and not vary for similar billed items in the different sections.</p>

10	BROAD BASED BLACK ECONOMIC EMPOWERMENT <ol style="list-style-type: none"> 1. It is the deliberate policy of the Provincial Administration of KwaZulu-Natal to foster and to encourage the economic empowerment of Black South Africans. This policy will be implemented without prescription and without prejudicing the principles and the integrity of the Provincial Administration of KwaZulu-Natal. Subject to these constraints and also subject to good business practise and commercial consideration, it is therefore considered appropriate that the Provincial Administration of KwaZulu-Natal should encourage business relationships with companies which actively pursue Affirmative Action and Black Economic Empowerment Programmes. 2. In responding to this tender you are therefore encouraged to devote attention to these two subjects of Affirmative Action and Economic Empowerment. In addition, in considering the appointment of sub-contractors, you are requested to extend the spirit of these policies. 3. The foregoing enunciations of this policy are not intended to be prescriptive nor to preclude any individual or operation from responding to this tender. 					
11	REGISTRATION ON THE CENTRAL SUPPLIERS DATABASE <ol style="list-style-type: none"> 1. In terms of the Public Finance Management Act (PFMA), 1999 (Act No 1 of 1999) Section 38 (1) (a) (iii) and 51 (1) (iii) and Section 76 (4) of PFMA National Treasury developed a single platform, The Central Supplier Database (CSD) for the registration of prospective suppliers including the verification functionality of key supplier information. 2. Prospective suppliers will be able to self - register on the CSD website: www.csd.gov.za 3. Once the supplier information has been verified with external data sources by National Treasury a unique supplier number and security code will be allocated and communicated to the supplier. Suppliers will be required to keep their data updated regularly and should confirm at least once a year that their data is still current and updated. 4. Suppliers can provide their CSD supplier number and unique security code to organs of state to view their verified CSD information. 5. Tenderers are required to fill in clearly, legibly, in bold print and black ink their CSD supplier number in the space hereunder: <table border="1"> <tr> <td>Name of Supplier</td> <td></td> </tr> <tr> <td>Central Supplier Database (CSD) Supplier Number:</td> <td></td> </tr> </table>		Name of Supplier		Central Supplier Database (CSD) Supplier Number:	
Name of Supplier						
Central Supplier Database (CSD) Supplier Number:						

12	<p>TAX CLEARANCE REQUIREMENTS</p> <p>It is a condition of tender that the taxes of the successful tenderer must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the Tenderer's tax obligations. It is a condition of this Offer of Commission that your practice remains in good standing with SARS (South African Revenue Services) in terms of its tax clearance, during the project, which is required to process your payment certificates.</p> <ol style="list-style-type: none"> 1 In order to meet this requirement tenderers are required to apply via e-filing at any SARS branch office nationally. The Tax Compliance Status (TCS) requirements are also applicable to foreign Tenderers / individuals who wish to submit Tenders. 2 SARS will then furnish the Tenderer with a Tax Compliance Status (TCS) PIN that will be valid for a period of 1 (one) year from the date of approval. 3 In tenders where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Compliance Status (TCS) PIN. 4 Application for Tax Compliance Status (TCS) PIN can be done via e-filing at any SARS branch office nationally or on the website www.sars.gov.za. 5 Tax Clearance Certificates may be printed via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za. 6 Tax Clearance Certificates may be printed via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za. <table border="1"> <tr> <td>Security PIN Number</td><td></td></tr> <tr> <td>Company / Entity Tax Reference Number</td><td></td></tr> </table>	Security PIN Number		Company / Entity Tax Reference Number	
Security PIN Number					
Company / Entity Tax Reference Number					
13	<p>BILLS OF QUANTITIES/LUMP SUM DOCUMENT</p> <p>The Bills of Quantities document forms part of and must be read and priced in conjunction with all the other documents forming part of the contract documents, the Standard Conditions of Tender, Conditions of Contract, Standard Preambles to all Trades, Specifications, Drawings and all other relevant documentation.</p>				
14	<p>VALUE ADDED TAX</p> <p>The tender price must include for Value Added Tax (VAT). All rates, provisional sums, etc. in the Bills of Quantities must however be net (exclusive of VAT) with VAT calculated and added to the Total Value thereof in the Final Summary.</p>				
15	<p>FIXED PRICE CONTRACT</p> <p>Should the Bills of Quantities/Lump Sum Document be a fixed price contract, the following clause must be inserted in the Pricing Instructions:</p> <p>Tenderers are to take note that the contract price adjustments are not applicable to this contract. Tenderers should therefore make provision in the Contract Sum, schedule of rates, etc. for possible price increases during the contract period, as no claims in this regard shall be entertained.</p>				



KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

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

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area					
BILL NO. 1					
C2 .2 PRELIMINARY AND GENERAL					
	NOTES	UNIT	QUANTITY	RATE	AMOUNT
i)	The agreement is to be the General Conditions of Contract for Works of Civil Engineering Construction (2010) (Second Edition) , published by the S. A. Institution Of Civil Engineering.				
ii)	The Preliminaries are to be the Construction and management requirements for works contracts - Part 1: General engineering and construction works (SANS 1921-1: 2004 Edition 1) prepared by Standards South Africa and shall be deemed to be incorporated herein.				
iii)	Tenderers are referred to the abovementioned documents for the full intent and meaning of each clause thereof (hereinafter referred to by heading and clause number only) for which such allowance must be made as may be considered necessary.				
iv)	Where standard clauses or alternatives are not entirely applicable to this contract such modifications, corrections or supplements as will apply are given under each relevant clause heading.				
v)	Where any item is not relevant to this specific contract such item is marked N/A (signifying "not applicable").				
vi)	Adjustment of the preliminaries: each item priced, is to be allocated to one or more of the three categories, where "F" denotes a fixed amount (amount not to be varied), "V" denotes an amount variable in proportion to value and "T" denotes an amount in proportion to time.				
vii)	Time (T) related Preliminaries will only be adjusted for omissions or additions, issued by the Employer, or delays caused by the Employer, for which variation and extension of time has been granted. See Contract Data .				
SECTION A: GENERAL CONDITIONS OF CONTRACT					
A1	General (clause 1) F:..... V:..... T:.....	Item			
A2	Basis of Contract (clause 2) F:..... V:..... T:.....	Item			
A3	Engineer (clause 3) F:..... V:..... T:.....	Item			
A4	Contractor's General Obligation (clause 4) F:..... V:..... T:.....	Item			
A5	Time and Related Matters (clause 5) - As referred to in the Contract Data under Special Condition of Contract. The Contract Period shall be deemed to include all Non – Working Days, Special Non – Working Days and the year-end Builders Annual Industry Holiday Periods. F:..... V:..... T:.....	Item			
Carried forward to collection				R	

		UNIT	QUANTITY	RATE	AMOUNT
A6	Payment and Related Matters (clause 6) F:..... V:..... T:.....	Item			
A7	Quality and Related Matters (clause 7) F:..... V:..... T:.....	Item			
A8	Risk and Related Matters (clause 8) F:..... V:..... T:.....	Item			
A9	Termination of Contract (clause 9) F:..... V:..... T:.....	Item			
A10	Claims and Disputes (clause 10) F:..... V:..... T:.....	Item			
SECTION B: SANS 1921-1:2004 (Edition 1): CONSTRUCTION AND MANAGEMENT REQUIREMENTS FOR WORKS CONTRACTS: PART 1					
Refer to the SCOPE OF WORK for detail requirements:					
B1	Scope F:..... V:..... T:.....	Item			
B2	Normative references F:..... V:..... T:.....	Item			
B3	Definitions F:..... V:..... T:.....	Item			
B4	Requirements for construction and management F:..... V:..... T:.....	Item			
B4.1	General F:..... V:..... T:.....	Item			
B4.2	Responsibilities for design and construction F:..... V:..... T:.....	Item			
B4.3	Planning, programme and method statements F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

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

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

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

		UNIT	QUANTITY	RATE	AMOUNT
D11	Provision and erection of signboards - CLAUSE 4.14.6 F:..... V:..... T:.....	Item			
D12	Termination, diversion or maintenance of existing services - CLAUSE 4.17.1 F:..... V:..... T:.....	Item			
D13	Services which are known to exist - CLAUSE 4.17.3 F:..... V:..... T:.....	Item			
D14	Detection apparatus - CLAUSE 4.17.4 F:..... V:..... T:.....	Item			
D15	Additional health and safety requirements - CLAUSE 4.18 F:..... V:..... T:.....	Item			
	SECTION E: SPECIFIC PRELIMINARIES <u>Section E contains Specific Preliminary items which apply to this contract except where "N/A" (Not Applicable) appears against the item.</u>				
E1	PROPRIETARY BRANDED PRODUCTS The contractor shall take delivery of, handle, store, use apply and/or fix all proprietary branded products in strict accordance with the manufacturers' instruction after consultation with the manufacturer's authorised representative. F:..... V:..... T:.....	Item			
E2	OVERTIME Should overtime be required to be worked for any reason whatsoever, the costs of such overtime are to be borne by the Contractor unless the Engineer/Principal Agent has specifically authorised in writing, prior to the execution thereof, that costs for such overtime are to be borne by the Employer. F:..... V:..... T:.....	Item			
E3	AS BUILT DRAWINGS The position of construction breaks and the extent of individual concrete pours are to be recorded by the Contractor on the Structural Engineer's drawings and are to be submitted to the Engineer/Principal Agent and the Structural Engineer for their records. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

	SECTION E: SPECIFIC PRELIMINARIES	UNIT	QUANTITY	RATE	AMOUNT
E4	SITE INSTRUCTIONS Site Instructions issued on site are to be recorded in triplicate in a Site Instruction book which is to be maintained on site by the Contractor. F:..... V:..... T:.....	Item			
E5	LABOUR RECORD At the end of each week the Contractor shall provide the Engineer/Principal Agent with a written record, in schedule form, reflecting the number and description of tradesmen and labourers employed by him and all sub-contractors on the works each day. F:..... V:..... T:..... <i>Note : In the event that the contractor fails to satisfy the requirements of this specification, the Employer (Head: Public Works) may apply any of the sanctions provided in the contract. Sanctions may include the application of a financial penalty of .04% of the Contract Sum per calendar day of which the required report has not been submitted.</i>	Item			
E6	PLANT RECORD At the end of each week the Contractor shall provide the Engineer/Principal Agent with a written record, in schedule form, reflecting the number, type and capacity of all plant, excluding hand tools, currently used on the works. F:..... V:..... T:.....	Item			
E7	NON CESSION OF MONIES The Contractor shall not cede nor assign his rights or claims to any monies due or to become due under this contract. F:..... V:..... T:.....	Item			
E8	SECTIONAL COMPLETION When it is required that the contract be executed in sections or portions, the tenderer shall allow for all costs in this regard as no claim for additional costs will be entertained. F:..... V:..... T:.....	Item			
E9	LOCAL LABOUR It is a general requirement of this contract that persons normally resident in the ward of the works (Local Labour) be given preference for employment on the contract. Provided, however, that should adequate and appropriate Labour not be available within the ward , others may be employed subject to satisfactory proof being provided that every reasonable endeavour has been made to employ Local Labour (Local Sub-Contractor(s); Skilled; Semi-Skilled; and Unskilled). The Contractor shall in consultation with the local community leaders (Project Steering Committee) with the purpose of negotiating with them regarding the utilization of local resources in the construction process. In this regard, the Contractor shall furthermore give preference, wherever possible to the employment of single heads of households, women and youth. The Contractor shall, in general, maximize the involvement of the local community, however workers from other communities should not exceed 20% of all persons working on the project. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

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

		UNIT	QUANTITY	RATE	AMOUNT
	<p>E12.1 c Labour rate and payment intervals</p> <p>The contractor should ensure that labour rate paid to unskilled local labour is commensurate to the daily task. When determining the rate, consideration should be given to that EPWP beneficiaries are mostly bread winners in their families, as the program intends alleviating poverty. There should also be consideration that the labour rate promotes creation of expanded number of jobs created and person days of work.</p> <p>Contractors should make endeavours to ensure that labourers, particularly unskilled are remunerated on fortnight basis and prior notification be made should there be a shortfall on their wages.</p> <p>The labour rate for local unskilled shall also be determined in consideration of the location of the project, i.e. for projects implemented in urbanized municipalities will not be the same as that for rural municipalities.</p> <p>F:..... V:..... T:.....</p>	Item			
	<p>12.2 LABOUR INTENSIVE CONSTRUCTION METHOD</p> <p>E12.2 a Labour Intensive Construction (LIC) method</p> <p>On site there must a person(s) having competency in managing and implementing LIC methods.</p> <p>*Foreman @ NQF Level 4 the Unit Standard on Implementing LIC methods on site.</p> <p>*Site Agent/ Managers @ NQF level 5 the Unit Standard on Manage Labour-Intensive Skills Programme both must be CETA accredited</p> <p>F:..... V:..... T:.....</p>	Item			
	<p>E12.2 b Labour Intensive Construction Method</p> <p>Those parts of the contract to be constructed using Labour Intensive methods will be marked in the BoQ with letter LI (indicating Labour Intensive) against every item so designated. Such works will only be constructed using method so indicated.</p> <p>Reference to be made to Guidelines for the implementation of Labour Intensive Infrastructure projects under EPWP. "Scope of Work in Respect of Work Relating to the Expanded Public Works Programme (EPWP)"</p> <p>F:..... V:..... T:.....</p>	Item			
	<p>E12.3 RECORD KEEPING</p> <p>12.3.1 Every employer must keep in the project site office the following minutes of site progress minutes; contractors' monthly site progress reports; accurately recorded attendance register; proof of payment as means to verify authenticity of data in the EPWP Beneficiary form submitted with payment certificates. Copies of submitted EPWP beneficiary data forms should also be kept in the site office.</p> <p>F:..... V:..... T:.....</p>	Item			
	<p>12.3.2 The employer must keep this record for a period of at least three (3) years after the completion of the project in his/her office as the project site office would have been relocated.</p> <p>This should be safely kept for job creation data verifications and periodical audits on projects conducted by National and Provincial Department of Public Works after one (1) or two (2) quarters of submitting captured EPWP Data to the National EPWP coordinating Department.</p> <p>F:..... V:..... T:.....</p>	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	<p>E12.4 EPWP REPORTING as per EPWP DATA FORM</p> <p>At the end of each month as part of site progress report and to be attached to every contractors' progress payment certificate; the contractor shall provide the principal agent & Public Works with a written records, as per EPWP data form; which will be reflecting, beneficiaries full name & surname; ID No and job description of labour employed by main contractor and sub-contractors on site. At the end of each month the contractor must submit the following documents to be attached to the Progress payment certificate:</p> <ol style="list-style-type: none"> 1. EPWP monthly data collection form 2. Worker monthly payment upload 3. Worker monthly proof of payment i.e <ol style="list-style-type: none"> 3.1 Acknowledgement of receipt of payment or 3.2 Payslips 3.3 Bank statement highlighted the workers paid 4. Worker monthly training form 5. Monthly attendance register 6. Certified copies of ID's (once off) 7. ID size photos (once off) 8. Proof of UIF 9. Proof of COIDA <p>F:..... V:..... T:.....</p> <p>E12.5 EPWP PROMOTION</p> <p><u>12.5.1 EPWP signage board</u></p> <p>EPWP Program at the project level shall always be promoted through have the projects signage board that embrace EPWP logo at the bottom, correct measurement for this signage board will be provided by the project leader during the site handing over meeting. the standard "HELVETIVA MEDUIM " letters are to be used . Professional title to be 10 mm above line . Line thickness to be 8 mm thick . Space between bottom of the line and bottom of the lettering below the line has to be 100 mm. Letter sizes are as follows : Helvetica medium 100 mm black upper case to be for project name and owner . Helvetica medium 75mm black upper case only to be used for professional titles. Project name and owner shall be black lettering on white background. Board sizes are as follows : Board to be minimum 2000mm from ground level and to be constructed from reinforced formed chromadek panels minimum 0,6mm thick chromadek. The contractor is responsible for ensuring that the project board remains neatly and safely erected for the full duration including maintenance period, after which the project board and post are to be dismantled and handed to the client in good order.</p> <p>F:..... V:..... T:.....</p> <p><u>12.5.2 Branding of labour apparel</u></p> <p>Contractor & Sub-contractors' labourers shall be provided with EPWP branded Personal Protective Equipment (PPE), reflector vest with EPWP wording at the back is an ideal and cost effective means of promoting program on site.</p> <p>The contractor is then advised to price for both item 12.5.1 and 12.5.2</p> <p>F:..... V:..... T:.....</p>	Item			
		Item			
		Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	<p>E12.6 COMMUNITY LIAISON OFFICER (CLO) UTILISATION OF A COMMUNITY LIAISON OFFICER In addition to the requirements of Clause E9, contained in this document; The Contractor shall allow for and pay any and all costs necessary for the engagement of the services of a Community Liaison Officer (CLO) for the full duration of this contract</p> <p>In the interest of providing a sound service to both the community and the Contractor, a CLO may only manage one project at a given time.</p> <p>A CLO will be identified by the local structures of the ward areas and appointed following fair and transparent interviewing process, to be conducted in the presence of local structures and the contractor representative, in order to assist the Contractor in the procurement of any local labour, etc. required for this project. The Contractor is to liaise with the CLO and afford him any assistance needed in ensuring sound working relations with the local community.</p> <p>Key Responsibilities of the CLO are envisaged to include and not necessary be limited to:</p> <ol style="list-style-type: none"> 1. Assisting local leadership in conducting skills and resources audit which facilitates sourcing labour from within the ward or targeted areas for employment, as required by contractor. 2. Assisting in sourcing labour-only domestic sub-contractors and the procurement of materials from local resources, as required by the contractor. 3. Assisting the contractor by identifying areas of potential conflict and or threats to the project or to stakeholders in the project and recommend appropriate action to the contractor. 4. Assisting contractor and stakeholders in the project in the resolution of any conflict which may arise. 5. Establishing and ensuring that sufficient and open communication channels between the contractor and the work force are maintained. 6. Establish and ensuring that efficient and open communication channels between the contractor and the community are maintained 7. Identifying and reporting to the Contractor regarding issues where communication between stakeholder is necessary, recommend courses of action and facilitate such communications 8. Assisting the Contractor and the work force in the establishment of grievance procedures and necessary recommendation to the Contractor regarding the grievances and solution thereto. 9. Attending to site meetings and project implementation meetings as required by the Contractor and prepare periodic reports as may be required by the Contractor from time to time. 10. Attending to such other duties which are consistent with the functions of a CLO, as may be required by the Contractor from time to time. <p>Tenderers are to price twice the rate of unskilled local labour rate against this item for any and all costs arising out of compliance with the foregoing and in the event of a Tenderer failing to price against this item or making inadequate financial provision against this item for compliance as aforesaid, then no claim for costs or additional cost incurred will be entertained by the Head: Works</p> <p>F:..... V:..... T:.....</p>	Item			
	Carried forward to collection			R	

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

		UNIT	QUANTITY	RATE	AMOUNT
	<p>E12.8.1 Sub-Contractor Procedure</p> <p>The recommendation will be that the Contractor shall advertise and call for competitive tenders in respect of each portion of the works that are required to be subcontracted. The tenders received are then evaluated by both the employer and the contractor. The evaluation panel shall comprises equal representatives from the Employer and from the Contractor.</p> <p>The Contractor shall without delay enter into contract with the successful tendering subcontractor based on their accepted tender submission.</p> <p>This will promote the cost effective participation and development of smaller registered contractors in larger valued contracts without losing single point of accountability for projects. This will allow the emerging contractors to tender for work in a fair, transparent and equitable manner rather than having to negotiate such contracts with the main contractor. Also guarantees the participation of contractors registered in lower contractor grading designation.</p> <p>F:..... V:..... T:.....</p> <p>E12.8.2 Sub-Contractor Mentoring</p> <p>Once the Subcontractors have been identified and engaged, the Contractor shall closely monitor their performance in the execution of their contracts.</p> <p>The Contractor will be responsible for drawing implementation plan that will assist in managing the development of sub-contractors undertaking Labour Intensive work.</p> <p>The Contractor will be responsible for management of the sub-contractors and to ensure that they comply with all EPWP requirements as set-out in this specification.</p> <p>The Contractor and sub-contractors will be required to compile monthly progress reports to be submitted with payment certificates. The reports shall include planned targets with regards to the works and employment, employment of EPWP beneficiaries and project expenditure. Failure to produce monthly reports will render payment certificates incomplete</p> <p>The contractor will be required to assist, train, mentor and monitor its Sub-contractors and report through monitoring tool on progress of each Sub-contractor.</p> <p>F:..... V:..... T:.....</p> <p>E12.8.3 Portfolio of Evidence</p> <p>The Contractor is to develop and /or maintain a portfolio of evidence for each sub-contractor. The Portfolio of Evidence is a collection of proof of the training, coaching, guidance and monitoring inputs provided to the Sub-contractor. It is the document which records the development progress of the Sub-Contractor and will need to be updated continually throughout the duration of the contract.</p> <p>The Portfolio of Evidence should include but not limited to the following documentation:</p> <ul style="list-style-type: none"> - The development path designed for each Sub-Contractor, - The Training course completed by the Sub-Contractor, - The hours of guiding, coaching and mentoring received for each activity listed in the developmental plan, - A list of outcomes achieved at each level for each activity.B431 <p>F:..... V:..... T:.....</p>	Item			
		Item			
		Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	<p>Performance and penalties</p> <p>The Contractor performance will be monitored throughout the contract. Should the Contractor fail to fulfil his obligation he will be liable for penalties. Payment of the penalty shall not absolve the Contractor of any claim, or relieve the Contractor of any of his duties, obligations or responsibilities under the contract.</p> <p>- Utilisation of the Sub-Contractors</p> <p>The Contractor's achievement of the targets will be measured quarterly to determine the progress made to date.</p> <p>E12.8.4 Local Suppliers</p> <p>Local material suppliers within the vicinity of the site to be utilise as long as their materials meets the required specification. However, quality and suitability would have to be checked by the employer, if the local suppliers are unable to meet the demand the nearest suitable suppliers are to be used.</p> <p>Production of materials should be done on site, where economies of scale allow e.g. concrete paving blocks should be encouraged which will enable employment creation and also allow for enterprise development.</p> <p>F:..... V:..... T:.....</p> <p><u>TENDERER'S TO NOTE CONDITIONS</u></p> <p>a) The contract to be entered into between the Contractor and the Priority Population Group's (PPG's) will be a labour and material sub-contract or labour only depending on the contractor and subcontractor agreement.</p> <p>b) The Contractor will be responsible for ensuring that all materials for use by the PPG's in the works are to be on site timeously. The Contractor shall liaise with The Mentor and PPG to determine the nature and extent of materials required and the lead time necessary.</p> <p>c) The Contractor shall be responsible for the overall programming of the Works and he is to allow for monitoring the PPG's programme and progress.</p> <p>d) In conjunction with the Mentor, he is to allow for the supervision and mentoring (where necessary) of the PPG to ensure quality and adherence to standard building practice</p> <p>e) The Contractor is to allow for extra storage facilities on site for the PPG's tools and equipment.</p> <p>f) Basic tools shall be provided by the PPG's and where these are not available; the Contractor will supply him with the necessary tools and equipment and deduct the costs thereof from the interim claims made by the PPG.</p> <p>g) Work requiring specialized tools will be provided free of charge by the Contractor with the provision that these be returned upon completion of the Work.</p> <p><u>CO-ORDINATION</u></p> <p>The Contractor is to co-ordinate and supervise the work of all the PPG's, Sub-Contractors and Nominated Sub- Contractors appointed direct by the Employer in such a manner and at all times as will suit the building programme and he is to allow adequate access, for the PPG's, where required, to carry out their work in an efficient manner and acceptable quality standards in accordance with the specifications as no claims for extras in this connection will be entertained.</p> <p>F:..... V:..... T:.....</p>	Item			
		Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	<p>ATTENDANCE The Contractor may allow for attendance upon the PPG's concerned to execute the work. The Contractor is to allow the PPG's the use of any scaffolding belonging to him while it remains so erected on the site.</p> <p>Where scaffolding is necessary for the use by any PPG and the Contractor has not erected any for his own use or has removed same after his own use, the Contractor shall supply sufficient scaffolding to the PPG to be erected and dismantled by the PPG and returned to the Contractor.</p> <p>This attendance upon PPG's to execute the work is to include for the scaffolding provisions as aforesaid and, in addition, is to include for co-operating to the fullest extent with all the parties, attending on off-loading materials, providing suitable storage for tools and materials used by the PPG's, use of general facilities such as latrines, etc., supply and cost of power, lighting, water and the like.</p> <p>F:..... V:..... T:.....</p> <p>E12.9 EPWP CONTRACT FOR LABOUR It is compulsory that shortly after the contractor and or sub contractor has appointed local labour, the employment contract should be signed by both parties, prior to commencement with works on site. The employment contract forms part of the Ministerial Determination or from the regional EPWP officials. Each contract will lapse at the end of each financial year therefore requiring the Contractor to do a renewal of each contract should the need of employment still exist for that particular labourer.</p> <p>F:..... V:..... T:.....</p> <p>E12.10 EPWP SCOPE of WORK Note: Contractors are to price any item on the Bill of Quantities having below, bearing in mind that they are regarded as main sources of job creation, whether sub contracted or undertaken by the main contractor.</p> <p>Elements on the scope of work where application of Labour Intensive Construction methods as will indicated with letters (LI) are regarded feasible are as follows;</p> <p>i) Excavating trenches for foundations and any other civil works with the depth not more than 1.5 m</p> <p>ii) All masonry works which include concrete mixing on site; brickwork; plastering; screed works; jointing; etc.</p> <p>iii) Painting, Plumbing, Ironmongery; roof cladding; glazing; tiling; carpentry; flooring; waterproofing; etc.</p> <p>iv) External works such as landscaping; cleaning; paving; fencing; tarmac; etc.</p> <p>F:..... V:..... T:.....</p>	Item			
		Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	<p>Note: It is a general requirement of this contract that persons normally resident in the ward of the works (local labour) be given preference for employment on the contract. Provided, however, that should adequate and appropriate labour not be available within the ward, others may be employed subject to satisfactory proof being provided that every reasonable endeavour has been made to employ local labour (Local Sub-contractor(s); Skilled; Semi-Skilled and Unskilled). The contractor shall in consultation with the local community leaders with the purpose of negotiating with them regarding the utilization of local resources in the construction process. In this regard, the contractor shall furthermore give preference, wherever possible to the employment of single heads of households, women and youth as well as families declared as most indigent by War on Poverty/ Sukuma Sakhe program profiling process. The contractor should aim, in general, to maximise the involvement of the local community, however workers from other communities should not exceed 20% of all persons working on the project, where local employees possess skills at level of competency that meet contractors requirements.</p> <p><u>Payment for the labour-intensive component of the works</u> Payment for works identified in the Scope of Work as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the Scope of Work. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict.</p> <p><u>Linkage of payment for labour-intensive component of works to submission of project data</u> The Contractor's payment invoices shall be accompanied by labour information for the corresponding period in a format specified by the employer. If the contractor chooses to delay submitting payment invoices, labour returns shall still be submitted as per frequency and timeframe stipulated by the Employer. The contractor's invoices shall not be paid until all pending labour information has been submitted.</p> <p><u>Applicable labour laws</u> The current Ministerial Determination (also downloadable at www.epwp.gov.za) Expanded Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice , shall apply to works described in the scope of work as being labour-intensive and which are undertaken by unskilled or semi-skilled workers.</p> <p>F:..... V:..... T:.....</p>	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
E13	HIV/AIDS AWARENESS Tenderers are to price against the following items for compliance with the SPECIFICATION FOR HIV/AIDS AWARENESS bound into this document (The clauses referred to are those of the Specification for HIV/AIDS)				
E13.1	Provide and maintain a condom dispenser in terms of Clause 5.1a) F:..... V:..... T:.....	Item			
E13.2	Provide and maintain HIV/AIDS awareness posters terms of Clause 5.1b) F:..... V:..... T:.....	Item			
E13.3	HIV /Aids Awareness Programme on Site for not less than 90% of workers inclusive of all direct and indirect costs; Engage a qualified service provider as described in the scope of works to conduct an HIV Awareness Programme in terms of Clause 5.2.1a) F:..... V:..... T:.....	Item			
E13.4	Arrange for workers to attend the HIV Awareness Programme in terms of Clause 5.2.1b) F:..... V:..... T:.....	Item			
E13.5	Reporting Prepare and attach to claims for payment a brief report in terms of Clause 5.3 (see also HIV/STI Compliance Report included with this document). F:..... V:..... T:..... <i>Note: In the event that the contractor fails to satisfy the requirements of this specification, the employer (Head: Public Works) may apply any of the sanctions provided for in the contract. Sanctions may include the application of a financial penalty of .04% of the Contract Sum per calendar day of which the required reports has not been submitted.</i>	Item			
E14	OCCUPATIONAL HEALTH AND SAFETY ACT NO. 85 OF 1993 Tenderers are to allow for costs in providing a project specific ' Construction Phase Safety, Health and Environmental Plan' in accordance with "Section 2 - Specification Data associated with SANS 1921-1:2004" clause C4.18 in "Part C3 - Scope of Work" (Amount brought forward from "Health and Safety Implementation Costing" Bill of Quantities - refer to annexure 7) F:..... V:..... T:.....	Item			
E15	NOTICE BOARD, SITE OFFICE, ETC. Tenderers are to allow for the provision and removal of a project notice board and a site office in accordance with the Principal Agent's requirements. F:..... V:..... T:.....	Item			
E16	IMPORTED MATERIALS AND EQUIPMENT Where imported items are listed in the tender documents, the tenderer shall provide all information called for, failing which the price of any such item, material or equipment shall be excluded from currency fluctuations. (Refer to T2.14 - Schedule of Imported Materials and Equipment . F:..... V:..... T:.....	Item			
E17	CONTRACT DOCUMENTS The drawings issues with these Tender documents do not comprise the complete set but serves as a guide only for tendering purposes and for indicating the scope of works to enable the Tenderer to acquaint him with the nature and extent of the works and the manner in which they are to be executed. Should any part of the drawings not be clearly legible to the Tenderer he shall, before submitting his Tender, obtain clarification in writing from the principal agent. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

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

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

SECTION 1			
SUMMARY – PRELIMINARY & GENERAL			
Collection	Page No.	Amount	
	1	R	
	2	R	
	3	R	
	4	R	
	5	R	
	6	R	
	7	R	
	8	R	
	9	R	
	10	R	
	11	R	
	12	R	
	13	R	
	14	R	
	15	R	
	16	R	
	17	R	
	18	R	
	19	R	
Carried forward to Final Summary		R	
Section No. 1 Preliminary & General Summary			



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

PART C2.3 BILL OF QUANTITIES

Item No	Quantity	Rate	Amount
<u>BILL NO. 2</u>			
<u>EARTHWORKS</u>			
<u>(CPAP WORK GROUP NO. 104 UNLESS OTHERWISE STATED)</u>			
<u>PREAMBLES</u>			
<p>The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item</p>			
<u>Nature of ground</u>			
<p>Tenderers must acquaint themselves with the nature of the material to be excavated and also refer to the attached geotechnical investigation report annexed to these Bills of Quantities.</p>			
<u>Carting away of excavated material</u>			
<p>Descriptions of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations or, alternatively, from stock piles situated on the building site</p>			
<u>Excavation for working space in rock</u>			
<p>Notwithstanding clause 11 page 8 of the Standard System of Measuring Building Work, excavation for working space in rock will be measured in cubic metres to the extent executed and given as "extra over" bulk excavation or trench and hole excavation as the case may be</p>			
<u>Filling</u>			
<p>Notwithstanding the reference to prescribed multiple handling in clause 1 page 6 of the Standard System of Measuring Building Work, prices for filling and backfilling shall include for all selection and any necessary multiple handling of material.</p>			
Carried Forward		R	
<p>Bill No. 2 Earthworks</p>			

Brought Forward			R
Testing			
Prices for filling are to include for all necessary density tests in accordance with SABS 1200D			
<u>EXCAVATION, FILLING, ETC. OTHER THAN BULK</u>			
<u>Excavation in earth not exceeding 2m deep</u>			
1	Reduced levels under floors (LI)	m3	644
2	Ground beams (LI)	m3	150
3	Pile caps (LI)	m3	39
4	Holes (LI)	m3	36
<u>Back excavation of vertical sides of excavations in earth for working space including backfilling compacted to 98% Mod. AASHTO density</u>			
5	Not exceeding 500mm deep for placing and removing formwork to walls 300mm away from excavated face (LI)	m2	802
6	Exceeding 500mm and not exceeding 1500mm deep for placing and removing formwork to walls 300mm away from excavated face (LI)	m2	212
<u>Extra over trench and hole excavations in earth for excavation in</u>			
7	Intermediate material (LI)	m3	81
8	Hard material	m3	41
<u>Extra over all excavations for carting away</u>			
9	Surplus material from excavations and/or stock piles on site, to a dumping site to be located by the contractor	m3	853
10	Removal of piling spoil and cart away	m3	333
<u>Risk of collapse of excavations</u>			
11	Sides of trench and hole excavations not exceeding 1,5m deep	m2	1 014
Carried Forward			R
Bill No. 2 Earthworks			

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoasphal**

Brought Forward			R
<u>Keeping excavations free of water</u>			
12	Keeping excavations free of all water other than subterranean water	Item	
<u>Earth filling obtained from the excavations and/or prescribed stock piles on site, compacted to 95% Mod AASHTO density.</u>			
13	Backfilling to trenches, holes, etc. (LI)	m3	16
<u>Earth filling supplied by the contractor, compacted to 95% Mod. AASHTO density</u>			
14	Under floors of G5 material in accordance with SABS 1200 DM and compacted to 95% Mod. AASHTO density (LI)	m3	276
<u>Compaction of surfaces</u>			
15	Compaction of ground surface under bases, etc. including grading, levelling and scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 98% Mod. AASHTO density	m2	279
16	Compaction of ground surface under ground beams, etc. including grading, levelling and scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 98% Mod. AASHTO density	m2	1 097
17	Compaction of ground surface under floors, etc. including grading, levelling and scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 98% Mod. AASHTO density	m2	1 527
<u>Prescribed density tests on filling</u>			
18	Modified AASHTO Density tests	No	40
<u>SOIL POISONING</u>			
Carried Forward			R
Bill No. 2 Earthworks			

Proposed New Orthotic and Prosthetics Centre At Ngwelezane Hoasptial

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Proposed New Orthotic and Prosthetics Centre At Ngwelezane Hoasptial

Item No	Quantity	Rate	Amount
<u>BILL NO. 3</u>			
<u>PILING</u>			
<u>(CPAP WORK GROUP NO. 106 UNLESS OTHERWISE STATED)</u>			
<u>PREAMBLES</u>			
The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item			
Carried Forward			R
Bill No. 3 Piling			

		Brought Forward	R
		<u>SUPPLEMENTARY PREAMBLES</u>	
		<p>The contractor shall take full responsibility for piling work and shall guarantee that piling work will support the calculated loads laid down by the engineer without injurious settlement.</p>	
		<p>The actual lengths of piles shall be determined on site by the contractor in consultation with the project engineer who will give all assistance possible. This does not in any way relieve the contractor of his responsibility or obligation to provide the specified guarantee from his own independent piling engineer. The contractor shall indemnify the employer against any injury to or death of any person and all loss or damage to all structures resulting from the failure of any pile.</p>	
		<p>In the event of the failure of a pile, the contractor shall make good such pile and all consequent damage at his own expense.</p>	
		<p>The contractor shall insure by means of a policy, by the principal agent, against risks arising out of the responsibilities, guarantee and indemnities specified. A copy of the construction engineers professional indemnity cover must be attached to the bid submission</p>	
		<p>The contractor shall pay all premiums in respect of this insurance policy. The guarantee shall be for the amount and effective period as stated hereafter in this bill.</p>	
		<p>The contractor shall insure by means of a policy by the principal agent , against risks arising out of the responsibilities, guarantee and indemnities specified.</p>	
		<u>THE FOLLOWING IN PILING</u>	
		<u>GUARANTEE AND INSURANCE</u>	
1	Insurance policy against claims arising from the installation of piling up to a limit of R5,000,000.00 (Five Million Rand) per claim of the number of claims with no limit on the number of claims that may occur and effective for a period of 5 years from the date from the completion of the contract	Item	
		Carried Forward	R
Bill No. 3 Piling			

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoospital**

Brought Forward			R
<u>ESTABLISHMENT</u>			
2	Transporting to and establishment of site of necessary plant for the execution of the work and removal thereof on completion	Item	
3	Set out pile positions	No 110	
4	Setting up plant at each pile position	No 110	
<u>CONTINUOUS FLIGHT AUGER (CFA) IN-SITU CONCRETE PILES</u>			
<u>Drilling not exceeding 10m deep in earth below reduced ground level</u>			
5	350mm Diameter pile shafts	m 1 100	
<u>Continuous flight auger drilling exceeding 10m and not exceeding 15m deep in earth below ground level</u>			
6	350mm Diameter pile shafts	m 220	
7	Extra over drilling for 350mm diameter pile for under reaming spherical shaped enlarged foot 1100mm diameter	No 110	
<u>Continuous flight auger drilling in strata of a more difficult character</u>			
8	Extra over drilling and under-reaming in earth for drilling in soft rock (Provisional)	m3 40	
9	Extra over drilling and under-reaming in earth for drilling in hard rock (Provisional)	m3 40	
<u>CONCRETE (CPAP Work Group No. 110)</u>			
<u>30MPa Concrete grout cast against excavated surfaces</u>			
10	350mm Diameter piles	m 1 408	
11	Additional concrete to 350mm diameter pile for spherical shaped enlarged foot 1100mm diameter	No 110	
Carried Forward			R
Bill No. 3 Piling			

Brought Forward			R
<u>TEST CUBES</u>			
12	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	90
<u>CONCRETE SUNDRIES</u>			
<u>Stripping back heads of concrete piles for a height not exceeding 1000mm to expose reinforcement including trimming to defined levels and bending reinforcement as necessary for casting into pile caps</u>			
13	Piles of varying diameters ranging from 300mm diameter to 750mm diameter	No	110
<u>FORMWORK (CPAP Work Group No. 111)</u>			
<u>Rough formwork to sides (Class 1)</u>			
14	Formwork to 350mm diameter pile above ground level (Provisional)	m	90
<u>REINFORCEMENT (PROVISIONAL) (CPAP WORK Group No. 114)</u>			
<u>Mild steel reinforcement</u>			
15	Bars of various diameters	t	2.40
<u>High tensile steel reinforcement</u>			
16	Bars of various diameters	t	13.50
<u>TESTING (CPAP WORK Group No. 106)</u>			
17	Transporting and establishment of site of necessary testing plant for execution of the work and removal thereof on completion		Item
18	Testing 350mm diameter pile to a maximum load 500kN (English Method)	No	4
19	Testing 350mm diameter pile acoustically for shaft integrity	No	110
Carried Forward			R
Bill No. 3 Piling			

[illegible]

Item No		Quantity	Rate	Amount
	<u>BILL NO. 4</u>			
	<u>CONCRETE, FORMWORK AND REINFORCEMENT</u>			
	<u>(CPAP WORK GROUP NO. 110 UNLESS OTHERWISE STATED)</u>			
	<u>PREAMBLES</u>			
	The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item			
	<u>SUPPLEMENTARY PREAMBLES</u>			
	<u>Cost of tests</u>			
	The costs of making, storing and testing of concrete test cubes as required under clause 7 "Tests" of SABS 1200 G shall include the cost of providing cube moulds necessary for the purpose, for testing costs and for submitting reports on the tests to the Engineer. The testing shall be undertaken by an independent firm or institution nominated by the contractor to the approval of the Engineer. (Test cubes are measured separately)			
	<u>Formwork</u>			
	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			
	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.			
	Carried Forward		R	
	Bill No. 4 Concrete, Formwork & Reinforcement			

<p style="text-align: right;">Brought Forward</p> <p>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"</p> <p>Formwork to soffits of solid, etc. shall be deemed to be slabs not exceeding 250mm thick unless otherwise described and propping not exceeding 3,5m high unless otherwise stated. Formwork to walls and columns is not exceeding 3,5m high above bearing level unless otherwise stated.</p> <p style="text-align: right;">Carried Forward</p> <p>Bill No. 4 Concrete, Formwork & Reinforcement</p>		R	
		R	

Brought Forward			R
<p><u>Polished Concrete</u></p> <p>It must be noted that where polished concrete finishes are required, the pouring and polishing of such concrete should be done by the same specialist contractor.</p> <p>The Contractor is to allow for sufficient and adequate protection of all concrete surfaces which are to have a polished finish surface.</p> <p>To achieve the optimum aesthetic finish to the floors, the casting and finishing of such concrete in connection with the laying process is of extreme importance, requiring a high degree of accuracy in placing. When grinding, the top surface of the concrete is exposed and any defects such as cracks, pores and 'gumboot marks' that originated during casting will become evident and will not be accepted and it will be required that such defects are corrected to the complete satisfaction of the Architect.</p> <p>Place concrete to a FM2 tolerance using a bull float. Separation of aggregate from walking in the green concrete is to be prevented and avoided.</p> <p>Saw cutting where required is to be done in squares to minimise the risk of shrinkage cracks and shall be done timeously within 12 hours of placing the concrete.</p> <p>During the grinding and polishing process all depressions and imperfections must be corrected and repaired to the satisfaction of the Architect.</p> <p>During grinding and polishing the required silicate densifiers and stain resistant products shall be applied in accordance with the manufacturer's specifications.</p> <p>A sample panel of the polished finish is to be provided for the Architect's approval prior to any work commencing.</p> <p><u>UNREINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES</u></p> <p><u>10MPa/19mm concrete</u></p>			
1	Surface blinding under footings and bases (LI)	m3	18
Carried Forward			R
<p>Bill No. 4 Concrete, Formwork & Reinforcement</p>			

Brought Forward			R
<u>REINFORCED CONCRETE CAST AGAINST ON/IN FORMWORK</u>			
<u>25MPa/19mm concrete</u>			
2	Bases (LI)	m3	14
3	Pile caps (LI)	m3	36
4	Ground beams (LI)	m3	126
5	Surface ground slab on waterproofing (LI)	m3	382
<u>30MPa/19mm concrete</u>			
6	Columns in foundations (Provisional) (LI)	m3	1
7	Columns (LI)	m3	24
8	Ring beams (LI)	m3	42
9	Isolated beams (LI)	m3	8
10	Inverted beams (LI)	m3	3
11	Slabs (LI)	m3	46
12	Concrete infill in cavity walls (LI)	m3	6
<u>TEST CUBES</u>			
13	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	111
<u>CONCRETE SUNDRIES</u>			
<u>Finishing top surfaces of concrete smooth with a wood float</u>			
14	Surface beds, slabs, etc. (LI)	m2	1 700
<u>40Mpa Non-shrink grout</u>			
15	Bedding approximately 25mm thick under base plate including chamfered edges all round	m2	1
Carried Forward			R
Bill No. 4 Concrete, Formwork & Reinforcement			

Brought Forward			R
<u>Finishing top surfaces of concrete to a polished surface, including all preparatory work, the necessary grinding and sealing as required. Work to be carried out by specialist Sub-Contractor.</u>			
16	Surface beds, slabs, etc. (LI)	m2	594
<u>FORMWORK (CPAP Work Group No. 111)</u>			
<u>ROUGH FORMWORK (DEGREE OF ACCURACY III)</u>			
<u>Rough formwork to sides</u>			
17	Bases (Provisional) (LI)	m2	27
18	Pile caps (Provisional) (LI)	m2	193
19	Ground beams (Provisional) (LI)	m2	663
20	Edges, risers, ends and reveals not exceeding 300mm high or wide (LI)	m	283
<u>SMOOTH FORMWORK (DEGREE OF ACCURACY II)</u>			
<u>Smooth formwork to sides</u>			
21	Columns propped up not exceeding 3.5m high (LI)	m2	51
22	Columns propped up exceeding 3.5m and not exceeding 5m high (LI)	m2	76
23	Columns propped up exceeding 5m and not exceeding 6.5m high (LI)	m2	156
24	350mm Diameter columns propped up exceeding 3.5m and not exceeding 5m high (LI)	No	4
25	350mm Diameter columns propped up exceeding 5m and not exceeding 6.5m high (LI)	No	2
26	Inverted beams (LI)	m2	27
27	Edges, risers, ends and reveals not exceeding 300mm high or wide (LI)	m	75
Carried Forward			R
Bill No. 4 Concrete, Formwork & Reinforcement			

**Proposed New Orthotic and Prosthetics Centre
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	Brought Forward			R
	<u>Smooth formwork to sides and soffits</u>			
28	Ring beams (LI)	m2	331	
29	Isolated beams (LI)	m2	86	
	<u>Smooth formwork to soffits</u>			
30	Slabs, propped up exceeding 3.5m and not exceeding 5m high (LI)	m2	25	
31	Slabs not exceeding 3.5m high and exceeding 250mm and not exceeding 500mm thick (LI)	m2	147	
	<u>Boxing in smooth formwork to form</u>			
32	25 x 25mm High horizontal chamfer to sides along top edges (LI)	m	149	
33	25 x 25mm High horizontal chamfer to sides along bottom edges (LI)	m	764	
34	25 x 25mm High vertical chamfer to sides (LI)	m	805	
	<u>Boxing out smooth formwork to form</u>			
35	100 x 255mm High projecting along bottom edges	m	14	
	<u>MOVEMENT JOINTS, ETC.</u>			
	<u>Two sheets of tempered hardboard (smooth sides together) to form slip joint between abutting horizontal concrete and brickwork surfaces</u>			
36	Not exceeding 300mm wide (LI)	m	368	
	<u>Expansion joints with 12mm bitumen impregnated softboard between vertical concrete surfaces, including necessary formwork</u>			
37	12mm Joints not exceeding 300mm high (LI)	m	74	
	<u>Saw cut joints</u>			
38	3 x 30mm Saw cut joints in top of concrete	m	981	
	<u>REINFORCEMENT (PROVISIONAL) (CPAP WORK Group No. 114)</u>			
	Carried Forward			R
	Bill No. 4			
	Concrete, Formwork & Reinforcement			

Brought Forward			R
<u>Mild steel reinforcement to structural concrete work</u>			
39	Bars of various diameters (LI)	t	61.87
<u>High tensile steel reinforcement to structural concrete work</u>			
40	Bars of various diameters (LI)	t	16.98
Carried to Summary			R
Bill No. 4			
Concrete, Formwork & Reinforcement			

Item No	Quantity	Rate	Amount
<p><u>BILL NO. 5</u></p> <p><u>MASONRY</u></p> <p><u>(CPAP WORK GROUP NO. 116 UNLESS OTHERWISE STATED)</u></p> <p><u>PREAMBLES</u></p> <p>The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>SAMPLES</u></p> <p>Samples of masonry building units to be provided before construction commences</p> <p><u>SIZES IN DESCRIPTIONS</u></p> <p>Where sizes in descriptions are given in brick units, "one brick" shall represent the length and "half brick" the width of a brick</p> <p><u>HOLLOW WALLS</u></p> <p>Descriptions of hollow walls shall be deemed to include every fifth perpend of the bottom course of the external skin open as a weep hole</p> <p><u>BAGGED AND SEALED WALLS</u></p> <p>User Note: The following preamble generally applies for works in hot and humid coastal areas.</p> <p>Walls in two skins described as "bagged and sealed" shall be deemed to include having the outer face of the inner skin bagged with 1:6 cement and sand mixture and sealed with two coats bitumen emulsion waterproofing coating.</p>			
<p>Bill No. 5 Masonry</p>	Carried Forward	R	

Brought Forward			R
<u>FACE BRICKS</u>			
Bricks shall be ordered timeously to obtain uniformity in size and colour.			
All face brick work is to be protected from other finishing trades during the construction period.			
All interior face brickwork is to receive two coats water based silicone sealant at completion including preparatory work as per manufacturer's instructions.			
<u>POINTING</u>			
Descriptions of recessed pointing to fair face brickwork and face brickwork shall be deemed to include square recessed, hollow recessed, weathered pointing, etc.			
<u>FOUNDATIONS (PROVISIONAL)</u>			
<u>Brickwork of NFX bricks in class II mortar</u>			
1	Half brick walls lining to concrete (LI)	m2	141
<u>SUPERSTRUCTURE</u>			
<u>Brickwork of NFP bricks in class II mortar</u>			
2	Half brick walls (LI)	m2	198
3	Half brick walls in beamfilling (LI)	m2	35
4	One brick walls (LI)	m2	1 967
5	330mm Hollow walls formed of two half brick skins including wire ties and concrete infill (Concrete infill elsewhere measured) (LI)	m2	124
<u>BRICKWORK SUNDRIES</u>			
<u>2.5mm Galvanised brickwork reinforcement</u>			
6	75mm Wide reinforcement built in horizontally (LI)	m	1 466
7	155mm Wide reinforcement built in horizontally (LI)	m	8 624
Carried Forward			R
Bill No. 5 Masonry			

Brought Forward			R
	<u>Bagging of 1:3 cement and sand mixture</u>		
8	On brick walls, piers, etc. (LI)	m2	793
	<u>Joint forming material in movement joints</u>		
9	12mm Bitumen impregnated fibre board built in vertically between brick skins (LI)	m2	92
	<u>Prestressed fabricated concrete lintels including necessary temporary supports</u>		
10	75 x 110mm Lintels in lengths not exceeding 3m (LI)	m	400
11	75 x 110mm Lintels in lengths exceeding 3m and exceeding 4.5m (LI)	m	33
	<u>Galvanised hoop iron cramps, ties, etc.</u>		
12	30 x 1,6mm Cramp 500mm long with one end shot pinned to concrete and other end built into brickwork (LI)	No	3 153
	<u>FACE BRICKWORK</u>		
13	Extra over brickwork for face brickwork in "Corobrick Firelight Satin FBX" or other equally approved face bricks pointed with flush joints (LI)	m2	793
14	Extra over brickwork for brick-on-edge header course bands one course high (LI)	m	135
	<u>CILLS</u>		
	<u>"Nutec" or other equally approved High density window cills in single lengths with width not exceeding 300mm with galvanised fixing lugs embedded in epoxy cement mortar.</u>		
15	15 x 150mm Wide bullnosed edge sill set flat and projecting internally (LI)	m	125
	<u>'LG Green' or other equally approved precast concrete window cills</u>		
16	Precast cills size 165 x 110mm high (Code: C15) laid on 10mm mortar bed above wall (LI)	m	125
	Carried Forward		R
	Bill No. 5 Masonry		

[illegible]

Item No	Quantity	Rate	Amount
<u>BILL NO. 6</u>			
<u>WATERPROOFING</u>			
<u>(CPAP WORK GROUP NO. 120 UNLESS OTHERWISE STATED)</u>			
<u>PREAMBLES</u>			
The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Waterproofing to SABS 021</u>			
Waterproofing shall be laid under a 10 year written guarantee for site workmanship and water tightness and to be laid to even falls to outlets, etc. Descriptions of sheet or membrane waterproofing shall be deemed to include for additional labour to turn-ups and turn downs			
<u>DAMP-PROOFING OF WALLS AND FLOORS</u>			
<u>One layer of 375 micron "Consol Plastics Brikgrip DPC" or other equally approved embossed damp proof course</u>			
1	In walls (LI)	m2	70
2	Under cills (LI)	m2	21
<u>One layer of 375 micron "Consol Plastics" or other equally approved waterproof sheeting sealed at laps</u>			
3	Under surface beds (LI)	m2	2 383
<u>Two coats "Brixal" or other equally approved emulsion bitumen emulsion waterproof coating</u>			
4	On bagged brick walls (LI)	m2	793
Carried Forward			R
Bill No. 6 Waterproofing			

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	Brought Forward			R
	<u>"RFK Sika Chemflex" or other equally approved waterproofing slurry, with and including "Sika membrane applied as per manufacturer's instructions"</u>			
5	On shower floors	m2	3	
6	On shower walls	m2	42	
	<u>WATERPROOFING TO SLABS</u>			
	<u>One Layer "Derbigum" or other equally approved SP4 waterproofing membrane sealed to solvent based bitumen primed surface by means of torch fusion with minimum 100mm side laps and minimum 150mm end laps</u>			
7	On slabs	m2	172	
	<u>"Sika Blackseal Silvercoat ZL4082" or other equally approved waterproofing coating, applied as per manufacturer's instructions</u>			
8	On slabs	m2	172	
	<u>JOINT SEALANTS, ETC.</u>			
	<u>silicone acrylic sealer</u>			
9	Around window and window frame at junction with brickwork, plaster or concrete	m	404	
	<u>"Sika" or other equally approved two-part grey polysulphide sealing compound including backing cord, bond breaker, primer, etc.</u>			
10	3 x 10mm In expansion joints in saw cut joints, etc.	m	981	
11	12 x 12mm In vertical expansion joints including raking out expansion joint filler as necessary	m	804	
12	12 x 12mm In horizontal expansion joints including raking out expansion joint filler as necessary	m	74	
	<u>"Sika" or other equally approved silicone sealing compound including backing cord, bond breaker, primer, etc.</u>			
13	To bathroom fittings	m	44	
	Carried to Summary			R
	Bill No. 6			
	Waterproofing			

Item No		Quantity	Rate	Amount
	<u>BILL NO. 7</u>			
	<u>ROOF COVERINGS, ETC.</u>			
	<u>(CPAP WORK GROUP NO. 124 UNLESS OTHERWISE STATED)</u>			
	<u>PREAMBLES</u>			
	The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item			
	<u>SUPPLEMENTARY PREAMBLES</u>			
	<u>SHEETING</u>			
	Roof pitch to be 15 degrees & 3 degrees. 0,8mm aluminium roof sheeting with pre-painted G4 colortech finish on both sides complete with fixings, ridge flashing and mastic sealant to all side laps supplied by roof manufacture. determine direction of wind before laying sheets. sheets to project a minimum of 50mm beyond purlins at eaves. sheets to be fixed to 76 x 50mm timber purlins at max. of 1250mm centers on prefabricated trusses by engineer at max. of 1250mm centers to be strapped to 114 x 38mm wall plate with 30 x 1.6 x 1600mm long galvanised hoop iron straps built into coursing. Sisalation "RF405" underlay over trusses and under purlins on straining wires. prefabricated cleated roof trusses 114 x 38mm rafters and ties, 114 x 38mm intermediate members as per details hurricane clips be used externally to secure purlins to trusses at eaves overhangs. double wound 2.5mm diameter galvanised wire to secure purlins internally. all exposed roof timber to be painted with 2 coats of ABE provonite, before fixing of roof sheets, fascias and barge boards			
	<u>SAFETY</u>			
	The contractor shall exercise special care when handling long length sheeting, particularly in windy conditions. Should work be interrupted for any reason, all loose sheeting and incomplete sections must be adequately secured against possible movement by wind			
	Carried Forward		R	
	Bill No. 7 Roof Covering			

<p style="text-align: right;">Brought Forward</p> <p>and gravity.</p> <p><u>INSTALLATION</u></p> <p>Every precaution shall be taken to prevent damage to roof sheets during all stages of construction. Duck boards should be used when necessary to protect the sheeting from damage. Sheeting which has become deformed or damaged in any way, should be replaced. Care shall be taken to ensure that no sheeting or flashing will be cut with abrasive disc on roof surfaces in order to prevent steel particles from penetrating coated surfaces.</p> <p><u>HANDLING AND STORAGE</u></p> <p>The contractor shall ensure that all materials used on site for roofing/cladding, be transported, handled and stored in accordance with the manufacturer's recommendations. Material damaged shall be rejected and replaced with undamaged material at the contractor's expense. Repair of damaged material will not generally be permitted. Rates are to include for preventing damage and protecting sheets through all stages of construction.</p> <p><u>INSPECTION PRIOR TO INSTALLATION</u></p> <p>Before commencing installation, the contractor shall verify that the following items have been checked and accepted:</p> <ol style="list-style-type: none"> a. The entire structure or the portion thereof to be sheeted has been correctly aligned, levelled and grouted. b. Purlins and girths are at the correct spacing and are within the specified tolerances. c. The corners of the roof are square and the wall framework is perpendicular or as specified. d. No protrusions such as bolt heads, splice plates, cleats, etc. appear on the face of the framework. e. All members to which roofing and cladding are to be fixed in aesthetically sensitive areas are true and square. <p style="text-align: right;">Carried Forward</p> <p>Bill No. 7 Roof Covering</p>	<p style="text-align: center;">R</p>
	R

	Brought Forward			R
	<p>f. Paint and any other materials that may be incompatible with the sheeting, have been painted over or, so dealt with that direct contact with the sheeting is avoided.</p> <p>g. The contact faces between the purlins or the girths and the cladding are in the same plane. Should the alignment be inadequate, the contractor shall request instructions from the engineer before proceeding with the fixing of the cladding.</p>			
	<u>PROTRUSION THROUGH SHEETED SURFACES</u>			
	<p>Protrusions such as pipes, ducts and the like, shall be adequately flashed where they pass through the sheeting surface. Where ribs have to be cut away to permit penetration, additional framing is to be installed as required to support the sheeting. Depending on the position of the penetration through the roof, special attention shall be given to back flashing the sheeting to the ridge or point of water entry. In all cases, all cutting and flashings shall be so arranged that adequate provision is made for the drainage of all troughs and corrugations.</p>			
	<u>GUARANTEE</u>			
	<p>The manufacturer shall comply with ISO 9001:2008 Quality Management System. Klip-Tite™ sheeting shall be laid in strict accordance with the manufacturer's specifications by a GRS contractor. A written and five year guarantee of water-tightness shall be issued after approval of roofs by the manufacturer Global Roofing Solutions.</p>			
	<u>PROFILED METAL SHEETING AND ACCESSORIES</u>			
	<u>"Global Kliptite" or other equally approved double interlocking concealed fix, 0.8mm spelter galvanised sheet steel and accessories, fixed to timber purlins</u>			
1	Roof covering with pitches not exceeding 25 degrees	m2	1 765	
	Carried Forward			R
	Bill No. 7 Roof Covering			

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Brought Forward				R
<u>Sundries</u>				
2	Valley flashings 550mm girth	m	84	
3	Head wall flashings 550mm girth	m	42	
4	Counter flashing 700mm girth	m	42	
5	Side flashing 550mm girth	m	226	
<u>0,6mm Craft Lock or other approved Zincalume sheet with colour to one side:</u>				
6	Gutter Flashing	m	84	
<u>ROOF AND WALL INSULATION</u>				
<u>"Isoover" or other equally approved 50mm thick Factorylite non-combustible flexible lightweight industrial roof insulation with metallized foil facing, nominal density 12kg/m3, fixed to underside of roof sheeting and purlins (Roof sheeting and purlins elsewhere measured). All in accordance with the Manufacturer's recommendations</u>				
7	Lightweight industrial roof insulation laid over purlins and fixed concurrent with roof covering, including holes through boards, etc. as per manufacturer's instruction.	m2	1 655	
Carried to Summary				R
Bill No. 7				
Roof Covering				

Item No		Quantity	Rate	Amount
	<u>BILL NO. 8</u>			
	<u>CARPENTRY AND JOINERY</u>			
	<u>(CPAP WORK GROUP NO. 126 UNLESS OTHERWISE STATED)</u>			
	<u>PREAMBLES</u>			
	The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item			
	<u>SUPPLEMENTARY PREAMBLES</u>			
	Dimensions in descriptions of trusses are nominal and actual measurements are to be obtained from the Architect and/or taken on site before design or fabrication commences			
	<u>PRE-TREATMENT OF TIMBER</u>			
	This service falls within the areas defined in the National Building Regulations for treatment of timber against insect infestation / insect pest affecting softwood fixed permanently in all buildings.			
	The regulations require that the timber be treated in terms of SABS 05 and to comply with SABS 457, 753, 754 or 1288 as relevant. Tenderer's are to make allowance in there rates.			
	<u>PINNING BOARDS</u>			
	<u>Tempered hardboard</u>			
1	3mm Backboard plugged and screwed to walls at edges with brass screws and cup washers at 450mm centres.	m2	6	
	<u>"9mm Van Dyck" or other equally approved pinning board</u>			
2	Pinning board fixed to walls with an adhesive (timber surround elsewhere measured)	m2	6	
	Carried Forward		R	
	Bill No. 8 Carpentry and Joinery			

Brought Forward				R
	<u>Wrot Meranti</u>			
3	19 x 69mm Once rebated and arris rounded pinning board surround with mitred corners, plugged and screwed to walls with counter sunk brass screws and cupped washers	m	6	
	<u>Keyboard</u>			
4	1750 x 850mm high Keyboard formed of 22mm block board with hardwood veneer front fixed to wall with 4mm diameter mirror screws and 25 x 25mm natural anodised frame with mitred corners. Tenderer's are referred to the Architects drawing 5.102 Rev P01 annexed to these Bills of Quantities	No	4	
	<u>CUPBOARDS TO KITCHENS, BEDROOMS, ETC.</u>			
	Kitchen fittings shall be constructed of 16mm melamine faced chipboard V 313 boards bottoms, sides, divisions and shelves, waterproof plinths and spray painted backs. Tops are to be 32mm composition board post formed on leading edge with 1.2mm thick "Astral Graphite Crystal" Formica.			
	Doors shall be hung on rustproof concealed self-closing hinges and shall be fitted with magnetic catches and anodised aluminium bow handles.			
	Drawers to be hung to epoxy coated mild steel runners and guiders.			
	Prices shall include for the assembling and fixing complete in position, including all necessary cleats, cover fillets, drilling, screwing and nailing, etc. and painting of exposed fillets to match.			
	<u>Prefabricated factory finished kitchen cupboards</u>			
5	Kitchen sink unit cupboard 2400 x 600mm deep x 900mm high with three equal leaved doors and three equal cupboard and drawer units all in accordance with the Architects Drawing annexed to these Bills of Quantities	No	2	
	Carried Forward			R
	Bill No. 8 Carpentry and Joinery			

**Proposed New Orthotic and Prosthetics Centre
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Brought Forward			R
<u>Floor Cupboards, etc.</u>			
6	Floor mounted cupboard overall size 2050 x 600 x 750mm high with eight drawers, 16mm melamine faced board in storm grey-Peen finish with 30mm thick MDF worktop including 70 x 6mm thick mild steel post. Tenderers are referred to Architects drawings annexed to these Bills of Quantities.	No	1
7	Floor mounted cupboard size 2175 x 600 x 900mm high with four doors and four drawers comprising of 16mm thick board match melamine faced board in cherry finish with high impact edging, consisting of melamine impregnated decorative paper, fused under heat and pressure to both sides of a chip board substrate, 32mm thick post formed top. Tenderers are referred to Architects drawings annexed to these Bills of Quantities.	No	1
8	Floor mounted cupboard size 4820 x 600 x 870mm high with six doors comprising of 16mm thick board match melamine faced board in cherry finish with high impact edging, four sets of four drawers and open shelving consisting of melamine impregnated decorative paper, fused under heat and pressure to both sides of a chip board substrate, 32mm thick post formed top. Tenderers are referred to Architects drawings annexed to these Bills of Quantities.	No	1
9	L-Shaped Floor mounted cupboard overall size 5725 x 638 x 900mm high with seven doors of equal leaves, 19mm chipboard with hardwood veneer including 32mm thick saligna worktop. Tenderers are referred to Architects drawings annexed to these Bills of Quantities.	No	1
<u>Wall cupboards, etc.</u>			
10	Wall mounted cupboard size 2175 x 400 x 760mm high with four doors comprising of 16mm thick board match melamine faced board in cherry finish with high impact edging, consisting of melamine impregnated decorative paper, fused under heat and pressure to both sides of a chip board substrate, 32mm thick post formed top. Tenderers are referred to Architects drawings annexed to these Bills of Quantities.	No	1
Carried Forward			R
Bill No. 8 Carpentry and Joinery			

**Proposed New Orthotic and Prosthetics Centre
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Brought Forward			R
11	L-Shaped Wall mounted cupboard size 2960 x 400 x 970mm high with one door and four drawers comprising of 16mm thick melamine faced board. Tenderers are referred to Architects drawings annexed to these Bills of Quantities.	No	1
12	Purpose made wall mounted worktop size 2265 x 700 x 750mm high fixed to wall including 75mm diameter pvc sleeve with 30mm MDF board worktop. Tenderers are referred to Architects drawings annexed to these Bills of Quantities.	No	1
<u>Prefabricated factory finished reception desk and counter</u>			
13	Reception L-shaped desk overall size 3815 x 550 x 750mm high formed of laminated 22mm thick laminated Saligna. The outer component of the Shape with continuous lengths of 3815 x 550mm high including four drawers formed of 32mm thick laminated saligna top 550mm wide. Tenderers are referred to Architects drawings annexed to these Bills of Quantities.	No	1
<u>THE FOLLOWING IN SHELVING</u>			
<u>Laminated pine fixed to metal brackets (Metal brackets elsewhere measured)</u>			
14	22 x 380mm Shelving including all brackets and fixing, all as detailed on Architects drawings annexured to these Bills of Quantities Drawing number 5.203 Rev 01-WIP & 5.501 Rev P01 for the full description of the shelving.	m	62
15	22 x 400mm Shelving including all brackets and fixing, as per Architects drawings annexured to these Bills of Quantities Drawing number 5.301 Rev 01 & 5.502 Rev P01 for the full description of the shelving.	m	29
16	500mm wide Shelving formed of 32mm thick laminated saligna worktop fixed to 170 x 170 x 3mm mild steel gusset plate welded onto bracket and anchored to wall as per Architects drawings annexed to these Bills of Quantities Drawing number 5.102 Rev P01 for the full description of the shelving.	m	10
Carried Forward			R
Bill No. 8 Carpentry and Joinery			

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Brought Forward			R
17	750mm wide Shelving formed of 32mm thick laminated saligna worktop fixed to 200 x 200 x 3mm mild steel gusset plate welded onto bracket and anchored to wall as per Architects drawings annexed to these Bills of Quantities Drawing number 5.102 Rev P01 for the full description of the shelving.	m	4
18	Island shelving size 5000 x 600 x 1748mm high comprising of 16mm thick Board match melamine faced board in cherry finish as per Architects drawings annexed to these Bills of Quantities Drawing number 201403-G-502 Rev A Detail 6	No	1
19	Island shelving size 2380 x 600 x 1748mm high comprising of 16mm thick Board match melamine faced board in cherry finish as per Architects drawings annexed to these Bills of Quantities Drawing number 201403-G-502 Rev A Detail 6	No	1
20	300 x 1000 x 750mm high Display shelving formed of 18mm thick melamine shelf, 18 x 45mm melamine cleat including 6,5mm plate glass sliding doors and all necessary fittings as per Architects drawings annexed to these Bills of Quantities Drawing number 5.604 Rev T01-WIP Detail: DJ70	No	1
<u>TIMBER BENCHES</u>			
<u>The following in selected wrot meranti timber benches fixed to steel angle supports (Steel angle supports elsewhere measured)</u>			
21	38 x 42mm Twice arris edged slats counter sunk screwed to steel bracket with stainless steel tapping screws sunk and pelleted (steel bracket elsewhere measured)	m	46
22	22 x 42mm Bearer bolted to steel bracket (steel bracket elsewhere measured)	m	46
<u>The following in saligna timber benches fixed to steel angle supports (Steel angle supports elsewhere measured)</u>			
23	44 x 70mm Thick meranti seat screwed to steel frame (steel frame elsewhere measured)	m	12
Carried Forward			R
Bill No. 8 Carpentry and Joinery			

Brought Forward				R
<u>EXTERNAL TIMBER SEATING</u>				
24	Timber seating 450mm wide formed of 100 x 30mm thick Wrought Balu timber bolted with stainless steel countersunk fixings onto purpose made metal brackets at 500mm centres and bolted to wall with M16 chemical anchors.	m	11	
<u>WORKTOPS, COUNTERS, ETC.</u>				
<u>1.2mm "Astral Graphite" or other equally approved Formica decorative plastic laminate on 32mm waterproof chipboard</u>				
25	600mm Wide worktop, post formed on leading edge, and with one edge fixed to 38 x 38mm bearers plugged to wall and supported by metal brackets (Metal brackets elsewhere measured)	m	32	
26	1200mm Wide counter top, post formed on leading edge, and with one edge fixed to 38 x 38mm bearers plugged to wall and supported by metal brackets (Metal brackets elsewhere measured)	m	6	
<u>SKIRTINGS</u>				
<u>Wrot meranti</u>				
27	22 x 75mm Meranti skirting with 19mm meranti quarter round nailed to skirting rounded and ploughed at back skirting board plugged and screwed to walls with and including 19mm quadrant bead planted on. All nails to be punched, filled and neatly sand down.	m	191	
<u>FLUSH DOORS</u>				
<u>Approved solid flush doors with Sapele veneer covering on both sides and hard wood edging strips on vertical sides.</u>				
28	44mm Single door 810 x 2032mm high hung to steel frame with viewing panel. (D14) Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0 for the full description of the door.	No	2	
Carried Forward				R
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	Brought Forward			R
29	44mm Single door 1000 x 2032mm high hung to steel frame. (D4) Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0 for the full description of the door.	No	5	
30	44mm Single door 1000 x 2032mm high hung to steel frame. (D5) Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0 for the full description of the door.	No	7	
31	44mm Double door 1613 x 2032mm high hung to steel frame. (D3) Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0 for the full description of the door.	No	3	
32	44mm Double door 1613 x 2032mm high hung to steel frame. (D13) Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0 for the full description of the door.	No	3	
33	44mm Double door 1613 x 2032mm high hung to steel frame with viewing panel. (D15) Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0 for the full description of the door.	No	2	
34	44mm Double door 1613 x 2032mm high hung to aluminium frame. (D16) Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0 for the full description of the door.	No	3	
35	44mm Double door 1613 x 2550mm high hung to aluminium frame. (D2) Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0 for the full description of the door.	No	1	
36	44mm Double door 1613 x 2550mm high hung to aluminium frame. (D20) Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0 for the full description of the door.	No	1	
	Carried Forward			R
	Bill No. 8 Carpentry and Joinery			

Brought Forward			R
<u>Approved semi-solid flush doors with Sapele veneer covering on both sides and hard wood edging strips on vertical sides.</u>			
37	44mm Single door 813 x 2032mm high hung to steel frame. (D18) Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0 for the full description of the door.	No	2
38	44mm Single door 813 x 2032mm high hung to steel frame. (D19) Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0 for the full description of the door.	No	1
<u>'Pelican' or other equally approved Wrought meranti doors hung to steel frames</u>			
39	44mm 'Jumbo' solid core flush single door 813 x 2032mm high with veneer suitable for painting on both sides and hardwood edge strips all round (D12). Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0 for the full description of the door.	No	4
<u>FIRE DOORS</u>			
<u>"Bitcon" or other equally approved 2hr rated fire door hung to steel frames including hinges, locks, etc.</u>			
40	Class B double door 1613 x 2032mm high hung to steel frames with galvanised mild steel face on both sides (D7). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0 for the full description of the door.	No	4
41	Class B double door 1810 x 2032mm high hung to steel frames with galvanised mild steel face on both sides (D9). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0 for the full description of the door.	No	1
Carried to Summary			R
Bill No. 8 Carpentry and Joinery			

Item No	Quantity	Rate	Amount
<p><u>BILL NO. 9</u></p> <p><u>CEILINGS, PARTITIONS & ACCESS FLOORING</u></p> <p><u>(CPAP WORK GROUP NO. 129 UNLESS OTHERWISE STATED)</u></p> <p><u>PREAMBLES</u></p> <p>The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p>Openings in ceilings for light fittings, etc. are to include for additional suspension as required</p> <p><u>Fixings</u></p> <p>Items described as "nailed" shall be deemed to be fixed with hardened steel nails or shot pinned to blockwork or concrete.</p> <p>Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 500mm centres, and where described as "bolted", the bolts have been given elsewhere</p> <p><u>Ceilings</u></p> <p>Unless otherwise described ceilings shall be deemed to be horizontal</p>			
Carried Forward		R	
<p>Bill No. 9 Ceilings, Partitions & Access Flooring</p>			

	<p style="text-align: right;">Brought Forward</p> <p><u>Bulkheads</u></p> <p>Bulkheads are defined as those portions of ceilings which are stepped down from the general ceiling level in a particular room or area and which generally occur along the perimeter. Their purpose is either to conceal services or to create architectural features.</p> <p>Bulkheads have only been described as such where they conform to the above definition and where the horizontal or vertical dimensions do not exceed 900mm such portions of ceilings have been included in the appropriate general items of ceilings.</p> <p>Unless otherwise described bulkheads shall be deemed to be horizontal along the length.</p> <p>Circular bulkheads shall be given separately.</p> <p><u>Steel components</u></p> <p>All steel components for ceilings, partitions, etc. are to be galvanised in accordance with SANS 121</p> <p><u>SUSPENDED CEILINGS</u></p> <p><u>"OWA" or other approved 12.5mm Vinyl Faced Gypsum Ceiling Panels, face covered with white embossed vinyl, size 1200 x 600mm, laid on fire rated Clip system S3 exposed demountable suspension system including galvanised main tees, cross tees, etc., all suspended with galvanised hangers at centres not exceeding 1200mm.</u></p> <p>1 Ceilings suspended not exceeding 1m below structural steel</p> <p style="text-align: right;">Carried Forward</p> <p>Bill No. 9 Ceilings, Partitions & Access Flooring</p>		<p style="text-align: right;">R</p>	
			<p style="text-align: right;">R</p>	

Brought Forward				R
	<p><u>6mm Thick "Everite" or other equally approved pressed fibre cement ceiling boards installed on 3600mm Jumbo main tees at 1200mm centres in one direction and 1200mm Jumbo cross tees at 400mm centres perpendicular to main tees. Main tees to be suspended at 1200mm centres by means of 25 x 25 x 0.6mm galvanised steel angle, hangers fixed to bulb of main tee with wafer tek screws/steel pop rivets and to structural steel trusses with 6 x 30mm express nails and washers. Fit 6mm fibre cement ceiling boards to the underside of grid system with tapered edge of board facing down with 25mm drywall screws at 150mm centres. Apply 50mm JUMBO tape to all joints and finish the entire ceiling with 3-5mm JUMBO Skimming Plaster. Installed all in accordance to manufacturer's instructions</u></p>			
2	Ceilings suspended not exceeding 1m below structural steel	m2	13	
	<u>Cornices, etc. to suspended ceilings</u>			
3	"OWAconstruct" or other approved shadowline W trim plugged and screwed at 200mm centres.	m	558	
	<u>"Lafarge" or other approved Coved cornices fixed with galvanised nails at 400mm centres to wall and ceiling surface</u>			
4	75mm Coved cornices	m	83	
	<u>INSULATION</u>			
	<u>80mm thick "Lambda Board" or equivalent and approved insulation board, fixed in accordance with the manufacturers recommendations</u>			
5	Insulation laid taut over purlins and fixed concurrent with battens, purlins, etc. including white PVC coated straining wires at 383mm center	m2	321	
	<u>FIXED PARTITIONS</u>			
Carried Forward				R
Bill No. 9 Ceilings, Partitions & Access Flooring				

Brought Forward			R
<p><u>"Gypwall Classic 51/F30S39" or other equally approved drywall partitioning consisting of 1 layer Gyproc Rhinoboard 12.5mm fixed to both sides of the framework using Gyproc Rhinoboard sharp point screws 3.5mm diameter x 25mm at maximum 220mm centres and all joints skimmed to a smooth finish, with and including 0.5mm galvanized steel sheet to inner both sides of boards, Partitioning board to be fixed to brickworks, concrete, precast concrete, steel frame, aluminium, etc.</u></p>			
6	Partitions 2.9m high with bottom and top tracks plugged	m	34
7	Extra over partition for aluminium skirting	m	53
<u>DOORS</u>			
8	Extra over partition for 40mm semi solid timber panel door size 813mm x 2032mm high hung to & including aluminium frame size 949mm x 2496mm high including fanlight size 949mm x 535mm high door hung on 3 no. aluminium sinkless hinges. (B.D3). Tenderers are referred to Architect's drawings annexured to these Bills of Quantities Drawing number S7.201 Rev 01 for the full description of the door.	No	4
Carried to Summary			R
Bill No. 9 Ceilings, Partitions & Access Flooring			

Item No		Quantity	Rate	Amount
	<u>BILL NO. 10</u>			
	<u>FLOOR COVERINGS, WALL LININGS, ETC.</u>			
	<u>(CPAP WORK GROUP NO. 130 UNLESS OTHERWISE STATED)</u>			
	<u>PREAMBLES</u>			
	The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item			
	<u>SUPPLEMENTARY PREAMBLES</u>			
	Screed deviations are not to exceed 5mm over 3000mm			
	Thoroughly clean down with SABS 5825 compliant diluted natural detergent and thoroughly rinse, allow to dry and apply 3 coats water based floor dressing compliant with SABS 1042.			
	Remove all contaminates, clean down and apply TAL screed master, prime with TAL Floor Primer using pump method all by TAL contractor in accordance with the manufacturer's instructions			
	<u>2,5mm "Marley Superflex" or other equally approved, 2m wide vinyl sheeting fitted in strict accordance to manufacturers instructions, using Qualichem QAR 298 adhesive to floors and BAN 523 to coves. Coves to include butterfly corners</u>			
1	On floors	m2	481	
2	On walls with turn-ups over coves and up against walls up to a height of 400mm	m	299	
	<u>Skirting, nosing, etc.</u>			
	<u>"Polyflor" or other equally approved</u>			
3	PC20 Polycove pvc half round corner strip 100mm high	m	299	
	Carried Forward		R	
	Bill No. 10 Floor Coverings			

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Brought Forward			R
4	Extra over for PC20 polycove pvc taper door piece	No	30
<u>Polish, Sealers, etc.</u>			
5	Prepare, strip with and approved vinyl wax stripper, and apply three coats heavy duty commercial vinyl floor sealant and mechanically buff up to high gloss finish	m2	481
Carried to Summary			R
Bill No. 10			
Floor Coverings			

Item No	Quantity	Rate	Amount
<u>BILL NO. 11</u>			
<u>IRONMONGERY</u>			
<u>(CPAP WORK GROUP NO. 132 UNLESS OTHERWISE STATED)</u>			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Proprietary items</u>			
Where applicable the manufacturers' names or product catalogue titles are given in sub-headings preceding the items.			
Prices are to be based on the specific products/articles specified. If tenderers wish to offer alternative products/articles for certain items, these items are to be clearly marked and the alternative specification given with supporting brochures, etc. clarifying the features of the products/articles offered.			
On request returnable samples are to be provided to the principal agent for consideration.			
The following locks are to be suitable for master key operation.			
<u>Finishes to ironmongery</u>			
Where applicable finishes to ironmongery are indicated by suffixes in accordance with the following list: BS Satin bronze lacquered: CH Chromium plated: SC Satin chromium plated: SE Silver enamelled: GE Grey enamelled: AS Anodised silver: AB Anodised bronze: AG Anodised gold: ABL Anodised black: PB Polished brass: PL Polished and lacquered: PT Epoxy coated			
<u>HINGES, BOLTS, ETC.</u>			
<u>Manufactured by "Union" or other equally approved</u>			
1	JH-BB-STD-2-SS/2BB Butt hinge EN1935GRD13	Pairs	60.0
2	SS2016SS Bathroom deadbolt	No	4
3	AL8208-180AS/MD Flush bolt	No	2
Carried Forward			R
Bill No. 11 Ironmongery			

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	Brought Forward			R
4	37651AS Paraplegic indicator bolt	Pairs	8.0	
5	QR25X85MM-SS Roller latch and deadbolt lock	No	5	
6	8052-150SC Flush bolt	No	4	
	<u>Manufactured by "Assa Abloy" or other equally approved</u>			
7	DCA120-40 Mounting plate	No	9	
	<u>LOCKSETS, ETC.</u>			
	<u>Manufactured by "Union" or other equally approved</u>			
8	SS5004-73SS Escutcheon on rose bathroom indicator	Pairs	4	
9	SS5305-05SS Escutcheon on rose profile	Pairs	14	
10	PZ-05SS Escutcheon on rose profile	Pairs	5	
11	L-2115-78SS Euro-profile cylinder deadlock	No	15	
12	2X18SC Double Cylinder profile KD SC	No	17	
13	2X19SC Knob cylinder profile	No	11	
14	2X20SC Single cylinder profile	No	6	
15	ARC1182SS Roller catch	No	13	
	<u>HANDLES</u>			
	<u>Manufactured by "Union" or other equally approved</u>			
16	PHD-BB-150-22SS Back to back pull handle	Pairs	4.0	
17	PHD-BT-150-22SS Pull handle	No	2	
18	PHD-CF-300-22SS Handle with flange	No	16	
19	PHD-BB-225-22SS Back to back pull handle	Pairs	6.0	
20	PHD-BB-225-22SS Back to back pull handle	No	10	
21	5206BBSS 400mm pull handle back to back	Pairs	2.0	
	Carried Forward			R
	Bill No. 11 Ironmongery			

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Brought Forward				R
22	5210BBSS 350mm BTB pull handle	Pairs	4.0	
23	SS5D66L-05SS Dove pull handle on back plate LH profile	No	13	
24	SS5D66R-05SS Dove pull handle on back plate RH profile	No	13	
25	SS5D66-06SS Dove pull handle on back plate blank	No	22	
<u>Manufactured by "Assa Abloy" or other equally approved</u>				
26	J-882-SIL Single Panic bolt push bar 900mm	No	8	
<u>PUSH PLATES AND KICK PLATES</u>				
<u>Manufactured by "Union" or other equally approved</u>				
27	SS5023L-05-228W stainless steel push plate blank with four holes pre drilled for stainless steel counter sunk screw fixings and polished edges	No	5	
28	SS5089-200W 800 x 200 x 2mm thick Kick plate with four holes pre drilled for stainless steel counter sunk screw fixings and polished edges	No	58	
29	SS5023-06-228W Stainless steel Push plate with four holes pre drilled for stainless steel counter sunk screw fixings and polished edges	No	5	
<u>DOOR CLOSERS AND FLOOR SPRINGS</u>				
<u>Manufactured by "Assa Abloy" or other equally approved</u>				
30	DC500 CAM Action closer EN1-4 SIL	No	28	
31	DC300DA R&P Closer EN3-6 DA SIL	No	8	
32	DC300 R&P Closer EN3-6 SIL	No	33	
33	DC420 CAM Action FS EN3 NON HO	No	2	
34	FD461-DC500 Mech co-ordinator double door	No	4	
Carried Forward				R
Bill No. 11 Ironmongery				

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Brought Forward				R
<u>LETTERS, NAMEPLATES, ETC.</u>				
35	SS5066-06SSE10 Male indicator sign	No	3	
36	SS5066-06SSE11 Female indicator sign	No	2	
37	SS5066-06SSE14 Paraplegic indicator sign	No	9	
38	SS5066-06SSE02 Tea/Kitchen indicator sign	No	1	
39	SS5066-06SSE17 Cleaner mop and bucket sign	No	2	
40	SS5066-06SSE01 Electric Shock sign	No	4	
41	SS5066-06SSE05 Fire hydrant sign	No	36	
<u>SIGNAGE</u>				
<u>Statutory signage to be SABS and photo luminescent, external signage to be UV rated</u>				
<u>Red and white single sided signage screwed fixed on to walls as per manufacturer's details</u>				
42	190 x 190mm Arrow sign	No	16	
43	190 x 190mm Fire extinguisher sign	No	16	
44	190 x 190mm Fire hose reel sign	No	4	
45	190 x 190mm Fire hydrant sign	No	4	
46	190 x 190mm Exit sign	No	5	
47	190 x 190mm No smoking sign	No	1	
48	300 x 200mm Keep clear sign	No	5	
<u>Green and white single sided signage screwed fixed on to walls as per manufacturer's details</u>				
49	190 x 190mm Arrow sign	No	19	
50	190 x 190mm Running man sign	No	19	
Carried Forward				R
Bill No. 11 Ironmongery				

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Brought Forward			R
<u>Lettering and number formed with aluminium sheeting, powder coated fixed to brick walls with concealed fixings to specialist details</u>			
51	Name plate overall size 400 x 50mm high fixed to doors including wording to be confirmed by the Architect on site.	No	55
52	Signage plate overall size 4200 x 50mm high including wording to be confirmed by the Architect on site. Tenderer's are referred to Drawing No.: 6.001, annexed to these Bills of Quantities for full details.	No	6
53	Signage plate overall size 4200 x 100mm high including wording to be confirmed by the Architect on site. Tenderer's are referred to Drawing No.: 6.001, annexed to these Bills of Quantities for full details.	No	4
<u>Wall mounted stainless steel plate external signage</u>			
54	300mm high Letters to be cut out of 6mm brushed stainless steel plate and fixed to wall with three (3) No. 10mm diameter mild steel rods welded to back of letter. All letters are to be in "Helvetica Bold" and in Capitals. Letters are to be strictly 15mm away from wall. Exact position and spacing of lettering is to be determined by the Architect on site.	No	30
<u>SUNDRIES</u>			
55	87001SS door stop	No	13
56	99022SS wall projection door stop	No	13
57	B3441 SC 150 x 30mm door stop & holder	No	71
58	8852SC Dust proof keep	No	13
59	SS8025SS Hat and coat hook buffer	No	50
60	AL8103AS Multi-track three hooks	No	6
61	2915SC Rebate set	No	11
62	"Franke" or other equally approved rob hook (Code: 359945) plugged and screwed to door with stainless steel screws.	No	21
Carried Forward			R
Bill No. 11 Ironmongery			

Brought Forward			R
<u>PELMETS AND CURTAIN TRACKS</u>			
<u>"Yokota" or other similar approved</u>			
63	"Silverline" hospital cubicle curtain rail fixed to suspended ceilings approximately 900mm below soffit of slab or timber trusses including 11 gliders per metre, hangers, brackets, stopped ends, etc.	m	28
64	Extra over for end plugged	No	8
65	Extra over for bend	No	6
66	Extra over for joint at bend	No	6
<u>BATHROOM FITTINGS</u>			
67	"Franke STRX672" or other equally approved double toilet roll holder with spindle system for wall mounting, stainless steel, surface satin finished, front with InoxPlus surface refinement for the reduction of finger marks and better cleaning characteristics (easy to clean), material thickness 1.5 mm, curved front cover, cylinder lock with Franke standard key (Code: 008422). Size 156mm x 303mm x 141mm (W x H x D). Plugged and screwed to the wall with stainless steel screws.	No	13
68	"Franke STRX611" or other equally approved sanitary towel and disposal bin for wall mounting, stainless steel, surface satin finished, front with InoxPlus surface refinement for the reduction of finger marks and better cleaning characteristics (easy to clean), material thickness 1.5 mm, curved front cover, approx. 3.8 litre capacity, folding self-closing lid with piano hinge, removable plastic container inside (Code: 2120050/359740, Chilli-B) plugged and screwed to wall with stainless steel screws.	No	6
69	"Franke RODX605" or other equally approved waste bin for wall mounting, stainless steel, surface satin finished, material thickness 0.8 mm, rounded edges, mounting either with mounting bracket or directly onto the wall (Code: 7262, Gelmar) plugged and screwed to wall with stainless steel screws.	No	15
Carried Forward			R
Bill No. 11 Ironmongery			

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At Ngwelezane Hoospital**

	Brought Forward			R
70	<p>“Franke STRX618” or other equally approved Soap dispenser for wall mounting, stainless steel, surface satin finished, front with InoxPlus surface refinement for the reduction of finger marks and better cleaning characteristics (easy to clean), material thickness 1.5 mm, curved front cover, cylinder lock with Franke standard key, inspection window on front, suitable for liquid soaps and lotions, 0.8 litre soap tank, with plastic pull lever. Size 100mm x 304mm x 134mm (W x H x D). Plugged and screwed to wall with stainless steel screws.</p> <p><u>PARAPLEGIC FITTINGS</u></p> <p><u>Paraplegic Fittings - Supplied by Chairman Industries or other equally</u></p>	No	16	
71	32mm Serrated stainless steel rear grab rail fixed vertically next to seat (Code SR2)	No	8	
72	32mmn Serrated stainless steel vertical wall grab rail at shower (Code SR1)	No	8	
73	32mm Serrated 90 degree angled stainless steel dog leg side grab rail angled to suite (Code DL3)	No	8	
Carried to Summary				R
Bill No. 11 Ironmongery				

Item No	Quantity	Rate	Amount
<p><u>BILL NO. 12</u></p> <p><u>STRUCTURAL STEELWORK</u></p> <p><u>(CPAP WORK GROUP NO. 134 UNLESS OTHERWISE STATED)</u></p> <p><u>PREAMBLES</u></p> <p>The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p>Descriptions of bolts shall be deemed to include nuts and washers.</p> <p>Descriptions of L-shaped and U-shaped anchor bolts shall be deemed to include pending, threading, nuts and washers and embedding in concrete.</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>Structural steelwork shall comply with the requirements of SABS 1200H and the relevant project specifications.</p>			
<p>Carried Forward</p>			<p>R</p>
<p>Bill No. 12 Structural Steel</p>			

<p style="text-align: center;">Brought Forward</p> <p><u>Corrosion Protection</u></p> <p>All steelwork</p> <p>a) Abrasive blast to Sa 2.5</p> <p>b) Galvanize to SABS 763 (Heavy Duty)</p> <p>c) Clean with Galvanized iron cleaner, treat galvanizing in such a way so that paint may be applied over it</p> <p>d) Apply 1 coat galvanizing primer - Inter guard 269 or equally</p> <p>e) Apply 2No. Coats re-coatable polyurethane - Interthane 900 or equal approved . Colour to Architect's specification.</p> <p>All hot rolled steelwork shall be grade 350W, all hollow tube steelwork shall be grade 300W and all cold formed steelwork shall be SANS 10162 Part 1 with a minimum yield stress of 200Mpa and a minimum tensile stress of 365Mpa unless noted otherwise.</p> <p>All fixing bolts for structural steelwork shall be M20 grade 8.8 unless otherwise noted, and is deemed included. Only chemical anchor bolts are to be measured as a measurable item.</p> <p>All welds shall be 6mm continuous fillet welds unless noted otherwise.</p> <p>When steelwork connects to structures, the steelwork contractor shall check all site dimensions and levels before fabrication and erection.</p> <p>No flame cutting or site welding shall be carried out without the written approval of the engineer.</p> <p>Shop drawings shall be submitted in duplicate to the engineer for approval before commencing any fabrication.</p> <p><u>Traceability of steel</u></p> <p>All steel to be marked with manufacturer's test certificate number to ensure full traceability and to facilitate re-use of the steel members.</p> <p style="text-align: center;">Carried Forward</p> <p>Bill No. 12 Structural Steel</p>	<p style="text-align: center;">R</p>
	R

Brought Forward				R
<u>Marking steelwork</u>				
Completed components shall be marked with a durable and distinguishing erection mark, section size, steel grade and manufacturer's test certificate number in such a way as not to damage the component. Marking shall be in a discrete location. Hard stamping may be used unless noted otherwise.				
<u>Testing of welds</u>				
10% of all fillet welds and 100% of butt welds to be subjected to non destructive testing.				
Fabricate, supply, deliver and erect including shop and site painting as described.				
<u>Note: All Structural steel work to trusses, girders, columns, etc. to be priced inclusive of Grade 8.8 galvanised bolts or other bolts as necessary</u>				
<u>HOT DIPPED GALVANISED BEAMS</u>				
1	IPE 200 x 100 Beam, with one end fixed to purlin (Purlin elsewhere measured) and other end fixed to concrete column (concrete column elsewhere measured), with and including all necessary welding, bolts, washers, etc.	t	1.32	
2	305 x 165 x 41 UB Beam	t	4.59	
3	356 x 171 x 45 UB Beam	t	1.77	
4	457 x 191 x 67 UB Beam	t	1.57	
<u>HOT DIPPED GALVANISED PURLINS, BRACINGS, TRIMMER, EAVES RUNNER, ETC.</u>				
<u>Welded bracing, etc. with flat section connection plates bolted to steel</u>				
5	150 x 75 x 20 x 2.5 CFLC	t	6.81	
6	150 x 75 x 20 x 2.5 CRLC	t	1.51	
7	45 x 45 x 3L - Knee Brace	t	0.77	
8	50 x 50 x 5L - Verticals	t	0.76	
Carried Forward				R
Bill No. 12 Structural Steel				

Proposed New Orthotic and Prosthetics Centre At Ngwelezane Hoospital

Brought Forward			R
9	50 x 50 x 5L - Diagonals	t	0.60
10	50 x 50 x 6L - Verticals	t	0.34
11	50 x 50 x 6L - Diagonals	t	0.58
12	50 x 50 x 6L - False Rafter	t	0.36
13	60 x 60 x 6L - Rafter Bracing	t	1.37
14	70 x 70 x 6L - Horizontal Tie Bracing	t	0.68
15	80 x 80 x 8L - Top Chord	t	3.03
16	80 x 80 x 8L - Bottom Chord	t	3.01
17	50 x 3.0 CHS - Verticals	t	0.73
18	50 x 3.0 CHS - Diagonals	t	0.93
19	102 x 3.5 CHS - Top Chord	t	0.95
20	102 x 3.5 CHS - Bottom Chord	t	0.87
<u>SUNDRY STEELWORK</u>			
<u>Sundry Steelwork</u>			
21	100 x 10 Flat	t	0.20
22	Cleats, plates, gussets, connectors, etc.	t	2.00
<u>Chemical anchors, etc.</u>			
23	"Fisher" or other approved M16 (8.8) galvanised HD chemical anchors studs (with embedment length of minimum 280mm into concrete (concrete elsewhere measured) with and including "Fisher V360" or other approved chemical mortar.	No	536
Carried Forward			R
Bill No. 12 Structural Steel			

[illegible]

Item No		Quantity	Rate	Amount
	<u>BILL NO. 13</u>			
	<u>METALWORK</u>			
	<u>(CPAP WORK GROUP NO. 136 UNLESS OTHERWISE STATED)</u>			
	<u>PREAMBLES</u>			
	The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item			
	<u>SUPPLEMENTARY PREAMBLES</u>			
	<u>Descriptions of bolts, anchors, etc.</u>			
	Descriptions of bolts shall be deemed to include nuts and washers.			
	Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete.			
	Items described as "holed for bolt(s)" shall be deemed to exclude the bolts unless otherwise described.			
	Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 600mm centres.			
	<u>Aluminium doors, windows, etc.</u>			
	Doors and windows shall comply with AAAMSA design criteria.			
	Doors and windows shall be supplied with protective tape and plastic and shall be removed only once surrounding trades have been completed.			
	The Contractor is advised that the design, supply and installation of the aluminium windows, doors and shopfronts are to be carried out in strict accordance with the Architect's specification and all aluminium profiles, manufacturing and fixing methods are to comply with AAMSA specifications and installation standards.			
	Carried Forward		R	
	Bill No. 13 Metalwork			

Brought Forward	R
<p>The Contractor to provide shop drawings for approval by the Architect. The Contractor shall submit shop drawings for approval by the Architect within two weeks of appointment. The Contractor shall only proceed with the works after written approval has been given by the Architect.</p> <p>The Contractor is to allow for and calculate tolerances for expansion and contraction of all aluminium profiles.</p> <p>The contractor is to provide a waterproofing guarantee for all shopfront and windows.</p> <p>The Contractor is to confirm all window and shopfront sizes with the Architect.</p> <p>The following certificates shall be provided prior to commencement of work on site:</p> <ol style="list-style-type: none"> 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 respectively. 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 10137 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 de-lamination and colour degradation for a period of not less than five years. 	
Carried Forward	R
<p>Bill No. 13 Metalwork</p>	

<p style="text-align: right;">Brought Forward</p> <p><u>Ironmongery</u></p> <p>All ironmongery to aluminium windows, doors, shopfronts, roller shutter doors, etc. is to be high quality adjustable stainless steel friction hinges with restrictors included with self tapper stainless steel screw fixing of plastic handle and lock piece supplied and fixed by the contractor. The Contractor is to provide for approval by the Architect samples of these ironmongery. All ironmongery shall be by the Architect prior to installation.</p> <p>The Contractor to supply all relevant shopfronts with catches, handles, hinges, etc. to match shopfronts and doors, all to the Architects approval and as per Architect's drawing & schedules.</p> <p><u>Sliding gear</u></p> <p>All sliding gear to sliding doors and windows to be supplied by the contractor unless otherwise specified. The contractor to provide samples for approval by the Architect of these sliding gear. All sliding gear shall be by the Architect prior to installation.</p> <p><u>Joints and sealants</u></p> <p>All joints in frames shall be made by mechanical means.</p> <p>An silicone sealant is to be provided for both sides of all internal and external shop fronts between the aluminium frames and brick wall or concrete column and between the aluminium frame and plaster finish.</p> <p><u>ALUMINIUM WINDOWS, DOORS, ETC. (CPAP WORK GROUP NO.140)</u></p>		R	
<p style="text-align: right;">Carried Forward</p> <p>Bill No. 13 Metalwork</p>		R	

**Proposed New Orthotic and Prosthetics Centre
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Brought Forward			R
<u>"Crealco" or other equally approved aluminium windows, shopfronts and doors complete with subframes, ironmongery, glass, sealing, etc. and fixing to brickwork or concrete complete with 'KoastGuard" or other equally approved Qualicoat class 2 powder coating, Interpon D2525, Jet Black code QN205P all in accordance with suppliers instruction</u>			
1	Window size 1800 x 600mm high overall with 6.38mm clear laminated safety glass (W1). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	32
2	Window size 1200 x 600mm high overall with 6.38mm clear laminated safety glass (W2). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	6
3	Window size 600 x 900mm high overall with 6.38mm obscure safety glass (W3). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	14
4	Window size 1200 x 600mm high overall with 6.38mm obscure safety glass (W4). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	2
5	Window size 900 x 1800mm high overall with 6.38mm clear laminated safety glass (W5). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	15
6	Window size 2000 x 1225mm high overall with 6.38mm clear laminated safety glass (W6). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	3
7	Window size 1800 x 600mm high overall with 6.38mm obscure safety glass (W7). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	2
8	Window size 1200 x 1225mm high overall with 6.38mm clear laminated safety glass (W8). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	1
Carried Forward			R
Bill No. 13 Metalwork			

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	Brought Forward			R
9	Window size 945 x 1225mm high overall with 6.38mm clear laminated safety glass (W9). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	2	
10	Window size 2000 x 1225mm high overall with 6.38mm clear laminated safety glass (W10). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	2	
11	Window size 1200 x 925mm high overall with 6.38mm clear laminated safety glass (W13). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	2	
12	Window size 2762 x 925mm high overall with 6.38mm obscure safety glass (W14). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	1	
13	Shopfront size 4390 x 2550mm high with 6.38mm clear toughened safety glass and 85mm top and side rails and 135mm bottom kick rail (W11). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	1	
14	Shopfront size 4130 x 2550mm high with 6.38mm clear toughened safety glass and 85mm top and side rails and 135mm bottom kick rail (W12). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8100-0	No	1	
15	Purpose made Aluminium door size 5000 x 2550mm high (D1). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0	No	1	
16	Purpose made Aluminium louvre door size 830 x 2125mm high (D6). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0	No	6	
17	Purpose made Aluminium louvre door size 1700 x 2125mm high (D8). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0	No	4	
	Carried Forward			R
	Bill No. 13 Metalwork			

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	Brought Forward			R
18	Purpose made Aluminium sliding door size 4540 x 2550mm high (D22). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0	No	1	
19	Purpose made Aluminium sliding door size 4000 x 2550mm high (D23). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0	No	1	
20	Purpose made Aluminium sliding door size 2850 x 2550mm high (D24). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0	No	1	
21	Purpose made Aluminium sliding door size 3000 x 2550mm high (D25). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0	No	1	
22	Purpose made Aluminium sliding door size 6000 x 2550mm high (D30). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0	No	1	
	<u>Jet Black (Code: QN205P) class 2 powder coated aluminium door frames, complete with sealing, etc. and fixing to brickwork or concrete.</u>			
23	Aluminium door frame and side light to suit opening size 1613 x 2550mm high (D2). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8050-0	No	1	
24	Aluminium door frame and side light to suit opening size 2586 x 2125mm high (D16). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0	No	3	
25	Aluminium door frame and side light to suit opening size 2535 x 2550mm high (D20). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0	No	1	
26	Aluminium door frame to suit opening size 900 x 2125mm high (D21). Tenderers are referred to Architect's drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0	No	1	
	Carried Forward			R
	Bill No. 13 Metalwork			

Brought Forward			R
<u>SHOWER DOORS</u>			
<u>8mm Obscure toughened safety glass door fixed with "Dorma" or other equally approved tensor double action hinge fixed directly onto brick wall and including oscar knobs</u>			
27	Door size 965 x 2032mm high (D11)	No	4
<u>GALVANISED MILD STEEL LOUVRE DOORS</u>			
<u>Hot Dipped Galvanised Mild Steel louvers, complete with subframes, ironmongery, sealing, etc. and fixing to brickwork or concrete</u>			
28	Steel Louvred door (D26) size 1093 x 2125mm high. Tenderers are referred to Architect's drawings annexed to these Bills of Quantities; Drawing number: 070638 DOH-A-8051-0	No	3
29	Steel Louvred door (D27) size 1700 x 2125mm high. Tenderers are referred to Architect's drawings annexed to these Bills of Quantities; Drawing number: 070638 DOH-A-8051-0	No	4
30	Steel Louvred sub-station door (D28) size 2000 x 2202mm high. Tenderers are referred to Architect's drawings annexed to these Bills of Quantities; Drawing number: 070638 DOH-A-8051-0	No	1
<u>STEEL ROLLER SHUTTERS, ETC.</u>			
<u>'Seranda' or other equally approved Galvanised steel powder coated roller shutters fixed to brickwork or concrete</u>			
31	Galvanized mild steel manual operated roller shutter door suitable for opening size 1800 x 2125mm high and fixing to 40 x 40 x 5mm angle iron corner protection, complete with 85mm wide x 1.2mm thick interlocking slatted curtain, 75 x 30 x 3mm channel section guides and spring loaded roller mechanism with canopy. Installed complete with cushion rubber, bottom weather seal. (D17). Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0	No	1
Carried Forward			R
Bill No. 13 Metalwork			

Brought Forward			R
32	Galvanized mild steel manual operated roller shutter door suitable for opening size 2400 x 2125mm high and fixing to 40 x 40 x 5mm angle iron corner protection, complete with 85mm wide x 1.2mm thick interlocking slatted curtain, 75 x 30 x 3mm channel section guides and spring loaded roller mechanism with canopy. Installed complete with cushion rubber, bottom weather seal. (D29). Tenderers are referred to Architects drawings annexed to these Bills of Quantities Drawing number 070638 DOH-A-8051-0	No	1
<u>GALVANISED STEEL FLOORS</u>			
<u>Galvanised floor duct covers</u>			
33	6mm "Vastrap" plate duct covers in approximately 650mm widths and suitable lengths laid loose in framing	m	10
34	50 x 50 x 6mm Angle section frame with diameter bent lugs each 100mm long welded on at 300mm centres including embedding in concrete	m	21
<u>GALVANISED PRESSED STEEL DOOR FRAMES</u>			
<u>'KZN Window and Door Frames' or other equally approved standard 1,6mm Double rebated frames suitable for half brick wall fitted with three hinges</u>			
35	Frame for single door 810 x 2032mm high	No	2
36	Frame for single door 813 x 2032mm high	No	6
37	Frame for single door 1000 x 2032mm high	No	12
38	Frame for double door 1613 x 2032mm high	No	5
<u>'KZN Window and Door Frames' or other equally approved standard 1,6mm Double rebated frames suitable for one brick wall fitted with three hinges</u>			
39	Frame for single door 813 x 2032mm high	No	1
40	Frame for double door 1613 x 2032mm high	No	1
<u>GALVANISED PRESSED STEEL TRANSFORMER ROOM DOORS AND FRAMES</u>			
Carried Forward			R
Bill No. 13 Metalwork			

**Proposed New Orthotic and Prosthetics Centre
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Brought Forward			R
<u>Transformer Room Doors</u>			
41	Single Transformer room door size 1013 x 2125mm High as per Architects Detail (D26)	No 1	
42	Double Transformer room door size 1700 x 2125mm High as per Architects Detail (D27)	No 4	
43	Double Transformer room door size 2000 x 2400mm High as per Architects Detail (D28)	No 1	
<u>GALVANISED MILD STEEL LOUVERS</u>			
<u>'Renson' or other approved fixed pre-painted louvre units</u>			
44	'Renson No. 431' surface mounted louvre unit size 1800 x 2650mm high including fixed louvres, external frame, stainless steel insect screen mesh, etc. fixed to galvanised mild steel.	No 2	
<u>STAINLESS STEEL BALUSTRADES, HANDRAILS, ETC.</u>			
<u>Stainless steel (Grade 304) balustrade, handrails, etc.</u>			
45	Horizontal balustrades 1000mm high formed of 50mm diameter continuous top and centre rails supported on 43mm diameter stanchions at 1000mm centres, each stanchion fitted with 150 x 75mm base plate twice drilled for and bolted to concrete with 16mm anchor bolts.	m 30	
46	50mm diameter handrail fixed to walls at 1m centres with brackets made of 12mm diameter bar 150mm girth and once bent with one end welded to handrail and other end fitted with 4mm thick x 50mm diameter clamp plate welded on, twice holed and bolted to concrete	m 15	
47	Extra over balustrades for ends	No 12	
<u>HEAVY DUTY INDUSTRIAL RACKING, SHELVING, ETC.</u>			
Carried Forward			R
Bill No. 13 Metalwork			

Brought Forward			R
	<u>"Dexion static industrial and commercial Shelving Systems" or other approved Epoxy powder coated galvanised 7 tier shelving system complete with shelves / decking, anchor bolted to concrete floor with stainless steel anchors, fixed strictly in accordance with the manufacturers specifications.</u>		
48	Shelving size 2400mm long x 2048mm high comprising slotted angle uprights at 914mm centres with 762mm x 914mm shelves assembled with bolts to adjustable heights	No	78
	<u>WHITE BOARDS</u>		
	<u>Aluminium framed magnetic whiteboard fixed to walls</u>		
49	Size 2400 x 1200mm high	No	13
	<u>STEEL LOCKERS</u>		
	<u>"Supply Wise" or other equally approved steel double compartment stacked lockers (Code: HHH-LOC002-Grey), epoxy powder coated with flush fitting doors, for padlock. Colour: Hammertone Grey.</u>		
50	300 x 450 x 1800mm high steel lockers	No	28
	<u>STEEL BENCHES</u>		
	<u>The following in galvanised mild steel work benches fixed to steel angle supports</u>		
51	310mm wide x 350mm high work bench formed of 50 x 50 galvanised mild steel. Tenderer's are referred to the architects drawings annexed to these bills of quantities.	m	24
	<u>The following in galvanised mild steel shower benches fixed to steel angle supports</u>		
52	310mm wide x 350mm high shower bench formed of 50 x 50 galvanised mild steel. Tenderer's are referred to the architects drawings annexed to these bills of quantities.	m	35
	<u>STEEL WELDING TABLES</u>		
	Carried Forward		
	Bill No. 13 Metalwork		
			R

Brought Forward			R
<u>The following in hot dipped galvanised mild steel welding tables</u>			
53	900 x 600 x 800mm high welding table, Supplier Code: 756S5. Tenderer's are referred to the architects drawings annexed to these bills of quantities.	No	1
<u>HOT DIPPED GALVANISED SUNDRY STEELWORK</u>			
<u>Brackets, etc. to benches, shelvings, etc.</u>			
54	Wall support to worktops formed of 50 x 50 x 5mm L-section framing to horizontal rail 500mm wide, vertical post 500mm high and raking stay 300mm long, all mitred and welded together with closed ends to horizontal rail and vertical post, the vertical post drilled for and bolted to wall with four M8 expansion bolts.	No	31
55	Double slotted H25 wall band fixed to wall to manufacturer's specifications and including wall band saddle H30 for heavy loading. All in accordance with Architects drawings. Tenderers are referred to Architects drawings annexed to these Bills of Quantities for the full description.	m	42
56	300mm straight shelf bracket fixed to underside of timber shelves and slotted wall band. All in accordance with Architects drawings. Tenderers are referred to Architects drawings annexed to these Bills of Quantities for the full description.	No	62
57	90 x 90 x 8mm Angle iron fixed to edge of slab for brick supports with and including M8 expandable bolts fixed at 450mm centre.	No	23
<u>HULABOND CLADDING</u>			
<u>Hulabond cladding or other approved 4mm custom profile aluminium composite cladding panels</u>			
58	4mm Hulabond or other approved fixed to steel structure as per manufacturers "Casette" detail with the minimum silicon joint onto and including aluminium subframe. As per Architects drawings, aluminium cladding A, B and C	m2	130
Carried to Summary			R
Bill No. 13 Metalwork			

Item No	Quantity	Rate	Amount
<p><u>BILL NO. 14</u></p> <p><u>PLASTERING</u></p> <p><u>(CPAP WORK GROUP NO. 142 UNLESS OTHERWISE STATED)</u></p> <p><u>PREAMBLES</u></p> <p>The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item</p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Method</u></p> <p>The method to be used shall be either the monolithic method or the bonded method</p> <p><u>Preparation</u></p> <p>For granolithic applied monolithically, the concrete floor shall be swept clean after bleeding of the concrete has ceased and the slab has begun to stiffen; any remaining bleed water shall be removed and the granolithic applied immediately thereafter. For granolithic to be bonded to the floor slab after it has hardened, the slab surface shall be hacked (preferably by mechanical means) until all laitance, dirt, oil, etc. is dislodged and swept clean of all loose matter. The slab shall then be wetted and kept damp for at least six hours before applying the granolithic.</p> <p><u>Mix</u></p> <p>Granolithic shall attain a compressive strength of at least 41MPA. The coarse aggregate shall comply with SANS 1083 and shall generally be capable of passing a 10mm mesh sieve. Where the thickness of the granolithic exceeds 25mm, the size of the coarse aggregate shall be increased to the maximum size compatible with the thickness of the granolithic.</p>			
<p style="text-align: right;">Carried Forward</p> <p>Bill No. 14 Plastering</p>		R	

<p style="text-align: center;">Brought Forward</p> <p><u>Panels</u></p> <p>Granolithic shall be laid in panels not exceeding 14m² for monolithic finishes, not exceeding 9.5m² for bonded finishes and not exceeding 6m² for all external granolithic. Wherever possible, panels shall be square but at no time should the length of the panel exceed 1.5 times its width.</p> <p>Where possible joints between panels shall be positioned over joints in the floor slab and shall be at least 3mm wide through the full thickness of the finish, separated by strips of wood or fibreboard and finished with V-joints.</p> <p><u>Laying</u></p> <p>Granolithic shall be applied to the partially set slab and thoroughly compacted and lightly wood floated to the required levels.</p> <p>Bonded granolithic shall be applied to the slab after applying a 1:1 sand and cement slurry brushed over the surface and allowed to partially set before applying the granolithic. The granolithic shall be thoroughly compacted and lightly wood floated to the required levels.</p> <p>After wood floating, the monolithic and bonded granolithic shall remain undisturbed until bleeding has ceased and the surface has stiffened. Any remaining bleed water and laitance shall then be removed and the surface steel trowelled or power floated.</p> <p><u>Curing, seasoning and protection</u></p> <p>Granolithic shall be covered with clean hessian with waterproof building foil over and kept wet for at least seven days after laying.</p> <p><u>Colour</u></p> <p>Coloured granolithic shall be tinted with an colouring pigment mixed into a true and even colour.</p> <p><u>SCREEDS</u></p>		R	
<p style="text-align: center;">Carried Forward</p> <p>Bill No. 14 Plastering</p>		R	

Proposed New Orthotic and Prosthetics Centre At Ngwelezane Hoospital

	Brought Forward		R
	Screeds wood floated, on concrete		
1	30mm Thick on floors (LI)	m2	1 247
2	120mm Thick on floors laid to falls and currents (LI)	m2	172
	GRANOLITHIC		
	Untinted granolithic, on concrete		
3	Average 30mm thick on floors with upper surface to falls (LI)	m2	148
	INTERNAL PLASTER		
	One coat cement plaster steel floated on brickwork		
4	On walls (LI)	m2	3 283
5	On narrow widths (LI)	m2	261
	Cement plaster steel trowelled on concrete		
6	On ceilings (LI)	m2	139
7	On columns (LI)	m2	127
8	On beams (LI)	m2	197
	EXTERNAL PLASTER		
	One coat cement plaster wood floated on brickwork		
9	On walls (LI)	m2	537
	One coat cement plaster wood floated on concrete surfaces		
10	On columns (LI)	m2	85
11	On beams (LI)	m2	138
	CORNER PROTECTORS, DIVIDING STRIPS, ETC.		
	Carried Forward		R
	Bill No. 14 Plastering		

[illegible]

Item No	Quantity	Rate	Amount
<u>BILL NO. 15</u>			
<u>TILING</u>			
<u>(CPAP WORK GROUP NO. 144 UNLESS OTHERWISE STATED)</u>			
<u>PREAMBLES</u>			
The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Fixing</u>			
Unless described as "fixed with adhesive to plaster (plaster elsewhere)" descriptions of tiling on brick or concrete walls, columns, etc. shall be deemed to include 1:4 cement plaster backing and descriptions of tiling on concrete floors etc. shall be deemed to include 1:3 plaster bedding.			
Tiling described as "fixed with adhesive on power floated concrete" shall be deemed to include for tiling key-coat.			
Ceramic, porcelain, marble and granite tiles are to be fixed and grouted with suitable adhesives and grouts from the Tal Professional range of products as recommended by the manufacturer.			
<u>WALL TILING</u>			
<u>300 x 300 x 7mm Tileoria "RN-STARWH" or other equally approved porcelain tiles fixed with an approved adhesive to plastered walls (plaster elsewhere measured) and flush pointed with waterproofing jointing compound to match tile colour</u>			
1	On walls (LI)	m2	503
Carried Forward			R
Bill No. 15 Tiling			

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	Brought Forward			R
2	On narrow widths (LI)	m2	68	
3	Fair exposed around pipe not exceeding 100mm internal diameter	No	14	
4	Fair exposed cutting and fitting around pipe exceeding 100mm and not exceeding 150mm internal diameter	No	12	
<u>FLOOR TILING</u>				
<u>300 x 300 x 7mm Tileoria "RN-STAR DG" or other equally approved porcelain tile fixed with an approved adhesive mixture for porcelain tiles to screed (screed elsewhere) and flush pointed with tinted grout</u>				
5	On floors (LI)	m2	168	
6	100mm High skirting (LI)	m	25	
<u>300 x 300 x 7mm Tileoria "RN4501" or other equally approved porcelain glazed mosaic tile fixed with an approved adhesive mixture for porcelain tiles to screed (screed elsewhere) and flush pointed with tinted grout</u>				
7	On shower floors (LI)	m2	3	
<u>SUNDRIES</u>				
<u>"M-trim" or other equally approved:</u>				
8	8 x 12mm aluminium square edge trim (Code: ASQE120)	m	127	
Carried to Summary				R
Bill No. 15 Tiling				

Item No	Quantity	Rate	Amount
<u>BILL NO. 16</u>			
<u>PLUMBING AND DRAINAGE</u>			
<u>(CPAP WORK GROUP NO. 148 UNLESS OTHERWISE STATED)</u>			
<u>PREAMBLES</u>			
The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Sealing of edges</u>			
Outer edges of sinks, basins, baths, urinals, etc. are to be sealed against adjacent surfaces with silicone			
<u>uPVC pipes and fittings</u>			
Sewer and drainage pipes and fittings shall be jointed and sealed with butyl rubber rings. Soil, waste and vent pipes and fittings shall be solvent weld jointed or sealed with butyl rubber rings			
<u>uPVC pressure pipes and fittings</u>			
Pipes of 50mm diameter and smaller shall be plain ended with solvent welded uPVC loose sockets and fittings pipes of 63mm 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			
<u>High density polyethylene (HDPE) pipes and fittings</u>			
Pipes shall be type IV and of the class specified with Plasson or Alprene compression fittings			
Carried Forward		R	
Bill No. 16 Plumbing and Drainage			

<p style="text-align: center;">Brought Forward</p> <p><u>Polycorp polypropylene pipes</u></p> <p>Polypropylene pipes 54mm diameter and smaller shall be seamless copper coloured Class 16 pipes jointed with Fast-Fuse heat welded thermoplastic or where so described Polylock compression fittings. 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><u>Copper pipes</u></p> <p>Pipes shall be hard drawn and half-hard Maksal pipes of the class described. Class 0 (thin walled hard drawn) pipes shall not be bent. Class 1 (thin walled half-hard) Class 2 (Half-hard) and Class 3 (heavy walled half-hard) pipes shall only be bent with benders with inner and outer formers. Fittings to copper waste, vent and anti-syphon pipes, capillary solder fittings and compression fittings shall be Cobra Watertech type. Capillary solder fittings shall comply with ISO 2016.</p> <p>Copper pipes are to be installed in accordance with the latest revision of the Code of Practice for Copper Plumbing soldering techniques. Flux, solder, etc. to be strictly in accordance with the manufacturer`s requirements with special attention to copper flux composition.</p> <p><u>Reducing fittings</u></p> <p>Where fittings have reducing ends or branches they are described as "reducing" and only the largest end or branch size is given. Should the contractor wish to use other fittings and bushes or reducers he may do so on the understanding that no claim in this regard will be entertained.</p> <p><u>Fixing of pipes</u></p> <p>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.</p>		R	
<p style="text-align: center;">Carried Forward</p> <p>Bill No. 16 Plumbing and Drainage</p>		R	

<p style="text-align: right;">Brought Forward</p> <p><u>Paper wrapping to pipes</u></p> <p>Pipes chased into brickwork must be wrapped with two layers of sout brown paper tied with wire. Rates are to include for wrapping around joints and fittings</p> <p><u>Densyl petrolatum anti-corrosion tape as manufactured by Denso SA (Pty) Ltd</u></p> <p>Pipes to be taped shall be coated with the appropriate primer and the tape shall be applied in the appropriate widths and with overlaps. Couplings and fittings to pipes shall be taped in strict accordance with the manufacturer's instructions including mastic, tape, Lay flat sheeting, securing of same, etc.</p> <p>Prices for wrapping of pipes shall include for all work as described to couplings in the length.</p> <p><u>Excavations</u></p> <p>No claim for rock excavation will be entertained unless the contractor has timeously notified the quantity surveyor thereof prior to backfilling</p> <p>"Intermediate material" and "hard material" shall be as defined in "Earthworks"</p> <p><u>Laying, backfilling, bedding, etc. of pipes</u></p> <p>Pipes shall be laid and bedded and trenches shall be carefully backfilled in accordance with manufacturers' instructions</p> <p>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</p>		R	
<p style="text-align: right;">Carried Forward</p> <p>Bill No. 16 Plumbing and Drainage</p>		R	

<p style="text-align: right;">Brought Forward</p> <p><u>Flush pans</u></p> <p>Flush pans shall have straight or side outlets and "P" or "S" traps as necessary</p> <p><u>Stainless steel basins, sinks, wash troughs, urinals, etc.</u></p> <p>Units shall have standard aprons on all exposed edges and tiling keys against walls where applicable</p> <p><u>General</u></p> <p>Descriptions of cast iron roof outlets shall be deemed to include joints to pipes and casting into concrete (adaptors for joints to PVC pipes, etc. are given separately) Descriptions of overflow pipes where measured in number, shall be deemed to include joints to cisterns and splay cut ends.</p> <p>Descriptions of pipes laid in and including trenches and inspection chambers, catchpits, etc. shall be deemed to include excavation, bedding, backfilling, compaction to a minimum of 95% Mod AASHTO density.</p> <p>Descriptions of service pipes and flexible connecting pipes shall be deemed to include connections to taps, cisterns, etc and to steel pipes (adaptors for connections to copper pipes, etc. are given separately).</p> <p>Descriptions of WC pans, slop hoppers, etc. shall be deemed to include for joints to soil pipes (pan connectors are separately measured).</p> <p><u>As-built drawings</u></p> <p>Where required, the contractor shall prepare an updated set of as-built drawings. At completion of the contract the contractor shall hand these drawings to the principal agent for reproducing onto the originals for handing over to the employer (provision for allowance of as built drawings elsewhere)</p> <p><u>RAINWATER DISPOSAL</u></p> <p style="text-align: right;">Carried Forward</p> <p>Bill No. 16 Plumbing and Drainage</p>	<p style="text-align: center;">R</p> <p style="text-align: center;">R</p>
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Brought Forward			R
<u>"Ogee profile aluminium H3003h 14" or other equally approved seamless gutter in marble white colour with and including matching rivet fixed mitres and end caps internally sealed using "Sika" or other equally approved silicon mastic sealer. Gutters are to be hung with nailed fixed internal aluminium hangers at 600mm centres to fibre cement fascia boards (Fibre cement fascia boards elsewhere measured)</u>			
1	125 x 85 x 0.6mm Ogee profile gutter	m	111
2	Extra over gutter for outlet	No	6
3	Extra over gutter for box gutter approximate size 600 x 350mm deep six times bent	m	42
<u>0.7mm Baked enamel aluminium downpipe including holder butts</u>			
4	100 x 75mm rainwater pipe	m	20
5	Extra over rainwater pipe for bend	No	12
6	Extra over rainwater pipe for shoe	No	6
<u>SOIL DRAINAGE</u>			
<u>uPVC pipes in class C bedding:</u>			
7	110mm Pipes vertically or ramped to cleaning eyes, etc. (no excavation) (LI)	m	13
8	110mm Pipes laid in and including trenches not exceeding 1m deep (LI)	m	57
<u>Extra over uPVC pipes for fittings:</u>			
9	110mm Bend (LI)	No	26
10	110mm Access junction (LI)	No	13
<u>Testing</u>			
11	Testing soil drainage pipe system	Item	
Carried Forward			R
Bill No. 16 Plumbing and Drainage			

Brought Forward				R
<u>SUNDRIES</u>				
12	Excavate for and construct gulley comprising of 110mm uPVC gulley trap with 190mm diameter uPVC hopper head with pvc grating, all set in mass concrete and not exceeding 500mm deep. The top of the gulley to be raised 75mm above surrounding ground level and internally dished down to hopper head with smoothened render and external of raised sides to be finished neatly.	No	6	
<u>SANITARY FITTINGS</u>				
<u>Supply, fix, clean, wash and leave in a satisfactory condition the following items of sanitaryware:</u>				
13	"Vaal" or other equally approved BI wall hung urinal – white. Wall-hung urinal with top inlet. Supplied with a 38 mm chrome plated dome grating, a spreader (with a 20mm diameter thread), including flush pipe and two hanger brackets. 385mm x 380mm x 600mm (Code: VAA-705426WH).	No	3	
14	"Grohe" or other equally approved bau ceramic wall-hung pan with horizontal outlet white (Code: Gro-39491000), size: 412 x 180 x 494mm.	No	5	
15	"Grohe" or other equally approved bau soft close toilet seat and lid with quick release function (Code: GRO-39493000), colour: white, size: 383 x 49 x 460mm.	No	5	
16	"Grohe" or other equally approved uniset for WC concealed cistern flush system 6 - 9 L adjustable (Code: GRO-38729000), size 1108 x 556 x 80mm.	No	5	
17	"Grohe" or other equally approved skate air for stop / start act horizontal chrome (Code: GRO-38565000).	No	5	
18	"Grohe" or other equally approved rapid SL 4 outlet adaptor female black (Code: GRO-42242000).	No	5	
19	"Vaal" or other equally approved pearl paraplegic" semi close couple 90° outlet open rim wash-down pan and matching 9 litre cistern complete with lid, fitments, and purpose made C.P. side-flush lever (left or right) supplied with purpose made urea seat and cover plate (Code: 7300SCWH).	No	8	
Carried Forward				R
Bill No. 16 Plumbing and Drainage				

**Proposed New Orthotic and Prosthetics Centre
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	Brought Forward			R
20	"Grohe" or other equally approved bau ceramic wall-hung basin one hole punched with overflow (Code: GRO-39440000), colour: white, size: 553 x 386mm. Basin fix to walls with bracket.	No	11	
21	"Vaal" or other equally approved cameo oval self-rimming vanity basin with three semi-punched tap holes. One tap hole configuration, and chain stay hole through the centre semi-punched tap hole (Code: Vaa-702803WH). Basin fixed on vanity top (Vanity top elsewhere measured) including silicon around basin.	No	10	
	<u>Stainless Steel</u>			
	<u>The following stainless steel units shall be manufactured in accordance with SABS 242</u>			
	Flush pans shall have straight or side outlets and "P" or "S" traps as necessary.			
22	"Franke PLN 611" or other equally approved single end bowl inset sink (Code: 821047), grade 304 18/10 polished stainless steel finish, and supplied complete with 90mm basket strainer waste fittings. Sinks to be fitted to counter top (Counter top elsewhere measured). Silicone seal between sink and counter top. Size- 800 x 460mm.	No	1	
23	"Franke" or other equally approved floor standing bucket sink manufactured from grade 1.4301 (304) stainless steel, material thickness 1.2 mm, with splash back, hinged grating, 38 mm BSP waste fitting and complete with integral wall brackets. The bucket sink is supported on two front legs and is held in position by screwing the two integral wall brackets directly to the wall (Code: G21663N).	No	1	
24	"Franke" or other equally approved 1,2mm thick grade 304 18/10 stainless steel double pressed bowl industrial overall sink size 2400 x 700 x 900mm high with grade 304 stainless steel tubular legs with adjustable foot pieces for easy levelling on the floor, with an integral 150mm high splash back to the rear (Code: E20628D).	No	1	
	Carried Forward			R
	Bill No. 16 Plumbing and Drainage			

**Proposed New Orthotic and Prosthetics Centre
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	Brought Forward			R
	<u>"The Water Company" or other equally approved economy water fountain:</u>			
25	Water fountain (Code: WC-H-DFC020) comprising stainless steel cold tank, compressor cooling, adjustable thermostat for cold water, cooling capacity, ambient operation temperatures, etc. overall size 1230mm x 320mm x 310mm (H x D x W). Water fountain to connect to power and water main.	No	1	
	<u>SANITARY PLUMBING</u>			
	<u>uPVC pipes</u>			
26	50mm Pipes (LI)	m	9	
27	50mm Pipes in chase in walls and floors (LI)	m	80	
28	110mm Pipes (LI)	m	46	
29	110mm Pipes in chase in walls and floors (LI)	m	26	
	<u>Extra over pipes for fittings</u>			
30	50mm Bend (LI)	No	64	
31	50mm Access bend (LI)	No	32	
32	50mm Junction (LI)	No	4	
33	50mm Access junction (LI)	No	9	
34	110mm Bend (LI)	No	25	
35	110mm Access bend (LI)	No	14	
36	110mm Access junction (LI)	No	20	
37	110 x 50mm Access junction (LI)	No	10	
38	110mm "GI Two-way" vent valve (LI)	No	12	
39	110mm Straight or bent pan connector	No	12	
40	110mm Rodding eye with cast iron cover and frame (LI)	No	4	
	Carried Forward			R
	Bill No. 16 Plumbing and Drainage			

**Proposed New Orthotic and Prosthetics Centre
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	Brought Forward			R
	<u>"Flexitraps"</u>			
41	"Marley" or other equally approved 38mm Butyl rubber "P" or "S" trap jointed to waste outlet fitting and uPVC pipe including clamps	No	3	
	<u>Brass traps, waste unions, etc.</u>			
42	"Franke" or other equally approved plumbing kits Spazi F/2 double bowl	No	1	
43	"Franke" or other equally approved Spazi F/1 Single Bowl Plumbing Kit 1120008	No	1	
44	"Cobra" or other equally approved urinal bottle trap (Code: COB-360)	No	3	
45	"Cobra" or other equally approved basin bottle trap, 32 x 40mm, chrome (Code: COB-0617CH)	No	21	
46	"Cobra" or other equally approved basin wastes - chrome (Code: COB-P-303)	No	21	
47	"Cobra" or other equally approved 38mm Shower trap with incorporated chromium square grating (Code: COB-373SQ)	No	4	
	<u>Floor Drains</u>			
48	"Herbish" or other equally approved HB 200 V (H) NW100 stainless steel floor drain connected uPVC pipes all in accordance to manufacturer's details	No	1	
	<u>Testing</u>			
49	Testing waste pipe system		Item	
	<u>WATER SUPPLIES</u>			
	<u>HDPE class 12 pipes in ground</u>			
	20mm Pipes laid in trenches (No excavations) (LI)	m	2	
	20mm Pipes laid in trenches including excavations, risk of collapse, backfilling, etc. (LI)	m	4	
50	32mm Pipes laid in trenches (No excavations) (LI)	m	3	
	Carried Forward			R
	Bill No. 16 Plumbing and Drainage			

**Proposed New Orthotic and Prosthetics Centre
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	Brought Forward			R
51	32mm Pipes laid in trenches including excavations, risk of collapse, backfilling, etc. (LI)	m	13	
52	40mm Pipes laid in trenches (No excavations) (LI)	m	1	
53	40mm Pipes laid in trenches including excavations, risk of collapse, backfilling, etc. (LI)	m	3	
	<u>Extra over HDPE pipes for fittings:</u>			
54	20mm Elbow (LI)	No	4	
55	32mm Elbow (LI)	No	7	
56	40mm Elbow (LI)	No	2	
	<u>Copper pipes:</u>			
	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			
	<u>Class 2 copper pipes</u>			
57	15mm Pipes (LI)	m	5	
58	15mm Pipes in chase in walls (LI)	m	403	
59	22mm Pipes (LI)	m	243	
60	22mm Pipes in chase in walls (LI)	m	2	
61	28mm Pipes (LI)	m	39	
62	28mm Pipes in chase in walls (LI)	m	5	
	<u>Extra over class 2 copper pipes for capillary fittings</u>			
63	15mm Fittings (LI)	No	266	
64	22mm Fittings (LI)	No	309	
	Carried Forward			R
	Bill No. 16 Plumbing and Drainage			

Proposed New Orthotic and Prosthetics Centre At Ngwelezane Hoospital

Brought Forward			R
65	28mm Elbow (LI)	No	29
<u>Extra over copper pipes for brass compression fittings:</u>			
66	15mm Fittings (LI)	No	82
67	22mm Fittings (LI)	No	2
68	28mm Fittings (LI)	No	3
69	40 x 28mm Reducer (LI)	No	1
<u>TAPS, VALVES, ETC.</u>			
<u>Taps, valves, etc. jointed to copper pipes are to include brass connectors, adaptors, etc. Installation and fixings to be as per manufacturers specifications and SANS 1808-9 compliant.</u>			
70	15mm Flexible service pipe 300mm girth	No	75
71	15mm Angle valve	No	75
72	22mm Ball-O-Stop valve	No	18
73	28mm Ball-O-Stop valve	No	4
74	"Cobra" or other equally approved junior flush valves - chrome. Junior flush master exposed flush valve, chrome. Includes-3/4 Ball-O-Stop control inlet, wall flange, additional toilet piston screw, and non-hold open feature. SANS 1240, JASWIC listed. (Code: COB-FJ6-000)	No	3
75	"Cobra" or other equally approved Noka 15mm chrome plated deck mounted sink mixer with overarm swivel outlet and adjustable flanges (Code: NA-970), manufactured in accordance with SANS 226:2004 Type 1 (BS 5412)	No	1
76	"Franke" or other equally approved water save self-closing push button pillar tap, chrome finish, with flow time of 6 - 9 sec. (Code: F5SV1001)	No	9
Carried Forward			R
Bill No. 16 Plumbing and Drainage			

**Proposed New Orthotic and Prosthetics Centre
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	Brought Forward			R
77	"Cobra" or other equally approved medical elbow action pillar tap with high waist - chrome. Medical elbow-action pillar tap, chrome. Includes: 1/4 inch turn ceramic disc head part, blue indice, 1/2 inch BSP male inlet, and flanged back nut. SANS 226 TYPE 2. (Code: COB-515-21)	No	13	
78	"Cobra" or other equally approved brass hose bib tap (Code: 108-20), manufactured in accordance with SANS 226:2009 Type 1 (BS 1010)	No	3	
79	"Cobra" or other equally approved Noka 15mm chrome plated wall mounted underwall mixer (Code: NA-956), manufactured in accordance with SANS 226:2004 Type 2 (BS 5412)	No	4	
80	"Idral" or other equally approved water save vandal proof shower rose, chrome finish (Code: 09033)	No	4	
	<u>ELECTRIC HEAT PUMPS, WATER HEATERS, EXPANSION VESSELS, ETC.</u>			
81	Allow a budgetary amount of R50,000.00 (Fifty Thousand Rand) for the supply, delivery and installation of Heat Pumps		Item	
82	Allow for profit on last if required		Item	
83	'Kwikot' or other approved 50 litre high pressure hot water heater and hoist and fix in position on and including fibreglass drip tray, draincock, catch tray, vacuum breaker, multi pressure control, isolator, expansion relief valve, safety valve, water overflow pipe including fittings, necessary fixing accessories and two connections for 22mm copper pipes including connectors	No	1	
84	'Kwikot' or other approved 100 litre high pressure hot water heater and hoist and fix in position on and including fibreglass drip tray, draincock, catch tray, vacuum breaker, multi pressure control, isolator, expansion relief valve, safety valve, water overflow pipe including fittings, necessary fixing accessories and two connections for 22mm copper pipes including connectors	No	1	
	Carried Forward			R
	Bill No. 16 Plumbing and Drainage			

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	Brought Forward			R
85	'Kwikot' or other approved 150 litre high pressure hot water heater and hoist and fix in position on and including fibreglass drip tray, draincock, catch tray, vacuum breaker, multi pressure control, isolator, expansion relief valve, safety valve, water overflow pipe including fittings, necessary fixing accessories and two connections for 22mm copper pipes including connectors	No	1	
86	'Kwikot' or other approved 200 litre high pressure hot water heater and hoist and fix in position on and including fibreglass drip tray, draincock, catch tray, vacuum breaker, multi pressure control, isolator, expansion relief valve, safety valve, water overflow pipe including fittings, necessary fixing accessories and two connections for 22mm copper pipes including connectors	No	3	
	<u>FIRE APPLIANCES, ETC.</u>			
87	4.5kg DCP fire extinguisher securely fixed to wall on backing board in strict accordance with all requirements of authorities	No	8	
88	9kg DCP fire extinguisher securely fixed to wall on backing board in strict accordance with all requirements of authorities	No	3	
89	5kg CO2 fire extinguisher securely fixed to wall on backing board in strict accordance with all requirements of authorities	No	2	
90	Fire hose reel fixed to wall with bracket including cover	No	4	
	<u>WATER SUPPLIES TO FIRE APPLIANCES</u>			
	<u>Galvanised mild steel pipes in ground wrapped with rust protection tape</u>			
91	100mm Pipes vertically, etc. (no excavation) (LI)	m	4	
92	100mm Pipes laid in trenches including excavations, risk of collapse, backfilling, etc. (LI)	m	80	
	<u>Extra over galvanised mild steel pipes for fittings:</u>			
93	100mm Bend (LI)	No	11	
	Carried Forward			R
	Bill No. 16 Plumbing and Drainage			

Brought Forward			R
<u>SABS Black Mild Steel pipes including all holder butts and couplings in the running length with welded type fittings to be used. All pipe in wall/floor chases to be wrapped twice in brown Kraft paper. Pipes passing through opening in brickwork or slab shall be coated with DENZO Protective pipe wrapping. All pipes to be painted with one coat primer and two coats signal red.</u>			
94	25mm Pipes (LI)	m	50
95	100mm Pipes (LI)	m	7
<u>Extra over Black Mild Steel pipe for welded type fittings:</u>			
96	28mm Bend (LI)	No	4
97	100mm Stop end (LI)	No	4
98	100mm Coupling (LI)	No	4
99	100 x 28mm Tees (LI)	No	4
<u>SUNDRIES TO WATER SUPPLIES</u>			
100	28mm M1 Union	No	4
101	28mm Stop valve	No	4
102	65mm Instantaneous fire hydrant complete with mounting bracket, etc.	No	2
103	100mm Fire hydrant	No	4
<u>PIPE INSULATION</u>			
<u>Thermaflex snap on sectional pipe insulation, neatly cut around pipe as required</u>			
104	Insulation to 15mm diameter piping and couplings including working around fittings (LI)	m	169
105	Insulation to 22mm diameter piping and couplings including working around fittings (LI)	m	132
<u>Testing</u>			
106	Testing water pipe system	Item	
Carried to Summary			R
Bill No. 16 Plumbing and Drainage			

Item No	Quantity	Rate	Amount
<u>ELECTRICAL WORK</u>			
<u>BILL NO. 17</u>			
<u>(CPAP WORK GROUP NO. 160 UNLESS OTHERWISE STATED)</u>			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Specifications, drawings, etc</u>			
Tenderers are referred to the specification and drawings annexed to these bills of quantities for the electrical work, for the full descriptions of the following items which are to be read and priced in conjunction with the said specification and drawings			
<u>Distribution boards etc</u>			
Rates for distribution boards, etc. are to include for busbars, jumpers, neutral bars, internal wiring and connections, circuit identification markers, control gear labels, circuit legend cards and working drawings			
<u>Switches, socket outlets, etc.</u>			
Rates for switches, socket outlets, etc. are to include for screwing to outlet boxes, connecting up and cover plates			
<u>Light fittings</u>			
Rates for light fittings are to include for hanging, fixing and connecting and for lamp holders and fluorescent tubes and lamps of the type and wattage described			
<u>HIGH TENSION DISTRIBUTION</u>			
1	95mm² 3 Core XLPE on Groupe Schneider ring main unit switch disconnecter using Raychem heat shrink termination kit and cable gland	No	4
2	Test each cable length once installed prior to preparing ends	No	4
Carried Forward			R
Bill No. 17 Electrical Work			

	Brought Forward			R
3	Test each cable length once ends have been prepared and termination kits fitted, but not connected to equipment	No	4	
	<u>LOW TENSION DISTRIBUTION</u>			
	<u>DISTRIBUTION BOARDS</u>			
	<u>Distribution Boards as per Distribution Board schedule</u>			
4	Main LV Board as per Drawing No. 403	No	1	
5	DB A/AE/A-UPS as per Drawing No. 404	No	1	
6	DB B/BE/B-UPS as per Drawing No.405	No	1	
7	DB GE (Guard House) as per Drawing No. 406	No	1	
8	DB DE (Domestic Waste) as per Drawing No.407	No	1	
9	DB UPS as per Drawing No. 408	No	1	
	<u>CABLING</u>			
	<u>1000/600V PVC/SWA/ECC/PVC copper cables secured to cable laid in trenches or drawn through sleeve pipes (trenches and sleeve pipes elsewhere measured)</u>			
10	95mm ² 4 Core	m	260	
11	70mm ² 4 Core	m	110	
12	35mm ² 4 Core	m	150	
13	25mm ² 4 Core	m	220	
14	16mm ² 4 Core	m	50	
15	10mm ² 4 Core	m	150	
16	16mm ² 2 Core	m	95	
17	10mm ² 2 Core	m	35	
18	6mm ² 2 Core	m	175	
	Carried Forward			R
	Bill No. 17 Electrical Work			

**Proposed New Orthotic and Prosthetics Centre
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		Brought Forward			R
	<u>1000/600V PVC/SWA/ECC/PVC copper cables secured to cable trays and ladders (cable trays and ladders elsewhere measured)</u>				
19	95mm ² 4 Core	m	20		
20	70mm ² 4 Core	m	50		
21	35mm ² 4 Core	m	30		
22	25mm ² 4 Core	m	40		
23	16mm ² 4 Core	m	60		
24	10mm ² 4 Core	m	40		
25	16mm ² 2 Core	m	45		
26	10mm ² 2 Core	m	40		
	<u>Cable joints</u>				
	<u>Cable terminations</u>				
27	95mm ² 4 Core	No	4		
28	70mm ² 4 Core	No	2		
29	35mm ² 4 Core	No	8		
30	25mm ² 4 Core	No	8		
31	16mm ² 4 Core	No	6		
32	10mm ² 4 Core	No	6		
33	16mm ² 2 Core	No	2		
34	10mm ² 2 Core	No	2		
	<u>CABLE LADDERS</u>				
	<u>Galvanised heavy duty cable trays, including short lengths and fixed to walls</u>				
35	100mm Wide	m	25		
		Carried Forward			R
	Bill No. 17 Electrical Work				

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Brought Forward				R
36	200mm Wide	m	20	
37	300mm Wide	m	125	
38	400mm Wide	m	10	
39	600mm Wide	m	10	
40	800mm Wide	m	10	
<u>Extra over 100mm wide cable ladder for</u>				
41	Elbow	No	2	
42	Tee	No	1	
<u>Extra over 200mm wide cable ladder for</u>				
43	Elbow	No	5	
44	Tee	No	2	
<u>Extra over 300mm wide cable ladder for</u>				
45	Elbow	No	4	
46	Tee	No	1	
<u>Extra over 400mm wide cable ladder for</u>				
47	Elbow	No	3	
48	Tee	No	1	
<u>Extra over 600mm wide cable ladder for</u>				
49	Elbow	No	2	
50	Tee	No	1	
<u>Extra over 800mm wide cable ladder for</u>				
51	Elbow	No	1	
52	Tee	No	1	
Carried Forward				R
Bill No. 17 Electrical Work				

Brought Forward				R
<u>Extra on last to install horizontally (trapeze) or vertically (P1000 Unistrut). Fixings at 1000mm. Installation is to include for all joiner splices, raw bolts, and fixing cable trays to Unistrut with bolt fasteners complete with spring washer, fixing bolts, etc.</u>				
53	200mm Wide	m	25	
54	300mm Wide	m	10	
55	400mm Wide	m	125	
56	600mm Wide	m	10	
57	800mm Wide	m	10	
58	Earthing and bonding of cable ladder and galvanised trunking		Item	
<u>CABLE TRENCHES</u>				
59	Excavate in earth not exceeding 2m deep for cable trenches including risk of collapse of excavations, keeping excavations free from water, setting aside excavated material and later refilling of trenches	m3	783	
60	Extra over trench excavations in earth for excavation in soft rock	m3	78	
61	Extra over trench excavations for carting away surplus material to a dumping site to be located by the contractor	m3	78	
<u>SUNDRIES</u>				
<u>Build the following manholes including trenching and manhole covers</u>				
62	600mm x 600mm x 800mm deep - LV Power	No	2	
63	600mm x 600mm x 800mm deep - Telkom	No	4	
64	1 000mm x 1 000mm x 800mm deep - MV Power	No	4	
<u>GENERAL LIGHTING AND POWER</u>				
Carried Forward				R
Bill No. 17 Electrical Work				

Brought Forward				R
<u>SLEEVES, ETC.</u>				
<u>Unplasticised polyvinyl chloride (UPVC) sleeve pipes laid in trenches (trenches elsewhere measured)</u>				
65	75mm Diameter	m	370	
66	110mm Diameter	m	562	
<u>Extra over UPVC sleeve pipes for</u>				
67	75mm Diameter	No	8	
68	110mm Diameter	No	8	
<u>CONDUITS, ETC.</u>				
<u>Rigid PVC conduit cast into slab and/or chased into brickworks, etc.</u>				
69	20mm	m	330	
70	25mm	m	3 250	
71	32mm	m	100	
<u>Galvanised steel conduit accessories</u>				
72	100 x 100 x 50mm Outlet box with cover	No	170	
73	Round outlet box for 20mm conduit	No	247	
74	Round outlet box for 25mm conduit	No	2 076	
75	Round outlet box for 32mm conduit	No	6	
<u>WIRING CHANNELS</u>				
76	Type P9000 galvanised wiring channels fitted with full length PVC cover plates complete with hangers, connectors, splices, etc.	m	397	
<u>Extra over wiring channels for</u>				
77	Pre-punched opening for socket outlet	No	64	
Carried Forward				R
Bill No. 17 Electrical Work				

**Proposed New Orthotic and Prosthetics Centre
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		Brought Forward		R
78	Elbow	No	14	
79	Tee	No	16	
80	End caps	No	22	
	<u>POWER SKIRTINGS</u>			
81	Execuduct PVC two compartment power skirting fixed to walls	m	107	
	<u>Extra over power skirting for</u>			
82	Corner piece	No	4	
83	End caps	No	12	
84	16A 3 pin single switched socket outlet	No	5	
85	16A 3 pin single switched socket outlet, shaved pin (red)	No	5	
86	16A 3 pin single switched socket outlet including 2 prong plus earth socket complete with white cover and toggle switch, fixed to skirting.	No	13	
87	16A 3 pin single switched socket outlet complete with white cover and red toggle switch, fixed to skirting.	No	26	
88	16A 3 pin single switched socket outlet complete with white cover and blue toggle switch, fixed to skirting.	No	6	
89	16A 3 pin single switched socket outlet complete with red cover and red toggle switch, chamfered earth pin, fixed to skirting.	No	26	
90	Data socket	No	31	
	<u>CONDUCTORS</u>			
	<u>Twin and earth wire lay in ceiling or clipped to structure</u>			
91	2.5mm ² 2 Core	No	600	
92	4mm ² 2 Core	m	1 500	
		Carried Forward		R
	Bill No. 17 Electrical Work			

Proposed New Orthotic and Prosthetics Centre At Ngwelezane Hoospital

	Brought Forward			R
	<u>Extra over twin and earth wire for terminations and connection</u>			
93	2.5mm ² 2 Core	No	540	
94	4mm ² 2 Core	No	48	
	<u>PVC insulated 1000V grade hard drawn copper wire into conduit, trunking and power skirting</u>			
95	1.5mm ²	m	1 050	
96	2.5mm ²	m	34 300	
97	4mm ²	m	600	
	<u>BOXES, ETC.</u>			
	<u>Partition / cluster boxes surface mounted or chased into brickwork or cast into concrete. Crab tree or approved equal including universal cradle, and modular outlet plates. Blank cover plates to be installed where no accessories are installed. Toggles white, red or blue.</u>			
98	Nine (9) ways	No	10	
	<u>Boxes cast in floors</u>			
99	Cab strut access floor conduit box system 205 x 287 x 79mm complete with 2x switch socket outlets, 1 x standard socket outlet and 3 x RJ45 outlets. All sockets with white, red or blue toggles.	No	4	
	<u>Cast in box and stainless steel face plate</u>			
100	340mm x 125mm cast in box and 350 x 150mm stainless steel plates as per Drawing No. 16016-509	No	10	
101	340mm x 150mm cast in box and 350 x 150mm stainless steel plates as per Drawing No. 16016-509	No	10	
	<u>Stainless steel pedestal for supporting isolators and switched socket outlets</u>			
102	340mm / 120mm x 3mm thick stainless-steel pedestal	No	6	
	Carried Forward			R
	Bill No. 17 Electrical Work			

Brought Forward				R
<u>LIGHT SWITCHES, SOCKET OUTLETS, ETC.</u>				
Rates for switches, socket outlets, etc. are to include for screwing to outlet boxes, connecting up and cover plates				
<u>Supply, install and connect electrical accessories (Crab tree or approved equal) including covers and boxes. Toggle White, Red or Blue</u>				
103	1 lever, 1 way light switch in 100mm x 100mm box	No	348	
104	1 lever, 1 way zone 1 (Intrinsic safe) light switch in 100mm x 100mm box	No	3	
105	2 lever, 1 way light switch in 100mm x 100mm box	No	8	
106	5A 3 pin socket outlet in conduit box	No	1 447	
107	16A 3 pin flush mounted single switched socket outlet including 2 prong plus earth socket complete with toggle and white cover	No	30	
108	Double 16A 3 pin flush mounted single switched socket outlet complete with white cover and toggle	No	6	
109	16A 3 pin flush mounted single switched socket outlet complete with white cover and red toggle switch	No	6	
110	16A 3 pin flush mounted single switched socket outlet complete with white cover and blue toggle switch	No	20	
111	16 3 pin flush mounted single switched socket outlet complete with red cover and red toggle switch. Chamfered earth pin	No	6	
<u>Supply, install and connect electrical accessories (Crab tree or approved equal) including covers and boxes. Toggle White, Red or Blue</u>				
112	16A 3 pin flush mounted single switched socket outlet	No	5	
113	20A SP isolator in conduit box, surface mounted or flush mounted	No	33	
114	30A TP industrial isolator in conduit box, surface mounted	No	13	
Carried Forward				R
Bill No. 17 Electrical Work				

**Proposed New Orthotic and Prosthetics Centre
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	Brought Forward			R
115	60A TP industrial isolator in conduit box, surface mounted	No	6	
	<u>Mains switching soffit mounted motion/daylight sensors (BEG Lux mat or equal and approved).</u>			
116	Luxomat PD3 (1 channel - lighting)	No	35	
	<u>LUMINARIES</u>			
	<u>Rate for luminaries are to include for hanging, fixing and connecting and for lamp holders and fluorescent tubes and lamps of the type and wattage describe, Drawing No. 2013-600</u>			
117	Type A	No	14	
118	Type B	No	24	
119	Type C	No	26	
120	Type D	No	37	
121	Type E	No	101	
122	Type F	No	5	
123	Type H	No	5	
124	Type K	No	19	
125	Type L	No	1	
	<u>EQUIPMENT</u>			
	<u>MV SWITCH GEAR</u>			
126	Supply, deliver and install 800 kVA minisub as per specification provided (Drawing No. 20013_602_0) complete with 3-way RM6 ring main, transformer and L.V. section as per single line diagram:	No	1	
127	Submit test report and commission the MV installation	No	1	
128	Allow to live seal/95 mm ² 3 core copper XLPE	No	2	
129	Insulated 11 000 Volt cable specified	No	1	
	Carried Forward			R
	Bill No. 17 Electrical Work			

Brought Forward			R
<u>DIESEL GENERATORS</u>			
130	Supply and install 50 kVA (Prime) diesel generator including delivery, off loading and installing in position complete with exhaust pipe, sound attenuators and full tank of diesel on completion of testing as specified in schedule 20013_603	No	1
<u>UPS</u>			
131	Supply, install, test and commission 10 kVA UPS at 0.8 lag pf, three phase in (400 V, 50HZ) three phase out with 20minute battery back up at full load as per attached schedule 20013_606	No	5
<u>EARTHING AND LIGHTNING PROTECTION</u>			
<u>LIGHTNING PROTECTION</u>			
<u>Conductor, etc.</u>			
132	Aluminium circular conductor fixed to roof / parapet with proprietary fixings.	m	100
133	6000mm lengths of 50mm ² Green PVC insulated copper conductors fitted into conduit complete with lugs, ferrules and termination clamps between roof steelwork and Earth Electrode.	No	45
134	1600mm x 16mm copper clad earth electrodes driven into ground connected to first earth rod with 70 mm ² Cu bare earth wire inclusive of ferrules, lugs, etc.	No	45
135	Testing and commissioning the entire lightning protection installation as per I.E.C.standards, including re- testing as may be required after making good, and typed test certificates		Item
<u>EARTHING</u>			
136	Soil testing, design, supply and installation for 1Ohm substation earth		Item
137	Soil testing, design, supply and installation for 1 Ohm telecommunications earth		Item
Carried Forward			R
Bill No. 17 Electrical Work			

Brought Forward				R
<u>Pre-drilled copper earth bars complete with insulated mountings and removable test links</u>				
138	50mm x 12mm x 800mm	No	4	
139	50mm x 6mm x 600mm	No	8	
<u>Cu PVC earth wire (SANS 1507-3) in continuous lengths</u>				
140	16mm ²	m	85	
141	35mm ²	m	150	
142	70mm ²	m	50	
143	120mm ²	m	215	
144	Allowance for general earthing and bonding in accordance with SANS 0142		Item	
145	I.E.C. standards, including re-testing as may be required after making		Item	
146	Testing and commissioning the entire earthing installation as per I.E.C. standards, including re-testing as may be required after making good, and typed test certificates		Item	
<u>ELECTRONIC CONTAINMENTS</u>				
<u>The complete supply, transport to site, store in \ accordance with the specification of hot dip galvanised wire mesh for data and telephony systems. Rates to include for bends, T's, risers and offsets as required</u>				
<u>CABLE LADDERS</u>				
<u>Galvanised heavy duty cable trays, including short lengths and fixed to walls</u>				
147	150mm Wide	m	50	
148	200mm Wide	m	650	
Carried Forward				R
Bill No. 17 Electrical Work				

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	Brought Forward			R
	<u>Extra over 150mm wide cable ladder for</u>			
149	Elbow	No	2	
150	Tee	No	1	
	<u>Extra over 250mm wide cable ladder for</u>			
151	Elbow	No	2	
152	Tee	No	1	
	<u>Extra on last to install horizontally (trapeze) or vertically (P1000 Unistrut). Fixings at 1000mm. Installation is to include for all joiner splices, raw bolts and fixing cable trays to Unistrut with bolt fasteners complete with spring washer, fixing bolts, etc.</u>			
153	150mm Wide	m	50	
154	200mm Wide	m	650	
	<u>Extra over wiring channels for</u>			
155	Pre-punched opening for socket outlet	No	16	
156	Elbow	No	6	
157	Tee	No	2	
158	End caps	No	12	
	<u>CONDUITS, ETC.</u>			
	<u>Rigid PVC conduit cast into slab and/or chased into brickworks, etc.</u>			
159	25mm	m	2 500	
160	32mm	m	500	
161	50mm	m	100	
	<u>Galvanised steel conduit accessories</u>			
162	Round conduit box, complete with cover	No	300	
	Carried Forward			R
	Bill No. 17 Electrical Work			

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	Brought Forward			R
163	100 x 100 x 50mm Outlet box with cover	No	52	
164	Round outlet box for 25mm conduit	No	242	
165	Round outlet box for 32mm conduit	No	48	
166	Round outlet box for 50mm conduit	No	10	
	<u>PVC conduit accessories</u>			
167	300mm x 300mm PVC junction box with screw lid	No	32	
	<u>WIRING CHANNELS</u>			
168	Type P9000 galvanised wiring channels fitted with full length PVC cover plates complete with hangers, connectors, splices, etc.	m	250	
	<u>ELECTRONIC INSTALLATION</u>			
	<u>IT NETWORK</u>			
	<u>Supply, install, test and commission IT Network complete with all hardware, software, connectors, adapters, fixings, power supplies, cables, consumables and all material to complete the installation as intended</u>			
	<u>Riser equipment, complete with power supplies and mounting equipment</u>			
	<u>IT CUPBOARD</u>			
169	9U 600 wide, 475 deep wall mounted rack, complete with 10 way (16A) dedicated power rail and 2-way fans	No	3	
170	Aruba 2530 24 port 1G PoE plus switch	No	2	
171	Aruba 2530 8 port 1G PoE plus switch	No	1	
172	24 Way modular (populated) UTP Cat 6, complete with mimic labels	No	30	
173	Fibre splice panel sliding tray (empty)	No	3	
	Carried Forward			R
	Bill No. 17 Electrical Work			

Brought Forward				R
<u>Supply and installation of fibre backbone 8 core indoor duct cable-single mode fibre (Server room to electronic cupboards)</u>				
174	8 Core indoor duct cable-single mode fibre	m	3 500	
<u>Termination and splicing into connection of fibre</u>				
175	Mid coupler module - LC DX 6 port - OM3 10G APPL	No	6	
176	Unjacketed pigtails - Duplex LC - single mode	No	6	
177	Termination and splicing of 8 core cable	No	6	
178	OTDR test and certificate		Item	
179	Label backbone cable (Heat shrink labels on each end)	No	6	
<u>Supply and installation of cable and wiring on cable basket ceiling void or drawn into conduit as specified including all labels and termination at both ends</u>				
180	Category 6 UTP cable	m	4 000	
181	Termination of UTP Cat 6 on to RJ45	No	60	
182	Connectors, adaptors, power socket, cables, consumables and other material to complete the installation as intended		Item	
<u>WIRELESS ACCESS POINT SYSTEM</u>				
183	Wi-Fi Controller	No	1	
184	Wi-Fi Security Gateway With rack mount 4 ports	No	1	
185	Dual-Band ceiling mounted access point	No	8	
186	Configure and document the complete system		Item	
<u>CLOSED CIRCUIT TELEVISION</u>				
Carried Forward				R
Bill No. 17 Electrical Work				

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoasptial**

Brought Forward				R
	<u>Supply, install, test and commission CCTV system (HIK Vision or equal and approved) complete with all hardware, software, connectors, adapters, fixings, power supplies, cables, consumables and all material to complete the installation as intended</u>			
187	Network Video Recorder - DS-9632NI-I8	No	2	
188	Hard Drive 8 TB SATA 6Gb/s - WD4NPURX	No	2	
189	<u>Video Management System software and licences for 100 cameras - IVMS-4200</u>		Item	
190	Video and audio decoder for up to 4 monitors - 6904UDI	No	1	
191	Joystick and keyboard DS-1005KI	No	1	
192	46" control room monitor suitable for 24 hour, 7 days a week operation complete with universal wall mount	No	1	
193	Desktop PC with I7 processor,8GB RAM plus 500 Gbit SSD storage, 19" monitor, mouse, keyboard, etc., Windows 10	No	1	
	<u>Cameras, complete with all mounting equipment</u>			
194	Camera Type 1 - 2MP In ceiling dome - DS 2CD2725FWD-IZS	No	18	
195	Camera Type 1 - 2MP surface dome - DS 2CD2725FWD-IZS and bracket (DS-1280ZJ-DM18)	No	1	
196	Camera Type 5 - 2MP bullet - DS-2CD2025WD-I (fixed lens)	No	1	
197	Camera Type 5 - 2MP bullet - DS-2CD2625FWD-IZS (vary focal lens)	No	1	
198	Camera Type 3 - PTZ 2 MP surface mounted - DS 2DE4A225IW-DE	No	1	
199	Camera Type 3 - PTZ 4 MP mounted in ceiling - DS 2DE5425W-AE	No	26	
200	Wall mount bracket for surface mounted dome domes - DS-1473ZJ-155	No	2	
Carried Forward				R
Bill No. 17 Electrical Work				

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoasptial**

	Brought Forward			R
	<u>Supply and installation of cable and wiring on cable basket/trunking in ceiling void or drawn into conduit as specified, including labels at both ends.</u>			
201	Category 6 UTP cable	m	2 560	
202	Termination of UTP Cat 6 onto patch panels	No	44	
203	Termination of UTP Cat 6 onto RJ45 at camera end	No	44	
	<u>SUNDRIES</u>			
204	Configure and document the complete system.		Item	
	<u>PUBLIC ADDRESS</u>			
	<u>Supply, install, test and commission Bosch Paver (or equal and approved) public address and voice evacuation system complete with connectors, adapters, fixings, power sockets, cables, consumables and all material to complete the installation as intended</u>			
	<u>Control Room equipment, complete with power supplies and mounting equipment (19" rack supplied and installed by others).</u>			
205	Central Paging Manager for 12 zones (PVA - 4CR12)	No	1	
206	Power amplifier (2x500W) - PVA-2P500	No	1	
207	Call station - PVA-15CST	No	1	
208	Tuner BGM source - PLE-SDT	No	1	
209	External antenna for above	No	1	
210	Power management / battery charger - PLN-24CH12	No	1	
211	Allowance for Maintenance free batteries rated at 85 ampere hours with minimum life expectancy of 7 years or 250 complete discharge cycle		Item	
	<u>Loudspeakers, complete with fixings for ceiling, soffit/structure or wall mounting, and terminations.</u>			
212	Ceiling Loudspeaker (6W) - LC3-UC06E	No	52	
	Carried Forward			R
	Bill No. 17 Electrical Work			

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoasptal**

	Brought Forward			R
213	Back box for above - LC3-CBB	No	55	
214	Box Loudspeaker (6W) - LC3-UC06E	No	2	
215	Horn Loudspeaker (10W) - LH1-10M10E	No	2	
	<u>Supply and installation of cable (red) on cable basket in ceiling void or drawn into conduit as specified, including all labels and terminations at both ends.</u>			
216	PH120 2 core, 2.5mm ² stranded fire rated cable (red)	m	2 500	
217	PH120 2 core, 4mm ² stranded fire rated cable (red)	m	1 500	
218	<u>Connectors, adapters, power sockets, cables, consumables and other material to complete the installation as intended.</u>		Item	
219	Configure and document the complete system.		Item	
220	Termination junction boxes in electronics risers complete with terminals	No	8	
	<u>ACCESS CONTROL</u>			
	<u>Supply, install, test and commission Impro Access Portal Basic (Or equal and approved) access control and intercom system complete with connectors, adapters, fixings, power sockets, cables, consumables and all material to complete required</u>			
	<u>Control room equipment complete with all power supplies and mounting equipment.</u>			
221	Programming and enrolment station, PC (I7 8 Gb RAM plus 500 Gbit SSD storage, Windows 10, Office and Acrobat) with 21" monitor, mouse, keyboard, etc.	No	1	
222	Card reader fingerprint enrolment reader	No	1	
223	Enrolment camera	No	1	
224	Setup and program access control software for 100 users and 40 No. doors		Item	
	Carried Forward			R
	Bill No. 17 Electrical Work			

**Proposed New Orthotic and Prosthetics Centre
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Brought Forward			R
<u>Door control complete with all mounting equipment. Located in IT cupboard</u>			
225	Wall mounted door controller in IP 54 housing complete with 2 No. Wiegand reader modules and power supply	No 6	
226	Card reader	No 14	
227	600kg surface mounted monitored maglock with LED	No 7	
228	ZL bracket for maglock	No 7	
229	No touch exit sensor	No 4	
230	Green Break glass unit with internal buzzer (resettable)	No 7	
<u>Supply and installation of cable and wiring on cable basket in ceiling void or drawn into conduit as specified, including all labels and terminations at both ends.</u>			
231	Category 6 UTP cable	m 1 500	
232	Termination of UTP Cat 6	No 20	
233	8 twisted pair PVC insulated mylar cable. 0.22mm ² stranded tinned copper cores. Aluminium polyester shield and drain.	m 1 570	
234	Termination of above cable	No 20	
235	2 Core PVC insulated cable. 1mm ² stranded copper cores.	m 400	
236	Termination of above cable	No 20	
237	Cards Printer, Catridge for 50 prints, software and installation	No 1	
<u>INTERCOMS</u>			
<u>NOTE: Descriptions in this bill shall be read in conjunction with the specification</u>			
<u>Supply, install, test and commission intercom with colour video system complete with all hardware, software, terminations, fixings etc.</u>			
Carried Forward			R
Bill No. 17 Electrical Work			

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		Brought Forward		R
	<u>Aiphone or equal approved system</u>			
	<u>Central equipment</u>			
238	Master station unit suitable for 2 No. door stations and hands free with 3.5" colour LCD display	No	2	
	<u>Field equipment</u>			
239	Door station with audio and video, flush mounted with stainless steel face	No	5	
240	Door maglock release connection via a I/O interface to access control system located in IT Room	No	5	
	<u>Cabling</u>			
241	Cat 6A cabling	m	1 500	
242	RJ45 termination	No	10	
243	4 core 1.0 mm Cu PVC cable	m	800	
244	Terminated in above equipment	No	10	
	<u>SMOKE DETECTION SYSTEM</u>			
	<u>Supply, install, test and commission ZITON ZP2 (or equal and approved) smoke detection and alarm system complete with connectors, adapters, fixings, power sockets, cables, consumables and all material to complete the installation</u>			
	<u>Analogue addressable fire panels with master / slave network connections, complete with backup batteries and programming</u>			
245	Master 4 loop, 40 zone	No	1	
246	Slave 4 loop, 40 zone	No	1	
247	Repeater panel	No	1	
	<u>Addressable base mounted detectors, complete with base and fixings for floor void, ceiling, soffit/structure or wall mounting, and terminations.</u>			
248	Optical sensor - under ceiling	No	50	
		Carried Forward		R
	Bill No. 17 Electrical Work			

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	Brought Forward			R
249	Optical sensor - Soffit mounted	No	10	
250	Optical sensor - ceiling void	No	10	
251	Heat sensor	No	2	
252	Rate of rise temperature sensor	No	2	
253	Extra on last for base sounder	No	2	
254	Extra on last for base sounder with beacon	No	2	
	<u>Addressable field devices, complete with fixings for ceiling, soffit/structure or wall mounting, and terminations.</u>			
255	Manual call point with isolator (resettable)	No	6	
256	IO unit with isolator (complete with hinged lid enclosure)	No	10	
257	Multi tone sounder/strobe	No	4	
258	Surface mount door hold open magnet complete with universal stainless steel adjustable bracket and emergency release button and door anchor plate (400N) and power supplies.	No	4	
	<u>SMOKE DETECTION SYSTEM</u>			
	<u>Supply and installation of cable (red) on cable basket in ceiling void or drawn into conduit as specified, including all labels and terminations at both ends.</u>			
259	PH120 2 Core, 1.0mm ² stranded fire rated cable (red)	m	1 500	
260	PH120 2 Core, 1.5mm ² stranded fire rated cable (red)	m	3 000	
261	PH120 2 Core, 2.5mm ² stranded fire rated cable (red)	m	800	
262	Termination junction boxes in electronics risers complete with terminals	No	6	
263	Connectors, adapters, power sockets, cables, consumables and other material to complete the installation as intended.		Item	
	Carried Forward			R
	Bill No. 17 Electrical Work			

Brought Forward			R
264	Staff training on equipments	Item	
<u>GENERAL</u>			
265	Provide one sample lug cut through at 45 deg. for each of the PVC SWA PVC ECC cables exceeding 25 mm ² as per the cable schedule including supply of lug	Item	
266	Liaise with Telecommunications provider for the approval of conduits, cable trays, sleeves, power skirting and JBs installed	Item	
267	Liaise with Telecommunications provider for the approval of Comms room and underground sleeves around the site	Item	
268	Allowance to finalise the requirements of the local electrical supply authority and liaise the date of connection of power, submission of relevant certificates of compliance to ensure energisation of all outgoing circuits.	Item	
269	Inspect and take over all below ground electrical sleeves and manholes installed by others	Item	
270	Conduct Infra Red Theram imaging of the Completed Electrical installation and provide a comprehensive report	Item	
271	Proving of existing services i.e. tracing MV, LV cables for the entire site	Item	
<u>TESTING AND COMMISSIONING</u>			
272	Testing equipment to carry out site tests as specified for lux levels, cables, relays, switchgear, distribution boards, etc.	Item	
273	Test complete electrical installation in conjunction with the other services, viz., MV electrical, air-conditioning security system / smoke detection system, fire protection system, domestic water pumps, lifts smoke extract fans etc. as specified	Item	
274	Collate the "as built drawings" and manuals for correctly indexed, and submit to the Engineer for review	Item	
Carried Forward			R
Bill No. 17 Electrical Work			

Brought Forward			R
<u>HANDOVER</u>			
275	Budgetary allowance to produce and print As Built CAD drawings	Item	
276	Budgetary allowance for technical authoring of As Built manuals.	Item	
<u>GUARANTEES</u>			
277	Maintenance and guarantee of the complete installation including fitting, material and workmanship for a period of twelve months from date of completion and handover	Item	
278	Budgetary allowance for ISP connection costs and monthly rental	Item	
<u>GENERAL ITEMS</u>			
279	Compile all typed test reports, commissioning data, marked up "as built" drawings, package in plastic covered A4 files and plastic envelopes correctly indexed, and submit to the Engineer for review	Item	
280	Update as built drawings and test results as necessary, and suppliers' information indexed correctly	Item	
281	Complete an IBUYA test sheet per DB including earth loop impedance tests on all cables prior to terminating ends and earth loop impedance testing of each circuit as specified	Item	
282	Set up all protection devices as required	Item	
283	Set up all meters as required	Item	
284	Certificate of compliance to be issued on completion of the project in addition to detailed testing as specified	Item	
285	3 Sets of as-built drawings and manuals	Item	
Carried to Summary			R
Bill No. 17 Electrical Work			

Item No	Quantity	Rate	Amount
<p><u>BILL NO. 18</u></p> <p><u>MECHANICAL WORK</u></p> <p><u>(CPAP WORK GROUP NO. 170 UNLESS OTHERWISE STATED)</u></p> <p><u>SUPPLEMENTARY PREAMBLES</u></p> <p><u>Specifications, drawings, etc</u></p> <p>Tenderers are referred to the specification and drawings numbered ? to ? prepared by ?, annexed to these bills of quantities (accompanying these bills of quantities?) for the mechanical work, for the full descriptions of the following items which are to be read and priced in conjunction with the said specification and drawings</p> <p><u>Ductwork</u></p> <p>Descriptions of ducts shall be deemed to include stiffeners, jointing materials, sealants, couplers in the running length and access/inspection panels in accordance with the specification</p> <p><u>Dampers</u></p> <p>Descriptions of smoke and fire dampers shall be deemed to include fusible links, sleeves, frames, supports and access openings in ducts</p> <p><u>Air diffusion</u></p> <p>Descriptions of air terminals, grilles, louvres and the like shall be deemed to include necks, frames, supports and flexible connections</p> <p><u>Fans</u></p> <p>Descriptions of fan assemblies shall be deemed to include supports from the structure, flexible or other connections to ductwork, vibration isolation mountings and airtight inspection doors</p>			
<p style="text-align: right;">Carried Forward</p> <p>Bill No. 18 Mechanical Work</p>		R	

<p style="text-align: center;">Brought Forward</p> <p><u>Sound attenuators</u></p> <p>Descriptions of sound attenuators shall be deemed to include flanged or flexible connections to ducts and supports from the structure</p> <p><u>Fan coil units, fan air terminals and fan heaters</u></p> <p>Descriptions of fan coil units, fan air terminals and fan heaters shall be deemed to include connection points for water, air and electrical supply, for air grilles, dust trays, condensate trays and vibration isolation mountings. Flexible ducts, flexible hose and connecting cables for connecting these units to each other or to water pipe, and electrical supply are separately measured</p> <p><u>Major equipment</u></p> <p>Descriptions of major equipment such as chillers, air handling units and the like shall be deemed to include connections to water, air and electrical supply and/or discharge points, supports, bearers, vibration insulation mountings, filters, insulation, inspection ladders and gangways, access doors and panels and painting etc as specified</p> <p><u>Piping</u></p> <p>Pipe diameters are nominal internal unless otherwise stated</p> <p>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 diameter 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 diameters are given and no claim for extra bushes, reducers, etc will be entertained</p> <p><u>Fixing of pipes</u></p> <p>Unless 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</p>		R	
<p style="text-align: center;">Carried Forward</p> <p>Bill No. 18 Mechanical Work</p>		R	

Brought Forward				R
<u>Pump sets</u>				
Descriptions of pumps shall be deemed to include connections to water and electrical supply and/or discharge points, vibration insulation mountings, insulation, drip trays with outlets, pressure gauges, etc				
<u>Valves</u>				
Descriptions of valves shall be deemed to include flanged or screwed connections to pipes, reducers, supports, etc				
<u>Insulation</u>				
Descriptions of insulation shall be deemed to include priming the pipes with zinc chromate primer before the insulation is applied, painting the insulation when completed and applying vapour barrier where specified				
<u>AIR CONDITIONING INSTALLATION</u>				
<u>DX SPLIT UNITS</u>				
1	3.6kW Wall mounted midwall inverter unit including pump and cooling capacity. Condenser unit mounted on external wall.	No	5	
2	4.2kW Wall mounted midwall inverter unit including pump and cooling capacity. Condenser unit mounted on external wall.	No	2	
3	7.2kW Wall mounted midwall inverter unit including pump and cooling capacity. Condenser unit mounted on external wall.	No	1	
4	9.0kW Wall mounted midwall inverter unit including pump and cooling capacity. Condenser unit mounted on external wall.	No	2	
<u>SUPPLY DUCTWORK</u>				
<u>Rectangular galvanised sheet metal low pressure ducting including supports</u>				
<u>CONDENSER WATER PIPEWORK, ETC.</u>				
<u>Refrigerant piping</u>				
Carried Forward				R
Bill No. 18 Mechanical Work				

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	Brought Forward			R
	<u>Class 2 copper piping including brackets, cable tray, etc.</u>			
5	6.35mm Pipe	m	35	
6	9.52mm Pipe	m	32	
7	12.7mm Pipe	m	35	
8	15.88mm Pipe	m	32	
	<u>Extra over Class 2 copper pipes for capillary fittings</u>			
9	6.35mm Fittings	No	6	
10	9.52mm Fittings	No	5	
11	12.7mm Fittings	No	6	
12	15.88mm Fittings	No	5	
	<u>Drain piping</u>			
	<u>Class 6 uPVC piping Including brackets, cable tray, etc.</u>			
13	20mm Pipe	m	35	
14	32mm Pipe	m	5	
15	40mm Pipe	m	10	
	<u>Extra over Class 6 uPVC pipes for fittings</u>			
16	20mm Fittings	No	6	
17	32mm Fittings	No	2	
18	40mm Fittings	No	4	
	<u>TRUNKING</u>			
	<u>P2000 Galvanized wired mesh light duty cable trays including short lengths, tees, bends and fixed with hangers, brackets to walls, trusses, etc.</u>			
19	41.3mm Wide cable trays	m	70	
	Carried Forward			R
	Bill No. 18 Mechanical Work			

Brought Forward				R
<u>PIPE INSULATION</u>				
<u>Insulation to concealed pipes including vapour barrier</u>				
20	6.35mm Pipe	m	35	
21	9.52mm Pipe	m	32	
22	12.7mm Pipe	m	35	
23	15.88mm Pipe	m	32	
24	20mm Pipe	m	35	
25	32mm Pipe	m	5	
26	40mm Pipe	m	10	
<u>Extra over insulation to concealed pipes for insulation to</u>				
27	6.35mm Fittings	No	7	
28	9.52mm Fittings	No	5	
29	12.7mm Fittings	No	6	
30	15.88mm Fittings	No	4	
31	20mm Fittings	No	6	
32	32mm Fittings	No	2	
33	40mm Fittings	No	4	
<u>SUPPLY AIR DUCTWORK</u>				
<u>MEDIUM PRESSURE DUCTWORK</u>				
<u>Rectangular galvanised sheet metal medium pressure ducting including supports</u>				
34	Category 1 ducting suspended not exceeding 1m below steel roof trusses	m2	35	
Carried Forward				R
Bill No. 18 Mechanical Work				

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	Brought Forward			R
35	Category 1 ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m2	29	
36	Category 2 ducting suspended not exceeding 1m below steel roof trusses	m2	12	
37	Category 2 ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m2	9	
	<u>Extra over rectangular galvanised sheet metal medium pressure ducting including supports for</u>			
	<u>Category 1 ducting</u>			
38	Stopped end	No	6	
39	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	14	
	<u>Category 2 ducting</u>			
40	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	7	
	<u>Galvanised sheet metal medium pressure ducting including supports</u>			
41	100mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	8	
42	100mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	10	
43	150mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	17	
44	150mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	20	
45	200mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	17	
46	200mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	21	
47	250mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	14	
	Carried Forward			R
	Bill No. 18 Mechanical Work			

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Brought Forward			R
48	250mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	17
49	300mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	5
50	300mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	7
51	350mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	12
52	350mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	9
53	400mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	14
54	400mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	9
55	450mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	11
56	450mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	13
57	500mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	14
58	500mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	17
59	550mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	2
60	630mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	4
61	650mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	7
<u>Extra over galvanised sheet metal medium pressure ducting including supports for</u>			
Carried Forward			R
Bill No. 18 Mechanical Work			

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Brought Forward			R
<u>100mm Diameter ducting</u>			
62	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No 11	
<u>150mm Diameter ducting</u>			
63	Stopped end	No 3	
64	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No 23	
<u>200mm Diameter ducting</u>			
65	Stopped end	No 2	
66	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No 21	
<u>250mm Diameter ducting</u>			
67	Stopped end	No 1	
68	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No 26	
<u>300mm Diameter ducting</u>			
69	Stopped end	No 1	
70	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No 7	
<u>350mm Diameter ducting</u>			
71	Stopped end	No 2	
72	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No 7	
<u>400mm Diameter ducting</u>			
73	Stopped end	No 1	
74	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No 5	
Carried Forward			R
Bill No. 18 Mechanical Work			

Brought Forward			R
<u>450mm Diameter ducting</u>			
75	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	6
<u>500mm Diameter ducting</u>			
76	Stopped end	No	1
77	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	5
<u>550mm Diameter ducting</u>			
78	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	3
<u>630mm Diameter ducting</u>			
79	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	4
<u>650mm Diameter ducting</u>			
80	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	2
<u>RETURN AIR DUCTWORK</u>			
<u>MEDIUM PRESSURE DUCTWORK</u>			
<u>Rectangular galvanised sheet metal medium pressure ducting including supports</u>			
81	Category 1 ducting suspended not exceeding 1m below steel roof trusses	m2	9
82	Category 1 ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m2	11
83	Category 2 ducting suspended not exceeding 1m below steel roof trusses	m2	7
84	Category 2 ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m2	8
<u>Extra over rectangular galvanised sheet metal medium pressure ducting including supports for</u>			
Carried Forward			R
Bill No. 18 Mechanical Work			

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Brought Forward			R
<u>Category 1 ducting</u>			
85	Stopped end	No	1
86	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	1
<u>Category 2 ducting</u>			
87	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	6
<u>Galvanised sheet metal medium pressure ducting including supports</u>			
88	250mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	7
89	250mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	9
90	300mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	4
91	350mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	9
92	350mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	10
<u>Extra over galvanised sheet metal medium pressure ducting including supports for</u>			
<u>250mm Diameter ducting</u>			
93	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	22
<u>300mm Diameter ducting</u>			
94	Stopped end	No	1
<u>350mm Diameter ducting</u>			
95	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	3
<u>EXTRACT AIR DUCTWORK</u>			
Carried Forward			R
Bill No. 18 Mechanical Work			

Brought Forward			R
<u>MEDIUM PRESSURE DUCTWORK</u>			
<u>Rectangular galvanised sheet metal medium pressure ducting including supports</u>			
96	Category 1 ducting suspended not exceeding 1m below steel roof trusses	m2	10
97	Category 1 ducting suspended not exceeding 1m below steel roof trusses	m2	12
98	Category 2 ducting suspended not exceeding 1m below steel roof trusses	m2	48
99	Category 2 ducting suspended not exceeding 1m below steel roof trusses	m2	39
<u>Extra over rectangular galvanised sheet metal medium pressure ducting including supports for</u>			
<u>Category 1 ducting</u>			
100	Stopped end	No	3
101	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	19
<u>Category 2 ducting</u>			
102	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	7
<u>Galvanised sheet metal medium pressure ducting including supports</u>			
103	100mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	3
104	150mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	13
105	150mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	11
106	200mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	7
Carried Forward			R
Bill No. 18 Mechanical Work			

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	Brought Forward			R
107	200mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	5	
108	250mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	4	
109	300mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	10	
110	300mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	9	
111	350mm Diameter ducting suspended not exceeding 1m below steel roof trusses	m	7	
112	350mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	6	
113	400mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	1	
114	630mm Diameter ducting suspended exceeding 1m and not exceeding 2m below steel roof trusses	m	2	
	<u>100mm Diameter ducting</u>			
115	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	5	
	<u>150mm Diameter ducting</u>			
116	Stopped end	No	1	
117	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	36	
	<u>200mm Diameter ducting</u>			
118	Stopped end	No	3	
119	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	7	
	<u>250mm Diameter ducting</u>			
120	Stopped end	No	1	
	Carried Forward			R
	Bill No. 18 Mechanical Work			

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	Brought Forward			R
121	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	2	
	<u>300mm Diameter ducting</u>			
122	Stopped end	No	4	
123	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	16	
	<u>350mm Diameter ducting</u>			
124	Stopped end	No	2	
125	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	1	
	<u>400mm Diameter ducting</u>			
126	Stopped end	No	1	
127	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	1	
	<u>630mm Diameter ducting</u>			
128	Reducer, radius bend, square bend, transformation, spigot, branch or tee	No	1	
	<u>DUCTING INSULATION</u>			
	<u>External insulation</u>			
129	50mm Thick insulation	m2	279	
130	75mm Thick insulation with sheet metal covering	m2	121	
	<u>DIFFUSERS, GRILLES, ETC.</u>			
	<u>Anodised aluminium door grilles</u>			
131	200 x 200mm Door grille (DG01)	No	21	
132	250 x 250mm Door grille (DG02)	No	5	
133	300 x 300mm Door grille (DG03)	No	9	
	Carried Forward			R
	Bill No. 18			
	Mechanical Work			

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Brought Forward			R
<u>Anodised aluminium supply diffusers</u>			
134	600 x 600mm Medium cone vav diffuser (SD02)	No	18
135	600mm Diameter medium cone vav diffuser (SD03)	No	5
136	600mm Diameter medium cone vav diffuser (SD05)	No	6
<u>Anodised aluminium extract, transfer and return air grilles</u>			
137	150mm Diameter ceiling mounted extraction disc valve (DV01)	No	5
138	200mm Diameter ceiling mounted extraction disc valve (DV02)	No	34
139	150mm Diameter ceiling mounted fresh air supply disc valve (FD01)	No	6
140	200mm Diameter ceiling mounted fresh air supply disc valve (FD02)	No	22
141	250mm Diameter ceiling mounted fresh air supply disc valve (FD03)	No	8
142	300mm Diameter ceiling mounted fresh air supply disc valve (FD04)	No	2
143	250 x 250mm Extraction EGG crate grille with OBD dampers (EG01)	No	4
144	1200 x 600mm Extraction EGG crate grille with OBD dampers (EG02)	No	6
145	1200 x 600mm Return air grille (RG01)	No	5
<u>Powder coated anodised aluminium weather louvres</u>			
146	150 x 150mm Weather louvre with vermin screen, mounted on end of duct (WL01)	No	1
147	250 x 250mm Weather louvre with vermin screen, mounted on end of duct (WL02)	No	2
148	350 x 350mm Weather louvre with vermin screen, mounted on end of duct (WL03)	No	6
Carried Forward			R
Bill No. 18 Mechanical Work			

Brought Forward			R
<u>DUCTING SUNDRIES</u>			
<u>Dampers</u>			
149	100mm Diameter balancing damper (BD01)	No 6	
150	150mm Diameter balancing damper (BD02)	No 22	
151	200mm Diameter balancing damper (BD03)	No 13	
152	250mm Diameter balancing damper (BD04)	No 28	
153	300mm Diameter balancing damper (BD05)	No 6	
154	150mm Diameter round fire damper (FD01)	No 1	
155	250mm Diameter round fire damper (FD02)	No 1	
156	350mm Diameter round fire damper (FD03)	No 1	
157	400mm Diameter round fire damper (FD04)	No 1	
158	450mm Diameter round fire damper (FD05)	No 2	
159	150mm Diameter non-return damper (NR01)	No 1	
<u>EQUIPMENT</u>			
<u>Fresh air ventilation fans including FA filters, plenum and sound attenuators</u>			
160	AP 560mm diameter fresh air axial fan 912 litres/second (FA1.0.63)	No 1	
161	AP 560mm diameter fresh air axial fan 1012 litres/second (FA2.0.61)	No 1	
162	AP 630mm diameter fresh air axial fan 1609 litres/second (FA3.0.62)	No 1	
<u>Extraction wall fans</u>			
163	AMS HXM 350mm diameter extraction wall fan 190 litres/second (EF1.0.24)	No 2	
164	AMS HXM 300 S 300mm diameter extraction wall mount fan 15 litres/second (EF2.0.26)	No 1	
Carried Forward			R
Bill No. 18 Mechanical Work			

**Proposed New Orthotic and Prosthetics Centre
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	Brought Forward			R
165	AMS HXM 300 S 300mm diameter extraction wall mount fan 65 litres/second (EF2.0.27)	No	2	
166	AMS HXM 300 S 300mm diameter extraction wall mount fan 45 litres/second (EF2.0.28)	No	2	
167	AMS HXM 300 S 300mm diameter extraction wall mount fan 60 litres/second (EF2.0.29)	No	1	
168	AMS HXM 300 S 300mm diameter extraction wall mount fan 75 litres/second (EF2.0.34)	No	1	
169	HIT 250 B 250mm diameter extraction wall fan 300 litres/second (EF3.0.33) including fire damper	No	1	
	<u>Silent axial extraction fans plenum & sound attenuators</u>			
170	HIT 250 B 250mm diameter extraction fan 150 litres/second (EF3.0.65)	No	4	
171	HIT 250 B 250mm diameter extraction fan 210 litres/second (EF4.0.37)	No	1	
172	AMS HIT 315 B 315mm diameter extraction fan 310 litres/second (EF5.0.54)	No	1	
173	AMS HIT 315 B 315mm diameter extraction fan 310 litres/second (EF5.0.55)	No	1	
174	TD 400mm diameter extraction fan 350 litres/second (EF6.0.36)	No	2	
175	TD 400mm diameter extraction fan 425 litres/second (EF6.0.51)	No	1	
176	AP 560mm diameter extraction air axial fan 2400 litres/second (EF7.0.64)	No	1	
	<u>Air handling units</u>			
177	Air handling unit as per the specification (AHU1.0.58). Tenderers are referred to Mechanical Engineer drawings annexed to these Bills of Quantities.	No	1	
178	Air handling unit as per the specification (AHU2.0.60). Tenderers are referred to Mechanical Engineer drawings annexed to these Bills of Quantities.	No	1	
	Carried Forward			R
	Bill No. 18 Mechanical Work			

Brought Forward			R
<u>GAS</u>			
<u>COMPRESSED AIR</u>			
For the complete supply, delivery, installation, testing, commissioning and handing over of the following			
<u>Compressors and receivers as per specification</u>			
179	0.8m3/min Rotary screw compressor	No	1
180	6.5m3 Receiver with fittings	No	1
181	Refrigerated air dryer	No	1
182	General purpose air filters (1.0 micron, oil < 0.5ppm)	No	1
183	Oil absorber	No	1
<u>Pressure regulators</u>			
184	20mm Line pressure regulator, filter condensate drain for 0.6 m3/min (R)	No	1
185	End of line condensate trap	No	1
186	Automatic condensate trap	No	1
187	Spirax automatic drain trap	No	1
<u>Pipes and valves</u>			
Supply, install & commission			
<u>Galvanised mild steel pipe to SABS 62 heavy grade</u>			
188	20mm Pipe	m	40
<u>Extra over for pipe fittings of malleable iron</u>			
189	20mm Radius bend	No	13
<u>Valves</u>			
190	20mm Solenoid valve	No	1
191	20mm Shut off valve	No	1
Carried Forward			R
Bill No. 18 Mechanical Work			

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Brought Forward			R
192	20mm Safety relief valve	No	1
<u>GAS INSTALLATION</u>			
<u>All piping, hangers, brackets and cages, connections balancing testing and commissioning of the following gas cylinders:</u>			
193	Oxygen 48kg gas cylinders	No	2
194	Acetylene 48kg gas cylinders	No	2
<u>Pressure regulators</u>			
195	20mm Line pressure regulator	No	6
<u>Gas piping</u>			
<u>Copper, Medical Grade, piping and ancillaries including supports and fixings</u>			
196	20mm Pipe	m	25
<u>Extra over for copper pipe, Medical Grade, for capillary fittings</u>			
197	20mm Elbow	No	24
<u>Extra over for copper pipe, Medical Grade, for compression fittings</u>			
198	20mm Shut off valve	No	6
199	20mm Non-return valve	No	4
200	20mm Isolation valve	No	10
201	20mm Pressure gauge	No	2
<u>GENERAL</u>			
202	Testing and commisioning the installation	Item	
203	Provision of as-built drawings, manuals and operative training	Item	
204	Coding and labelling of plants	Item	
Carried Forward			R
Bill No. 18 Mechanical Work			

Proposed New Orthotic and Prosthetics Centre At Ngwelezane Hoasptial

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Item No	Quantity	Rate	Amount
<u>BILL NO. 20</u>			
<u>PAINTWORK</u>			
<u>(CPAP WORK GROUP NO. 152 UNLESS OTHERWISE STATED)</u>			
<u>PREAMBLES</u>			
The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>SABS Specifications</u>			
Alkali resistant primer - SABS 1416			
Wash primer (metal etch) - SABS 723			
Primers for internal wood work - SABS 678 Type 111			
Zinc chromate primer for steel - SABS 679 Type 1			
Undercoat for paints (Except emulsion paint) - SABS 681 Type 1			
Gloss enamel paint - SABS 631			
Aluminium paint - SABS 682 Grade 11			
Structural steel paint - SABS 684 Type B			
Emulsion paint - SABS 1586 (Gloss, Semi gloss, Matt : Internal / External)			
<u>ON EXTERNAL FLOATED PLASTER SURFACES</u>			
		R	
Carried Forward			
Bill No. 20 Paintwork			

	Brought Forward			R
	<u>"Plascon" or other equally approved alkali resistant primer and two coats "Micatex" emulsion paint for exterior use</u>			
1	On walls (LI)	m2	537	
2	On columns (LI)	m2	85	
3	On beams (LI)	m2	138	
	<u>"Plascon" or other equally approved three coats waterproofing compound (PWC 520)</u>			
4	On cills (LI)	m2	21	
	<u>ON INTERNAL FLOATED PLASTER SURFACES</u>			
	<u>"Plascon" or other equally approved alkali resistant primer and two coats "Micatex" emulsion paint for exterior use</u>			
5	On walls (LI)	m2	2 780	
6	On narrow widths (LI)	m2	261	
7	On soffits (LI)	m2	139	
8	On columns (LI)	m2	127	
9	On beams (LI)	m2	197	
	<u>ON WOOD SURFACES</u>			
	<u>Prepare and apply two coats "Plascon" or other equally approved mat varnish</u>			
10	On doors (LI)	m2	183	
	<u>ON PLASTERBOARD SURFACES</u>			
	<u>"Plascon" or other equally approved gypsum and plaster primer (PP700) and two coats professional super matt (PEM 900/TSA) for interior use</u>			
11	Ceilings including priming metal cover strips and nail heads (LI)	m2	13	
12	75mm Coved cornices (LI)	m	83	
	Carried Forward			R
	Bill No. 20 Paintwork			

Brought Forward			R
<u>ON METAL</u>			
<u>"Plascon" or other approved alkyd based zinc phosphate primer, one coat alkyd based universal undercoat and two coats superior quality universal enamel paint, on steel</u>			
13	On door frames (LI)	m2	31
<u>One coat calcium plumbate primer on:</u>			
14	Backs of galvanised steel door frames before fixing (LI)	m2	31
Carried to Summary			R
Bill No. 20 Paintwork			

**Proposed New Orthotic and Prosthetics Centre
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Item No		Quantity	Rate	Amount
	<u>BILL NO. 21</u>			
	<u>EXTERNAL WORKS (ALL TRADES)</u>			
	<u>PREAMBLES</u>			
	The descriptions given in the various items below are not necessarily full and complete and reference must be made to the "Standard Preambles To All Trades", "Supplementary Preambles" and "Supplementary Specifications" to this contract for the full requirements of each scheduled item			
	<u>SITE CLEARANCE (CPAP Work Group No. 104)</u>			
1	Allow for clearing the area of the site to be built upon of all grass, weeds, shrubs, trees with trunks not exceeding 200mm girth, debris, etc., including grubbing up all roots, scoffling up as required and cart away all vegetation and debris.	m2	5 711	
	<u>Surface preparation</u>			
2	Trim and level off surface of ground (excavated or filled under this Contract) including excavating or filling, ripping and scarifying as necessary and hydraulically compacting the whole area for a depth of 300mm.	m2	5 711	
3	Keeping excavations free of all subterranean water by methods to be determined by the contractor		Item	
	Carried Forward			
	Bill No. 21 External Works		R	

Brought Forward			R
<u>BULK EXCAVATION, FILLING, ETC</u>			
A Geotechnical Assessment is included with these Bills of Quantities. All excavations described as being in earth shall be deemed to include for all material described in the Geotechnical Assessment.			
Bulk earthworks quantities are based on the final levels required. Rates are deemed to include for sequencing of work if required, temporary ramps, double handling etc, deemed necessary during the construction period.			
Backfilling to platforms, embankments, etc. using in-situ material or imported fill from commercial sources, must be evenly spread, graded and mechanically compacted in layers not exceeding 200mm thick to a 95% Mod. AASHTO maximum density.			
The contractor shall make his own arrangement for disposal of spoil materials off site and the cost of all royalty and haulage; loading and unloading are to be included in the relevant rate.			
Rates for bulk excavations are deemed to include for risk of collapse/shoring to sides of excavated faces.			
Rates for bulk excavations are deemed to include for any neccessary precautions or varied method of excavation required for excavating along the lateral support structure, existing services, etc.			
Temporary access ramps, forming temporary support banks, etc, as required by the Contractor and the sequencing and staging thereof have not been separately measured and are deemed to be included in the items described hereunder.			
<u>Open face excavation in earth</u>			
4	Open face excavation over sloping site to reduce levels	m3	7 300
5	Strip average 150mm thick layer of topsoil, stockpile on site and maintain.	m3	720
6	Filling with selected material from the excavations including haulage from within the boundary of the site to form slopes, contours, platforms, etc. compacted to 95% Mod. AASHTO maximum density	m3	825
Carried Forward			R
Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
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	Brought Forward			R
7	Filling with G7 material supplied by the contractor to form slopes, contours, platforms, etc. compacted to 95% Mod. AASHTO maximum density	m3	1 000	
8	Allow for all necessary tests by an independent testing authority of compaction and moisture content of compacted earth to ensure that the required compaction are being attained and for submitting results to the Engineer		Item	
	<u>Extra over bulk excavation in earth for excavation in:</u>			
9	Intermediate material (Provisional)	m3	400	
10	Hard material (Provisional)	m3	365	
11	Boulder excavation Class A material (Provisional)	m3	200	
	<u>Excavation other than bulk in earth not exceeding 2m deep</u>			
12	Locate and carefully excavate by hand to prove position of existing services	m3	94	
	<u>Extra over all excavations for loading, carting and dumping surplus excavated material, rubble, etc. (no allowance made for increase in bulk)</u>			
13	Off site to a dumping site to be found by the Contractor.	m3	6 475	
	<u>SUBSOIL DRAINAGE (CPAP Work Group No. 146)</u>			
	<u>HDPE pipes</u>			
	<u>Slotted HDPE flexible drainage pipes</u>			
14	110mm HDPE flexible slotted agricultural pipes laid behind retaining walls for a depth not exceeding 6m including 19mm crushed stone encasing 300 x 300mm and "Kaymat" U14 geofabric filter blanket wrapped around encasing with 150mm side and 300mm end laps including stitching. (LI)	m	273	
15	Extra over for 110mm capped end (LI)	No	2	
16	Extra over for 110mm bend (LI)	No	5	
	Carried Forward			R
	Bill No. 21 External Works			

Brought Forward			R
<u>Earthworks (CPAP Work Group No. 104)</u>			
17	Excavation in earth not exceeding 2m deep for pipe trenches (LI)	m3	273
18	Extra over excavation in earth for pipe trenches, chambers, etc. for excavation in intermediate material (LI)	m3	41
19	Extra over excavation in earth for pipe trenches, chambers, etc. for excavation in hard material (LI)	m3	27
20	Extra over for imported granular bedding and backfill to pipe trenches to 95% Mod. AASHTO density (LI)	m3	164
21	Backfilling obtained from excavations and backfill to pipe trenches to 95% Mod. AASHTO density (LI)	m3	55
22	Extra over on excavations for carting away surplus material from excavations and/or stock piles to an area where directed on site or adjacent site and spread and levelled (LI)	m3	218
<u>STORMWATER DRAINAGE (CPAP Work Group No. 146)</u>			
<u>Alterations to existing manholes etc:</u>			
23	Break through one brickwall situated on side of manhole for and connect up new 375mm Class 75D concrete pipe (elsewhere measured) and make good all round including new channels, benching, etc. (LI)	No	1
<u>Class 34 HD uPVC pipes in class C bedding:</u>			
24	160mm Pipes laid in and including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material and shoring to pipe trenches exceeding 1m not exceeding 2m deep. (LI)	m	77
25	250mm Pipes laid in and including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material and shoring to pipe trenches exceeding 1m not exceeding 2m deep. (LI)	m	182
Carried Forward			R
Bill No. 21 External Works			

Brought Forward			R
<u>Class 75D concrete pipes in class C bedding:</u>			
26	375mm Pipes laid in and including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material and shoring to pipe trenches exceeding 1m deep and not exceeding 2m deep. (LI)	m	6
<u>Manholes, etc:</u>			
27	Build manhole complete with benching, haunching, etc. size internally 590 x 590mm with one brick sides to suit depth as per the Engineer not exceeding 1000mm deep including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material, shoring and fitted with type 4A heavy duty polymer manhole cover and frame (refer to drawing no. D3806/20-SW04 detail SWD03 annexured to these bills of quantities). (LI)	No	2
28	Build manhole complete with benching, haunching, etc. size internally 590 x 590mm with one brick sides to suit depth as per the Engineer exceeding 1000mm and not exceeding 1500mm deep including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material, shoring and fitted with type 4A heavy duty polymer manhole cover and frame (refer to drawing no. D3806/20-SW04 detail SWD03 annexured to these bills of quantities). (LI)	No	3
29	Build manhole complete with benching, haunching, etc. size internally 590 x 590mm with one brick sides to suit depth as per the Engineer exceeding 1500mm and not exceeding 2000mm deep including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material, shoring and fitted with type 4A heavy duty polymer manhole cover and frame (refer to drawing no. D3806/20-SW04 detail SWD03 annexured to these bills of quantities). (LI)	No	5
Carried Forward			R
Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
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Brought Forward			R
30	Build manhole complete with benching, haunching, etc. size internally 590 x 590mm with one brick sides to suit depth as per the Engineer exceeding 2000mm and not exceeding 2500mm deep including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material, shoring and fitted with type 4A heavy duty polymer manhole cover and frame (refer to drawing no. D3806/20-SW04 detail SWD03 annexured to these bills of quantities). (LI)	No	1
<u>Grid inlets for Stormwater:</u>			
31	Build catchpit complete with benching, haunching, etc. size internally 740 x 740mm with one brick sides to a depth exceeding 1000mm and not exceeding 1250mm deep including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material , shoring and fitted with Type 2A polymer grating and frame. (refer to drawing no.D3806/20-SW04 detail SWD04 annexured to these bills of quantities). (LI)	No	3
32	Build catchpit complete with benching, haunching, etc. size internally 740 x 740mm with one brick sides to a depth exceeding 1250mm and not exceeding 1500mm deep including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material , shoring and fitted with Type 2A polymer grating and frame. (refer to drawing no.D3806/20-SW04 detail SWD04 annexured to these bills of quantities). (LI)	No	5
33	Stormwater channel, etc. of approximate size 500 x 500 x 1250mm deep, with concrete walls 200mm thick, with smooth off shutter finish in lower pit level with and including galvanised "Mentis Rectagrid" grating (RS40-40x3.0/30 kg/m2) including casting in galvanised 45 x 45 x 5mm angle section framing with 30 x 5mm flat section lugs each 150mm girth welded on at 400mm centres. (LI)	m	10
<u>Sundries</u>			
34	Unreinforced concrete encasing to horizontal pipe including the necessary formwork (LI)	m3	33
Carried Forward			R
Bill No. 21 External Works			

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Brought Forward			R
35	Extra over excavation in earth for pipe trenches, chambers, etc. for excavation in intermediate material (LI)	m3	18
36	Extra over excavations for importation of G7 material for backfilling to pipe trenches (LI)	m3	182
37	Allow for testing all the stormwater drains as directed by the Employer or his agents and for re-testing after replacing any defective work to his satisfaction. The contractor is to provide all testing apparatus and labour and is to follow the instructions implicitly.	Item	
<u>SOIL DRAINAGE (CPAP Work Group No. 146)</u>			
<u>Alterations to existing drains, manholes etc:</u>			
38	Break through one brickwall situated on side of manhole for and connect up new 110mm Class 34 uPVC pipe (elsewhere measured) and make good all round including new channels, benching, etc. (LI)	No	1
<u>uPVC class 34 pipes in class C bedding</u>			
39	110mm Pipes laid in and including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material and shoring to pipe trenches not exceeding 1m deep. (LI)	m	50
40	110mm Pipes laid in and including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material and shoring to pipe trenches exceeding 1m and not exceeding 2m deep. (LI)	m	221
<u>Extra over uPVC pipes for fittings</u>			
41	110mm Bend (LI)	No	31
42	110mm Junction (LI)	No	15
43	110mm Access junction (LI)	No	10
Carried Forward			R
Bill No. 21 External Works			

Brought Forward			R
<u>Precast concrete circular manholes (covers elsewhere measured) formed of manhole rings (SABS 1294) including excavation, risk of collapse, working space, backfilling with selected material from the excavations, cart away surplus material, shoring, hoisting in position, step irons, benching and haunching</u>			
44	Precast concrete manhole rings (SABS 1294) size internally 1000mm diameter, exceeding 1m and not exceeding 1.25m deep internally including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material, shoring, step irons, benching and haunching. (LI)	No	1
45	Precast concrete manhole rings (SABS 1294) size internally 1000mm diameter, exceeding 1.25m and not exceeding 1.5m deep internally including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material, shoring, step irons, benching and haunching. (LI)	No	3
46	Precast concrete manhole rings (SABS 1294) size internally 1000mm diameter exceeding 1.5m and not exceeding 1.75m deep including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material, shoring, step irons, benching and haunching. (LI)	No	2
47	Precast concrete manhole rings (SABS 1294) size internally 1000mm diameter exceeding 1.75m and not exceeding 2m deep including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material, shoring, step irons, benching and haunching. (LI)	No	2
48	Precast concrete manhole rings (SABS 1294) size internally 1250mm diameter exceeding 2m and not exceeding 2.25m deep including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material, shoring, step irons, benching and haunching. (LI)	No	2
Carried Forward			R
Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
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Brought Forward			R
49	Precast concrete manhole rings (SABS 1294) size internally 1250mm diameter exceeding 2.25m and not exceeding 2.5m deep including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material, shoring, step irons, benching and haunching. (LI)	No	1
50	Precast concrete manhole rings (SABS 1294) size internally 1250mm diameter exceeding 2.5m and not exceeding 2.75m deep including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material, shoring, step irons, benching and haunching. (LI)	No	1
51	Precast concrete manhole rings (SABS 1294) size internally 1250mm diameter exceeding 2.75m and not exceeding 3m deep including excavation, risk of collapse, working space, hoisting in position, backfilling with selected excavated material, cart away surplus material, shoring, step irons, benching and haunching. (LI)	No	1
<u>Gratings, covers, etc.</u>			
52	550mm Diameter 190kg type 2A cast iron manhole cover and frame	No	13
53	110mm Cast iron cleaning eye	No	10
54	400 x 400 x 75mm Precast concrete inspection eye marker slab set in ground	No	10
<u>Sundries</u>			
55	Unreinforced concrete encasing to horizontal pipe including the necessary formwork. (LI)	m3	5
56	Allow for testing all the soil drainage lines as directed by the Employer or his agents and for re-testing after replacing any defective work to his satisfaction. The contractor is to provide all testing apparatus and labour and is to follow the instructions implicitly.	Item	
<u>WATER SUPPLIES TO DOMESTIC AND FIRE RETICULATION (CPAP Work Group No. 146)</u>			
Carried Forward			R
Bill No. 21 External Works			

Brought Forward			R
<u>"HDPE" or other equally approved pipes with solvent welded joints</u>			
57	80mm "HDPE 100PN 12.5", in ground including excavation, backfilling compacted to 95% Mod. AASHTO density, risk of collapse, etc. not exceeding 1m. (LI)	m	276
58	110mm "HDPE 100PN 12.5" Pipe, in ground including excavation, backfilling, compacted to 95% Mod. AASHTO density, risk of collapse, etc. not exceeding 1m deep. (LI)	m	244
<u>Extra over HDPE Pipes for Electroweld Fusion couplings for Fittings</u>			
59	80mm Tee (LI)	No	7
60	100mm Tee (LI)	No	7
61	80mm Electro weld elbow (LI)	No	17
62	100mm Electro weld elbow (LI)	No	8
63	80mm Reducer (LI)	No	6
64	100mm Reducer (LI)	No	4
65	80 Table D brass flanges complete with backing plate and bolts including gaskets and flange adapters	No	6
66	100 Table D Brass flanges complete with backing plate and bolts including gaskets and flange adapters	No	5
<u>Extra over all excavations for loading, carting and dumping surplus excavated material (no allowance made for increase in bulk)</u>			
67	Off site to a dumping site to be found by the Contractor	m3	94
<u>Backfilling with G5 material supplied and carted onto site by the Contractor, compacted to a density of at least 95% Mod. AASHTO maximum density</u>			
68	Imported G5 material in trenches (LI)	m3	94
Carried Forward			R
Bill No. 21 External Works			

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Brought Forward			R
<u>Sundries</u>			
69	Plain tee or bulb section galvanised mild steel fencing post standard 1800mm long driven into ground as support for standpipe	No	11
70	Unreinforced concrete Class B (1:3:5) in thrust blocks size 500 x 500 x 700mm high at bends, tees, etc., including necessary excavation, formwork, etc. (LI)	No	11
<u>Valve chamber</u>			
71	Excavate in ground for and build valve chamber 600 x 600 x 1000mm deep of one brick sides with 150mm (20MPa) thick concrete base, fitted with and including 450 x 600mm x 81kg single seal cast iron cover and frame.	No	11
<u>"Chubb" or other equally approved</u>			
72	80 x 65mm Brass hydrant booster connection with cap and chain	No	2
73	80 x 65mm Brass double booster pump connection with caps and chains	No	2
<u>Fire Hydrant pedestals</u>			
74	Unreinforced concrete hydrant pedestal 900mm high cast around vertical pipe with bottom 300mm below ground, 300 x 300mm square at base and tapering to octagonal shaped top 200 x 200mm overall including necessary excavation, formwork and two coats of paint to exposed surfaces	No	4
<u>Extra over for Fittings to Valve Chamber</u>			
75	22mm Gate Valve	No	2
76	28mm Gate Valve	No	3
77	40mm Gate Valve	No	1
78	80mm Gate Valve	No	2
79	100mm Gate Valve	No	5
Carried Forward			R
Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
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Brought Forward			R
<u>Water Meter</u>			
80	80mm Sealed counter semi-positive rotary piston type water meter with a body length 165mm as "Kent PSM Size 5", suitable for vertical or horizontal installation and joints to brass connectors (elsewhere measured).	No 1	
<u>Testing</u>			
81	Allow for testing the whole water supplies as directed by the Employer or his agents and for re-testing after replacing any defective work to his satisfaction. The contractor is to provide all testing apparatus and labour and is to follow the instructions implicitly.	Item	
<u>SEPERATION TANK</u>			
<u>Earthworks (CPAP Work Group No. 104)</u>			
<u>Excavation other than bulk</u>			
82	Holes not exceeding 2m deep (LI)	m3 20	
83	Holes exceeding 2m not exceeding 4m deep	m3 1	
84	Compaction of ground surface under bases etc., including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 95% Mod. AASHTO density	m2 10	
85	Extra for excavations in intermediate rock (LI)	m3 3	
86	Risk of collapse of sides of trenches and holes exceeding 1,5m deep	m2 31	
87	Extra over all excavations for loading, carting and dumping surplus excavated material off site to a dumping site to be found by the Contractor (no allowance made for increase in bulk)	m3 21	
88	Allow for keeping excavations free of all water other than subterranean water	Item	
89	Approved brand of anti-termite soil poison applied by a registered pest control company and guaranteed against termite infestation for ten years bottoms and sides of holes and trenches (LI)	m2 10	
Carried Forward			R
Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
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Brought Forward			R
90	Allow for the execution of all the prescribed density tests on filling, etc., as pointed out by the Engineer on site to the approval of the Principal Agent.	Item	
<u>Concrete (CPAP Work Group No. 110)</u>			
<u>Concrete</u>			
91	15MPa/19mm Unreinforced concrete in blinding layer cast against excavated surfaces. (LI)	m3	1
92	30MPa/19mm Reinforced concrete in surface beds on waterproofing (LI)	m3	2
93	40MPa/19mm Reinforced concrete in slabs (LI)	m3	2
94	Finishing to top surfaces of concrete with smooth wood float (Class U2) to surface beds, slabs, etc. (LI)	m2	10
95	Allow for necessary concrete test cubes size 150 x 150 x 150mm from batches of concrete required for this building as specified, made, stored, cured and tested in accordance with SABS Methods 861 and 863, including use of approved cube moulds, transporting to an approved laboratory for testing, paying all charges and submitting reports to the Head: Works	Item	
<u>Formwork (CPAP Work Group No. 111)</u>			
<u>Formwork</u>			
96	Class F1 ordinary finish formwork to edges not exceeding 300mm high (LI)	m	15
97	Class F1 ordinary finish formwork to soffits of slab propped up exceeding 1.5m and not exceeding 3.5m above bearing level (LI)	m2	10
<u>Reinforcement (CPAP Work Group No. 114)</u>			
<u>Reinforcement</u>			
98	Type 245 fabric reinforcement in surface beds (LI)	m2	20
99	High tensile reinforcement bars of varying diameters (LI)	t	1.00
Carried Forward			R
Bill No. 21 External Works			

Brought Forward			R
<u>Masonry (CPAP Work Group No. 116)</u>			
<u>Brickwork of NFX bricks in class II mortar</u>			
100	Half brick walls (LI)	m2	5
101	One brick walls (LI)	m2	25
<u>2.5mm Galvanised brickwork reinforcement</u>			
102	75mm Wide reinforcement built in horizontally (LI)	m	18
103	155mm Wide reinforcement built in horizontally (LI)	m	88
<u>Waterproofing (CPAP Work Group No. 120)</u>			
<u>Waterproofing</u>			
104	50 x 50mm Prostruct 531 MGP corner fillet 300mm girth	m	22
<u>Plastering</u>			
105	25mm Thick on floor (LI)	m2	10
<u>Drainage (CPAP Work Group No. 146)</u>			
<u>Plumbing and Drainage</u>			
<u>uPVC class 34 pipes in class C bedding</u>			
106	110mm Diameter pipe cast in walls (LI)	m	10
107	Extra over uPVC pipe for 110mm Bend (LI)	No	4
108	Extra over uPVC pipe for 110mm junction (LI)	No	3
<u>Gratings, covers, etc:</u>			
109	Besaans Du Plessis or other equally approved double seal M2400 550mm diameter heavy duty cover with 200mm diameter inspection cover	No	4
<u>Sundries</u>			
110	Unreinforced concrete encasing to horizontal pipe including the necessary formwork. (LI)	m3	1
Carried Forward			R
Bill No. 21 External Works			

Brought Forward			R
<u>Painting (CPAP Work Group No. 152)</u>			
<u>One coat "Pro-Struct 256" MCL epoxy primer and two coats "Pro-Struct 627" non-slip epoxy enamel coating with silica sand mixture to achieve a total dry film thickness of 500 microns</u>			
111	On cement render floors	m2	10
<u>RAINWATER TANKS AND PLINTHS</u>			
<u>Earthworks (CPAP Work Group No. 104)</u>			
112	Excavate in earth not exceeding 2m deep for bases (LI)	m3	51
113	Risk of collapse of sides of trench excavations not exceeding 1.5m deep (LI)	m2	55
114	Earthfilling from the excavations as backfilling to trenches compacted to 95% Mod. AASHTO density (LI)	m3	16
115	Extra over backfilling with G3 material obtained from commercial sources compacted to 98% Mod AASHTO density under bases (LI)	m3	10
116	Extra over backfilling with G5 material obtained from commercial sources compacted to 98% Mod AASHTO density under bases (LI)	m3	10
117	Surplus material from excavations to be spread and levelled where directed on site	m3	35
118	Compaction of ground surface under floors compacted to 95% Mod. ASSTO density	m2	34
119	Modified AASHTO Density tests on fillings	No	9
120	brand of weed killer applied to surfaces of earth under floors and to sides of excavations (LI)	m2	34
<u>Concrete (CPAP Work Group No.110)</u>			
<u>30Mpa/19mm Reinforced concrete cast against excavated surfaces</u>			
121	Slab (LI)	m3	5
Carried Forward			R
Bill No. 21 External Works			

	Brought Forward			R
122	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	2	
	<u>Reinforcement (CPAP Work Group 114)</u>			
123	Various diameter bars in mild steel reinforcement (LI)	t	1.00	
	<u>Fabric reinforcement (CPAP Work Group 114)</u>			
124	Type ref. 193 fabric reinforcement in concrete surface beds, slabs, etc. (LI)	m2	34	
	<u>Masonry (CPAP Work Group No. 116)</u>			
	<u>Brickwork of NFX bricks in class II mortar</u>			
	One brick walls in foundations (LI)	m2	18	
	<u>Brickwork of NFP bricks in class II mortar</u>			
125	One brick walls (LI)	m2	37	
126	Extra over brickwork for face brickwork in "Corobrick Firelight Satin FBX" or other equally approved face bricks pointed with flush joints (LI)	m2	37	
	<u>Slip joints between horizontal concrete and brickwork surfaces including cement mortar bedding</u>			
127	Two layers of 3mm thick masonite board not exceeding 300mm wide or high	m	37	
	<u>Waterproofing (CPAP Work Group No. 120)</u>			
128	'Pro-Struct 749' or other equally approved polysulphide joint sealant including backing cord, bond breaker, etc. to slip joints	m	37	
	<u>Plumbing (CPAP Work Group No. 148)</u>			
	<u>Polyethylene rainwater tanks, etc.</u>			
129	5000 litre "JoJo" tank with access lid with inlet hole and sieve and outlet union for 15mm tap and place in position on plinth and secure with twisted double strand 3mm galvanised wire. (LI)	No	8	
	Carried Forward			R
	Bill No. 21 External Works			

Brought Forward			R
<u>Taps, valves, etc.</u>			
130	KM2.200 Mastermatic metering bibtaps	No	8
<u>REINFORCED CONCRETE RETAINING WALLS</u>			
<u>Earthworks (CPAP Work Group No. 104)</u>			
<u>Excavation other than bulk</u>			
131	Trenches not exceeding 2m deep (LI)	m3	983
132	Extra over for excavations in intermediate material (LI)	m3	147
133	Extra over for excavations in hard material	m3	98
134	Back excavation of vertical sides of excavations in earth for working space including backfilling compacted to 98% Mod. AASHTO density exceeding 500mm and not exceeding 1500mm deep for placing and removing formwork to walls 300mm away from excavated face (LI)	m2	219
135	Risk of collapse of sides of trench and hole excavations not exceeding 1,5m deep	m2	819
136	Imported G7 material imported from commercial sources supplied by contractor, compacted to 98% Mod. AASHTO density under floors (LI)	m3	287
137	Extra over all excavations for loading, carting and dumping surplus excavated material off site to a dumping site to be found by the Contractor (no allowance made for increase in bulk)	m3	983
138	Modified AASHTO Density tests on fillings	No	164
<u>Concrete, Formwork and Reinforcement</u>			
<u>Concrete (CPAP Work Group No. 110)</u>			
139	10MPa/19mm Unreinforced concrete cast against excavated surfaces for blinding (LI)	m3	33
140	30MPa/19mm Reinforced concrete cast against excavated surfaces for strip footings (LI)	m3	262
Carried Forward			R
Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
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	Brought Forward			R
141	30MPa/19mm Reinforced concrete in walls (LI)	m3	273	
	<u>Concrete Sundries</u>			
142	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	324	
	<u>Expansion joints with bitumen impregnated soft board between vertical concrete joints</u>			
143	20mm Joints exceeding 300mm high (LI)	m2	182	
	<u>Formwork (CPAP Work Group No. 111)</u>			
144	Class FM2 ordinary finish formwork to sides of strip footings (LI)	m2	219	
145	Class FM1 smooth finish formwork to sides of walls exceeding 3500mm and not exceeding 5000mm high (LI)	m2	1 823	
	<u>Boxing in smooth formwork to form</u>			
146	25 x 25mm Chamfers along top and bottom edge (LI)	m	546	
	<u>Reinforcement (CPAP Work Group No. 114)</u>			
147	Various diameter bars in mild steel reinforcement (LI)	t	14.53	
148	Various diameter bars in high tensile steel reinforcement (LI)	t	33.90	
	<u>Waterproofing (CPAP Work Group No. 120)</u>			
	<u>One Layer "Derbigum" or other equally approved CG4 waterproofing membrane sealed to solvent based bitumen primed surface by means of torch fusion with minimum 100mm side laps and minimum 150mm end laps</u>			
149	On retaining walls	m2	911	
150	Extra over waterproofing to walls for one layer of 'interdek' or other equally approved approved sheeting with a minimum lap of 200mm to receive backfilling (Back filling else where measured)	m2	911	
	<u>APRONS</u>			
	Carried Forward			R
	Bill No. 21			
	External Works			

**Proposed New Orthotic and Prosthetics Centre
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Brought Forward			R
<u>Earthworks (CPAP Work Group No. 104)</u>			
151	Reduce levels in earth not exceeding 2m deep (LI)	m3	33
152	Extra over all excavations for loading, carting and dumping surplus excavated material off site to a dumping site to be found by the Contractor (no allowance made for increase in bulk)	m3	33
153	Backfilling with G5 material supplied and carted onto site by the Contractor, compacted to a density of at least 95% Mod. AASHTO maximum density under channelling (LI)	m3	32
154	Keeping excavations free of all water other than subterranean water		Item
155	Modified AASHTO Density tests on fillings	No	6
156	Anti-termite soil poison applied by a registered pest control company and guaranteed against termite infestation for ten years under floors etc including forming and poisoning shallow furrows against foundation walls etc., filling in furrows and ramming (LI)	m2	211
<u>Concrete, Formwork and Reinforcement</u>			
<u>Concrete (CPAP Work Group No. 110)</u>			
157	25MPa/19mm Reinforced concrete in panels cast against compacted earth (LI)	m3	33
158	Finishing to top surfaces of concrete with smooth wood float (Class FM2) (LI)	m2	218
159	Movement joint not exceeding 300mm high formed with one layer of 10mm 'Masonite Flexi joint Board' or other equally approved bitumen impregnated softboard filler board vertically between block and concrete surfaces (LI)	m	218
160	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	6
<u>Formwork (CPAP Work Group No. 111)</u>			
161	Class FM2 ordinary finish formwork to edges not exceeding 300mm high (LI)	m	218
Carried Forward			R
Bill No. 21 External Works			

Brought Forward			R
<u>Reinforcement (CPAP Work Group No. 114)</u>			
162	Type ref. 193 fabric reinforcement in surface beds (LI)	m2	218
<u>Waterproofing (CPAP Work Group No. 120)</u>			
163	Thioflex 600' or other equally approved two-part polysulphide flexible joint sealants, including backing cord, bond breaker, primer, etc., in horizontal joints 10 x 10mm at expansion joints.	m	218
<u>FENCING AND GATES</u>			
<u>Metalwork (CPAP Work Group No. 136)</u>			
<u>'Clearvu' or other equally approved galvanised steel security fencing:</u>			
164	Marine fusion bonded galvanized mesh panels with aperture of 76 x 12mm and widths not exceeding 3297mm wide and height of 1800mm high bolted to 2400mm high tapered locking posts embedded in 20Mpa/19mm concrete. (LI)	m	10
165	Marine fusion bonded galvanized mesh panels with aperture of 76 x 12mm and widths not exceeding 3297mm wide and height of 2100mm high bolted to 2700mm high tapered locking posts embedded in 20Mpa/19mm concrete. (LI)	m	292
<u>Extra over 'Clearvu' or other equally approved fence for:</u>			
166	Marine fusion bonded galvanized 'Shark tooth spike' fitted to fencing panels (Fencing panels elsewhere measured) (LI)	m	292
<u>Gates, etc.</u>			
167	Single gate size 1000 x 2100mm high with frame and mullions formed of 100 x 50 x 5mm hot dipped galvanised frame and filled in with marine fusion bond wire mesh complete with posts, keep, etc. (LI)	No	1
168	Single swing gate overall size 9000 x 2100mm high formed of two equal leaves with frame and mullions formed of 100 x 50 x 5mm hot dipped galvanised frame and filled in with marine fusion bond wire mesh complete with posts, keep, etc. (LI)	No	1
Carried Forward			R
Bill No. 21 External Works			

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Brought Forward			R
169	Double swing gate overall size 1800 x 2100mm high formed of two equal leaves with frame and mullions formed of 100 x 50 x 5mm hot dipped galvanised frame and filled in with marine fusion bond wire mesh complete with posts, keep, etc. (LI)	No	1
<u>GUARD HOUSE</u>			
<u>Earthworks (CPAP Work Group No. 104)</u>			
<u>Excavation in earth not exceeding 2m deep</u>			
170	Reduced levels under floors (LI)	m3	2
171	Ground beams (LI)	m3	3
<u>Extra over trench and hole excavations in earth for excavation in for:</u>			
172	Soft material (LI)	m3	1
173	Hard material	m3	1
<u>Extra over all excavations for carting away</u>			
174	Surplus material from excavations and/or stock piles on site, to a dumping site to be located by the contractor	m3	5
<u>Risk of collapse of excavations</u>			
175	Sides of trench and hole excavations not exceeding 1,5m deep	m2	20
<u>Keeping excavations free of water</u>			
176	Keeping excavations free of all water other than subterranean water	Item	
<u>Earth filling supplied by the contractor, compacted to 95% Mod. AASHTO density</u>			
177	Under floors of G5 material in accordance with SABS 1200 DM and compacted to 95% Mod. AASHTO density (LI)	m3	2
Carried Forward			R
Bill No. 21 External Works			

	Brought Forward			R
	<u>Compaction of surfaces</u>			
178	Compaction of ground surface under floors etc including grading, levelling and scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 98% Mod. AASHTO density	m2	14	
	<u>Prescribed density tests on filling</u>			
179	"Modified AASHTO Density" test	No	1	
	<u>Soil poisoning</u>			
	<u>Anti-termite soil poison applied by a registered Pest Control company and guaranteed against termite infestation for ten years</u>			
180	Under floors etc including forming and poisoning shallow furrows against foundation walls etc., filling in furrows and ramming (LI)	m2	14	
181	To bottoms and sides of trenches, etc. (LI)	m2	27	
	<u>Concrete, Formwork and Reinforcement</u>			
	<u>Concrete (CPAP Work Group No. 110)</u>			
	<u>Reinforced concrete cast against excavated surfaces</u>			
	<u>25Mpa/19mm concrete</u>			
182	Ground beams (LI)	m3	3	
183	Surface beds on waterproofing (LI)	m3	3	
184	Surface bed thickening (LI)	m3	0.3	
	<u>30MPa/19mm concrete</u>			
185	Slabs (LI)	m3	4	
	<u>Test Cubes</u>			
186	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	1	
	Carried Forward			R
	Bill No. 21			
	External Works			

Brought Forward			R
<u>Concrete Sundries</u>			
<u>Finishing top surfaces of concrete smooth with a wood float</u>			
187	Surface beds, slabs, etc. (LI)	m2	14
<u>Movement Joints</u>			
<u>Expansion joints with 12mm bitumen impregnated softboard between vertical concrete surfaces, including necessary formwork</u>			
188	10mm Joints exceeding 300mm high (LI)	m	21
<u>Saw cut joints</u>			
189	3 x 30mm Saw cut joints in top of concrete	m	9
<u>(CPAP Work Group No. 111)</u>			
<u>Formwork (Degree of Accuracy II)</u>			
<u>Rough formwork to sides</u>			
190	Edges, risers, ends and reveals not exceeding 300mm high or wide (LI)	m	2
<u>Smooth formwork to sides</u>			
191	Edges, risers, ends and reveals not exceeding 300mm high or wide (LI)	m	15
<u>Smooth formwork to soffits</u>			
192	Slabs, propped up not exceeding 3.5m high (LI)	m2	24
<u>(CPAP Work Group No. 114)</u>			
<u>Reinforcement (Provisonal)</u>			
193	Bars of various diameters (LI)	t	0.66
<u>Fabric reinforcement</u>			
194	Type ref. 193 fabric reinforcement in concrete surface beds, slabs, etc. (LI)	m2	14
Carried Forward			R
Bill No. 21 External Works			

Brought Forward			R
<u>Masonry (CPAP Work Group No. 116)</u>			
<u>Brickwork of NFX bricks (14Mpa nominal compression strength) in class II mortar</u>			
<u>Foundations</u>			
195	Half brickwall (LI)	m2	3
196	One brick walls (LI)	m2	15
<u>Superstructure</u>			
197	Half brick walls (LI)	m2	7
198	One brick walls (LI)	m2	38
<u>Brickwork sundries</u>			
<u>2.5mm Galvanised brickwork reinforcement</u>			
199	75mm Wide reinforcement built in horizontally (LI)	m	35
200	155mm Wide reinforcement built in horizontally (LI)	m	186
<u>Bagging of 1:3 cement and sand mixture</u>			
201	On brick walls, piers, etc. (LI)	m2	38
<u>Joint forming material in movement joints</u>			
202	12mm Bitumen impregnated fibre board built in vertically between brick skins (LI)	m	5
<u>Prestressed fabricated concrete lintels including necessary temporary supports</u>			
203	75 x 110mm Lintels in lengths not exceeding 3m (LI)	m	1
<u>Turning pieces to lintels, etc.</u>			
204	220mm Wide turning pieces (LI)	m	6
Carried Forward			R
Bill No. 21 External Works			

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	Brought Forward			R
	<u>'Everite' or other equally approved:</u>			
205	Fibre cement cill of approximate width of 120mm set and fixed in position with adhesive as per manufacturer's instruction, with and including all edge to be neatly sealed with silicon (LI)	m	6	
	<u>Face Brickwork</u>			
	<u>" Corobrick Firelight Satin FBS " or other equally approved face bricks pointed with tinted flush horizontal and vertical joints</u>			
206	Extra over brickwork for face brickwork in foundations (Provisional) (LI)	m2	3	
207	Extra over brickwork for face brickwork (LI)	m2	38	
208	Extra over brickwork for brick-on-edge header course bands one course high set at slope (LI)	m	6	
	<u>Waterproofing (CPAP Work Group No. 120)</u>			
	<u>One layer of 375 micron "Consol Plastics Brikgrip DPC" embossed damp proof course</u>			
209	In walls (LI)	m2	4	
210	Under cills (LI)	m2	1	
	<u>One layer of 375 micron "Consol Plastics" waterproof sheeting sealed at laps</u>			
211	Under surface beds (LI)	m2	14	
	<u>Two coats emulsion bitumen emulsion waterproof coating</u>			
212	On bagged brick walls (LI)	m2	38	
	<u>One Layer "Derbigum" or other approved SP4 waterproofing membrane sealed to solvent based bitumen primed surface by means of torch fusion with minimum 100mm side laps and minimum 150mm end laps</u>			
213	On slabs to falls	m2	24	
	Carried Forward			R
	Bill No. 21			
	External Works			

Brought Forward			R
	<u>"Sika Blackseal Silvercoat ZL4082" or other equally approved waterproofing coating, applied as per manufacturer's instructions</u>		
214	On slabs	m2	24
	<u>Joint sealants, etc.</u>		
	<u>"Sika" or other equally approved two-part grey polysulphide sealing compound including backing cord, bond breaker , primer, etc</u>		
215	6 x 10mm In expansion joints in saw cut joints, etc.	m	9
216	12 x 12mm In vertical expansion joints including raking out expansion joint filler as necessary	m	5
	<u>Carpentry and Joinery (CPAP Work Group No. 126)</u>		
	<u>Framed Doors, etc.</u>		
	<u>Wrought meranti doors hung to steel frames</u>		
217	44mm Ledged, braced and batten door size 813 x 2032mm high with 44 x 110mm styles and top rail, 24 x 144mm middle ledge, 44 x 220mm bottom legde and 25 x 110mm braces hung to steel frames. (D31) (steel frames elsewhere measured)	No	2
218	44mm Ledged, solid core doors with veneer suitable for painting on both sides and hardwood edge strips all round hung to steel frames. (D12) (steel frames elsewhere measured)	No	1
	<u>Worktop, counters, etc.</u>		
	<u>1.2mm Formica decorative plastic laminate on 32mm waterproof chipboard</u>		
219	600mm wide worktop, post formed on leading edge, and with one edge fixed to 38 x 38mm bearers plugged to wall and supported by metal brackets (metal brackets elsewhere measured)	m	5
	<u>Ceilings (CPAP Work Group No. 129)</u>		
Carried Forward			R
Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
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	Brought Forward			R
	<u>Gypsum plasterboard cornices</u>			
220	75mm Coved cornices mitred at corners with splayed heading joints and bed with Rhinobed gypsum plaster and spiked to branders	m	15	
	<u>Ironmongery (CPAP Work Group No. 132)</u>			
	<u>Locksets, etc.</u>			
221	'Union' or other equally approved 3 lever lockset	No	2	
222	SS2016SS Bathroom deadbolt	No	1	
223	SS5004-73SS Escutcheon on rose bathroom indicator	Pairs	1	
	<u>Sundries</u>			
224	'9002AS 1 EA' Aluminium door stop AS or other equally approved	No	3	
	<u>Metalwork (CPAP Work Group No. 136)</u>			
	<u>Natural anodized aluminium windows, complete with subframes, ironmongery, glass, sealing, etc. and fixing to brickwork or concrete.</u>			
225	Window size 600 x 900mm high overall (W 3). Tenderers are referred to Architect's drawings annexured to these Bills of Quantities Drawing number 070638 - DOH - A - 8100 -0	No	1	
226	Window size 1200 x 925mm high overall (W 11). Tenderers are referred to Architect's drawings annexured to these Bills of Quantities Drawing number 070638 - DOH - A - 8100 -0	No	2	
227	Window size 2762 x 925mm high overall (W 13). Tenderers are referred to Architect's drawings annexured to these Bills of Quantities Drawing number 070638 - DOH - A - 8100 -0	No	1	
	<u>Galvanised pressed steel door frames</u>			
	<u>1,6mm Double rebated frames suitable for half brick wall fitted with three 100mm hinges</u>			
228	Frame for door 813 x 2032mm high.	No	3	
	Carried Forward			R
	Bill No. 21 External Works			

Brought Forward			R
<u>Hot dipped galvanised sundry steelwork</u>			
<u>Brackets, etc. to shelvings:</u>			
229	Wall support to worktops formed with 50 x 50 x 5mm L-section framing to horizontal rail 600mm wide, vertical post 530mm high and raking stay 300mm long, all mitred and welded together with closed ends to horizontal rail and vertical post, the vertical post twice drilled for and bolted with M10 expansion bolts.	No	5
<u>Plastering (CPAP Work Group No. 142)</u>			
<u>Screeds</u>			
<u>Screeds wood floated, on concrete</u>			
230	30mm Thick on floors and landings (LI)	m2	14
231	75mm Thick on floors laid to falls and currents (LI)	m2	24
<u>Internal plaster</u>			
<u>One coat cement plaster steel floated on brickwork</u>			
232	On walls (LI)	m2	52
233	On narrow widths (LI)	m2	5
<u>Corner protectors, dividing strips, etc.</u>			
<u>Dividing strips</u>			
234	3 x 40mm Flat section brass dividing strips between differing floor finishes	m	2
<u>Tiling (CPAP Work Group No. 144)</u>			
<u>Wall tiling</u>			
<u>200 x 200 x 5mm White matt "Johnson" or other approved ceramic tiles fixed with an approved adhesive to plastered walls (plaster elsewhere measured) and flush pointed with waterproofing jointing compound to match tile colour</u>			
235	On walls (LI)	m2	22
Carried Forward			R
Bill No. 21 External Works			

Proposed New Orthotic and Prosthetics Centre At Ngwelezane Hoospital

Brought Forward			R
236	On narrow widths (LI)	m2	1
<u>Floor tiles</u> <u>300 x 300 tiles "Sondela" or other approved "Code ST967" fixed with adhesive mixture for porcelain tiles to screed (screed elsewhere) and flush pointed with tinted grout - Contact no: 031 569 3377</u>			
237	On floors (LI)	m2	14
238	100mm High skirting (LI)	m	18
<u>Sundries</u> <u>"Genesis" or other approved aluminium corner protectors, stair nosings, expansion joint strips, etc.</u>			
239	10mm Tile edge trim "Code ESA 100" and seal behind tiles at horizontal, vertical or sloping external corners	m	8
<u>Plumbing an Drainage (CPAP Work Group No. 148)</u> <u>Sanitary Fittings</u> Supply, fix, clean, wash and leave in a satisfactory condition the following items of sanitaryware: <u>'Vaal' or other approved</u>			
240	"Vaal springboard Code 0112" ceramic fireclay rectangular basin fitted with one "Cobra Lidimo pillar Code LO-214-15" square type tap with either hot or cold indicator flags to suit, 32mm chromium plated chain and stay as per "Cobra 301" and fixed to plastered or tiled wall on semi-concealed cast iron brackets (Code 8118Z1) screwed to including plugs in wall and finished all round with silicone sealant.	No	1
241	"Vaal Parktown" vitreous 90 degree outlet pan (Code 431500) closed rim back to wall unit with top inlet with an exposed flush valve	No	1
<u>'Franke' or other approved</u>			
Carried Forward			R
Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoasphital**

	Brought Forward			R
	<u>Stainless steel</u>			
242	"Franke Quinline QLX 611 (Product Code 820 000)" or other approved single end bowl insert sink and drainer supplied with 90mm basket strainer waste fitting formed of AISI grade 304 (18/10) stainless steel size 900 x 500mm wide overall complete with "Franke Spazi F/ 1 waste trap and pipe to suit waste outlet and "code 311" chromium plated sink waste slotted with 86 mm diameter flange and 93mm long shank and chain with rubber plug and fixed on counter (elsewhere measured) and seal at junction with brickwork with clear silicone sealer (S9)	No	1	
	<u>Sanitary plumbing</u>			
	<u>Unplasticized polyvinyl chloride (UPVC) pipes</u>			
243	50mm Pipes (LI)	m	9	
244	50mm Pipes in chase in walls and floors (LI)	m	3	
245	110mm Pipes (LI)	m	4	
246	110mm Pipes in chase in walls and floors (LI)	m	4	
247	110mm Pipes laid in trenches (No excavations) (LI)	m	4	
248	110mm Pipes laid in trenches including excavations, risk of collapse, backfilling, etc. (LI)	m	39	
	<u>Extra over uPVC pipes for fittings</u>			
249	50mm BSP adaptor (LI)	No	5	
250	50mm Bend (LI)	No	16	
251	110mm Bend (LI)	No	4	
252	50mm Access bend (LI)	No	7	
253	110mm Access bend (LI)	No	2	
254	50mm Junction (LI)	No	10	
255	110mm Junction (LI)	No	5	
256	110mm Reducing junction (LI)	No	1	
	Carried Forward			R
	Bill No. 21 External Works			

Proposed New Orthotic and Prosthetics Centre At Ngwelezane Hoospital

Brought Forward				R
257	110mm Double junction (LI)	No	3	
258	110mm Reducing double junction (LI)	No	2	
259	50mm Access junction (LI)	No	2	
260	110mm Access junction (LI)	No	1	
261	110mm Reducer (LI)	No	2	
262	110mm "GI Two-way" vent valve (LI)	No	1	
263	110mm Straight or bent pan connector	No	1	
264	160mm "ABC" cast iron rodding eye cover and frame and joint up UPVC pipe with and including necessary adaptor (LI)	No	2	
<u>UPVC gulleys</u>				
265	110mm Diameter gulley trap jointed to drain, complete with hopper head and grid and the whole set on and encased in unreinforced concrete Class A, including necessary excavation and formwork.	No	1	
266	Extra over 110mm diameter gulley trap for 380 x 380 x 170mm precast gulley surround placed on and including 75mm thick Class C concrete base and fitted with 187mm diameter uPVC grating.	No	1	
<u>"Flexitraps"</u>				
267	40mm Butyl rubber for single bowl sink jointed to waste outlet fitting including clamps	No	1	
<u>"Cobra" or other approved brass traps, waste unions, etc.</u>				
268	32mm Chromium plated bottle trap as "Cobra 345/50"	No	1	
<u>Water supplies</u>				
Carried Forward				R
Bill No. 21 External Works				

Brought Forward				R
<u>Copper pipes:</u>				
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				
<u>Class 2 copper pipes</u>				
269	15mm Pipes (LI)	m	24	
270	15mm Pipes in chase in walls (LI)	m	12	
271	22mm Pipes (LI)	m	8	
272	22mm Pipes in chase in walls (LI)	m	4	
273	28mm Pipes (LI)	m	2	
<u>Extra over class 2 copper pipes for capillary fittings</u>				
274	15mm Fittings (LI)	No	48	
275	22mm Fittings (LI)	No	32	
276	28mm Fittings (LI)	No	4	
277	80mm Reducer (LI)	No	1	
<u>Extra over class 2 copper pipes for brass compression fittings:</u>				
278	15mm Fittings (LI)	No	24	
279	22mm Fittings (LI)	No	14	
280	28mm Fittings (LI)	No	8	
281	42mm Reducing tee (LI)	No	1	
282	80mm Reducer (LI)	No	1	
Carried Forward				R
Bill No. 21 External Works				

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoasphital**

Brought Forward			R
<u>Taps, valves, etc.</u>			
Taps, valves, etc. jointed to copper pipes are to include brass connectors, adaptors etc. Installation and fixings to be as per manufacturers specifications and SANS 1808-9 compliant.			
283	15mm 832/350FCP Ball type angle valve with 350mm long flexible hose connector	No 3	
284	"Flushmaster FJ6.000" exposed type top entry flush valve in accordance with SANS 1240 complete with standard chromium plated straight wall flange, flush pipe with flush pipe connector and fix to vertical inlet of WC pan	No 1	
285	Sink pillar tap with aerated swan neck swivel outlet 1/2" BSP male inlet as Cobra CS-215/044CP but with lidimo handle	No 1	
286	Square type Cobra Lidimo pillar tap with hot & cold indices code: LO-214-15	No 1	
<u>Fire Appliances etc.</u>			
287	4.5kg D.C.P stored pressure (70% powder) fire extinguisher securely fixed to wall on backing board in strict accordance with all requirements of authorities	No 1	
<u>Testing</u>			
288	Testing water pipe system	Item	
<u>Paintwork (CPAP Work Group No. 152)</u>			
<u>On internal floated plaster surfaces</u>			
<u>"Plascon" or other equally approved alkali resistant primer and two coats "Wall and All" emulsion paint for interior use</u>			
289	On walls (LI)	m2 52	
290	On narrow widths (LI)	m2 5	
<u>On plasterboard surfaces</u>			
Carried Forward			R
Bill No. 21 External Works			

	Brought Forward			R	
	<u>"Plascon" or other equally approved alkali resistant primer and two coats "Wall and All" emulsion paint for interior use</u>				
291	75mm Coved cornices (LI)	m	15		
	<u>CARPORTS</u>				
	<u>Earthworks (CPAP Work Group No. 104)</u>				
	<u>Excavation in earth not exceeding 2m deep</u>				
292	Holes (LI)	m3	58		
	<u>Extra over trench and hole excavations in earth for excavation in for:</u>				
293	Soft material (LI)	m3	9		
294	Hard material	m3	6		
	<u>Extra over all excavations for carting away</u>				
295	Surplus material from excavations and/or stock piles on site, to a dumping site to be located by the contractor	m3	58		
	<u>Risk of collapse of excavations</u>				
296	Sides of trench and hole excavations not exceeding 1,5m deep	m2	144		
	<u>Keeping excavations free of water</u>				
297	Keeping excavations free of all water other than subterranean water		Item		
	<u>Earth filling supplied by the contractor, compacted to 95% Mod. AASHTO density</u>				
298	Under bases of G5 material in accordance with SABS 1200 DM and compacted to 95% Mod. AASHTO density (LI)	m3	6		
	Carried Forward			R	
	Bill No. 21 External Works				

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoasptial**

Brought Forward			R
<u>Compaction of surfaces</u>			
299	Compaction of ground surface under floors etc including grading, levelling and scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 98% Mod. AASHTO density	m2	38
<u>Prescribed density tests on filling</u>			
300	"Modified AASHTO Density" test	No	10
<u>Soil poisoning</u>			
<u>Anti-termite soil poison applied by a registered Pest Control company and guaranteed against termite infestation for ten years</u>			
301	Under floors etc including forming and poisoning shallow furrows against foundation walls etc., filling in furrows and ramming (LI)	m2	38
<u>Concrete, Formwork and Reinforcement</u>			
<u>Concrete (CPAP Work Group No. 110)</u>			
<u>10MPa/19mm concrete</u>			
302	Surface blinding under footings and bases (LI)	m3	2
<u>Reinforced concrete cast against excavated surfaces</u>			
<u>25Mpa/19mm concrete</u>			
303	Bases (LI)	m3	19
304	Stub columns (LI)	m3	7
<u>Test Cubes</u>			
305	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	4
<u>Concrete Sundries</u>			
Carried Forward			R
Bill No. 21 External Works			

Brought Forward			R
	<u>Finishing top surfaces of concrete smooth with a wood float</u>		
306	Bases (LI)	m2	38
	<u>40Mpa Non-shrink grout:</u>		
307	Bedding approximately 25mm thick under base plate including chamfered edges all round.	m3	1
	<u>Formwork (CPAP Work Group No. 111)</u>		
	<u>Smooth formwork to sides</u>		
308	Stub columns propped up not exceeding 1.5m high (LI)	m2	39
	<u>Reinforcement (Provisonal)</u>		
	<u>(CPAP Work Group No. 114)</u>		
	<u>Reinforcement to structural concrete work</u>		
309	Bars of various diameters (LI)	t	2.90
	<u>Roof Covering (CPAP Work Group No. 124)</u>		
	<u>"Global Kliptite" or other equally approved double interlocking concealed fix, 0.8mm spelter galvanised sheet steel and accessories, fixed to timber purlins</u>		
310	Roof covering with pitches not exceeding 25 degrees	m2	571
	<u>Structural Steel (CPAP Work Group No. 134)</u>		
	<u>Hot Dipped Galvanised Columns</u>		
311	203 x 133 x 25kg/m UB columns with and including base plate formed of 550 x 400 x 20mm thick plate welded to bottom end of post and chemically fixed to concrete surface and other end with welded closure piece to accommodate steel rafter (Steel rafter elsewhere measured)	t	2.63
Carried Forward			R
Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoasptial**

	Brought Forward			R
	<u>Hot Dipped Galvanised Beams</u>			
312	203 x 133 x 25kg/m UB Rafters with one end fixed to steel columns (Steel Columns elsewhere measured), with and including all necessary welding, bolts, washers, etc	t	5.96	
	<u>Hot Dipped Galvanised Purlins</u>			
313	150 x 75 x 20 x 2.5mm Cold rolled lipped channels	t	1.60	
314	89 x 3.5 thick CHS tie	t	0.60	
	<u>Sundry Steelwork</u>			
315	Cleats, plates, gussets, connectors, etc	t	2.00	
	<u>Chemical anchors, etc</u>			
316	"Fisher" or other approved M20 (8.8) galvanised HD chemical anchors studs (with embedment length of minimum 280mm into steel (steel elsewhere measured) with and including "Fisher V360" or other approved chemical mortar	No	48	
	<u>Holding down bolts, etc.</u>			
317	Set out and embed set of four holding down bolts in top of concrete in exact position comprises of 400mm long holding down bolt, 12mm diameter grade 4.8 bolts with 100mm threaded projection. 60 x 60 x 10 Anchors drilled and welded to bolts set in 10mm from bottom. All in accordance with the Engineers details.	No	60	
	<u>RAMPS</u>			
	<u>Earthworks (CPAP Work Group No. 104)</u>			
	<u>Excavation other than bulk</u>			
318	Excavate in earth not exceeding 2m deep for strip footings (LI)	m3	54	
319	Extra over for excavations in soft material (LI)	m3	8	
320	Extra over for excavations in hard material	m3	5	
	Carried Forward			R
	Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoasptial**

Brought Forward			R
321	Risk of collapse of sides of trench and hole excavations not exceeding 1,5m deep	m2	155
322	Imported G5 material imported from commercial sources supplied by contractor, compacted to 98% Mod. AASHTO density to strip footing (LI)	m3	5
323	Imported G5 material imported from commercial sources supplied by contractor, compacted to 98% Mod. AASHTO density to floors (LI)	m3	194
324	Extra over all excavations for loading, carting and dumping surplus excavated material off site to a dumping site to be found by the Contractor (no allowance made for increase in bulk)	m3	54
325	Allow for the execution of all the prescribed density tests on filling, etc., as pointed out by the Engineer on site to the approval of the Principal Agent.	Item	
<u>Concrete, Formwork and Reinforcement</u>			
<u>Concrete (CPAP Work Group No. 110)</u>			
326	10MPa/19mm Unreinforced concrete cast against excavated surfaces for blinding (LI)	m3	2
327	25MPa/19mm Reinforced concrete cast against excavated surfaces for trenches (LI)	m3	16
328	30MPa/19mm Reinforced concrete in ramps (LI)	m3	25
<u>Concrete Sundries</u>			
329	Allow for necessary concrete test cubes size 150 x 150 x 150mm from batches of concrete required for this building as specified, made, stored, cured and tested in accordance with SABS Methods 861 and 863, including use of approved cube moulds, transporting to an approved laboratory for testing, paying all charges and submitting reports to the Engineer.	Item	
<u>Expansion joints with 12mm bitumen impregnated softboard between vertical concrete surfaces, including necessary formwork</u>			
330	10mm Joints not exceeding 300mm high (LI)	m	46
Carried Forward			R
Bill No. 21 External Works			

Proposed New Orthotic and Prosthetics Centre At Ngwelezane Hoospital

[illegible]

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoasphital**

Brought Forward			R
<u>Stainless steel (Grade 304) balustrading, handrails, etc</u>			
339	Horizontal balustrades 1000mm high formed of 50mm diameter continuous top and centre rails supported on 43mm diameter stanchions at 1000mm centres, each stanchion fitted with 150 x 75mm base plate twice drilled for and bolted to concrete with 16mm anchor bolts.	m	52
340	50mm diameter handrail fixed to walls at 1m centres with brackets made of 12mm diameter bar 150mm girth and once bent with one end welded to handrail and other end fitted with 4mm thick x 50mm diameter clamp plate welded on, twice holed and bolted to concrete	m	30
341	Extra over balustrades for ends	No	3
342	Extra over balustrades for 90 degree bend	No	3
<u>ROADWORKS (CPAP Work Group No. 154)</u>			
<u>Excavation other than bulk</u>			
343	Trim and level off surface of ground (excavated or filled under this contract) to receive sub-base to roads, parking areas, etc., including excavating or filling, ripping and scarifying as necessary and compacting the whole area for a depth of 150mm to at least 95% Mod. AASHTO density.	m2	2 900
344	150mm Thick layer of G2 sub-base course under roads, parking areas, etc., with selected and approved natural G2 quality material, supplied and carted onto site by the contractor, compacted in layers of 150mm thickness to at least 102% Mod. AASHTO density.	m3	435
345	150mm Thick layer of G5 sub-base course under roads, parking areas, etc., with selected and natural G5 quality material, supplied and carted onto site by the contractor, compacted in layers of 150mm thickness to at least 95% Mod. AASHTO density.	m3	435
346	150mm Thick layer of G7 sub-base course under roads, parking areas, etc., with selected and natural G7 quality material, supplied and carted onto site by the contractor, compacted in layers of 150mm thickness to at least 95% Mod. AASHTO density.	m3	435
Carried Forward			R
Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoospital**

Brought Forward			R
347	Keeping excavations free of all water other than subterranean water	Item	
348	brand of weed killer applied by a registered pest control company under roads, parking and paving.	m2	2 900
349	Allow for the execution of all the prescribed density tests on filling, etc., as pointed out by the Engineer on site to the approval of the Principal Agent.	Item	
<u>Tarmacdam</u>			
<u>Bituminous premix road surfacing</u>			
350	Prime and lay 40mm thick 40/50 pen. Bitumen 9.5mm Stone, laid compacted, to falls	m2	2 900
<u>Precast concrete (CPAP work group no. 112)</u>			
351	Kerb (SABS 927 Fig 6) 125 x 230mm high with minimum 150 x 150 x 300mm unreinforced concrete bedding and haunching, mortar jointing to joints, including excavation, backfilling etc	m	379
352	Ditto, but circular on plan not exceeding 4m radius	m	118
<u>Paintwork (CPAP Work Group No. 152)</u>			
<u>Two coats 'Plascon' or other equally approved road marking paint including setting out, etc. in accordance with the Provincial Road Department specification and standards in</u>			
353	100mm Wide solid lines to parking demarcation bays, etc.	m	185
354	1,0m Long directional arrows	No	6
355	1,3m Long letters to 'STOP' sign, etc.	No	2
356	Disabled parking bay sign approximately 1,2m high	No	2
<u>LANDSCAPING (CPAP Work Group No. 154)</u>			
Carried Forward			R
Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoasptial**

Brought Forward			R
<u>Excavation in all type of material not exceeding 2m deep below natural, reduced or made up ground level</u>			
357	Excavate for and form hole 500 x 500 x 500mm deep for trees, and fill with topsoil mixed with compost and fertilizer. (LI)	No	20
<u>Topsoil obtained from stockpiles on site, including spreading and levelling</u>			
358	Topsoil making up shortages in dressing ground and planters for an average thickness of 150mm	m3	75
<u>Grassing, Trees, etc</u>			
<u>Supply and plant the following grass</u>			
359	Grass planting to level areas with Cynadon Dactylon continuous root planting described including all necessary fertiliser, weed killer, watering and rolling, mowing, etc. (LI)	m2	500
<u>Supply and plant the following plants</u>			
360	Lampranthus at the rate of five per square metre (LI)	m2	200
361	Carex Evergold at the rate of five per square metre (LI)	m2	100
362	Chondropetalum at the rate of three per square metre (LI)	m2	100
<u>Supply and plant the following shrubs and trees of the minimum height stated (holes elsewhere measured)</u>			
363	Heteropyxis Natalensis 2000mm high, in 60 litre bag (LI)	No	10
364	Podocarpus Henkelii 2000mm high, in 60 litre bag (LI)	No	5
<u>Maintenance</u>			
365	Maintenance of grassed areas for a period of 12 months (total area approximately 500m ²) including regularly cutting, weeding and irrigating as necessary (LI)	Item	
Carried to Summary			R
Bill No. 21 External Works			

**Proposed New Orthotic and Prosthetics Centre
At Ngwelezane Hoasptal**

<u>FINAL SUMMARY</u>		Page No	Amount	
Bill No				
1	Preliminaries and General	20		
2	Earthworks	24		
3	Piling	29		
4	Concrete, Formwork & Reinforcement	36		
5	Masonry	40		
6	Waterproofing	42		
7	Roof Covering	46		
8	Carpentry and Joinery	54		
9	Ceilings, Partitions & Access Flooring	58		
10	Floor Coverings	60		
11	Ironmongery	67		
12	Structural Steel	72		
13	Metalwork	83		
14	Plastering	87		
15	Tiling	89		
16	Plumbing and Drainage	103		
17	Electrical Work	126		
18	Mechanical Work	145		
19	Glazing	146		
20	Paintwork	149		
21	External Works	191		
	Sub-Total		R	
	Value Added Tax (15%)		R	
	Carried to Form of Tender (Refer to T2.22)		R	



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

PART C3. SCOPE OF WORKS

C3.1 SCOPE OF WORKS
GCC FOR CONSTRUCTION WORKS (Edition 2 of 2010)

Scope of Works complied in accordance with SANS 10403 where reference is made to this part of SANS 1921-1:2004

Project title:		Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area		
Tender no:		ZNTU04138W	Project Code: 070638	
1	<u>SECTION 1</u>			
	<u>EXTENT OF THE WORKS</u>			
	1.1	EMPLOYERS OBJECTIVES To expand capacity for Medical Orthotics and Prosthetics (MOP's) for future graduate practitioners. To reduce travelling burden and costs across the province for both patients and the Department due to lack of facilities in more central areas. To improve patient access and reduce waiting times for assessment and treatment. To reduce the reliance on Air Mey Services (Emergency Response Helicopter).		
	1.2	OVERVIEW OF THE WORKS The contract comprises the construction of new Orthotics and Prosthetics Centre with the following spaces: Patient assessment areas, office areas, workshop areas, generator room, guard room parking area and associated Electrical, mechanical civil/ structural works		
	1.3	EXTENT OF THE WORKS The contract comprises the construction of new Orthotics and Prosthetics Centre with the following works breakdown:		
	1.4	LOCATION OF THE WORKS The site is situated within the premises of the Ngwelezane Hospital along Thandisiwe Road on ERF A1241. GPS Co-ordinates: Latitude: 29°51'3.70"S / Longitude: -28.7795563 in Ngwelezane Township, Empangeni, Kwa-Zulu Natal.		
	1.5	TEMPORARY WORKS All temporary work to comply with the Occupational Health and safety Act (Act 85 of 1993). All temporary works shall be designed and costed for by the Contractor.		
	2	<u>ENGINEERING</u>		
		2.1	EMPLOYER'S DESIGN Not applicable	
		2.2	DESIGN BRIEF Not applicable	
2.3		DRAWINGS See list of drawings/Annexure's attached to this document.		

2.4	<p>DESIGN PROCEDURES</p> <p>Not applicable</p>
3	<p><u>PROCUREMENT</u></p>
3.1	<p>PREFERENTIAL PROCUREMENT PROCEDURES</p> <p>This tender will be subject to the implementation of the Preferential Procurement Regulations, 2022, pertaining to the Preferential Procurement Policy Framework Act, Act Number 5 of 2000 and the relevant Supply Chain Management Legislation and the KwaZulu-Natal Supply Chain Management Policy Framework published by the KwaZulu-Natal Provincial Treasury. Tenderers are referred to www.kzntreasury.gov.za for access to the relevant documents.</p> <p>Tenderers are advised to familiarize themselves with the contents of the KwaZulu-Natal Supply Chain Management Policy Framework regarding Preference Point Systems, evaluation of tenders appeals and other matters.</p>
3.2	<p>RESOURCE STANDARD PERTAINING TO TARGETED PROCUREMENT</p> <p>NOTE : This project will be adjudicated as exceeding R 50,000 000,00</p>
3.3	<p>PREFERRED SUBCONTRACTORS/SUPPLIERS</p> <p>Not applicable</p>
3.4	<p>SUBCONTRACTING PROCEDURES</p> <p>Not applicable</p>
4	<p><u>CONSTRUCTION</u></p>
4.1	<p>APPLICABLE SANS 2001 STANDARDS FOR CONSTRUCTION WORKS</p> <p>The Contractor is referred to the "Model Preambles to Trades - 2008", any "Supplementary Preambles", the Electrical Specifications and Mechanical Specification for full descriptions of materials and methods referred to in these Bills of Quantities/Lump Sum documents, insofar as they apply. The Contractor is advised to study the "Standard Preambles to all Trades", any "Supplementary Preambles", the Electrical Specifications and Mechanical Specification, before pricing Bills of Quantities/Lump Sum documents.</p> <p>Where the description in the Bills of Quantities/Lump Sum documents differ from those in the Standard Electrical Specifications, the descriptions in the Bills of Quantities/Lump Sum documents are to apply. No claim whatsoever will be allowed in respect of errors in pricing due to brevity of description of items in the Bills of Quantities/Lump Sum documents which are fully described when read in conjunction with the relevant Preambles and/or Specifications. Suppliers of materials and the like, whose quality systems apply with one or more of the SABS/SANS ISO 9000 Series should be used whenever possible in the absence of a particular SABS/SANS Specification Standard Mark.</p> <p>Wherever the words "shall be deemed to be included in the description", "shall be stated" or other words having the same effect, appear in the Standard System, it shall be deemed that all descriptions in these Bills of Quantities/Lump Sum documents incorporated such inclusions and statements whether specifically stated or not.</p> <p>The Contractor is hereby informed that where SABS/SANS Specifications are referred to in these Bills of Quantities/Lump Sums documents and Specifications thereto, then ONLY the Specification of Work Clauses will apply. The method of measurement and payment clauses will NOT apply to this Contract.</p> <p>The Contractor is hereby informed that risk of collapse and keeping excavations free from water (excluding subterranean water) generally are deemed to be included in the descriptions unless accommodated in the system of measurement. Please refer to the Geotechnical Investigation report when included at the end of these tender documents.</p> <p>Whenever reference is made to "Sub-Contractor", "Nominated Sub-Contractor" or the like in the specifications included or referred to in these Bills of Quantities/Lump Sums documents, it shall be deemed to mean "Contractor" as defined.</p>

4.2	<p>APPLICABLE NATIONAL AND INTERNATIONAL STANDARDS</p> <p>See above 4.1</p>												
4.3	<p>PARTICULAR / GENERIC SPECIFICATIONS</p> <p>The Contractor is referred to the following documents whether attached to this document or not:</p> <table border="0"> <thead> <tr> <th><u>SPECIFICATION</u></th><th><u>PAGES</u></th></tr> </thead> <tbody> <tr> <td>Specification for HIV/AIDS Awareness (CIDB)</td><td>HIV1 TO HIV3</td></tr> <tr> <td>Specific Construction, Safety, Health and Environmental Plan</td><td>1 to 57</td></tr> <tr> <td>Standard Preambles for all Trades (Rev 3) - DOH 2009</td><td>1 to 95</td></tr> <tr> <td>General Electrical Specification</td><td>E/1 to E/21</td></tr> <tr> <td>Lightning Protection Installation</td><td>LP/1 to LP/6</td></tr> </tbody> </table>	<u>SPECIFICATION</u>	<u>PAGES</u>	Specification for HIV/AIDS Awareness (CIDB)	HIV1 TO HIV3	Specific Construction, Safety, Health and Environmental Plan	1 to 57	Standard Preambles for all Trades (Rev 3) - DOH 2009	1 to 95	General Electrical Specification	E/1 to E/21	Lightning Protection Installation	LP/1 to LP/6
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General Electrical Specification	E/1 to E/21												
Lightning Protection Installation	LP/1 to LP/6												
4.4	<p>CERTIFICATION BY RECOGNIZED BODIES</p> <p>Only contractors registered with the Electrical Contracting Board of South Africa in accordance with the Regulations of the Occupational Health and Safety Act will be accepted and permitted to do work under this contract.</p>												
4.5	<p>AGRÉMENT CERTIFICATES</p> <p>Not applicable</p>												
4.6	<p>PLANT AND MATERIAL PROVIDED BY THE EMPLOYER</p> <p>Not applicable</p>												
4.7	<p>SERVICES AND FACILITIES PROVIDED BY THE EMPLOYER</p> <p>Not applicable</p>												
4.8	<p>OTHER SERVICES AND FACILITIES</p> <p>The Contractor shall provide any artificial lighting which may be necessary or required for the proper execution of the works, and provide electric power and water required by all Sub-Contractors, Nominated Sub-Contractors and Sub-Contractors appointed directly by the Administration.</p> <p>The Contractor shall give all notices and pay all fees in connection with temporary electrical and water connections and shall connect temporary Electrical and Water meters for and pay for all current and water consumed.</p> <p>The Contractor is advised that the permanent light fittings and water points of any kind installed in the Works are not to be used to provide temporary lighting and supplement water requirements for construction purposes.</p>												
5	<p><u>MANAGEMENT</u></p> <p>5.1 APPLICABLE SANS 1921 STANDARDS</p> <p>Tenderers are referred to SECTION 2 : SPECIFICATION DATA ASSOCIATED WITH SANS 1921-1:2004 IN THIS DOCUMENT</p>												

5.2	RECORDING OF WEATHER The Contractor shall keep record of abnormal climatic conditions to facilitate the adjudication of claims for extension of the contract period.																																																																	
	<p>The Contractor shall allow in his programme for the following number of days for rain days (rain > 10mm per day) as per the table below:</p> <table><tr><th colspan="3">CURRENT YEAR</th><th>YEAR + 1</th><th>YEAR + 2</th></tr><tr><td>January</td><td>w/days</td><td></td><td>3</td><td>3</td></tr><tr><td>February</td><td>w/days</td><td></td><td>3</td><td>3</td></tr><tr><td>March</td><td>w/days</td><td></td><td>3</td><td>3</td></tr><tr><td>April</td><td>w/days</td><td></td><td>3</td><td>3</td></tr><tr><td>May</td><td>w/days</td><td></td><td>3</td><td>3</td></tr><tr><td>June</td><td>w/days</td><td></td><td>3</td><td>3</td></tr><tr><td>July</td><td>w/days</td><td></td><td>3</td><td>3</td></tr><tr><td>August</td><td>w/days</td><td></td><td>3</td><td>3</td></tr><tr><td>September</td><td>w/days</td><td>3</td><td>3</td><td></td></tr><tr><td>October</td><td>w/days</td><td>3</td><td>3</td><td></td></tr><tr><td>November</td><td>w/days</td><td>3</td><td>3</td><td></td></tr><tr><td>December</td><td>w/days</td><td>3</td><td>3</td><td></td></tr></table>	CURRENT YEAR			YEAR + 1	YEAR + 2	January	w/days		3	3	February	w/days		3	3	March	w/days		3	3	April	w/days		3	3	May	w/days		3	3	June	w/days		3	3	July	w/days		3	3	August	w/days		3	3	September	w/days	3	3		October	w/days	3	3		November	w/days	3	3		December	w/days	3	3	
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5.3	MANAGEMENT MEETINGS In order to facilitate the smooth functioning of the Works and to ensure the closest co-operation between all the parties concerned, the Employer will call meetings every two weeks to be held on the site, at which a senior member of the Contracting firm and the General Foreman of the Works will always be required to be present. In addition to the above, other persons will be required to attend these meetings as and when their presence is necessary, e.g., Consultants in all disciplines, representatives of the various Sub-Contractors, etc. Proper minutes of these meetings will be kept by the Employer\Principal Agent and copies will be circulated to all persons attending the meetings and to others who need to be kept informed.																																																																	
5.4	FORMS FOR CONTRACT ADMINISTRATION The Employer shall provide all necessary forms.																																																																	
5.5	ELECTRONIC PAYMENTS The Contractor shall provide all required information to the Employer to facilitate electronic payments upon request.																																																																	
5.6	DAILY RECORDS The Contractor shall keep daily records of people and equipment employed as well as a site diary in respect of work performed on the site. At the end of each week the Contractor shall provide the Principal Agent with a written record, in schedule form, reflecting the number and description of tradesmen and labourers employed by him and all Sub-Contractors on the works each day. At the end of each week the Contractor shall provide the Principal Agent with a written record, in schedule form, reflecting the number, type and capacity of all plant, excluding hand tools, currently used on the works.																																																																	
5.7	BONDS AND GUARANTEES The Contractor shall within 10 calendar days after receiving notice from the Engineer and prior to receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the Employer's agent (whose details are given in the contract data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the Contract Data.																																																																	

5.8	PAYMENT CERTIFICATES Requirements will be in accordance with the Employers prescriptions.
5.9	PERMITS The Contractor is advised that, in the case of an existing building or institution, all security measures in force will remain in operation and he must acquaint himself and his Employees with them as he and his Employees will at all times be subject to these measures. The Contractor will on no account extend his operations beyond the confines of the building site as indicated by the Employer and must ensure that all his Employees are made aware of these limits. Any Employee disregarding this instruction and found outside the limit of the building site without authority, shall be redeployed immediately and shall not again be employed on this Contract. The Contractor will be responsible for ensuring that this instruction is strictly enforced and must provide and remove upon completion or when directed, such other necessary temporary barriers, fences, etc., as may be required and is to allow opposite this item for any charges he may wish to make in this connection. The Employer will accept no responsibility whatsoever for damage to or the loss of plant, materials, etc., from the site.
5.10	PROOF OF COMPLIANCE WITH THE LAW The following certificates must be provided before first delivery is taken: - HIV/STI Report (Bound into this document) - Electrical Compliance Certificate - Plumbing Compliance Certificate - Lightning Certificate - Soil Protection Certificate - Concrete test and cube certificates - Waterproofing Guarantee certificates - TR1 and TR2 prefabricated roof truss certificates - Soil compaction certificates - Electrical and Mechanical test certificates - Plumbing and drainage pressure test certificates - Fire Compliance Certificate - Entomology Certificate - SANS 10400-A:2010 compliance certificates - Latest National Building Regulation
5.11	INSURANCE PROVIDED BY THE EMPLOYER Not Applicable <u>SECTION 2</u> <u>SPECIFICATION DATA ASSOCIATED WITH SANS 1921-2004</u>
Clause Numbers	4.1.7 The requirements for drawings, information and calculations for which the Contractor is responsible are: Structural steel and piling design must be submitted for approval 30 days prior to erections.
	4.2.1 The responsibility strategy assigned to the Contractor for the works is: Strategy A
	4.2.2 The structural engineer is: LSC Brunette cc
	4.2.3 Drawings & other info are to be submitted in accordance with the contractors programme Yes

4.3	<p>The planning, programme and method statement are to comply with the following:</p> <ul style="list-style-type: none"> - Format of programme to be MS Projects - Detailed programme with their dependencies - Critical path activities, with resource allocation and construction methodology - Programme to be updated frequency in line with progress to date
4.12.1	<p>Samples of materials</p> <p>The work is to be executed with materials of the best specified and in the most substantial and workmanlike manner under the inspection of the Employer and to his satisfaction. The Contractor shall furnish, without delay, such samples as called for or may be called for by the Employer, who may reject all materials or workmanship not corresponding with the approved sample. The samples of materials, workmanship and finishes that the Contractor is to provide and deliver to the employer are:</p> <ul style="list-style-type: none"> - Tile samples. - Vinyl flooring samples. - Ceiling board samples. - Timber door samples. - Aluminium window and door samples. - Ironmongery fitting samples. - Bathroom fitting samples. - Sanitary fitting samples. - Joinery fitting samples. - Brick samples. - Roof sheeting samples. - Light fitting samples. - Screed panel 2m x 2m impact test. - Plaster panel 2m x 2m. - Paintwork samples. - Tested trial mix to be approved by the Engineer. <p>4.12.2 Fabrication drawings that the contractor is to provide to the employer are:</p> <p>Structural steel , piling, aluminium windows and doors, built-in cupboard joinery works</p>
4.12.3	<p>Office accommodation, equipment, accommodation for site meetings and other facilities for use by the employer and his agents are:</p> <p>OFFICE FOR FOREMAN</p> <p>Provide, erect, maintain and remove at completion a suitable temporary office for the Contractor or his Foreman, perfectly secured, lighted and ventilated and having a desk with drawers.</p> <p>TELEPHONE</p> <p>The Contractor shall provide a telephone on the site for the use of the Contractor and all Sub-Contractors for the duration of the Contract, and must make the necessary application for connection, give all notices and pay all fees, rentals and charges for the service and also for all calls.</p> <p>OFFICE FOR INSPECTOR OF WORKS</p>

	<p>Provide, erect, maintain and remove at completion a well constructed temporary office for the Inspector of Works not less than 4 x 3 m on plan and 3 m high to eaves to the approval of the Employer. The office shall be constructed of wood framing covered externally with corrugated iron or corrugated asbestos and with a lean-to roof covered with the same material as the external wall covering. The office shall be lined internally with soft board or other approved material and a ceiling shall be provided of the same material as the internal lining. A suspended wood floor shall be provided and is to finish not less than 300 mm above the ground level. A lockable door and a window, which provides adequate light and ventilation, shall be fitted.</p> <p>An office constructed of 115 mm thick brick-work and provided with a screeded concrete floor and roofed and ceiled as above described may be accepted as an alternative but prior permission of the Employer will be necessary before construction of such an office is commenced and his requirements shall be stated and fulfilled by the Contractor.</p> <p>The office shall be fitted in an approved manner with a sloping topped desk of height and length suitable for the laying out and studying of drawings, a desk or table with not less than two lock-up drawers, shelves, seating and wash-stand, and the Contractor shall provide all necessary attendance.</p>
	TELEPHONE IN OFFICE FOR INSPECTOR OF WORKS
	<p>The Contractor shall arrange for the installation of a lockable telephone in the Office for the Inspector of Works for the duration of the Contract. The Contractor will be required to make the necessary application for connection and give all notices on behalf of the Employer. The Employer will, however, be responsible for the direct payment of all fees, rentals and other charges by Telkom for the service for the Inspector of Works and for all calls made from this telephone.</p>
	<p>SHED</p>
	<p>Provide, erect, maintain and remove at completion, ample temporary sheds for the proper storage of materials and for the use of the workmen, and remove when no longer required.</p>
4.14.6	The requirement for provision and erection of signboards are:
	<p>Supply, erect, maintain and remove at completion a painted notice board, size overall 2800 x 2345 mm high sign written to detail as Drawing No. T9506 which drawing is available from offices of the Department of Public Works. Only the official notice board is to be displayed on the site and no Sub-Contractor's boards will be permitted. The Contractor, at his own cost, may provide a board on which all sub-contract firms' names may be sign written. The notice board is to be to the approval of the Employer and is to be maintained in first class condition and placed where directed at the entrance to the site and remain there for the duration of the Contract.</p>
4.17.1	Requirement for the termination, diversion or maintenance of existing services:
	<p>Should the Contractor come in contact with any underground cables or pipes during excavations, immediate notification must be made to the Employer and all work in the vicinity of such cables, pipes, etc., shall cease until authority to proceed has been obtained from the Employer. Should the Contractor damage underground cables or pipes resulting in a disruption of services to an existing institution such damage shall be repaired immediately.</p>
4.17.3	Services which are known to exist on the site:
	Contractor to investigate and provide detail drawings.
4.17.4	Requirement for detection apparatus
	None

<p>4.18</p>	<p>ADDITIONAL HEALTH AND SAFETY REQUIREMENTS ARE:</p> <p>By the submission of a tender, any Tenderer will, if awarded the contract to which this tender document relates, be deemed to be the mandatory as envisaged by Section 37 (2) of the Act. As a mandatory the successful Tenderer will be deemed to be the “principal contractor” and an employer in his/her/their own right with duties as prescribed in the Act and accordingly will be deemed to have agreed to be solely responsible for ensuring that in connection with the service to which this tender document relates, all work will be performed and machinery and plant used in accordance with the Act. Should the Contractor, for whatever reason be unable to perform as required by the Act, the Contractor undertakes to inform the Employer accordingly.</p> <p>Tenderers are advised that it is a Condition of this Tender that a 'Construction Phase Safety, Health and Environmental Plan' specifically relates to the project for which tenders are being submitted and must be prepared by the Tenderer and submitted with the other tender documents at the time of tender. Failure to do so will invalidate the tender.</p> <p>Tenderers are therefore advised to study the 'Construction Safety, Health and Environmental Specification' which is issued as part of this tender document, the Model Preambles to Trades - 2008, any project Specification included in this tender document and any and all drawings which are referred to and issued as part of this tender document before preparing their own project specific 'Construction Phase Safety, Health and Environmental Plan' . Tenderers are also advised that such a plan which is submitted with a tender but is incomplete or considered inadequate by the Employer or his Representative will invalidate the tender.</p> <p>The Contractor will be deemed to have satisfied himself with his obligations in terms of the Act and to have allowed for all costs arising from compliance with the Act as no claim for extra costs arising from compliance with, and obligations in terms of the Act will be entertained.</p>
<p>4.22</p>	<p>WORK BY NOMINATED AND SELECTED SUBCONTRACTORS COMPRISE:</p> <p>Not applicable</p>

C3.2 - SPECIFICATION FOR HIV/AIDS AWARENESS

1 Scope

This generic specification contains requirements applicable to the reduction of the risk of transfer of the HIV virus between and among construction workers and the local community through the following four strategies:

- a) raising awareness about HIV/AIDS;
- b) providing construction workers with access to condoms;
- c) HIV counselling, testing and referral services; and
- d) Sexually Transmitted Infection diagnosis and treatment.

2 Normative references:

The following standard contains provisions that, through reference in this text, constitute provisions of this standard:

SANS 4074 ISO 4074, *Condom Rubbers*

3 Definitions and Abbreviations

3,1 Definitions

Construction Worker: all persons in the employ of the contractor or in the employ of any of the subcontractors contracted by the contractor.

Local Community: the communities local to the site which are most likely to have contact with the construction worker and, in particular, sex workers in those communities.

Service provider: the natural or juristic person recognised by the South African Department of Health as specialist in conducting Aids Awareness Programmes.

3,2 Abbreviations

STI: Sexually transmitted infection

HIV: Human Immunodeficiency Virus

AIDS: Acquired Immune Deficiency Syndrome

4 Objectives

The objectives are to:

- a) reduce the risk of transfer of the HIV virus between and among construction workers and the local community;
- b) raise awareness amongst construction workers and the local community of the risk of infection with the HIV virus;
- c) promote early diagnosis; and
- d) assist affected individuals to access care and counselling.

5 Requirements

5,1 General requirement

The contractor shall, in order to satisfy the objectives stated in 4:

- a) make condoms complying with the requirements of SABS ISO 4074 available to all construction workers at readily accessible points on the site, suitably protected from the elements, for the duration of the contract;
- b) either place and maintain HIV/AIDS awareness posters of size of not less than A1 in areas which are highly trafficked by construction workers, or provide construction workers with a pamphlet, in languages largely understood by construction workers, which

- c) encourage voluntary HIV/STI testing;
- d) provide information concerning counselling, support and care of those that are infected services; and
- e) comply with the requirements of 5.2.

The provisions of 5.1 c) and d) do not apply to this contract.

5,2 HIV awareness programme

5.2.1 The contractor shall:

- a) engage a qualified service provider as described in the scope of works to conduct an HIV Awareness Programme which is structured to achieve the outcomes stated in 5.2.3 for contract workers as soon as a construction workers camp is established and populated or, where no such camp is established, within two weeks of the commencement of a significant portion of the works and at subsequent intervals, if any, provided for in the scope of works; and
- b) arrange for, provide a suitable venue, and instruct all construction workers to attend the HIV Awareness Programme and notify the Employer's Representative of the date, time and venue whenever a session with construction workers is conducted.

Note: The National Department of Public Works maintains a list of qualified service providers.

5.2.2 The contractor shall do nothing to dissuade construction workers from attending such an HIV Awareness Programme and shall take all reasonable steps to ensure that a minimum of 90% of construction workers engaged in the works attend such a programme, when it is conducted.

5.2.3 The outcomes of the HIV Awareness Programme shall as a minimum, result in contract workers exposed to such a programme being able to:

- a) communicate the existence of problems of HIV and be able to outline the consequences of transmission of HIV to or from the local community;
- b) recall and communicate the mode of HIV transmission and preventative measures including the proper use of the condom.

The HIV/ Aids awareness programme described in 5.2 is to be repeated at four month intervals throughout the duration of the contract. (Four times in total, including the initial one at the start of the contract)

5,3 Reporting

5.3.1 The contractor shall prepare and attach to his claims for payment a brief report which outlines how the actions taken by the contractor in the period for which payment is claimed satisfy the requirements and a schedule which lists the names, identity numbers, trade / occupation and name of employer of all construction workers exposed to the programme (see **HIV/STI Compliance Report**).

5.3.2 The employer's representative shall certify the report and schedule described in 5.3.1 whenever a claim for payment is issued to the employer.

Note: In the event that the contractor fails to satisfy the requirements of this specification, the employer (Head: Public Works) may apply any of the sanctions provided for in the contract. Sanctions may include the application of a financial penalty of .04% of the Contract Sum.

The HIV /Aids awareness programme described in 5.2 shall in addition be conducted for the benefit of the local community on two occasions in the community centre nearest to the building site. The contractor shall be responsible for inviting identifiable community-based institutions and organisations, churches, and schools to participate in the programme.

C3.3 - HIV/STI COMPLIANCE REPORT

Pro-forma reporting format in terms of the SPECIFICATION FOR HIV/AIDS AWARENESS

Project Code:

070638

Payment Claim number:

Period covered by payment claim:

1. Distribution of condoms (briefly describe where and how condoms are distributed).

2. Posters / pamphlets (briefly describe where posters were placed / how pamphlets were distributed).

3. Voluntary testing (briefly describe the actions taken / information provided to promote testing).

4. Counselling, support and care (summarise information provided).

5. HIV awareness programme (briefly describe action).

6. Schedule of construction workers exposed to the HIV awareness programme.

[illegible]

I hereby declare the above to be a true reflection of actions taken to ensure compliance with the specification.

For Contractor:

Name: _____

Signature: _____

Date: _____

Employer's representative:

Name: _____

Signature: _____

Date: _____



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

PART C4. SITE INFORMATION

C4.1 SITE INFORMATION GCC FOR CONSTRUCTION WORKS (2 Edition of 2010)			
Project title:	Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area		
Tender No.	ZNTU04138W	Project Code:	070638
C4.1 Site Information			
C4.1	GENERAL (a) The study area is underlain by sandy fill and colluvial soils, clayey sand/sandy silty clay residual soils, and granite bedrock of the Hlobane Complex. Granite bedrock occurs at a depth typically in excess of 3.0 metres below EGL. Groundwater seepage was not encountered during the course of the field investigation and it is anticipated that the permanent groundwater table occurs at a depth in excess of 10.0 metres below EGL. (b) All earthworks should be carried out in a manner to promote stable development of the site. It is recommended that earthworks be carried out along the guidelines given in SANS 1200. The bottom of the foundation trenches/bases be compacted to engineer's specifications. (c) Any additional site information such as location, improvements on site, adjacent buildings, environmental issues, etc. must be described in detail herein. If project is phased, indicate the phased work procedure with a colour coded site plan or graphical key or sorts.		
C4.2	GEOTECHNICAL INVESTIGATION REPORT (a) Refer to report annexured to tender document for the geotechnical site information		



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

PART C5 - DRAWINGS / ANNEXURES

C5.1 - LIST OF DRAWINGS/ANNEXURES

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

Tender No.:	ZNTU04138W	Project Code:	070638
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(Where drawings/annexure's are issued, document compilers must insert the following paragraph and list the applicable drawings/annexure's below.)

The following drawings/annexure's shall be issued during the Tender period to form part of the tender documentation. Where applicable, drawings/annexure's could be re-issued to the Contractor at commencement of the construction phase.

DRAWING NO

DESCRIPTION

	Architect Drawings
070638-DOH-A-1001	Service co-ordinated drawing
070638-DOH-A-1002	Site plan
070638-DOH-A-2000	Ground storey plan
070638-DOH-A-2001	Ground storey plan - machine layout
070638-DOH-A-2002	Ceiling layout
070638-DOH-A-3000	Sections: A-A / B-B / C-C
070638-DOH-A-3001	Sections: D-D / E-E / F-F
070638-DOH-A-3002	Sections: H-H / J-J / K-K
070638-DOH-A-3003	Sections: M-M / N-N
070638-DOH-A-3004	Sections: G-G / L-L
070638-DOH-A-4000	Elevations
070638-DOH-A-5050	Joinery details (Sheet 1 of 4)
070638-DOH-A-5051	Joinery details (Sheet 2 of 4)
070638-DOH-A-5052	Joinery details (Sheet 3 of 4)
070638-DOH-A-5053	Joinery details (Sheet 4 of 4)
070638-DOH-A-5100	Tile layout (Sheet 1 of 9)
070638-DOH-A-5101	Tile layout (Sheet 2 of 9)
070638-DOH-A-5102	Tile layout (Sheet 3 of 9)
070638-DOH-A-5103	Tile layout (Sheet 4 of 9)
070638-DOH-A-5104	Tile layout (Sheet 5 of 9)
070638-DOH-A-5105	Tile layout (Sheet 6 of 9)
070638-DOH-A-5106	Tile layout (Sheet 7 of 9)
070638-DOH-A-5107	Tile layout (Sheet 8 of 9)
070638-DOH-A-5108	Tile layout (Sheet 9 of 9)
070638-DOH-A-5200	Handrail details
070638-DOH-A-5201	Mechanical equipment screen details
070638-DOH-A-8000	Finishes schedule (Sheet 1 of 5)
070638-DOH-A-8001	Finishes schedule (Sheet 2 of 5)
070638-DOH-A-8002	Finishes schedule (Sheet 3 of 5)
070638-DOH-A-8003	Finishes schedule (Sheet 4 of 5)
070638-DOH-A-8004	Finishes schedule (Sheet 5 of 5)

070638-DOH-A-8050	Door schedule (Sheet 1 of 2)
070638-DOH-A-8051	Door schedule (Sheet 2 of 2)
070638-DOH-A-8100	Window schedule
070638-DOH-A-8200	Sanitary schedule
	Civil and Structural Engineer Drawings
D3806/20 - EW01	Earthwork layout
D3806/20 - EW02	Earthwork long sections
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KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURES



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 1

Standard Preambles for all Trade (Rev 3) - DOH 2009



KWAZULU-NATAL
DEPARTMENT OF HEALTH

STANDARD PREAMBLES TO ALL TRADES

REV 3 – JANUARY 2009

**Compiled by:
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NOTE:

Only those clauses or portions of clauses in the following preambles, which refer to items in the Bills of Quantities, shall be considered as applying to the performance of this Contract.

2.

1.

ALTERATIONS

SITE VISIT: — Tenderers are advised to visit the site prior to tendering and satisfy themselves as to the nature and extent of the work to be done, also to examine the condition of all existing buildings as no claim will be entertained on the grounds of ignorance of the conditions under which the work was to be executed.

MATERIALS FROM THE ALTERATIONS: — unless otherwise stated, will become the property of the Contractor and all these materials, together with all rubbish and debris must be carried away and the site left clean and unencumbered.

Items described as “removed” shall mean removed from the site.

Credit for the value of materials from the alterations is to be allowed for on the Summary/ Final Summary page.

Items described as to be re-used or to be handed over to the Administration are to be dismantled where necessary and stacked on site where directed, and the Contractor will be responsible for their removal and storage until required, and shall make good all items missing, damaged or broken at his own expense.

Unless otherwise described, no materials from the alterations shall be re-used in any new work without the written approval of the Department.

Prior to the removal of any timbers from the site, these are to be inspected by Government Entomologists. If any of these timbers are infested by wood destroying agencies, these timbers are to be disposed of in the manner prescribed by the Government Entomologist.

In taking down and removing existing work, particular care must be taken to avoid any structural or other damage to the remaining portions of the buildings.

ASBESTOS REGULATIONS 2001:

In terms of Asbestos Regulations 2001, no individual person, contractor or agent shall remove, demolish or strip any building containing asbestos or products containing asbestos (including asbestos roof sheeting, ceilings, guttering and down pipes) unless the work is performed by a **“Registered Contractor”, registered with the Department of Labour**. All asbestos work shall be carried out under the supervision of an “Approved Inspection Authority”.

It is a requirement that before any work involving asbestos removal is carried out, the following procedure and documentation is followed: -

1. Prior to the commencement of any demolition work, written notification shall be given to the Assistant Manager (Inspection and Enforcement), Durban Labour Centre, Masonic Grove, Durban, stating the name, address and details of the person(s) removing or stripping the asbestos. The notification shall include the date, time and place where the proposed work is to be carried out. (Regulation 3).
2. The name and details of the Approved Inspection Authority that is to supervise and confirm that the work is being carried out according to the specific requirements of the Asbestos Regulations 2001 (as amended), including the approved “written work procedure” document. This document shall be submitted and signed at least 14 days prior to commencement of demolition work by the Approved Inspection Authority. (Regulation 21).
3. The production of valid accreditation certification of training for all employees involved in the asbestos removal work.

4. On completion of the asbestos related work a "Clearance Certificate" which includes the asbestos disposal certificate shall be forwarded to the Department by the Approved Inspection Authority.

In terms of the above regulations, it is an offence to carry out any asbestos work as defined in the above regulations without the necessary approval / requirements being met.

Individual persons or contractors found to contravene these regulations will be issued with a **PROHIBITION NOTICE** which in effect will stop all work on site and the offenders will then be liable for prosecution.

Any employer found guilty under the Asbestos Regulations 2001 may be liable to a fine and or imprisonment not exceeding 12 months.

NOTICE OF DISCONNECTIONS: — The Contractor is to give ample notice to the Department and Local Authorities regarding any disconnections necessary prior to the removal or interruption of electrical or telephone cables, water supply and sanitary services, etc.

DUST: — The Contractor is to allow in his rates for taking all precautions necessary to prevent any nuisance from dust whilst carrying out the works.

SHORING: — Rates for shoring are to include for the use and waste of all props, needles, wedges, braces, nails and screws, etc. required and for all cutting, notching, framing and fitting, maintaining in position for the required periods and removing at completion. All shoring is to be executed in a manner approved by the Department.

MATCHING EXISTING WORK: — The terms "make good" or "making good" to existing work as described in the items shall mean making good with materials to match, all joined to existing.

FORMING NEW OPENINGS, ETC. IN EXISTING WALLS: — Rates for items of forming new or altering existing openings are, unless otherwise stated, to include for the following: -

- a) Breaking out for and inserting adequate lintels over the new openings (except where stated in the items as being below an existing beam, slab or lintel), to the approval of the Department. The lintels are to be of in-situ concrete Class C, or of pre-cast pre-stressed concrete or of brickwork in 1:3 cement mortar, with a minimum bearing of 230mm at each end and suitably reinforced, and rates are to include for all necessary formwork, turning pieces, etc. and for wedging and pinning up to existing brickwork over in 1:3 cement mortar.
- b) All shoring and propping required.
- c) Facing up jambs in new brickwork in cement mortar properly bonded to existing,
- d) Building up the portions of the openings stated in the items in new brickwork in cement mortar properly bonded to existing.
- e) Formwork for concrete sills and thresholds where required.
- f) Making good only to the finishes as stated in the items. (Note: — The making good of paint finishes has been measured separately).
- g) Forming rounded angles, throats on external plastered soffits, mitres, etc. where required in all new plaster, render and granolithic finishes.

The supply, building in, fixing, etc. of all windows, doors, frames, etc. to the newly formed openings and the removal of all existing windows, doors, frames, etc. from openings to be altered, have been elsewhere measured.

2. EARTHWORKS

SITE CLEARANCE: —The item given in the Bills of Quantities for site clearance shall be deemed to include the removal from the site, or burning if permitted by the Local Authority, of shrubs and trees with trunks under 200mm girth measured at 1m above ground level,

hedges, bushes, other vegetation, rubbish and debris.
Holes left by roots are to be backfilled with earth and rammed.

EXCAVATIONS: — Rates for excavations are to include for forming and trimming to the correct levels, falls, slopes, curves, etc. for trimming sides, stepping, levelling and ramming bottoms, staging and disposing of the excavated material as described in the items. Rates for excavations to reduce levels over site are also to include for forming and trimming banks to the required batter. The Contractor is to allow in his rates for the bulking of excavated material.

The term “excavate”, unless otherwise stated, shall mean excavate in “soft excavation” as defined below and for the purpose of classifying excavations the following will apply: —

- a) **Soft excavation:** — shall be excavation in material that can be efficiently removed by a back-acting excavator of flywheel power approximately 0, 10 kW per millimetre of tined-bucket width without the assistance of pneumatic tools such as paving breakers, or that can be efficiently loaded without prior ripping or stockpiling by a rubber tired front-end loader of approximately 15t mass and a flywheel power of approximately 100 kW.
- b) **Intermediate excavation:** — shall be excavation in material that requires a back-acting excavator of flywheel power exceeding 0,10kW per millimetre of tined-bucket width and the assistance of pneumatic tools prior to removal by equipment equivalent to that specified in (a) above.
- c) **Hard rock excavation:** — shall be excavation in material that cannot be efficiently removed without blasting or without wedging and splitting prior to removal.
- d) **Class A Boulder excavation:** — shall be excavation in material containing more than 40% by volume of boulders of size between 0.03m³ and 20m³ in a matrix of softer material or smaller boulders.
Note: — Excavation of solid boulders or lumps of size exceeding 20m³ will be classed as hard rock excavation. (2) Excavation of fissured or fractured rock will not be classed as boulder excavation but as hard rock or intermediate excavation according to the nature of the material.
- e) **Class B Boulder excavation:** — shall be excavation of boulders only in a material containing 40% or less by volume of boulders of size between 0.03m³ and 20m³ in a matrix of softer material or smaller boulders.
Note: — Those boulders requiring individual drilling and blasting in order to be loaded by a back-acting excavator as specified in (a) above, or by a track type front-end loader, will each be separately measured as Class B boulder excavation.
The excavation of the rest of the material will be classed as soft or intermediate excavation according to the nature of the material.

Method of Classifying: —The Contractor may use any method he chooses to excavate any class of material but his chosen method of excavation shall not determine the classification of the excavation. The Department will decide on the classification of the materials. The classification will be based on inspection of the material to be excavated and the criteria given in (a) to (e) above, as applicable. The decision of the Department shall be, subject to the relevant provisions of the contract, final and binding.

Should the Contractor consider that the excavation is other than “soft excavation” he must notify the Department immediately in order that an inspection be made and a decision arrived at by the Department as to the category of such excavation. Should the Contractor fail to give such notification, the excavation shall be deemed to be “soft excavation” and shall be measured and valued accordingly.

Blasting will only be permitted with the written authority of the Department, if and when permission is granted, it is to be executed only by persons holding the necessary Government Blasting Certificate and subject to all regulations imposed by the Department and/or Local Authority. In addition, the Contractor is to indemnify the Provincial Administration against all claims in respect of damage to persons and property resulting from such blasting operations.

Before commencing any excavations, the Contractor must satisfy himself as to the accuracy of any levels indicated on the drawings, as no claim will be entertained at a later date for any alleged inaccuracy in such levels.

Excavation shall be carried down to such depths as are necessary to obtain firm foundations, but before proceeding to greater depths than are shown on the drawings, the Department's approval must be obtained.

The Contractor will be responsible if he excavates wider or deeper than shown or required. If the excavations are deeper than shown or required such extra excavations are to be filled in with mass concrete at the Contractor's expense. If the excavations are wider than shown or required, any form-work or mass concrete filling required to the side of the concrete foundations is to be executed at the Contractor's expense and to the approval of the Department.

Depths of excavations as approved shall be checked and recorded by the a Departmental Official and the Contractor's Foreman before any concrete is laid or the excavations are otherwise covered or filled in.

Notwithstanding such approval, any excavations which become waterlogged or otherwise spoilt after approval, shall be cleaned out and reformed, at the Contractor's expense and to the satisfaction of the Department, before any concrete, etc. is laid.

WATER: — The Contractor shall keep all excavations free from water or mud by pumping, baling or otherwise.

WORKING SPACE: — The Contractor is to allow against the items of "excavate to provide working space" for excavating beyond the extent of the net excavations measured to provide the necessary working space for the carrying out of such work as is described in the items. Rates are to include, in addition to the extra excavation, for any additional risk of collapse so incurred and for filling back and compacting the excavated material.

No separate item for working space is provided or will be considered where the face of the measured excavation is 750mm or more away from the finished face of the structure. Separate items for working space for the building of brick foundation walls on ordinary concrete wall footings will not be considered.

In the case of column base and pile cap excavations, where the dimensions between the column face and the excavation face is less than 500mm, working space has been measured for the width of the column face from the commencing level of excavation to the top of the column base or pile cap only where the top of the column base or pile cap exceeds 1.5m below the commencing level of excavation.

RISK OF COLLAPSE: — The Contractor shall maintain all excavated faces affecting the safety of the works and workmen. He must either provide all necessary temporary planking, strutting or shoring to all vertical excavated faces or carry the risk of collapse of these faces with all its implications. He must assume full responsibility in this connection and must allow in his rates accordingly. In addition, all excavated faces exceeding 1.5m deep are to be maintained in accordance with Government Regulations.

Quantities reflect the total superficial areas of the vertical excavated faces and will be subject to variation only in so far as these areas may vary, notwithstanding whether any temporary supports are used or not.

FILLING, ETC.: — All backfilling and filling under floors and paving must be of selected material from the excavations, unless otherwise stated, returned and compacted in layers as later described and with the top surface dressed to the correct levels and grades, all to the approval of the Department. Under no circumstances will the Contractor be allowed to use clay, peat or other unsuitable material for filling.

Rates for all items of filling with material from the excavations are to include haulage not exceeding 100m from the perimeter of the excavations.

Any filling supplied by the Contractor is to be of suitable material approved by the Department.

COMPACTION OF FILLING ETC.: — All filling and backfilling is to be done in layers not exceeding 200mm thick before compaction, with the layers level to ensure uniform compaction. Each layer is to be thoroughly compacted over the whole of the area to a dry density not less than 90% of Mod. A.A.S.H.O. density. The surface of each compacted layer shall be uniform and tightly bonded. Care is to be taken that no damage is done to foundation walls, drains and other services.

The densities of compaction referred to are to be determined by tests carried out in accordance with A.S.T.M. Designation D 1557-58 and at an optimum moisture content of not more or less than 5% of the required Mod. A.A.S.H.O. The Contractor shall be responsible for having sufficient tests taken of the density of the compacted filling to ensure that the required compaction is being attained to the satisfaction of the Department. These tests are to be undertaken by an independent testing authority nominated by the Contractor to the approval of the Department. The costs of all tests in this connection shall be borne by the Contractor and shall be allowed for in his rates.

PROTECTION AGAINST SUBTERRANEAN WOOD-DESTROYING TERMITES: — Where protection against termites is to be provided: —

- a) Remove vegetable matter
All dead roots and other vegetable matter likely to encourage termites must be removed from the ground under, against the building and from all filling material.
- b) Treating the ground
The ground under surface beds, and below suspended wood floors, must be treated by the application of Soil Insecticides of Chlordane or Aldrin types complying with SANS Specifications 1165 and 1164 respectively, mixed with water and applied at the rate of not less than 5 litres of solution per square metre uniformly over the whole surface. The concentration of the solution must be strictly in accordance with the manufacturer's instructions and to the approval of the Department.

The Department reserves the right to take samples of the diluted solution, at any time, in order to test the concentration of the chemicals used.

Where the ground to be treated is of earth filling, the upper 50mm layer of filling must be levelled by raking, but must not be rammed until after the solution has been applied, and where of natural ground, it must be loosened to a depth of not less than 50mm and similarly levelled, in order to enable the solution to penetrate into the soil. After the solution has been applied and allowed to penetrate the surface, the soil must be well rammed and consolidated.

Before applying the solution to the ground under the floors, splay back earth for a depth and width of 75mm from the internal faces of walls enclosing the floors, against internal walls, sleeper piers, etc. and thoroughly saturate with the solution. After the solution has soaked into the earth, the splayed grooves must be filled with earth and consolidated.

The treated layer of soil under suspended wood floors must be protected with a 75mm thick layer of approved clean gravel, finished to an even surface.

The treated layer of soil under concrete surface beds must be protected with a 25mm thick layer of well-consolidated approved grit prior to laying the waterproofing membrane.

Great care must be taken when laying concrete surface beds, protective layers, etc. in order to avoid rupturing the treated layer of soil. Should the treated layer be ruptured at any

point it must be made good and the area affected re-treated with the soil insecticide.

Contractors are advised that:

- a. Special precautions must be taken to protect the workmen whilst using the soil insecticide.
- b. The treatment of filling or ground under floors shall be done as soon as practicable, so that treatment may dry out before the floors are laid.
- c. The treatment of the ground must be carried out under the supervision of the Department.
- d. The soil insecticide to be delivered to the site in sealed drums clearly labelled or stamped with the name of the product.
- e. In addition to the foregoing the application of the soil insecticide to be carried out in accordance with SANS Code of Practice 0124 — the application of Certain Soil Insecticides for the Protection of Buildings.
- f. The protective layers of gravel or grit have been measured separately.

RE-USE OF EXCAVATED MATERIAL: — Material of any kind that may be discovered on the site during the excavation shall remain the property of the Administration. Such material may, if approved, be used for aggregate. Material so used shall be valued and the value deducted from the Contract Sum.

DEMOLITIONS: — The Contractor is referred to the preambles for “Alterations” insofar as they apply and the following: —

The demolition of existing buildings is to be done in a practical and safe manner, under the continuous supervision of a competent Foreman. Rates for the demolition of existing buildings are to include for breaking up and removing all external screen walls, steps and ramps, surface water channels, rainwater sumps, gulleys, etc. and grubbing up and removing all foundation walls and footings, disconnecting and removing all services to a point not less than 1m beyond the perimeter of the buildings, plugging off ends of all remaining pipes, and for filling in all holes with clean earth and ramming up to ground level. All movable fittings and furniture, fire extinguishers and electrical and other equipment in the buildings to be demolished are to remain the property of and will be removed by the Administration prior to the commencement of the demolition.

Before commencing the demolitions, the Contractor shall comply with any Local Authority regulations in force in respect of rodent extermination, etc. and he shall obtain the required Clearance Certificate. Items to cover the cost of obtaining the certificate and the fumigation, etc. of the buildings to be demolished have been provided elsewhere in the Bills of Quantities, and the fumigation is to be carried out by a firm specialising in this type of work. The fumigation of the buildings to be demolished shall only be carried out if called for by the Local Authorities and if not required the value of the relevant items in the Bills of Quantities will be deducted from the Contract Sum.

After handing over the site to the Contractor, the risk of any loss or damage to the buildings to be demolished and the materials therein, caused by theft, vandalism, etc. shall be the responsibility of the Contractor and he shall take such precautions as he deems necessary against such loss or damage.

GRASS PLANTING AND TURFING: — Is to be “Cape Kweek” or “Umgeni” grass scientifically known as *Cynodon dactylon* or other local fine grass approved by the Department. In areas where fine grass does not grow readily, Kikuyu grass *Pennisetum clandestinum* may be substituted. The areas must be identified and the approval of the Department obtained before Kikuyu grass is to be planted.

Grass Planting To Level Areas: — The areas to receive grass are to be weeded and raked free of stones and other superfluous matter and all depressions left by the earthworks plant are to be filled in with approved topsoil. The planting of grass is to be carried out in continuous root planting in rows 200mm apart. The method of planting called “sprigging” may be used as an alternative.

Immediately after completion of each strip or square, the area thus grassed is to be thoroughly watered and lightly rolled. Any drifting or piling up of the top soil due to wind or any other cause must be prevented as far as possible and should such piling up of soil against newly planted grass occur the soil must immediately be raked level and lightly rolled.

Turfing: — Banks are to be carefully trimmed to an even surface and weeded and raked free of stones, etc. and all depressions filled in with approved topsoil as before described. Turfing of banks is to be carried out with 25mm thick maximum 500mm x 1000mm weed-free grass sods, of grass as before described, and as approved by the Department. The grass sods are to be set in position in horizontal rows to broken bond and closely fitted together and tamped flat with a timber pummel, a maximum of two sods in every square metre of area covered being staked to the bank to maintain position, with and including one sharpened wood or bamboo skewer 250mm long and with all cavities between sods filled in with approved top soil and the whole area lightly top soil dressed on completion.

Established Lawn: — The use of established lawn in pieces size approximately 500mm x 1000mm x 25mm thick in lieu of grass sods on banks will be permitted provided that the established lawn is supplied and laid by a firm experienced in this type of work and to the approval of the Department. The fitting, tamping, staking and top dressing must all be as described for turfing, except that one piece per square metre is required to be staked as described.

Fertilizer: — An approved fertilizer of the following types— Type 2:3:2 for grass planted levelled areas and Type 3:2:1 for turfed or established lawn covered banks is to be supplied and applied by the Contractor at the rate of 400 kg per hectare. In the case of grass planted levelled areas the fertilizer is to be applied either before or after grass planting and in the case of turfed or established lawn covered banks the fertilizer is to be applied after the sods or pieces have been laid.

The fertilizer above described is to in addition to any fertilizer which may have been specified to be applied during either the operation of scarifying and grading the area to be grassed or the re-spreading of top soil.

A sample of the existing topsoil or the topsoil to be re-spread is to be sent to an approved fertilizer manufacturer for testing and advice on the acid or alkaline content of the soil. The cost of this test is to be borne by the Contractor if this is not provided free by the fertilizer manufacturer.

The requisite quantities of limestone ammonium nitrate for acidic soil or ammonium sulphate for alkaline soil as determined by the soil test will be supplied to the Contractor by the Department and the cost thereof is to be included in a Provisional Sum elsewhere in the Bills of Quantities. The application of this treatment is to be undertaken by the Contractor and his rates for grassing, etc. must include for same.

Weed killer: — “Weed Master or Turf Master” or other approved weed killer is to be applied to the entire grassed or turfed areas at a rate of 4 litres mixed with 200 litres of water per hectare, this being equivalent to 40-45 millilitres mixed with 5 litres of water per fifty square metres. The solution is to be sprayed on with a suitable spraying apparatus to achieve an even distribution. Six to eight weeks later, the operation is to be repeated. The application of weed killer is not to take place during wet weather. Weather conditions should be such as to allow a minimum of two hours or absorption before the likelihood of rain.

Watering and Rolling: — The entire turfed area is to be kept clear of weeds, lightly rolled and thoroughly watered throughout the period of the Contract and or at least three months from the time of acceptance of the grounds or until the grassing or turfing is well established if that is sooner, all to the satisfaction of the Department.

In the absence of rain, the initial watering of grassed or turfed areas is to be carried out as follows: —

Grass planted levelled areas: - at least twice a week.

Established lawn areas: - at least once a week.

Turfed areas: - at least once a day for the first ten to fourteen days, thereafter at least once a week.

The Contractor must allow in his rates for providing and removing at completion all necessary temporary water piping complete with fittings, sprinklers, hoses, etc. as required for the proper watering of the grassed or turfed areas of the plateaux and banks.

Cutting of Grass: — The Contractor must commence mowing as soon as possible once turfed areas have become established and undertake regular mowing at approximately one-week intervals up to the date of final delivery, except that, during the maintenance period, the mowing of the plateaux will be undertaken by the Institution.

Note: — All stages of grass planting and turfing are to be supervised on a full time basis by a competent person with the necessary experience and knowledge.

It shall be the responsibility of the Contractor to advise the Department when the following operations are to be carried out in order that his representative may be present: —

- a) the application of fertilizer
- b) the application of weed killer.

Should the Contractor fail to do so, the Department shall have the right to instruct the Contractor to repeat the operation at his own expense.

3. **CONCRETE, FORMWORK AND REINFORCEMENT**

GENERAL: — This specification applies to concrete work formed into its final shape and position in-situ.

All concrete and formwork shall be carried out in accordance with SANS Specification 1200 G — Concrete (Structural) (a copy of which the Contractor will be required to keep on the site so that it can be referred to at all times during the Contract), with the following amplifications and amendments: —

INTERPRETATIONS: — Clauses 2.1 and 2.2 of SANS Specification 1200G refer. This preamble, together with any other supplementary preambles appearing in these Bills of Quantities shall be deemed to be the project specification and are the "Portion 2" referred to in Clause 2.2.

DEFINITIONS: — Clause 2.3 of SANS Specification 1200 G refers. All references to the Engineer shall be deemed to mean the Department.

MATERIALS

Cement: — unless otherwise specified, shall be one or more of the following and shall, in each case, comply with the requirements of the relevant standard specification: —

Portland cement and rapid-hardening cement to SANS 471 Specification

Portland blast-furnace cement to SANS Specification 626.

Portland cement 15 to SANS Specification 831.

Nevertheless, no cement other than ordinary Portland cement shall be used without the approval of the Department. Cement containing more than 15% blast-furnace slag will not be permitted in columns or in members less than 50mm thick.

In addition (for the abovementioned items) where Ordinary Portland cement is used, blast-furnace slag (from separate containers) **must not** be added in any proportion whatsoever.

No mixing of two different types of cement in the same batch will be allowed, and unless otherwise approved by the Department, the same brand and type shall be used in all exposed concrete.

Lumpy cement, broken sacks and sweepings shall not be used.

Cement supplied in sacks shall be used in the order in which it was delivered and shall not be kept in storage for longer than six (6) weeks without the approval of the Department.

Water: — Shall be clean and free from injurious amounts of acids, alkalis, sugar, organic matter and other substances that could impair the strength or durability of the concrete. If so required by the Department, the suitability of the water shall be proved by tests carried out by an approved laboratory.

Aggregates: — Unless otherwise specified both the coarse aggregate (stone) and the fine aggregate (sand) shall comply with the requirements of SANS Specification 1083. The Contractor is to prove compliance by means of either a certificate from the supplier or by grading analysis tests.

Admixtures: — i.e. materials other than cement, aggregate and water shall not be used in the concrete mix without the approval of the Department. The onus for proof of satisfaction to the Department for any admixture proposed shall be with Contractor.

Reinforcement: — for concrete shall be as specified and shall, in each case, comply with one of the following: —

- a) Type A hot rolled mild steel bars of plain round cross section to SANS Specification 920
- b) Type C Class 2 hot rolled high yield stress Grade 1 deformed bars to SANS Specification 920
- c) Type D Grade 1 cold worked deformed bars to SANS Specification 920.
- d) Welded steel fabric to SANS Specification 1024 manufactured from plain hard-drawn mild steel wire.

A sample reinforcing rod, approximately 600mm long, may be taken from each consignment of rods of similar diameter, for testing. If any sample is found unsatisfactory the whole consignment of rods from which the sample was taken will be rejected.

No substitution of the bars specified shall be made without the prior approval of the Department.

REINFORCEMENT

Bending: — Reinforcing bars shall be cut and bent according to the dimensions shown on the working drawings and in accordance with SANS Specification 82.

Except as allowed for below, all bars shall be bent cold and bending shall be done slowly, a steady even pressure being used without jerk or impact.

If approved by the Department, hot bending of bars of diameter at least 32mm shall be permitted, provided that the bars do not depend for their strength on cold working. When hot bending is approved, the bars shall be heated slowly to a cherry red heat (not above 840 C°) and after bending shall be allowed to cool slowly in air. Quenching with water shall not be permitted.

Fixing: — All steel reinforcement, at the time of placing of the concrete, must be free from loose rust, scale, oil and other agents which will reduce the bond between the steel and the concrete or initiate corrosion of the reinforcement. Reinforcement exposed to sea spray shall be washed down, and the formwork drained, just prior to concreting.

Reinforcement shall be positioned as shown on the working drawings or as directed by the Department and maintained in those positions within the tolerances given in the Specification for Tolerances. It shall be secured against displacement by tying at intersections with 1.6 or 1.25mm diameter annealed wire or by the use of suitable clips or, if permitted by the Department, by welding in accordance with SANS 1856. Welding will not

be permitted on cold worked bars. Reinforcement shall be supported in its correct position by hangers, saddles or cover blocks and aligned by chairs and spacers all of approved design and material. Where such hangers, saddles, chairs or spacers are of steel, they will be detailed on the drawings or in bending schedules.

Cover: —The minimum cover of concrete over reinforcement, excluding any applied finish, shall be as shown on the working drawings, or as directed by the Department.

Cover shall be maintained by using cover blocks, which shall be made of small aggregate concrete, not mortar, using the same cement and aggregate type and ratio as the parent concrete. Alternatively, cover blocks may be of the plastic type provided that sufficient number are used to prevent their collapse, that they are of a colour compatible with that of concrete and that the prior approval of the Department is given. Metal cover blocks shall not be used.

If the concrete face has a Class F2 smooth finish or some other special finish as is described elsewhere, hemispherical or pyramid shaped concrete cover blocks shall be used unless otherwise specifically approved by the Department.

Splicing: — or joining of reinforcing bars shall be made only as and where shown on the working drawings or as otherwise approved. The length of the overlap in a splice shall be not less than that shown on the working drawings or forty-five times the diameter of the bar if not shown.

Protection of Exposed Bars: — If left exposed for future bonding of extensions to the works, reinforcement shall be protected from corrosion as specified by the Department.

Electric Current: — Reinforcement shall not be used as a means for conducting electric current unless there is conformity with the requirements of SANS Code of Practice 03.

Inspection of Reinforcement: — Reinforcement shall be subject to inspection by the Department after the Contractor is satisfied that it has been completely and correctly fixed. The amount of notice given by the Contractor to the Department before concreting commences that reinforcement is ready for his inspection shall be agreed between the Department and the Contractor at the commencement of the Contract.

FORM WORK

Design: — Formwork shall be so designed and constructed by the Contractor that the concrete can be properly placed and compacted and that the required shapes, finishes, positions, levels and dimensions shown on the working drawings are maintained, subject to the tolerances given in the Specification for Tolerances. Unless otherwise directed by the Department, all formwork to beams and slabs shall be evenly cambered, unless otherwise specified or shown on the drawings, to the mid-point of the span of the member at the rate of 2mm per metre of span, all to the approval of the Department and the full cross section of the member shall be maintained after placing of concrete.

The formwork and joints shall be capable of resisting the dead load and pressure of the wet concrete, effect of vibration equipment, wind forces and all other superimposed loads and forces it is necessary for it to carry.

Should it be necessary to support formwork off suspended or ground bearing slabs, the manner of execution of the support shall be agreed with the Department so that overstress of, or damage to, those members is prevented.

In structures having, in whole or part, two or more reinforced concrete floors, props to the approval of the Department shall be provided under the soffits of beams and slabs of any floor which is being used to support the formwork and new concrete of the floor above. These props shall not be removed until the formwork for the new concrete has been struck.

Wedges and clamps shall be used in preference to nails. Joints in forms shall be tight enough to prevent leakage of cement paste.

Finish: — The quality of the finished surface of the concrete shall be as shown on the working drawings or as otherwise specified, and the type of formwork used shall be adequate to provide such finishes.

Ties: — The type of ties used and their position shall be such that the finish required in terms of the clause “Finish” is achieved. Tie rods are preferable to wire ties and the forms shall not be secured to the reinforcement. No corrodible tie rod or wire tie shall be allowed within the depth of concrete cover, and in the case of water-retaining or tanked structures, no removable tie rod or wire shall pass right through the concrete member.

Preparation of Formwork: — Surfaces that are to be in contact with fresh (wet) concrete shall be so treated by coating with a non-staining mineral oil or other approved material, or, in the case of timber forms, by thoroughly wetting surfaces so as to ensure easy release and non-adhesion to formwork during stripping. If any substance other than water is used, every precaution shall be taken to avoid contamination of the reinforcement.

Re-use of Formwork: — Before re-use, all formwork shall be reconditioned, and all form surfaces that are to be in contact with the concrete shall be thoroughly cleaned without unduly damaging the surfaces of the formwork.

Openings: — Where necessary for the proper placing of the concrete, temporary openings for cleaning, inspection or placing purposes shall be provided, taking cognisance of the finishes specified.

Removal of Formwork: — Formwork shall not be removed before the concrete has attained sufficient strength to support its own mass and any loads that may be imposed on it. Except where the Contractor can prove by means of cube tests, at his own expense to the satisfaction of the Department that, because of its strength development characteristics the concrete has attained sufficient strength and that shorter periods are practicable, formwork shall not be removed within shorter periods than those given in Table A. The number of cube tests required shall be equal to the number required for testing at 28 days. Where full design loads are carried, no soffit forms and props may be removed until the full design strength is attained.

In structures having, in whole or part, two or more reinforced concrete floors, props to the approval of the Department shall be provided under the soffits of beams and slabs of any floor which is being used to support the formwork and concrete of the new floor above. These props shall not be removed until the formwork for the new concrete has been struck.

All formwork props shall have been removed from under beams and slabs before the commencement of construction of brickwork thereon, unless otherwise agreed with the Department. Formwork shall be removed carefully so that shock and damage to the concrete are avoided.

TABLE A—REMOVAL OF FORMWORK (MINIMUM TIMES IN DAYS (24 hrs))

1	2	3	4	5	6	7	8	9	10
Type of structural member or formwork	Type of cement used								
	Portland cement and Portland cement 15			Rapid-hardening Portland cement* and rapid-hardening Portland cement 15			Portland blast-furnace cement		
				Weather					
	Hot or normal	Co ol	Col d	Hot or normal	Co ol	Col d	Hot or normal	Co ol	Cold
(a) Beam sides, walls, and unloaded columns.	0,75	+	1,5	0,5	+	1	2	+	4
(b) Slabs with props left underneath	4	+	7	2	+	4	6	+	10
(c) Beam soffits with props left underneath, and ribs of a ribbed floor construction	7	+	12	3	+	5	10	+	17
(d) Slab props including cantilevers	10	+	17	5	+	9	10	+	17
(e) Beam props including cantilevers	14	+	21	7	+	12	14	+	21

* Shorter periods may be used for sections of thickness 300mm or more.

+ In cool weather, stripping times shall be determined by interpolation between the periods specified for normal and cold weather.

CONCRETE QUALITY

General: — Concrete shall comply with the requirements for “Strength Concrete” as specified. The type of aggregate and cement, and their sources of supply, shall not be altered during the currency of the Contract without the prior written agreement of or instruction from the Department.

Strength Concrete: — The Contractor shall be responsible for the design of the concrete mix and for the proportions of its constituent materials, measured as described, necessary to produce concrete that complies with the requirements specified by the Department thus:-

- a) For each section of the work, the class of concrete and position on the Works, as shown on the drawings:
- b) For each class of concrete:
 - i) the minimum compressive strength at 28 days as shown in Table B
 - ii) the maximum nominal size of coarse aggregate as shown in Table B

- iii) the slump as shown in Table D
- iv) the maximum cement/water ratios as shown in Table C.

At the earliest possible stage in the Contract, at least 35 (thirty-five) days before the first concrete is placed, or as otherwise agreed with the Department, the Contractor shall submit samples of the aggregates which he proposes to use on the works to the Department.

The Contractor, under the supervision of the Department, shall prepare trial mixes using these same aggregates, to establish his ability to achieve the strengths specified, and satisfactory workability of the concrete. The Contractor shall provide all necessary equipment for, and carry out tests of moisture content of aggregates at the time of preparation of the trial mixes, tests of the slump of the mixes and at the same time cast not less than six standard cubes from each mix for compression tests.

The target strengths to be achieved under trial mix procedure shall exceed the specified minimum compressive strengths by a factor which is acceptable to the Department.

The Contractor shall also, when required to do so, prove the concrete yield obtained per sack of cement by suitable measurement of batches after placing.

No structural concrete work shall be poured until trial mix procedure has been properly followed and satisfactory 7 (seven) day compression strengths achieved. (Equivalent 28 (twenty-eight) day strength = $4/3 \times 7 \text{ day strength} + 5 \text{ MPA}$).

Thereafter, the materials, preparation of and method of manufacture of subsequent concrete shall conform accurately to those used in the trial mixes. If materials vary in the course of the Contract from the samples first submitted, the Contractor shall, on the instructions of the Department, repeat the trial mix procedure and vary the proportions to attain the specified qualities.

The costs of preparation of trial mixes, with tests associated with them, shall be borne by the Contractor and must be allowed for in the pricing of the concrete.

A valid concrete test result shall be the average obtained from the testing of three test cubes of concrete in accordance with SANS Method 863.

TABLE B—CONCRETE CLASSES: STRENGTH, AGGREGATE SIZE AND COMPACTION

Class	Minimum 28 day cube compressive strength (MPa)	Maximum nominal size of coarse aggregate (mm)	Method of Compaction
50/26 50/19	50	26,5 19,0	Mechanical (see clause “Compaction”)
45/26 45/19	45	26,5 19,0	
40/26 40/19	40	26,5 19,0	
35/26 35/19	35	26,5 19,0	
30/37 30/26 30/19 30/13	30	37,5 26,5 19,0 13,2	
25/37 25/26 25/19 25/13	25	37,5 26,5 19,0 13,2	
20/37 20/26 20/19 20/13	20	37,5 26,5 19,0 13,2	
15/37 15/26 15/19	15	37,5 26,5 19,0	Non- mechanical (See clause “Compaction”)
10/37 10/26 10/19	10	37,5 26,5 19,0	

The Contractor shall be deemed to have satisfied himself, before tendering, of his ability to produce concrete of the required quality with available materials conforming to the specification, and mixed in the proportions on which his tendered rates are based. Any subsequent alterations of the mix proportions to meet these requirements shall be at the Contractors expense.

If, in the opinion of the Department, the concrete proportions are likely to lead to excessive segregation, honeycombing, bleeding or shrinkage cracking, he shall have the right to order the Contractor to amend the proportions at the Contractors own cost.

TABLE C — MAXIMUM CEMENT / WATER RATIOS FOR DIFFERENT CONDITIONS OF EXPOSURE

1	2	3	4	5
Type of structure	Exposure Conditions			
	Mild	Moderate	Severe	Very Severe
Thin sections; reinforced piles; all sections with less than 25mm cover reinforcement.	*	0.53	0.48	0.40
Moderate sections; retaining walls, piers, beams	*	*	0.53	0.43
Exterior portions of mass concrete	*	*	0.53	0.43
Concrete slabs laid on ground	*	0.53	0.48	*
Concrete protected from the weather, inside buildings, or in ground below frost level	*	*		*

* In these cases the ratio will be based on the strength for the workability desired.

Consistency and Workability: — Slump measurements taken in accordance with SANS Method 862 shall be within the limits given in Table D appropriate to the type of construction, or within such other limits as are laid down by the Department.

The concrete shall be of such workability that it can readily be compacted into the corners of the formwork and around reinforcement without segregation of the materials or excessive “bleeding” of free water at the surface.

TABLE D—SLUMP LIMITS

1	2	3	4	5
Type of construction	Slump, mm			
	Non-mechanical compaction		Mechanical compaction	
	Max.	mm.	Max.	mm.
Paving and pre-cast units	75	50	50	30
Heavy mass construction	75	25	50	20
Reinforcing foundation walls and footings	125	50	80	30
Slabs, beams, columns, and reinforced walls	125	50	80	30
Slabs and industrial floors on ground	125	75	80	50
Plain footings, caissons, and substructure walls	100	25	60	20

Ready-mixed Concrete: — This may be used subject to the approval of the Department. This approval may be withdrawn on 24 (twenty-four) hours notice to the Contractor if at any time if documents do not conform to the requirements of this Specification. Ready-mixed concrete shall also comply with the requirements of SANS Specification 878. Details of the

mix ingredients and tests thereon, the mix designs and relevant tests shall be forwarded to the Department for his approval. Ready-mixed concrete shall be cast within 3 (three) hours of placing all the ingredients in the mixing plant. Ready-mixed concrete shall be subject to the same sampling and testing at the site as that mixed on site and only the results of these tests will be regarded as valid.

TRANSPORTATION AND PLACING

Transportation: — Unless agreed with the Department, concrete shall not be pumped into its final position.

The Contractor must provide suitable runways for the distribution of concrete to the various parts of the structure and these must be solidly constructed in such a manner so as to obviate the possibility of interference with the steel reinforcement.

Placing: — Unless otherwise agreed with the Department, the Contractor shall give the Department at least 24 (twenty-four) hours notice of his intention to place concrete. No concrete shall be placed without the prior approval of the Department and without a representative of the Department being present. Concrete shall be placed within one hour of the time of its discharge from the mixer. Concrete shall not be re-tempered by the addition of water or other material. The forms to be filled shall be clean internally. All excavations and other surfaces of an absorbent nature that are to come into contact with the concrete shall be dampened with water. There shall be no free-water on the surface against which concrete is to be placed. Wherever possible, the concrete shall be deposited directly into its final position to avoid segregation and displacement of reinforcement and other items that are to be embedded. Deposited concrete shall not be so worked (whether by means of vibrators or otherwise) as to cause it to flow laterally in such a way that segregation occurs. Where possible, the concrete shall be brought up in horizontal layers of compacted thickness not exceeding 450mm and heaping shall be avoided.

Where a chute is used to convey the concrete, its slope shall be such as will not cause segregation, and a suitable spout or baffles shall be provided for the discharge of the concrete. Concrete shall not be allowed to fall freely through a height of more than 3 m, unless otherwise approved. Concrete shall not be placed during periods of heavy or prolonged rainfall.

Compaction: — The concrete shall be fully compacted by approved means during and immediately after placing. It shall be thoroughly worked against the formwork and around reinforcement and other embedded fittings without displacing them.

The concrete shall be free of honeycombing and planes of weakness. Successive layers of the same lift shall be thoroughly worked together.

The method of compaction shall be as specified. Mechanical compaction shall be undertaken by means of high frequency immersion vibrators of minimum frequency of 6000 vibrations per minute and a maximum acceleration of 4 g when under load, being capable of visibly affecting concrete over a radius of at least 500mm. Vibrators shall be inserted at about 500mm centres and withdrawn slowly to close the hole formed by the vibrator.

Non-mechanical compaction shall be undertaken by means of spading, rodding or forking.

Over-compaction resulting in segregation, surface laitance or leakage (or any combination of these) shall not be allowed.

Vibrators shall not be allowed to come within 30mm of the face of the formwork in the case of formed finishes, nor within 75mm of the face of the formwork in the case of special finishes.

Construction Joints: — Concreting shall be carried out continuously up to the construction joints shown on the working drawings or as prior approved by the Department, except that

if, because of an emergency (such as a breakdown of the mixing plant or the occurrence of unsuitable weather), concreting has to be interrupted a construction joint shall be formed at the place of stoppage in conformity with the detail shown on the drawings for construction joints generally and in the manner which will least impair the durability, appearance and proper functioning of the concrete. The Department shall approve the method adopted for forming the construction joints, one of the following methods being adopted, as relevant: —

- a) Construction joints when concrete is not more than 24h old: — The surface of the concrete shall be brushed with a steel wire brush before new mortar and concrete are placed as specified in (b) below.
- b) Construction joints when concrete is more than 24h but not more than 3 days old: — The surface of the concrete shall be sand-blasted or chipped with a light hammer, swept clean, and thoroughly wetted and covered with a 10mm thick layer of mortar composed of cement and sand mixed in the same ratio as the cement and sand in the concrete mixture. This mortar shall be freshly mixed and placed immediately before the new concrete is placed.
- c) Construction joints when concrete is more than 3 days old: — The procedure specified in (b) above shall be followed, except that the old surface shall be prepared and kept continuously wet for at least 24h before the mortar and new concrete are placed.
- d) Construction joints at tops of columns: — The procedure for brushing or cleaning specified in (a) or (b) above, as applicable, shall be followed before the steel reinforcement of the slab or floor to be cast on the columns is placed in position.

Curing and protection: — Formwork shall be retained in position for the appropriate period given in the clause “Removal of Formwork” and shall be considered as providing adequate curing on those surfaces for that period. Should this curing period still be less than that specified, alternatively, should surfaces not be cured by forms then all such concrete shall immediately be protected from contamination and loss of moisture by one or more of the following methods: —

- a) ponding the exposed surfaces by means of water, except where atmospheric temperatures are low, i.e., less than 2°C,
- b) covering the concrete with sand, or mats made of a moisture-retaining material, and keeping the covering continuously wet;
- c) continuous spraying of the exposed surfaces with water;
- d) covering with a waterproof or plastic sheeting firmly anchored at the edges,
- e) using a prior approved curing compound applied in accordance with the manufacturer’s instructions, provided that in this case, the presence of the compound is not detrimental to subsequently applied finishes.

Whatever method of curing is adopted, its application shall not cause staining, contamination, or marring of the surface of the concrete.

The curing period shall be at least 5 days for concrete made with Portland cement, at least 2 days for that made with rapid-hardening Portland cement and at least 7 days if Portland blast-furnace cement is used. When atmospheric temperatures are below 5° C these minimum curing periods shall be extended by 72, 36 and 72 hours respectively.

CONSTRUCTION DETAILS

Holes, Chases and Fixing Blocks: — No holes or chases other than those shown on the working drawings or approved by the Department shall be cut or otherwise formed in the concrete. No blocks for the attachment of fixtures shall be embedded in the concrete unless approved by the Department.

Pipes and Conduits: — No pipes or conduits other than those shown on the working drawings shall be embedded in the concrete without the approval of the Department. The clear space between any such pipes and the clear distance between such-a pipe and any reinforcement shall be at least 25mm or the maximum size of the coarse aggregate plus 5mm, whichever is greater. The amount of concrete cover over pipes and fittings shall be at least 25mm.

Honeycombing and Other Defects: — After removal of the forms, if the concrete shows any defect in terms of the Specification for Finishes for that concrete, the Contractor shall, on the instructions of the Department, make good the defect at his own cost, by either removing and replacing the defective concrete, or by patching, all as approved by the Department and to the standard of finish required. No remedial work shall be carried out by the Contractor without the prior approval of the Department.

Building on Concrete Footings: — No structural load shall be imposed on concrete footings until at least three days after depositing the concrete in the case of mass concrete footings and after seven days in the case of reinforced concrete footings, or as may be directed by the Department.

RECORDS: —The Contractor shall maintain written records indicating: —

- a) the date on which each section was concreted, the time taken to place the concrete, and the position of that section in the Works and its construction joints;
- b) daily weather conditions with temperatures being recorded by maximum and minimum thermometers and
- c) the nature of samples and dates on which they were taken. In the case of cubes these shall also state the identification marks, test results and age, minimum strength required and position of parent concrete.

TESTS

Compressive Strength: — During the time in which each class of concrete, having a specified 28 day compressive strength equal to or greater than 20 MPA, is being placed, samples of the concrete shall be taken from the point of deposit at the rate of at least one sample from each 5m³ of concrete placed in columns, and from each 30 m³ or part thereof of concrete placed elsewhere, but in either case, nevertheless at least once a week. A group of at least three 150mm test cubes shall be made from each sample for testing at 28 days age. If the Contractor plans to execute further work which relies on previously completed work for support but for which the results of 28 day tests are not available, he is to prove the strength of that concrete by taking and testing at 7 days age an equal number of test cubes to that which is to be tested at 28 days age, prior to the commencement of the planned further work.

The cost of the necessary extra test cubes and testing will be for the Contractor's account. Each group of test cubes shall be deemed to represent the whole of the concrete from which sample was taken and shall be identifiable with the concrete.

The Contractor shall provide, at his own expense, sufficient moulds to keep pace with the rate of concreting. He shall also perform all tasks in respect of compressive strength testing except the actual crushing.

If ready-mixed concrete is used, site testing as specified herein shall still be undertaken, and only the results of such site testing shall be considered in determining the acceptance or otherwise of the concrete.

Grading Analysis: — If so directed by the Department, a grading analysis shall be made for each 40m³ of fine aggregate to be used and for each 75 m³ of the coarse aggregate to be used. The analysis shall be made by the method given in SANS Specification 1083.

Determination of Consistency: — When the slump test is used to measure the consistency of the concrete mix, it shall be carried out by the method given in SANS Method 862 with samples taken in accordance with SANS Method 861.

Costs of Tests: — to concrete, trial mixes, cement, aggregates, water and reinforcing steel shall be borne by the Contractor. The Contractor shall also bear the costs of any other tests (including load tests), which are required as a result of failure on the part of the Contractor to meet the requirements of the Specification.

An item against which the Contractor may allow for all costs in connection with tests on concrete cubes has been included elsewhere in these Bills of Quantities.

Testing Authority: — The crushing of cubes and testing of other samples except in the case of the clause “Determination of Consistency” shall be undertaken by an independent Authority as approved by the Department. The Contractor shall arrange with the Authority that copies of the results of all tests are sent direct to the Department.

ACCEPTANCE CRITERIA FOR STRENGTH OF CONCRETE: — Should any test result obtained from a set of three test cubes of concrete of a specific grade that have been made and tested as specified show that the strength is more than 3 MPA below the specified strength, the concrete represented by such results shall be deemed to have failed to meet the Specification. Should an examination carried out in terms of the clause “Procedure in the event of failure” satisfy the Department that the structural adequacy and durability of that part of the structure where the concrete concerned has been used, is not impaired, the concrete will be acceptable. The Contractor will however be required to review the mix design and any other factors influencing the quality to ensure that further concrete is acceptable.

Where three or more consecutive valid test results (i.e., results of sets of three test cubes that have been made and tested as specified) become available, the following criteria shall apply: —

- a) The average of any three consecutive valid test results obtained on concrete of a specific grade must exceed the specified strength by at least 2 MPA.
- b) If the criterion given in (a) above is not met but the average is at least equal to the specified strength, the concrete cast will be acceptable but the Contractor will be required to adjust the mix design and standard of control.
- c) Should the average result be less than the specified strength, an examination must be carried out in terms of the clause “Procedure in the event of failure” on that part of the structure in which concrete represented by the result has been used.

Alternatively, should a concreting operation be of such size or the testing be of such frequency that thirty or more valid test results (i.e., results of sets of three test cubes that have been made and tested as specified) become available within three months, the Contractor may choose, subject to the approval of the Department, to have the results assessed statistically. In such a case, the average of all the test results of a specific trade of concrete at *any stage* must exceed the specified strength by at least 1,7 standard deviations, failing which the Contractor will be required to adjust the mix design to ensure compliance with this criterion.

PROCEDURE IN THE EVENT OF FAILURE: — If after the evaluation of the test results in terms of the clause “Acceptance criteria for strength concrete” an examination of the concrete in the structure is necessary, one or more of the following procedures in the sequence given may be adopted at the discretion of the Department, and for the account of the Contractor, to determine the acceptability or otherwise of the concrete in that particular part of the structure: —

- a) An assessment of the stress level in the structure concerned in relation to the test result obtained.
- b) Non-destructive testing, subject to the availability of similar concrete of proven acceptable quality in comparable members in the same construction as a reference.
- c) The testing of drilled cores in accordance with the relevant SANS Standard Methods.
- d) Full scale load tests in accordance with Section 6 of SANS Code of Practice 0100: Part II.

Where load tests are, in the opinion of the Department, unsuitable or impracticable, and if an examination carried out in terms of the above does not show the concrete strength

to be acceptable, or if a tested portion of the structure fails to pass the tests, the Contractor shall, on the instructions of the Department, replace or strengthen by approved means: —

- each portion that failed or contains concrete that failed, as relevant, and
- any other portion, irrespective of strength, the functional purpose of which is affected by the portion or concrete referred to in (a) above.

NON-STRUCTURAL PRESCRIBED MIX CONCRETE: — Concrete for non-structural purposes shall be “Prescribed mix concrete” produced in accordance with the requirements indicated in the table below, and the Contractor is also referred to the foregoing Preambles insofar as they apply: —

TABLE E – PRESCRIBED MIX CONCRETE FOR NON-STRUCTURAL PURPOSES

Class of Concrete	Estimated minimum compressive strength in MPA at 28 days	Maximum nominal size of coarse aggregate in mm	Proportion of Constituents		
			Cement (Parts)	Fine Aggregate (Parts)	Coarse Aggregate (Parts)
A	1	37,5	1	4	8
B	15	19,0	1	3	5
C	20	19,0	1	2 ½	3 ½

Cement and aggregates shall be mixed by volume and the contents of a 50 kg sack of cement shall be taken to be 0.033 m³

The cement / water ratios and the maximum and minimum slumps for concrete shall be as previously listed in Tables C and D.

The Department shall have the right to vary the proportions of the constituents in any of the prescribed mixes as necessary to obtain the required compressive strength, optimum density and workability of the concrete. Any variation in the rates of the concrete will only be considered if the proportion of cement to the total volume of aggregate, in each case, is varied from that Specified.

Notwithstanding any requirements previously described, the Department may permit certain items of non-structural concrete in small quantities to be mixed by hand.

Where concrete is mixed by hand, the coarse aggregate shall be spread out on a timber, concrete or metal platform in a flat heap, the sand then spread evenly over the heap, followed by the cement also spread evenly, and the whole thoroughly mixed by shovelling from the centre to the side to form a ring, then back to the centre and again to the side. Water shall then be poured into the ring and the materials mixed into it and then back into the ring, the remainder of the water then added slowly as materials are mixed into it. Mixing shall continue until the colour is uniform and the consistency the same throughout the pile.

“NO-FINES” CONCRETE: — shall consist of one part of cement to eight parts of 19mm aggregate (1:8— 19mm stone) with a water/cement ratio of approximately 0,46. This water/cement ratio may be varied slightly to suit conditions on approval by the Department.

The quantity of water used shall be just sufficient to form a smooth grout, which shall completely coat every particle of aggregate, and also to ensure that the grout is just wet enough to form a small fillet at each point of contact between the stones. ‘No-fines’ concrete mixed with excessive water, which results in a thin grout which drops off the aggregate, will be rejected.

“No-fines” concrete shall be placed in its final position within 20 minutes of mixing and shall be placed in continuous horizontal layers. “No-fines” concrete shall be spade worked sufficiently to ensure that it fills the forms but vibrating, tampering or ramming will not be permitted.

BREEZE CONCRETE: — shall consists of one part cement to eight parts clean dry furnace ashes, the ashes being free from all coal or other foreign matter and graded up to particles which will pass a 26. 5mm ring from a minimum which passes a 4.75mm mesh. The finer materials from the screening to be first mixed with the cement into the mortar and the ashes added afterwards and thoroughly incorporated. The breeze concrete is to be mixed in batches not exceeding 0, 1 in 3 and each batch is to be immediately placed in position. The ashes for breeze concrete are to be obtained in an unscreened state and are to be kept dry so that sufficient fine material will be obtained from the screening to make the mortar.

FINISHES TO IN-SITU CONCRETE

Formed Finishes: — are the concrete surface finishes developed using formwork and whose standard of finish in each class shall be as described.

The Department shall be informed by the Contractor of any defect in terms of this Specification, and no remedial work shall be carried out by the Contractor without the prior approval of the Department. Any defect shall be made good at the Contractor's expense by either removing and replacing the defective concrete, or, in certain instances only, by patching, all as approved by the Department and to the standard of finish required.

Class F1 Ordinary Finish: — Formwork panels shall be of such quality that upon removal, the concrete is true and even, free from fins and recesses greater than 5mm size, honeycombing, large air holes and the like. Bolt holes shall be filled if so required by the Department.

Class F2 Smooth Finish: —This class of finish requires a high standard of concrete work, formwork and technique.

Concrete placed in any one structure to give this finish shall be made from cement and aggregates from the same source, and similarly, the grading of the aggregate shall be kept constant.

Formwork shall be metal or wrot timber in a new condition designed and constructed to suit the particular job in hand and with shutter bolts and joints between panes in a pattern approved by the Department. Joints between panels shall be watertight, but the use of sealing tape, which marks the concrete, shall not be permitted.

Construction joints shall be in the position and of the detail shown upon the working drawings. Should the Contractor wish to incorporate further construction joints or amend the position of those shown to suit his own requirements or technique, this may be allowed provided that all design considerations are met, that the prior approval of the Department is obtained and that any extra costs are borne by the Contractor. In the case of horizontal construction joints, the top edge of the concrete on the Class F2 smooth finish side is to be struck true and level with a trowel.

Special care shall be taken to ensure that forms are clean of all pieces of tying wire, nails and other debris at the time of concreting.

The standard of finish shall be such that, upon removal of the formwork, no further treatment, other than treatment of bolt holes if required shall be found necessary to provide a straight, smooth and uniform finish of good quality and consistent colour and texture, free of all honeycombing and large air holes.

UNFORMED FINISHES: — are those concrete surface finishes developed without the use of formwork -

Class U1 Ordinary Finish: — Immediately after placing, the concrete shall be finished by screeding with the edge of a wooden board of straight and true line and working between guides set accurately to level. No mortar shall be added and noticeable surface

irregularities caused by the displacement of coarse aggregate shall be made good by re-screeding after removing or tamping down the offending aggregate.

Class U2 Wood Float Finish: — The concrete surface shall first be brought to the standard Class U1 ordinary finish and then floated with a wood float. Floating shall be started as soon as the screeded finish is stiffened sufficiently and the bleed water has evaporated or been removed and it shall be the minimum necessary to produce a surface free from screed marks and uniform in texture.

Class U3 Steel Trowel Finish: — The concrete surface shall first be brought to the standard of Class U2 wood float finish with floating being continued until a small amount of mortar without excess water is brought to the surface and then when the floated surface has hardened sufficiently to prevent any more excess fine material from being drawn to the surface, troweling with a steel trowel. Troweling shall be performed with firm pressure such as will flatten the sandy texture of the floated surface and produce a dense uniform surface free from blemishes and trowel marks. Gradual surface irregularities shall not exceed 5mm over any 3m. The sprinkling of sand and/or neat cement on the surface to absorb excess moisture shall not be permitted.

Class U4 Power Float Finish: — The concrete surface shall first be brought to the standard of Class U1 ordinary finish using wooden screeding boards or steel rollers. After evaporation or removal of all bleed water and immediately the concrete is stiff enough to support the machine the surface shall be closed with a mechanical power float and then finished with a mechanical power trowel. The texture of the finished surface shall be either non-slip or polished as shown on the drawings. Irregularities shall be of long wavelength not exceeding a curvature of 2mm in 600mm. Under no circumstances shall sand and/or neat cement be sprinkled over the surface either to absorb excess moisture or to fill surface blemishes or irregularities. Power floats and trowels shall be operated by skilled operators.

TOLERANCES: — Clause 6 of SANS Specification 1200G refers. Unless otherwise agreed by the Department, 'Degree of Accuracy' shall apply to all concrete work and steel reinforcing.

SUPERVISION: — The construction of all concrete work shall, at all times, be under the supervision of a competent person experienced in the production and placing of high-grade concrete. He shall personally supervise all work relating to the concrete construction and pay special regard to: —

- a) The quality, testing and mixing of materials.
- b) The finish, stability and cleanliness of formwork and excavations.
- c) The cleanliness, correct positioning and maintenance in position of steel reinforcement.
- d) The transporting, placing, compacting and curing of the concrete. The construction and stripping of formwork.
- e) The production of samples, test cubes, slump and other tests.

GENERAL

Measurement and Payment: — The provisions of Clause 8 of SANS Specification 1200G will NOT apply and the system of measurement that is adopted in these Bills of Quantities is the only system of measurement that will be recognised in this Contract.

No deductions have been made for pipes not exceeding 200mm internal diameter, reinforcement, conduits, structural steel, bolts and the like.

Rates for Concrete: — are to include for mixing, handling and depositing (by hoisting or lowering) in the forms. Rates for items of reinforced concrete are to include for thoroughly working and packing around the steel reinforcement. All reinforcement, except where otherwise described, has been measured separately.

Rates for concrete surface beds are to include for laying in suitable size panels not exceeding 20m² or as may be directed. The Contractor is to allow in his pricing of the concrete for all construction joints.

Striking off and Curing: — of concrete slabs and surface beds has been measured separately. The rates for all other items of concrete including stairs and landings and concrete bindings, are, except where otherwise described, to include for all necessary striking off of surfaces and curing.

The rates for items of striking off and curing top surfaces of concrete shall, unless otherwise described, apply to level surfaces.

Where exposed sloping surfaces of concrete do not exceed the limits of pitches laid down for the measurement of back shuttering, the striking off and curing of the sloping top surfaces has been measured in the case of concrete slabs and surface beds, and in other-cases provision has been made for dressing the concrete surfaces to splay.

Where items of striking off and curing are described as to falls or ramps this shall include cross-falls, etc.

The rates for striking off and curing of surface beds formed in panels must also include for all necessary temporary formwork in forming the panels.

Rates for Formwork: — are to be for use and waste only (except where described as “permanent”) and are to include for fitting together in the required forms, propping, strutting, shoring, wedging, plumbing and fixing to true angles and surfaces, cambering formwork to slabs and beams where required, preparation and treatment of surfaces as necessary to ensure easy release during stripping, reconditioning as necessary before re-use, providing necessary temporary openings for the purpose of cleaning, inspection and placing of concrete, and for all straight cutting, splayed edges, intersections, notching and narrow widths, including waste and properly fitting at intersections, maintaining in position for periods as directed and for striking and removing.

Rates for items of formwork to soffits of slabs and to sides and soffits of beams, lintels and the like are to include for horsing exceeding 1,5m and not exceeding 4,5m high unless otherwise stated in the items.

Rates for formwork to soffits of stairs and landings are to include for all necessary horsing.

Rates for Permanent Formwork: — are to include for leaving in all formwork, props, etc. as permanent formwork shall be regarded as not being recoverable.

Rates for Steel Fabric Reinforcement: — are to include for lapping the reinforcement at all edges, as specified, for all cutting and waste, notching, etc. bending where required, wiring together at laps and for maintaining in position during placing of concrete.

Rates for Steel Bar Reinforcement: — are to include for all cutting, bending, hooked ends, wiring together at passing points, hoisting or lowering to the required levels, fixing in accordance with the detail drawings, cover blocks and maintaining in position during placing of concrete. The mass of mild and high yield stress steel bars shall be based on the values shown in Table E1 of SANS Specification 920— Appendix E (with no allowance being made for rolling margin and waste).

The mass of the binding wire required for fastening the reinforcement together is not included in the mass of the reinforcement. Provision for the cost of this wire shall be deemed to have been made by the Contractor in calculating the unit rate for the net mass (i.e. excluding the mass of binding wire) of the reinforcement.

4. **BRICKWORK**

SAND: — shall comply with the requirements of SANS Specification 1090, washed where necessary and screened through a 2360 micrometer mesh sieve.

CEMENT: — shall be Portland cement of normal setting quality complying with SANS

Specification 471 or Portland cement 15 complying with SANS specification 831. Cement containing more than 15 % blast furnace slag will not be permitted to be used.

LIME: — shall be hydrated lime complying with SANS Specification 523.

WATER: — shall be clean and free from injurious amounts of acids, alkalis, and other organic substances. If so required by the Department, the suitability of the water shall be proved by tests carried out by an approved laboratory.

CEMENT MORTAR: — unless otherwise described, shall be composed of one part by volume of cement to five parts by volume of sand.

COMPO MORTAR: — unless otherwise described, shall be composed of one part by volume of cement, one part by volume of lime to ten parts by volume of sand.

STRENGTH MORTAR: —where required, shall be of the class specified and as defined in Table C-I of SANS Code of Practice 0164—Part I.

MIXING OF MORTAR: — the materials are to be mixed dry on a non-absorbent and close jointed timber or iron platform until the mixture is of uniform colour with water added and the mixture turned over until the ingredients are thoroughly incorporated.

No cement mortar that has once commenced to set will be allowed to be used. Mixing platforms are to be cleaned and old mortar removed before any new batch of mortar is prepared for mixing. No mortar mixing by adding additional materials is permitted after 5 (five) hours.

TESTING OF STRENGTH MORTAR: — During the time brickwork is being laid samples shall be taken of the mortar being used as shall be directed by the Department. A group of three 70mm x 70mm x 70mm test cubes shall be made from each sample for testing at 28 days of age. Each group test cubes shall be deemed to represent the whole of the batch from which the sample was taken and shall be identifiable with the batch.

The testing shall be undertaken by an independent firm or institution nominated by the Contractor to the approval of the Department. An item for the testing of mortar cubes has been provided elsewhere in these Bills of Quantities.

BURNT CLAY COMMON BRICKS: — shall comply with SANS Specification 227 and are to be good quality, sound, hard, well burnt bricks, uniform in size and shape.

A sample load of bricks is to be approved by the Department and all subsequent loads are to be equal thereto.

BRICKS FOR FOUNDATIONS: — are to be as above but extra hard burnt bricks. Reject facing bricks may be used in lieu of extra hard burnt foundation bricks provided they are equal to a sample to be submitted to and approved by the Department. These bricks are also to be used for septic tank walls.

BRICKWORK: —unless otherwise described is to be in burnt clay common bricks and wherever practicable is to be in stretcher bond with the skins tied together with and including galvanized crimped wire wall ties in accordance with SANS Specification 28. The wire ties are to be of sufficient length to allow each end to be built into brickwork built into every fourth course and spaced at 450mm staggered centres (seven ties per square metre). The bricks are to be well wetted before being laid and the course of bricks laid last is to be well wetted before bedding the next course of bricks upon it. The brickwork is to have all perpend flushes up solid and each course is to be laid on a solid bed of mortar. No false headers are to be used. Whole bricks are to be used except where bats or closers are legitimately required to form bond.

Unless otherwise described one brick walls are taken at a nominal thickness of 230mm.

The joints of all walls to be plastered are to be raked out as the work proceeds to form key for plaster. All walls are to be carried up regularly so that no part is built more than 1,2m higher than the adjoining walls.

Mortar joints generally are not to exceed 10mm thickness unless otherwise indicated on the drawings. If a specific brick scale is indicated on the drawings, either drawn or written, it must be adhered to.

Solid bricks to X-Ray Room walls are to be used. If hollow core bricks are used, these are to be grouted up solid.

HOLLOW WALLS: — are to be formed of two thicknesses of brickwork as specified with cavity between, tied together, unless otherwise specified, with and including A.I.S.I. Type 304 stainless steel wire butterfly type wall ties in accordance with SANS Specification 23, of sufficient length to allow each end to be built into brickwork, built into every fourth course and spaced at 450mm staggered centres (seven ties per square metre). Cavities are to be kept clear of all rubbish, mortar droppings and projecting mortar.

BRICK LININGS TO CONCRETE: — unless otherwise described are to be tied to concrete with and including A.I.S.I. Type 304 stainless steel wire wall ties complying with SANS Specification 28 with one end embedded is to deep into concrete and other end built into the brick joints and spaced not less than seven ties per square metre.

REINFORCED BRICK LINTELS: — unless otherwise detailed are to be constructed in accordance with KZN Public Works Type Drawing.

PRE-CAST AND PRE-STRESSED CONCRETE LINTELS: — where specified, are to be of approved manufacture and the Contractor is to provide the Department with a certificate issued by the manufacturer certifying that the lintels are adequate for the purpose in terms of span, loading and number of courses and construction of brickwork above the lintel. The manufacturer is also to specify the minimum bearing required at each bearing end and the nature and period of temporary propping required. Rates or pre-cast pre-stressed concrete lintels are to include for any cement mortar filling required and for temporary propping in accordance with the manufacturer's instructions.

BAGGING DOWN BRICKWORK: — shall be carried out when the mortar in joints is still soft by rubbing over with wet rough sacking until all joints and crevices are evenly filled, including additional mortar if necessary to obtain an even surface or, when the mortar in joints is set, by rubbing over as described but including cement grout as necessary to fill up the joints and crevices.

CRAMPS: — for timber door frames shall be 1.6mm thick galvanized hoop iron 32mm wide with one end turned up 50mm and twice screwed to stile of frame and built 450mm deep into wall with other end turned up into brick joint and cranked as necessary where built into cavity wall. Cramps shall be built in approximately 330mm from top and bottom of stile and intermediately at not exceeding 825mm.

TIES TO WALL PLATES, RAFTERS, ETC.: — shall be 1.6mm thick galvanized hoop iron 32mm wide and at least 1500mm long with one end turned up and built in not less than ten courses deep into brickwork or embedded in concrete beams or slab and with end left projecting and wrapped around timber rafter and spiked to timber wall plate. Where ties are embedded to concrete beam or slab, they must be wrapped around the bottom steel bar reinforcement of the beam or slab.

WELDED MESH BRICK REINFORCEMENT: — shall be 55mm, 80mm, 155mm or 235mm wide consisting of two 3.55mm main high tensile steel wires at 50mm, 75mm, 150mm or 230mm centres respectively with 2.80mm high tensile-steel cross wires electrically welded at 300mm centres, lapped 150mm at end joints, 75mm at angles and built 110mm into connecting walls. No allowance has been made for laps.

BITUMEN EMULSION WATERPROOFING TO BRICKWORK: — The inner thickness of external superstructure walls whether hollow or solid, behind facing bricks, is to be bagged and painted with two coats of approved bitumen emulsion waterproofing compound.

FACING BRICKS. PAVING BRICKS, QUARRY TILES, ETC.: — Facing bricks shall comply with SANS specification 227. Facing bricks, paving bricks, quarry tiles, terra cotta grille blocks, etc. are to be of the types and colours specified, specially selected, free from blemishes, square on all faces, uniform in size, shape and colour and equal to a sample to be deposited with and approved by the Department.

Special care must be taken to preserve the arrases and faces of facing bricks, paving bricks, quarry tiles, etc. during transit and handling.

FACED BRICKWORK: — Facing bricks shall be sorted to ensure proper mixing of the bricks within the colour range of each type of facing bricks. Sudden changes in the general colour of faced brickwork in any one type of facing brick will not be acceptable. Sand used in mortar for faced brickwork is to be clean washed sand and sand from the same source is to be used throughout to maintain a uniform appearance. Faced brickwork is to be pointed as specified as the work proceeds. Keyed-in joints are to be formed with a round jointing tool and square recessed joints are to be approximately 6mm deep formed with a square jointing tool. All perpends are to be accurately kept. The bond is to be broken, if necessary, in the centre of panels above and below windows, above doors, between openings and in the centre of sides to piers. No broken bond will be allowed at reveals or quoins. All cutting to face bricks is to be done with a carborundum or other approved high-speed brick saw. Faced brickwork is to be protected from injury, mortar splashes, etc. and cleaned down with spirits of salts and scrubbed down with water at completion to the approval of the Department.

PAVING BRICKS AND QUARRY TILES: — unless otherwise described are to be pointed as the work proceeds with 6mm wide keyed-in joints. Paving bricks and quarry tile paving, sills, etc. are to be protected from injury, mortar splashes, etc. and cleaned down with spirits of salts and scrubbed down with water at completion to the approval of the Department.

FIBRE CEMENT SILLS: — are to be of approved manufacture without fixing lugs, even in shape, uniform in colour, free from cracks, twists and other defects, in single length between reveals and of the thickness and colour specified and equal to approved sample.

RATES

Brickwork Generally: — Rates for brickwork are to include for hacking the face, or raking out the joints, of brickwork where necessary to form key for plaster, etc. and for plumbing angles and surfaces, all square cutting, wedging and pinning against columns, beams, slabs, etc. for all waste in cutting and wire ties required in tying skins together as described.

Rates for hollow walls are to include in addition to the above for keeping the cavities clean and free of mortar droppings and for butterfly type wall ties, all as described.

Where items are described as cut and pinned, built in, bedded, wedged and pinned, etc. rates are to include for grouting in or bedding solid with 1:3 cement mortar, unless otherwise stated.

Where window units, etc. are described for building in as composite, rates are to include for assembling of units as required and, unless otherwise described, for tap screwing to coupling mullions or transoms, including holes:

Faced Brickwork, etc.: — Rates for all fair and faced brickwork, brick paving, grille block walls and the like are to include in addition to the foregoing for building or laying to true surfaces and angles, all fair square cutting and fitting and cleaning down to approval at

completion.

Rates for brick sills, copings, steps, margins, thresholds and the like shall include for fair ends and angles unless different bricks or tiles are used or special cutting is required.

Rates for items described as “Extra over ordinary brickwork” are to be for the extra cost of the facing bricks specified over common brickwork built in stretcher bond, and are to include for building in cement mortar consisting of one part cement to five parts clean washed sand and for pointing as described.

Rates for items described as “Labour and Material” are to be for the full cost of the facing bricks specified, and otherwise as above described.

Rates for all cut face brick linings are to include for cutting and bonding at ends.

Quarry Tiles: — Rates are to include for all square cutting and fitting, bedding and jointing in cement mortar consisting of one part cement to three parts clean washed sand, for pointing as described as the work proceeds and cleaning down to approval at completion.

Rates for treads, sills, copings, cappings, skirtings etc. are to include for pointing to exposed edges, ends and projecting soffits.

Air Bricks: — Rates for air bricks and air vent, gratings are to include for forming openings through the walls, for all necessary jack arches and turning pieces, for plastering all round the openings in cement mortar, and where in hollow walls, for building cavity solid all round in addition.

Fibre Cement Sills: — Rates are to include for all square cutting, waste, and fitting and for bedding in an approved epoxy adhesive.

Terra Cotta Grille Blocks: — Rates are to include for all square cutting and waste and fitting, bedding and jointing in cement mortar consisting of one part cement to three parts clean washed sand and for pointing with keyed in joints on both faces and into reveals of openings as the work proceeds.

5. WATERPROOFING

GENERAL: — All measurements are nett — no allowance being made for laps in sheet materials or for waste in cutting.

WORKMANSHIP: — All work is to be carried out to the approval of the Department by skilled and qualified workmen and in accordance with the methods prescribed in SANS Code of Practice 021 for waterproofing of buildings.

All work is to be executed in accordance with the instructions issued by the manufacturer of the material being used. Roof coverings and linings are to be laid to the falls, cross falls, etc. provided in the screeds or other surfaces to which they are to be applied.

Surfaces to be waterproofed are to be dry and cleaned of all dust, chips, etc. immediately prior to the commencement of this work and are to be free of any contaminating substances or projections that may damage the waterproofing materials being used.

POLYETHYLENE SHEETING: — is to comply with SANS Specification 952 and bear the SANS mark. The sheeting is to be laid with a minimum lap of 150mm, unless otherwise specified, at angles and junctions with laps sealed in accordance with the manufacturer’s instructions.

MASTIC ASPHALT ROOFING: — is to conform to SANS Specification 297 and is to be laid hot in two or three layers, as stated, with each layer of minimum 4mm thickness and laid to break joint with the underlying layer by not less than 150mm.

Prior to the commencement of any work, the specialists who lay the mastic asphalt roofing are to satisfy themselves as to the acceptability of the surfaces upon which the mastic asphalt is to be laid, as the said specialists will be held fully responsible therefore.

Mastic asphalt to surfaces not exceeding 10-degree slope is to be laid in two layers on and including one layer of approved reinforced waterproof building paper lapped 75mm at all edges. Rates are to include for all cutting and waste on building paper.

Mastic asphalt to surfaces exceeding 10 and not exceeding 20 slope is to be laid in two layers on surfaces which have been hacked, grooved or scoured to provide an adequate key. Rates are to include for the necessary preparation of the surfaces.

Mastic asphalt to vertical surfaces and surfaces exceeding 20-degree slope is to be laid in three layers on and including any necessary expanded metal lathing securely fixed to the surfaces to prevent creeping. Where vertical surfaces do not exceed 300mm in height the surfaces to receive mastic asphalt may alternatively be prime coated with a latex based bitumen emulsion primer prior to the application of the mastic asphalt.

Anile fillets to all internal angles are to be run in one operation.

Finishing coats of bituminous-based aluminium paint on mastic asphalt roofing have been measured separately.

FLEXIBLE GLASS-FIBRE REINFORCED POLYESTER WATERPROOFING: — shall be of the type specified, or other approved, supplied and laid in-situ by a specialist sub-contractor, all to the approval of the Department and shall carry a written 10 (ten) year guarantee.

The waterproofing applied in-situ shall consist of one layer of three-ply bituminous felt underlay bonded to the substrate and covered with flexible glass-fibre reinforced polyester waterproofing comprising a chopped strand glass-fibre mat having a minimum mass of 450g / m², impregnated with flexible unsaturated polyester resin and finished with two coats of abrasion-resistant flexible unsaturated polyester surface coating which shall not show any sign of the glass-fibre reinforcement. The total mass of the waterproofing (excluding the bituminous felt underlay) shall be not less than 1.8kg / m².

Chopped strand glass-fibre mat reinforcement is to comply with the requirements of SANS Specification 419.

All unsaturated polyester resins are to be suitable for their intended use and comply with SANS Specification 713 and are to be ultra-violet ray stabilised.

All flexible glass-fibre reinforced polyester waterproofing is to be finished to approved opaque colours (excluding red or orange tints), is to be properly cured, and is to be free from porosity, blisters, cracks, surface crazing or other defects which may affect its appearance or its performance, with the surface colours consistent throughout.

Samples of flexible glass-fibre reinforced polyester waterproofing are to be submitted to and approved by the Department and all work executed is to be equal to the approved samples.

EXPANSION JOINT SEALANTS: — Polysulphide sealants, where specified, are to be approved polysulphide sealants complying with SANS Specification 110 Type 2, well compacted into joint.

Rates are to include for priming joints where recommended by the manufacturer of the sealant being used with a suitable and approved primer.

All work is to be executed by the manufacturer of the material, or other specialist firm, all in accordance with the manufacturer's instructions.

RATES: — for all roofing and linings are to include for cleaning and preparing the surfaces to be waterproofed as before described, for protecting from damage and cleaning down, flood-testing if required and handing over in an acceptable and guaranteed watertight condition at completion.

Rates for sheet waterproofing materials are to include for all dressing, bending, narrow widths, angles, intersections, cutting and waste and where applicable for the extra material required for lapping and for sealing laps as described.

Rates for roofing described as laid on “flat” roofs are to include for laying to slopes not exceeding 100mm from the horizontal.

6. **ROOF COVERINGS**

CONCRETE ROOFING TILES: — shall conform to SANS Specification 542. The tiles are to be of pattern and colour specified and is to be even in thickness, uniform in shape and colour and free from cracks and blemishes. The tiles are to be laid to “straight bond” in accordance with SANS Code of Practice 062 with vertical joints and bottom edges of each course ranging perfectly straight.

Unless otherwise specified each tile in every third course, all tiles in eaves and ridge courses and tiles in every course on each side of hips and valleys shall be secured with copper clout headed nails driven into the battens or with approved non-corrodible tile clips and nails in accordance with the manufacturer’s instructions. Where nail holes in tiles have been cut off at hips, valleys, top edges, etc. new holes are to be drilled.

All ridge and hip cappings are to be of the types specified and of colour to match the roofing tiles. The cappings are to be bedded, jointed, pointed and torched up over roofing tiles in 1:3 cement mortar tinted to match the tiles. Where cappings having butt jointed ends are specified, an approved damp proof course conforming to Type C of SANS Specification 952 is to be fixed under, laid over the roofing tiles in accordance with the manufacturer’s instructions.

Barge cappings are to be of the types specified and of colour to match the roofing tiles. The barge capping tiles are, unless otherwise specified, to be bedded, jointed, pointed and touched up over roofing tiles in 1:3 cement mortar tinted to match the tiles with every tile drilled and secured with copper clout headed nails to timber barge boards or bearers (elsewhere measured).

Concrete tiles to residential units in non hail area’s are permitted.

“CHROMODEK” ROOFING SHEETS: - Shall be the secret fixed type, supplied with all fittings in full-length sheets in the profile and colour as specified. Sheets shall be a minimum of .58mm and maximum of .8mm thickness. When .58 thick sheets are used, purlin spacings shall be a maximum of 1.2mtrç and maximum 1.5mtrç for .8 thickness. Sheets shall leave the factory in the specified colour and any scratches etc., due to handling are to be ‘touched up’ on site after installation. All fixings, valleys, cappings and securing clips shall be to manufacturers’ recommendations and no variations shall be accepted without prior approval from the department.

0,58mm thick roof sheeting for purlins up to 1,2m spacing and 0,8mm thick roof sheeting for purlins exceeding 1,2m – 1,5m spacing.

In area’s up to 30Km from the coast, metal roof sheeting to be 0,58mm thick with special corrosion protection as supplied in “Global- Duro” roofing sheets. All other area’s to be 0,58mm as “Global-Tech corrosion protection. 0,58mm “Klip Lock 700 “ or “Craflock “ and 0,8mm “ Brownbuilt “. (0,8mm is recommended for high rainfall and snow fall area’s due to deeper trough.)

RATES: — for roof coverings, are to include for all necessary half tiles at verges and for all square cutting and waste at verges, abutments, and top and bottom edges and to both sides of ridges.

Rates for cappings, etc. are to include for all short lengths, cutting, waste and fitting at intersections.

All measurements are nett. No allowances have been made for overlaps.

CORRUGATED IRON ROOFING, CLADDING AND FITTINGS: — are to be of an approved brand and are to be manufactured from galvanized steel sheets of the thickness specified after galvanising and having a galvanized coating of "Isacor Coating Designation Z275" for inland areas and 'Z600" for coastal areas as specified.

Roofing, etc. shall be lapped one and a half corrugations at sides and 30mm at ends unless otherwise specified. Roofing, etc. shall be fixed to timber purlins, rails etc. with standard galvanized drive screws 65mm long and to steel purlins, etc. with 8mm galvanized hook bolts of the lengths stated.

Each screw or bolt shall be fitted with one lead washer and one bituminous felt washer and shall be spaced not less than one screw or bolt to every alternate corrugation across the width at end laps and ends of sheets and at each intermediate purlin or rail.

Rates for roofing, cladding and fittings are to include for: —

- a) Fixing as described.
- b) Bedding washers in an approved mastic sealing compound
- c) Coating projecting ends of hook bolts and nuts with bitumen after fixing
- d) All square notches, square cutting and waste, laps, fitting and drilling. All measurements are nett. No allowance has been made for laps.

FLUTED STEEL ROOFING, CLADDING AND FITTINGS: — are to be approved galvanized fluted steel sheets and fittings manufactured from galvanized steel sheets of the thickness specified after galvanising

(a) **Galvanized steel sheets and fittings:** — are to be manufactured from galvanized steel having a galvanized coating of "Isacor Coating Designation Z275" for inland areas and of "Z600" for coastal areas as specified with the sheets having a plain galvanized finish and the fittings an embossed galvanized finish.

Roofing, etc. shall be fixed to timber purlins, rails, etc. with standard drive crews of the lengths stated and to steel purlins, rails, etc. with 8mm galvanized hook bolts of the lengths stated. Each fixing screw or bolt shall be fitted with washers as recommended by the manufacturer of the roofing

Vertical cladding shall be fixed with broad flutes externally - unless otherwise described - to timber rails with standard galvanized drive screws 50mm long and to steel rails with 6mm diameter x 25mm long galvanized sheet bolts. Each fixing screw or bolt shall be fitted with washers as recommended by the manufacturer of the cladding including drilling steel rails as necessary.

(b) **Baked enamel finished galvanized steel sheets and fittings:** — are to be manufactured from un-passivated galvanized steel having a galvanized coating of "Isacor Coating Designation Z275" and finished where described in the items, with approved factory applied baked enamel finish of colours to be selected by the Department.

Roofing, etc. shall be fixed to timber purlins, rails, etc. with sherardised or stainless steel drive screws of the lengths stated and to steel purlins, rails, etc. with 8mm diameter sherardised or stainless steel hook bolts of the lengths stated. Each fixing screw or bolt shall be fitted with washers as recommended by the manufacturer of the roofing.

Vertical cladding shall be fixed with broad flutes externally, unless otherwise described, to timber rails with sherardised or stainless steel drive screws 50mm long and to steel rails with 6mm diameter x 25mm long sherardised or stainless steel sheet

bolts. Each fixing screw or bolt shall be fitted with washers as recommended by the manufacturer of the cladding including drilling rails as necessary.

- (c) **Generally:** — where sheet lengths are in excess of 12m these have been measured separately.

Roofing, etc. shall be lapped one flute at sides and 230mm at ends unless otherwise specified. Fixing roofing sheets are to be spaced one every crest along purlins at top and bottom edges of roof slopes and one to every alternate crest along intermediate purlins. Fixings to vertical cladding are to be spaced one to even alternate trough to each rail.

Fittings, unless otherwise specified, are to be lapped a minimum of 150mm and where necessary are to be drilled for and fixed with the fixings securing the roofing and cladding sheets.

Rates for roofing, cladding and fittings are to include for: —

- (a) Fixing as described and in accordance with the manufacturer's instructions.
- (b) Seam bolting all side laps at not exceeding 450mm centres with 6mm diameter x 25mm long sheet bolts or with 20mm x No. 14 self-tapping screws and each screw or bolt is to be fitted with washers as recommended by the manufacturer of the roofing.
- (c) Fixing of fittings where described as fastened to roofing, cladding, etc. with approved pop rivets spaced at not more than 340mm centres.
- (d) Sealing side and end laps of sheeting and end laps of fittings with one continuous strip of approved 5mm diameter pre-formed flexible sealant strip.
- (e) Coating the exposed heads of fixings and fasteners to baked enamel finished materials and cut edges of sheets and fittings with matching touch-up compound supplied by the manufacturer of the sheeting and in accordance with his instructions.
- (f) All square notches, square cutting and waste, laps fitting and drilling. No punched holes will be permitted.
- (g) Taking special care at all times to prevent damage to the finished surfaces of the baked enamel finished materials.

All measurements are nett. No allowance has been made for laps.

7. CARPENTRY AND JOINERY

NOMENCLATURE OF TIMBERS: — Timber described as "softwood" is to be South African softwood of the relevant type, grade, etc. as specified.

The names used for imported timbers are those given in Supplement No. 1 to SANS Code of Practice 12 under "Nomenclature of Standard Trade Names of Imported Commercial Timbers used in South Africa" and the Contractor is referred thereto.

TIMBER SIZES: — Sawn and wrot timbers are to be of the full sizes stated.

Where "out of" sizes have been shown for wrot timbers on the drawings, an allowance of 4mm for each wrot face off the sizes shown has been made.

Doors, fanlight, sashes, manufactured boarding, plywood, veneers, etc. must be of the full thickness specified.

Where doors, door frames, fanlights and frames; sashes, windows and frames are measured as numbered items, the overall sizes are given to the nearest 10mm.

Tolerances in nominal dimensions for imported timber shall not exceed the following:

- a) For nominal dimensions up to 76mm the actual dimension may be 2.5mm under for each 25mm
- b) For nominal dimensions 76mm and over the actual dimension may be 1.6mm under for

each 25mm.

STORAGE OF TIMBERS: — Timber delivered to the site is to be properly stacked above ground, either on bearers or platforms under cover and protected from inclement weather.

ORDERS: — for timber, are to be placed immediately after the Contract is signed, as the Contractor will be held responsible for any delay in delivery.

PRE-TREATMENT OF TIMBERS: — All permanent timbers installed in the buildings are to be treated against borer, cryptotermites, termites, and all wood destroying agencies with an approved preventative, all in accordance with SANS Code of Practice 05.

Any surface subsequently exposed by cutting or planing must be touched up with the same preservative solution and rates are to include for all preservative required.

The Contractor is to obtain a certificate from the merchants supplying the treated timber, to the effect that the timber has been treated against wood destroying agencies. The Department has the right to remove samples of the treated timber to have tests carried out by the Division of Entomology or any other Authority.

Temporary timber on the site, e.g. shuttering props, etc. must be free from wood destroying agencies. Any timber so affected is to be immediately removed from the site.

Materials which do not comply with the above requirements or are in any way damaged or discoloured by the pre-treatment must be replaced by the Contractor at his own expense, if so directed by the Department.

STRESS GRADING OF SOFTWOOD TIMBER: —The Mechanical Stress Grading of Softwood Timber (Flexural Method) shall be in accordance with SANS Code of Practice 0149.

STRUCTURAL TIMBER: — for carpentry is to be South African softwood in accordance with SANS Specification 563 and, unless otherwise specified, of Stress Grade V4, and branded accordingly. If it is necessary to use sizes that have to be re-sawn, these shall be re-graded and stamped with the respective SANS stress grade mark. Unless this is done, timber which is re-sawn is no longer considered as complying with the specification and shall on no account be used.

BRANDERING / BATTENS: — of cross-sectional size 50 x 50mm and under shall be South African softwood in accordance with SANS Specification 653 and branded accordingly.

JOINERY AND SHELVING: — Softwood for joinery and shelving shall be South African softwood (S. A. Pine) in accordance with SANS Specification 1359 and branded accordingly. All timber for joinery is to be air or kiln-dried to a moisture content of approximately 12 %.

Shelving to linen stores to be timber slatted with wall bands or free standing units as specified.

STRUCTURAL LAMINATED TIMBERS: — are to be of the sizes detailed, wrot on all faces and are to be manufactured by an experienced fabricator to the approval of the Department. Adhesives used must meet the requirements of the current SANS 1204 for external use.

The surface appearance of members shall be Class C (Constructional) or Class S (Selected) as defined in SANS Specification 876 and as stated in the items

FINGER-JOINTED TIMBERS: — are to be manufactured in accordance with SANS Code of Practice 096— “The manufacture of finger-jointed structural timber”.

Contractors wishing to use finger-jointed timber must supply a guarantee that the finger jointing complies with the above Code of Practice and that the glue is suitable for the particular member.

JOINTING OF PURLINS, FASCIAS, RAILS, BEAMS, ETC.: —shall, unless otherwise detailed, be as follows: —

Purlins, slating battens, etc. of cross-sectional size 50 x 76mm and under shall be jointed over the rafter. Larger sized purlins may be dealt with in the same way or by using some other suitable, recognised method. All purlins and battens shall be fixed to the supporting rafter by at least one nail skew driven from the direction of the ridge. Where the purlin or batten is fixed at more than 900mm centres, at least two nails shall be used at every fixing point.

Fascias shall be jointed over rafters.

Beams, rails, etc. shall be jointed over a support or at 1/5th span with a recognised joint using bolts, etc.

Roof and floor plates are to be halved at joints, angles and intersections and nailed together.

Floor joists and bearers are to have splayed heading joints nailed together and staggered to occur over bearers and sleeper piers respectively.

Sawn brandering is to be butt-jointed at heading joints and angles and where wrot, is to have splayed heading joints and mitred angles over all point of support.

HARD WOODS: — (Red Meranti and Sapele) are to be best quality, specially selected and well seasoned, free from all sapwood to the approval of the Department and are to be well kiln-dried.

Red Meranti is to be even in grain and colour, selected from “Standard and Better” grade from Malaysia. Sapele is to be *Entaindrophragma cylindrium* of F..A.S. grade.

PREFABRICATED TIMBER ROOF TRUSSES: -

Design: —The design of prefabricated roof trusses, bracing, and secondary members forming part of the total timber roof construction shall be prepared by a professional structural engineer (Truss Systems Engineer) strictly in accordance with SANS Code of Practice 0160 and the superimposed loading, unless otherwise specified, is to be taken as that for inaccessible roofs.

Analysis: — From the configuration and mechanism shown on the tender drawings the Truss System Engineer shall submit, through the Contractor, to the Department detailed calculations and working drawings showing timber sizes, connections, truss dimensions, etc.

This submission must include details of both trusses and bracing as specified below:

- a) **TRUSSES:** The analysis of the truss system is to include diagrams of the trusses with marked up members and nodes showing dimensions, positions of supports and positions and values of applied loads, which, if not specified in the tender documents, must be derived from an approved source of reference which shall be indicated in the analysis. Due account must be taken of any eccentricity particularly at supports.

The analysis must also indicate allowable stresses, internal axial forces, moments and resulting stresses, as well as timber sizes and grades and detailed plate sizes

- (b) **BRACING:** Bracing must be designed to withstand the forces specified in SANS Code of

Practice 0163 clauses 6 and 7.

If the bracing system incorporates trusses, the additional forces must be shown in the analysis of the trusses.

The drawings must give all the information necessary for the construction of the bracing.

An outline of the bracing system, including temporary bracing must be shown on a working drawing giving clear details of fixings and anchorages into the supporting structure at wall plate level. Interference of bracing with truss members must be taken into account. Moments caused by forces applied between node points of bracing trusses and the axial forces must be given in the bracing calculations, also sizes and fixings of the bracing system.

Submissions: — A copy of letter reference TR1 (attached at the end of this document) completed and signed by the Truss System Engineer must be submitted by the Contractor at the same time as the list of Sub-Contractors. Two sets of calculations and drawings with pertinent erection instructions for the whole roof construction as presented by the Truss System Engineer must be submitted to the Department for consideration and permission to proceed.

This in no way absolves the Contractor of his responsibilities.

Any modifications to design or drawings are to be arranged directly between the Truss System Engineer and the Department. It will be the Contractor's responsibility to ensure that information is presented to the Department in good time and no claims will be entertained in respect of any delays resulting from the late approval of drawings, etc.

Any difference in cost between the roof system initially submitted by the Contractor and the finally accepted system to meet the original design requirements will be for the account of the Contractor.

The Truss System Engineer will be required to inspect the roof structure and certify on letter reference TR2 (attached at the end of this document) that the construction is in conformity with his design, and any costs in this respect must be included in rates for the truss system.

If, in the opinion of the Department, further visits are necessary due to errors or omissions on the part of the Contractor or the Truss System Engineer the costs of these inspections will be for the account of the Contractor.

Fabrication and Storage: — Fabrication shall not commence until written permission has been given by the Department. The prefabricated roof trusses shall be manufactured, supplied and delivered to site by an approved manufacturer with all members accurately mitre cut, close butted and rigidly fixed together by approved galvanized metal spike connectors applied simultaneously to both sides of every joint by use of a mechanical press in accordance with SANS Code of Practice 0163.

Permissible deviations in fabrication of trusses are to be as specified in SANS Code of Practice 0155.

The following will not be permitted at joints: —

- b) knots, splits or finger joints
- c) varying member thicknesses
- d) plates not fully pressed into timber
- e) gaps between members exceeding 1.5mm average over the width of the mitred members.

Stress grade marks must be clearly visible on all members.

Relevant dimensions must be checked on site before fabrication. Trusses must be stored off the ground and under cover both at the factory and on site.

Erection and Bracing: — Unless otherwise instructed, erection must be carried out as described in “The Erection and Bracing of Timber Roof Trusses” published by the Truss Plate Association of South Africa and the National Timber Research Institute - CSIR.

Where the overall lengths of trusses exceed 13 m, complete braced bays are to be assembled on level ground and lifted into position suspended at maximum 3m intervals from a spreader bar. Alternatively, braced bays may be assembled in position on a minimum of two lines of temporary intermediate supports below node joints. Temporary supports must be removed before roof covering is placed.

The erector must be suitably qualified and must satisfy the Department that he can meet the specification.

Where the roof incorporates a hipped end, the construction is to commence with the hip, otherwise erection is to be commenced with a fully braced bay.

Temporary bracing must be installed as erection proceeds in accordance with the accepted design.

The Contractor must notify the Department in sufficient time in order that an inspection may be made before the roof covering is placed.

The trusses will be subject to the following tolerances: —

- a) maximum out of straight — length/400
- b) maximum out of vertical at any point—height/200.

Rates: — The Contractor is to allow in his rates for the roof trusses for the design, manufacture, supply, hoisting and fixing of the roof trusses and permanent bracing, any necessary temporary bracing, and for the costs of all inspections by the Truss System Engineer.

Purlins or battens for roof coverings have been measured elsewhere. Rates for roof trusses are also to include for the exposed rafters at eaves overhangs to be wrot all round and trimmed and splay cut as required.

INSULATION, WATERPROOFING AND DUST PROOFING MATERIAL FOR ROOFS: — shall be of an approved aluminium foil faced both sides laminated Kraft Paper and synthetic reinforced material fixed in accordance with the manufacturer's instructions, lapped 150mm at all edge, unless otherwise specified.

GYP SUM PLASTERBOARD: — is to be in accordance with SANS Specification 266.

GYP SUM COVED CORNICES: — are to be in accordance with SANS Specification 622.

FIBRE CEMENT SHEETS: — are to be in accordance with SANS Specification 685.

FIBRE CEMENT CELLULOSE SHEETS: — are to be in accordance with SANS Specification 803.

HARDBOARD: — is to be in accordance with SANS Specification 540. Tempered and un-tempered hardboard is to be conditioned in accordance with the manufacturer's instructions before fixing in position.

VENEERS: — All decorative face veneers are to be selected kiln dried of best quality of the respective timbers, free from knots, cracks, patchwork, sapwood and other defects and bonded under heat and hydraulic pressure with water-resistant synthetic resin adhesive.

Commercial veneers are to be selected rotary cut hardwood veneers and otherwise as

described above.

PLYWOOD: — is to be long grain three or five-ply type manufactured with hardwood veneers with selected face veneers as described, bonded under heat and hydraulic pressure with water-resistant synthetic resin adhesive and sanded to a smooth finish.

CHIPBOARD: — All joinery fixtures shall be manufactured from 18mm Moisture resistant V313 Melamine Faced Chipboard (Particle Board) only with 32mm worktop as specified.

BATTEN BOARDING: — is to be long grain three-ply boarding manufactured with kiln-dried South African Meranti softwood core formed of laminations not exceeding 45mm wide and faced on both sides with selected veneers as described, bonded under heat and hydraulic pressure with water-resistant synthetic resin adhesive and sanded to a smooth finish.

DECORATIVE LAMINATE LININGS: — are to be 1.2mm thick approved general purpose quality high pressure decorative melamine laminate sheeting with satin finish and of selected colours and patterns, and rates are to include for all square cutting and waste and square notching, close cut and mitred external angle intersections where required and for bonding to the timber backings with an approved adhesive in accordance with the manufacturer's instructions.

The linings are to be cut out of single sheets in obviate joints but where joints are unavoidable, the sheets are to be butted to form a tight inconspicuous joint.

NAILS AND SCREWS: — Mild steel nails are to be in accordance with SANS Specification 820. Mild steel and brass screws are to be round headed, countersunk, etc. as appropriate and are to be in accordance with SANS Specification 1171. Nails and screws shall be of the size, length and type appropriate to their respective uses.

PLUGS, ETC.: — Where items of woodwork are described as "plugged", these may be nailed to timber plugs or slips built into the structure, and where described as "plugged and screwed" these may be screwed to timber or approved patent fixing plugs.

SHOT FIXING: — Where items of woodwork are described as "shot fixed" these are to be fixed with an approved cartridge-assisted tool, and rates are to include for all nails, spikes, blanks, washers, cartridges, accessories, etc.

CARPENTRY: — Timbers are to be the best of their respective kinds, free from sap, shakes, large, loose or dead knots, wavy edges and other defects and thoroughly seasoned. Wrot surfaces are to be finished clean, smooth and free from tool marks.

Timbers shall be in as long lengths as possible.

Rates for sawn and wrot structural timbers are to include for notching, splay and birds mouth cutting, housing, halving, scarfing, cutting timbers to the required lengths, spiking and clinching and or hoisting and fixing timber in position.

CEILINGS: — are to be of the types described, fixed to timber brandering, bearers etc. as described and with panels set out so as to give even width panels not less than half a sheet wide at edges. Brandering shall be spaced at not more than 400mm c/c and fixed at right angles to sheets.

FLUSH PLASTERED CEILINGS: — are to be formed of gypsum plaster board of the thickness stated, generally in 1200mm widths and long lengths, fixed grey side down to timber brandering, bearers, etc. as described, with butted joints between the boards covered with 65mm wide strips of galvanized wire scrim fixed along both edges, including all square notches and square cutting and waste, and the ceiling finished with two coats of approved retarded hemi hydrate gypsum plaster applied in accordance with the manufacturer's instructions to a finished thickness of not less than 6mm, including pressing into scrim over joints and finished to a smooth polished surface.

TRAP DOORS:- 900 x 600 Prefabricated hinged trap door.

SUSPENDED CEILINGS BOARDS: — are to be of the types described or as specified – normally 6mm x 600mm x 1200mm embossed fibre cement boards - and inclusive of their component parts must be of sufficient strength to perform the function for which they are to be used, manufactured from best quality materials and conform to the requirements of the Fire Master. The exposed surfaces of all ceiling panels and supporting members are to be uniform in colour and free from surface blemishes.

Hangers are to be galvanized and are to be at maximum 1, 2mtr centres to meet the requirements of the specification, each with one end fixed to the suspension grid main bearers and the other end fitted with suitable galvanized fixing straps to the roof structure. Fixing points must be agreed to by the Department before any power shot fixings are made. Hangers must not be suspended from air-conditioning ducts. Hangers to be provided at all four corners of recessed light fittings.

Component parts and fixings other than aluminium must be non-corrosive and able to withstand atmospheric pollution. Surfaces of aluminium which are in contact with other materials when fixed, particularly ferrous metals, are to be suitably insulated to prevent electrolytic corrosion.

All work is to be executed by specialists in accordance with the manufacturer's instructions, and to the approval of the Department.

Rates for ceilings are to include for hangers, suspension systems, ceiling panels, for constructing the ceilings in a manner suitable for carrying air conditioning diffusers and light fittings in the positions required, for setting out the ceilings to layouts approved by the Department, for all non-standard size panels, for modifications to standard suspension systems as necessary to work around any air-conditioning ducts or pipes or light fittings, for all necessary square cutting and waste, notching and fitting around projections, columns, etc.

EXPOSED TEE-SYSTEM SUSPENDED CEILINGS: — are to be of the type described with main tees and cross tees spaced at the required centres to suit the sizes of panels used, with the cross tees fitted between and notched to form a flush fit with main tees unless otherwise described. All suspended ceilings to be fitted with shadow line trimming to perimeters.

Main and cross tees shall be holed as necessary and provided with timber wedges or steel clips to prevent ceiling panels from lifting.

CONCEALED TEE-SYSTEM SUSPENDED CEILINGS: — are to be of the type described with main and cross tee section bearers spaced at the required centres and all properly fitted together at intersections.

ALUMINIUM TRIMS TO CEILINGS: — are to be of extruded aluminium of 6063-TF or equivalent quality and temper, of the sections described. Anodised trims are to be of the colour stated.

Rates are to include for all cutting, fitting at intersections, mitres, etc. and rates for items described as fixed with screws are to include for countersunk drilling and fixing with approved countersunk stainless steel screws.

INSULATION MATERIAL FOR CEILINGS: — shall be 75mm thick resin bonded glass wool / mineral wool thermal insulation blanket complying with SANS Specification 1381 of the thickness specified, delivered to the site in unopened rolls in its original factory wrappings over solid gypsum boards or styrene of 25mm thickness as specified glued to suspended ceiling tiles.

DOORS: —

Flush Doors: - Semi-solid and solid laminated flush doors are to be of approved manufacture complying with SANS Specification 545.

The doors are to be finished on both sides with the facing veneers specified and concealed on both stiles unless otherwise specified, with hardwood edge strips and where doors are required to receive a transparent finish, the edge strips are to match the facing veneers.

Doors with rebated meeting stiles are to have edge strips to the meeting stiles not less than 19mm thick.

Each door or leaf of double door, described as hung to swing, is to be fitted with necessary hardwood reinforcing blocks for bottom shoe and top centre of spring hinge.

Unless otherwise specified, all flush doors are to be interior quality, but, where exterior doors are specified, the glue used must comply with Type WBP of SANS 2304.

FRAMED, LEDGED AND BRACED BATTEN DOORS, ETC.: — Doors described as filled in with V-jointed boarding are to be filled in flush on one side with tongued and grooved vertical boarding, V-jointed on one or both sides and of the thickness stated. The boarding is to be in narrow widths, closely cramped up, rebated on outer edge and housed to grooves in stiles and rails and twice brass countersunk screwed at each intersection.

Ledges and braces and inner edges of the abutting stiles and rails are to be chamfered to form a V-joint at junction with the boarding. Braces to fall from lock to hinge side.

ENTRANCES TO SECLUSION WARDS: - Entrances to seclusion ward buildings shall be fitted with remote controlled full height 'Man Trap' Security Cubicles with bell pushes fitted to both entry and exit sides and remote unlocking / release operation enabled from security booth.

Doors to Seclusion Rooms: - Doors to seclusion rooms are to be steel lined solid core units with 100mm x 100mm viewing panel, glazed with 40mm bullet proof glass in a steel frame. Steel lining for doors is to be epoxy laminated to doors and around edges. Internal steel lining to be primed and finished with approved epoxy paint. External face of doors to be finished in veneer as per DOH standard details. Doors to be hung to open inward on special 6mm galvanized steel door frames with lugs pre welded to frame to fit every third course of brickwork. The complete unit is to be hot dip galvanized and built into surrounding 230mm solid brick walls. No welding to be done on site.

NOTE: - Above Anti-Bandit Security doors are solely supplied by "Chubb" and "Bitcon Industries" as a complete unit with all fittings and ironmongery.

DOORS TO X-RAY UNITS

Entrance doors to X-Ray rooms shall be top hung sliding door size 1830 x 2032 x 40mm, complete with heavy duty sliding door track – 'Henderson' or other approved -, 2.2mm lead insert between panels and four door stoppers. Door is to overlap door opening 100mm each side when closed.

JOINERY: — All timbers shall be in as long lengths as possible. Lengths for joinery shall be single where possible and where joints are unavoidable, they shall be made as inconspicuous as possible.

Timber for grounds, firrings, blocks, plugs, etc. shall be sound and free from defects.

All joinery work is to include for work in connecting by mortise and tenon, dovetailing, housing, flush pinning, etc. as may be by required and for all screws, nails and glueing

together and for sinking flush all exposed screws unless otherwise specified.

Wrot surfaces and edges are to be steel scraped and sandpapered before and if necessary, after fixing.

Edges are to be arras rounded unless specified to be angle rounded.

“Arras rounded” denotes that the sharp edges are slightly rounded off and that no mitring is required.

“Angle rounded” denotes rounded from 3mm to 10mm radius and is to include for housed and mitred joints.

Hardwood doors, frames, jamb and soffit linings, etc. are to be treated on all surfaces with one coat of approved sealer before building in, etc. and rates for these items must include for this. Batten doors with tongued and grooved battens are to have the tongues and grooves well sealed before assembling. The sealer used shall be compatible with the finishing coats to be applied.

Horns of door frames are to be checked and splayed back where frames are fixed projecting or flush with surface and built in.

Where doors, fanlights or sashes are described as hung to butts on steel or aluminium frames, rates are to include for supplying necessary steel, brass or stainless steel screws.

Panel work is to be secured to the grounds, etc. with screws concealed behind the mouldings or by sinking the screws and pelleting as directed.

Joinery is to be framed up, but not glued or wedged, immediately the order is given to commence work. Wherever possible, joinery shall not be placed or fabricated in position until the plaster has dried out. Reasonable tolerance shall be provided at all connections between the joinery and building carcass so that any irregularities, settlements or other movements shall be adequately compensated. All joinery shall be accurately scribed to fit the contour of any irregular surface. Should the joints of any joinery open or give, such defective work is to be taken down, refitted and redecorated or replaced by new joinery at the Contractor's expense.

Only brass screws may be used for hardwood joinery.

The Contractor is to allow for cross-tonguing all solid wood sections unobtainable in single widths.

No joinery is to be primed until it has been inspected and approved by the Department.

All joinery liable to injury must be protected to the satisfaction of the Department. Rates must include for this temporary protection.

Rates for timber frames, mullions, transoms, linings, standards, rails, fascias, cornices, skirtings, beads, picture rails, etc. are to include for mitres, etc.

Rates for all items of timber-are to include for fixing and planting on as may be required with necessary panel pins or nails.

PARTITIONS:

These are to be of an approved system of standard construction, with an average sound rating of not less than 30 decibels taken over the whole face area.

Framing is to be natural finish anodised aluminium comprising posts at 1200mm centres unless otherwise described, with transom rails where specified, fitted between the posts, a

rail against ceiling and an aluminium standard skirting on each side at base, all neatly and securely fixed together.

Provision is to be made at the base of the partitions and in the ceiling rails and posts for electrical wiring, which will be installed under the electrical sub-contract, and the ceiling tails and end posts are to be fitted with continuous removable access plates.

Solid panelling is to be approved solid chip core panels of the thickness specified faced on both sides as described in the items.

Glazed panels are to be glazed as required, complete with all necessary natural finish anodised aluminium glazing beads and vinyl glazing strips.

Louver panels where specified are to be approved natural finish anodised aluminium adjustable louver sets each comprising head and sill weather bars and two jamb strips each fitted with louver brackets with spring loaded clips for and fitted with and including louvers as required and complete with tilt bars and operating lever handles. Where the openings are not the correct size to suit a full number of standard width louver blades, an alternate head weather bar must be provided to suit a fixed louver blade of the required width. The louver sets are to be fitted with the jamb strips positioned horizontally so that the louvers will be fixed vertically.

Partitions are to be in 1200mm modules, unless otherwise specified, except at ends where the odd lengths are to be made up by a narrow width at one end of the partition.

Ends of partitions against walls, window frames, etc. and the top edge of partitions against ceilings are to be fitted on both sides of partition with approved vinyl scribing sections fitted between the structure and the end post or top rail of the partition.

Plain openings are to have aluminium frames similar to door openings neatly fitted into the framing.

Doors are to be solid laminated flush doors complying with SANS Specification 545. The doors are to be finished on both sides with veneer as described in the items and concealed on both stiles with matching hardwood edge strips.

Where doors are described as having observation openings, these openings are to be of the sizes stated, glazed as specified with all edges bedded in approved neoprene gaskets and fixed with 10 x 25mm wrot matching hardwood rebated glazing beads mitred round and bradded to both sides.

Rates for doors are to include for all necessary additional aluminium framing to form door openings, and for hanging the doors on and including one and a half pairs of 102mm satin chrome finish brass hinges to each door.

All locks to doors in demountable partitions are to be supplied with two keys, and are to be controlled by the same master key as the mortise locks used elsewhere in the Contract when specified.

Unless otherwise specified all veneered solid panelling and doors are to be finished as follows: —

Prepare, stop with tinted stopping, apply an approved stain as necessary to achieve uniform colour appearance, and three coats of approved clear matt polyurethane finish including burnishing with steel wool between coats.

Rates for demountable partitions are to include for supplying, assembling, erecting, finishing, glazing and fixing complete between finished surfaces of concrete floors, plastered walls and ceilings, and all in accordance with the manufacturer's instructions.

DEMOUNTABLE PARTITIONS 50MM (NATURAL ANODISED).

Extruded Aluminium Sections

Supply and fit demountable "Kappa" partition system comprising anodized aluminium U-Channel fitted to suspended ceilings. Vertical split-post (mullion) to be fitted between floor and ceiling U-Channel at 1225mm c/c with angle brackets. Once framing is fixed, fit panels into place and secure with clip-on cover plates.

All aluminium sections may be anodized or powder coated in a variety of colours.

Panels

41mm thick semi solid core panels 2032 x 1200mm. The panels are made up of two outer skins of 3.2mm hardboard cladding. Lower panels to be provided with a 150mm wide solid mid-rail 850mm from the base of the panel to the centre of the mid-rail built in as part of the construction. The panels to be prepared before applying the final finish as specified.

Construction

Right angled corners to be formed with natural anodized aluminium radiused corner post fitted from floor to ceiling. Floor fixing to be angle brackets and ceiling fixing to be hidden block. The ceiling U-Channel butts up against radiused corner post.

Door Frames

Door frames to be natural anodized aluminium pre-fitted with woolpile gaskets, clipped into H-Profile at head and clipped into combination split post and cover plate at styles. The rebate on the door frame caters for standard doors of a thickness between 40mm and 44mm.

Glazing

Glazed panes to be framed with H-Profile fitted horizontally at top and bottom, butted against side of split-post and clip on cover plate combination and fixed with angle brackets. Glazing sections pre-fitted with woolpile gaskets and set into H-profiles and into post / cover plate combinations to form a neat glazing opening. Glazing beads pre-fitted with woolpile gaskets and then clipped into glazing section.

Termination

Openings for louver frames, sliding doors and windows, serving hatches and partition ends are to be lined with the aluminium termination section.

Skirtings

76mm high aluminium skirting to be glued to panels.

DRYWALL PARTITIONS:

Studs

50mm x 33.5mm x 0.5mm thick drywall galvanised steel studs are used. The studs to receive aluminium extrusions clipped onto both sides of the stud. Framing to be securely fixed to walls, floor and ceilings where necessary. Stud connectors to be used to join horizontal studs to vertical studs.

Floor Track

52mm x 25mm x 0.6mm galvanised sheet steel track to be used.

Panels

12,7mm thick tapered edged gypsum plasterboard panels used and decorated in situ with panels secured to either side of framework.

Patient care areas to be 12mm Supa Wood panels in framework as specified.

Construction

Internal walls are constructed by fixing drywall studs to floor track @ 600mm c/c. Wall and ceiling junctions are formed by fixing 84mm x 19mm aluminium ceiling and wall channel to wall or ceiling. The floor track is then fixed into this; alternatively, these components may be fixed simultaneously. The studs are then fixed to floor.

The partitions, unless otherwise described are to be 75mm thick and covered both sides with 12,7mm thick tapered edged gypsum board in 1200mm widths to height specified.

The gypsum boards are screwed @ +/- 300mm c/c at all intersections to the floor and head wall tracks and vertical studs.

Using self-drilling, self-tapping, rust proofed countersunk screws, with screw heads and joints between boards and between abutting edges of boards flushed up with an approved jointing material.

Exposed Aluminium Framing

Door frames, glazing termination and ceiling and wall channels to be natural anodised aluminium. 25 x 25 x 1.5 aluminium angle stuck to external corners of partitioning. 80mm high aluminium skirting glued in position.

Glazing

Aluminium glazing section is clipped onto the flanged end of the stud around the glazing perimeter. The glazing section has a recess to accept a rectangular clip-in glazing bead which enables 3mm-8mm thick glass to be received in the system. The glass is retained with various sizes of PVC glazing gasket.

Termination

Openings for louver frames, sliding doors and windows, serving hatches and partition ends are to be lined with the aluminium termination section.

Skirting

The system is designed to accept recessed base, female, 60mm high aluminium skirting.

Sound Insulation

75mm Fibreglass Cavity Bat with a 35g glass tissue or 75mm Isotherm "Acoustisorb" mineral wool blanket is to be installed between studding before fixing final outer panel.

All work is to be executed by a firm specialising in this type of work and all to the approval of the Department.

8. FLOOR COVERINGS, PLASTIC LININGS, ETC.

FLOOR SHEETING: — are to be of the composition, type, size and thickness specified with colour, pattern, graining, etc, consistent throughout, all to the approval of the Department.

Thermoplastic floor tiles: — are not to be used.

Fully flexible vinyl floor sheeting: — are to comply with SANS Specification 786 and is to be 2.5 mm nominal thickness.

Recessed entrance mats with brass frame at main entrance into a health facility as "Belgotex" Grimbuster or other approved. This to be positioned outside before entering.

In patient care area's, no perforations to floor covering is to be made. Eg door stops, door barrel bolt floor keeps etc.

Where the specified sizes and/or thicknesses of floor sheeting differ from those in the SANS Specifications, such items of floor sheeting shall comply in all other respects with the relevant SANS Specifications.

SKIRTINGS, STAIR NOSINGS, EDGING STRIPS, ETC.: —are to be of the types and sizes specified and are to be of approved manufacture

CARPET TILES AND SHEETING: — are to be of the types specified and of approved colours and patterns all to approval of the Department.

LAYING: —

Vinyl Floor covering laying procedure and polishing.

Site conditions required before the layer commences an installing of a Resilient Floor covering. Some of these conditions may appear obvious, but they are not always complied with. If any of the following recommendations are ignored, it is likely that a number of problems will arise during or after installation of the flooring.

1. All building materials and equipment, e.g. sand, scaffolding, tools, etc. should be removed. (Do not allow heaps of sand, concrete, etc., to remain on the surface of the sub-floor since moisture transfer to the sub-floor takes place).

2. All resilient flooring materials require a smooth, hard, clean and level surface, not only for appearance but also for achieving a satisfactory adhesive bond and long-term durability. The Specifier and the Main Contractor shall ensure that the sub-floor is acceptable to receive the resilient flooring specified in respect of levelness, smoothness, soundness and cleanness. (The SANS Code of Practice 070/1991 as amended 1993 Section 9.3 details the requirements in this regard).

The flooring contractor shall ensure that the sub-floor is sufficiently dry prior to the installation of the flooring material. The floor should be tested by means of a Hygrometer or a Tramex. (Of the instruments available for determining moisture levels in sub-floors, the most practical and accurate is the hygrometer).

SHEETING

Ensure that the following steps are followed during the installation:

1. Trim off factory leading edge before laying sheeting.
2. Align the sheet in position that there is an opening no bigger than 1mm between adjacent sheets. For the best results, the width of a credit card is an acceptable measure.
3. Apply adhesive according to the manufacturers' specifications.
4. Roll the floor during and after installation with a 68kg roller to maximize the adhesion between the sheeting and the adhesive.
5. Complete the welding 24 hours after the installation. Groove the joins open with a suitable hand or electric groover to a width of not wider than 3mm and not deeper than 1.5mm. Weld the joins with a hot air welding gun with temperature settings of between 4-6 temperature setting and use a speed nozzle that will not burn the material or damage the coating. Use a sharp spatula and guide plate and remove the excess welding in two stages.
6. All vinyl sheeting needs to be stripped and sealed 72 hours after installation. Please ensure you use a good quality product.

2.1 HYGROMETER

When a hygrometer is positioned on a sub-floor surface, the reading of the relative humidity of the entrapped air space is obtained.

- A hygrometer reading of less than 70% indicates that the sub-floor is sufficiently dry for flooring to be laid upon it.
- If the hygrometer indicates a final reading of more than 70% when the initial reading of the atmosphere was less than 70% then the sub-floor is unacceptably damp and must be allowed to dry out before any flooring is installed.
- If the hygrometer indicates a final reading of more than 70% when the initial reading of the atmospheric humidity was also greater than 70%, as can occur in coastal areas, then the following applied:
 1. If the final reading is significantly higher than the initial reading, then the sub-floor must be considered to be unacceptably damp.
 2. If the final reading is similar to, or less than the initial reading, then the moisture content of both the atmosphere and the sub-floor are similar.

2.2 TRAMEX CONCRETE MOISTURE ENCOUNTER (C.M.E.)

Any reading on the C.M.E. of 60% or less indicates acceptable moisture content for the installation of any vinyl floor covering.

3. Floor Preparation – New and Existing (old) Screeds

3.1 Use of screed smoothing compounds should be avoided except for making minor repairs, however should a full skim be required, then the most common method in both instances is the use of a smoothing compound e.g. **Pavelite** in combination with **Pavelite Bonding Liquid**, mixed to the correct ratio and consistency. Only recommended products, mixed strictly in accordance with manufacturers instruction should be used. Do not use smoothing compound on power floated finishes. It is recommended that in new structures the screeding should be as specified by “Tal” using “Screedmaster”, the pumped method.

A badly undulating floor may require grinding by mechanical means to improve the overall levelness. Although smoothing compounds such as **Pavelite** will improve the sub-floor it will not achieve perfection.

3.2 In cases where old vinyl floor coverings have been uplifted, leaving a bitumen adhesive residue, it is recommended that a strict procedure relating to the “Preparation of Sub Floors with Bitumen Residue”, be complied with.

(This method may not constitute good flooring practice, but has proved to be successful on many occasions. No guarantee is however given or implied).

4. Construction joints (saw cuts) and Expansion Joints

4.1 Construction joints (saw cuts) in the sub-floor should be cleaned out, and the sides of the saw cut be painted with **Pavelite Bonding Liquid** and allowed to dry. The joint should then be filled with a mixture of **Pavelite** and **Pavelite Bonding Liquid**. It is advisable to slightly overfill the joints, which when dry should be rubbed down with a carborundum stone.

4.2 Expansion joints should be filled with a suitable **Sealant** to prevent the ingress of dirt. **It is bad flooring practice to lay flooring over such a joint.** The flooring should stop at the edge of the joint and cover strips placed over the joint itself. Expansion joints and cover strips should be discussed and designed by a structural engineer.

5 Correct setting out is critical, and consideration should be given to the squareness of the area. It is safest to set out from the longest outside wall.

5.1. The recommended notching for a trowel to spread adhesive is a V notch of 1,5 x 1,5 x 1,5mm at 4,00mm centres. Consideration should however be given to the porosity of the sub-floor. Ensure the use of the recommended adhesive with the appropriate flooring. **Do not** spread the adhesive over a larger area than can be covered within the working/open time of the adhesive.

5.2 All installations must be rolled with a 68kg three sectional articulated metal floor roller on completion, within the working time of the adhesive.

5.3 Welding of sheeting is to be done only after 24 hrs after installation.

5.3. a. Trimming

While the welding rod is still warm, trim off most of the top half using a sharp spatula and spatula guide which fits over the welding rod. Carry out the final trimming using the spatula knife only, when the welding rod has cooled.

5.3.b Glazing

The trimmed welding rod will tend to soil more rapidly than the sheeting. It is therefore Important to glaze the surface of the trimmed welding rod.

6. After installation the flooring should be adequately protected, preventing damage caused by other trades working on the site.

7. The completed floor should not be washed or polished for a period of 72 hours after the installation in order to allow the adhesive to cure. This period will vary from one adhesive to another.

7.1 The vinyl floor covering must be cleaned with an approved water based floor Stripper, in order to achieve an acceptable standard of cleanliness for sealing. Avoid excessive use of water at all times

7.2 Foreign matter such as paint stains, tar, etc. which may not respond to the process must be removed by other means.

7.3 Three coats of a Water Based Emulsion floor dressing, shall then be applied on completely dry surface in accordance with the manufacturer's instructions, allowing one hour drying time between the first and second application of each dressing coat.

RATES: —for all floor coverings are to include for laying as described, for cleaning down backing surfaces before laying and or all square and raking cutting and waste and fitting, fair cutting at edges where no skirting occurs, protecting from injury, and for cleaning down, etc. as described, at completion.

Rates for all wall linings are to include for laying as described, cleaning down backing surfaces before laying, sizing backing surfaces if necessary to ensure proper adhesion, all square and raking cutting and waste and fitting, fair cutting at exposed edges, bending at angles and for all narrow widths and protecting from injury and cleaning down, etc. as described, at completion. Wall linings in widths not exceeding 300mm to returns, reveals and the like have not been measured separately, but have been included in the area of the general items of wall linings and rates must include or this.

Rates for skirting, stair nosing, edging strips, etc. is to include for fixing as described, cutting to lengths and fitting at intersections, mitres, ends, etc. and for cleaning down at completion.

9. IRONMONGERY

Ironmongery is to be to the approval of the Department and rates are to include for fixing screws of corresponding metal and finish and for oiling and easing as required at completion.

Where catalogue references are given, the articles are to be of the brand specified or other approved.

No two-lever mortise locks are to be used.

Mortise locks, cylinder locks, cupboard locks, etc. are to differ so that no key will pass a second lock, unless otherwise specified. Where mortise locks, cylinders, locks, etc. are specified to be "en-suite" they are to be made "en-suite" in the specified number of "suites". The "suites" are to be controlled by differing sub-master keys with a grand master key controlling all "suites", and no sub-master is to pass any lock of another "suite".

All locks are to be fitted with two keys and the locks are to be stamped with consecutive numbers and the keys to each are to be stamped to correspond with the lock.

Items of ironmongery specified as chrome plated or satin chrome finish are, unless otherwise specified, to be chromium plated or satin chrome finish on solid brass.

Items of ironmongery specified aluminium are to be natural anodised.

Where items of ironmongery are specified as fixed to pressed steel door frames, the Contractor is to ensure that the suppliers of the steel frames prepare the frames for all keeps and do all mortising and drilling required and receive all information necessary regarding ironmongery. Preparation of steel doorframes for ironmongery has been measured elsewhere.

Where tests of ironmongery are described as "plugged and screwed" these are to be screwed to patent fixing plugs of approved manufacture, and this shall include for plugging and screwing to brickwork or concrete.

Key tags are to be 40mm diameter x 3mm thick plaster of approved colour, engraved on face with the required number of letters and numerals finished in an approved colour, and the tag is to be holed for and fitted with a steel split ring and fixed to key.

Engraved plastic door signs and numeral plates are to be of 5mm thick clear plastic with square polished edges all round with an approved coloured background and sans-serif letters and numerals as described in the items, reverse engraved in the plate with splayed sides and flat reading face and finished in an approved contrasting colour. Each sign is to be twice drilled for and fixed to softwood or hardwood, unless otherwise described, with chromium plated round beaded brass screws. Unless otherwise described, the signs are to be 50mm high with 30mm high, engraved letters or numerals and are to allow a minimum margin of 25mm at both ends. All signs are to be equal to sample to be submitted to and approved by the Department.

Pictorial plastic signs are to be of 5mm thick clear plastic of the sizes stated in the items with square polished edges all round and with the silhouette described in the items applied to the back of the plate by means of the silk screen process in an approved colour and the whole back of the plate finished in an approved contrasting colour. Each sign is to be four times drilled and fixed to softwood or hardwood, unless otherwise described, with chromium plated round-headed brass screws. All signs are to be equal to sample to be submitted to and approved by the Department.

10. STRUCTURAL STEEL WORK

GENERALLY: — The fabrication, assembly and erection of structural steelwork is to be executed in accordance with SANS Specification 1200H — Structural Steelwork (a copy of which the Contractor will be required to keep on site so that it can be referred to at all times during the Contract) with the following amplifications and amendments: —

INTERPRETATIONS: — Clauses 2.1 and 2.2 refer. This preamble, together with any other supplementary preambles appearing in these Bills of Quantities shall be deemed the project specification and are the "Portion 2" referred to in Clause 2.2.

DEFINITIONS: — Clause 2.3 of SANS Specification 1200H refers. All references to the Engineer shall be deemed to mean the Department.

SUB-CONTRACTORS: — The Contractor shall either (a) have adequate satisfactory and approved experience in this type of work or (b) employ an approved specialist structural steelwork Sub-Contractor. The Contractor, in the case of (a), or the specialist Sub-Contractor, in the case of (b), shall employ at all stages of the Works both on and off site a competent Supervisor experienced in the work.

MATERIALS: — Unless otherwise shown on the drawings or hereunder, all rolled sections shall be hot rolled mild steel, and all materials shall comply with one of the following: —

- a) Weldable Structural Steels to SANS 4360:
- b) Hollow sections to SANS 4848 Part 2 and SANS 6323.
- c) Cold rolled sections to SANS 2994.
- d) Black bolts and nuts to SANS 135.
- e) Precision bolts and nuts to SANS 136.
- f) High-strength friction-grip bolts and nuts to SANS 1282.
- g) Flat and tapered washers to SANS 1149.
- h) Electrodes for welding to SANS 455.

SHOP DETAIL DRAWINGS: — The Contractor shall prepare shop detail drawings, in conformity with the details shown on the structural steelwork drawings and to show all information necessary for complete fabrication, assembly, erection and painting. In the preparation of the shop detail drawings the Contractor is to comply with the requirements of SANS Code of Practice 0162.

The cost of preparing all necessary shop detail drawings and copies thereof is to be allowed for by the Contractor in his rates.

The Contractor shall submit two copies of his shop detail drawings to the Department for approval at least 10 days before fabrication of the member concerned is due to commence. Such approval does not imply that a complete and comprehensive check of the detail drawings has been carried out, and the Contractor shall remain responsible for ensuring that the steelwork is correctly fabricated, assembled, erected and painted.

SUBSTITUTION OF SIZES, ETC.: — No substitution of sizes or joints additional to those shown on the drawings shall be made without the prior approval of the Department. Except in cases of proven non-availability of materials specified, any additional costs involved due to substitution shall be for the Contractor's account.

FIXINGS: — The positions and manner of fixing the hangers for suspended ceiling air-conditioning ducts, pipe installations, etc. to the structural steelwork are to be approved by the Department before work on such installations commences.

FABRICATION, ASSEMBLY AND ERECTION

Welding: — shall be carried out in accordance with SANS Code of Practice 044 and the relevant recommendations of SANS Code of Practice 0162 and SANS 5135, and in any case of conflict, the SANS Codes of Practice shall be deemed as binding.

All welders employed on the Works shall be currently classified at least as grade 2 welders as defined by SANS Code of Practice 044. Should the Department so request, proof of the classification shall be produced.

Unless otherwise specified all welds are to be continuous fillet welds of 6mm leg length or not less than the thinnest plate or section being welded.

Handling, Storage and Erection: — of members is to be undertaken in such a manner to prevent overstress or damage. Should overstress or damage occur, the Department shall be informed and his instructions sought.

Storage shall be arranged such that damage to applied finishes is prevented.

All plant and equipment used in the erection of structural steelwork shall be adequate in every respect. The Contractor shall allow in his rates for all necessary temporary bracing, and for maintaining and finally removing such temporary bracing.

Fixing of Bolts, etc.: — Unless approved by the Department, no pre-drilled fixings for bolts, etc. will be permitted through hollow section members. Any hollow section member that has been drilled or punctured in any way shall be considered condemned and must be replaced to the satisfaction of the Department.

INSPECTION AND TESTING

Facility for Inspection: — The Contractor shall afford to the Department all reasonable access to inspect the steelwork at any stage of its fabrication, and shall give due notice before delivery of steelwork to the site to allow inspection and tests to be conducted if so required by the Department.

Cost of Tests: — The cost of all tests required by the Department shall be borne by the Administration, except that the costs of the following tests shall be borne by the Contractor:-
(a) Testing of welders and equipment
(b) Such tests (including load tests) as may be necessary by failure on the part of the Contractor to meet the requirements of the specification.

Procedure in the Event of Failure: — In the event of a failure of a test, the Contractor shall

either replace the defective item or prove its sufficiency by means of a load test carried out in accordance with Appendix B of Chapter 6 of the South African Standard Building Regulations. If so required by the Department the Contractor shall also demonstrate by means of tests at his own cost that all like members meet the requirements of the Specification.

PRIMING OF STRUCTURAL STEELWORK

General

(a) Painting conditions.

No painting shall be undertaken when one or more of the following conditions exist: —

- (i) The atmospheric or steel temperature is below 10⁰ C,
- (ii) The atmospheric or steel temperature is expected to fall below 7⁰ C before the paint is dry,
- (iii) The atmospheric or steel temperature is high enough to cause damage to the paint film,
- (iv) In fog or mist,
- (v) The relative humidity is greater than 90 %,
- (vi) Surfaces are or will be wet or damp from rain or other causes,
- (vii) Surfaces are contaminated by dirt, dust, grease, oil or other matter detrimental to painting,
- (viii) Wind will deposit dust onto un-dried surfaces.

(b) Extent of shop painting.

All surfaces shall be primed as described in the shop except: —

- (i) Those to be encased in concrete which are to be left as prepared metal; unless otherwise specified
- (ii) Contact surfaces of high strength friction-grip bolt connections which are to be left as prepared metal
- (iii) Edges or faces yet to be welded which are to be left as prepared metal over sufficient width from the weld to avoid contamination of the weld or damage to the paint by the effect of welding.

(c) Paint identification, storage and preparation.

All paint shall be supplied in unopened original containers showing the manufacturer's name and trademark date of manufacture and the relevant SANS or other specification number.

No paint shall be used past its maximum life span but otherwise oldest paint shall be used first. Containers shall not be opened until required and opened containers shall be used before unopened containers

Before use, paint shall be thoroughly stirred and prepared in accordance with manufacturer's instructions.

(d) Thinning.

No paint shall be thinned except strictly in accordance with manufacturer's instructions.

(e) Dry film thickness.

Where not specifically later stated this shall be in accordance with manufacturer's instructions for spreading rates. A tolerance of approximately 10% of that thickness will be allowed.

(f) Touching-up surfaces.

Surfaces shall be protected against damage, but should this occur, then the paint shall be rubbed down over the damaged and surrounding area to a sound surface and then restored by re-applying the removed coat properly feathered in with the existing.

Upon completion of site connections, these connections shall be stripe painted with the specified primer before any further painting is carried out.

Class P1 Preparation and Priming Coat: — Unless otherwise specified, rates for structural steel-work are to include for Class P1 Preparation and Priming Coat as follows:-

(i) Surfaces are to be cleaned in accordance with SANS Code of Practice 064 to remove all rust, scale, grease, oil, etc. endeavouring to bring the surface to a bright metallic condition, and painted, unless otherwise specified, with one coat of red -oxide zinc chromate primer in accordance with SANS Specification 909 prior to despatch from the works.

(ii) Upon delivery to the site and again after erection any bared or damaged surfaces are to be made good with similar primer.

The Contractor is advised that the finishing coats of paint to be executed after the erection of the structural steelwork have been measured elsewhere.

Class P2 Preparation and Priming Coat: — Where specified, rates for structural steelwork are to include for Class P2 Preparation and Priming Coat as follows: —

(i) Surfaces shall be thoroughly cleaned by sandblasting to Swedish Standard SIS 055900 standard Sa 2½ to give minimum peak to valley profile of 50 micrometer when measured by SANS Draft Test Method No. 772.

(ii) Surfaces shall be blown thoroughly clean with compressed air and within four hours of sandblasting, one coat of “Plascon SN 162 Ironguard-4-Zinc” or other approved primer of minimum dry film thickness of 75 micrometer shall be applied by pressure pot spray system in accordance with the manufacturer’s instructions in the shop.

(iii) Upon delivery to the site and again after erection, any bared or damaged surfaces are to be made good with similar primer.

The Contractor is advised that the finishing coats comprising one intermediate coat and one finishing coat of chlorinated rubber paint to be executed after the erection of the structural steelwork have been measured elsewhere.

Class P3 Preparation and Priming Coat: — Where specified, rates for structural steelwork are to include for Class P3 Preparation and Priming Coat as follows: —

(i) Surfaces shall be thoroughly cleaned by sandblasting to Swedish Standard SIS 055900 standard Sa 2½ to give maximum peak to valley profile of 50 micrometer when measured by SANS Draft Test Method No. 772.

(ii) Surfaces shall be blown thoroughly clean with compressed air and within four hours of sandblasting, one priming coat of “Epidermix 352” or other approved epoxy coal tar of minimum dry film thickness of 75 micrometer shall be applied in the shop.

(iii) Upon delivery to the site and again after erection, any bared or damaged surfaces are to be made good with similar primer.

The Contractor is advised that the finishing coat comprising a further coat of epoxy coal tar to be executed after the erection of the structural steelwork has been measured elsewhere.

MEASUREMENT AND PAYMENT: — The provisions and Clause 8 will **NOT** apply and the system of measurement which is adopted in these Bills of Quantities is the only system of measurement which will be recognised in this Contract.

RATES FOR STRUCTURAL STEELWORK: — Rates for structural steelwork are to include for all necessary cutting to lengths, splay cut ends, shaping, holing, tapping, threading, forging, turning, assembling, welding, and fixing in position.

11. **METALWORK**

PROPRIETARY MATERIALS: — Where proprietary materials are specified, the materials used are to be of the type, specified or other approved by the Department.

RATES: — for all metalwork, unless otherwise stated, are to include for cutting to length, shaping, turning, threading, forging, fitting, assembling, riveting, welding, welded running joints, filing smooth, also for all screws and holes and hoisting and fixing in position. All screwed work is to have full threads.

WELDING AND BRAZING: — Where items are described as welded or brazed, rates must include neat welding or brazing by experienced workmen using a recognised process and for cleaning and filing or grinding off smooth, all to approval. All welding is to be continuous unless otherwise described.

SCREW FIXINGS: — Where items are described as tap screwed, grub screwed, set screwed, etc. rates must include for the necessary screws, for drilling all components and for tapping the components where necessary to receive such screws.

PIPE MEMBERS: — All galvanized mild steel pipe members are to be “medium” pipes complying with SANS 1387. Diameters of pipes, unless otherwise stated, are normal internal diameters.

PRIMING OF STEELWORK: — All items of fabricated mild steel except where described to be galvanized, are to be cleaned in accordance with SANS Code of Practice 064 to remove all scale, rust, grease, oil, etc. endeavouring to bring the surface to a bright metallic condition, and painted, unless otherwise specified, with one coat of red-oxide zinc chromate primer in accordance with SANS Specification 909 prior to despatch from the works.

GALVANISING OF STEELWORK: — All steel surfaces described to be galvanized are to be thoroughly sand, grit or steel shot blasted to white metal in accordance with SANS Code of Practice 064 and fluxed ready for galvanising, and the completed unit is to be hot dip galvanized after fabrication in accordance with SANS Specification 763 for general applications on the relative thicknesses of metal.

The zinc coating shall be continuous and of even thickness over all surfaces entirely free of bare spots, dull, rough patches, blisters and other imperfections and shall show no signs of peeling. Where site welding has to be done, the welds are to be properly cleaned down and cold galvanized to the approval of the Department.

If requested by the Department, the manufacturer shall carry out tests to prove that the requisite mass / thickness of zinc coating is applied and that it is of uniform thickness. The tests shall be made by attaching a test piece of mild steel, approximately 250 x 25 x 6mm, by means of wire, to an article being galvanized, and subjecting the test piece to the same cleaning, fluxing and galvanising treatment as the article being galvanized, and at completion, the test piece tested by a method approved by the South African Bureau of Standards, the cost of which will be borne by the Contractor.

CHROMIUM PLATING OF STEELWORK: — All items of fabricated mild steel described to be chromium plated are to be properly de-greased, cleaned and polished perfectly smooth before plating and all in accordance with SANS Specification 728. All items are to be first nickel-plated then chromium plated to provide a bright mirror finish and all plating is to be equal to sample to be submitted for the necessary approval by the Department.

PRESSED STEEL DOOR FRAMES: — shall be manufactured from mild steel sheet 1.60mm thick for single rebated frames and 1.20mm thick for double rebated frames. Rebates shall be suitable for 42mm thick doors and fanlights.

The sections are to be accurately bent to form the profiles. Corners are to be mitred and welded and reinforced at back with 1.60mm thick steel angle sections. Transoms for

fanlights are to be let into the jambs and welded. All welds are to be solid and cleaned off flush, leaving a perfect outside finish.

Each frame is to be fitted with one pair of sturdy angle or channel section tie bars at base, welded below the frame, and where required for additional strength, cross struts of the same section are to be welded between and at right angles to the main tie bars. Each frame is also to be fitted with one 'diagonal brace as temporary support, standard 230mm long corrugated adjustable building-in lugs at jambs, three rubber shock absorbers in rebate of lock jambs of frames for single doors and one rubber shock absorber, for each leaf in the rebate of the head or transom of frames for double doors.

All frames are to be primed on all surfaces with an approved red oxide zinc chromate priming coat in accordance with SANS Specification before leaving the manufacturer's works, unless specified to be hot dip galvanized, and rates are to include for touching up where necessary with similar primer after building in.

Where frames are specified to be galvanized they are to be hot dip galvanized after manufacture in accordance with the relevant provisions of SANS Specification 763 for general applications on the relative thicknesses of metal.

Frames, unless otherwise described, are to be fitted with one and a half pairs of 100mm five-knuckle loose pin steel hinges, unless otherwise specified for each door or each leaf of double door and with one pair of 75mm five-knuckle loose pin steel hinges for each fanlight. The three-knuckle leaf of each hinge is to be welded into the frame or transom.

Where frames are described to be fitted with brass butts, the frames are to be checked out and fitted, unless otherwise specified, with one and a half pairs of 100mm double bronze washered brass butts for each door or leaf of double door, unless otherwise described, as one pair of 75mm brass butts for each fanlight, with open leaf of each butt secured to the frame or transom by means of 6mm diameter countersunk headed brass set screws screwed to and including a 3mm thick steel backing plate of suitable size welded to frame or transom and drilled and tapped to receive the set screws.

Where frames are described to be fitted with aluminium hinges the frames are to be checked out for and fitted, unless otherwise specified, with one and a half pairs of 100mm five-knuckle aluminium hinges of 6082 alloy with nylon bushes for each door or leaf of double door, unless otherwise described, and one pair of similar hinges to each fanlight, with the three-knuckle leaf of each hinge secured to the frame or transom by means of 6mm diameter countersunk headed stainless steel set screws screwed to and including a 3mm thick steel backing plate of suitable size welded to frame or transom and drilled and tapped to receive the set screws.

Where frames are to be prepared for the top centres of floor spring hinges, a 6mm thick steel backing plate of suitable size is to be welded into the back of the frame and drilled and tapped to receive the fixing screws of the top centre.

The preparation of frames or all items of ironmongery, other than butts, has been measured separately and the rates against these items are to include for all drilling, mortising, tapping for screws, etc. required for the fixing of keeps, brackets, etc. of the items of ironmongery described. Preparation of frames for locks and latches is to include, in addition to the above, for recessing and fitting the frames with and including standard keeps and adjustable striking plates to suit the types of locks and latches used and with totally enclosed mortar guards 1, 15 metre high above finished floor.

Door and fanlight sizes are given to the nearest 10mm. The building in of frames has been measured separately.

STAINLESS STEEL DOOR FRAMES:- shall be manufactured from grade 304 stainless steel sheet 1.60mm thick for single and double rebated frames to profiles as per detailed drawings. Rebates shall be suitable for 42mm thick doors and fanlights. Stainless steel

frames to be used only in Patient Treatment facilities.

PRESSED STEEL CUPBOARD DOOR FRAMES: — shall be manufactured from 1.20mm thick mild steel sheet standard sections, having rebates for 42mm thick doors, and fitted with transoms and/or mullions where required and with sill section allowing the cupboard doors to be taken down to general floor level with the floor level inside cupboards not less than 12mm above general floor level. The frames are to be 102mm wide overall.

The sections are to be accurately bent to form the profiles. Corners are to be mitred and welded and reinforced at back with 1.60mm thick steel angle sections. Transoms, mullions and sills are to be neatly fitted at intersections and welded. All welds are to be solid and cleaned off flush, leaving a perfect outside finish.

All frames are to be fitted with rubber shock absorbers to the lock jambs of single doors, and to the head, transom and sill of double doors. Each door is to be fitted with standard corrugated adjustable building in lugs at jambs.

All frames are to be primed on all surfaces with an approved red-oxide zinc chromate priming coat in accordance with SANS Specification 909 before leaving the manufacturer's works, unless specified to be hot dip galvanized, and rates are to include for touching up where necessary with similar primer after building in.

Where frames are specified to be galvanized they are to be hot dip galvanized after manufacture in accordance with the relevant provisions of SANS Specification 763 for general applications on the relative thicknesses of metal.

Frames are to be fitted with one pair of 100mm five-knuckle loose pin steel hinges for each lower door or each leaf of lower double door and with one pair of 75mm five-knuckle loose pin steel hinges for each upper door or each leaf of upper double door. The three-knuckle leaf of each hinge is to be welded into the frame or mullion. Frames for single cupboard doors shall be prepared for locks or catches as specified and the frames for double doors are to be prepared for two barrel bolts for the first closing leaf of lower doors and one barrel bolt for the first closing leaf of upper doors.

Overall sizes are given to the nearest 10mm. Building in of the frames has been measured separately.

STEEL WINDOWS AND DOORS: — shall be in accordance with SANS Specification 727 and the frames are to be provided with fixing lugs or are to be holed for screwing as required.

Industrial type windows are to be suitable for glazing from the inside and all other windows from the outside, unless otherwise described.

Side hung and vertically pivot hung sashes shall open to at least 90 degree horizontally pivot hung sashes to at least 80 degree and bottom hung sashes to 30 degree. Unless otherwise stated, hinges for side hung opening out sashes are to be of the projecting type for easy cleaning.

All opening sashes are to have polished brass furniture.

The transoms and mullions of all purpose-made windows and doors are to be equally spaced between the outer frames of the windows and doors to form openings of equal size. Where this is not the case either the width or the height of the opening is stated, unless otherwise stated, the fixed lights and sashes of all purpose-made windows are to be in one square and the sashes and doors are to open out.

Windows and doors, unless otherwise specified, shall be of "one piece" construction. Composite windows and doors are to be supplied complete with all necessary standard coupling transoms or mullions.

Stock and purpose made residential type steel windows and school type windows of residential section shall be constructed of standard 25mm steel sections and of metal not less than 3mm thick.

Stock and purpose made industrial type steel windows shall be constructed with main frames of standard 35mm steel sections and of steel not less than 3mm thick, with sashes of standard 25mm steel sections and of steel not less than 3mm thick.

“Universal” sections, where specified, shall be not less than 33mm wide (measured over one opening section only) and of metal not less than 4mm. thick, and with all sight lines maintained (whether consisting of all fixed lights, all opening sashes, or portions of both) and with all glass in the same plane.

Stock and purpose made steel doors, sidelights and fanlights, shall be constructed with the doors of “Universal” sections as before described and the sidelights and fanlights of standard residential sections as before described. Bottom openings in doors and sidelights shall be fitted with kicking plates of one thickness of 1.60mm mild steel sheet fixed with metal beads. Frames of outward opening doors shall be fitted with bottom sills of door framing section (stepped sills) and of inward opening doors with metal ties welded to frames for embedding in threshold (flush sills)

Top Hung Sashes: — are to open out on a pair of steel hinges having brass pins and washers and fitted with brass peg stay, steel peg and locking bracket.

Outward Opening Side Hung Sashes: — are to open out on a pair of steel projection hinges having brass pins and washers and fitted with brass two-point handle and brass striking plate and brass sliding stay with friction fastener.

Inward Opening Side Hung Sashes: — are to open in on a pair of steel hinges having brass pins and washers and fitted with brass single point handle and steel engaging hook and brass sliding stay with friction fastener.

Bottom Hung Sashes: — are to open in on a pair of steel hinges having brass pins and washers and fitted with steel concealed side arms with brass guides and brass spring catch for long arm or hand operation and steel catch plate.

Horizontally Pivot Hung Sashes: — are to have brass adjustable friction ring centres and fitted with brass spring catch for long arm or hand operation and steel catch plate.

Projected Out Sashes: — are to be balanced on steel concealed side arms, the top of the sash fitted with spring loaded brass shoes to slide in brass guides and fitted at bottom with brass handle and brass striking plate.

Doors: — are to be hung on one and a half pairs per leaf of steel projection hinges with brass pins and washers and fitted with mortise lock set as specified, and each lock is to be provided with two keys.

Brass concealed bolts are to be fitted at top and bottom of meeting edge of first closing leaf of double doors. Sidelights and fanlights are to be hung as described for windows.

Adjustable Louver Sets: — are to be natural anodised aluminium louver sets of approved manufacture consisting of head and sill weather strips complete with neoprene gaskets and two jamb strips each fitted with louver brackets with spring loaded clips for the specified width of glass louver blades complete with tilt bars and operating lever handles. Where openings are not of a height to suit standard width louver blades an alternate head section with static clips must be provided to take a fixed louver blade of the required width. The louver sets are to be screwed to the steel window frame with stainless steel self-tapping screws and all portions of the louver set which come in contact with the window frame are to be insulated with approved pressure sensitive PVC tape to prevent electrolytic corrosion.

Burglar Bars: — are to be standard type burglar bars formed of 20 x 5mm mild steel bars riveted at intersections and riveted at ends to the window frames. The burglar bars to the small-pane type windows are to line through with the glazing bars and windows of the horizontal-pane type or of the no-glazing bar type are to be fitted with burglar bars which are divided as for the small-pane type window.

Fly screens: — are to be standard type fly screens suitable for residential opening-out type steel windows, unless otherwise described, and are to be constructed of stove enamelled pressed steel frames fitted with 0.25mm thick mosquito-proof mesh glass-fibre gauze. The fly screens are to be clipped onto the inner face of the steel window after all painting is completed.

All steel windows and doors are to be primed on all surfaces with an approved red oxide zinc chromate priming coat in accordance with SANS Specification 909 before leaving the manufacturer's works, unless specified to be hot dip galvanized, and rates are to include for touching up where necessary with similar primer after building in.

Where steel windows and doors are specified to be galvanized they are to be hot dip galvanized in accordance with the relevant provisions of SANS Specification 763 for general applications on the relative thicknesses of metal.

Loose metal glazing beads, where specified, are to be of an approved type and size, and are to be fixed with screws set in the correct positions for the type of glazing to be used, and neatly mitred at angles.

Immediately the windows and doors have been delivered on site, they are to be thoroughly overhauled and all necessary adjustments or repairs are to be made before they are fixed in position. A further inspection is to be made after building in and any further servicing required must be carried out in order to leave windows and doors in a satisfactory condition after glazing is completed.

All glass and glazing has been measured elsewhere.

Sizes of windows and doors are given to the nearest 10mm. The building in of windows and doors has been measured separately.

STAINLESS STEEL: — is to be of the thickness and grade specified and unless otherwise stated is to be buffed to an even satin finish to the approval of the Department.

All welding to stainless steel shall be by argon arc process and where filler rods are used these are to have properties not less than those of the parent metal. All welds are to be ground off smooth and uniform and the whole buffed to an even finish all over. Stainless steel is to be cut and bent in such a manner that a minimum of welding is required.

Where bending is required, all external angles are to be arras rounded and all internal angles are to be radiused.

All stainless steel work is to be of the highest quality and executed by specialists in this type of work and to the approval of the Department.

Note that where stainless steel fittings are specified and support work or fixings with bolts, nuts, rivets, etc, are required / specified, these fixings and support work are to be of stainless steel of the same rating / grade as the equipment specified.

ALUMINIUM AND ANODISED ALUMINIUM: — is to be of the brand specified or other approved and of 6063-TF or equivalent quality and temper.

Aluminium bars and sections shall comply with the relevant clauses of SANS 1476, extruded tube and hollow sections with the relevant clauses of SANS 1474, and sheet and

strips with the relevant clauses of SANS 1470. All alloys to be anodised are to be of anodising quality.

Aluminium is to be free from flaws, hammer and die markings or other imperfections.

Anodising of aluminium is to be carried out in accordance with SANS Specification 999 by an approved process. The average anodic film thickness shall be 25 micrometer, and at no point should the anodic film thickness fall below 22 micrometer or be thicker than 30 micrometer.

Prior to anodising, all surfaces are to be de-greased and cleaned, all irregularities removed and flushed off smooth and buffed where necessary.

All anodised aluminium must be coated with a suitable "non-yellowing" methylacrylate lacquer film, approved by the Department, over the entire surface. The lacquer film must be continuous and of a uniform average thickness not less than 10 micrometer. The lacquer thickness must be determined by use of a film meter or other instrument methods as described in ASTM B244-49T. Rates for anodised aluminium must include for this protective coating.

Before the work is put in hand, samples of finish are to be submitted to the Department for approval, and all finished work is to be equal in all respects to the approved samples.

The Contractor shall provide all samples required for testing in accordance with SANS Specification 999. If required, tests on the anodic film are to be carried out at the works of the anodised to verify that the work conforms to SANS Specification 999, the cost of which will be borne by the Contractor.

The surfaces of all aluminium which are jointed to or are in contact with other materials when fixed, particularly ferrous metals, are to be suitably insulated to prevent electrolytic corrosion.

Joints in all aluminium members are to be neatly formed in an approved manner with screw heads, pins, rivets, etc. concealed so that the joints are practically invisible. Screw or bolt jointing is to be kept to a minimum and will be permitted only when welding is impracticable. Unless otherwise described, stainless steel screws or bolts are to be used for jointing and fixing aluminium work. Welded joints are to be formed by argon arc process using SANS 1476/NS6 welding rods and finished off smooth.

Welding is to be executed in such a manner as not to affect the colour of the material or the anodic coating.

Exposed heads of screws, pins, rivets, etc. in coloured anodised aluminium are to be touched up with enamel paint to match the coloured anodised finish.

No deviation may be made from the general requirements or dimensions, but improvements in the general construction and design affecting neatness, strength or durability may be introduced. If any deviation is proposed, the Contractor must submit detailed drawings showing the particular construction and form or section he proposes to use and such drawings, details and samples of fittings, etc. are to be approved by the Department before manufacture is commenced and every facility must be given for the work to be inspected during manufacture.

No work may be fixed in position until it has been inspected and approved. Anodised aluminium work must be erected as near to the end of the Contract period as possible, to minimise the danger of damage or deterioration.

All work is to be suitably protected during building operations and left in a clean and satisfactorily finished condition on completion. In particular, all anodised aluminium work must be protected against damage, and against deterioration or discolouration caused by

mortar droppings, wax, paint, etc. all to the entire satisfaction of the Department. All work so damaged, deteriorated or discoloured must be replaced at the Contractor's expense.

Rates for aluminium work are to include for necessary cutting to lengths, shaping, turning, threading, forging, fitting, assembling, riveting, welding, welded running joints, filing smooth, also for all screws and holes and hoisting and fixing in position. All screwed work is to have full threads.

ANODISED ALUMINIUM WELDED WINDOWS AND DOORS: — are to be of an approved manufacture and design.

Windows and doors are to be fabricated from Medium Universal equal leg sections, unless otherwise specified, measuring 33mm over one opening section and not less than 4mm thick through the flanges and not less than 4.75mm through the web, unless otherwise stated.

The aluminium sections are to be of approved manufacture and of 6063-TF or equivalent quality and temper and are to be anodised after manufacture to the approval of the Department. Welds are to be electrically flash butt resistance welded, properly ground and cleaned off to give a uniform appearances.

Anodising, etc. is to be carried out as before described.

All windows and doors are to be suitable for internal glazing and are to be fitted with approved anodised aluminium glazing beads of the "clip on" type. Drilling for the fixing of glazing beads is to be done to suit the thickness of the glass used.

The frames are to be perfectly flat, square, butt-welded at joints (mechanical joints will not be permitted) and all opening sashes must fit perfectly on all faces and open or close freely without binding at any point. The glazing bars must be continuous with continuous intersections (mitred intersections will not be permitted) with ends scribed and fitted to the frames with shouldered ends passed through and riveted over. The sight lines of the main frame, whether consisting of all fixed lights, all opening sashes or portions of both and the glass plane must be the same throughout each window.

Weathering on sections is to be solid extruded with the sections (screwed or riveted on strips will not be permitted) except weather bars to sills of inward opening sashes which must be welded on and not screwed or riveted except in the approved designs of built-up transoms.

No steel is to be used in the manufacture of the windows unless it is stainless steel of quality to A.I.S.I. Type 316. All fittings, butt hinges, screws, nuts, bolts, etc. are to be of high quality aluminium or other approved non-corrosive material compatible with aluminium and of sufficient strength to perform the functions for which they are used. The handles, sliding stays and peg stays are to have nylon washers, bushes and pressure pads and are to be secured to the frames with screws having riveted ends. Pop rivet fixings will not be permitted.

The transoms and mullions of all purpose-made windows and doors are to be equally spaced between the outer frames to form openings of equal size. Where this is not the case, either the width or the height of the opening is stated. Unless otherwise stated, the fixed lights and sashes of all purpose-made windows and doors are to be in one square and the sashes and doors are to open out.

Frames must be provided with suitable fixing lugs bolted on to frame with aluminium alloy bolts or are to be holed for screwing as required with lugs or holes spaced one near top, one near bottom and not more than 750mm apart intermediately each side of frame. Frames more than 900mm wide are to be provided with similar fixings to top and bottom and not more than 750mm apart.

All composite windows, doors, etc. are to be supplied with suitable and approved coupling mullions or transoms. Rectangular hollow section transoms where specified are to be

25mm x 115mm in section manufactured from 3mm thick aluminium.

The Contractor must submit drawings showing details of sections he proposes to use and these drawings are to be approved by the Department before manufacture is commenced, and when requested, specimen windows and doors complete with all fittings as well as specimen coupling mullions, transoms etc. must be submitted for approval and all windows, doors, etc. supplied must conform to the approved samples.

The manufacturer of the windows and doors must supply a dimensioned set of drawings with the windows and doors, for use on the site, including clearance and strict fixing methods and details.

Windows and doors are to be delivered to the site in suitable protective wrappings or crates and are to be stacked on end and carefully handled at all times to prevent any marking or staining of surfaces.

Immediately the windows and doors have been delivered on the site, they are to be thoroughly overhauled and all necessary adjustments or repairs are to be made before they are fixed in position. A further inspection is to be made after fixing and any further servicing required must be carried out in order to leave the windows and doors in a satisfactory condition and waterproof after glazing is completed.

Side Hung Sashes: — are to open out on a pair of aluminium hinges complete with anti-friction weatherproof bushings fixed pin and nylon washers and fitted with anodised aluminium alloy sliding stay with friction fastener and an approved anodised aluminium two point handle and striking plate.

Bottom Hung Sashes: — are to open in on a pair of aluminium hinges complete with anti-friction weatherproof bushings, fixed pin and nylon washers and fitted with concealed side arms and strong lever action spring catch and keep.

Top Hung Sashes: — are to open out on a pair of aluminium hinges complete with anti-friction weather proof bushings, fixed pin and nylon washers and fitted with anodised aluminium peg stay with cranked locking stay.

Horizontally Pivot Hung Sashes: — are to be hung on a pair of approved weatherproof brass satin-chrome finished friction pivots of the greatest possible diameter permissible and fitted at top with strong lever action spring catch for long arm or hand operation and striking plate, unless otherwise stated.

Vertically Pivot Hung Sashes: — are to be hung on free pivot cups at the head incorporating nylon bearing sleeves and lever pivots at the sill and fitted with one two-point casement handle and striking plate.

Projected Out Sashes: — are to be balanced on approved concealed side arms with stainless steel shoes and channels and fitted at bottom with one approved bow handle with catch incorporated.

Projected In Sashes: — are to be balanced on approved concealed side arms with stainless steel shoes and channels and fitted at top with strong lever action spring catch for long arm or band operation and striking plate:

Doors: — are to be side hung to open out on one and a half pairs of aluminium hinges to each leaf complete with anti-friction weatherproof bushings, fixed pin and nylon washers and fitted with lock set as specified, and each lock is to be provided with two keys. Satin chrome finish flush bolts are to be fitted at top and bottom of meeting edge of first closing leaf of double doors.

Adjustable Louver Sets: — are to be approved anodised aluminium adjustable louver sets consisting of head and all weather strips fitted with neoprene gaskets and two jamb strips

each fitted with louver brackets with spring loaded clips for the specified width of glass louver blades and complete with tilt bars and operating lever handles. Where the openings are not of height to suit standard width louver blades an alternate head section with static clips must be provided to take a fixed louver blade of the required width. The sets-sets are to be tap screwed to the window frame with stainless steel self-tapping screws.

GLAZING TO DOORS / ALUMINIUM GLAZED SCREENS

No glazing permitted to any fitting below Lock Rail (ie 1,2m high.).

Burglar Bars: — are to be standard type burglar bars formed of 20mm x 5mm aluminium bars riveted at intersections and riveted at ends to the window frame with high strength aluminium rivets. The burglar bars to the small pane type window are to line through with the glazing bars, and windows of the horizontal-pane type or of the no-glazing bar type are to be fitted with burglar bars which are divided as for the small pane type window.

All exposed surfaces of anodised aluminium are to be protected by means of an approved fabric backed adhesive tape. The Contractor shall satisfy the Department that the tape he proposes to use can be easily stripped after long exposure to sunlight, and rates are to include or the final stripping of the protective tape and cleaning down to approval at completion.

All work is to be protected during building against deterioration or discolouration caused by mortar droppings, wax, paint, etc. and all work so damaged is to be replaced at the Contractor's expense to the approval of the Department.

All glass and glazing has been elsewhere measured. All sashes and openings, unless otherwise stated, are to be single panes without glazing bars.

All windows and doors must be fixed into preformed openings in the structure (the building-in of windows and doors will not be pen fitted) and rates are to include for supplying necessary templates for forming the openings. Fixing in position of windows and doors has been measured separately. Sizes of windows and doors are given to the nearest 10mm.

STRONG ROOM DOORS: — must comply in all respects with SANS Specification 1015 Category 1. Each door is to be provided with two keys and the keys must be forwarded by the supplier under registered cover direct to the Department, and the supplier must clearly indicate the institutions in which the door (or doors) is being installed.

BURGLAR RESISTING SAFES: — must comply in all respects with SANS Specification 751. The safes shall be "Office Safe Category 1" as laid down in SANS Specification 751. Each safe is to be provided internally with one shelf and two lockable drawers.

Where the mass of each safe is 680kg or less, provision must be made for securing it rigidly to prevent unauthorised removal; the means of securing shall be at least equal in effectiveness to that which would be provided by four 12mm bolts. Locks shall be lever locks with a minimum of six levers. Each safe is to be provided with two keys to each lock and the keys for any safe must be forwarded by the supplier under registered cover direct to the Department, and the supplier must clearly indicate the institution in which the safe (or safes) is being installed.

ADJUSTABLE LOUVER GEAR SETS: — are to be approved natural anodised aluminium adjustable sets consisting of head and sill weather strips fitted with neoprene gaskets and two jamb strips and fitted with sets brackets with spring loaded clips for the specified glass sets blades and complete with tilt bars and operating handles. Where the openings are **not** of a height to suit standard width sets blades an alternate head section with static clips must be provided to take a fixed sets blade of the required width.

RATES: — are to include for fixing in accordance with the manufacturers instructions for screwing head and sill weather strips and jamb strips with stainless steel screws to frames (Elsewhere measured) and for oiling and easing at completion.

12. **PLASTERING**

MIXING

The mixing of the materials is to be done on a hard surface.

Once all materials have been mixed, they are not to be remixed with new materials added after 5 (five) hours.

MATERIALS

Stone Chippings: — are to be approved clean stone chippings of the sizes stated complying with SANS Specification 1083.

River Sand: — for floor finishes and screeds is to be clean, sharp, coarse sand free from all impurities, washed if so directed and complying with SANS Specification 1090.

Plaster Sand: — is to be clean, sharp, free from all impurities, washed if so directed and is to comply with SANS Specification 1090.

Cement: — unless otherwise specified is to be Portland cement of normal setting quality, is to comply with SANS Specification 471, and must be used fresh. Cement containing more than 15% blast furnace slag will not be permitted to be used.

Lime: — is to comply with SANS Specification 523.

Water: — is to be clean, fresh and free from injurious amounts of acids, alkalis and other organic substances.

MEASUREMENT OF CONSTITUENT PARTS OF FLOOR FINISHES, TOPPINGS, SCREEDS AND PLASTER FINISHES: — Cement, sand and stone chippings are to be measured exactly by means of gauge boxes or purpose made wheelbarrows. Part filling or heaping of normal wheelbarrows will not be permitted.

Water is to be accurately measured for each batch, to approval.

Waterproofing compounds, where specified, are to be added to the mixture in the proportions recommended by and in strict accordance with the manufacturer's instructions.

PREPARATION OF SURFACES: — Prior to the application of floor finishes, toppings, screeds, plaster finishes etc. the surfaces of the new or existing concrete, brickwork, etc. are to be thoroughly cleaned, chipped, hacked, sloshed, etc. as necessary to ensure a satisfactory bond. The Contractor will be held entirely responsible for the proper and adequate preparation of the surfaces and any work which results in failure in this regard must be made good at the Contractor's expense to the satisfaction of the Department.

FLOOR SCREEDS, ETC: — Cement screeds are to consist of one part cement and three parts sand, unless otherwise described, and are to be steel towelled, unless otherwise stated, to true smooth and even surfaces, free from tool marks to the satisfaction of the Department to receive the finishes stated in the items. It is recommended that in new structures the screeding should be as specified by "Tal" using "Screedmaster", the pumped method.

GRANOLITHIC FINISH TO CONCRETE FLOORS, ETC: — Float up to within 6mm of finished surface with layers on concrete approximately 10mm thick, composed of one part cement, two and a half parts concrete and three and a half parts granite or other approved hard stone chippings. Form finished surface with one part cement and one part fine granite chippings or other approved hard stone graded up to particle, which will pass a 6mm mesh brought to a smooth surface with a steel trowel. The floating and finishing coats are to be performed in one operation.

The granolithic work is to be carried out by experienced workmen and is to be laid in panels

V-jointed and not and not exceeding 6m² in area or as shown on drawings or described in the Bills of Quantities.

Thin strips if wood or other suitable materials are to be laid between panels to break contact.

Where granolith is described to be tinted, the requisite quantity of oxide of iron or other colouring materials is to be mixed with the finishing thickness.

All granolithic floors, etc. are to be covered up and protected from injury and discolouration during the progress of the work.

Rates for granolithic work are to include for cleaning down and for a coat of approved wax polish or stoep reviver well rubbed in at completion.

13. PLASTER

GENERAL

Except where otherwise described, all external plaster is to be finished with a wood float and internal plaster is to be finished with a steel trowel, unless otherwise described, all to true and even surfaces, free from tool marks and other defects to the satisfaction of the Department. No distinction has been made for brick or concrete surfaces.

CEMENT PLASTER

External cement plaster to wall is to consist on one part cement and four parts sand.

External cement plaster to ceilings is to consist of one part cement and three parts sand.

Internal cement plaster to walls is to consist of one part cement and five parts sand.

Internal cement plaster to ceilings is to consist if one part cement and three parts sand.

One coat cement plaster to walls shall not be less than 13mm or more than 16mm in thickness, and one coat cement plaster to ceilings shall not be less than 10mm or more than 13mm in thickness, unless otherwise described.

Where plaster is described as undecorated, the same type of approved sand the same brand of cement is to be used throughout to maintain a uniform colour and texture.

BARIUM PLASTER

Barium plaster shall consist of two coats plaster, the first coat 13mm thick consisting of one part cement and five parts sand, and the second coat 6mm thick consisting of one part cement and five parts Barium Sulphate. (This is to be applied only to X-Ray Room walls where holed bricks have been used).

All surfaces are to be plastered in one operation from ceiling to floor and corner-to-corner; breaks are to be made only in corners or at junctions of walls and ceilings.

CURING, PROTECTION, ETC.: — All floor finishes, paving, plaster finishes and screeds are to be properly cured to approval and all cracks, blisters and other defects which may occur are to be made good and the whole left in a satisfactory-condition at completion.

The finished surfaces are to be properly protected from damage and cleaned down at completion.

RATES: — Rates for floor finishes and screeds are to include for preparation of new or existing surfaces, dressing to falls where required, V-joints where specified, curing, protecting from damage and cleaning down at completion.

Rates for skirtings, risers, etc. are to include for internal angles at junction with floor, treads, etc. to be square or coved to not more than 50mm girth and in addition are to include for mitres, stops, etc. except where given separately in terms of the Standard System of Measuring Builders' Work.

Rates for plaster finishes are to include for preparation of new or existing surfaces, curing, protecting from damage and cleaning down at completion.

Rates for plastering are to include for internal angles to be square or coved to not exceeding 50mm girth.

Rates for rounded angles, fair edges and arrases and the like are to include for mitres, stops, etc. except where given separately in terms of the Standard System of Measuring Builders' Work.

Rates for mouldings, projecting bands, coves, weatherings and the like are to include for dubbing out.

Rates are to include for cutting back against frames and for V-joints cut where concrete abuts brickwork.

Rates generally are to include for all sundry making good and working around pipes, balusters, etc.

GENERALLY

Narrow Widths

Items described as "Extra over for narrow widths" include for all reveals, edges, soffits, treads, risers, etc. not exceeding 500mm wide, narrow widths not exceeding 500mm wide in general surfaces caused by openings or projections, all of which have been included in the areas of horizontal or vertical surfaces. No distinction has been made for finishes of differing thicknesses.

14. TILING

MATERIALS

River Sand: —is to be clean, sharp, coarse sand, free from all impurities, washed if so directed and complying with SANS Specification 1090.

Plaster Sand: — for wall backings is to be clean, sharp, free from impurities, washed if so directed and complying with SANS Specification 1090.

Cement: —unless otherwise specified, is to be Portland cement of normal setting quality complying with SANS Specification 471 and must be used fresh. Cement containing more than 15 % blast furnace slag will not be permitted to be used

Water: —is to be clean, fresh and free from injurious amounts of acids, alkalis and other organic substances.

MEASUREMENT OF CONSTITUENT PARTS OF BACKINGS, ETC.: — Cement and sand are to be measured exactly by means of gauge boxes or purpose made wheelbarrows. Part filling or heaping of normal wheelbarrows will not be permitted:

Water is to be accurately measured for each batch to approval.

Waterproofing compounds, where specified, are to be added to the mixture in the quantities recommended by and in strict accordance with the manufacturers' instructions.

PREPARATION OF SURFACES: — Prior to the application of the backing for tiles, the surfaces of the new or existing concrete, brickwork, etc. are to be thoroughly sloshed, etc. as necessary to ensure a satisfactory bond. The Contractor shall be held responsible for the proper and adequate preparation of the surfaces and any work which results in failure in this regard must be made good at the Contractor's expense to the satisfaction of the Department.

GLAZED CERAMIC WALL TILES AND FITTINGS: — shall comply with SANS Specification 22 of selected grade, free from defects and blemishes and of uniform colour.

Rates are to include for either bedding tiles on and including a solid cement mortar backing consisting of one part cement to three parts sand on brickwork or concrete, or fixed with an approved tile adhesive on and including a coat of cement plaster consisting of one part cement to five parts sand and finished to a surface to receive tiles.

Tiles are to have vertical and horizontal joints continuous with all joints solidly flushed up in neat white cement.

MOSAICS: — Glass or ceramic mosaics are to be of approved South African manufacture of the sizes and colours specified, fixed to paper panels for ease of handling.

Mosaics are to be bedded to a true even surface on and including a solid cement mortar backing consisting of one part cement and three parts sand on brickwork or concrete, or fixed with an approved mosaic adhesive on and including a coat of cement plaster consisting of one part cement to three parts sand finished to a surface to receive mosaics.

After setting, the paper panels are to be removed and all joints are to be solidly flushed up in neat white cement.

Samples of mosaics are to be submitted to the Department for approval before any work is put in hand.

UNGLAZED CERAMIC FLOOR TILES AND FITTINGS: — are to be unglazed acid and alkali resistant tiles and fittings of the types specified in the items, and of approved manufacture, uniform in size, shape and colour, free from cracks, twists and other defects and equal to samples to be deposited with and approved by the Department.

Floor tiles are to be laid with maximum 10mm wide joints continuous in both directions on and including a 15mm thick cement mortar bed consisting of one part cement to three parts sand, unless otherwise specified, to true levels and grades with the joints raked out and grouted up solid and flush pointed with an approved epoxy jointing compound.

Floor tiles are to be set out so as to have no long edges of tiles cut to suit room size.

RATES: — for tiles, mosaics, etc. are to include for all necessary preparation of surfaces, for laying in accordance with the manufacturer's instructions, all square cutting and waste and fitting, protecting from damage and cleaning down at completion.

Rates for tiles are also to include for laying, bedding, jointing and pointing as described and in accordance with SANS Code of Practice 0107 where applicable.

Rates for treads, risers, sills, copings, cappings, skirting etc. are to include for pointing to exposed edges and projecting soffits.

No distinction has been made for brick or concrete surfaces.

TRANSITION TRIMS:-

Aluminium Wide Tile-In Ramp splayed transition trims to be used at junction between ceramic / porcelain tiles and vinyl sheeting.

MOVEMENT JOINTS:-

Aluminium Structural Screed joints bolted to slab to be capable of total movement of minimum of 5mm either way with flexible PVC Hospital Insert.

Movement joints to be in high traffic area's as "Migua" FV35/1500 or "Kirk" ASSJ390H of approved height with hospital insert bolted to slab before screeding.

Metal movement joints in low traffic area's with hospital insert strips..

15. DRAINAGE AND PLUMBING

GENERALLY: —The Standard Preambles for other trades, with reference to Excavations, Concrete, Brickwork and Plastering, and, in particular for the full description intent and meaning of the classification for excavations, are to apply equally to this trade.

LICENSED DRAINLAYERS AND PLUMBERS: — Only licensed drain layers shall be employed on any drainage work and licensed plumbers on plumbing work.

SUBSOIL DRAINS

Unplasticised polyvinyl chloride (UPVC) slotted drainage pipes and fittings: — shall be of approved manufacture jointed in accordance with the manufacturer's instructions.

Pitch-fibre perforated or slotted drainage pipes and fittings: shall comply with SANS Specification 921 and shall be jointed in accordance with the manufacturer's instructions.

Filter fabric: — shall be non-woven, spun bonded, needle punched and continuous polyester fabric, resistant to the effects of alkalis, acids, saline solution and sunlight.

STORMWATER AND SOIL DRAIN PIPES

Reinforced concrete non-pressured pipes: shall comply, with SANS Specification 677 and must be Type SC of the class specified with spigot and socket ends with rubber insertion ring or with ogee joints with approved rubber collars. Pipes must be marked with the manufacturer's name, trade name or registered trade mark, nominal bore, class and type, date of manufacture, the letter "R" denoting reinforced and the SANS mark. Joints shall be made in accordance with SANS Code of Practice 058.

Unplasticised polyvinyl chloride (UPVC) drain and sewer pipes and fittings: — shall comply with SANS Specification 791. Joins shall be made with fittings in accordance with SANS Code of Practice 058.

CONCRETE BEDS AND ENCASEMENT TO DRAIN PIPES: — Where pipes are required to be bedded on concrete, the bed of concrete shall be Class B, a minimum of 500mm wider than the diameter of the pipe, laid to correct falls and levels with recesses formed in same for pipe joints including all necessary formwork and any additional excavation. The barrel of the pipe shall then be bedded on a thin cement mortar (1:3) bed and laid to falls. After jointing, the recesses previously formed shall be filled in with concrete Class B and the haunching or surrounding completed.

Where pipes are fixed vertically they shall be encased in concrete Class B having a minimum thickness of 150mm around the pipe and carried up to ground level and shall include for any necessary formwork.

PIPE LAYING: — All drain and sewer pipes are to be laid to a straight line to even gradients and jointed in accordance with SANS Code of Practice 058 except in the case of polyethylene or unplasticised polyvinyl chloride drain and sewer piping which is to be in accordance with SANS Code of Practice 01 12.

Before laying, each pipe shall be examined to ensure that the bore is clean and free of any foreign matter and shall be tested for soundness by striking with a wooden mallet, and any cracked or damaged pipes shall be rejected. Ends of all pipes must be clean before

jointing. Immediately after jointing a tight fitting wad or scraper shall be drawn several times through the bore of the pipe to ensure that it is left clean and free from obstructions. Whenever work is suspended, the open ends of pipes and junctions must be temporarily plugged to prevent the entrance of rubbish during construction.

GULLEY TRAPS: — Gulley trap assemblies must be of the material specified with “P” or “S” trap, jointed to drain and with hopper head with vertical and side inlets, the head fitted with 190mm diameter cast iron gulley grating complying with SANS Specification 1115 laid loose in socket. The trap, hopper head and vertical pipe shall be set on and encased in concrete Class B having a minimum thickness of 150mm at any one part, carried up 75mm above ground level as kerb, dished down to grating and finished on all exposed surfaces in 1:3 cement plaster with angles rounded, including necessary excavation and formwork.

GREASE TRAPS: — Grease trap assemblies of vitrified clay must consist of outlet junction jointed to trap with side inlet. Access openings of trap and junction shall be fitted with vitrified clay stoppers laid loose in socket of trap and set in bitumen in socket of junction. The trap and junction and vertical pipe shall be set on and encased in concrete Class B having a minimum thickness of 150mm at any one part, carried up 75mm above ground level as kerb, dished down to grating and finished, on all exposed surfaces in 1:3 cement plaster with angles rounded, including necessary excavation and formwork.

RODDING EYES: — Where pipes are carried up in ramps for rodding eyes, the head of the pipe at ground level must be fitted with an “A.B.C.” cast iron cover and frame, complying with SANS Specification 746, jointed to pipe, the frame rebated for and including cover with raised letters “CE” cast on same, secured to frame with gun-metal screws and with the whole encased in concrete Class B having a minimum thickness of 150mm at any one part, carried up 75mm above ground Level and finished on all exposed surfaces in 1:3 cement plaster with angles rounded, including necessary excavation and formwork,

INSPECTION EYE BLOCKS: — Where inspection eye fittings are provided in pipelines, the position of these inspection eyes must be registered and demarcated with concrete Class C. block size 300 x 300 x 50mm thick finished on all exposed surfaces with 1:3 cement plaster with angles rounded and with sunk letters “I.E.” formed in top and set in ground, including necessary excavation and formwork.

SURFACE WATER CHANNELS: —Concrete open surface water channels shall be formed with concrete Class B with segmental channel formed in same to the size and shape specified and finished on exposed surfaces in 1:3 cement plaster, steel towelled to a smooth even surface with all angles rounded, cast in lengths not exceeding 2m and laid to falls, including necessary excavation and formwork.

GRATINGS FOR GULLEYS AND STORMWATER DRAINS AND CAST IRON SURFACE BOXES AND MANHOLE COVERS AND FRAMES: — Cast iron or Polymer gratings for gulleys and storm water drains shall comply with SANS Specification 1115 and SANS 1882:2003 respectively.

Cast iron surface boxes and manhole covers and frames shall comply with SANS Specification 558.

All cast iron gratings, cast iron surface boxes and cast iron manhole covers and frame must be coated with approved preservative solution before leaving the manufacturer’s works.

The masses stated are the combined mass of the grating and frame or the combined mass of the cover and frame.

STORM WATER SUMPS, JUNCTION BOXES, MANHOLES, INSPECTION CHAMBERS, CABLE INSPECTION CHAMBERS AND VALVE CHAMBERS: — shall be of the internal size specified and are to be constructed of one brick sides, unless otherwise specified, built in 1:3 cement mortar on a 150mm thick concrete Class C bottom and finished on top with an 85mm thick pre-cast concrete Class C cover slab, reinforced as detailed and bedded in

cement mortar. The cover slab, except to junction boxes, is to have a rebated opening formed in same, suitable for and fitted with a cast iron orating and frame, or cover and frame, of the size and mass specified with the frame bedded in cement mortar. The bottom of the sump, manhole, etc. and the exposed surfaces of the cover slab are to be finished smooth in 1:3 cement plaster with angles rounded. The internal brick surfaces are to be faced with smooth facing bricks and pointed with flush joints.

Inspection chambers and manholes with an invert not exceeding 1m shall have an internal dimension of 470mm x 700mm and those exceeding 1m shall have an internal dimension of 920mm X 920mm. Where the invert of the hole exceeds 1m, a 150mm thick reinforced concrete Class C corbel slab, reinforced as detailed, with opening size 470mm x 700mm formed in same and finished smooth off the formwork, is to be built into the brick sides at a height not exceeding 1, 5 inches above the concrete bottom with the reduced manhole shaft built off the top of the corbel slab. Cast iron step irons spaced at 300mm staggered centres vertically are to be built into one side of all manholes with an invert exceeding 1m.

Where measured in number, rates for all sumps, manholes, etc. are to include for excavating to the depths required, taking precautions against collapse of sides of excavations, staging, ramming, pumping and baling to keep excavations free from water or mud, filling around and ramming and depositing and levelling spoil on site or carted away as directed. Ends of pipes are to be built through the sides of the sumps, manholes, etc. and rates are to include for this.

SOIL DRAIN MANHOLES AND INSPECTION CHAMBERS: —are to be of the internal diameter and inverts specified and are to be constructed of pre-cast reinforced concrete manhole ring sections with walls a minimum of 50mm thick, pre-cast reinforced concrete cover slabs and spacer pieces complying with SANS Specification 677. The joints for the ring sections shall be of the ogee type. The bottom shall be of concrete Class C-cast in-situ.

The placing of the concrete bottom and benching shall be carried out in three stages with the initial stage being the laying of the concrete bottom projecting 100mm beyond the external diameter of the manhole on which is laid the inspection eye pipe, branches, etc. The second stage comprises the laying of concrete within the manhole to the height of the pipes and around the perimeter of the bottom to a height of not less than 25mm above the collar of the pipe at the highest end. This annular base is to be shuttered to provide a horizontal setting for the first ring section which is to be firmly bedded in the wet concrete. The third stage comprises the laying of the benching within the initial ring section and finished in 1:3 cement plaster with all angles rounded. Thereafter, the ring sections of the required standard height are joined together to form the required depth, with all joints primed with "Bituprime" and sealed with "Bitujoint Putty". A 125mm thick pre-cast reinforced concrete cover slab, rebated on underside to suit ring sections and with opening size 600mm x 600mm formed in same is to be bedded on top of the ring section. The shaft above the cover slab is to be constructed of either pre-cast reinforced concrete spacer units to suit the type of cast iron cover and frame specified, or one brick kerb walls faced internally with smooth facing bricks jointed with flush joints, and finished on top with an 85mm thick pre-cast concrete Class C cover slab, reinforced as detailed and bedded in cement mortar with the exposed surfaces finished smooth in 1:3 cement plaster with all angles rounded. The cover slab is to have a rebated opening formed in same suitable for and fitted with cast iron cover and frame of the size and mass specified, with the frame bedded in cement mortar.

MANHOLE COVERS AND FRAMES:- Cast iron, Concrete or Cultured Polymer covers and frames to be suitable for the area of usage.

SOAK PITS: — shall be of the lengths and widths specified and shall be a minimum of 900mm deep below the invert of the inlet pipe. A perforated pitch-fibre drainpipe, jointed to the inlet pipe and with other end capped, is to be laid level in a 19mm stone packing of a minimum thickness of 15mm below and at sites of pipe and a minimum thickness of 150mm below the top of the pipe. The remainder of the soak pit is to be filled with stone graded

from 50mm to 75mm, to a level of 50mm above the top of the pipe. The stone is to be covered with corrugated asbestos cement sheets extending 150mm beyond the walls of the soak pit all round. The trench shall be backfilled above the sheeting to a minimum depth of 300mm lightly rammed with the final 100mm of backfilling being approved topsoil from the excavations.

SEPTIC TANKS: —shall be of the internal sizes specified and are to be constructed of one brick sides built in 1:3 cement mortar on 150mm thick concrete Class C bottom laid to falls. A half brick baffle wall finished 75mm below underside of concrete cover slab and with opening size 150 x 150mm high formed in wall is to be built in 1:3 cement mortar on the concrete bottom. A 115mm thick reinforced concrete Class C cover slab, reinforced as detailed, is to be cast in-situ on removable formwork and is to have two openings formed in same, each suitable either for and fitted with 600 x 450mm x 38 kg cast iron single seal manhole cover and frame, or for the shaft of the inspection chamber built off the cover slab in one, brick walls in 1:3 cement mortar with smooth face bricks internally, finished on top with 85mm thick pre-cast concrete Class C cover slab, reinforced as detailed and rebated for and fitted with 600 X 450mm X 38-kg cast iron single seal manhole cover and frame. The bottom and sides of the septic tank are to be finished in 1:3 cement plaster, 19mm thick, with an approved waterproofing compound added, with all internal angles coved to 50mm radius. Inlet and outlet chambers attached at either end of the septic tank shall be size 600 x 450mm internally, of the depth required and each shall be constructed of one brick walls built in 1:3 cement mortar on a concrete Class C bottom 150mm thick, or where extended above the top of the septic tank cover, built off the cover and finished on top with 85mm thick pre-cast concrete Class C cover slab, reinforced as detailed and bedded in cement mortar with the exposed surfaces finished smooth in 1:3 cement plaster with angles rounded. The cover slab is to have a rebated opening formed in same suitable for and fitted with a 600 x 450mm x 38 kg cast iron single seal manhole cover and frame. Chambers shall be provided with inspection eye pipes or bends, straight or curved channel sections, benched up to sides of chambers in concrete Class C, finished in 1:3 cement plaster with all angles rounded.

The inlet and outlet of the septic tank shall be formed of cast iron square junction piece with tail-pipe extending 300mm below water level in tank, built in through end walls and jointed to channels in inlet and outlet chambers.

TESTING OF DRAINS, MANHOLES AND INSPECTION CHAMBERS: — All drains, manholes and inspection chambers with the exception of subsoil drains shall be constructed so as to be watertight. No trenches shall be backfilled or pipes encased in concrete until the drains have been tested and approved. Any drains covered by the Contractor prior to testing shall be exposed at the Contractor's expense.

The Contractor shall give at least 24 hours notice of any particular length between manholes ready for testing. The drains shall not be tested until a period of 24 hours, or such other period as may be required, has been allowed for the pipe joints to set. The Contractor shall provide all necessary testing apparatus, expanding plugs, stoppers, water and any other materials and all labour that may be required for carrying out the tests.

The whole of the drainage system shall be tested using one or more of the following tests:-

- (a) **Visual test**— Each length of pipe shall be inspected for invert level grade, direction and line. Internal inspection of the bore of the pipes shall be made using mirrors and a powerful source of light. The drains must be free of invert lips and the bases of the pipes must be straight.
- (b) **Air test** — All openings in the drain shall be plugged and sealed and all associated traps filled with water and air pumped into the drains until a manometric pressure of 40mm is indicated, after which, without further pumping, the pressure shall not drop below 25mm for a period of at least 30 seconds.
After the entire drainage system has been completed, all plumbing fittings installed and permanently connected up, and traps filled with water, a final air test shall be applied to the whole system.

- (c) **Water test**— All openings-in the drain, except the highest one, shall be plugged and sealed and the drain filled with water so that every part of the system is tested under a head of water of not less than 1.5m and not more than 3.5m. After allowing period of 10 minutes for initial absorption, the amount of water it shall be necessary to add to maintain the water level over the next 15 minutes shall not exceed a rate of 25 litres for 100mm diameter pipe and 3,75 litres for 150mm diameter pipe for 100m of drain and an equivalent rate for larger drains. In carrying out the water test, the head of water shall be obtained by providing temporary pipes, fittings, etc. wherever necessary or by such other method as may be approved.

In cases where the maximum head of water, owing to the gradient of the drains, would be exceeded in any section, inspection eyes at suitable intervals may be provided and the drain plugged, in order not to subject the lower portion of the drain to a greater head of water than that required. Drains must be free of air before testing.

- (d) **Manhole and Inspection Chamber test** — The inlet and outlet pipe hose shall be plugged and sealed and the inspection chamber filled with water. After allowing the water to stabilise due to absorption, the water level should not fall more than 5mm in 2 hours.

DEFECTS TO BE MADE GOOD: — Should the drain system fail to withstand the above tests, all defects shall be made good and the tests repeated at the Contractor's expense until the whole system is sound and passed to the satisfaction of the Department. In making good, all defective parts shall be cut out and replaced with new. No patching of pipes, joints or connections will be permitted.

SHEET METALWORK: — generally is to be lapped 75mm at ends and 150mm at angles, unless otherwise specified. Rates for sheet metalwork shall include for all labour, cutting and waste, laps, seams, welts, angles, clips, tacks, soldered dots, riveting, soldering, brazing, burning, nailing, dressing and wedging as required. All measurements are net with no allowance being made for laps, seams, welts, angles, clips and tacks or waste in cutting. Where stepped flashings are described as to flat slope, the pitch of the roof to which they apply does not exceed 40 degrees

- (a) **Galvanized sheet iron:** — shall be of an approved brand of the thickness specified after galvanising and having a galvanized coating of "Isacor Coating Designation Z450". Corroded or otherwise defective sheets shall not be used. All nailing or screwing shall be done with galvanized nails or screws.
- (b) **Sheet aluminium:** — shall be of the thickness and quality specified. All nailing shall be done with aluminium alloy nails and all screwing done with stainless steel screws.
- (c) **Sheet copper:** — shall be cold rolled sheet of the thickness and temper specified. Sheet copper for covering flat roofs and for valley and gutter linings, flashings, soakers, etc. shall be of dead-soft temper and for eaves gutters, rainwater pipes and other unsupported or semi self-supported work shall be of half-hard temper. All nailing shall be done with copper or copper alloy nails and all screwing done with brass screws.
- (d) **Sheet lead:** — shall be best milled sheet lead of the full mass specified and of equal thickness throughout and must comply with SANS Specification 1178.

LININGS TO VALLEYS: — shall be of the material specified, lapped 200mm at ends and dressed up on to purlins or battens at sides of valleys with edges bent back to form open beads.

LININGS TO SECRET GUTTERS: — at back of chimney stacks and wall abutments and at raking intersections of walls and roofs shall be of the material specified, turned 100mm up vertical surfaces and dressed 250mm up roof slope and on to purlin or batten at edge.

SOAKERS: — to slate covered roofs shall be of galvanized sheet iron or sheet copper of 0.6mm thickness, 450mm wide to closed valleys and 250mm wide to raking intersections of roofs with vertical wall and chimney stack abutments and turned 75mm up vertical surfaces. Soakers shall be 75mm longer than the gauge of the slate roofing.

UNDER-FLASHINGS: — to all iron roofs and where specified to slate or tiled roofs shall be 0.6mm thickness galvanized sheet iron. Flashings to asbestos cement roofs shall be asbestos cement preformed units fitted in accordance with the manufacturer's instructions. Where specified, copper flashings shall be formed from sheet of 0.6mm thickness and aluminium flashings shall be formed from 1200-H4 quality sheet of 0.6mm thickness. Lead flashings, where specified, shall be formed from sheet having a mass of 24 kg/in 2.

COVER FLASHINGS: — shall be either galvanized sheet iron, copper or aluminium, as specified, of 0.6mm thickness fitted over under-flashing, stepped where required on rake and with top edge bent and wedged 25mm deep into joint of brickwork or groove formed in concrete face and flush pointed in 1:3 cement mortar.

FLASHINGS AROUND PIPES THROUGH ROOF COVERINGS

- (a) Pipes through preformed sheet steel roofing shall be flashed around with 0.6mm galvanized sheet iron apron pop-riveted to top of roofing with edges cut and dressed to profile of roofing, soldered all round and with conical sheet iron 'u' stand, riveted and soldered at joint and at base to apron. The top of the conical upstand is to be fixed around the pipe with 25mm x 3mm galvanized mild steel strap wrapped around the pipe and fixed with a galvanized steel gutter bolt.
- (b) Pipes through fibre cement roofing shall be flashed around with 24 kg/in 2 lead apron dressed into corrugations, bedded in mastic and bolted to roof sheeting with galvanized steel gutter bolts and with conical lead upstand, wiped on at joint with apron, and secured around pipe with copper wire.
- (c) Pipes through slate or tile roofing shall be flashed around with 24 kg/in 2 lead apron dressed to profile of slates or tiles with top edge of lead apron dressed over back edge of slate or tile under overlap of slates or tiles. A conical lead upstand, wiped on at joint with apron, is to be secured around the pipe with copper wire.
- (d) Pipes through pre-printed or embossed sheet steel or aluminium roofing shall be flashed around with flexible glass-fibre reinforced waterproofing dressed to profile of roofing, pop-riveted around edges to roofing and dressed up and around pipe. The waterproof is to be finished in a colour to match that of the roofing material.

RAINWATER PIPES

GENERALLY:

Full bore outlets for flat roofs are not allowed. Where flat roofs are specified, it is preferred to have a drain along the edges into a common outlet. Where roof cover is of 'Chromodek' sheets, the preferred guttering is of the same material in the same colour in continuous lengths.

(a) **Unplasticised polyvinyl chloride (UPVC) rainwater pipes and accessories** shall comply with SANS Specification 967 and must be fixed clear of the finished wall face on stock pattern brackets in accordance with the manufacturer's instructions.

(b) **Galvanized mild steel rainwater pipes**, shall be medium quality screwed and socketed normalised welded mild steel pipes, galvanized inside and outside, and shall comply with SANS Specification 62.

Fittings for galvanized mild steel pipes shall comply with SANS Specification 509. The screwed joints must be made with lead paint and hemp or approved thread sealing tape. The pipes must be fixed clear of the finished wall face with galvanized cast iron hinged

holderbats built into walls at not exceeding 2m centres in 1:3 cement mortar.

EAVES GUTTERS

- a) **Galvanized sheet iron gutters, rainwater heads, etc.** shall be formed from 0.6mm sheet and must have beaded edges with all laps riveted and soldered. Corners must be reinforced with 0.6mm X 50mm wide galvanized sheet iron strips and must be soldered across the inside of the angles.

Gutters must be laid to even falls on approved galvanized mild steel gutter brackets screwed to roof timbers at approximately 1m centres. Half round pattern gutters shall be bolted to each bracket with 6mm galvanized gutter bolt fitted close to the beaded edge. Rectangular pattern gutters shall be fixed at each bracket with galvanized mild steel long-screw with 1mm thick galvanized sheet iron spacer tube.

- (b) **Fibre cement gutters and accessories** shall be of approved manufacture, not less than 6mm thick, with spigot and socket joints made in an approved mastic compound in accordance with the manufacturer's instructions. Gutters must be laid to even falls on approved aluminium alloy or stock asbestos cement brackets screwed to roof timbers at the manufacturer's recommended spacings.
- (c) **Unplasticised polyvinyl chloride (UPVC) gutters and accessories** shall comply with SANS Specification 11 and must be laid to falls and fixed on brackets in accordance with the manufacturer's instructions.

SANITARY PLUMBING AND FITTINGS, WASTE, VENTILATION AND ANTI-SIPHON PIPES

(a) **Unplasticised polyvinyl chloride (UPVC) pipes and fittings** shall be of approved manufacture marked with the manufacturer's name and trade name, the nominal bore and the South African Bureau of Standards mark and shall comply with SANS Specification 967. Joints shall be made with injection moulded fittings in accordance with the manufacture's instructions and SANS Code of Practice 0112. The pipes must be fixed clear of the finished wall face with aluminium alloy holderbats fitted with plastic cushion strips with the holderbats fixed to plugs in wall.

(b) **Polypropylene pipes and fittings** shall be of approved manufacture and shall have a mechanical form of jointing. Pipes and fittings are to be fixed and jointed in accordance with the manufacturer's instructions.

(c) **Multilayered pipes** shall be of approved manufacture and shall have a mechanical form of jointing. Pipes and fittings are to be fixed and jointed in accordance with the manufacturer's instructions.

SANITARY FITTINGS: — All sanitary ware must comply with SANS 497 Specifications and be fitted with Ball-O-Cock valves in supply lines.

Wash hand basins shall be of white glazed fireclay or vitreous china of the type and size specified. Basins shall have an integral overflow to non patient treatment facilities and be fitted with 32mm chromium plated waste union with flange and grating, rubber plug on chromium plated brass chain and, where required, tap hole stopper cemented in.

WC pans shall be of white glazed fireclay or vitreous china of the type specified with 'S' or 'P' trap with straight or side outlet and shall be fitted with single or double flap plastic seat as required, secured to pan with concealed brass holding down bolts. Pans shall be bedded on the concrete floors in 1:3 cement mortars. Pans in seclusion rooms and other public areas to be 'Gypsy' vandal proof – or other approved.

Glazed ceramic urinals of the bowl or stall type shall be of white glazed fireclay or vitreous china. Bowl urinals shall be fitted with 40mm chromium plated waste union, with flange and

domical grating and with spreader with flush pipe connector. Stall urinals shall be fitted with 75mm chromium plated waste union with flange and hinged domed grating and with spreader with flush pipe connector.

Flushing cisterns shall be as specified, either of white porcelain enamelled cast iron, white glazed fireclay, vitreous china or black plastic complying with SANS Specification 821, each with body and cover. Cisterns shall be a maximum of 11 litre capacity and the flushing apparatus shall be of brass, copper or other corrosion resistant metal, PVC or other approved plastic or of an approved ceramic material. All cistern lids must be able to be **screwed** down. Connections for flush pipe, inlet and overflow pipe must be provided in the body. Cisterns shall be fitted with 15mm brass ball valve with copper, PVC or polystyrene ball and with either chromium plated operating lever handle or galvanized steel pull chain and handle. A galvanized, white enamelled or chromium plated steel or copper flush pipe, of the required length, as specified, is to be jointed to the flush pipe connection on the body of the cistern and in the case of WC pans is to be fixed to the inlet of the pan with an approved patent adaptor. From the overflow connection on each cistern a 22mm copper overflow pipe, bent as required, shall be taken through wall to discharge externally, with ends splay cut and projecting 50mm beyond wall face, or where this is not possible, bent to discharge into WC pan.

Baths shall be enamelled cast iron baths of the type and size specified, holed for and fitted with chromium plated brass overflow union with grating, 40mm chromium plated brass waste union with flange and grating, rubber plug on chromium plated brass chain and fitted with adjustable cast iron feet. The fall along bottom of baths from head ends to outlets must be adequate for complete emptying.

Stainless steel sinks and drainers shall be of the types and sizes specified with exposed surfaces buffed to a satin finish and sound deadened on underside by application of an approved sound deadening coating. Splashbacks with tiling keys shall be provided at back and at ends against walls or as specified. Sink bowls are to be pressed out of single sheets with complete drainage to outlets and each bowl is to be fitted with integral built-in overflow with chromium plated brass grating and 40mm recessed waste outlets with chromium plated brass waste union with grating, rubber plug and chromium plated brass chain. Sink bowls, unless otherwise specified, are to be 450 x 355 x 140mm deep. Drainers are to be pressed out of single sheets and are to have pressed flutes to give complete drainage.

(a) For domestic use — Sinks shall comply with SANS Specification 242 and shall be manufactured from A.I.S.I. Type 430 stainless steel 0.8mm thick for units not exceeding 2,4m long and from stainless steel 1.2mm thick for units exceeding 2,4m Long. -

(b) For hospital use and laboratories — Sinks shall be manufactured from A.I.S.I. Type 304 stainless steel 0.9mm thick for units not exceeding 2.4m long and from stainless steel 1.2mm thick for units exceeding 2.4m long.

Stainless steel wash hand basins and wash troughs shall be of the types and sizes specified complying with SANS Specification 906, with exposed surfaces buffed to a satin finish and sound deadened on underside by application of an approved sound deadening coating. Each basin or wash trough in non patient treatment area's are to be fitted with integral built-in overflow with chromium plated brass grating and 40mm recessed waste outlet with chromium plated brass waste union with grating, rubber plug and chromium plated brass chain.

Stainless steel urinals shall be of the types and sizes specified complying with SANS Specification 924 and shall be manufactured from A.I.S.I. Type 304 stainless steel, 1.2mm thick, buffed to a satin finish and sound deadened at back by application of an approved sound deadening coating. The back and sides of urinals are to be made rigid by means of integral pressed ribs or by bowing. Edges at sides and top are to have plaster key. Tread plates are to be ribbed and the front edges are to be stiffened and bent to form key for floor finish. The trough shall be a minimum of 125mm wide and half round in section with all corners radiused and shall fall to ensure complete drainage to 75mm recessed outlet with

chromium plated domed hinged grating and frame.

RATES FOR SANITARY WARE: — shall include for the supply and fixing of the units as specified and for cleaning, washing and leaving in a satisfactory condition on completion.

BELOW GROUND WATER RETICULATION

Unplasticised polyvinyl chloride (UPVC) piping and fittings shall be of approved manufacture complying with SANS Specification 966. Pipes must be of the class specified and must be marked with the manufacturer's name, trade name or registered trademark, nominal diameter, class reference and the SANS mark. Pipes shall be laid and jointed in accordance with the manufacturer's instructions.

High density polyethylene (HDPE) piping shall be of approved manufacture complying with SANS Specification 533 and shall be of the class specified, laid and jointed in accordance with the manufacturer's instructions. Piping must be jointed with compression fittings with compression rings and coupling nuts.

High Density Polyethylene / Polypropylene / Multilayered piping shall be of approved manufacture, complying with SANS Specification 15875-1-2004 & 2/2003 & 1315, laid and jointed in accordance with the manufacturer's instructions.

Copper piping shall be of approved manufacture complying with SANS Specification 460 and shall be of Class 2. Pipes must be jointed with brass compression fittings with compression rings and coupling nuts complying with SANS Specification 1067 Part I Type 'A'. Copper piping must be bent, where required, with an approved bending machine.

ABOVE GROUND WATER SUPPLIES

Colour Coding Cold Water Supply the exposed piping for this non potable (recycled) water shall be colour banded Brilliant Green (B49) / Yellow Band(H10). The other exposed piping for potable (drinkable) water shall be colour banded Brilliant Green (B49) / Blue Band(F29)

Galvanized mild steel piping for water supplies shall be medium quality screwed and socketed normalised welded mild steel pipe, galvanized inside and outside, and shall comply with SANS Specification 62.

Fittings to galvanized mild steel piping shall be steel pipe fittings complying with SANS Specification 62 or malleable cast iron fittings complying with SANS Specification 509.

Copper piping shall be of approved manufacture, complying with SANS Specification 460 and shall be of Class 2 – fixed and jointed in accordance with the manufacturer's instructions. Class 2 copper piping must be jointed with brass compression fittings with compression rings and coupling nuts complying with SANS Specification 1067 part I Type 'A'.

Polypropylene / Multilayered Piping shall be of approved manufacture, complying with SANS Specification 1315, laid and jointed in accordance with the manufacturer's instructions. This applies to hot and cold water supply within ceiling spaces also.

Stainless steel piping shall be of approved manufacture, complying with SANS Specification 4127 and shall be A.I.S.I. Type 304 L. Fittings to stainless steel piping not exceeding 50mm nominal bore shall be brass compression fittings with compression rings and coupling nuts.

Piping exceeding 50mm nominal bore shall be welded piping with 1.5mm wall thickness, unless otherwise stated, and of A.I.S.I. Type 316 stainless steel. Joints are to comprise approved A.I.S.I. Type 316 stainless steel pressed collars welded to ends of pipes and fittings with loose galvanized mild steel slip-on flanges complete with galvanized mild steel bolts, nuts and washers, and neoprene gaskets. Fittings must be A.I.S.I. Type 316

stainless steel butt weld fittings.

Phosphoric acid based fluxes must be used for all welded joints which are to be argon arc TIG welded using Type 316 filler rods, with the welds treated with suitable pickling compound.

WATER TAPS AND VALVES: — Water taps, stopcocks, ball-o-cocks and wheel valves shall be of approved manufacture complying with SANS Specification 226.

Ball valves with brass valve and copper or plastic ball float shall be of approved manufacture complying with SANS Specification 1056. Plastic floats when supplied, must comply with SANS Specification 1006.

Full Bore Teflon Seated Ball Valve shall be of approved manufacture complying with SANS Specification 664. Valves shall be clockwise closing with non-rising, cap-fitted spindles and flanked connections and of the class specified.

Pressure reducing valves shall be of approved manufacture complying with SANS Specification 198.

FIXING OF WATER PIPES: — Galvanized mild steel water piping shall be fixed, unless otherwise described, to walls or ceilings with galvanized malleable iron holderbats (school board pattern), built into walls in 1:3 cement mortar. Pipes shall be fixed to timber work with galvanized mild steel pipe clips screwed on.

Copper and stainless steel water piping shall be fixed, unless otherwise described, to walls or ceilings with brass holderbats (school board pattern) built into walls in 1:3 cement mortar. Pipes shall be fixed to timber work with brass or copper pipe clips screwed on.

Polypropylene / Multilayered Piping - shall be fixed to walls according to manufacturers recommendations.

CONCRETE THRUST AND ANCHOR BLOCKS: — shall be of the sizes required and provided where directed to anchor the water pipelines against the thrust due to hydrostatic pressure. Concrete blocks shall be cast against the undisturbed face of the excavation. Backfilling behind the thrust face of the block will not be permitted.

TESTING OF WATER MAINS: — The whole of the water reticulation shall be subjected to a hydraulic test pressure 1.5 times the maximum working pressure of the pipeline. Testing of pipelines may only commence after the installation of all anchor blocks, valves and fittings have been completed. Testing shall be carried out between installed sluice valves whenever possible. Where this is not possible the ends of the pipes shall be sealed with end caps properly held in place with temporary props.

The tests shall be carried out on lengths not exceeding 300 metres.

The pipeline shall be filled from the lowest end in order to expel the air at the upper end through special taps or through service connections, stand pipes, etc. When full the line shall be allowed to stand for 24 hours and any further accumulated air shall be expelled. The full test pressure shall then be applied and maintained for one hour, during which time the line will be examined for any leaks, movement at anchors and other defects.

Any defective work is to be taken out and replaced at the Contractor's expense and the whole retested until found satisfactory.

The Contractor shall provide all necessary testing apparatus, temporary end caps, plugs, stoppers, special taps and any other materials that may be required, and all labour for carrying out the tests.

EXCAVATIONS FOR PIPE TRENCHES: — Excavations for pipe trenches, gully traps, manholes, inspection chambers, valve, chamber, soakpits and septic tanks shall be to the

depth and gradients shown on the drawings using sight rails and boning rods and shall include for taking precautions against collapse of sides of excavations, staging, pumping and baling to keep the excavations free from water or mud and for filling in and ramming.

The bottoms of pipe trenches are to be excavated to even falls. The barrel of the pipe, except where it is laid on a sand or concrete bed, must rest on solid ground and hand-holds of sufficient size must be cut under pipe joints to enable the jointing and filleting to be properly performed. Any excavations taken out deeper than required shall be made up to the correct grade with well rammed earth. In intermediate or hard rock excavation and where a bedding is not specified, the trench bottom must be excavated 100mm deeper than required for the grade and be backfilled with well rammed earth.

The Contractor is to notify the Department when the trenches are ready for inspection and approval. Any work put in hand before approval has been given shall, if so required, be replaced with new at the Contractor's expense.

Notwithstanding such approval of the trench bottoms, any excavations which become waterlogged or otherwise spoilt after approval, shall be cleaned out and reformed at the Contractor's expense and to the satisfaction of the Department before any piping or sand or concrete beds are laid.

Depths of excavations as approved shall be checked and recorded by a Departmental Official and the Contractor before excavations are filled in.

For the purpose of any measurement, whatever size may have been excavated, excavations are taken as follows: — Trenches not exceeding 0.75m deep shall be taken 0.5m wider than the internal diameter of the pipe. This width shall be increased by 75mm for each successive depth of 0.75m to a maximum of 1m wider than the internal diameter of the pipe.

BACKFILLING: — No trench shall be backfilled until the Department is satisfied that the works therein have been satisfactorily completed, tested and are ready for backfilling.

The backfilling around and 300mm above the pipe is to be of approved selected material, imported if necessary, free from rock or stone, carefully packed, watered and lightly rammed equally on either side of the pipe and then filled in above this level with suitable material from the excavations, watered and compacted in layers not exceeding 300mm thick with the top 300mm consolidated to dry density of not less than 95% MOD. A.A.S.H.O. density. Topsoil from the excavation is to be set aside and used in the final layer of backfilling.

Any disturbance of or damage to the pipes during backfilling must be made good by the contractor at his own expense.

All spoil from the excavations for trenches, etc. shall be deposited and levelled on site or carted away as directed. Any subsidence or depressions below the level of the adjacent ground shall be filled in, as and when necessary, until the end of the maintenance period.

SIZES OF PIPES: The diameters stated for galvanized mild steel piping, cast iron piping, vitrified clay piping and asbestos cement pressure piping (C.I.D.) are the nominal internal diameters. The diameters stated for all other pipes are nominal external diameters.

In the case of piping and fitting which are manufactured in imperial diameters, the size nearest the metric equivalent must be used.

RATES FOR PIPES: — Rates for all pipes, gutters, channels, etc. are to include for couplings in running lengths, joints, short lengths and cutting and fixing as required. Rates for mild -steel pipes shall include for all plain sockets and nipples. Where fittings have reduced ends or branches the fittings are described as "reduced" and the largest end or branch has been stated. The Contractor may use equal fittings with reducers or bushings if he so desires, but no claim for extras in this connection will be entertained.

Rates for pipes fixed to walls, soffits of slabs, roof timbers, etc. are to include for all

brackets, holderbats, pipe clips and approved extended hangers where pipes are required to be laid to falls and for plugging and screwing or for cutting and pinning or building in tails of holderbats.

Rates for piping are to include for cleaning down at completion, and in addition, the rate for stainless steel piping is to include for polishing exposed piping, all to the approval of the Department.

RATES FOR CHASES, HOLES ETC.: — are to include for making good to approval. The term “hole” is to include for sleeves where required through concrete work.

FIRE EXTINGUISHERS: — Where specified, carbon dioxide gas type fire extinguishers shall be 2.26kg type, complying with SANS Specification 889 and fixed in position on wall brackets screwed to and including 20mm thick chamfered and oiled wrot hardwood backboard, size 450mm x 100mm screwed to plugs in wall.

Where specified, dry powder type fire extinguishers shall be of 10 litre capacity, complying with SANS Specification 810 and fixed as before described on backboard size 1000mm x 200mm.

FIRE HOSE REELS: — shall be non-swinging rotary fire hose reels, complying with SANS Specification 543, with solid side discs and 25mm waterway at bracket incorporating rotary pressure joint to hose connection at hub and fitted with 25mm screwed malleable iron ‘Sanders type A’ valve with “S” grade diaphragm, connection for supply pipe with the handwheel clearly marked in red with arrows and the words “OPEN”, “OOP”.

The reel is to be secured to the wall with and including three steel anchor bolts and fitted with 30m length of 20mm internal diameter best quality reinforced red rubber non-kinkable hose with one end fixed to wheel hub connection and the other end fitted with 20mm chromium plated gunmetal adjustable “Centorium” type nozzle with hose threaded through and including chromium plated hose guide, designed to permit the hose to run out in any direction and the nozzle supported on and including chromium plated bracket fixed to wall.

For ease of removal, a union shall be installed between the valve and the reel.

FIRE HYDRANTS: — shall be of the wheel valve pattern with instantaneous coupling outlets, size 63.5mm or 70mm as stated on the drawings. Hydrants fixed in a horizontal position shall have oblique angle outlets and those fixed in a vertical or inclined position shall have right angle outlets. The materials used in the manufacture of the hydrants shall be as laid down for the manufacture of couplings, branch pipes, etc. in SANS Specification 1128, and the various requirements of instantaneous couplings and dimensions for 70mm outlets shall comply with the requirements for Morris instantaneous pattern couplings.

The valve spindle shall have a minimum diameter of 22mm with swivelling clack at one end fitted with first quality dexine or other approved washer, bedded on to a raised seat not less than 6mm wide, and the other end shall be machined to form a square shank of 15mm minimum thickness and a length corresponding with the thickness of the boss of the handwheel, the portion protruding from the boss shall be threaded and fitted with a washer and nut to hold the handwheel firmly in place. Valve inlet shall be male screwed 80mm Whitworth pipe thread, and outlet shall be fitted with approved India-rubber coupling gasket. The internal diameter of the valve body shall be not less than 95mm in the case of 63.5mm outlets or 100mm in the case of 70mm outlets.

The valve hand wheel shall have an overall diameter of 165mm and the rim shall be of oval cross-section and shall have the words “OPEN” and “OOP” together with direction arrows embossed on the face.

All hexagonal faces shall be machined and all exposed surfaces of the valve and the wheel periphery shall be buffed and polished. Parts of the wheel not polished shall be painted two coats bright red high gloss paint.

The completed hydrant valve shall be guaranteed hydraulically tested by the manufacture to a pressure of 35 bar and shall be badged or stamped accordingly with the manufacturer’s

name or symbol and the words "TESTED 35 bar".

16. **GLAZING**

MATERIALS: — Glass shall conform to the requirements of the relevant current British Standards Specification for the respective materials.

Clear glass shall be float quality glass.

Silvered glass mirror to comply with SANS Specification 1236 Class A.

Toughened safety glass is to be "Armourplated" float quality safety glass of the thickness specified and as manufactured by Armourplate Safety Glass (Pty) Ltd. or other approved, and glazed to sashes, etc. in strict accordance with the manufacturer's instructions.

All toughened safety glass is to have the manufacturer's name or motif sand-blasted in one corner of each pane

Laminated safety glass is to be float quality normal strength glass, unless otherwise stated, and of the type specified and as manufactured by Shatterprufe Safety Glass Co. (Pty) Ltd., or other approved, and glazed to sashes, etc. in strict accordance with the manufacturer's instructions.

All laminated safety Glass is to have the manufacturer's name or motif sand-blasted in one corner of each pane.

All glass is to be free from imperfections and is to be left in a thoroughly clean condition on completion.

No glazing is permitted in Patient Treatment area's below 1 (one) meter.

GLAZING: — The glazing and fixing of glass in buildings shall be in accordance with SANS Code of practice 0317.

Glass panes shall have adequate glazing clearance between edges of glass and the rebates.

Putty for glazing shall comply with SANS Specification 680 type 1 for glazing in wood and type 2 for glazing in steel. Putty for glazing in natural finished wood shall be tinted to match the colour of the wood. Putty to be mixed with a hardener to allow for painting within +/- 3 days. Putty for glazing in aluminium windows shall be tinted to match the aluminium or anodised aluminium where required.

All rebates, other than those in natural finished hardwoods, are to be primed before glazing. Glass fixed with glazing beads shall be well bedded in back putty in the rebates.

Putty shall be carefully trimmed and cleaned off with front putty worked to within 3mm of the sight lines.

RATES: — Rates for glass generally shall include for preparing the rebates, etc. all putty, sprigs, clips, etc. as required and all cutting.

Rates for toughened and laminated glass shall include in addition for all necessary spacing and setting blocks in accordance with the manufacturer's requirements.

17. **PAINTING**

MATERIALS: — Proprietary materials where specified are to be of the brand specified or other approved by the Department.

All primers, emulsion paints, enamels, stains, varnishes, etc. are to comply with the relevant SANS Specification.

Paints, etc. shall be suitable for application on the surfaces to which they are being applied and those used externally shall be of exterior quality or suitable for exterior use.

For any particular work the priming coat and subsequent coats of paint are to be executed with paints from the same manufacturer and in accordance with that manufacturer's instructions.

The materials are to be brought to the site in unopened containers and no adulteration will be permitted, except thinners of a quantity and quality directed by the manufacturer.

The Department shall at all times be permitted to take samples for testing purposes from open containers of any brand of paint being used on the work.

All materials, if and when required by the Department, will be subject to tests by the South African Bureau of Standards, and the cost of such tests, should the material under test not meet the requirements of this specification, shall be borne by the Contractor. Fillers and stoppings are to be suitable for use with the material being filled or stopped and to the approval of the Department.

PREPARATORY WORK: — All new and existing surfaces are to be thoroughly dry and are to be cleaned of all dust, dirt, grease, oil, rust, scale, efflorescence, fungus, loose or flaking material, etc. rubbed down, stopped, filled, knotted and sanded smooth as required in accordance with the paint manufacturer's recommendations and to the approval of the Department prior to the application of paint, etc.

Ceilings are to have nail heads, including those to cornices and cover strips, primed and stopped up as necessary and rubbed down smooth.

Asbestos cement shall be primed with an approved alkali resistant primer before the application of subsequent coats which are not, in themselves, alkali resistant.

Iron, steel and other ferrous metals shall be cleaned in accordance with SANS Code of Practice 064 to remove rust, scale, grease, oil, etc. and the surface brought to a bright metallic condition.

Galvanized iron and zinc shall be cleaned in accordance with SANS Code of Practice 062 to remove the manufacturer's temporary protective coating, white rust, etc.

Other non-ferrous metals shall be thoroughly cleaned to remove all milling oils, temporary protective coatings, etc. and the surface abraded with fine water-paper and white spirit.

Woodwork to be painted shall have all knots and resinous areas treated with an approved knotting, the surface shall then be primed and all holes, etc. stopped and rubbed down smooth,

Woodwork to be oiled, stained, varnished, etc. shall be free of all stains, pencil marks and other surface discolorations and all holes, etc. stopped with tinted stopping and rubbed down smooth.

In preparing existing glazed sashes and sash doors, all loose putty is to be removed, the rebates primed and glass re-sprigged and re-puttied as necessary before the painting is commenced.

Previously distempered or lime washed surfaces to receive any other type of paint, are to have the existing distemper or lime wash completely removed by scraping or wire brushing and the surfaces treated with an approved bonding liquid.

Where existing paint film are in good condition any flaking or bared patches are to be properly feathered into the surrounding paint and spot primed as necessary.

Where existing paint films are in poor condition and require to be removed completely, they are to be removed by means of wire brushing, paint remover, burning off, or other approved method. Paint removers shall be free of wax and caustic substances and shall preferably be of water rinseable type. When burning off paint from wood, care must be taken to avoid charring the wood.

The final state of preparatory work to existing decorated surfaces shall in all cases produce in the finished decorated surfaces a condition similar to new work.

The Contractor will be held responsible for the proper and adequate preparation of the surfaces and any work which fails to meet the manufacturer's recommendations must be made good at the Contractor's expense to the satisfaction of the Department.

APPLICATION OF PAINTS, ETC.: — Painting may be carried out by brush, roller or spray as recommended by the manufacturer and to the approval of the Department. All paints, etc. are to be applied in strict accordance with the manufacturer's instructions. Each coat of paint is to be adequately and permanently keyed onto the previous coat or surface and shall be evenly distributed and continuous and shall dry to a smooth film, free from sags, runs or other imperfections. Each coat of paint is to be of a colour distinctive from previous or succeeding coats.

All painting must be done in accordance with a colour scheme which will be provided by the Department, and rates for painting etc. are to include for all cutting in of contrasting colours and masking as required. No distinction has been made where more than one colour of the same material is required on the walls or ceiling of the same room.

Samples of colours for the final coats are to be prepared in all cases to the approval of the Department and all work must be finished to the approved colours.

Backs of wood door and similar frames and the surfaces of other new or prefixed joinery in contact with brickwork, etc. and built in as the work proceeds, shall be primed or sealed before building in to prevent moisture seeping into the wood from the mortar bedding.

Tongued and grooved and rebated edges of boards in batten doors and other such like inaccessible parts of new joinery shall, before assembly, be primed, or where the joinery is to receive a finish other than paint, be given one coat of such other finishing material.

All new external structural timbers shall be primed before the timbers are fixed in position and shall include all surfaces such as backs of fascias and barge boards.

RATES: — Rates for painting, etc. are to include for all preparatory work, and where spraying is employed, are to include or adequately masking all surrounding areas.

Where diameters of pipes are stated these are the nominal internal diameters, and rates for painting pipes are to include for painting the holderbats, hangers, clips, etc. supporting the pipes.

Rates are to include for providing all necessary dust sheets, covers, etc. taking all necessary precautions to prevent marking the surfaces of joinery, walls, floors, glass, electrical fittings, etc. All surfaces disfigured or otherwise damaged shall be completely renovated or replaced as necessary to the approval of the Department at the Contractor's own expense.

18. ROADWORK

The Contractor is referred to the preambles for "Earthworks" with particular reference to the full description, intent and meaning of the classification for excavations and the preambles for "Concrete, Formwork and Reinforcement"

The construction of the roads is to be carried out by an approved Specialist Sub-Contractor in accordance with the following specifications and all to the approval of the Department.

SUB-GRADE: — All materials placed in the sub-grade layer which is defined as being the 150mm thick layer immediately below the sub-base or the base course (where no sub-base is specified), shall conform to the following specification: —

(a) Minimum C.B.R. at 93% Mod. A.A.S.H.O. density = 10 %

(b) Maximum C.B.R. Swell = 1.5 %

(c) Maximum Plasticity Index if:
 more than 30% passes the 2mm sieve = 12
 less than 30% passes the 2mm sieve = 16

The sub-grade layer in cut areas shall be treated in place either to achieve a uniform standard of compaction or to break up undesirable formations of hard rock.

In the case of materials other than hard rock, treatment in place shall consist of scarifying or otherwise loosening to a depth of 150mm and re-compacting to a density of 93 % Mod. A.A.S.H.O. where directed, with the material stabilised in place before compacting.

In hard rock, treatment in place shall consist of thoroughly loosening to a depth of 450mm by rip in or blasting and then sized by rolling or knapping until the maximum dimension of any spall shall be not more than 300mm.

Compaction of the rock in the sub-grade shall be achieved by spreading and sorting by bulldozer to a reasonable uniform thickness with sufficient fine material added to fill the voids and bind the surface.

Compaction shall be achieved by means of a vibratory roller until the Department is satisfied that the mass is sufficiently dense, to provide a stable sub-grade layer.

Density tests shall be carried out at the minimum rate of one test per every 500m² of sub-grade area or not more than 50m apart but not less than four tests for smaller areas and shall assess the full layer thickness. The costs of such control tests shall be included in the Contractor's rate for sub-grade treatment. The Department may; at its discretion, arrange for independent check tests to be performed, but the costs of the tests in this instance will be borne by the Administration.

Processing of the material will be measured under the relevant items. An approved total weed killer shall be applied during the formation of the sub-grade. The rate of application shall be in accordance with the manufacturer's specification.

Rates shall include for the supply, delivery, spreading and stabilisation with lime, if required, and compacting and shaping to correct lines and levels.

The lime and method of mixing and watering shall be as described in the specification for stabilisation.

SUB-BASE: — All material placed in the sub-base layer, which is defined as being that layer of 150mm thickness immediately below the base course layer, shall conform to the following specification: —

	Unstabilised	Stabilised
Minimum C.B.R. at 95 % Mod. A.A.S.H.O. density	70%	50%
Minimum C.B.R. Swell	0, 5%	0, 5%

Maximum Plasticity Index	10	10
Minimum Liquid Limit	35%	35%
Maximum size of aggregate	63mm	63mm
Material passing the No. 75 micrometer sieve shall not exceed		25 %
Minimum relative compaction in place	95 % Mod. A.A.S.H.O.	

Combined coarse and fine sand density fractions shall exceed 35 % of the soil mortar

Unless otherwise specified, the responsibility for obtaining material that conforms to the above specification rests with the Contractor who will be required to perform his own tests to prove compliance, and to submit samples to the Department before the material is delivered on site. Further control tests will be required by the Department during the placing and compaction of the material, the locations of which will be selected at random.

Should the Contractor wish to use material from the site excavations, he shall first obtain the approval of the Department. His rates shall in this case include for the selection and stockpiling.

Density tests shall be carried out at the minimum rate as specified for the sub-grade layer.

The layer shall be finished off to present a uniform texture and tightly bonded surface.

Rates shall include for the supply, delivery, spreading and stabilisation with lime, if required, and compacting and shaping to correct lines and levels.

The lime and method of mixing and watering shall be as described in the specification for stabilisation.

The finished surface shall be within 20mm of the design level. The finished width shall not be less than the design width. The average of five thickness tests at the rate of one test for every 200m² of surface shall not be less than 150mm and at any point not less than 130mm.

The surface finish when measured under a 3m straight edge shall have no slacks or bumps greater than 5mm.

The cost of the density control tests shall be included in the Contractor's rate for sub-base construction. The Department, at his discretion, may arrange for independent check tests to be conducted, and the costs in these instances will be borne by the Administration.

STABILISATION: — The stabilisation agent shall be slaked lime of the calcium type conforming to the requirements of SANS Specification 824.

The rate of application shall conform to the design rate and all materials to be stabilised shall be approved by the Department before processing.

The material shall be spread in a uniformly thick loose layer over the full area and thoroughly dried by scarifying or blading with a grader to ensure exposure to the air of all particles and to ensure thorough mixing to obtain a uniform grading of the material.

When the material has been approved as being ready for stabilising it shall be lightly rolled to facilitate the spreading of the lime. The lime shall be evenly applied to the surface, preferably by mechanical spreader, at the specified rate and thoroughly mixed by rotavator or disc harrow until a uniform integrated mixture of uniform colour is obtained over the full depth of the layer.

Before mixing is commenced, the Contractor shall satisfy the Department that the lime has been applied at the specified rate.

Immediately after the lime has been mixed in, water shall be added in small increments by suitable watering equipment and mixed into the layer until the required water content has been obtained which shall not exceed the Mod. A.A.S.H.O. optimum plus 2%:

The efficiency of the spreading and mixing shall be measured by Lime Determination Test according to A.S.T.M.D. Test Number 3155/1973 or the California Test Method No. 338-B July 1996. Only where the result from every 15 tests at locations selected by the Department indicate that more than 90 % of the layer has a time content exceeding 60 % of the nominal lime content will the work be accepted, provided that the coefficient of variation shall not be greater than 25%.

The test positions shall be spaced at one for every 100m² of surface area, but shall not be spaced, greater than 20m apart

BASE COURSE: — When the sub-grade has been prepared and approved, the base course, consisting of one of the following, shall be formed to the compacted thickness specified.

Crusher Run Base Course

Crusher-run base course shall be fresh dolerite, hard blue tillite, quartzite, fresh granite, fresh basalt or other stone which meets the following specifications.

TABLE F: CRUSHER RUN BASE COURSE: STONE SPECIFICATIONS

Sieve Size	% Passing
37.5mm	100
26.5mm	82 - 95
19.1mm	70 - 85
13.2mm	58 - 75
4.75mm	34 - 55
Sieve Size	% Passing
2.00mm	22 - 40
0.425mm	10 - 25
0.075mm	5 - 12

Minimum C.B.R. @ 98% Mod. A.A.S.H.O. density	80%
Maximum C.B.R. Swell	0, 5 %
Maximum Liquid Limit	25
Maximum Plasticity Index	4
Maximum Linear Shrinkage	2
Minimum Sand Equivalent Value	30
Maximum Flakiness Index	35
The soundness of the aggregate shall be such that after 5 cycles using Magnesium	

Sulphate it shall not show a loss of more than 15% by weight.
The maximum Aggregate Crushing Value should not exceed 30.
The moisture content used for field compaction shall not exceed the Mod. A.A.S.H.O. optimum plus 2 %.

Natural Ground Base Course

Natural ground base course shall be approved stone which meets either of the following specifications.

Natural Gravel (Unstabilised)

Minimum C.B.R. at 98% Mod. A.A.S.H.O.	80 %
Minimum C.B.R. Swell	0.5 %
Group Index value	0
Maximum Plasticity Index	4
Maximum Liquid Limit	35
Maximum Linear Shrinkage	2
Minimum Sand Equivalent Value	30
Maximum size of particle	53mm

Material passing No. 75 micrometer sieve shall not exceed 25 %

The combined coarse sand and coarse/fine sand fraction shall not exceed 35 % of the soil mortar

Natural Gravel (Stabilised with Lime)

Lime must comply with SANS Specification 824 Minimum C. B .R.

at 98% Mod. A.A.S.H.O. density,	160	140	120
provided that the minimum C.B.R. before stabilising, at			
95 % Mod. A.A.S.H.O. density	30	45	60
Maximum C.B.R. S well			0, 5%
Maximum Plasticity Index	4		
Maximum particle size	2/3 layer thickness		
Maximum percentage passing No. 75 micrometer sieve	25		
Grading Modules	1, 5		

The responsibility for obtaining suitable base course material complying with the above rests with the Contractor, unless otherwise specified, and the provisions for sub-base material in regard to tests, etc. to prove compliance with the specification shall apply to the base course.

During construction, the base course shall be evenly distributed over the sub-grade. The stone shall then be rolled with a 4 to 5 tonne roller or equal unless otherwise instructed. After a few passes of the roller the surface shall be checked for shape camber and levels and all depressions filled in. Rolling and trimming shall continue until the surface is true to required levels and falls.

Minimum density in place after compaction shall be 98% Mod. A.A.S.H.O. density.

CHIP AND SPRAY SURFACING

Binders

One of the following may be used: —

M.C. 3000 Bitumen to SANS Specification 308 (150/200 Pen.)

M.C. 800 Bitumen to SANS Specification 308 (150/200 Pen.)

RTH 45 / 50 Tar to SANS Specification 748 Spray-grade 60% emulsion where approved or specified by the Department. If emulsion is used then the specified application rates shall be increased to give the required net bitumen content.

Cover Aggregate

All Cover aggregate used in the surface treatment shall be washed 13.2mm nominal sized crusher stone in accordance with SANS Specification 647.

Aggregate Crushing Value shall not exceed 15.

Binder shall be applied after the prime coat has dried completely and all tackiness has vanished.

The binder is to be applied by means of a distributor at a rate of 1.1 litre/m² followed immediately afterwards by the spreading of a cover aggregate of 13.2mm stone at the rate of 125m² / m³. The aggregate is to be spread by means of an approved chip spreader; band spreading will only be permitted in those areas inaccessible to the spreader. The aggregate is to be rolled immediately with two passes of a pneumatic tyred roller. When the binder has set the surface shall be drag-broomed twice in each direction and then rolled again with four passes of the roller during the heat of the day or until the aggregate is firmly keyed into a tight surface.

DOUBLE SEAL COAT WITH BLACK TOP SURFACING: — The prime and first seal coat shall be applied as previously specified.

After the first seal coat has been drag-broomed and rolled as previously described, the binder shall be applied to the surface at a rate of 0.8 litre/in² followed immediately by the spreading of 6.7mm stone chips at the rate of 150m²/m³. This stone aggregate shall then be drag-broomed and rolled as previously described.

A seal spray having a net bitumen content of 0.7 litre/in² shall then be applied to the surface when this coat has dried completely, and shall be rolled to firmly bed any loose aggregate.

If the surface is to be opened early to traffic, it shall be covered very lightly with sand or crusher dust distributed evenly with a hessian drag and back rolled with wet wheels before opening to traffic.

SLURRY SEAL SURFACING: — The aggregate for slurry seal shall conform to the following grading: —

Sieve Size (mm)	Percentage Passing
4, 75	100
2, 36	90—100
1, 18	65—95
0, 600	42—72
0, 300	23—48
0, 150	10—27
0, 075	5—12

Slurry sand shall be crusher sand with a minimum sand equivalent of 35.

Binder — Stable grade emulsion (60%)
Anionic to SANS Specification 309
Cationic to SANS Specification 548

Consistency of the slurry shall consist of 90% crusher sand, cement filler not less than 1% and net binder content of not less than 9% by weight. Water to be added as required. As a guide, approximately 300 litres of emulsion and 160 litres of water are required per cubic metre of slurry.

The slurry shall be machine mixed and wherever possible applied by means of a spreader box. The rate of application shall be $170\text{m}^2/\text{m}^3$. The slurry shall be of a creamy, homogeneous mixture, free of lumps, and if the mixture shows signs of breaking before application to the surface it shall be discarded.

After the first seal has been approved by the Department, but before the application of the slurry, a fog spray comprising of a solution of 1 part emulsion to 3 parts water shall be applied at a rate of $0.8\text{ litre}/\text{m}^2$ to cover the aggregate. The application of the slurry may commence when the fog spray has been applied to assist with the spread of the slurry and to smooth out squeegee marks the slurry shall, immediately after being applied and before it has broken, be smoothed by a damp hessian drag either attached to the spreader box or pulled over by hand.

After the slurry has set it shall be covered by two passes of a pneumatic-tyred roller during the heat of the day.

The permissible variation in the application of the slurry shall not vary from the specified rate by more than 10%.

PREMIX TARMACADAM SURFACING

Prime Coat

When the base course is complete and dry it shall be cleaned of all loose material and be given a prime coat of one of the following primers: —

M.C. cut-back bitumen.

Tar Primer R.T.H. 3/P.

Emulsion Primer (60%).

The rate of application of the primer shall be within the range $0.65\text{—}1.0\text{ litre}/\text{m}^2$, the actual rate to be determined by test and observation on site. Where emulsion primer is used, the application rate shall be increased to give the required nett bitumen content.

Hand spraying shall be used only in those areas inaccessible to mechanical distributors. Before spraying is commenced, the surface shall be lightly watered to settle dust.

Single Coat Premix Tarmacadam

When the prime coat has dried the single coat premix wearing course, of the compacted thickness specified, shall be constructed.

The wearing course shall be Type A (Hot Mix), unless otherwise specified or approved by the Department, and shall conform to the following specification: —

TABLE G: SINGLE COAT PRE-MIX WEARING COURSE: SPECIFICATIONS

	Screen Size mm	A Hot Mix	B Hot Mix	C (Kerbs)

Aggregate	26.5	100	-	-
Grading	19.0	100	-	-
Per Cent	13.2	80 - 100	100	-
Passing	9.5	70 - 90	80 - 95	100
	6.7	-	60 - 75	90 -
	4.75	50 - 70	45 - 60	100
	2.36	35 - 50	28 - 42	65 - 75
	1.18	27 - 40	18 - 30	52 - 62
	0.6	19 - 30	7 - 20	50 - 60
	0.3	13 - 23	2 - 10	45 - 55
	0.15	8 - 16	0 - 5	30 - 40
	0.075	4 - 10	0 - 4	9 - 19
				4 - 8
Grade Binder		60 / 70	Emulsion	60 / 70
Nominal Nett Binder Content		5.5 % +/- 0.38	4.75 % +/- 0.3	5.5 % +/- 0.3

Penetration grades to comply with SANS Specification 307.

Cut-back bitumen to comply with SANS Specification 308.

Maximum heating temperature of bitumen 170°C.

Delivery temperature at the paver for hot mixes 130—160°C.

For every 500m² of area paved the Contractor shall produce an extraction test result from a sample taken during laying operations showing grading and bitumen content of the premix carpet. The test as specified or any further tests to prove compliance with the specification shall be at the Contractor's expense.

In order that the stone and binder shall be properly mixed, this operation must be carried out in a pug-mill mixer or by hand with shovels and wheelbarrows or on metal plates, in which case the binder must be added in the correct proportions in small quantities. Mixing shall continue until the aggregate is uniformly coated with the binder. Bituminous surfacing shall not be carried out in rainy weather nor when atmospheric shade temperature is below 10°C. Immediately after mixing, the surfacing materials must be spread and rolled on the same day. Spreading shall be done evenly over the base to ensure a consolidated thickness as specified and shall be performed by means of a mechanical spreader or by a drag spreader, or by hand, using rakes and screeds.

Where hand spreading is used, the premix must not be dumped on the base, but taken from the boards on barrows by shovel and then evenly distributed over the base. Hand raking must be reduced to a minimum to avoid segregation of aggregate. Rolling shall commence as soon as the binder has set sufficiently and, unless otherwise instructed, this shall be done with a 4 to 5 tonne roller or equal.

Places inaccessible to a roller may be compacted by means of 12kg tampers. The surface shall be rolled true to line and level without slacks or irregularities.

After three days the rolling shall be repeated during the hottest part of the day and a light application of fines may be added during the final rolling.

Premix Tarmacadam Kerb

Premix kerbs are to be Type C as specified above and constructed to give the following compacted size: —

Width at top	125mm
Width at base	230mm

PRE-CAST CONCRETE PAVING BLOCKS: — shall be of the type, class and thickness specified, of approved colour and shall comply with SANS Specification 1058. Paving blocks which fail to meet these requirements must immediately be removed from the site and replaced at the Contractor's expense to the satisfaction of the Department.

Paving blocks shall be one of the following types as specified: —

Type S-A: — allows geometrical interlock between all vertical faces of adjacent blocks,

Type S-B: — allows geometrical interlock between some vertical faces of adjacent blocks.

Type S-C: — allows no geometrical interlock between vertical faces at adjacent blocks.

Paving blocks shall be one of the following classes as specified: —

Class 25: — average compression strength of at least 25 MPa.

Class 35: — average compression strength of at least 35 MPa.

Paving blocks are to be laid to approved patterns as specified and in accordance with the relevant clauses (excluding Clause 8) of SANS Specification 1200 MJ on and including a sand bed of the compacted thickness specified. After laying, the paving blocks are to be compacted by means of a vibrating plate compactor with the joints filled in, after compaction, by sweeping in jointing sand.

Sand for bedding shall conform to the following grading: —

Sieve size (mm)	Percentage Passing
9, 52	100
4, 75	95-100
2, 36	80-100
1, 18	50-85
0, 60	25-60
0, 30	10-30
0, 15	5-15
0,075	0-10

Sand for jointing shall pass a 1.18mm sieve and shall contain 10-50% of material that passes a 0,075mm sieve.

Spaces constituting less than 25% of a full block unit and of 25mm minimum dimension at perimeter edges of pavings against kerbs, buildings, inspection chambers, etc. are to be filled with Class B concrete trowelled to a smooth even surface to match paving blocks.

Rates for paving block pavings are to include for all straight cutting and waste, all half blocks at straight edges, filling with concrete as described, fitting, protecting from injury and cleaning down at completion.

KERBS

Generally

The kerbs are to be laid before the base course is commenced to the lines and positions as shown on the drawings. The Contractor is to allow sufficient time for the mortar bedding and joints to set and is to take all necessary precautions to maintain the line of the kerbs especially while rolling the base course and surfacing, as no claims in this connection will be considered.

Rates for kerbs are to include for necessary excavation, well consolidated bottom under kerbs and for filling and ramming to secure the kerbs in position.

Pre-cast Concrete Kerbs

Pre-cast concrete mountable kerbs as SANS Fig8 are to be of concrete Class 20 (20 MPa) and of the sizes described in the items, cast generally in 1m lengths, and finished smooth off the mould on top edge and both sides, with angles rounded, and rates are to include for all necessary formwork and moulds. The kerbs are to be bedded on and including a mat of

1:3 cement mortar, and the abutting ends of the kerbs are to be fully jointed in a similar mortar and pointed with a keyed-in joint on top edge and exposed sides.

Brick on edge kerbs

Brick on edge kerbs are to be of extra hard burnt bricks of the colour specified. The kerbs are to project 10mm above the finished tarmacadam level and are to be bedded on a mat of 1:4 cement mortar, and the abutting ends of bricks are to be fully jointed in a similar mortar and pointed with a keyed-in joint on top and exposed sides.

19. FENCING AND GATES

GENERALLY: — The Department shall be responsible for the initial location and exposure of all necessary boundary beacons and their indication to the Contractor at the site handover. The Contractor shall be responsible for subsequently ensuring that these beacons remain undisturbed and that the fencing is correctly aligned between boundary beacons. Should, during setting out of the further boundary beacons be uncovered or located and reasonable doubt arise regarding the correct alignment of fencing, then the Contractor shall be responsible for immediately notifying the Department, in writing, of such doubt, in order that the setting out may be checked and rectified, if necessary.

All bushes, trees, old fencing, rocks, debris, long grass and other obstructions shall be removed from the fencing line to produce a clear even strip 500mm wide on either side.

Trees, rocks or other items of horticultural or archaeological interest that are not to be removed will be indicated by the Department.

Straining Posts: - shall be erected at ends, corners and intermediately at not exceeding 30m centres with standards or intermediate posts erected between posts at not exceeding 3m centres.

Where fences are erected directly over boundaries, corner beacons shall be preserved by splaying the corner by planting two straining posts, each with one stay, 1 m from the beacon peg.

Security fences (i.e. fences with projecting overhangs if specified) shall be sited 350 mm back from the boundary line so that the end of the overhang is exactly on the boundary line.

SECURITY FENCING:

2.3m High security fencing shall consist of: -

- 1) Straining and Intermediate Posts (2.9mtr long).
- 2) Stays (2.6mtr long).
- 3) Welded mesh fencing (1.8mtr high).
- 4) Razor wire.
- 5) Concrete ground beam.
- 6) Tubular steel gate posts (when specified).

Straining and corner posts shall be 150mm \varnothing x 3mm wall thickness steel tubing, in lengths as specified, with upper end capped and 3mm thick x 300mm x 300mm footplate welded to base. The whole shall be **hot dipped galvanized**. 80mm diameter stays x 3mm wall thickness shall be secured to posts with galvanised bolts. Straining posts to be positioned at maximum 30mtr c/c. Bottom of posts bedded in concrete to be painted with bitumen paint prior to erection. Where holes have to be drilled on site, drilling shall be cold galvanized before corrosion sets in.

Intermediate posts shall be 2.9mtr long x 100mm x 100mm square pre-stressed, precast concrete posts with top end splayed, spaced at maximum 3mtr apart. Stays for posts shall be prestressed reinforced concrete members of 75mm x 75mm x 2.6mtr long, splayed at the top end, with a 10mm \varnothing x 50mm long galvanized steel pin attached to fit into a drilled hole in the upright and bonded to posts with approved epoxy.

Fence shall comprise of galvanized rectangular welded mesh fencing 1,80mtr high x 3.15mm \varnothing x 25mm x 50mm rectangles fixed to 8 gauge or 3.15mm diameter – as

specified - hardened galvanized steel straining wires x 5, spaced vertically at 450mm ϕ . Welded mesh shall be secured to straining wires with 2mm ϕ galvanized tying wire spaced at a maximum of 250mm between ties. Fencing overlap to be a minimum of 150mm.

Straining wires shall be fixed to posts with doubled strands of 2mm ϕ galvanized tying wire, pulled tight around posts and wound tightly around the straining wires.

Coils of 500mm ϕ galvanized flat wrap razor wire shall be fixed vertically above the welded mesh to a height of 450mm above the top of the welded mesh. Razor wire shall be supported on and fixed to three strands of galvanized double strand barbed wire. Barbed wire shall be fixed to the posts in the same manner as the straining wires.

Razor wire shall be fixed to the barbed wire at every intersection and laced to the concrete posts with galvanized tying wire.

A 250mm wide x 150mm minimum depth concrete ground beam of 15mpa strength shall be excavated for and cast along the entire length of the fence. Shuttering for the ground beam sides shall be provided as required. Finished level of the ground beam shall be 50mm above final ground level at the highest point, finished in a straight line both vertically and horizontally. 75mm of the welded mesh fencing and the bottom straining wire shall be embedded in this ground beam to secure the lower fence line. The top of the concrete beam shall be shaped to allow water to run off the top of the beam to prevent water collecting and standing on top of the beam.

At any change in direction of the fence line, two 150mm ϕ x 3mm wall thickness straining posts shall be erected with bottom ends embedded in a common concrete base with each post stayed separately.

Concrete bases for posts shall be Class B (1:3:5-19mm stone) size 400 x 400 x 500mm deep, unless otherwise specified, with tops of bases 100mm below ground level.

When required, gateposts shall be supplied in steel tubing complying with CKS 82, 150mm ϕ x 5mm wall thickness, in lengths as specified, with upper end capped with 1.6mm thick pressed mild steel domed cap welded on and 3mm thick x 300mm x 300mm footplate welded to base. Gateposts are to be drilled and fitted with mild steel ferrules welded into position to receive 20 mm ϕ mild steel hinges. Threaded 12 mm ϕ studs or approved stay collars are to be fixed on to the posts to locate and secure the top ends of stays. The whole shall be hot dipped galvanized. Where holes for the threading and fixing of straining wires are required, holes shall be drilled on site and cold galvanized on completion. Stays shall have the top end flattened, bent as required, holed 12 mm ϕ for bolting to post and the whole hot dip galvanized.

Mild steel tubing for gate components shall comply with SANS Specification 657 Part 1. The diameters specified are the nominal external diameter of the tubing.

Straining wire: - shall be as specified, or either Type 1 galvanized wire of 3,15 mm diameter or Type 2 PVC coated galvanised wire with 3, 15 mm diameter core wire PVC coated to an overall diameter of 3,95 mm. Stainless steel straining wire when specified shall be 2,50 mm diameter A.I.S.I. Type 304 stainless steel, strained between posts and tied to same at terminal ends by turning each wire twice around the post and tying off by twisting it a minimum of three turns around the strained wire.

Binding or Tying wire: - shall be as specified, either Type 1 galvanised wire of 2 mm diameter or Type 2 PVC coated galvanised wire with 2 mm diameter core wire PVC coated to an overall diameter of 2, 80 mm.

Galvanized barbed fencing wire: - shall consist of two strands of 1, 60 mm diameter high tensile steel wire twisted together with barbs at 125 mm centres and each row of barbed wire shall be strained between posts and tied to same at ends by turning each wire around the post and tying off by twisting it a minimum of three turns around the strained wire.

Galvanising: - shall comply with SANS Specification 763 and all items of posts, stays, gate

framing, etc., described as galvanised shall be hot dipped galvanised after fabrication with Class A galvanising with all internal and external surfaces fully coated.

GATES: — Generally single gates and double gates shall be of the sizes stated and formed with mild steel tubular framing all round, covered with chain link wire mesh of the type specified laced to framing. Tubular framing to gates shall be mitred and welded at corners and, at all other intersections, the tubular framing shall be scribed and welded together with all welds ground smooth.

Preferred gate hinges are Bullet Type or through pin type hinges.

Where gates are to be hung on precast concrete posts, hinges shall be fixed to and including mild steel clamps, each formed of two 50 x 5 mm mild steel plates 200 mm long, twice holed for and bolted on opposite sides of post with two 10 mm \varnothing x 140 mm galvanized mild steel hex-head bolts and with each plate holed to receive 20 mm \varnothing gate hinge.

Each single gate and one leaf of each double gate shall be fitted with gate latch formed of 25 x 6 mm mild steel bracket, 550 mm girth, twice bent to U-shape with centre section 150 mm high and with ends scribed and welded to tubular stile of gate. A locking bar formed of 25 x 6 mm mild steel plate, 100 mm long, twice holed 13 mm diameter for shackle of padlock and for pad bolt, shall be welded to inside of bracket. The sliding pad bolt shall be formed of 12 mm \varnothing mild steel rod, 220 mm long, with 25 x 6 mm mild steel flat bar 60 mm long welded on at one end and holed 13 mm diameter for shackle of padlock. The stile of the gate and the locking post or locking stile of the double gate shall be holed for and fitted with mild steel ferrule welded in to receive pad bolt. In addition, fittings to each leaf of double gate shall comprise 50 x 6 mm mild steel locking bar, 80 mm long, holed 20 mm \varnothing for shackle of padlock and welded to locking stile of gate and drop bolt formed of 16 mm diameter mild steel rod, 575 mm girth, once bent to L-shape, fitted through and including 20 mm internal diameter mild steel sleeve welded to gate at bottom corner, with 12 mm diameter mild steel peg stay 25 mm long welded on to gate frame.

A concrete gate stop block size 230 x 230 x 230 mm deep with two 20 mm internal diameter mild steel sockets, each 75 mm long, cast into top shall be embedded in the road surface between each pair of double gates in the closed position. A similar gate stop block but with one socket shall be embedded in the road surface to each leaf of double gate in the open position.

Each single or double gate shall be fitted with an approved 51 mm brass padlock with hardened steel shackle and two keys.

Gates for 1, 20 m high fencing

Single gates shall be size 1,00 x 1,20 m high, each hung on hinges as stated above and formed of 32 mm diameter x 2 mm wall thickness mild steel tubular framing all round. Each gate shall be fitted with locking pad bolt with brass padlock.

Double gates shall be in two equal leaves with each leaf size 2.25 x 1, 20 m high, hung on hinges as stated above, formed of 38 mm diameter x 2 mm wall thickness mild steel tubular framing all round with two 38 mm diameter x 2 mm wall thickness mild steel tubular braces welded on between bottom corners and centre of top rail of each leaf. Each pair of double gates shall be fitted with locking pad-bolt, locking bars with brass padlock, drop bolts and concrete gate stop blocks as specified above.

Gates for 1, 50 m high fencing

Single gates shall be size 1, 00 x 1, 50 m high as described for gates for 1, 20 m high fencing but with each stile of gate extended 330 mm above top rail and braced between top rail and top of extension arm with 32 mm diameter x 2 mm wall thickness mild steel diagonal brace welded on and hung on hinges as stated above. Two rows of galvanised barbed wire, spaced 150 mm apart, shall be strained and tied to the extension arms.

Double gates shall be in two equal leaves with each leaf size 2, 25 x 1.50 m high with each hung on hinges as stated above, all as described for double gates for 1, 20 m high fencing but with each stile of each leaf extended 3 mm above top rail and braced between top rail and top of extension arm with 38 mm diameter x 2 mm wall thickness mild steel diagonal brace welded on. A vertical extension arm 330 mm high - formed of 38 mm diameter x 2 mm wall thickness mild steel tube - shall be welded on above centre of top rail. Two rows of galvanised barbed wire, spaced 150 mm apart, shall be strained and tied to extension arms.

Gates for 3, 00 m high fencing

Single gates shall be size 1,00 x 1,50 m high, hung on hinges as stated above and formed of 38 mm diameter x 2 mm wall thickness mild steel tubular framing all round with 38 mm diameter x 2 mm wall thickness mild steel horizontal centre rail. Each gate shall be fitted with locking pad bolt with brass padlock.

Chain link wire mesh fencing shall be carried over and above the top of the gate as previously described for fencing.

Double gates shall be in two equal leaves with each leaf size 2, 25 x 3, 00 m high, each hung each hung on hinges as stated above, and formed of 51 mm diameter x 2 mm wall thickness mild steel tubular framing all round with two 51 mm diameter x 2 mm wall thickness mild steel tubular braces welded on between bottom corners and centre of top rail of each leaf. Each pair of double gates shall be fitted with locking pad bolt, locking bars with brass padlock, drop bolts and gate stop blocks.

Gates for 1, 8 m high security fencing:

Single gates shall be size 1,00 x 1,80 m high, hung on hinges as stated above and formed of 38 mm diameter x 2 mm wall thickness mild steel tubular framing all round with 38 mm diameter x 2 mm wall thickness mild steel horizontal centre rail. Each gate shall be fitted with locking pad bolt with brass padlock.

Single gates shall be hung on mild steel tubular gate posts with cranked overhang when specified and the galvanised barbed wire overhang shall be carried over above the gate as previously described.

Double gates shall be in two equal leaves with each leaf size 2, 25 x 1, 80 m high, each hung on hinges as stated above and formed of 51 mm diameter x 2 mm wall thickness mild steel tubular framing all round with two 51 mm diameter x 2 mm wall thickness mild steel tubular braces welded on between bottom corners and centre of top rail of each leaf. The stiles of each gate shall be extended 450 mm high above the top rail and braced between top rail and top of extension arm with 51 mm diameter x 2 mm wall thickness mild steel diagonal brace welded on. A vertical extension arm 450 mm high formed of 51 mm diameter x 2 mm wall thickness mild steel tube shall be welded on above centre of top rail. Three rows of galvanised barbed wire, spaced 150 mm apart, shall be strained and tied to extension arm. Each pair of double gates shall be fitted with locking pad bolt, locking bars with brass padlock, drop bolts and gate stop blocks.

Double gates shall be hung on posts without cranked overhang but with the posts extended 450 mm high above top of chain link wire mesh fencing to receive continuation of barbed wire and razor wire.

Gates for 2, 40 m high security fencing

Single gates shall be of size 1, 00 x 2, 00 m high, all as described for gates for 1, 80 m high security fencing.

Chain link wire mesh fencing shall be carried over above the top of the gate to an overall height of 2, 40 m with the razor wire carried across between the gateposts.

Double gates shall be in two equal leaves, with each leaf 2, 25 x 2, 40 m high, all as described for double gates in 1, 80 m high security fencing.

Double gates shall be hung on posts without cranked overhang but with the posts extended 450 mm high above top of chain link wire mesh fencing to receive continuation of razor wire.

SUBMISSIONS FOR PREFABRICATED TIMBER ROOF TRUSSES

Letter Ref. TR 1

I / We hereby undertake to be responsible for the design of the total timber roof construction and will satisfy myself / ourselves that the fabrication and erection is in accordance with my / our design.

Project: _____

Part(s):

NAME

OF

FIRM:

SIGNATURE: _____

QUALIFICATION:

DATE: _____

Letter Ref. TR 2

I / We am/are satisfied that the fabrication and erection of the total roof construction has been completed in conformity with my / our design.

Project: _____

Part(s):

NAME

OF

FIRM:

SIGNATURE: _____

QUALIFICATION:

DATE: _____

SUPPLEMENTARY PREAMBLES

The following Supplementary Preambles are to be read in conjunction with the "Standard Preambles to all Trades" included here before and are to apply to this Contract.

Where these "Supplementary Preambles" are at variance with the "Standard Preambles to all Trades" referred to above, such variances are to take precedence and are to apply to this Contract.

1. ALTERATIONS

All Notes, Preambles, etc. applicable for the various trades in the Bills of Quantities, will apply equally to the trades in this Bill.

Tenderers are advised to visit the site and satisfy themselves as to the nature and extent of the work to be done, and also to examine the condition of the existing building.

Tenderers are advised that all materials from the pulling down (except where described to be re-used or handed over to the Department) will become the property of the Contractor, and all these materials, together with all rubbish and debris, must be immediately carted away, and the site left clean and unencumbered. Materials, etc. which are described to be handed over to the Department are to be carefully dismantled where necessary, and neatly stacked where directed on site. Items described as removed shall be removed from site.

Credit for the value of the materials from the pulling down may be allowed for on the Final Summary page.

Prior to the removal of any timbers from the site, they are to be inspected by the Government Entomologist as laid down in Section 32 of the Government Forest and Veld Conservation Act of 1941 (Act 13 of 1941) as amended. If any of the timbers are infested with wood destroying agencies, they are to be disposed of in the manner prescribed by the Government Entomologist.

The Contractor is to give ample notice to the Department and Local Authorities regarding any disconnections necessary prior to the removal or interruption of electric light or telephone cables, water and sanitary services, etc.

Tenderers are advised that adjacent sections of this building will be occupied during the building operations, and the Contractor is required to carry out the work with as little noise, dust and disturbance as possible. Undisturbed access is to be given to patients, staff and visitors.

The Contractor is advised to check all dimensions affecting the existing building as he will be held solely responsible for all new work being of the correct size. All sizes stated are approximate and under no circumstances will claims be entertained should actual sizes of existing items on site vary marginally from the sizes stated in this document.

The Contractor will be held solely responsible for any damage to persons, property, and equipment and for the safety of the structure throughout the whole of the Contract, and must make good at his own expense any damage that may occur.

The Contractor must obey the instructions of the Department in carrying out any portion of the work which in his opinion requires expediting, and the Contractor shall give priority to such work as and when directed.

In taking down and removing existing work, the utmost care is to be observed to avoid any structural or other damage to the remaining portions of the building. The Contractor must also protect all work not removed, such as walls, floors, doors, windows or joinery, loose and fixed fittings and electrical equipment, appliances, etc. from damage during the progress on the works and provide all necessary materials in so doing.

Special care is to be taken not to interfere with any electric light, bell, power or telephone wires and fittings that may be encountered on site. New work to the existing electrical, air-conditioning, gas and telephone installations, etc. is included elsewhere in this document.

The Contractor must take the exigencies of the Hospital Service into consideration. Liaison is to be carried out through the offices of the Regional Engineer, with referrals to the Director: Physical Facilities Management for a final decision. No instructions may be received by the Contractor from the Hospital Authorities and all instructions are to be given by the Chief Department in writing before they are put in hand.

2. CONCRETE, FORM WORK AND REINFORCEMENT

Cement is to comply with:

SANS ENV 197 (1 to 2)
SANS ENV 413 (1 to 2)
SANS ENV 196 (1 to 7)
SANS ENV 196 (21)

as applicable, and replaces the following SANS Specifications in the Standard Preambles:

SANS 471 Portland cement (ordinary, rapid hardening and sulphate resisting)
SANS 626 Portland blast furnace cement.
SANS 831 Portland cement 15 (ordinary and rapid hardening)

3. MASONRY

Masonry is to comply with SANS Code of Practice 0249 and 0164 as applicable.

4. ROOF COVERINGS, ETC.

The installation of roof coverings and side claddings is to comply with SANS Code of Practice 0237 as applicable.

5. CARPENTRY AND JOINERY

Note:

All timber must be treated in terms of SANS Code of Practice 05 for GYMNOSPERMAE including all SA Pine species and ANGIOSPERMAE including all Eucalyptus species but excluding laminated timber.

It is now a compulsory requirement to use only treated timber in buildings. The treatment shall comply with SANS 457, 753, 754 or 1288 as relevant.

Reference must also be made to the appropriate Standard Preambles and SANS requirements for items not covered by these joinery preambles, etc. i.e. ironmongery, aluminium, glazing, paintwork, etc.

Where items are described as “plugged and screwed”, they are to include for plugging and screwing to new or existing brickwork or concrete, with heads of screws sunk and pelleted.

Sawn softwood timber: General, Stress Graded, Industrial, Brandering and Battens is to comply with SANS 1783 Parts 1 to 4 as applicable.

All hardwood is to be dark red Meranti, even in grain and colour selected for “Standard and Better” quality, from Malaysia, with a minimum density of 550 kg per cubic metre at moisture content of 12%, and is to comply with SANS 1099 as applicable.

Hardboard is, unless otherwise described; to be 3mm un-tempered hardboard for floor units and 6mm tempered hardboard for wall units.

Melamine faced moisture resistant V313 chipboard can be used when specified.

Materials generally are to comply with the following specifications and requirements as applicable:

TABLE H: CARPENTRY AND JOINERY: SANS SPECIFICATIONS

MATERIAL	SANS SPECIFICATION	GRADE OR CLASS
Softwood structural timber	1783	Parts 1, 2, 3, 4
Softwood engineering timber	1783	Parts 1, 2, 3, 4
Softwood studs for timber frames in building	1783	Parts 1, 2, 3, 4
Softwood bracing and battens	1783	Parts 1, 2, 3, 4
Softwood joinery timber	1783	Parts 1, 2, 3, 4
Softwood flooring boards	629	Flooring Grade
Hardwood joinery timber	1099	Heavy flooring board
Hardwood strip flooring	281	Knotty grade
Wooden ceiling and panelling boards	1039	As specified
Laminated timber (glulam)	1460	As specified
Gypsum, plasterboard	266	As specified
Wood fibreboard	540	As specified
Wood wool panels (cement bonded)	637	As specified
Fibre cement sheets: profiled and flat	685	As specified
Fibre cement boards	803	As specified
Plywood and composite board Particle Board: Highly Moisture resistant exterior and flooring type Interior Type	929 EN 312 EN 312	Parts 1 to 7
Decorative laminates	SANS ISO 4586 and SANS 1405	High Pressure
Decorative Melamine Faced Boards	1763	
Wooden Doors (flush)	545	
Materials for thermal insulation of buildings	1381	As applicable
Mild steel nails	820	
Metal screws for wood	1171	
Creosote	538	As specified
Timber roof trusses	0243	SANS Code of Practice

6. CEILINGS AND PARTITIONS

Refer to Joinery Fittings regarding specifications and requirements of materials.

7. IRONMONGERY

Materials

- i) Locks are to comply with SANS 4 as applicable
- ii) Door closers are to comply with SANS 1510 as applicable
- iii) Symbolic safety signs are to comply with SANS 1186 as applicable

All ironmongery, unless otherwise described, is fixed to timber.

Sheet steel furniture to comply with SANS 757 as applicable

8. **METALWORK**

Rates are to include for cutting to lengths, splay cut ends, shaping, holing, tapping, threading, forging, turning, fitting, assembling, welding, filing smooth, preparation, priming coats, hoisting, temporary bracing and fixing in position.

Towel rails are to be tubular Satin Chrome mild steel to diameters - minimum 19mm - and lengths as specified in matched Satin Chrome end pieces. End pieces to be either flat or bracket type - according to requirements, application and specification - plugged and screwed into walls with Chromed Brass screws.

Electro-plating is to comply with SANS ISO 1456 as applicable.

Curtain tracks to be "Forwin" Hospital Curtain Tracks as "Kirtan" (Pty) Ltd. - or other approved -, including 15 wheeled runners per metre, hangers, brackets, stopped ends, etc. Hangers are to be suspended from roof timbers or concrete slab over – **not off the ceiling grid**. Allowance is to be made for necessary bends and curving as per plan supplied. Curtains to be provided as (Chintz fabric (#155CZ) woven with 100% polyester yarn)

SHELVING FOR PHARMACIES: - Shall be epoxy coated steel shelving, either fixed to epoxy coated wall bands or free standing units as specified.

SHELVING FOR CSSD STERILE STORE: - Shall be slatted grade 304 stainless steel wall bands or free standing units as specified.

Aluminium Windows and Doors

NOTE:

Glazed aluminium alloy windows and sliding doors for external use are to comply with SANS 1651 as applicable.

All items must conform to and carry the Certification Seal of the AAAMSA and no items which are not so certified will be accepted on site.

The work is to be cleated and framed.

All visible surfaces are to have a 25 micron anodised finish as specified.

Anodised coatings on aluminium are to comply with SANS 999 as applicable.

Rates are to include for setting up and building in as well as for isolation material between the aluminium surfaces and adjacent surfaces of a differing material.

All visible surfaces are to be covered with a temporary protective tape, later to be removed.

Float glass for glazing is to comply with SANS CKS 55 and SANS 952 as applicable.

Safety and security glazing materials for buildings is to comply with SANS 1263(1) unless otherwise described. All panes are to be marked so as to be visible. Laminated safety glass is to carry a written five year guarantee.

Windows and doors are to be watertight.

Silicon pointing to windows and doors is covered elsewhere.

9. **PLASTERING**

Rates for new plaster, screeds, etc. to existing surfaces are to include for all preparatory work and forming a key.

Removal of paint and/or varnish as well as the roughening of the existing face brick surfaces both externally and internally to receive new plaster has been measured separately.

Plaster and screeds, etc. in patches is generally of an isolated nature and to existing surfaces. Portion of the work may be in narrow widths.

Where alterations are to be done to the existing structure, the new plaster, etc. has been measured to a point 300mm beyond the line of the alteration on the existing structure.

10. TILING

Ceramic Wall and Floor Tiles are to comply with SANS 1449 as applicable.

11. PLUMBING AND DRAINAGE

Water Supply and Drainage for Buildings is to comply with SANS Code of Practice 0252 as applicable.

Water Supply and Distribution System Components is to comply with SANS 1808 as applicable.

Electrical Water Heater:

Storage Heaters to comply with SANS 151.

Instantaneous Heaters to comply with SANS 1356 and IEC 335 (2-35).

12. GLAZING

Glass is to comply with SANS Specification 952.

Glass for glazing is to comply with SANS Specification CKS 55.

Safety and security materials are to comply with SANS Specification 1263 as specified.

Laminated safety glass is to carry a written five year guarantee.



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 2

General Electrical Specifications

GENERAL ELECTRICAL SPECIFICATION

(ALL IN CONTRACTS)

1. CONDUIT AND CONDUIT ACCESSORIES

1.1 Conduit

Conduit shall be of steel galvanised internally and externally, either solid drawn, or welded and not less than 20 mm diameter, with all rough edges removed. All tube ends removed. All tube ends are to be reamed. With screwed conduit one threaded end is to be fitted with a coupling and the other end is to be protected against damage.

UPVC conduit may only be used if permitted by the Head : Works and only in those areas which he may specify. In this case this conduit shall be according to SABS 950.

Conduit accessories, which are secured to the conduit by means of lugs, screws or setscrews, are not acceptable.

General requirements of conduiting to SABS IEC 60614 (1).

Metal conduits shall be fully in accordance with SABS 1065 PART I.

1.2 Conduit Accessories

All conduit accessories shall be galvanised both internally and externally and comply with SABS 1065 – PART II.

All screwed conduit fittings shall be of malleable cast iron.

Where fittings are fitted with covers, the covers shall be of galvanised pressed steel secured with brass screws.

1.3 Flexible Conduit

Flexible conduit shall be of the plastic covered metal type complete with brass connectors to the approval of the Head : Works.

2. INSTALLATION OF CONDUIT

2.1 General

Except where cables are specified for certain circuits, the installation(s) shall be tubed throughout in steel conduit. Split conduit is not permitted. All conduits shall, wherever possible, or unless otherwise specified or agreed, be concealed in the structural work.

Except where agreed or otherwise specified or indicated on the drawings, all conduit to points shall run via the ceiling and floor slabs or roof space. In damp situations and where exposed to the weather, the conduits shall be so installed as to avoid, as far as possible, the condensation of moisture within them. All running joints are to be painted with an approved metal primer.

Mechanical and Electrical continuity must be maintained throughout the installation. Each length of conduit and every conduit fitting must be inspected for defects and all sharp edges or burrs must be removed before it is installed. All joints are to be tightly fitted together.

Running joints with long threads, where used, are to be fitted with a lock nut and the running thread shall not be longer in length than a coupling and lock unit.

In conduits smaller than 32 mm elbows and normal bends are not to be used but conduits are to be set to the required angles.

Flexible connections between conduit and appliance or other equipment shall be by means of flexible tubing (see Par 1.3).

No wiring shall be drawn into conduits until the conduits have been installed.

Where more than one socket outlet is connected on a circuit, the conduit shall be looped from the one outlet box to the following outlet box.

All switch-boxes, socket outlet boxes and any other purpose made metal box including distribution board trays shall be suitable treated against corrosion before installation with "Rustodian" or other approved metal primer.

All conduits shall be securely fixed into chases, and all flush switch and socket outlet boxes must be firmly embedded in cement mortar.

The Contractor shall make himself familiar with the positions of all fittings, such as blackboards, pinning boards, cupboards, shelving, worktops, etc, before commencing the conduit installation. The position of switches and socket outlets as indicated on the drawings are approximate only. The Contractor must verify that the final position of these will not be covered by the installation of the fittings referred to above, or come midway between the junction of any dados and upper wall finishes.

No extras will be entertained for moving switches or socket outlets as a result of the Contractor's failure to verify the final positions of the fittings or type of wall finish.

2.2 **In Roof Spaces**

The conduit in roof spaces shall be installed parallel or at right angles to the roof truss members and shall be secured at centers not exceeding 1,2 m by means of galvanised saddles nailed to the timbers with galvanised clout nails. Crampets will not be allowed.

Crossing of conduits is to be avoided wherever possible. Where unavoidable, one conduit must be neatly set over the other. Where a number of conduits have to run back to the distribution board or switchboard, they shall run parallel to the distribution board or switchboard, and at saddle distance to each other wherever possible.

Conduit runs from distribution boards shall terminate in fabricated sheet steel draw boxes installed in the roof above the distribution boards. Each draw box shall be fabricated from 1,6 mm galvanised sheet steel with welded corners and

suitably treated against corrosion with “Rustodian” or other approved primer and finished in aluminium paint.

Each draw box is to be fitted with slip-on lid with a 13 mm skirt. The box shall be 75 mm deep, shall be rectangular in shape and the size of conduits entering or leaving the box. Conduits shall be fixed to the box by means of couplings and brass male bushes or lock nuts and brass bush-nuts.

Conduit droppers shall be neatly cut into timber wall plates and set to face the right direction. All sets must be uniform. Conduits may be set at angles only where droppers or ceiling points are within 230 mm of roof members.

No conduits are to be run over the top of gangplanks or trapdoors.

Draw-in boxes with metal covers shall be provided where required and shall be installed near the gangplanks, if any. All inspection conduit fittings in open roof spaces shall face upwards to facilitate wiring and to permit easy inspection. Three-way conduit boxes shall be used for tee-off purposed in open roof spaces. Inspection tees are not to be used except where otherwise agreed or specified.

All conduits extended into a roof space with a roof clearance of more than 900 mm shall be set onto the beam and extended into the roof for a distance where there is sufficient clearance. Under flat roofs or where there is less than 900 mm clearance, the conduit shall be installed as specified for tubing in concrete slabs, right angle bends should be kept to a minimum and the shortest route taken.

Where false ceilings occur they shall be tubed as called for in the detailed specification. Conduits in restricted spaces and run as for concrete slabs must however, be installed in a neat and orderly manner.

Conduits to ceiling points for all types of fittings must be firmly supported and shall terminate in a back entry conduit box. The conduit box shall be taken through to the face of the ceiling and finish flush. Where the ceiling brander interferes with the installation of the ceiling point specified, the Contractor must trim the brander to allow the conduit box to be taken through to the face of the ceiling as specified. Luminaires must be bonded to the conduit box by means of metal threaded screws.

2.3 **In Concrete Slabs**

In order not to delay building operations, the Contractor must ensure that all conduits and conduit fittings, which are to be cast in concrete, are laid in good time. The Contractor shall have a competent Electrical Artisan standing by during casting of concrete, etc, to ensure that the conduit boxes are not damaged during casting of concrete.

Draw boxes, expansion joints boxes and round conduit boxes are to be provided where necessary.

Deep type conduit boxes shall be used for side entering conduits and normal shallow boxes may be used for back entry conduits. No elbows, bends or sharp sets will be allowed in concrete slabs except in cases of conduits of 40 mm diameter or when larger sweeping bends will be permitted.

Common drawn and/or inspection boxes shall be used where there is more than one circuit involved. They shall be installed in lavatories, storerooms, or other inconspicuous places. Covers shall be of hardboard neatly finished to match the finished ceiling or wall surface, and shall be fitted parallel to the wall or ceiling.

All boxes, etc. are to be securely fixed to the shuttering to prevent displacement when concrete is cast. All conduits must be laid off the deck, supported and secured at regular intervals and installed as close as possible to the neutral axis of concrete beams and slabs.

Expansion joints shall be shown on layout drawings and shall consist of a metal box in which one conduit is fixed and the other capable of movement with the building's expansion and contraction. Earth continuity of these joints shall be maintained by means of stranded copper conductors bonded to the conduits in the box as shown on the drawing.

Earth conductors and clamps buried in concrete are not permitted.

Conduits must be spaced sufficiently apart to allow for proper concreting. All joints shall be painted with an approved metal primer after completion of the tubing installation, prior to the concreting. All exposed parts of the conduit installation shall be suitably, protected against corrosion at the discretion of the Head : Works.

Before any concrete slab is cast, all conduit droppers to switchboards shall be neatly spaced and rigidly fixed.

2.4 **Surface Work**

All conduit must be plumbed and leveled and only straight lengths shall be used.

In cases where doorframes are out of plumb, or fittings, beams etc, are out of level, the conduit shall be run parallel with the doorframes, fittings, beams etc.

No threads shall be visible when the conduit installation is complete, except on running couplings.

Running couplings shall only be used where unavoidable and shall be fitted with a sliced coupling as a lock nut.

No inspection or normal bends are to be used on surface work, except with the approval of the Works Inspector and where conduits of 32 mm diameter or larger are used. Conduits shall be set uniformly and inspection couplings shall be used where necessary.

Fittings, tees, boxes, couplings, etc, are to be cut into the surface to allow the conduit to fit flush against the surface or alternatively spacer bar saddles may be used. Conduit is to be bedded into any irregularities to avoid gaps between the surface and the conduit.

Double sets, where used, shall be parallel with no twists and shall be as short as possible. All conduits, which terminate at metal trays, boxes, industrial switches and plugs shall do so by means of couplings and male bushes. No couplings will be permitted in droppers of lengths less than 3.6 m.

Where crossings of conduits is unavoidable, purpose made metal boxes shall be used. The length of the box is to be 8 times the diameter of the largest conduit, the width one and half times the sum of the diameter of all the conduits, and the depth one and half times the diameter of the largest conduit with a minimum depth of 50 mm. The box shall be fitted with a neatly fitting cover and the finish shall be in keeping with the general layout.

Where a number of conduits are to be installed in parallel they shall be evenly spaced and grouped under one purpose made saddle. Conduit spacing shall not exceed 10 mm. The purpose made saddle shall be made of 25 x 2 mm galvanised steel strip or other approved material, formed to suit the curvature of the various conduits and shall be drilled and fixed by means of screws between. Saddles shall be spaced at intervals not exceeding 1.8 m, except for conduit droppers, which shall be saddled centrally between ceiling and accessory box. All saddles are to be secured to the wall by means of black japan or brass rounded head screws. Distribution boards, draw boxes, industrial switches and plugs, etc, shall be neatly recessed into the surface of plastered walls to avoid double sets or alternatively spacer bar saddles may be used. On face brick walls the conduit shall be tightly set into the switch or plug.

In situations where there are not ceilings, the conduits are to be run along the wall plates and tie beams.

No wiring is to be carried out until the tubing has been inspected and approved.

Where spacer bar saddles are used, these shall be installed at centers of 1 m for horizontal and 1.5 m for vertical runs.

All conduits shall be painted with an approved enamel paint to match the background colour.

2.5 **Future Extensions**

In roof spaces with a minimum clearance of 900 mm, switch and plug drips for future use are to be set 300 mm in the correct direction and shall be threaded and fitted with plugged couplings. Where the roof over a slab is to be removed for future expansions, conduits for future use are to terminate 40 mm above tie beams and shall be threaded and fitted with plugged couplings.

Where future extensions are to be below slabs, all switch, socket outlet and other conduit droppers are to terminate 130 mm below slabs or beams with conduit ends threaded and fitted with plugged couplings.

Where provision is made for future extensions to a concrete slab, all conduits required for future use are to project 130 mm from the slab. Conduit projections are to be painted with an approved anti-corrosive paint and must be fitted with plugged couplings.

All switch, plug and other outlet boxes required for future use shall be fitted with approved blank cover plates.

Unused lighting outlet boxes are to be fitted with round hardboard or plastic covers with brass cover screws, which shall fit flat on the finished ceiling.

2.6 **Fixing of Conduits**

Conduits shall be fixed to switch and socket outlet boxes by means of couplings and brass male bushes or lock nuts and brass bush nuts. Couplings and male bushes to be used on all surface work.

2.7 **Chases and Building Work**

Except where otherwise specified conduits, switch boxes, plug boxes and distribution boards are to be built into the brick walls by the Contractor. It will, however, remain the responsibility of the Contractor to ensure that the above-mentioned boxes and distribution boards are correctly built in and are firmly bedded and cemented into the walls, plumb and square.

The Contractor shall, unless otherwise specified, do all necessary chasing and cutting of bricks. All electrical materials (e.g. conduits up to 40 mm for UG cables, conduits, conduit boxes, distribution boards etc) must be supplied by the Contractor who must arrange to have these on site, and positioned when required for the building work. A competent Electrical Artisan must be in attendance and ensure that the conduits etc are correctly installed and positioned.

The Contractor is to ensure that tubing installed in chases is securely nailed and covered by a layer of 5:1 mixture of coarse sand and cement, finished flush with brickwork and that switch and plug boxes finish flush with the finished wall surface.

The Contractor is to ensure that below distribution boards connected by means of under-ground cables, a 230 mm wide by 115 mm deep cavity in the wall from the cable pipe to the distribution board is to be provided by the Contractor, or alternatively, cable sleeves as specified.

3. **PLUGGING OF WALLS**

Only approved plastic plugs shall be used to secure conduit or equipment up to 5kg mass. The use of round-headed screws only will be permitted.

Heavier equipment shall be secured by means of approved expansion bolts.

Wood plugs and any plugs in the joints in brick walls are not permitted.

4. **FIXING TO CONCRETE CEILINGS**

Ceilings mounted equipment other than luminaires shall be secured to concrete ceilings by means of expansion bolts, shot bolts or "Robot" tools bolts or as expressly specified for the service.

5. **WIRING**

5.1 **PVC Insulated Single Core Medium Voltage Conductor**

The conductor is to be of high conductivity copper wire insulated with Polyvinyl Chloride. The cable shall be finished in the required colours and shall be in accordance with SABS 1507 and 1574.

Circuit wiring shall be of the Loop-in system and no wiring joints in the conduit or conduit fittings will be permitted. Not more than two conductors of a kind will be allowed at any outlet point. the end strands of cables, whether single or looped which have to be connected to terminals of switched, plugs, lamp-holders, fittings and distribution boards, etc, are to be tightly twisted together. Cutting away of wire strands of any cable will not be allowed. Only one circuit in any one conduit will be permitted unless otherwise specified.

Conductor sizes shall be as follows except where otherwise specified:

Lighting circuits	1,5 mm ²	
Bells circuits	1,5 mm ²	
Clock circuits	1,5 mm ²	
Incinerator circuits	2,5 mm ²	
Ironing circuits	2,5 mm ²	with 2,5 mm ² insulated earth wire
Plug circuits	4,0 mm ²	with 2,5 mm ² insulated earth wire
Geyser circuits	4,0 mm ²	with 2,5 mm ² insulated earth wire
Heater circuits	4,0 mm ²	with 2,5 mm ² insulated earth wire
Stove	10 mm ²	with 6,0 mm ² insulated earth wire
Motor circuits		
Up to 4kW single phase	4,0 mm ²	with 2,5 mm ² insulated earth wire
Up to 11kW three phase	4,0 mm ²	with 2,5 mm ² insulated earth wire

To avoid deformation of PVC insulated cables at temperatures in excess of 57° C, they shall not be brought directly on to the terminals of appliances such as electric heaters, or any other electrical appliances or apparatus (including luminaires) which have a temperature in excess of 57° C. They shall terminate in a suitable terminal box as near to the appliance or fittings as possible and connect up from thereon, with heat resistant conductor.

6. **MOUNTING AND POSITIONING OF LUMINAIRES**

Luminaires and installation to comply with SABS 1464 Parts 1 to 22 and IEC 598-1 and IEC 60598 as applicable.

The contractor shall, in the case of board and acoustic tile ceilings (i.e. as opposed to concrete slabs), ensure that the luminaires are symmetrically positioned with regard to the ceiling pattern.

The layout of the luminaires as indicated on the drawings shall be adhered to as far as possible. The exact positions must be confirmed on site with the Head : Works.

Except where otherwise specified, pendant luminaires are to be mounted with the bottom of the fittings 2,5 m above finished floor level, mounted on either metal discs or wood blocks.

Under no circumstances shall cover strips be cut to accommodate wood blocks. Wood blocks must be neatly slotted to fit over cover strips and are to be secured by a minimum of two screws, which shall penetrate at least 25 mm into solid wood. Ceiling cover strips shall be neatly cut to accommodate fluorescent luminaires.

Where ceilings are raked, all incandescent luminaires are to be mounted on shaped leveling wood blocks securely fixed to the ceiling. Batten holders shall be secured to woodblocks by suitable brass screws. Fluorescent luminaires are to be mounted direct on raked ceiling without leveling blocks.

Fluorescent luminaires to be mounted on concrete ceilings shall be screwed to the outlet boxes and additionally supported by means of 50 x 6 mm expansion bolts. The bolts are to be $\frac{3}{4}$ of the length of luminaires apart.

Where a number of luminaires are installed end to end, outlet points must be provided after every second luminaire unless otherwise indicated on the drawing. The luminaires are to be joined together by means of 20 mm conduit nipples, lock nuts and male brass bushes, and the wiring led through the channels of the luminaires. The Contractor shall ensure that all such rows are correctly lined up and that the rows are parallel with the relevant building line.

The luminaires are to be jointed together by means of 20 mm conduit nipples, lock nuts and male brass bushes, and the wiring led through the channels of the luminaires. The Contractor shall ensure that all such rows are correctly lined up and that the rows are parallel with the relevant building line.

Incandescent luminaires are to be screwed directly to outlet boxes in concrete slabs and in board ceilings. In board ceilings the conduit box and the conduit shall be secured to the timberwork of the ceiling in such a manner that it shall support any incandescent luminaire, which is designed to be fixed to a normal conduit box.

Fluorescent luminaires shall be secured to board ceilings by means of the conduit box and 6 mm bolts passing through the boards and brandering.

7. **BATTEN HOLDERS**

B.C. batten holders shall be of brass or moulded plastic reinforced type complete with shade ring. The batten holders shall comply with SABS IEC 60238 and SABS IEC 61184. All lamp holders are to have brass terminals with screw type connection.

8. **LAMP HOLDERS**

Edison screw lamp holders : SABS IEC 60238

Bayonet lamp holders : SABS IEC 61184

Lamp holders for tubular fluorescent lamps : SABS IEC 60400

B.C. screwed lamp holders shall be of brass 20 mm E.T. complete with shade ring and shall comply with SABS IEC 60238 and SABS IEC 61184 with screw type connection terminals.

9. **SWITCHES AND SOCKET OUTLETS**

Switches SABS IEC 60669 as applicable and socket outlets SABS IEC 60884 as applicable shall be of the most modern manufacture and bear the SABS mark.

Flush switch and plug cover plates shall, unless otherwise specified, be of anodized aluminium of thickness not less than 0,9 mm, satin or other approved finish as directed and otherwise to be fully in accordance with SABS IEC 1084 for cover plates and SABS 1085 for wall boxes.

10. **POSITIONS OF SWITCHES AND SOCKET OUTLETS**

Except where otherwise specified, lighting switches and socket outlets are to be installed 1,4 m above finished floor level.

All mounting heights specified are to be measured from finished floor level to the bottom of the outlet box.

Where the lower portion of the wall consists of face brickwork and the upper portion of plastered finish, switches and socket outlets are to be mounted in the plastered surface, provided that the lower edge of the plasterwork does not exceed a height of 1,5 m above finished floor level in which case the switches or socket outlets are to be installed in the face brick dado.

Where socket outlet and switch boxes have been installed with fixing lugs below finished wall surface, only approved distance pieces required to compensate for the recess shall be used. The lengths of distance pieces are not to exceed 15 mm.

Unless otherwise approved, light switches adjacent to doors are to be installed at the lock side of the door. Where the lock position is not indicated on the drawings, its position shall be ascertained before the switch box is installed. Switches are to be installed 150 mm from the reveal, or centrally if there is a fitting near the door.

All switch and socket outlet boxes shall be installed plumb, and built into the wall with a 1:1 mixture of cement and sand.

Industrial type switches and socket outlets shall be neatly recessed into the surface of plastered walls to avoid sets or alternatively spacer bar saddles may be used.

Deep type boxes may be used where switches or socket outlets are back to back, but where one side only is to be utilized at the time and the other is for future use, the side for future use shall be suitably covered with a metal cover plate.

11. **LOW TENSION SWITCHBOARDS**

Low Voltage switch gear and control gear to comply with SABS 1473 and SABS IEC 60947 and SABS 60349.

Where switchboards are to be installed in switch rooms or switch cupboards, the Contractor must ensure that the boards are manufactured to suit the dimensions of the rooms or cupboards.

Low tension switchboards shall be specified in detail for each service, but shall generally conform to the following:

They are to be of strong and rigid construction, with suitable angle, channel or folded steel framework. They are to be flush fronted and totally enclosed with sheet steel panels suitably formed at the edges and reinforced to prevent distortion. Unless otherwise directed, all front panels must be at least 2 mm thick

and all other panels at least 1.6 mm thick. Panels are to be secured to the framework with studs and chromium plated dome nuts (self-tapping and similar screws are not permitted).

Switches, etc, are to be mounted on metal frames within the boards to give flush front panels. Equipment of normally surface mounted types such as energy meters, time switches and contractors, are to be mounted on inner metal trays behind hinged front panels. In the case of supply authority meters the hinged front panels must have transparent inserts.

All metal work of the boards must be thoroughly degreased, primed with PA 10 self etching primer and finished with one coat of undercoat and two coats of electrical orange high gloss enamel, unless otherwise specified.

All accessible current carrying parts, bus-bars, connecting strips, collector bars, etc, are to be adequately insulated in phase colours and suitably braced to withstand projected fault currents.

Connecting strips and collector bars must be of sufficient cross sectional area to carry full rated current of the switches served, irrespective of the fuse or trip rating.

The complete distribution board including bus-bars must be suitably constructed to withstand fault currents specified.

Connections to bus-bars are to be made by means of lugs suitably bolted and locked with high tensile bolts and connections to lugs must be effected by means of a crimping tools.

Incoming and outgoing bus-bar studs, where required, must be suitably insulated where they pass through panels of the board, and firmly supported within the board.

Where applicable, incoming and outgoing collector bars for cables in parallel must so arrange that the multiple cable ends can be connected to the bars with reasonably short tails which do not have to cross.

Cable supports must be placed at suitable heights having regard to the bending radius of the cables concerned and convenience in making off.

Wall-mounting and floor-standing back to wall type boards must be provided with full easy access to all equipment and wiring without any necessity of disconnecting or removing of any of the equipment mounted in the board.

Clear visible indication of all switch positions must be provided and the switches must be clearly labeled as directed by the Head : Works.

The details of construction proposed, and the Head : Works must approve all equipment of switchboards: Works before manufacture is commenced.

12. **DISTRIBUTION BOARDS**

12.1 **Approval**

The Head : Works must approve the details of construction proposed and all equipment within distribution boards: Works before manufacture is commenced.

12.2 **Flush Mounting Distribution Boards**

These shall be generally manufactured in accordance with SABS 1765. The board shall consist of two panels fitted side by side with common bonding tray and attached to a common architrave. One panel shall accommodate all single phase MCB's and the second panel shall accommodate the main isolator, main bus-bars and the triple pole MCB's. Chassis shall be of rigid channel section rust proofed steel with clip-on trays for the single pole MCB's. The main isolator is to be mounted at the bottom of the second panel with the triple pole circuit breakers above.

12.3 **Surface Mounting Distribution Boards**

These shall be generally manufactured in accordance with SABS 1765, with two panels as for flush boards.

12.4 **Single Phase Distribution Boards**

Single Phased boards shall be generally constructed as three phase boards except they shall have a single panel. Single phase boards shall be mounted with the bottom of the architrave 1,5 m above finished floor level unless specifically directed otherwise.

12.5 **Distribution Board – In Roof Spaces**

Where distribution boards are installed below a roof space, a minimum of 2 x 20 mm and 1 x 25 mm spare conduits are to be run from the distribution board into the roof space.

13. **METER BOXES**

The meter box shall be mounted with the top 1,7 m above finished ground level. Surface mounted meter boxes shall be secured by at least 4 x 10 mm expansion bolts.

Service cables entering the meter box shall be protected by means of a suitably sized galvanised pipe extended 450 mm below the ground surface and securely saddled to the wall and bonded to the meter box.

14. **CONNECTIONS TO OUTLETS**

14.1 **General**

Where connectors are used to connect to the wiring of luminaires and other appliances, the connectors shall comply with SABS Specification 1239.

14.2 **Connection to Stoves**

14.2.1 **General**

The connection to an electric stove, unless otherwise specified shall consist of 2 x 10 mm² conductors and a 6 mm² insulated earth wire in 25 mm conduit. The stove shall be controlled by a 60 Amp micro gap switch of approved make and the

connection shall be by means of a 45 Amp 3 pin stove plug of the "Cape Town" type. Cable ends, which are to be connected to the stove, shall be equipped with suitable soldered or crimped lugs. The connection between the stove plug and stove shall be by means of flexible conduit.

Except for high school domestic science unit kitchens (see Clause 14.2.2), the conduit shall be chased into the wall and fitted with a switchbox for housing the micro gap switch and a 25 mm circular conduit box over which the stove plug will be mounted. The stove plug shall be fitted with an adaptor plate and shall be screwed directly to the conduit box by means of round head metal screws. The plug outlet shall face downward.

The stove plug and switch shall be mounted 430 mm and 1,4 m respectively above finished floor level unless otherwise specified or indicated on the drawings.

14.2.2 **Stove Connections in High School Domestic Science Unit Kitchens**

Connections to stoves in High School Domestic Science Unit Kitchens, where the stoves are situated in front of a fitting, shall be generally as specified in Clause 14.2.1 except that the 25 mm diameter conduit shall be run in the floor slab, from the distribution board to a position to the right of the stove. A pedestal, which is complete with a 45 Amp 3 pin "Cape Town" type cooker plug, mounted on the back, shall be fitted over the conduit and securely bolted to the floor by means of expansion bolts. The plug circuit, which passes through the pedestal, is to be on a separate circuit.

14.3 **Connections to Hot-water Cylinders**

The connections to hot-water cylinders not exceeding 3kW loading shall consist of 2 x 4 mm² PVC conductors and 1 x 2,5 mm² earth wire in a 20 mm diameter conduit from the distribution board. The conduits shall be chased in the wall and shall terminate at the side of the cylinder in a box over which is to be mounted a double pole isolator with pilot light.

The final connection between the isolator and cylinder shall be by means of silicone heat resistant conductors in 20 mm diameter flexible conduit.

Connections to roof mounted hot-water cylinders shall generally be as specified above with an isolator with pilot light mounted adjacent.

14.4 **Connections to Power Points**

Connections to electric motors and fixed apparatus to vibration shall, unless otherwise specified or indicated on the drawings, have final connections consisting of conduit and flexible tubing or reinforced hose in accordance with Clause 1.3 of this specification and PVC cables and earth wire of the required size.

An isolator shall protect all fixed apparatus and where necessary a starter fitted with a no-volt coil and overload protection adjacent to such apparatus.

Power points for connection of fixed apparatus to be installed by others, shall terminate in an approved type wall mounted switch unless otherwise specified.

The minimum conductor size for all power points shall be 4 mm² unless otherwise specified.

14.5 **Underground Service Connection**

This clause refers to underground service connections not provided by the Supply Authority.

The service cable and earth wire to be connected at the supply point in accordance with Clause 15.8 of this specification, and unless otherwise specified, shall be laid 600 mm below ground level throughout and otherwise fully in accordance with Clause 15 and all applicable sub-clauses thereof. Cable entries to meter boxes shall be in accordance with Clause 13 and other entries shall be by pipe or duct as directed.

14.6 **Connections to Outbuildings**

Connections to outbuildings shall be made by means of underground cable only, laid in accordance with Clause 15 and all applicable sub-clauses.

Where the cable is run from the roof space of the main building, it shall be enclosed in suitably sized galvanised pipe built into the wall or run surface as directed. Surface run pipes shall be securely saddled at 1,8 m centers. Where the cable connects to the conduit in the roof space, a suitable joint box shall be provided or alternatively the cable may be taken through the roof space, a suitable joint box shall be provided or alternatively the cable may be taken through the roof space with fixings at regular intervals, and down to the main board. At the outbuildings, the cable shall be enclosed in a suitably sized galvanised sleeve pipe built into the wall or run surface and terminated in the distribution board tray.

14.7 **Connection and Mounting of Cable Fed Street/Site Lighting**

Street/site lights shall in all cases, except where otherwise specified, be fed by underground cable. Unless otherwise directed, a suitable terminal board shall be provided in the base of the lighting pole for the connection of the incoming and outgoing cables, the feeds from the terminal board to the fitting shall be as specified.

"Surfix" cable and compression glands shall be installed between terminal board and cross arm/bracket mounted luminaires. The terminal board shall also accommodate a miniature circuit-breaker in the phase connection to the fitting. Poles intended for mounting directly in ground are to be provided with a 300 x 300 mm base plate.

15. **UNDERGROUND CABLES**

1000 volt PVC SWA and 110 Volt PILCA cable and accessories shall be in accordance with the relevant SABS specifications to SABS 1507.

The storage, transportation, handling and laying of underground cables shall be according to the manufacturer's requirements and the Contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to cables during such operation. All cable pipes and ducts entering buildings are to be sealed against the ingress of vermin, water, etc.

15.1 **Trenching**

Cables, unless otherwise specifically directed, shall be laid at a depth of 600 mm below ground level. Trenches shall not be less than 300 mm wide for one to three cables, and the width shall be increased where more than three cables are to be laid together so that the cables may be placed at least 75 mm throughout the run.

The Contractor shall take all necessary precautions to prevent trenching work being in any way a hazard to the public and to safeguard all structures, roads, sewer works, or other property from risk of subsidence and damage.

15.2 **Cable Joints**

Joints in underground cable runs will not be permitted unless unavoidable and at the discretion of the Head : Works. Where cable joints are unavoidable, the cable jointer is to work efficiently and cleanly and so that each end of the cables to be joined may have a minimum of 0,9 m of slack disposed in a loop without stress. Back-filling under joints must be firmly tamped to prevent any subsequent settling.

15.3 **Bedding**

In trenches made in intermediate, hard rock, or boulder material, the cables shall be laid on a 75 mm thick bed of earth and be covered with a 150 mm layer of earth before the trench is filled in. The Contractor to supply all earth required for trench filling.

15.4 **Laying**

Cables shall be removed from the cable drum in such a way that no twisting, tension or mechanical damage is caused, and must be adequately supported at short intervals during the whole operation. Particular care must be exercised where it is necessary to draw cables through pipes and ducts, to avoid abrasion, elongation or distortion of any kind. The ends of such pipes and ducts shall be sealed to approval after the drawing in of the cables.

15.5 **Back Filling**

Back filling after bedding (see Clause 15.3) is to be carried out with a proper grading of the material to ensure settling without voids, and the material is to be tamped down after the addition of every 150 mm. The surface is to be made good as required.

Back filling of cable trenches must not be commenced until after the cable trenches and laid cable(s) have been inspected by the Head : Works. Where a Contractor fails to observe this requirement he may, at the discretion of the Head : Works, be required to re-open such cable trenches for inspection at his own expense.

15.6 **Protection of Cables**

Where so directed by the Head : Works, concrete or other warning covers shall be placed over cables above the top bedding layer. Cable pipes when directed are to be installed at road and other crossings.

15.7 **Marking of Cables**

Cable marking tape is to be supplied by the Contractor and is to be laid 150 mm below ground over a cable run and as may be directed by the Head : Works to give early indication of underground cable runs.

15.8 **Joints and Termination of Cables**

Joints in underground cables and terminations shall be made by means of "Scotch Cast" or other approved epoxy-resin pressure type jointing kits. Low tension PVC cables are to be made off with sealing glands and materials designed for this purpose, which must be of approved make.

15.9 **Sealing of Paper Insulated Cable Ends**

Where cables are cut and not immediately made off, the ends must be sealed without delay. If cables are cut and the ends not immediately made off or sealed, the cable may be rejected and the Contractor will be required to replace it at his own expense.

15.10 **Earth Wires**

Except where specifically directed otherwise, earth continuity conductors are to be run with all underground cables constituting part of a low tension distribution system. Such earth continuity conductors shall be bare copper wire of a cross sectional area in accordance with the Code of Practice 0142 but shall not be less than 4 mm² nor more than 70 mm². The earth continuity conductor is to be bonded to the cable armouring, and to the lead sheath if any, at each termination, as well as to the local earth bard. The earth wire must be secured to the cable at 1,8 m centers.

15.11 **Opening Up of Existing Cables**

Where it is necessary to expose existing buried cables for any purpose, or to excavate in the vicinity of existing buried cables, pipes, etc, every care is to be exercised and only labourers experienced in such work, and duly warned by the Contractor, shall be employed thereon.

15.12 **Definitions for Classifying of Excavation**

- (a) **Soft Excavation** – shall be excavation in material that can be efficiently removed by a back-acting excavator of flywheel power approximately 0,10kW per millimeter of tinned-bucket width, without the assistance of pneumatic tools such as paving breakers, or that can be efficiently loaded without prior ripping or stockpiling by a rubber tyred front-end loader approximately 15T mass and a flywheel power of approximately 100kW.
- (b) **Intermediate Excavation** – shall be excavation in material that requires a back-acting excavator of flywheel power exceeding 0,10kW per millimeter of tinned-bucket width and the assistance of pneumatic tools prior to removal by equipment equivalent to that specified in (a) above.

- (c) Hard Rock Excavation – shall be excavation in material that cannot be efficiently removed without blasting or without wedging and splitting prior to removal.
- (d) Class A Boulder Excavation – shall be excavation in materials containing more than 40% by volume of boulders of sizes between 0,03 cubic meter and 20 cubic meter in a matrix of softer material or smaller boulders.

Note: (1) Excavation of solid boulders or lumps of size exceeding 20 cubic meter will be classified as hard rock excavation.

(2) Excavation of fissured or fractured rock will not be classed as boulder excavation but as hard rock intermediate excavation according to the nature of the material.

(e) Class B Boulder Excavation – shall be excavation of boulders only in a material containing 40% or less by volume of boulders of size between 0,03 cubic meter and 20 cubic meter in a matrix of softer material or smaller boulders.

Note: Those boulders that required individual drilling and blasting in order to be loaded by a back-acting excavator as specified in (a) above, or by a track type front-end loader, will each be separately classed as Class B Boulder Excavation.

16. EARTHING

16.1 Main Earthing

The type of main earthing shall be as required by the Supply Authority, if other than the Head : Works and in any case as directed by the Head : Works who may require additional earthing to meet test standards.

Where required, an earth mat is to be provided, the minimum size, unless otherwise specified, being constructed from copper straps 950 x 25 x 3 mm at 230 mm centers and braced at all intersections. Alternatively or additionally earth rods or trench earths may be required, as the Head : Works may direct, and installed according to his instructions.

All earth electrodes and connections thereto must be approved "in-situ" by the Head : Works before back-filling.

The electrical installation shall not be earthed by means of the lightning arrester earth electrode, if such is included in the installation, but may be bonded thereto.

16.2 Earthing in Installations

The installation shall be effectively earthed in accordance with the relevant sections of the Code of Practice 0142 and the requirements of the Supply Authority.

All hot and cold water and waste pipes are to be effectively bonded by means of 12 x 1,5 mm solid copper tape (perforated tape or wire will not be permitted), clamped by means of brass bolts and nuts. Bonding tapes exceeding 75 mm in

length must be fixed to the wall by means of No. 6 x 20 mm brass screws and plastic plugs not exceeding 150 mm centers. Main earth copper tapes where installed less than 2,5 m from ground level, must be run in 20 mm diameter conduit securely saddled to the wall.

Gutters and down pipes are to be bonded by means of 6 mm round headed brass bolts, with nuts and washers. Self-tapping screws are not permitted.

Connections from the earth bar or terminal on the main board must be made to a visible cold water main, the incoming service conductor, if any, and the earth mat or plate (where such is required) by means of either 12 x 1,5 mm solid copper tape or bare 25 mm² copper wire, or such larger conductor as the Head : Works may direct. From each distribution board separate earth conductors are to be taken to the main earth bar or terminal on the main board. Each conductor shall consist to stranded copper conductors drawn into the conduit together with the distribution board feeders. The size of the earth conductors to be in accordance with the requirements of the Code of Practice 0142 or as specified.

Earthing clips shall be made of not less than 0,9 mm thick copper strips not less than 12 mm wide. They are to be complete with 25 x 7,7 mm brass bolts, washers and nuts and must be constructed so that the clips will fit firmly to the conduit without any additional packing.

Adjustable earth clips are not permitted.

17. **EXISTING BUILDINGS**

17.1 **Occupied Buildings**

Where work is to be carried out in occupied buildings the Contractor must arrange to carry out the installation with as little interruption to services and discomfort to the occupants as possible.

17.2 **Temporary Connections**

Temporary connections shall be provided where necessary for continuity of services, and as directed by the Head : Works. The contractor must ensure that such connections are both electrically safe and free from physical hazard.

17.3 **Old Materials**

Unless otherwise specified all existing materials removed by the Contractor shall remain the property of the Head : Works and are to be handed to the Head : Works.

17.4 **Making Good**

Any damage which may be done to the plaster work, floors, ceilings, wood and paint work, furniture and other equipment in the building, etc, during the progress of the electrical installation shall be repaired and made good by the Contractor to the satisfaction of the Head : Works.

18. **COMPLETION**

18.1 **Balancing of Load**

The Contractor is required to balance the load as equally as possible over multi-phase supplies.

18.2 **Tests**

The installation shall be tested by the Contractor as the service progresses or as required by the Head : Works and upon completion, for earth continuity and insulation. The final test before the taking over of the installation shall be made in the presence of the Head : Works.

The mandatory "Certificate of Compliance" shall be issued by the Contractor to the Supply Authority, with a copy to the Head : Works prior to first delivery being taken.

18.3 **Labelling**

All circuits and apparatus on switchboards shall be suitably correctly labeled by means of engraved plastic labels (white lettering on black), which are to be either bolted or screwed to the equipment panel, or fitted in channeling provided below the switch gear.

Sub-circuits are to be numbered and a legend detailing the circuits is to be framed and fitted to the door of the distribution board.

All other equipment is to be individually labeled to indicate the function.

All switchboards are to be fitted with a label on which the designation of the board is clearly indicated.

A separate engraved label depicting the origin and cable/conductor size shall be fixed below the main switch.

18.4 **Finishes**

Covers for all boxes, expansion boxes, etc, shall be finished to match the paint work of the ceiling or wall surface or as specified.

18.5 **Site Drawing**

On all completed new work or where specifically called for in the Tender Document, the Contractor shall, on completion of the works, submit to the Head : Works, a marked up site plan indicating the exact underground cable reticulation.

19. **POWER DUCTING FOR SCHOOL SCIENCE LABORATORIES**

The ducting shall be "Ductline 3" supplied by Messrs. Lascon Lighting, 102 Malbourne Road, P.O. Box 2479, Durban 4000: Telephone 031-2075081 or other approved.

20. **SPEAKER AND MICROPHONE OUTLETS**

Speaker and microphone outlets are to conform to the following details:

1. Speaker outlet – To have one flat and one round pin.
2. Microphone outlet – To have one round pin only.

Both female and male parts to be supplied and installed by the Contractor.

21. **BELLS AND BUZZERS**

21.1 **Bells**

Bells for schools and hostels shall be 220 Volt AC or 24 Volt DC as specified for the service. They are to be of robust construction encased in a sturdy cast metal weather-proof case. They are to operate on the frequency of the supply. They shall have an adjustable stabilizing spring, gold-silver contact points and 150 mm gongs.

21.2 **Doorbells, Buzzers and Bell Transformers**

These will be as specified for each service.

21.3 **Bell Pushes**

Except where otherwise specified, bell pushes shall be of the flush type suitable for mounting in a standard 100 x 50 mm box. They shall be clearly marked as a bell push and shall be fitted with satin finished anodized aluminium cover plates.

22. **SIGNAL TIMERS**

22.1 **Primary Schools**

The timer shall be designed to automatically signal the start and finish of school periods by the switching of a bell circuit and is to comply with the following specification:

1. The mechanism may be synchronous motor or quartz movement driven with a 24 hour dial or digital time read-out suitable for operation on a 220V 50Hz supply and is to be provided with a spring or battery reserve of a least 24 (twenty four) hours.
2. The unit is preferably to have minute to minute timing for a 24 (twenty four) hour period although 5 (five) minute intervals are acceptable, and is to be provided with Weekend lockout. Signal periods shall be adjustable from 5 – 45 seconds.
3. The unit shall be housed in a metal or plastic case with detachable front cover suitable for wall mounting.
4. Timers with punch tape programming are not acceptable.

22.2 **High Schools and Colleges**

Timers for these institutions shall generally be as for Primary Schools but are to have at least 3 (three) separate programmes and be fitted with three push buttons for independent manual operations for testing of each programme, plus an on/off switch for each programme, which does not affect the running of the clock.

23. **CLOCKS**

Electric clocks shall be of the quartz electronic battery operated type, with a dial of 250 mm diameter. The dial shall be white, with distinctive minute markings and chapters shall be black Arabic figures. Time adjustment shall be simple. Where mains operated electronic clocks are specified, these shall be of the synchronous self starting type, suitable for a 200 – 250 V 50 Hz AC supply

24. **TIME SWITCHES**

The time switch shall consist of a single pole switch with silver to silver or other approved contacts operated by a quartz movement with a 24 hour reserve.

A suitable 24 hour, night and day dial, with hour indicator and two adjustable strikers, one OFF and one ON must be provided. The whole mechanism is to be totally enclosed in a dust proof case.

The current rating shall be required and the switch is to be suitable for operation on 220 volt 50 Hertz AC supply. Time switches used for under floor heating are to be fitted with weekend cut-out.

25. **MOULDED CASE CIRCUIT BREAKERS (INCLUDING MINIATURE)**

Circuit breakers shall be of the size and type as directed and specified for the service. They shall comply with SABS Specification 156 and SABS IEC 60947-2.

26. **SWITCHES: ON-LOAD FAULT MAKING (CIRCUIT BREAKER TYPE) WITHOUT TRIPS**

The switches shall be triple pole, hand operated, panel mounting air break type, having continuous current rating as specified and suitable for operation of 380 – 440 Volt 50 Hz AC system.

The contacts are to be of silver alloy and the switch mechanism shall be of the quick-make, quick-break type.

27. **SWITCHBOARD EQUIPMENT**

Switchboard equipment such as switches, circuit breakers, etc, shall be as directed and specified in the detail specification for the service.

Circuit breaker equipment of SABS IEC 60934.

28. **FUSE-SWITCH UNITS (WITH HRC FUSES)**

The fuse-switch unit is to be of the double pole, or triple pole or triple pole with neutral link type, and of the required current rating, as specified for the service and must be in accordance with BS EN 60947-3.

The fuse links must be fully isolated when the switch is in the open position, and interlocks must be provided to prevent the switch being operated with the cover open.

The fuse links shall comply with SABS Specification 172 and SABS IEC 60269-1 to 4.

29. **BUS-BAR COPPER**

Bus-bar copper must be fully in accordance with Tables A1 and A2 of SABS 1473-2 and SABS IEC 60439-2.

30. **SPECIFICATION COMPLIANCE**

The complete installation shall comply with the requirements of this specification. Should any differences or contradictions exist between this Specification and the detailed requirements for a specific installation, then the detailed requirements shall take precedence.



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 3

Lightning Protection Specifications

LIGHTNING PROTECTION INSTALLATION

GENERAL SPECIFICATION

1. SATISFACTORY INSTALLATION

The whole of the installation shall be carried out in accordance with:

- (a) The latest S.A.B.S. Code of Practice for the Protection of Structures against Lightning - S.A.B.S. 03 ; SABS IEC 61024 (1) , 61024 (1 -1); SABS IEC 61312 (1) ; SABS IEC 61662 & NRS 042.
- (b) The KwaZulu-Natal Department of Works General Electrical Specification.
- (c) The Municipal By-Laws and any other special requirements as deemed necessary by the Local Supply Authority;
- (d) Local Fire Regulations.

2. S.A.B.S. APPROVED DRAWINGS

SABS Approved drawings are not required for this project.

3. TEST ON COMPLETION

Upon completion of the lightning protection system, the following tests shall be witnessed by an appointed representative of the Employer. The results shall be recorded on suitable test certificates which must be signed by both the Contractor and the Employers representative. A sketch must be included on each test certificate indicating the positions of each earth electrode in relation to some permanent reference point. It must also indicate the positions at which tests were carried out, the type of test and the results of these tests.

3.1 Earth Resistance Test

The Earth Resistance Test shall involve measuring the resistance to earth of each rod-type electrode, or group of rod-type electrodes, or trench earth which would normally be connected to one down-conductor or earth terminal. This test must be made with the electrodes completely disconnected from any part of the structure or lightning protection system.

3.2 Electrical Continuity Tests

(a) External Down-Conductors

Electrical continuity between the lower ends of external down-conductors which must all be disconnected from the earthing system during the test shall not exceed 1 (one) ohm.

(b) Metallic Services

Electrical continuity between any metallic structures of services (e.g. rainwater pipes) which form an integral part of the lightning protection system shall not exceed 1 (one) ohm. These tests should be carried out with all other components of the lightning protection system disconnected from the component being tested.

4. **DESCRIPTION OF MATERIAL**

4.1 **Air Terminals and Down-conductors**

All conductors must be in accordance with the requirements of BSS 1474 or American Standards Specification 6063. All aluminium conductors shall have a cross-section area of not less than 30 mm² (domestic dwelling only) or 50 mm² for all other applications. The dimensions of flat section conductors to be 20 mm x 3 mm. Where conductors are mounted in stand-off guides, the cross-section area of the conductor must be not less than 70 mm² to give adequate mechanical strength.

4.2 **Conductor Guides**

The conductor must be mounted in aluminium alloy guides conforming with the material specification given in 4.1 above. The guides must allow for free longitudinal movement of the conductor to cater for expansion and contraction of the system caused by temperature variation. The minimum thickness of any part of the guide shall not be less than 3 mm. The guides must be securely attached to the structure using two stainless steel screws and plugs, the use of plated screws is not permitted.

The conductor system shall be supported in guides so that an air gap exists at all times between the aluminium and the surface of the structure, the guides being seated upon plastic or other similar insulating material. Should conductors be installed directly upon the surface of concrete or cement plaster, an insulating strip is to be installed over its whole length to prevent contact between the two surfaces. Guides shall be installed to support the conductor at intervals not exceeding 1,2 metres horizontally or 1,5 metres vertically.

N.B.: No part of an aluminium conductor system must be allowed to come into direct contact with concrete or cement plaster as this may cause the aluminium to corrode.

4.3 **Expansion Loops**

Where conductors are installed horizontally without deviation from a straight line over long distances, expansion loops must be provided at distances not exceeding 30 metres. These expansion loops must have a cross-sectional area which is at least equal to that of the conductor.

4.4 **Protection of Down-conductors**

Where external down-conductors are installed in areas which are readily accessible to the public, the lower ends of the conductors shall be enclosed in a semi-rigid insulating material. In the case of a circular section conductor this shall comprise a 2 metre length of 20 mm diameter P.V.C. conduit. This conduit shall be securely attached to the wall by means of galvanized steel saddles fixed with stainless steel screws and plugs, spaced at intervals not exceeding 1 m. Where a flat section conductor is used this shall be covered by a similar length of 25 mm P.V.C. conduit. The lower end of the conduit shall be positioned as close as practicable to ground level, i.e. immediately above an aluminium to copper joint. The ends of the conduit shall not be sealed.

4.5 **Earthing Electrodes**

Earthing electrodes must consist of either copper-clad steel rods not less than 12 mm in diameter and having a minimum copper thickness of 0,20 mm driven into the ground, or a 50 mm² (35 mm² for domestic dwellings) bare copper conductor buried in a trench, or a combination thereof. Where copper clad steel electrodes are used they must have a suitable bond between the steel core and copper exterior to prevent moisture ingress between the two metals. Where it is necessary to extend earth rods, an electrolytically compatible corrosion resistant, coupling device, which prevents ingress or moisture into the joint shall be used. The copper conductor below the down-conductor joint shall be covered by a semi-rigid P.V.C. conduit for a distance of approximately 200 mm above ground and 400 mm below ground.

4.6 **Joints Above Ground**

Circular section aluminium conductors shall be jointed by aluminium ferrules or lugs which are securely crimped into place. Aluminium lugs must be bolted together using 10 mm diameter aluminium bolts and washers. The material specification for these components must conform with that laid down in paragraph 4.1. Alternatively heavily tinned copper lugs and ferrules may be used. The lugs should be joined together by means of 10 mm diameter copper, brass or bronze bolts and washers. Care should be taken to inhibit corrosion where dissimilar metals are used by thoroughly cleaning the surfaces of the metal before assembly and subsequently sealing the joint with an inert tenacious compound or tape.

Flat section aluminium conductors shall be joined by double riveting, using aluminium rivets which comply with the material specification laid down in 4.1. Alternatively 2 x 6 mm diameter stainless steel bolts, nuts and washers may be used. Fold over type bends will not be permitted.

Down-conductors are to be terminated approximately 200 mm above finished ground level. Circular section aluminium is to be jointed to a 50 mm² (35 mm² in the case of domestic dwellings) stranded copper conductor by securely crimping in place two heavily tinned lugs and bolting these together using 10 mm diameter copper, brass or bronze nuts, bolts and washers.

N.B. : Under no circumstances shall aluminium conductors be buried in the ground.

4.7 **Joints Below Ground**

A joint in the stranded copper conductor which forms part of the earthing system must be made by using a crimped copper ferrule clamping (not lugs) using two copper line taps of suitable dimensions, or exothermic welding. The copper earth conductor must be joined to an earth rod by either clamping, using a standard earth rod clamp or copper line tap or by exothermic welding. Joints which are made between dissimilar metals (i.e. copper conductor to galvanized steel water main), must be thoroughly cleaned before assembly. They shall be rendered watertight using waterproof adhesive tape on a suitable compound for a minimum distance of 200 mm in all directions from the joint.

4.8 **Bonds**

Where it is necessary to bond the aluminium conductor to any other metallic surface, this must be done by bolting or riveting. When attaching aluminium to a dissimilar metal the joints are to be thoroughly cleaned and sealed to prevent corrosion.

5. **GENERAL INSTALLATION PROCEDURE**

5.1 **Air Terminals for Non-metallic Pitched Roofs**

Aluminium conductors are to be installed along all ridges of roofs and projections such as dormer windows, etc., terminating at the ends with conductors running downwards over the surface of the roof and the eaves. Non-metallic chimneys must be protected by means of a finial of sufficient length to cover the chimney within a 45° angle struck downwards from its point. Alternatively it should have a conductor installed in the form of a closed loop upon the upper surface. The conductors are to follow the outer contour of the stack and must be bonded at a convenient point to the nearest component of the air terminal system.

N.B. : This bond may run in a horizontal or downward direction, but under no circumstances must any part of it run above horizontal.

Conductors may be dead-ended (i.e. have one end free and unbonded), providing that the length of such a conductor does not exceed 10 metres and that the unbonded end is either at the same level or higher than the bonded end. This technique may be used where ridge conductors are installed over dormer windows, etc.

In all cases where metallic gutters have been installed along the eaves of a pitched roof, these must be bonded to the air terminal system. Where metallic gutters do not exist, however, a conductor must be installed over the surface of the roof at eaves level to which the remainder of the air terminal system is to be bonded, with the following exceptions :

- (a) Where the maximum distance from the ground level to the eaves of the building is less than 4 metres and the pitch of the roof is more than 1 in 2 (27° from the horizontal).
- (b) Where the maximum distances from ground level to the eaves is less than 7 metres and the pitch of the roof is more than 1 in 1,5 (34° from the horizontal).
- (c) Where the distance from the ground level to the eaves is more than 7 metres and the pitch of the roof is more than 1 in 1 (i.e. the included angle at the apex of the roof is less than 90°).

Under these circumstances eaves conductors need not be installed.

Any non-metallic objects which protrude above the general roof lines, such as Cape Dutch gable ends, must be protected as described above with a suitable air terminal system. Any metallic objects which protrude above the general roof line, such as hot water expansion pipes must be bonded as directly as possible to the nearest eaves conductor, gutter or other part of the lightning system.

N.B. : These bonding conductors must run in a horizontal or preferably a downward direction, from the vent pipe, etc., to the lightning protection system.

5.2 **Air Terminals for Metallic Pitched Roofs**

Buildings with roofs covered with electrically continuous metal sheets do not require separate air terminals but must be earthed via down conductors generally as described in 5.6 and 5.7. Any non-metallic objects projecting above the general roof line must be separately protected as described in 5.1 and bonded to the metal roof covering.

5.3 **Air Terminals for Non-metallic flat or Mono-pitched Roofs**

For flat or mono pitched roofs of non-metallic construction the air terminal system must consist of aluminium alloy conductors installed around the outer perimeter of each section of the roof structure.

These conductors must be installed on top of parapet walls if these exist. Lift motor rooms, tank rooms, penthouses, etc., which protrude above the general roof line must have air terminal conductors installed around the outer perimeter of each roof slab or parapet wall. Any metallic objects which protrude above the roof line, such as expansion pipes, signs, flag poles, handrails, etc., must be bonded directly to the nearest component of the lightning protection system as described in 5.1.

N.B. : It is not permissible for the ends of conductors to be bonded directly to the perimeter air terminal system if the latter is installed upon a parapet wall having a height exceeding 500 mm above roof slab level. In these circumstances the conductors are to be bonded directly to the down conductors.

5.4 **Air Terminals for Metallic flat or Mono Pitched Roofs**

Metallic flat or mono pitched roofs do not require separate air terminal conductors, providing that there is electrical continuity between the metallic roofing sheets, (see 5.2). A metallic roof surrounded by a non-metallic parapet wall shall have conductors installed at the top of the parapet wall and these must be bonded to the metallic roof at intervals not exceeding 20 metres. If the parapet wall is clad with metal over its upper surface or a handrail is installed which affords good electrical continuity, separate air terminal conductors need not be installed. Under these circumstances the metal handrail or cladding must be bonded to the metal roof covering at intervals not exceeding 20 metres.

All non-metallic covering such as slates, tiles, asbestos cement sheeting, etc., supported by a steel structure being electrically continuous throughout may be treated as being of a complete metal construction. In these circumstances no separate air terminal system need be installed providing the steel roof structure is bonded to earth at intervals given in 5.5.

5.5 **Down Conductors for Non-metallic Structures**

Down conductors must be installed at regular intervals around structures and to run as directly as possible between the air terminal and earthing system. They must, where practicable, be positioned at the external corners of the structure. The maximum separating distance between down conductors around the perimeter of the structure must not exceed 30 metres. In the case of very tall buildings having a slender base (i.e. chimney stacks, water towers, etc.), a minimum of two down conductors must be installed.

The lower ends of down conductors are to be terminated and bonded to the earthing system approximately 200 mm above finished ground level. Under no circumstances must aluminium conductors be buried underground. Test joints must be provided between the down conductors and earthing system. Down conductors must run vertically between the air terminal and earthing systems. Where this is impracticable, their course may be deviated to run at any angle up to and including horizontal.

Where it is necessary to run conductors horizontally over the upper surface of a structural protrusion, such as an exposed concrete slab, the conductor may run down vertically over the edge of the slab and return to the main structure, so that the distance between the upper and lower conductors exceeds one third of the length of the horizontal run. Looped down conductors are not permitted. Down conductors must not run over the underside of large overhangs which are less than 6 metres above ground level, or other areas where people are likely to be present during a thunderstorm.

External or internal metallic rainwater pipes may be used as down conductors providing these are of substantial section and are jointed by screwing one length into another or welding. Thin gauge galvanized steel pipes whose sections are held together by friction, rivets or screws must not form part of a lightning protection system.

5.6 **Down conductors for reinforced concrete framed structures**

The steel reinforcement of this type of structure may be used in place of down conductors. Where the reinforcing system is used, the air terminal system must be bonded to it at a maximum of 30 metre intervals using steel clamps. This bond may be achieved by clamping, with a steel clamp, a steel conductor to a selected reinforcing bar, the opposite end of this conductor must terminate at a corrosion resistant metallic terminal such as Grade 316 stainless steel.

The reinforcing system of prefabricated concrete buildings must not be used unless special provision is made for bonding the various prefabricated sections together.

The terminals should be mounted flush with the face of the concrete. An aluminium alloy bond must then be taken from the air terminal system and be connected to the stainless steel terminal by means of a heavily tinned crimp lug for circular section aluminium, or a suitable bi-metallic joint in the case of flat section aluminium. A similar system must be used to bond the reinforcing system at ground level to the earthing system at points directly below the air terminal bonds. Here copper conductors must be used as the external bonding material.

Under no circumstances must copper, or other non-ferrous material be allowed to come into contact with steel reinforcing bars, as this may cause severe corrosion and subsequent structural damage. The lightning protection system must not be bonded to any part of the structure which is electrically isolated from the remainder of the building, i.e. cantilevered sections. In these circumstances, or where it is otherwise impracticable to use the reinforcing system, external down conductors must be installed as described in 5.5.

5.7 **Down conductors for steel framed structures**

Where the framework of a building is constructed of structural steel columns, these may be used in place of down conductors providing the separating distance between them does not exceed 30 metres. The upper ends of the columns must be bonded to the air terminal systems and the lower ends to the earthing system.

5.8 **Earthing by means of vertically installed rod type electrodes**

Rod-type electrodes must be driven into the ground at a position directly below each down connector. The maximum earthing resistance of each electrode or number of electrodes bonded to any one down conductor shall not exceed $N \times 30$ ohms, where N equals the total number of down conductors which are bonded to a common air terminal system, or 200 ohms whichever is the lower value.

The minimum horizontal separating distance between rod-type electrodes bonded together must not be less than their installed depth. The upper ends of installed rod-type electrodes are to be terminated approximately 500 mm below finished surface level. A 50 mm² copper bonding conductor must be installed to run between each earthing electrode system and the lower ends of the adjacent down conductors. A joint is to be made between each of these bonding conductors and the down conductors at a position approximately 200 mm above finished ground level. These bonding conductors must be installed in P.V.C. conduit securely affixed to the wall (see 3.4). The length of this P.V.C. conduit must be approximately 600 mm and must be installed so that approximately 200 mm protrudes above ground level, the remainder being buried into the soil.

5.9 **Earthing by means of metallic water mains**

Where two or three down conductors are installed the water mains may serve as an earth terminal for one of these. Where three or more down conductors are installed the water mains may serve as an earth terminal for two of these. Regardless of whether the water mains are used as an earth terminal or not, the incoming metal water pipe must be bonded to the lightning protection earthing system underground.

5.10 **Earthing by means of trench type electrodes**

Where the soil conditions prevent the satisfactory installation of rod-type electrodes, a trench earth system must be installed. This method is to comprise a 50 mm² stranded copper conductor installed horizontally into a trench at a depth of 500 mm below finished ground level. The conductor is to follow the general outline of the structure to be protected and be installed 1 metre away from the outside walls. Where the building stands on rocky ground, the trench earth may be attached to the lower part of the wall in areas where rock protrudes through the soil. The conductor must, however, be buried wherever possible as described above.

Each down conductor must be bonded to the trench earth system as directly as possible by means of a copper conductor.

Trench earth systems must have a maximum earth resistance of 30 ohms. An isolated length of trench earth mat must be bonded to the down conductor system in such a way as to reduce the length of dead-ends to the minimum.

Should trench earths be installed beneath pathways where people are likely to be present during a thunderstorm, a plastic, bitumastic or ceramic pipe must be installed having a length similar to the width of the pathway and the trench earth conductor run inside it.

N.B. : The maximum useful length of a dead-ended trench earth is 80 metres.



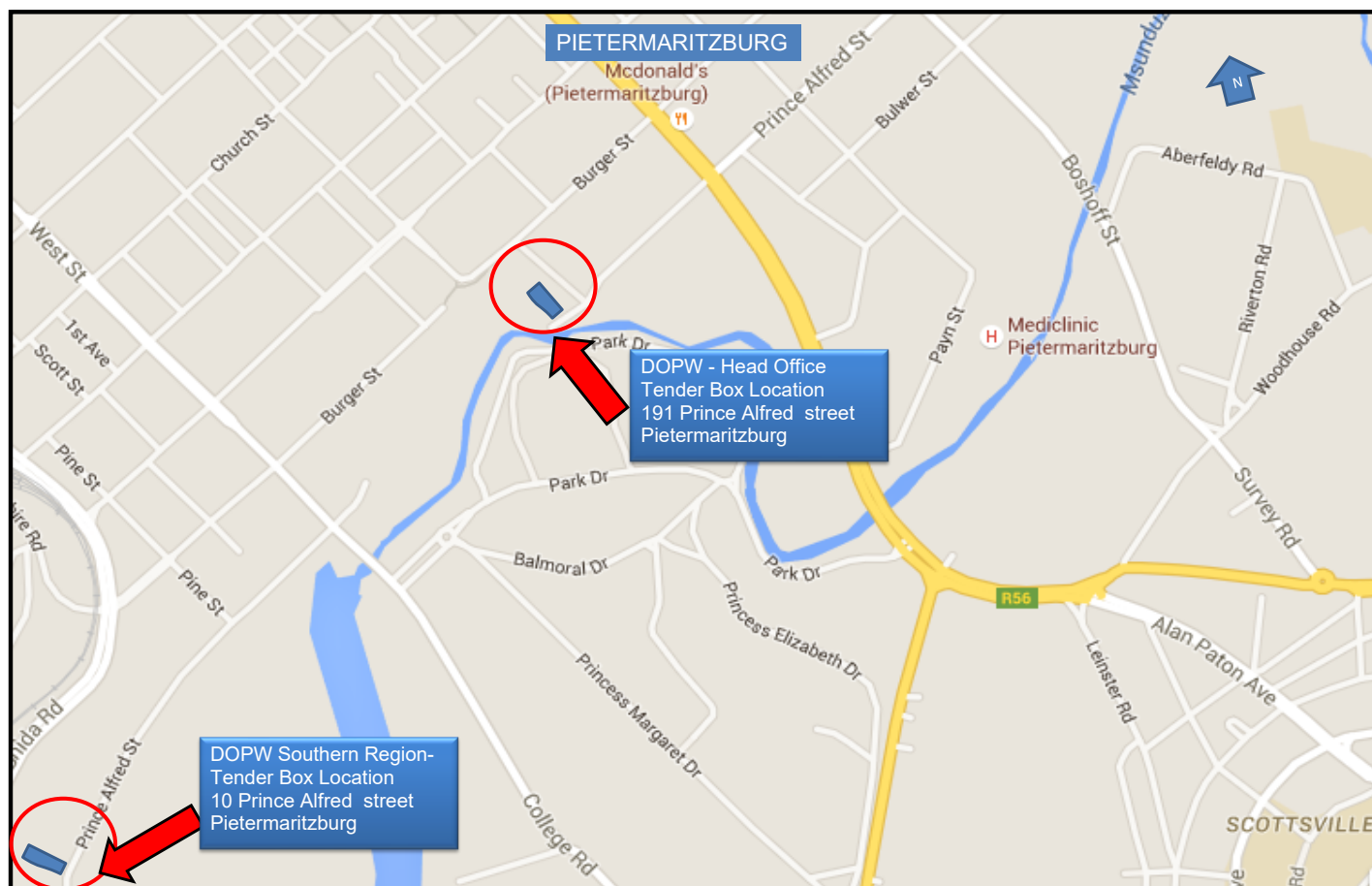
KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 4

Map of Tender Submission Location





KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 5

Joint Venture Agreement



Annexure 5
Joint Venture Agreement
(March 2004)
(First Edition of CIDB document 1017)

1. **PREAMBLE**

This agreement is made and entered into by and between

of the first part and

of the second part and

of the third part.

(allow for additional parties as necessary).

Whereas the foregoing parties have resolved to form a Joint Venture under the title of

for the exclusive purposes of securing and/or executing the Contract to be awarded by
(name of Employer)

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

for (brief description of Contract)

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

Now it is hereby agreed as follows :

2. **DEFINITIONS AND INTERPRETATION**

2.1 Definitions

The following words and expressions shall have the meanings indicated, except where the context otherwise requires. Defined terms and words are, in general, signified in the text of the Agreement by the use of capital initial letters, but the absence of such letters does not necessarily signify that a term, or word, is not defined.

‘Agreement’ means the agreement between the Members of the Joint Venture and includes this model form of agreement together with the Preamble, Specific Provisions, if any, Schedules ‘A’, ‘B’ and ‘C’ and any relevant Documents prepared prior to the signing of the Agreement and appended thereto.

‘Contract’ means the contract with the Employer for the supply of the Deliverables, for the purposes of securing and executing which, the Joint Venture has been formed.

‘Deliverables’ means the works and/or services, equipment, materials, goods, etc. to be furnished by the Joint Venture to the Employer in terms of the Contract.

‘Document’ means any written, drawn, typed, printed, or photographic material, which relates to the Agreement.

‘Employer’ means the person, or body, which is to award the Contract and will employ the Joint Venture if it is awarded the Contract.

‘Joint Venture’ means the joint venture formed by the Members in accordance with the Agreement.

‘Management Committee’ means the body established in terms of the Agreement to manage all aspects of the work of the Joint Venture in securing and executing the Contract and in meeting the provisions for the Agreement.

‘Member’ means a person, or body which, being a party to the Agreement, is a member of the Joint Venture.

‘Member’s Interest’ means the proportion expressed as a percentage, which the total monetary value of all resources provided and contributions made by a Member towards the execution by the Joint Venture of the Contract bears to the total of such values by all Members and, unless otherwise indicated in the Agreement, represents the extent to which the Member participates in the fortunes of the Joint Venture.

‘Representative’ means the person representing a Member on the Management Committee.

‘Schedules’ means Schedules ‘A’, ‘B’ and ‘C’ which set out general, financial and other information relating to the Members and the obligations, duties, rights, risks and benefits arising from their participation in the Joint Venture.

‘Specific Provisions’ means the variations, if any, required to this standard form of agreement for the specific purposes of the Agreement.

2.2 Interpretation

Unless inconsistent with the context, an expression in the Agreement which denotes:

- any gender shall include the other genders
- a natural person shall include a juristic person and vice versa
- the singular shall include the plural and vice versa

2.3 Headings

The headings to clauses of the Agreement shall not be considered part thereof, nor shall the words they contain be taken into account in the interpretation of any clause.

2.4 Law

The Agreement shall be construed in accordance with and governed by the laws of the Republic of South Africa and the English language versions shall prevail.

2.5 Language

English shall be exclusively used by the Members in the preparation of Documents unless otherwise indicated.

2.6 Conflict between Agreement and Contract

Should any provision of the Agreement be in conflict with the terms of the Contract, the Agreement shall be amended to the approval of the Management Committee so as to eliminate the conflict.

3. **JOINT VENTURE GENERAL**

3.1 Establishment and Purpose

The Joint Venture established by the Members in terms of the Agreement is an unincorporated association with the exclusive purposes of securing and executing the Contract for the benefit of the Members.

3.2 Termination

The operation of the Joint Venture and the validity of the Agreement shall terminate if and when it becomes evident that the Joint Venture will not be awarded the Contract, or, if the Joint Venture secures the Contract, when all obligations and rights of the Joint Venture and the Members in connection with the Contract and the Agreement have ceased and/or been satisfactorily discharged.

Unless otherwise decided by the Management Committee, the Agreement shall not terminate if a Member changes its name, or is taken over by, or merged with, another body.

This agreement will terminate when any one of the Members resigns, are liquidated or opts out of this agreement and the Joint Venture will be in breach of contract with the Employer and their contract could be cancelled.

3.3 Exclusivity

Unless otherwise agreed by the Management Committee, or provided for in the Contract no Member shall engage in any activity related to the Contract other than as a Member of the Joint Venture and Members shall ensure that their subsidiaries and other bodies over which they have control comply with this requirement.

3.4 Participation of Members

Except as may otherwise be stipulated in the Agreement, each Member shall be responsible for all costs incurred by it prior to the date of inception of the Agreement.

Subsequent to the date of inception of the Agreement, each Member shall, participate in the operations, risks, responsibilities and fortunes of the Joint Venture including, inter alia, the provision of funding, sureties, guarantees, insurances, human and other resources and participation in profits and losses to the extents indicated in the Schedules. Participation in any aspect not covered in the Schedules shall, if an agreement cannot be reached between the Members, be to the same extents as indicated by the Members Interests.

3.5 Management

The affairs of the Joint Venture shall be directed and controlled by the Management Committee, as set out in Section 4 hereof.

3.6 Confidentiality

All matters relating to the Agreement and the Contract shall be treated by the Members as confidential and no such matter shall be disclosed to any third party without the prior written approval of the Management Committee.

No Member shall be party to the dissemination of publicity relating to the Contract, or the Agreement, without the prior written approval of the Management Committee and the Employer.

3.7 Assignment

No Member shall cede, assign, or in any other way make over any of its rights, or obligations, under the Agreement without the prior written consent of the Management Committee.

3.8 Subcontracting

No Member shall subcontract any obligation, work or duty for which it is, itself, responsible in terms of the Agreement without the prior written consent of the Management Committee.

3.9 Variations to Agreement

No variation, modification, or waiver of any part of the Agreement shall be of any force, or effect, unless unanimously agreed by the Members and reduced to writing.

3.10 Liability

Each Member warrants that it will indemnify the other Members against all legal liabilities arising out of, or in connection with the performance of its obligations under the Agreement.

It is acknowledged by the Members that they may be held jointly and severally liable in respect of claims against the Joint Venture by the Employer or third parties.

4. MANAGEMENT OF JOINT VENTURE

4.1 General

The affairs of the Joint Venture shall be directed, controlled and managed by the Management Committee, which, within the terms of the Agreement and the Contract, shall have full authority to bind the Members in all matters relating to the affairs of the Joint Venture.

Communication between the Joint Venture and the Employer, or third parties, relating to the Contract shall be conducted exclusively by the Management Committee, or by such person as it may delegate to perform this function.

The Management Committee shall have the power to appoint a project manager and/or such other persons as it may see fit to appoint for the purpose of executing the Contract and may delegate such of its powers, responsibilities and duties as it may consider necessary, or desirable, to persons or bodies appointed or seconded for this purpose.

Such administrative functions as are necessary to ensure the effective operation of the Management Committee shall be performed by its chairman.

4.2 Management Committee

4.2.1 Composition

The Management Committee shall, unless otherwise agreed by all the Members, consist of one Representative of each Member and each Member shall be obliged, at all times, to maintain a Representative on the Management Committee.

Each member shall, not later than three working days after the signing of the Agreement, appoint its Representative and notify the other Members of the name and contact details of the Representative. Such Representative shall have the power to bind the Member that he represents in all matters relating to the execution of the Contract and the performance of the Agreement.

A Member shall be entitled, after giving the other Members not less than three working days written notice of his intention to do so, appoint, remove and/or replace, an alternate who shall, at any meeting of the Management Committee from which the Representative whom he represents is absent, be vested with all rights and powers and subjected to all the obligations of the absent Representative.

The chairman of the Management Committee shall be the Representative of the Member which has the largest Member's Interest. If two, or more, Members have the same, largest Member's Interest, the chairmanship shall rotate between the Representatives of such Members at three monthly intervals, the order of rotation to be determined by ballot.

Notwithstanding the foregoing, the chairmanship of the Management Committee may be determined, or changed, at any time by unanimous decision of the Management Committee.

No remuneration shall be paid by the Joint Venture to Representatives or their alternates for serving on the Management Committee,

4.2.2 *Meetings*

Meetings of the Management Committee shall take place at such times and places as the Management Committee may determine, provided that the chairman shall convene a meeting of the Management Committee to be held not later than ten working days after he has been requested, in writing, by a Member to do so. Not less than five working days written notice of any meeting of the Management Committee shall be given to all Representatives and their alternates.

The Management Committee may permit, or invite, persons other than Representatives or alternates to attend any of its meetings, but such persons shall not have voting rights.

4.2.3 *Decisions*

Each Representative shall have one vote on the Management Committee and where, in terms of this clause, a casting vote is required, this shall be exercised by the chairman.

All decisions of the Management Committee shall, desirably, be unanimous. Accordingly, if unanimity cannot, initially, be achieved in regard to a decision, the meeting at which that decision is sought shall be adjourned for a period of 48 hours to enable Representatives to consult with their principals. If, on resumption of the adjourned meeting, unanimity can still not be achieved, the decision, provided it is not one requiring unanimity of the Members, shall be taken by majority vote and, in the event of a tie, the chairman shall exercise a casting vote.

A Member not satisfied with a majority decision of the Management Committee may declare a dispute, to be dealt with in terms of Clause 8 hereof, but the majority decision shall, nevertheless, be implemented with immediate effect.

Decisions of the Management Committee, whether taken at a meeting, or otherwise, shall be recorded in written minutes, which shall be distributed by the chairman to reach the Representatives not later than five working days after those decisions were taken. Such minutes shall be deemed to have been affirmed by the Representatives unless written notice of dissent is received by the chairman not later than three working days after receipt of the minutes by the Representative.

4.2.4 *Powers and duties*

The functions, responsibilities and powers of the Management Committee shall include, inter alia, those listed below:

- 4.2.4.1 Formulating overall policy in regard to the achievement of the objectives of the Joint Venture.
- 4.2.4.2 Managing the day to day affairs of the Joint Venture.
- 4.2.4.3 Monitoring, directing and co-ordinating the activities of the Members to ensure that the objectives of the Joint Venture are achieved and that the obligations and responsibilities of the individual Members are met.
- 4.2.4.4 Monitoring and controlling the financial affairs of the Joint Venture and ensuring that proper books of account and financial records relating to affairs of the Joint Venture are maintained in an approved form and submitted to the Management Committee for approval at regular intervals, which shall not be longer than one month.
- 4.2.4.5 Determining the necessity for and the details of any changes in the duties and responsibilities of Members provided that any resulting changes in Members' Interests shall be unanimously approved by the Members.
- 4.2.4.6 Determining the terms and conditions of employment of personnel and the emoluments applicable to staff seconded to the Joint Venture by the Members.
- 4.2.4.7 Controlling and approving the appointment of all subcontractors.
- 4.2.4.8 Procuring, after the completion of the Contract and the release of all bonds, guarantees and sureties given in respect of the performances of the Joint Venture and the Members, the preparation and auditing of a final set of accounts, on the basis of which the final profits, or losses, attributable to the individual Members shall be determined and any necessary adjustments effected.

5 **RESOURCES OF JOINT VENTURE**

The resources to be utilised by the Joint Venture in securing and executing the Contract shall, insofar as these are to be provided directly by the Members, be as set out in the Schedules and may, from time to time, be amended by decision of the Management Committee, provided that the Member's Interests are not, except with the unanimous approval of the Members, affected thereby.

Similarly, specific areas of responsibility of the Members for the performance of work and the provision of facilities shall be as set out in the Schedules and may, from time to time, be amended by decision of the Management Committee, provided that the Members' Interest are not, except with the unanimous approval of the Members, affected thereby.

5.1 Schedule 'A' (General)

Schedule 'A' shall contain general information relating to the Joint Venture including, inter alia, the following :

1. The Employer's name and address.
 2. A brief description of the Contract and the Deliverables.
 3. The name, physical address, communications addresses and domicilium citandi et executandi of each Member and of the Joint Venture.
 4. The Members' Interests.
 5. A statement indicating whether, or not, Specific Provisions apply to the Agreement.
 6. A schedule of insurance policies which must be taken out by the Joint Venture and by the individual Members.
 7. A Schedule of sureties, indemnities and guarantees that must be furnished by the Joint Venture and by the individual Members.
8. Details of the persons, who, in the event of failure by the Members to reach agreement on the appointments of mediator and arbitrator, will nominate appointees to these positions in terms of Clauses 8.2 and 8.3.

5.2 Schedule 'B' (Financial)

Schedule 'B' shall contain information regarding the financial affairs of the Joint Venture including, inter alia, the following :

1. The working capital required by the Joint Venture and the extent to which and manner whereby this will be provided and/or guaranteed by the individual Members from time to time.
2. The banking accounts that are to be opened in the name of the Joint Venture and the manner in which these are to be operated.
3. The rates of interest that will be applicable to amounts by which Members are in debit, or credit, to the Joint Venture.
4. The names of the auditors and others, if any, who will provide auditing and accounting services to the Joint Venture.
5. The intervals at which interim financial accounts and forecasts will be prepared for approval by the Management Committee.
6. Insofar as not covered in Schedule 'C', the basis on which contributions of various types by the Members towards the work of the Joint Venture in securing, executing, managing and satisfactorily completing the Contract, will be valued.
7. The basis on which profits and/or surplus cash will, if available from time to time, be distributed to Members.
8. The basis upon which losses, if any, are to be apportioned to Members.

5.3 Schedule 'C' (Contributions by Members)

Schedule 'C' shall set out the contributions of various types, other than cash, that will be made by the individual Members towards the work and obligations of the Joint Venture and shall, as far as possible, indicate the monetary values to be placed on such contributions, which may include, inter alia, the following :

1. Staff seconded to the Joint Venture.
2. Work carried out and services provided to, or on behalf of, the Joint Venture.
3. Plant, equipment, facilities etc. made available for use by the Joint Venture.
4. Materials and goods supplied to, or on behalf of, the Joint Venture.
5. Licences, sureties, guarantees and indemnities furnished to, or on behalf of, the Joint Venture.
6. Joint Venture Disclosure form required for the Contract.

6. BREACH OF AGREEMENT

If a Member breaches any material provision of the Agreement, or delays or fails to fulfil its obligations in whole, or in part, and does not remedy the situation within fourteen calendar days of receipt of notice from the Management Committee, or another Member, to do so, the other Members shall have the right, without prejudice to any other rights arising from the default, to summarily terminate the Agreement and re-assign the defaulting Member's rights and obligations in the Joint Venture as they see fit and withhold any moneys due to the defaulting member by the Joint Venture.

Each Member shall indemnify the other Members against all losses, costs and claims which may arise against them in the event of the Agreement being terminated as a result of breach of the Agreement by the said Member.

7. INSOLVENCY OF MEMBER

Should a Member be placed in liquidation, or under judicial management, whether provisionally or finally, or propose any compromise with its creditors, the other Members shall be entitled to proceed in terms of Clause 6, as if the Member had breached the Agreement.

8. DISPUTES

8.1 Settlement

The Members shall negotiate in good faith and make every effort to settle any dispute, or claim, that may arise out of, or relate to, the Agreement.

If agreement cannot be reached, an aggrieved Member shall, if he intends to proceed further in terms of Clause 8.2 hereof, advise all other Members in writing that negotiations have failed and that he intends to refer the matter to mediation in terms of Clause 8.2.

8.2 Mediation

Not earlier than ten working days after having advised the other Members, in terms of Clause 8.1, that negotiations in regard to a dispute have failed, an aggrieved Member may require that the dispute be referred, without legal representation, to mediation by a single mediator.

The mediator shall be selected by agreement between the Members, or, failing such agreement, by the person named for this purpose in Schedule 'A'. The costs of the mediation shall be borne equally by all Members.

The mediator shall convene a hearing of the Members and may hold separate discussions with any Member and shall assist the Members in reaching a mutually acceptable settlement of their differences through means of reconciliation, interpretation, clarification, suggestion and advice. The Members shall record such agreement in writing and thereafter they shall be bound by such agreement.

The mediator is authorised to end the mediation process whenever in his opinion further efforts at mediation would not contribute to a resolution of the dispute between the Members.

8.3 Arbitration

Where a dispute or claim is not resolved by mediation, it shall be referred to arbitration by a single arbitrator to be selected by agreement between the Members or, failing agreement, to be nominated by the person named for this purpose in Schedule 'A'.

The Member requiring referral to arbitration shall notify the other Members, in writing, thereof, not later than thirty calendar days after the mediator has expressed his opinion, failing which the mediator's opinion shall be deemed to have been accepted by all Members and shall be put into effect.

Arbitration shall be conducted in accordance with the provisions of the Arbitration Act No. 42 of 1965, as amended, and in accordance with such procedure as may be agreed by the Members or, failing such agreement, in accordance with the rules for the Conduct of Arbitrations published by the Association of Arbitrators and current at the date that the arbitrator is appointed.

The decisions of the arbitrator shall be final and binding on the Members, shall be carried into immediate effect and, if necessary, be made an order of any court of competent jurisdiction.

9. DOMICILIUM

The Members choose domicilium citandi et executandi for all purposes of and in connection with the Agreement as stated in Schedule 'A'. A Member shall be entitled to change his domicilium from time to time, but such change shall be effective only on receipt of written notice of the change by all other Members.

Member No. 1

Thus done and signed at _____ this ____ day of _____ 20__

For and on behalf of _____ [Company]

by [name] _____ who warrants his authority to do so.

As witnesses 1. _____

As witnesses 2. _____

Member No. 2

Thus done and signed at _____ this ____ day of _____ 20__

For and on behalf of _____ [Company]

by [name] _____ who warrants his authority to do so.

As witnesses 1. _____

As witnesses 2. _____

Member No. 3

Thus done and signed at _____ this _____ day of _____ 20____

For and on behalf of _____ [Company]

by [name] _____ who warrants his authority to do so.

As witnesses 1. _____

As witnesses 2. _____

[Allow for additional parties as necessary].



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 6

Health and Safety Specification

Annexure 6

Occupational Health and Safety Specification

(OHSE SPEC)



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Project Name:

**Ngwelezane Hospital: Construction of New Orthotics and
Prosthetics Centre with Parking Area**

Project Code:

070638

Agent Name:

Ms. L. Ntuli (Head Office)

Region:

Head Office

District:

Head Office

REFERENCE NR	CHSM/070638
Revision	1
Date	February 2022



public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

OHS DESIGN RISK REPORT AND SPECIFICATION

NEW ORTHOTICS AND PROSTHETICS CENTRE Ngwelezane Hospital

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- 4. WHO SHOULD RECEIVE THE OHS DESIGN RISK REPORT?**
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- 6. HAZARD IDENTIFICATION AND RISK ASSESSMENT PROCESS**
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 - 6.4. METHODOLOGY (METHOD USED TO CONDUCT RISK ASSESSMENT)**
- 7. RISK ASSESSMENT PROFILE**
- 8. SPEC AND BASELINE RISK ASSESSMENT**

1. FOREWORD

This Health and Safety Specification details the legislative and contractual requirements in accordance with the Occupational Health and Safety Act (85 of 1993) and the Construction Regulations, 2014 which were incorporated into the Act on 18 July 2003. Legislation ensures that Contractors remain the responsibility of the Principal Contractor.

The Health and Safety Specification has been developed by the KZN Department of Public Works to be implemented to ensure compliance by all Contractors. This Specification, the Occupational Health and Safety Act (85 of 1993) and the Construction Regulations, 2014 shall constitute the minimum requirements to be met with regards to Health and Safety, with the ACT taking preference should there be any contradiction between the documents.

The Site	Ngwelezane Hospital
Client	Department of Health
Project Manager	Hanka Gorny
Principal Agent	Ukuza Consulting (PTY) LTD
PrCHA (Safety Agent)	T Hadebe

2. INTRODUCTION

- This Report of OHS Design Risk aims to develop a greater recognition of the role of OHS design Risk in improving occupational health and safety performance in the workplace.
- The OHS Design Risk report is aimed at the following groups:
 - **The Client,**
 - **Repairs and renovations of the structure.**

3. PURPOSE OF OHS DESIGN RISK REPORT

- ❖ The purpose of this OHS Design Risk Report is to specify the hazards relating to the architectural component of the design of this structure that create a risk to the health and safety of persons who are to carry out any construction work on the structure.
- ❖ The report also covers hazards associated with other stages of the lifecycle of the structure when it is used as a workplace.

4. WHO SHOULD RECEIVE THE OHS DESIGN RISK REPORT?

- ❖ The Designer has a statutory duty to provide a report on the potential hazards relating to the construction to the client who is required under Construction Regulation 2014 to pass the report on to the Principal Contractor.
- ❖ This information detailing how the structure has been designed to be without risk to health and safety, should also be given to each person who is provided with the design for the purpose of giving effect to it.
- ❖ The Designer must also, on request, supply this information to anyone who constructs, uses, maintains, installation or testing & commissioning.

5. LEGISLATION

- ❖ The Construction Regulations 2014 require the Designer to provide a written safety report to the client.
- ❖ The Client then has a responsibility to provide this OHS design Risk report to the Principal Contractor.
- ❖ All parties have a duty to consult with each other to ensure communication of this information.

6. HAZARD IDENTIFICATION AND RISK ASSESSMENT PROCESS

The Hazard Identification and risk Assessment process involves the identification of hazards, which is anything which may cause harm, injury, damage, work interruptions etc. and risks, the likelihood of such outcomes of the hazards being realised and should it be realised what would the severity be, or in other words the consequence.

6.1. REASONS TO DO A RISK ASSESSMENT

- It is a legislative requirement.
- It is a moral obligation.
- To ensure the most cost effective design are developed and reducing the cost of changes at the early stage of design.

6.2. CONDUCTING A HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA)

- Identifying Hazards and Risks associated with design applicable to the Construction, Use Maintenance and eventual installation stages of the design
- Considering Legislative, Codes of Practice, Bylaws etc. applicable to the design and evaluating compliance with such requirements
- Applying the Hierarchy of Risk Control to the design and striving to eliminate such hazards and risk levels to as low as is reasonably practicable by considering issues such as redesign, substitution etc.

6.3. DIFFERENT TYPES OF RISK

Risks could be associated with:

- Injury or illness to people;
- Damage to property;
- Effects on the environment;
- Productivity;
- Cost;
- Insurance; and
- Reputation.

6.4. METHODOLOGY (METHOD USED TO CONDUCT RISK ASSESSMENT)

a. Risk Value

- Is a value calculated by allocating a value extracted from a table in terms of the likelihood of the risk being realised and multiplying it with a value associated with the consequence, which is also extracted from a table. The value obtained is known as the Risk Value or otherwise known as the Pure Risk.
- Pure risk is a level of risk which has not been subjected to any risk reduction or elimination measures. After the application of Risk Control measures to the identified Pure Risk the Residual Risk level is calculated in the same manner which will result in obtaining a lower numerical outcome as that of the Pure Risk.

Risk value= Likelihood x consequence

✓ likelihood

It covers a range from 1 to 5:

- 1=Rare.
- 2=Unlikely.
- 3=Possible.
- 4=Likely
- 5=Almost certain

Consequence

It covers a range from 1 to 5:

- 1=Negligible
- 2=Minor
- 3=Moderate
- 4=Major
- 5=Severe

7. RISK PROFILE

SITE SPECIFIC OHS RISK PROFILE		
Activity	Recommended risk control measure	Risk Prioritisation Number
Collection and placement of construction materials	HIRA, Competent Management, Competent Supervision, safe systems of work, Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	2
Erection of scaffolding structure/s and hoarding	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	2
Vehicles entering & exiting a construction site	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	2
Carpentry & Joinery (incl. joinery fittings)	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE, etc.	2
Floor Coverings and Tiling	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE, etc.	2
Ironmongery	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE, etc.	2
Plumbing & Drainage	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE, etc.	2
Mechanical Works	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc	1
Fitting of DB – boxes, switches, plugs etc.	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	1
Piling	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	1
Excavation works	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	1
Demolition / Removal of old park homes	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	1

REFERENCE NR	CHSM/070638
Revision	1
Date	February 2022



public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Occupational Health and Safety Specification (OHSE SPEC)

NEW ORTHOTICS AND PROSTHETICS CENTRE Ngwelezane Hospital

WIMS no. : 070638

Client OHS

Representative : TPS Hadebe

Region : North Coast Region

District : Mhlathuze

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1. Introduction

The Kwa-Zulu Natal Department of Public Works is deemed as the “**Client**” in terms of the definitions of Construction Regulations of 2014 as published in *Government Gazette No. 37305*. The Construction Regulations of 2014 under CR(5)(1) stipulates that the client must prepare a suitable, sufficiently documented and coherent site specific Occupational Health and Safety Specification for the intended construction work based on the baseline risk assessment.

The purpose of this Occupational Health and Safety Specification document (*which hereinafter will be referred to as OHSE Spec*) is to provide designers and the successful tenderer with essential OHS information to ensure effective safety management during the design and construction phase of the project.

This OHSE Spec forms an integral part of the contract between the Client and the Principal Contractor, so as to ensure compliance with the Occupational Health and Safety Act, Act 85 of 1993 and its applicable regulations and must serve as the basis for the Principal Contractor to develop his/her Project Safety, Health and Environmental Management Plan. As with any other plan for it to be implemented and managed effectively it requires the allocation of sufficient funds to achieve the objectives set out in the plan. In line with this requirement Construction Regulation 5(1)(g) requires the Client to ensure that the Principal Contractor has made adequate provisions for the cost of Health and Safety Measures in their tenders.

It must be noted that this OHSE Spec as much as it is detailed it is not exhaustive and the onus is on the Principal Contractors to ensure that they comply with Section 8 of the OHS Act, Act 85 of 1993 which states that “*Every Employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees*”. This means that Principal Contractors as they are employers in their own right must at all times ensure continuous assessments are done for continued provision and maintenance of a healthy and safe working environment.

Attention is drawn to the requirements of the Disaster Management Act, 2002 and regulations issued in regards to the containment/management of COVID-19. The Directive issued by Minister of Employment and Labour in respect of COVID-19 Occupational Health Measures in Workplaces, 2020.

2. Definitions

For the purpose of the OHSE Spec, the abbreviations or definitions given hereunder shall apply and the reference to on gender will also apply to the other gender.

“CR” refers to the Construction Regulations 2014

“Agent (Pr.CHSA)” means a competent person who acts as a representative for a Client in terms of regulation (5)5.

“Client” means Department of Public Works

“Competent person” means a person who-

- (a) Has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable, qualifications, specific for that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualifications Framework Act, 2000 (Act No.67 of 2000), those qualifications and that training must be regarded as the required qualifications and training; and
- (b) Is familiar with the OHS Act, Act 85 of 1993 and with the applicable regulations made under the Act;

"Construction Manager (Site Agent)" means a competent person responsible for the management of the physical construction processes and the coordination, administration and management of resources on a construction site;

"Construction Site" means a work place where construction work is being performed;

"Construction Supervisor" means a competent person responsible for supervising construction activities on a construction site;

"Construction Vehicle" means a vehicle used as a means of conveyance for transporting persons or material, or persons and material, on and off the construction site for the purposes of performing construction work;

"Construction work" means any work in connection with –

- (a) The construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure; or
- (b) the construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving of earth, clearing of land, the making of excavation, piling, or any similar civil engineering structure or type of work;

"Construction Work Permit" means a document issued in terms of regulation 3 of the Construction Regulations 2014;

"Contractor" means an employer who performs construction work;

“COVID-19” Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus.

“COVID-19 compliance officer” designated person that oversee the implementation of the COVID-19 site management plan.

"Demolition Work" means a method to dismantle, wreck, break, pull down or knock down of a structure or part thereof by way of manual labour, machinery, or the use of explosives;

"Fall Protection Plan" means a documented plan, which includes and provides for-

- (a) All risks relating to working from a fall risk position, considering the nature of work undertaken;
- (b) The procedures and methods to be applied in order to eliminate the risk of falling; and
- (c) A rescue plan and procedures;

"Health and Safety File" means a file, or other record containing the information in writing required by these Regulations;

"Health and Safety Plan" means a site, activity or project specific documented plan in accordance with the client's health and safety specification;

"Health and Safety Specification" means a site, activity or project specific document prepared by the client pertaining to all health and safety requirements related to construction work;

"Medical Certificate of Fitness" means a certificate contemplated in regulation 7(8) of Construction Regulations 2014;

"Principal Contractor" means an employer appointed by the client to perform construction work;

"Safety Officer" – a person deemed competent by SACPCMP under the relevant category of registration.

"Professional Engineer or Professional Certificated Engineer" means a person holding registration as either a Professional Engineer or Professional Certificated Engineer in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000);

3. Scope of Application

The OHSE outlines the Client's (KZN DPW) commitment and involvement to implement policies and procedures to comply with legal and agreed Contractual Requirements. In order to prevent incidents or accidents for the duration of the Project, the Specification is a documented plan for all the health and safety requirements pertaining to the associated task being performed on the Project to ensure the health and safety of persons.

This OHSE Specification document stipulates the minimum Occupational Health, Safety, and Environmental requirements that the tenderer need to address in his/her OHSE Plan. This Specification also addresses legal compliance, hazard identification, risk assessment, risk control, and the promotion of a Health and Safety culture amongst those working on the project.

This Specification also makes provision for the protection of persons other than employees. This OHSE Spec is exclusively applicable to the project as listed on the cover page of this specification.

Summarised Scope of Work:

Construction of new Orthotics and Prosthetics Centre at Ngwelezane Hospital

4. PURPOSE OF OHSE SPECIFICATION

To define the arrangements between the Client (DPW) the Designers and the Principal Contractor, this agreement is to ensure that the Contractor and their subordinates comply with the legislation and the procedures in this Health and Safety Specification on the Project.

This OHSE Specification further seeks to achieve the following;

- a) To provide Principal Contractors with the Structure of the Detailed OHSE Plans they will have to prepare and submit for this project. **See Annexure A**
- b) Provide the overarching framework within which the Principal Contractor is required to demonstrate compliance with certain requirements for occupational health and safety established by the Occupational Health and Safety Act, Act 85 of 1993, all applicable regulations and Client Specific Requirements. **See Annexure B**
- c) To bring to the attention of the Bidding Principal Contractors that they need to make an undertaking that the costs for executing the project includes the costs of complying with the OHS Act, Act 85 of 1993, all applicable regulations including Client Specific requirements. Such undertaking is made by appending signatures on the OHS Declaration for Tenders. **See Annexure C**
- d) Ensure that the Principal Agent as the Professional Service Provider appointed by the Department of Public Works manages the project on behalf of the department. Furthermore, ensure terms of the Conditions of Contract applicable to this project, the contents of this document and the attached Baseline Risk Assessment are taken into consideration during design by all professions appointed and that the OHSE Specification is incorporated into the tender documents. **See Annexure D**

5. Contractual Issues

- a) Acceptance by the Principal Contractor of the contract with KZN DOPW shall constitute acknowledgement that the Principal Contractor has familiarised him/herself with the contents of the OHSE Spec and that he/she will comply with all its obligations in respect thereof.
- b) Due to fact that this document is based on legislative requirements, the Client requires that all Contractors comply with the requirements of this document and all other relevant legislative requirements not covered by this document.
- c) The Client or its duly appointed OHS practitioner reserves the right to stop any Principal Contractor or Sub-Contractors from working whenever Safety, Health or Environmental requirements are being violated as required by regulation 5(1)(q). Any resultant costs of such work stoppages will be for the relevant Contractor's account.
- d) The requirements as specified by the Client in this document must not be deemed to be exhaustive and the Client reserves the right to make changes as and when the Client deems fit to address issue of OHSE Compliance.
- e) The Client will not entertain any claim of any nature whatsoever which arises as a result of costs incurred or delays being experienced due to the Contractor not complying with the requirements of this document and/or any other applicable legislative requirements imposed on the Contractor.

6. Administrative Requirements

6.1. Notification of Construction Work

The successful tenderer must at least within 07 working days before commencing with construction work notify the Provincial Director in writing using **Annexure “2”** attached on the Construction Regs, 2014. A copy of the notification once stamped by the official from the *Department of Labour* Official must be submitted to the **client prior** to commencing with construction work.

7. Appointment of a fulltime Safety Officer – SACPCMP registered

The Principal Contractors will have to appoint a competent fulltime Construction H&S Officer who must be present on site at all times to conduct inductions, safety inspections on site and to the sub-contractors. The CHS officer must also ensure the administration of safety related documents is conducted and submit the SHE report to the client on monthly bases.

- Identify hazards in the workplace (Continuous risk assessment to updated)
- Give advice and suggest options for solving safety or health problems including COVID-19 related matters
- Suggest different kinds of help available, such as specialists in chemical, electrical and mechanical engineering safety to sort out issues at stake
- Investigate accidents/incidents and recommend remedial measures including recording and reporting to the client or PrCHS
- Carry out periodic checks and provide a written reports and the findings to the client or PrCHS
- Develop and maintain an effective safety and health programme including COVID-19
- Provide safety training and induction for employees and visitors

Site Safety Meetings: Ensure Health and Safety issues are been properly addressed on the Project, the Contractor must conduct and record meetings whenever necessary depends on the scope of work to discuss relative matters or incidents that have occurred. The minutes of the safety meetings must be filed in the Health and Safety File for viewing by the Client, Clients Representative or Inspector. All Employees attending meetings will be required to sign an attendance register as proof of attendance.

7.1. **Appointment of a COVID-19 compliance officer**

The Principal Contractors will have to appoint a COVID-19 compliance officer to oversee the implementation of the COVID-19 site management plan and conduct daily inspection of the work areas. Ensure that the following facilities are available onsite;

COVID-19 prevention facilities onsite

- Washing facilities and soap at suitable positions.
- Hand basins or bowls
- Water tap with buckets or portable containers.
- Hand sterilization facilities to promote hygiene
- Use of PPE
- Display handwashing signs in ablution areas and dining areas.

Principal contractor must provide resources and a work environment that promotes personal hygiene. Provide paper towels, no-touch dustbin, hand soap, alcohol-based hand rubs containing at least 60 percent alcohol, disinfectants, and disposable towels for workers to clean their work surfaces. Regular cleaning of tools (handles or contact points) using of alcohol-based sanitizers. Workers should always wash hands when they are visibly soiled and after removing any PPE.

7.2 Communication, Documentation and Site Audit

All H&S communication during the project between the parties will be in writing, including the issue and responses to non-conformances and H&S audit results. Communication between the DPW OHS practitioner and the principal contractor will be via the Project Manager. A comprehensive site SHE audit will be conducted monthly and DTSL's to be completed by construction work supervisor (CR8.7) prior to work daily. The site will be inspected by the appointed CHSO (CR8.5) and the documentation audited relative to verify past or completed activities, verify compliance of current activities and the H&S plan. The CHSO must accompany the, client on all audits and inspections. It is preferable that a H&S representative is present during all audits. The CHSO is to apply a similar approach to managing their Contractors. The frequency of the audits may be increased if the principal contractor, or contractors are not performing adequately. SHE audit results will be acted upon as per section 5(c) of this document. The client, designer may act, or require further outcomes if non-compliances are noted or unsafe acts are noted on site. Weekly internal audits are to be completed and 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 agreed upon between the CHSO and DPW.

7.3. The Project Team

The Project Team				
Name & Surname	Organisation	Discipline	Tel	Email
Mrs. Hanka Gorny	DOPW	Project Leader	033 355 5463 082 777 2508	hanka.gorny@kznworks.gov.za
Mr. George Kunje	Ukuza Consulting (PTY) LTD	Principal agent	031 265 0444	george@ukuza.co.za
Mr. Morgan Govender	Eyesizwe Consulting Engineers	Mechanical Engineers	032 941 2012	morgan.g@eyesizwekzn.co.za
Mr. Sfiso Nzama	Ibuya Consulting Engineers	Electrical Engineers	031 266 7332	sfiso@ibuya.co.za
Mr. Dhiren Naidu	Ukuza Consulting (Pty) Ltd	Quantity Surveyor	031 265 0444	dhiren@ukuza.co.za
TPS Hadebe	DOPW	Client Health and Safety Representative	066 301 8597 033 355 5510	Thokozani.hadebe@kznworks.go.za

In addition to the above, communication may be directly to the Client or his appointed Agent, verbally or in writing, as and when the need arises. Consultation with the workforce on OH&S matters will be through their appointed construction safety officer/Construction manager/supervisors. A safety representative will be appointed, through whom all communication for employees will be done. The Principal Contractor will be responsible for the dissemination of all relevant OH&S information to the other Contractors e.g. design changes agreed with the Client and/or its Agent on its behalf and the Designer, instructions by the Client and/or his/her agent, exchange of information between Contractors, the reporting of hazardous/dangerous conditions/situations.

7.4. Monthly Health and Safety Audit and Monitoring

The Contractor will be responsible for ensuring that all statutory test and inspections have been carried out on machinery, tools and equipment used on the Project. The Contractor shall provide and maintain the following Registers and Checklist applicable to the site activities.

- 7.4.1. Recording and Investigation of Incidents Register.
- 7.4.2. Contractor's appointed/responsible persons.
- 7.4.3. Lifting Equipment (Hoisting Machine, Slings, Shackles, etc.).
- 7.4.4. Hand Tools (ladders, spades, chisels etc.)
- 7.4.5. Portable Electric Equipment.
- 7.4.6. Ladder Checklist.
- 7.4.7. Health & Safety Representatives Register
- 7.4.8. Health and Safety Meetings Register.
- 7.4.9. Risk Assessment Register.
- 7.4.10. Toolbox Talks Register.
- 7.4.11. Hot work (Gas Welding, Flame Cutting and Arc Welder).
- 7.4.12. Fire Fighter Register.
- 7.4.13. Fire Fighting Equipment.
- 7.4.14. First Aid Box.
- 7.4.15. First Aiders Register.
- 7.4.16. Safety Harnesses and Lanyard.
- 7.4.17. Personal Protective Equipment.
- 7.4.18. Housekeeping/Staking and Storage.
- 7.4.19. Hazardous Chemical Substances present on site register.
- 7.4.20. Scaffolding (implementation of fall protection)
- 7.4.21. Construction Vehicles.

Annexure A

8.1. Structure of the Detailed OHSE Plan

A detailed OHSE Plan is to be submitted by the successful tenderer as per the Construction Regulations 7(1) (a) and section 4(a) of this document. The following are the minimum standard legal documentation that must form part of the OHSE Plan based on the risks attached in executing the project as listed on the cover page; **The scope of Work entail the following construction activities;**

Construction of new Orthotics and Prosthetics Centre at Ngwelezane Hospital

1. DOL - Stamped Notification to commence with construction work made to the Provincial Director of Labour using Annexure 2 of the Construction Regs, 2014.
2. A valid Letter of Good Standing with Compensation Commissioner or Registered Compensation insurer.
3. The Contractor's Health, Safety & Environmental Policy, signed by the chief executive officer, which outlines the Contractor's OHSE compliance objectives and how they will be achieved. The policy to include measures for the protection of employees against exposure to COVID-19.
4. COVID-19 Site Safety Management Plan
5. Pre-Construction risk assessment (*site specific, dated and signed*)
6. Fall protection Plan (*to be signed and dated by the developer*)
7. Relevant checklists and registers. (*a sample of to be used onsite*)
8. SHE Audit Format to be used for Self-audits and Sub-contractors
9. Site specific OHSE Organogram (onsite)
10. Preliminary Induction Program (*Including toolbox talks program*)
11. Environmental Management Plan (*detailed waste management plan*)
 - 11.1.1. *Compliance to National Environmental Management Act (NEMA)*
12. Proof of competency for the following legal appointees;
 - 12.1. *Construction Manager – (Detailed CV reflecting qualification, relevant experience and references from previous clients)*
 - 12.2. *Construction Work Supervisor – (Detailed CV reflecting qualification, relevant experience and references from previous clients).*
 - 12.3. *Construction H&S Officer – (Proof of registration with SACPCMP + CV)*
 - 12.4. *COVID-19 Compliance officer*
 - 12.5. *Risk Assessor – (SAMTRAC or equivalent)*
 - 12.6. *Fall Protection Planner -SAMTRAC or equivalent (Training recognised under SAQA unit standard u/s 229994.*

8.2. Overall Supervision and Responsibility for OH&S of site

The Client (DPW) and/or its Agent on its behalf to ensure that the Principal Contractor, appointed in terms of Construction Regulation 5(1)(k), implements and maintains the agreed and approved H&S Plan. Failure on the part of the Client or Agent to comply with this requirement will not relieve the Principal Contractor from any one or more of his/her duties under the Act and Regulations. The Chief Executive Officer of the Principal Contractor in terms of Section 16 (1) of the Act to ensure that the Employer (as defined in the Act) complies with the Act. The pro forma Legal Compliance Audit may be used for this purpose by the Principal Contractor or his/her appointed contractor. All OH&S Act (85 /1993), Section 16 (2) appointee/s as detailed in his/her/their respective appointment forms to regularly, in writing, report to their principals on matters of health and safety per routine and ad hoc inspections and on any deviations as soon as observed, regardless of whether the observation was made during any routine or ad hoc inspection and to ensure that the reports are made available to the principal Contractor to become part of site records (Health & Safety File). The Construction Manager and Assistant Construction Manager/s appointed in terms of Construction Regulation 8 to regularly, in writing, report to their principals on matters of health and safety per routine and ad hoc inspections and on any deviations as soon as observed, regardless of whether the observation was made during any routine or ad hoc inspection and to ensure that the reports are made available to the principal Contractor to become part of site records (Health & Safety File). All Health and Safety Representatives (SHE-Reps) shall act and report as per Section 18 of the Act. The following competent appointments, where applicable, in terms of the Construction Regulations are required to ensure compliance to the Act, Regulations and Safety Standards.

Prior Site Handover	After Site Handover on commencement with Construction work
<ol style="list-style-type: none"> 1. 16.2 2. Construction Manager 3. Construction Work Supervisor 4. Construction H&S Officer 5. Risk Assessor 6. Fall Protection Planner 7. COVID-19 compliance officer 	<ol style="list-style-type: none"> 8. Assistant Construction Work Supervisor 9. Excavation work supervisor 10. Mobile plant operators 11. First Aider <i>(only if there are more than 10 employees)</i> 12. Emergency co-ordinator 13. Fire Marshalls 14. Fire team members 15. Portable Electrical tool inspector 16. Hand tools inspector 17. Ladder Inspector 18. SHE Representative <i>(as per OHS Act requirements)</i> 19. Housekeeping inspector 20. Stacking and storage inspector 21. Lifting equipment inspector 22. Temporary electrical installation inspector 23. Traffic Controller <i>(Flagman)</i> 24. Flammable liquids Storage Inspector 25. Hazardous substance storage inspector 26. Incident / Accident investigator 27. Emergency Co-ordinator 28. Mobile plant operators 29. Demolition work supervisor

Annexure B

8.3. Client Specific Requirements

Items	Client Specific Requirements
Site Office location	<ul style="list-style-type: none"> The location of the site office should be in an area that will not require visitors to pass through or enter area where construction work is active and will not require the re-location of the office as the project progresses.
COVID-19 Site Management Plan	<ul style="list-style-type: none"> Construction projects operating during the Coronavirus (COVID-19) pandemic ensure they are protecting their workforce and minimizing the risk of spread of infection. Access control to site - All personnel and visitor entering the site must be temperature screened with a laser temperature scanner and records must be kept of the site register Medical screening of employees and visitors to site. The sanitization of work areas, transport for workers, facilities on site. On site record keeping - All employees, service providers, sub-contractors, visitors and consultants must sign the register with the above details on entering the site.
Public Safety when working in a hospital.	<ul style="list-style-type: none"> All areas where there construction activities are conducted must be barricaded and strict access control to those areas. Signage of hazards associated with construction activities conducted must installed and clearly visible. When working in this facility the contractors and sub-contractors risk assessment/ and subsequent safe work method statement must take into consideration the negative effect the contractors activities may have on the health and safety of the occupants of the facility or members of the public and make provisions for the implementation of all reasonably practicable measures to ensure the health and safety of the occupants of the building or facility. Prior arrangement and a plan must be developed before any disturbance of Hospital operations such as Theatre's.
Medical Certificates	<ul style="list-style-type: none"> In compliance with the requirements of the Construction Regulations 2014 section 7(8) the Contractor must ensure that, all of his/ her employee's onsite have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.
Appointment of a fulltime registered safety officer	<ul style="list-style-type: none"> The Principal Contractors will have to appoint a competent full time Construction H&S Officer for this project who will be onsite at all times.
Extreme weather conditions	<ul style="list-style-type: none"> If the weather condition poses a threat to the health & safety of employees be it extreme heat, cold, lighting or any adverse weather condition appropriate safety measures have to be taken.
Change to scope of work	<ul style="list-style-type: none"> Should there be changes to the original scope of work, the Principal Agent must inform appointed Construction Health and Safety Agent to effect changes to the OHSE Specification.
Safety Plan Submission	<ul style="list-style-type: none"> The successful Tenderer must submit a copy of the detailed OHSE Plan for approval and keep the original for onsite use during construction. The principal Contractor will not be allowed to start site establishment before his/her SHE Plan has been approved in writing.
Bylaws	<ul style="list-style-type: none"> The Principal Contractor must incorporate any aspects of the EThekweni Municipality bylaws which affect the, Safety and Environmental wellbeing of the employees and the public into his/her OHSE Plan and ensure compliance to such bylaws.
Risk assessment for construction work	<ul style="list-style-type: none"> To comply with CR(9) and to also address environmental issues To also include exposure to hazardous gases <p><i>See the attached baseline risk assessment to be considered by both the designer and the principal contractor.</i></p>
Demolition Work	<ul style="list-style-type: none"> The Principal contractor must ensure that before any demolition work is carried out a competent person is appointed in writing and that a demolition plan is certified by the structural engineer.

Occupational Hygiene and infection control	<ul style="list-style-type: none"> Occupational exposure to biological agents is a present risk to this project and the contractors must ensure that proper health and hygiene measures are put in place to prevent exposure to these hazards. Contractors must prevent inhalation, ingestion and absorption of any harmful chemical or biological agents. Compulsory of respiratory PPE at all times Sanitisation of workplace, ablution facilities, eating facilities are clean and hygienic Provide sanitising and/or hand wash facilities as required.
Fall protection	<ul style="list-style-type: none"> To comply with CR (10), Edge protection and protection of floor openings need to be of such a manner as to properly protect employees from falling off elevated positions or falling into floor openings
Construction vehicles and mobile plant	<ul style="list-style-type: none"> To comply with CR (23) and the following;
Electrical installations and machinery on construction sites	<ul style="list-style-type: none"> To comply with CR (24)
Use and temporary storage of flammable liquids on construction sites	<ul style="list-style-type: none"> To comply with CR (25)
Housekeeping and general safeguarding on construction sites	<ul style="list-style-type: none"> To comply with CR (27) and the following; Contractor to designate areas for placing refuse and rubble prior to being removed from site Contractor must implement a daily task site clean-up for all activities these should cover work areas, stairways, walkways etc. to free of any construction debris obstruction. Refuse to be separated for recycling purposes Hazardous materials may not be included in general rubble and need to be disposed of as per applicable legislative requirements
Stacking and storage on construction sites	<ul style="list-style-type: none"> To comply with CR (28)
Fire precautions on construction sites	<ul style="list-style-type: none"> To comply with CR (29) and the following; No smoking may be permitted on site except in designated smoking areas
Construction employees' facilities	<ul style="list-style-type: none"> To comply with CR (30) and the following; Gender signs to be placed at appropriate locations All welfare facilities to be kept in a hygienic condition at all times Employees to be trained in good hygiene practices
Public Safety & Signage	<ul style="list-style-type: none"> The Principal Contractor engaged in construction work must ensure that each person working on or visiting a site, and the general public in the vicinity of the construction site, shall be made aware of the dangers likely to arise from onsite activities and the precautions to be observed to avoid or minimise those dangers. Appropriate signage shall be posted at conspicuous points within and around the perimeter of the site. The steps to comply with this requirement must be outlined in the OHSE Plan. The public or visitors may only be permitted on site if they go through an appropriate health and safety induction detailing hazards and risks they may be exposed to and what measures are in place to control these hazards and risks The entire project site must be secured against unauthorized access and provided with appropriate warning signage. Where roadways or walkways must be encroached or closed due to work, adequate barriers shall be installed to safely redirect the flow of vehicles and pedestrians and protect them from construction activities. Whenever it is necessary to maintain public use of work areas (such as sidewalks, ramps, entrances to buildings, corridors, or stairways), the public shall be protected with appropriate guardrails, barricades, temporary fences, overhead protection, or temporary partitions and hoarding. The public must also be adequately protected from any work

	<p>created hazards, such as excavations. Appropriate warnings, signs, warning lights and instructional safety signs shall be conspicuously posted and placed where necessary.</p> <ul style="list-style-type: none"> The public must also be protected from falling debris and objects from the project site. Overhead protection shall be provided that will fully protect the public and be capable of withstanding the maximum forces that could be applied from potential falling objects. Special attention shall also be given to developing adequate means to protect against wind-blown debris and construction-related materials.
On Site Health and Safety Training & Induction	<ul style="list-style-type: none"> The Principal Contractor shall ensure that all site personnel and visitors undergo a risk-specific health & safety induction training session before starting work or being permitted to enter the site. A record of attendance shall be kept in the health & safety file. The Principal Contractor shall ensure that, on site periodic toolbox talks take place at least once per week. These talks should deal with risks relevant to the construction work at hand. A record of attendance shall be kept in the health & safety file. The above should also cover all sub-contractors that are onsite. All Contractors have to comply with this minimum requirement. Environmental issues to be included in toolbox talks where required.
General Record Keeping	<ul style="list-style-type: none"> The Principal Contractor and all Sub Contractors must keep and maintain Health and Safety records to demonstrate compliance with this Specification, The OHS Act 85/1993; and with the Construction Regulations of 2014. The Principal Contractor shall ensure that all records of incidents/accidents, training, inspections; audits, etc. are kept in a health & safety file held in the site office, which must be present on site at all times. The Principal Contractor must ensure that every Sub Contractor opens its own health & safety file, maintains the file and makes it available on request.
Health & Safety Audits, Monitoring and reporting	<ul style="list-style-type: none"> The Client or its duly appointed Agent shall conduct monthly health & safety audits. The Principal Contractor is obligated to conduct similar audits on all Sub Contractors appointed by them at least once a month. Detailed audit reports must be presented and discussed at all levels of project management meetings and a copy of such audit will be provided to the Client or its duly appointed Agent within 7 working days of such audit. Copies of the Client's audit reports shall be kept in the Principal Contractors Health & Safety File.
Emergency Procedures	<ul style="list-style-type: none"> The Principal Contractor shall submit a detailed Emergency Plan for approval by the Client prior to commencement on site. The plan shall detail the response procedure including the following key elements: <ol style="list-style-type: none"> 1. List of key competent personnel; 2. Details of emergency services; 3. Actions or steps to be taken in the event of the specific types of emergencies; 4. Information on hazardous material/situations.
First Aid Boxes and First Aid Equipment	<ul style="list-style-type: none"> The appointed First Aider(s) to be in possession of a valid first aid training certificate Level 2. Valid certificates are to be kept in the Site Safety File. All Sub Contractors with more than 5 employees shall supply their own first aid box, except if otherwise agreed upon between Principal and Sub- Contractor in writing.
Accident / Incident Reporting and Investigation	<ul style="list-style-type: none"> Injuries are to be categorised into Near miss, first aid, LTI, fatal etc. Fatal accidents to be reported in addition to applicable legislative requirements to the Client or its duly appointed Agent with immediate effect. The Principal Contractor must stipulate in its construction phase OHSE Plan how it will handle each of these categories. When reporting injuries to the Client, these categories shall be used. The Principal Contractor shall investigate all injuries, with a report being forwarded to the Client immediately. All Sub- Contractors have to report on the abovementioned categories of injuries to the Principal Contractor at least monthly. All categories of incidents/accidents must be in the Statistics Section of the Monthly Audit Reports, submitted to the Client or it's duly appointed Agent.
Hazards and Potential Situations	<ul style="list-style-type: none"> The Principal Contractor shall immediately notify other Sub Contractors as well as the Client of any hazardous or potentially hazardous situations that may arise during performance of construction activities. Should a hazardous situation require work stoppages, the work must be stopped and corrective steps taken such as the issue of Written Safe Work Procedures and the issue of Personal Protective Equipment.
Personal Protective Equipment (PPE) and Clothing	<ul style="list-style-type: none"> The Principal Contractor must ensure that all workers are issued with the required PPE as required by the risks associated with the activities they perform .The minimum PPE to be worn on site will be Safety Shoes/Boots, Hard Hats, Overalls and reflective vests. No Visitors may enter the site without Safety Shoes/Boots and Hard hats. The Principal

	<p>Contractor and all Sub Contractors shall make provision and keep adequate quantities of SABS approved PPE on site at all times. All employees issued with PPE to be trained in correct use, records of training and issue to be kept in the Site SHE File. Procedure to be in place to deal with:</p> <ul style="list-style-type: none"> 1. Lost or stolen PPE; 2. Worn out or damaged PPE replacement. 3. Employees not utilising PPE as required The above procedure applies to Principal Contractors and their appointed Sub-Contractors, as they are all employers in their own right.
Permits	<p>1) The Principal Contractor shall prepare and issue the required written permits relating to but not limited to the following:</p> <ul style="list-style-type: none"> Hot Work Roof Work; and Electrical work (both temporary and permanent) Confined Space Entry <p>2) The Principal Contractor must ensure that where permits are required that they are properly implemented and adhered to.</p>
Speed Restrictions and Protections	<p>Unless otherwise stipulated, the maximum speed limit on sites must be limited to 10 km/h.</p> <p>1) Vehicle movement routes on site must be clearly indicated where applicable.</p> <p>2) Signage to ensure the safe movement of vehicles on site, as well as to ensure the health and safety of all employees and visitors on site, must be displayed in strategic locations.</p>
Hazardous Chemical Substances (HCS)	<p>1) To comply with Hazardous Chemical Substances Regulations as published in Government Notice No. R. 1179 dated 25 August 1995.</p> <p>2) In addition to the abovementioned, Material Safety Data Sheets must be kept on site for all materials, which may contain hazardous chemical substances</p> <p>3) All containers used for decanting of hazardous substance must be marked to indicate</p>
Fire Extinguishers and Fire Fighting Equipment	<p>1) The Principal Contractor and Sub-Contractors must allow for and provide adequate provision of regularly serviced temporary fire fighting equipment located at strategic points on site, specific for the classes of fire likely to occur.</p> <p>2) The appropriate notices and signs must be allowed for and be erected as required</p> <p>3) Contractors may not utilize fire protection equipment belonging to the Client without prior consent</p>
Ladders and Ladder Work	<p>1) The Principal Contractor must allow for and ensure that all ladders are inspected at least monthly, are in a good safe working order, are the correct height for the task, extend at least 1m above the landing, are fastened and secured and are placed at a safe angle.</p> <p>2) Records of inspections must be kept in a register on site.</p>
General Machinery	<p>To comply with Driven Machinery Regulations as published in Government Notice No. R. 1010 dated 18 July 2003</p>
Portable Electrical Tools and Hand Tools	<p>1) The Principal Contractor shall ensure that all electrical tools, electrical distribution boards, extension leads, and plugs are kept in a safe working order.</p> <p>2) The Principal Contractor shall ensure that all portable electrical Equipment, is clearly numbered, inspected by a Competent appointed person and records of such inspections to be kept on record in an appropriate register on the site SHE file</p> <p>3) The Principal Contractor shall allow for and ensure the following in relation to hand Tools:</p> <p>That a "Competent Person" undertakes routine inspections and records are kept on site.</p> <p>That only authorized trained persons use the tools.</p> <p>That safe working procedures apply.</p> <p>That PPE is provided and used.</p>
High Voltage Electrical Equipment Installations and Equipment	<p>1) All Employees must be made aware of the presence and location of High Voltage Equipment such as underground cables and overhead lines, and ensure that the necessary precautionary steps are taken where work has to be executed in the vicinity of such equipment.</p> <p>2) Precautionary measures such as Isolation and Lock-Out of electrical systems or the use of electrically isolated tools must be used.</p>
Adequate Lighting	<p>All Contractors must allow for and ensure that adequate lighting is provided to allow for work to be carried out safely.</p>
Transportation of Workers	<p>1) In addition to CR 23 the following will apply</p> <p>The Principal Contractor and Sub-Contractors shall not:</p> <ul style="list-style-type: none"> Transport persons together with goods or tools unless there is an appropriate area or section of the vehicle in which to store such goods.

	<ul style="list-style-type: none"> • Transport persons on the back of trucks except if a proper canopy (properly covering the sides and top) has been provided with suitable seating areas. • Permit workers to stand or sit on the edge of the transporting vehicle. • Transport workers in LDVs unless they are closed/covered and have the correct number of seats for the passengers • No driver may transport more than six people on the back of a 1 Ton LDV and more than four passengers on the back of a ½ Ton LDV. <p>2) The driver of any LDV may not permit more than two passengers to occupy the cab of any LDV</p> <p>3) Drivers of such vehicles must have a valid driver's license for the code of vehicle being driven by them.</p> <p>4) No servicing of vehicles will be permitted on a Construction Site. No Vehicles or machinery leaking oil will be permitted on site due to the risk posed to the environment.</p> <p>5) Any oil or diesel spilled on site must be cleaned up as per accepted environmental practice</p>
Occupational Hygiene	<p>1) Occupational exposure is a major problem and all Contractors must ensure that proper health and hygiene measures are put in place to prevent exposure to these hazards.</p> <p>2) All Contractors must prevent inhalation, ingestion and absorption of any harmful chemical or biological agents</p> <p>3) Water to be utilized for drinking purposes may only be drawn from taps designated for drinking water purposes. Fire hydrants and fire hose reels may not be utilized for drinking water purposes.</p>
Environmental Management	<ul style="list-style-type: none"> • The Principal Contractor and Sub-Contractors must comply with the requirements of NEMA Act. • The Principal Contractor must develop a waste management plan, implement and maintained it onsite • Cement mixing to be done at a predetermined location on site which must include a solid, slab, and bunded edges to prevent runoff • Contaminated run off water from the site must be treated such as to ensure that it does not pose a risk to the environment • Any material which may have a harmful effect when disposed of by normal means must be disposed of in an appropriate manner to eliminate its harmful effect on the environment after disposal. • The Principal Contractor must allow for and ensure that adequate procedures are implemented and maintained to ensure that waste generated is placed in suitable receptacles and removed from the site promptly. • Plans to deal with spillages must be in place and maintained. • No waste materials (liquid or solid) may be disposed of in drains. • No burning of waste material may take place on site as such material being burned may result in pollution of the air or give off toxic vapours which could be harmful to the health of employees or any other person present on site.
Alcohol and other Drugs	<ul style="list-style-type: none"> • No alcohol and other drugs will be allowed on site without the express permission of the Principal Contractor • No person may be under the influence of alcohol or any other drugs while on the construction site. • Any person on the construction site who is on prescription drugs must inform his/her Employer accordingly and the Employer shall in turn report this to the Principal Contractor immediately. • Any person on the construction site who is suffering from any illness/condition that may have a negative effect on his/her safety performance must report this to his/her Employer, who in turn must report this to the Principal Contractor forthwith. • Any person on the construction site who is suspected of being under the influence of alcohol or other drugs must be removed from site immediately and be instructed to report back the next day for a preliminary inquiry. A full disciplinary procedure must be followed by the Contractor concerned and a copy of the disciplinary action must be forwarded to the Principal Contractor for his records.

T2.16 CONTRACTOR'S SAFETY, HEALTH AND ENVIRONMENTAL DECLARATION

Project title:	Ngwelezane Hospital – Department of Health		
Bid no:		WIMS no:	070638

INTRODUCTION

In terms of *Construction Regulation 7(1) (a)* of the *Construction Regulations of February 2014* a Contractor may only be appointed to perform construction work if the Client is satisfied that the Contractor has the necessary competencies and resources to carry out the work safely in accordance with the *Occupational Health and Safety Act, Act 85 of 1993* and the *Construction Regulations of February 2014*. In line with this requirement the Contractor is required to read through this document carefully, sign it and submit it with his/her Tender.

DECLARATION

1. I the undersigned hereby declare and confirm that I am fully conversant with the Occupational Health and Safety Act, Act 85 of 1993, the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specification attached in the tender document.
2. I hereby declare that my company and its employees has the necessary competency and resources to safely carry out the construction work under this contract in compliance with the Occupational Health and Safety Act, Act 85 of 1993, the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specification.
3. I hereby confirm that adequate provisions have been made in my tender to cover the cost of all Safety, Health and Environmental duties and responsibilities imposed on me by the Occupational Health and Safety Act, Act 85 of 1993, the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specification.
4. I confirm that I may not commence with any part of construction work under the contract until my Construction Safety, Health and Environmental Plan has been approved in writing by the Client.
5. I hereby confirm that copies of the following documentation will be kept on site for viewing and inspection purposes for the duration of the construction work:
 - a) Client's Construction Safety, Health and Environmental Specification
 - b) Approved Construction Safety, Health and Environmental Plan
 - c) Occupational Health and Safety Act, Act 85 of 1993, and
 - d) Construction Regulations of February 2014.
6. I agree that my failure to complete and execute this declaration to the satisfaction of the Client will mean that I am unable to comply with the requirements of the Occupational Health and Safety Act, Act 85 of 1993 and Construction Regulations 2014, and accept that my tender will be rejected.

Duly Signed at..... on this the..... day of.....201.....

Full Name of Signatory

Name of Enterprise

Capacity of Signatory

Signature of authorised representative of Bidder

8.5. Covid-19 Site Management Safety Requirements

The KZN Department of Public Works has developed the COVID-19 site management guidelines to assist contractors in relation to managing and prevention of the Coronavirus Disease (COVID-19) on construction sites. The contractor as employer has an obligation to assist government in limiting the spread of COVID-19 on site. In view of the COVID-19 pandemic the contractor is mandated to continuously review and update the Risk Assessment and provide training to employees. Contractors are advised to develop an emergency response plan in case someone displays signs of COVID-19 at the workplace (dry cough, fever, headache, shortness of breath). Allocate a room or area where someone who is feeling unwell or has symptoms can be safely isolated. Immediately stop all activities on site and contact the nearest health facility or the COVID-19 centre. If you are advised by the Department of Health to transport the worker to a health facility, you must have a plan for how they can be safely transported from there to a health facility. All activities on site must be ceased and all the details. A site emergency plan to dealing with COVID-19 must be conspicuously displayed onsite.

Onsite Record keeping and management requirements

Every employer (contractor) has an obligation to assist government in enabling contact tracing in the workplace. These obligations include the following measures:

- Contractors are advised to observe confidentiality of employee's details and medical results at all times.
- A register containing the details of employees, visitors and service providers that enter the site in a particular day to be kept in a secured environment only accessible to authorised personnel.
- The following details should be contained in the register, date, time (of entry and departure), name, surname, identity number, residential address, mobile number and next of kin details.
- All employees, service providers, sub-contractors, visitors and consultants must sign the register with the above details on entering the site.
- Adequately trained health and safety personnel, to perform daily workplace COVID-19 symptom screening.
- Provide compulsory medical screening equipment
- Provide prescribed personal protective equipment (PPE) to all employees onsite.
- All personnel and visitor entering the site must be temperature screened with a laser temperature scanner and records must be kept of the site register. If the temperature is above 37.3 C or more, advise the individual to stay at home, self-isolate, and observe the symptoms. They should also telephone the nearest health facility or the COVID-19 centre; provide them details of their recent travel and symptoms.

9. Annexure D Baseline Risk Assessment

Please note that this is a Baseline Risk Assessment and not a detailed Risk Assessment.
Activities as listed below may not be in the sequence preferred by the Contractor or may be conducted at the same time

Project:		Ngwelezane Hospital – Department of Health									
		WIMS NO : 070638									
REF NO		RISK ASSESSOR		TPS Hadebe	REVISION		DATE	02/02/2022			
Likelihood		Consequence		RISK VALUE= LIKELIHOOD X CONSEQUENCE			RISK RANKING		Risk Prioritisation Number		
				Score		Ranking					
Rare	1	Negligible	1	0-5		1 Low		5			
Unlikely	2	Minor	2	6-10		2		4			
Possible	3	Moderate	3	11-16		3		3			
Likely	4	Major	4	17-20		4		2			
Almost certain	5	Severe	5	21-25		5 High		1			
MAIN ACTIVITY											
Site establishment											
REF NO	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number		

SITE ESTABLISHMENT										
MAIN ACTIVITY	REF NO	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
	1									
	1.1	Fencing/ Hoarding the site office	1.Manual Handling 2.Struck by 3.Sharp edges 4.Physical exertion 5.Tripping Hazards 6. Hidden services , etc.	1. Muscular strain 2.Brusing, fractures 3.Cuts, abrasion 4.Dehydration 5.Fractures, 6. Electrocution, death etc.	None	1.Tripping, cuts etc.	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work, competent operators, Cable Detection Equipment usage, Medical Fitness Certificates, signage and barricading, training. PPE etc.	1x2=2	2
	1.2	Loading/Off- loading materials and equipment (Mechanical)	1.Uncontrolled movement of loads 2. Limbs caught between surfaces 3.Heated surfaces, 4. HCS 5. Sharp edges. 6.Moving vehicles.	1.Fractures,death, damage 2. Abrasions. Fractures, Cuts. 3.Burns 4. Dermattis 5. Cuts 6.Vehide/property Equipment damage, Fractures, Death etc.	1.Contamination of resources – oil leaks, fuel spillage	1.Death, Fractures , Damage etc.	4x4=16	HIRA, Competent Management, Competent Supervision, safe systems of work, competent operators, Flagmen, Medical Fitness Certificates ,Vehicle maintenance records, signage and barricading, training. PPE etc.	3x3=9	2

1.3	Loading/Off Loading materials and equipment (Manual)	1. Uncontrolled Movement. 2. Sharp edges 3. Caught Between Surfaces 4. Falling Materials 5. Incorrect Lifting methods 6. Spillage etc.	1. Muscular strain 2. Cuts, abrasions 3. Bruising, fractures 4. Crushing ,cuts 5. Lower back injuries 6. Dermatitis etc.	1. Contamination of resources due to spillage of HCS, oil leaks, etc if present.	none	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, competent operators, Medical Fitness Certificates , Vehicle maintenance records, signage and barricading, training in collect lifting methods, PPE etc.	3x3=9	2
1.4	Positioning of equipment and site office on site (mechanical)	1. Uncontrolled movement of loads 2. Limbs caught between surfaces 3. Heated surfaces, 4. HCS 5. Sharp edges. 6. Moving vehicles.	1. Fractures, death, damage. 2. Abrasions. Fractures, Cuts. 3. Burns 4. Dermatitis 5. Cuts 6. Vehicle/property damage, Fractures, Death etc.	1. Contamination of resources – oil leaks, fuel spillage	1. Death, Fractures , Damage etc.	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, competent operators Flagmen, Medical Fitness Certificates , Vehicle maintenance records, signage and barricading, training. PPE etc.	3x3=9	1
1.5	Electrical Connection to the Site Office	1. Electricity 2. Sharp edges, 3. Physical Exertion 4. Poor working posture etc.	1. Electrocution, death 2. Cuts 3. Muscular strain, etc.	None	None	4x5=20	HIRA ,Competent Supervision and Management, Insulated tools ,Lock out, testing and tagging , permit issue, PPE etc.	2x3=6	1

1.6	Water connection to site office area	1.Sharp edges 2.Hot climatic conditions, 3.Physical exertion, 4.Poor working posture etc.	1.Cuts, 2. Heat stroke, 3.Muscular strain, 4. Back strain etc.	None	None	2x2=4	HIRA, Competent Management, Competent Supervision, safe systems of work, Medical Fitness Certificates, training, PPE etc.	1x1=1	2
TOTAL VALUE OF ACTIVITY							89	36	

SCAFFOLD , SCREEN, BARRICADING SIGNAGE ETC. ERECTION										
MAIN ACTIVITY	REF NO	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
	2									
	2.1	Collection and placement of materials	Struck by sharp edges, physical exertion, manual handling etc.	Abrasions, cuts , muscular strain, fractures etc.	none	Struck by falling objects, slipping, tripping etc.	3x3=9	HIRA ,Competent Supervision and Management, Insulated tools ,Lock out, testing and tagging , permit issue, PPE etc.	2x3=6	2
	2.2.	Erection of scaffolding structure/s and hoarding	Falls from height, dropping of items, sharp edges, scaffolding collapse, struck by falling items etc.	Back strain, bruising, cuts, abrasions, fractures, death	none	Struck by falling items	3x3=9	Safe system of work, use of fall arrest equip, erection of safe scaffolding, Supervision, etc.	2x3=6	1
	2.3.	Erection of barricading	Hidden services, Physical exertion, struck by, sharp edges etc.	Abrasions ,cuts, muscular strain, fractures, electrocution etc.	None	Struck by falling objects, slipping, tripping etc.	3x3=9	HIRA, Supervision, PPE, Safe Systems of work etc.	3x3=9	2
	2.4.	Fitment of signage	Physical exertion, sharp edges etc.	Muscular strain ,cuts etc.	None	Struck by falling objects, slipping, tripping etc.	2 x2=4	HIRA, Supervision, PPE, Safe Systems of work etc.	1 x1=1	2
	TOTAL VALUE OF ACTIVITY						31	22		

COVID-19 BASELINE RISK ASSESSMENT				
The COVID-19 hazard identification and risk assessment aims to determine the level of risk exposure on site and for contractors to implement the control measures.			RECOMMENDED RISK CONTROL MEASURE	
ACTIVITY / IDENTIFIED POTENTIAL AREA OF EXPOSURE COVID-19	HAZARDS SHE	HEALTH RISK		
Exposure of employees entering the workplace with CV19	1. Transmitting the virus on to other employees, causing illness and possible death 2. Exposure at site access point (security control)	1. Respiratory infection that can lead to fatality's 2. Fever, cough, fatigue	1. Symptomatic individuals will not be allowed entry. 2. Hygiene requirements (handwashing etc.) and symptoms of 3. CV19 included with Induction. 4. CV19 Information posters placed in accessible locations in the workplace 5. All employees and visitors, to receive induction training 6. Adequately train identified personnel to perform regular COVID-19 screenings 7. Provide compulsory medical screening equipment and keep documented record of screenings and should an employee be tested positive, then such an	
Display symptoms within the workplace	1. Transmitting the virus on to other employees, causing illness and possible death 2. Enhancing the possibility of spreading the Covid 19 pandemic	1. fever, dry cough 2. Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1. Worker removed to a designated area at least 2 metres away from other people. 2. The individual will be sent home and advised to follow Governmental guidance. 3. Workplace decontaminated following accepted standards. 4. Relevant PPE to be issued All employees to receive awareness training on COVID-19 and personal hygiene (Toolbox talks) 5. Adequately train identified personnel to perform regular COVID-19 screenings 6. compulsory medical screening equipment and keep documented record of screenings	
Contaminated workplace	Workers catching CV19 due to contaminated surfaces, causing illness and possible death	1. fever, dry cough 2. Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1. cleaning equipment and facilities frequently. 2. Hand sanitisers to be placed in readily accessible locations. Extra hygiene requirements enforced. 3. PPE to be issued Clean and disinfect objects that are regularly touched	
Overcrowded work areas	Workers catching CV19 due to working closely with infected colleagues, causing illness and possible death	1. fever, dry cough 2. Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1. Social Distancing policy implemented. All work areas and activities been reevaluated for the possibility of implementing social distancing (no handshaking, deferring large meetings etc.) 2. Relevant PPE to be issued Clean and disinfect objects that are regularly touched 3. CV19 Information posters placed in accessible locations in the workplace 4. Employees and visitors, to receive induction training 5. Employees to receive awareness training on COVID-19 and personal hygiene (Toolbox talks) 6. Adequately train identified personnel to perform regular COVID-19 screenings	
Use of handtools or equipment onsite	Workers catching CV19 due to working closely with infected colleagues, causing illness and possible death	1. fever, dry cough 2. Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache	1. Daily disinfecting of all work surfaces, construction work vehicles, portable working tools and equipment prior to resuming construction work. 2. Hand sanitisers to be placed in readily accessible locations. 3. A formal training program implemented to cover risks, symptoms and control measures. 4. All employees to receive awareness training on COVID-19 and personal hygiene (Toolbox talks)	

			loss of taste or smell, a rash on skin, or discolouration of fingers or toes	
Transportation of workers to workplace	Workers catching CV19 due to sitting closely with infected colleagues, causing illness and possible death	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1. Adhere to general travel ban by SA Government no over crowding in the transport 70% load capacity 2. Social Distancing policy implemented. All work areas and activities been revaluated for the possibility of implementing social distancing (no handshaking, deferring large meetings etc.) 3.Relevant PPE to be issued Clean and disinfect objects that are regularly touched 4.CV19 Information posters placed in accessible locations in the workplace 5.All employees and visitors, to receive induction training	
Change rooms and dining facility	A worker catches CV19 because a Colleague continues working despite being unwell, causing further spread of disease and possible death	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1.decontamination of all facility regularly and provide hygiene requirements (handwashing etc.) and 2.CV19 Information posters placed in accessible locations in the workplace 3.Relevant PPE to be issued Clean and disinfect objects that are regularly touched 4. Provision of hand sanitisers, paper towel, soap and water for employee's onsite. 5. Hand sanitizers should be strategically placed at entrances and common areas. 6. Dining facilities and change rooms onsite be arranged to allow for half a meter physical distancing.	
First Aid Training	Workers exposed to CV19 due to providing First Aid in the workplace or during CPR	1.fever, dry cough 2.Tiredness, aches and pains sore throat, diarrhoea conjunctivitis, headache loss of taste or smell, a rash on skin, or discolouration of fingers or toes	1.Proper training of First Aid staff 2.Use of correct equipment while giving First Aid 3.Maintaining proper mannequin hygiene 4.Relevant PPE to be issued Clean and disinfect objects that are regularly touched	

Piling									
REF NO	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDU AL RISK	Risk Prioritisation Number
4									
4.1	Off-loading and setting up piling equipment	1.Struck by falling objects 2.Caught between surface, 3.unsafe lifting position , 4.sharp edges	Cuts, abrasions , bruising ,backstrain , death	None	None if work area access properly controlled	4x4=16	Supervision, safe systems of work , signage and barricading, training etc	3x4=12	2
4.2	Pile foundation drilling / insert of steel casing into ground	Struck by tools, tripping, snakes, uneven ground surfaces, sharp objects, toxic vegetation, exposed illegal connections	Back strain, cuts, abrasion, heat exhaustion, snakes bites, electrocutions	Contamination of environmental resources due to leaking of fuel, diesel and oil	Dust, noise, death, severe cuts and abrasions	4x4=16	Training; reflector vest, use of dust mask, barricading, signage and safe systems of work and supervision	3x3=9	1
4.3	Drilling of excavations using a rig machine	1.Noise 2.Dust 3. Heated surfaces 4.HCS 5.Moving Machinery etc.	1.Noise induced hearing Loss 2.Dust inhalation 3.Burns 4.Dermatitis 5.Fractures , death etc.	1.Contamination of resources – fuel and oil spillage etc.	Noise exposure, dust inhalation	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records, Competent Operators Medical Fitness Certificates, continuous housekeeping signage and solid barricading, training. PPE etc.	4x5=25	1

4.4	Making of Longitudinal & spiral reinforcement	1.Physical exertion 2. Cuts, 3.Fracture 4. Poor working posture	1.Muscular strain 2.Dermatitis 3. Dehydration	None	None	3x4=12	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training, PPE etc.	3x4=12	1
4.4	Lowering of reinforcement cage into a tube	1.Abrasive surfaces 2.Poor working posture 3.Hot climatic conditions 4.Cement Dust 4.HCS etc	1. Abrasions 2.Muscular strain 3.Heat exhaustion 4.Dermatitis 5. Lung Infection etc.	1.Contamination of resources – fuel and oil spillage etc.	None	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping	3x3=9	1
4.5	Pouring of wet concrete into a tube	1.Abrasive surfaces 2.Poor working posture 3.Hot climatic conditions 4.Cement Dust 4.HCS etc.	1. Abrasions 2.Muscular strain 3.Heat exhaustion 4.Dermatitis 5. Lung Infection etc.	1.Discarding of unused cement- contamination of natural resources	None	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Competent Operators	3x3=9	1

								Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc		
4.6	Levelling and compaction the site mechanically	Machine tilting over, fire, underground and above ground electrical connections, person struck by machines	Death, sever injuries, electrocutions and burns	Contamination of environmental resources due to leaking of fuel, diesel and oil	Dust, noise, death, severe cuts and abrasions	4x5=20	3x3=9	1		
	TOTAL VALUE OF ACTIVITY						124	85		

PROTECTION OF UNSTABLE BANKS										
MAIN ACTIVITY	REF NO	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
	5									
	5.1	Setting out foundations	1.Manual Handling 2.Dust 3.Flying particles 4. Sharp objects 5.tripping 6.Hazardous chemical substances etc.	1.Dust inhalation 2. Eye injuries 3.Fractures 4.Burns 5.Respiratory irritation 6.Dermatitis etc.	1.Contamination of natural resources – Hazardous chemical substance etc.	None	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work, Medical Fitness Certificates, continuous housekeeping signage and barricading, training. PPE etc.	1x1=1	2
	5.2	Excavation for Surface Trenches(manually)	1.Physical exertion 2.Sharp edges 3.Dust 4.Abrasive Materials 5.Hot climatic Conditions 6.Bump against Etc.	1.Muscular strain 2.Cuts, lacerations 3. Dust inhalation 4.Abrasions 5.Heat exhaustion 6. Bruising etc.	None	None	4x3=12	HIRA, Competent Management, Competent Supervision, safe systems of work, Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	3x3=9	2

5.3	Excavation of Surface Trenches (mechanical)	1.Noise 2.Dust 3. Heated surfaces 4.HCS 5.Moving Machinery etc.	1.Noise induced hearing Loss 2.Dust inhalation 3.Burns 4.Dermatitis 5.Fractures , death etc.	1.Contamination of resources – fuel and oil spillage etc.	Noise exposure, dust inhalation	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records, Competent Operators Medical Fitness Certificates, continuous housekeeping signage and solid barricading, training. PPE etc.	3x3=9	1
5.4	Backfilling and levelling	1.Noise dust, 2.Hot climatic conditions 4.Heated surface 5.Vibration 6.Moving equipment and machinery	1.Noise induced hearing loss 2.Heat exhaustion 3.Dermatitis 4. Burns 5.Work related upper limb disorder 6.Fractures, death, ,dust inhalation ,burns, etc.	None	Struck by falling material, tripping etc.	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	2x2=4	1

5.5	Compaction (Mechanical)	1.Noise, 2.Dust 3.Vibration 4.Heated surfaces, 5.High impact Moving Components HCS etc.	1.Noise induced hearing loss, 2.Dust Inhalation 3.White finger syndrome 4.Burns 5. Fractures etc.	1.Spillage of oil/diesel- contamination of natural resources	1.Noise exposure etc.	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	3x3=9	2
5.6	Cement mixing	1.Abrasive surfaces 2.Poor working posture 3.Hot climatic conditions 4.Cement Dust 4.HCS etc.	1. Abrasions 2.Muscular strain 3.Heat exhaustion 4.Dermatitis 5. Lung Infection etc.	1.Discarding of unused cement- contamination of natural resources	None	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc	3x3=9	2

5.7	Soil poisoning	1.HCS 2.Hot climatic conditions etc	1.HCS ingestion, inhalation and absorption 2. Heat exhaustion etc.	contamination of natural resources due to HCS Spillage	None	3x5=15	HIRA, Competent Management, Competent Supervision, safe systems of work, MSDS. Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping, signage, barricading, training. PPE etc.	3x3=9	2
5.8	Steel Reinforcement	1.Physical exertion 2. Cuts, 3.Fracture 4. Poor working posture	1.Muscular strain 2.Dermatitis 3. Dehydration	None	None	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	2x1=2	1

5.9	Temporary works /Formwork	1.Physical exertion 2. Cuts, 3.Fracture 4. Poor working posture 5.Wood dust	1.Muscular strain 2.Dermatitis 3. Dehydration 4. Respiratory infection	None	None	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training, PPE etc.	3x1=3	1
5.10	Concrete Pouring	1.HCS, 2. Physical exertion 3.Repetitive motion, 4.Hot climatic conditions etc.	1.Dermatitis 2.Muscular strain 3.Heat Exhaustion etc.	1.Discarding of unused cement- contamination of natural resources	None	2x2=4	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training, PPE etc.	1x1=1	1
TOTAL VALUE OF ACTIVITY								56	

CONSTRUCTION OF NEW BUILDINGS										
MAIN ACTIVITY	REF NO	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
	6									
	6.1	Setting out foundations	1.Manual Handling 2.Dust 3.Flying particles 4. Sharp objects 5.tripping 6.Hazardous chemical substances etc.	1.Dust inhalation 2. Eye injuries 3.Fractures 4.Burns 5.Respiratory irritation 6.Dermatitis etc.	1.Contamination of natural resources – Hazardous chemical substance etc.	None	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work, Medical Fitness Certificates, continuous housekeeping signage and barricading, training, PPE etc.	1x1=1	1
	6.2	Excavation for Surface Trenches(manually)	1.Physical exertion 2.Sharp edges 3.Dust 4.Abrasive Materials 5.Hot climatic Conditions 6.Bump against Etc.	1.Muscular strain 2.Cuts, lacerations 3. Dust inhalation 4.Abrasions 5.Heat exhaustion 6. Bruising etc.	None	None	4x3=12	HIRA, Competent Management, Competent Supervision, safe systems of work, Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training, PPE etc.	3x3=9	2

6.3	Excavation of Surface Trenches (mechanical)	1.Noise 2.Dust 3. Heated surfaces 4.HCS 5.Moving Machinery etc.	1.Noise induced hearing Loss 2.Dust inhalation 3.Burns 4.Dermatitis 5.Fractures , death etc.	1.Contamination of resources – fuel and oil spillage etc.	Noise exposure, dust inhalation	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records, Competent Operators Medical Fitness Certificates, continuous housekeeping signage and solid barricading, training. PPE etc.	3x3=9	2
6.4	Soil poisoning	1.HCS 2.Hot climatic conditions etc	1.HCS ingestion, inhalation and absorption 2. Heat exhaustion etc.	contamination of natural resources due to HCS Spillage	None	3x5=15	HIRA, Competent Management, Competent Supervision, safe systems of work, MSDS. Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping, signage, barricading, training. PPE etc.	3x3=9	2

6.5	Steel Reinforcement	1.Physical exertion 2. Cuts, 3.Fracture 4. Poor working posture	1.Muscular strain 2.Dermatitis 3. Dehydration	None	None	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	2x1=2	1
6.6	Formwork	1.Physical exertion 2. Cuts, 3.Fracture 4. Poor working posture 5.Wood dust	1.Muscular strain 2.Dermatitis 3. Dehydration 4. Respiratory infection	None	None	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	3x1=3	1
6.7	Concrete Pouring	1.HCS, 2. Physical exertion 3.Repetitive motion, 4.Hot climatic conditions etc.	1.Dermatitis 2.Muscular strain 3.Heat Exhaustion etc.	1.Discarding of unused cement-contamination of natural resources	None	2x2=4	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	1x1=1	1

6.8	Foundation Brick Work	1.Abrasive surfaces 2.Poor working posture 3.Hot climatic conditions 4.Cement Dust 4.HCS etc.	1. Abrasions 2.Muscular strain 3.Heat exhaustion 4.Dermatitis 5. Lung Infection etc.	1.Discarding of unused cement- contamination of natural resources	None	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	2x2=4	1
6.9	Backfilling and levelling	1.Noise dust, 2.Hot climatic conditions 4.Heated surface 5.Vibration 6.Moving equipment and machinery	1.Noise induced hearing loss 2.Heat exhaustion 3.Dermatitis 4. Burns 5.Work related upper limb disorder 6.Fractures, death, ,dust inhalation ,burns, etc.	None	Struck by falling material, tripping etc.	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	2x2=4	1

6.10	Compaction (Mechanical)	1.Noise, 2.Dust 3.Vibration 4.Heated surfaces, 5.High impact Moving Components HCS etc.	1.Noise induced hearing loss, 2.Dust Inhalation 3.White finger syndrome 4.Burns 5. Fractures etc.	1.Spillage of oil/diesel- contamination of natural resources	1.Noise exposure etc.	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	3x3=9	2
6.11	Cement mixing	1.Abrasive surfaces 2.Poor working posture 3.Hot climatic conditions 4.Cement Dust 4.HCS etc.	1. Abrasions 2.Muscular strain 3.Heat exhaustion 4.Dermatitis 5. Lung Infection etc.	1.Discarding of unused cement- contamination of natural resources	None	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc	3x3=9	2

6.11	Erect scaffold for brick work	1.Manual handling injuries 2.Fall from heights 3.Collapse of unstable scaffolding 4.Incompetent scaffold erectors/supervisors/inspectors	1.Heat exhaustion	None	None	4x5=20	1.All scaffolding to be erected as per SANS 10085 2.Required PPE to be used 3.Fall arrest equipment to be used for height work 4.Design plan to be provided for all scaffolding erection 5.Required scaffold forms to be provided for all scaffolding 6.Correct category of scaffold to be erected for brickworks 7.Required appointments to be in file 8.All works to be supervised	3x3=9	1
6.13	Brickwork Brick work for super structure	1.HCS, posture 2. Poor working 3.Abrasive surfaces 4.Hot climatic Conditions 5. Noise, 6.Dust 7. Physical exertion 9.Sharp edges etc	1.Dermatitis 2.,Muscular strain 3.Abrasions 4.Heat exhaustion etc.	None	None	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping, signage, barricading, training. PPE etc.	3x3=9	2

6.14	Fitting of doors / windows into frames /openings	1.Struck by Items 2.Hands Caught in between areas 3.falling objects 4.sharp edges 4. Noise, Dust, etc	1.Dermatitis 2.,Muscular strain 3.Abrasions 4.Heat exhaustion etc.	None	None	None	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping, signage, barricading, training. PPE etc.	3x3=9	2
6.15	Installation of steel roof Trusses	1.Falls, 2.Struck by, hands caught between 3.Physical injuries from falling from roof 4.Cuts 5.Laceration 6. Slips, trips 7. Manual handling 8. Noise 9.Dust etc.	1.Muscular strain, 2.Fracture 3.Cuts	None	None	None	3x4=12	HIRA, Competent Management, Competent Supervision, safe systems of work, competent operators, Cable Detection Equipment usage, Medical Fitness Certificates, signage and barricading, training. PPE etc.	3x3=9	1

6.16	Water proofing	1.Physical exertion 2. Cuts, 3.Fracture 4. Poor working posture	1.Muscular strain, 2.Fracture 3.Cuts	None	1.Struck by falling items	3x4=12	HIRA, Competent Management, Competent Supervision, safe systems of work, Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training, PPE etc.	2x1=2	1
6.17	Fitting of roof sheets (Metal Roof Sheeting)	1.Falls, 2.Struck by, hands caught between 3.Physical injuries from falling from roof 4.Cuts 5.Laceration 6. Slips, trips 7. Manual handling 8. Noise 9.Dust etc.	1.Muscular strain, 2.Fracture 3.Cuts	None	None	3x4=12	HIRA, Competent Management, Competent Supervision, safe systems of work, competent operators, Cable Detection Equipment usage, Medical Fitness Certificates, signage and barricading, training, PPE etc.	3x3=9	1
6.18	Plastering	Dermatitis from being exposed to cement; physical injuries from falling off the work platform; etc.	Respiratory condition due to Dust inhalation; Sprains & strains caused during the material handling; etc.	1.Littering due to poor housekeeping	None	4x5=20	Safe systems of work, training , PPE, Good Housekeeping Practises, Supervision; etc.	3x3=9	2

6.19	Painting	1.Poor working posture. 2.Repetitive motion, 3.Hazardous chemical substances etc.	1.Dermatitis 2.Muscular strain etc.	1.Contamination of natural resource, 2.Spillage and Disposal	None	1x2=2	HIRA, Training, Supervision, PPE etc.	1x2=2	1
6.20 <div>Concrete slabs upper floors</div>	Erection of scaffolding structure for temporary works	1. Falls from height, dropping of items 2. Sharp edges, 3.Scaffolding collapse, struck by falling items etc.	1. Back strain, bruising, 3. cuts, 4.abrasions, 5.Fractures, death	none	1.Struck by falling items	3x3=9	Safe system of work, use of fall arrest equip, erection of safe scaffolding, Supervision, etc.	1x1=1	1
	Steel Reinforcement	1.Physical exertion 2. Cuts, 3.Fracture 4. Poor working posture	1.Muscular strain 2.Dermatitis 3. Dehydration	None	None	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work, Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training, PPE etc.	2x1=2	1
	Water proofing	1.Physical exertion 2. Cuts, 3.Fracture 4. Poor working posture	1.Muscular strain, 2.Fracture 3.Cuts	None	1.Struck by falling items	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work, Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training, PPE etc.	2x1=2	1

6.21	Concrete Pouring	1.HCS, 2. Physical exertion 3.Repetitive motion, 4.Hot climatic conditions etc.	1.Dermatitis 2.Muscular strain 3.Heat Exhaustion etc.	1.Discarding of unused cement-contamination of natural resources	None	2x2=4	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	1x1=1	1
6.22	Install of fascia/ barge boards/ gutters	1.Fall from heights 2.Manual handling injuries 3.Use hand tools injuries	1.Ergonomical injuries 2.Heat exhaustion	None	None	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	3x3=9	2

6.23	Fitting of gutters, down pipes; etc.	1.Fall from heights 2.Manual handling injuries 3.Use hand tools injuries	1.Ergonomical injuries 2.Heat exhaustion	None	None	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	3x3=9	2
TOTAL VALUE OF ACTIVITY						313			
ELECTRICAL INSTALLATION External cabling and Internal									
REF NO 7	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number

7.1	Barricading / fencing site off	1.Manual Handling 2.Struck by 3.Sharp edges 4.Physical exertion 5.Tripping Hazards 6. Hidden services , etc.	1. Muscular strain 2.Brusing, fractures 3.Cuts, abrasion 4.Dehydration 5.Fractures, grazing death 6. Electrocution, etc.	None	1.Tripping, cuts etc.	3x4=12	HIRA, Competent Management, Competent Supervision, safe systems of work, competent operators, Cable Detection Equipment usage, Medical Fitness Certificates, signage and barricading, training, PPE etc.	1x2=2	2
7.2	Excavation (manual)	1.Physical exertion 2.Sharp edges 3.Dust 4.Abrasive Materials 5.Hot climatic Conditions 6.Bump against Etc.	1.Muscular strain 2.Cuts, lacerations 3. Dust inhalation 4.Abrasions 5.Heat exhaustion 6. Bruising etc.	None	None	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work, Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training, PPE etc.	2x2=4	1

7.3	Laying of underground Cable	1.Poor working posture, 2.Dust 3.Restricted working space 4.Abrasive surfaces 5.Sharp edges etc.	1.Muscular strain 2.Dust Inhalation 3.Brusing 4. Grazing 5. Cuts etc.	None	None	2x3=6	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	1x2=2	1
7.4	Grinding	1. Flying particles 2.Electricity 3.Vibration 4.Noise 5. Dust 6.High speed rotating components etc.	1. Eye injuries 2.Electrocution 3. White finger Syndrome 4.Noise induced hearing loss 5. Dust inhalation 6.Cuts etc.	None	1.Noise 2.Eye injuries 3.Dust etc.	3x4=12	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, screening, training. PPE etc.	2x2=4	1

7.5	Chasing on walls	1.Repetitive motion 2.Sharp edges 3.Struck by 4.Noise, 5. Flying particles etc.	1.Muscular strain 2.Fractures 3.Noise induced hearing loss etc.	None	None	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	1x1=1	1
7.6	Installation of DB board	1. Noise 2. Dust 3. Electricity 4. Bumping against 5. Struck by flying items 6. Entanglement 7. Moving parts etc.	1.Muscular strain 2.Fractures 3.Noise induced hearing loss etc.	None	None	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	3x3=9	2
7.7	Wiring	1.Abrasive surfaces 2.Poor working posture	1. Abrasions 2.Muscular strain	None	None	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	2x1=2	2

7.8	Fitting of fixtures	1.Abrasive surfaces 2.Poor working posture	1. Abrasions 2.Muscular strain	None	None	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	2x1=2	2
PLUMBING									
REF NO	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
8									

8.1	Excavation (manual)	1.Physical exertion 2.Sharp edges 3.Dust 4.Abrasive Materials 5.Hot climatic Conditions 6 Bump against Etc.	1.Muscular strain 2.Cuts, lacerations 3. Dust inhalation 4.Abrasions 5.Heat exhaustion 6. Bruising etc.	None	None	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work, Tools and equipment inspections, Competent Operators Medical Fitness Certificates, continuous housekeeping signage, barricading, training, PPE etc.	2x2=4	1
8.2	Chiselling and chasing	1.Repetitive motion 2.Sharp edges 3.Struck by 4.Noise, 5. Flying particles etc.	1.Muscular strain 2.Fractures 3.Noise induced hearing loss etc.	None	None	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training, PPE etc.	1x1=1	2

8.3	Laying of underground sewer line and Water lines	1.Poor working posture, 2.Dust 3.Restricted working space 4.Abrasive surfaces 5.Sharp edges etc.	1.Muscular strain 2.Dust Inhalation 3.Bruzing 4. Grazing 5. Cuts etc.	None	None	2x3=6	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training, PPE etc.	1x2=2	1
8.4	Backfilling and levelling	1.Noise dust, 2.Hot climatic conditions 4.Heated surface 5.Vibration 6.Moving equipment and machinery	1.Noise induced hearing loss 2.Heat exhaustion 3.Dermatitis 4. Burns 5.Work related upper limb disorder 6.Fractures, death, ,dust inhalation ,burns, etc.	None	Struck by falling material, tripping etc.	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training, PPE etc.	2x2=4	1

8.5	Placement manhole covers	1. Falls from height 2. Falling objects 3. Sharp edges, 4. Scaffolding collapse, 5. Struck by falling items etc.	1. Back strain, 2. Bruising, 3. Cuts, 4. Abrasions, 5. Fractures, death 6. Skin irritation etc.	None	None	4x5=20	HIRA, Competent Management, Competent Supervision, safe systems of work, maintenance records, Competent Operators Medical Fitness Certificates, continuous housekeeping signage and solid barricading, training. PPE etc.	3x3=9	2
8.6	Sanitary Fittings	1. Abrasive surfaces 2. Poor working posture	1. Abrasions 2. Muscular strain	None	None	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	2x1=2	2
8.8	Testing & Commissioning	Cuts & abrasion; trips & falls; Electric shock; Electrocuting; etc.	Back strain; dust inhalation; Electrocuting; etc.	None	None	4x5=20	Medical Fitness Certificates, Competent Management, Competent Supervision, safe systems of work. Training, PPE,	3x3=9	2

BULIDING FINISHES (Internal)										
REF NO	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number	
9										
9.1	Fitting and securing Ceiling sheets and Cornices	1.Falls 2.hazardous dust 3.sharp edges 4. Poor Work posture	1.Muscular strain, 2.Fracture 3.Cuts	None	None	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work, Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	1x1=1	2	
9.2	Ceiling Skimming	1.Falls 2.hazardous dust 3.sharp edges 4. Poor Work posture	1.Muscular strain, 2.Fracture	Contamination of natural resources due to wrong disposal of waste	None	4x3=12	HIRA, Competent Management, Competent Supervision, safe systems of work, Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, barricading, training. PPE etc.	1x2=2	2	

9.3	Painting	1.Repetitive Motion 2.HCS 3. High environmental temperatures	1.Muscular Strain 2. Dermatitis 3. Heat exhaustion	Contamination of natural resources due to wrong disposal of waste	None	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training, PPE etc.	1x1=1	2
9.4	Vinyl Floor	1.Hazardous Substance 2.Flammable Substance 3.Poor Working posture 4.Fumes, etc	1.Muscular Strain 2. Dermatitis 3. Heat exhaustion 4. Lung infection	Contamination of natural resources	None	4x3=12	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training, PPE etc.	2x2=4	1
9.5	Tiling	1.Repetitive Motion 2.HCS 3. High environmental temperatures	1.Muscular Strain 2. Dermatitis 3. Heat exhaustion	None	None	3x3=9	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates,	1x1=1	

									continuous housekeeping signage, training, PPE etc.			
9.6	Carpentry & Joinery (incl. joinery fittings)	1.Struck by Items 2.Hands Caught in between areas 3.falling objects 4.sharp edges 4. Noise, Dust, etc	1.Muscular Strain 2. Dermatitis 3. Heat exhaustion 4. Lung infection	None	None			None	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training, PPE etc.	1x1=1	1	
9.7	Ironmongery	1.Struck by Items 2.Hands Caught in between areas 3.falling objects 4.sharp edges 4. Noise, Dust, etc	1.Muscular Strain 2. Heat exhaustion	None	None			None	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training, PPE etc.	1x1=1	1	
9.9	Glazing	1.Glass particles 2.Sharp Objects 3.falling items	1.Eye infection 2.Cuts 3.Severe injuries 4.Abrasion	None	None			None	HIRA, Competent Management, Competent	3x1=3	1	

			4.hands caught in between							Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.			
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GENERAL SITE ACTIVITIES										
REF NO	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number	
10										
10.1	Sweeping	1.Repetitive motion 2.Dust, 3. Excessive environmental temperatures etc.	1.Muscular strain, 2.Dust inhalation 3.Heat exhaustion etc.	None	None	2x2=4	Hira, Training, PPE e.g. respiratory protection , etc.	2x2=4	5	
10.2	Lifting and Lowering	1.Heavy loads difficult to grasp items 2.Incorrect lifting methods, caught between etc.	1.Muscular strain, 2.lower back injuries , etc.	None except if item is dropped and poses an environmental risk due to its chemical properties	None	1x2=2	HIRA , Training , etc.	1x1=1	2	
10.3	Painting	1.Poor working posture 2.Repetitive motion 3.Hazardous chemical substances etc.	1.Dermatitis 2.Muscular strain etc.	Contamination of natural resource, spillage and disposal	None	1x2=2	HIRA, Training, Supervision, PPE etc.	1x2=2	2	
10.4	Ladder work	1. Elevated position, 2.Incorrect positioning, 3.Poor location slippery surfaces etc.	1.Fractures 2.Death etc.	None	Minor bruising etc.	1x4=4	HIRA, Training, Supervision, PPE etc.	2x2=4	1	
10.5	Use of Portable Electrical equipment	1.Electricity, 2.Faulty equipment, 3.High speed rotating equipment, 4.Tripping 5. Vibration, 6. Noise etc.	1.Electro-caution 2.Cuts, 3.Abrasions 4.Noise induced hearing loss etc.	None	Noise exposure, fractures, bruising	1x4=4	HIRA, Training, Supervision, PPE etc.	2x1=2	1	

10.6	Driving vehicles on site	1.Collisions 2.Flammable substances etc.	1.Fractures 2.Death, etc.	Contamination of resource due to fuel and oil leakage etc.	Fractures, death, etc.	3x4=12	HIRA, Training, Supervision, PPE etc.	2x2=4	1
10.7.	Extension cords	1.Electricity 2.Tripping hazards	1.Electrocution , 2.Fractures etc	none	None	1x2=2	HIRA, Training, Supervision, PPE etc.	1x1=1	1
10.8.	Hand tools	1.Tripping 2.Struck by items 3.Bumping against, 4.Abrasions 5.Sharp edges 6.Caught between surfaces 7. Flying metal particles etc	1.Cuts 2.Bruising 3.Foreign material in eyes etc.	none	None	1x4=4	HIRA, Training, Supervision, PPE etc.	2x1=2	1
10.9	Scaffolding erection, dismantling	1.Falls from height, 2.Dropping of items, 3.Sharp edges, 4.Scaffolding collapse, etc	1.Back strain, 2.Bruising 3.Cuts 4.Abrasions 5. Broken bones, 6.death etc.	none	None	3x4=12	HIRA, Training, Supervision, PPE etc.	2x2=4	1

8. Project / Site Specific Requirements

The following is a list of specific activities and considerations that have been identified for the project and site and for which Risk Assessments, Standard Working Procedures (SWP), management and control measures and Method Statements (where necessary) have to be developed by the Principal Contractor:

1. Clearing & Grubbing of the Area/Site
2. Site Establishment including:
 - ✓ Office/s
 - ✓ Secure/Safe Storage and storage areas for materials, plant & equipment
 - ✓ Ablution facilities
 - ✓ Sheltered dining area & Change rooms
 - ✓ Vehicle access to the site & parking
3. Dealing with existing Structures.
4. Working on heights
5. Location of existing Services
6. Installation & Maintenance of Temporary Construction Electrical Supply, Lighting and Equipment
7. Adjacent Land uses/Surrounding property exposures
8. Boundary & Access control/Public Liability Exposures (Remember: the Employer is also responsible for the OH&S of non-employees affected by his/her work activities.)
9. Health risks arising from neighbouring as well as own activities and from the environment e.g. threats by dogs, bees, snakes, lightning, allergies etc.
10. Exposure to Noise
11. Exposure to Vibration
12. Protection against dehydration and heat exhaustion
13. Protection from wet & cold conditions
14. Use of Portable Electrical Equipment including:
 - ✓ Angle grinder
 - ✓ Electrical Drilling machine
 - ✓ Skill saw
15. Manual and Mechanical Handling
16. Welding including:
 - ✓ Gas welding
 - ✓ Flame Cutting
 - ✓ Arc Welding
 - ✓ Use of LP Gas torches and appliances
17. Loading & Offloading of Trucks
18. Aggregate/Sand and other Materials Delivery
19. Lifting and Lowering Operations
20. Driving & Operation of Construction Vehicles and Mobile Plant.
21. Use and Storage of Flammable Liquids and other Hazardous Substances
22. As discovered by the Principal Contractor's hazard identification exercise
23. As discovered from any inspections and audits conducted by the Client and/or its Agent on its behalf or by the Principal Contractor or any other Contractor on site
24. As discovered from any accident/incident investigation.



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 7

Health and Safety Bill of Quantities

HEALTH AND SAFETY IMPLEMENTATION COSTING

Contractor to give a breakdown of his Health and Safety costs on this sheet.

ITEM	DESCRIPTION	UNIT	QUAN- TITY	MONTHS (Indicative)	RATE	AMOUNT
			(a)		(b)	(a) x (b)
1	MEDICALS					
1.1	Pre-employment medical	Nr.	-			
1.2	Re-medicals - yearly	Nr.	-			
	TOTAL					
2	PERSONAL PROTECTIVE EQUIPMENT					
2.1	Overalls	Nr.				
2.2	Hard Hats	Nr.				
2.3	Safety boots/shoes	Nr.				
2.4	Gloves	Nr.				
2.5	Gumboots steel toe cap	Nr.				
2.6	Safety glasses	Nr.				
2.7	Reflector Bibs	Nr.				
2.8	Barricading Material	M				
2.9	Dust masks	Box 20				
	TOTAL					
3	FIRE FIGHTING					
3.1	Fire extinguishers - 4.5Kg	Nr.				
3.2	Surveys - Annual Service	Nr.				
	TOTAL					
4	HEALTH AND SAFETY PERSONNEL					
4.1	Safety Manager	Nr.				
4.2	Safety Officer	Nr.				
4.3	Construction Phase Safety, Health, Environmental and Waste Management Plan	Nr.				
	TOTAL					
5	FACILITIES					
5.1	Provision of ablution facilities	Nr.				
5.2	Service and maintenance of ablution facilities	Nr.				
5.3	Provision of eating areas	Nr.				
5.4	Cleaning of Lay down and other storage areas	Nr.				
5.5	Wash hand basin	Nr.				
5.6	Hot and Cold running water	Nr.				
5.7	Degreasing & Toilet soap	Nr.				
	TOTAL					

6	FALL PREVENTION / PROTECTION					
6.1	Safety harnesses with double lanyards	Nr.				
6.2	Safety harnesses with Scaffold hooks	Nr.				
6.3	Lifelines and vertical fall arrest systems	Nr.				
6.4	Scaffolding – material, erection and inspection (Estimate for project)	Nr.				
6.5	Temporary hand railing material and kick flats	Nr.				
6.6	Chin Straps	Nr.				
	TOTAL					
7	FIRST AID					
7.1	Replenishment of boxes and other supplies	Nr				
	TOTAL					
8	TRAINING					
8.1	SHE Representative	Nr.				
8.2	First Aid Level 1	Nr.				
8.3	Fire Fighting	Nr.				
	TOTAL					
9	SIGNAGE					
9.1	All Signage as required by Law, regulatory, warning and information	Nr.				
9.2	Posters for awareness	Nr.				
	TOTAL					
10	ELECTRICAL					
10.1	Replacement of Locks required for lockouts	Nr.				
10.2	Replacement of tags	Nr.				
10.3	Replacement for Permit books	Nr.				
10.4	Replacement of Callipers	Nr.				
	TOTAL					
11	OTHERS (Project Specific)					
11.1		Nr.				
	TOTAL					
GRAND TOTAL TO BE CARRIED TO THE PRELIMINARIES AND GENERAL IN BILL OF QUANTITIES						



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 8

Builder Lien Agreement

WAIVER OF CONTRACTOR'S LIEN

DEFINITIONS

Contractor: _____

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

Agreement: GCC FOR CONSTRUCTION WORKS - SECOND EDITION 2010

Works (description):

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

Site:

KwaZulu Natal: King Cetshwayo District Municipality: uMhlathuze Local Municipality: Ward 28: Ngwelezane

AGREEMENT

The Contractor waives, in favour of the Employer, any lien or right of retention that is or may be held in respect of the Works to be executed on the Site

Thus done and signed at _____ on _____
[Date]

Name of signatory

Capacity of signatory

As witness

For and on behalf of the contractor who by signature hereof warrants authorisation hereto



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
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Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 9

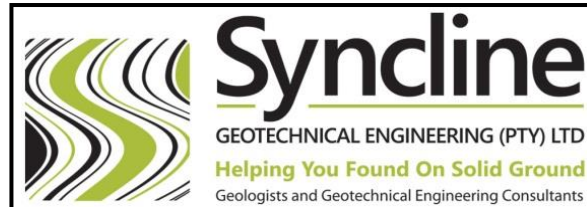
Geotechnical Investigation Report



public works

Department:
Public Works

PROVINCE OF KWAZULU-NATAL



**REPORT TO UKUZA CONSULTING (PTY) LTD ON THE RESULTS
OF A GEOTECHNICAL INVESTIGATION FOR THE PROPOSED
CONSTRUCTION OF A NEW ORTHOTICS AND PROSTHETICS
CENTRE AT NGWELEZANE HOSPITAL (OPTION 4),
UMHLATHUZE LOCAL MUNICIPALITY**

REPORT REFERENCE: SGE-003-2021.REP01

Prepared For:



Author: Y. Hansa (Pr.Sci.Nat.) 400269/16 (South African Council for Natural Scientific Professions)

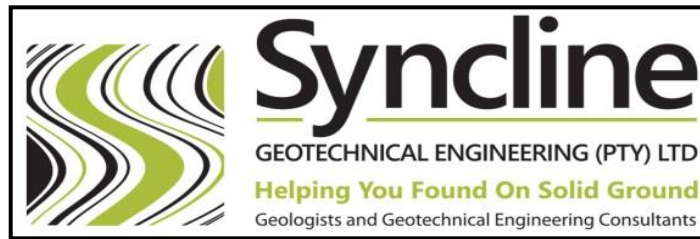
Reviewed: S. Pather (Pr.Sci.Nat.) 400020/08 (South African Council for Natural Scientific Professions)

Date: 25 February 2021

Syncline Geotechnical Engineering (Pty) Ltd

Company Registration No. 2012/181469/07

Director: S. Pather Pr.Sci.Nat. (SACNASP), BSc (Hons), MSAIEG, FGSSA, MAEG, NHBRC Registered



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Director E-Mail:	sundras@syncline.co.za
Website:	www.synclinegeo.co.za

EXPERTISE OF SPECIALIST TO CARRY OUT THE GEOTECHNICAL ASSESSMENT

Specialist:	Geotechnical Engineering/Engineering Geology		
Contact Person:	Mr Sundras Pather		
Role in Project:	Geotechnical Consultant		
Physical Address:	197 Peter Mokaba Road, Morningside, Durban		
Postal Address:	197 Peter Mokaba Road, Morningside, Durban		
Postal Code:	4001	Cell:	084-500 5095
Telephone:	031-207 1383	Fax:	031-207 1349
E-mail:	sundras@syncline.co.za		
Expertise to Conduct a Geotechnical Assessment	Professional Natural Scientist (Pr.Sci.Nat.) MSIEG, FGSSA, MAEG, NHBRC		
Professional Registration No:	400020/08 – SACNASP South African Council for Natural Scientific Professions		

REPORT TO UKUZA CONSULTING (PTY) LTD ON THE RESULTS OF A GEOTECHNICAL INVESTIGATION FOR THE PROPOSED CONSTRUCTION OF A NEW ORTHOTICS AND PROSTHETICS CENTRE AT NGWELEZANE HOSPITAL (OPTION 4), UMHLATHUZE LOCAL MUNICIPALITY

REPORT REFERENCE: SGE-003-2021.REP01

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Figure 1: Site Plan

REPORT TO UKUZA CONSULTING (PTY) LTD ON THE RESULTS OF A GEOTECHNICAL INVESTIGATION FOR THE PROPOSED CONSTRUCTION OF A NEW ORTHOTICS AND PROSTHETICS CENTRE AT NGWELEZANE HOSPITAL (OPTION 4), UMHLATHUZE LOCAL MUNICIPALITY

1. TERMS OF REFERENCE

Syncline Geotechnical Engineering (Pty) Ltd (hereafter referred to as SGE) was invited Mr Nathan O' Niel Sissel of Ukuza Consulting (Pty) Ltd on 13 October 2020 to tender for a geotechnical investigation for the **“PROPOSED CONSTRUCTION OF A NEW ORTHOTICS AND PROSTHETICS CENTRE AT NGWELEZANE HOSPITAL (OPTION 4), UMHLATHUZE LOCAL MUNICIPALITY”**.

SGE provided a quotation in an electronic message referenced *“Proposal 243-2020”*, and was subsequently formally appointed by Ukuza on 26 October 2020 to carry out the investigation.

2. SCOPE OF REPORT

This report details the results of a Geotechnical Investigation for the **“PROPOSED CONSTRUCTION OF A NEW ORTHOTICS AND PROSTHETICS CENTRE AT NGWELEZANE HOSPITAL (OPTION 4), UMHLATHUZE LOCAL MUNICIPALITY”**.

The subsoil conditions beneath the site are described and comment is made on slope stability, earthworks, foundations, subgrade treatment, stormwater disposal etc. in accordance with Umhlathuze Local Municipality, South African National Standards (SANS 10400) and the National Home Builders Registration Council (NHBC) requirements.

3. INFORMATION UTILISED

For the purposes of assisting with this investigation Ukuza provided SGE with a Site Plan and Ground Storey Plan of the proposed development for Option 4. SGE also made reference to the 250 000 Geological Map titled *“2830 Richards Bay”* as published by the Geological Survey.

4. LIMITATIONS

The nature of Geotechnical Engineering is such that variations in soil conditions may occur even where sites seem to be consistent. Variations in what is reported here may become evident during construction and it is thus imperative that a Competent Person inspects all excavations to ensure that conditions at variance with those predicted do not occur and to undertake an interpretation of the facts supplied in this report.

5. FIELDWORK

The fieldwork for the investigation was carried out on 19 January 2021 and comprised the following:

- Inspection Pits;
- CBR Dynamic Cone Penetrometer (DCP) tests;
- Percolation test; and
- Soil sampling (for laboratory testing).

5.1 Inspection Pits

Five (5No.) inspection pits, designated IP1 through IP5, were conducted by hand tools at the approximate positions indicated in Figure 1. The inspection pits were extended to an average refusal depth of 1.5 metres below existing ground level (EGL) and profiled using the “Guidelines for Soil and Rock Logging in South Africa”, (2001)¹.

Copies of the detailed inspection pit log profiles are given in Appendix A.

5.2 Dynamic Cone Penetrometer (DCP) Tests

Eight (8No.) Dynamic Cone Penetrometer (DCP) tests, designated DCP1 through DCP8, were conducted at the approximate positions indicated in Figure 1. The DCP tests were extended to refusal depths in the range 1.5 to 3.8 metres below EGL.

The results of the DCP tests comprising plots of blow counts versus depth are given in Appendix B.

5.3 Percolation Test

A single percolation test, designated PT1, was conducted on site to determine the permeability of the subsoils for stormwater disposal. The test comprised the excavation of a hole to a depth of 1.0 metre below EGL, pre-soaking of the lower 0.3 metres of the hole and thereafter recording the average fall in the level of water over a period of 35 minutes.

The results of the percolation test are given in Appendix C and discussed in Section 8.11 of this report.

5.4 Soil Sampling

Disturbed soil samples were retrieved from the inspection pits and sent to SOILCO (PTY) LTD laboratory for the following tests:

¹ AEG, SAICE and SAIEG. “Guidelines for Soil and Rock Logging in South Africa”. Editors, A. B. A. Brink and R. M. H. Bruin; Proceedings, Geoterminology Workshop, Johannesburg 2001.

- Particle Size Distribution/Grading;
- Atterberg Limits;
- Hydrometer Analysis (Foundation Indicator);
- Modified AASHTO; and
- California Bearing Ratio (CBR) tests.

The laboratory tests results are given in Appendix D of this report.

6. SITE DESCRIPTION

The study area is located at Ngwelezane Hospital near Empangeni in northern KwaZulu-Natal, at latitude S28° 46' 37" and longitude E31° 52' 02".

The site (approximately 3000m² in extent) is located at the northern end of the hospital premises and characterised by an existing open plot of land situated above road level, and containing a concrete block building, parkhome building structures and containers. Topographically the landform slopes gently to moderately to the east/southeast.

The layout of the site is indicated in Figure 1.

Plates 1 and 2 below show general views of the study area.



Plate 1



Plate 2

Plates 1 and 2: General views of the study area

7. LABORATORY TESTS RESULTS

The laboratory tests results are given in Appendix D and summarised in Table 1 below.

Table 1: Summary of laboratory tests results

IP No.	Depth (m)	Description	Particle Size %				*Atterberg Limits %			GM	OMC (%)	MDD (kg/m ³)	Natural Moisture Content %	% Swell	CBR (%)					HRB & TRH14 Classification	Potential Expansiveness	
			Clay	Silt	Sand	Gravel	LL	PI	LS						90	93	95	97	98			100
COLLUVIUM																						
IP2	0.2 – 0.8	Dark brown, moderately clayey, silty SAND	22	18	51	9	31	15	7.0	0.87	17.1	1736	18.5	0.2	4.3	7.2	10.2	14.5	17.3	24.6	A-6(3) SC G9	Medium
RESIDUAL GRANITE																						
IP3	0.6 – 1.5	Dark red/reddish brown, gravelly, moderately clayey silty SAND to SANDY SILTY CLAY	28	15	29	28	41	16	8.0	1.25	22.1	1647	22.0	0.1	4.8	8.2	11.8	17.0	20.4	29.3	A-7-6(4) SC G9	Low

LL - Liquid Limit
PI - Plasticity Index
NP - Non Plastic
MDD - Maximum Dry Density

OMC - Optimum Moisture Content
LS - Linear Shrinkage
CBD - Could Not Be Determined
SC - Unified Soil Classification

A-7-6 - Highway Research Board (HRB) Classification
GM - Grading Modulus
Low - Potential Expansiveness according to van der Merwe (1964)
G9 - TRH14 (1985) Classification

8. DISCUSSION

8.1 Proposed Development

Foundation loads for the proposed building structure were not available at the time of preparation of this report, however it is anticipated that the building will be single storey in extent, and net allowable bearing pressure not more than 120kPa.

8.2 Geology and Subsoils

The study area is underlain by sandy fill and colluvial soils, clayey sand/sandy silty clay residual soils, and granite bedrock of the Hlobane Complex at depth. In general, the following subsoil horizons were encountered:

- Slightly moist to moist, dark grey to greyish brown, loose to medium dense, slightly to moderately clayey, fine grained, silty SAND (containing builders rubble) – **FILL**.
- Slightly moist to moist, dark brown, loose to medium dense, moderately clayey, fine grained, silty SAND – **COLLUVIUM**.
- Slightly moist to moist, dark red to reddish brown, medium dense to dense/firm to stiff, moderately clayey, gravelly, fine grained, silty SAND to SANDY SILTY CLAY – **RESIDUAL GRANITE**.

Granite bedrock was not encountered during the field investigation and occurs at a depth in excess of 3.0 metres below EGL (inferred from DCP tests results).

Plates 3 and 4 below provide an indication of the typical subsoils encountered in the study area.



Plate 3 (IP2)



Plate 4 (IP3)

Plates 3 and 4: Typical subsoils encountered in the study area

8.3 Groundwater Occurrence

Groundwater seepage was not encountered during the course of the field investigation and it is anticipated that the permanent groundwater table occurs at a depth in excess of 10.0 metres below EGL.

8.4 Stability of the Study Area

It is considered that the site is stable and suitable for development provided that the recommendations given in this report are adhered to.

No signs of inherent ground instability such as slip scars, tension cracks or sloughing of the sandy fill/colluvial soils were evident during the fieldwork. It is, however, important to consider the following prior to earthworks and construction:

- The sandy fill/colluvial soils occurring on the site are considered susceptible to erosion by stormwater and it is important that adequate surface drainage be catered for. The need for subsoil drains will depend on the proposed development and will have to be assessed on site during the construction phase.
- Earth flows triggered by saturation of the sandy soils can cause liquefaction of these sands, resulting in downslope earthflows.
- The stability of the site will be altered by earthworks operations. It is important therefore to ensure that the design of the development promotes stable development.
- It should be noted that while no problematic areas were identified in the inspection pits put down during the fieldwork phase, it is possible that localised, potentially unstable areas can become exposed during development, i.e. during earthworks.
- It is important to allow for onsite inspections and evaluations by an experienced Engineering Geologist/Geotechnical Engineer so that stability problems can be timeously identified and remedied.

8.5 Earthworks

All earthworks should be carried out in a manner to promote stable development of the site. It is recommended that earthworks be carried out along the guidelines given in SANS 1200 (current version).

Where natural ground slopes are steeper than 1 vertical to 6 horizontal (6 degrees), the fill must be benched into the slope. Benches should be 0.5m deep and 2.0m wide.

Placement of fill layers should be undertaken in layers not exceeding 200mm thick when placed loose and compacted using suitable compaction plant to achieve 90% to 93% Modified AASHTO maximum dry density.

Terraces should be graded to direct water away from the fill edges, and small earth bunds should be constructed along the crests of fills, to prevent overtopping and erosion of fill embankment slopes. These bunds should be a minimum 450mm wide and 300mm high.

Density control of placed fill material should be undertaken at regular intervals during fill construction.

Boulders larger than 200mm diameter or $\frac{1}{3}$ of the layer thickness when loose should be removed from the fill material as these could complicate the compaction works, and also cause piping within fills. Furthermore, large boulders in fills could cause later problems during construction of foundations.

Cut slopes in soils should be formed to batters of 1 vertical to 1.5 horizontal (34 degrees) and to a height not greater than 1.5m where retaining walls are not provided.

Engineered fill slopes should be formed to batters of 1 vertical to 1.5 horizontal provided that the edge of fills are over constructed and thereafter trimmed back to the required position.

Inspection of cuts by a competent Engineering Geologist or Geotechnical Engineer may indicate that the angle of cut batter slopes need to be varied locally to promote stability of the site.

8.6 Rippability and Excavatibility

It is considered that the subsoils from 0.0 to 3.0 metres depth will be easily excavatable. These materials classify as SOFT in terms of SANS 1200DA criteria which can easily be removed by hand tools or a tractor loader backhoe (TLB) of flywheel power approximately 0.10kW per millimetre of tined bucket width.

It is anticipated that excavations from 3.0 - 5.0 metres will classify as INTERMEDIATE, which can be efficiently ripped by a bulldozer of mass approximately 35t, fitted with a single-tine ripper suitable for heavy ripping, and of flywheel power approximately 220kW. In addition, consideration can also be given to use of a tracked excavator of flywheel power exceeding 0.10kW per millimetre of tined bucket width.

Excavations below 5.0 metres classify as HARD and will require the use of pneumatic tools and possibly blasting.

8.7 Subgrade Treatment for Roads, Parking Areas & Surface Beds

The same criteria in terms of depth of cut and height of fills as that recommended in the creation of platforms apply to road construction.

The colluvial and residual soils classify as G9 in terms of TRH14, 1985 (good to fair subgrade materials). Where subsoils of G9 quality (or better) are encountered, the materials should be ripped to the depths specified by the Engineer and re-

compacted to 95% Modified AASHTO maximum dry density. A design CBR of 10 can be used in this instance.

The pavement formation layer for the proposed roads and parking areas should be designed taking into account anticipated traffic loads, volumes and design life of the parking area and roads.

8.8 NHBRC Classification of the Study Area

According to the guidelines provided by the NHBRC, it is considered that the site classifies as **S1/S2 (potentially compressible, clayey sand of low plasticity)**.

The parameters, as given by the NHBRC together with the foundation recommendations, are given below in Tables 2 and 3.

Table 2: Residential site class designations (from NHBRC)

TYPICAL FOUNDING MATERIAL	CHARACTER OF FOUNDING MATERIAL	EXPECTED RANGE OF TOTAL SOIL MOVEMENTS (mm)	ASSUMED DIFFERENTIAL MOVEMENT (% OF TOTAL)	SITE CLASS
Fine grained soils (clayey silts and clayey sands of low plasticity), sands, sandy and gravelly soils	COMPRESSIBLE SOILS	10 – 20 >20	50% 50%	S1 S2

Table 3: Foundation design, building procedures and precautionary measures for single storey residential structures founded on compressible soil horizons
(from NHBRC Part 1, Section 2, Table 1)

SITE CLASS	ESTIMATED TOTAL SETTLEMENT (mm)	CONSTRUCTION TYPE	FOUNDATION DESIGN AND BUILDING PROCEDURES (Expected damage limited to Category 1)
S1	10 - 20	Modified Normal	<ul style="list-style-type: none"> ✓ Reinforced strip footings. ✓ Articulation joints at some internal and all external doors. ✓ Light reinforcement in masonry. ✓ Site drainage and service/plumbing precautions. ✓ Foundation pressure not to exceed 50 kPa.
		Compaction of insitu soils below individual footings	<ul style="list-style-type: none"> ✓ Remove insitu material below foundations to a depth and width of 1,5 times the foundation width or to a competent horizon and replace with material compacted to 93% MOD AASHTO density at -1 % to + 2% of optimum moisture content. ✓ Normal construction with lightly reinforced strip foundation and light reinforcement in masonry.
		Deep Strip Foundations	<ul style="list-style-type: none"> ✓ Normal construction with drainage precautions. ✓ Founding on a competent horizon below the problem horizon.
		Soil Raft	<ul style="list-style-type: none"> ✓ Remove insitu material to 1,0 m beyond perimeter of the building to a depth of 1,5 times the widest foundation or to a competent horizon and replace with material compacted to 93% MOD AASHTO density at -1 % to + 2% of optimum moisture content. ✓ Normal construction with lightly reinforced strip footings and light reinforcement in masonry.
S2	>20	Stiffened strip footings, stiffened or cellular raft	<ul style="list-style-type: none"> ✓ Stiffened strip footings or stiffened or cellular raft with lightly reinforced or articulated masonry. ✓ Bearing pressure not to exceed to 50kPa. ✓ Mesh reinforcement in floor slabs. ✓ Site drainage and service/plumbing precautions.
		Deep strip foundations	<ul style="list-style-type: none"> ✓ As for S1 but with mesh reinforcement in floor slabs.
		Compaction of insitu soils below individual footings	<ul style="list-style-type: none"> ✓ As for S1.
		Piled or pier foundations	<ul style="list-style-type: none"> ✓ Reinforced concrete ground beams or solid slabs on piled or pier foundations. ✓ Ground slabs with fabric reinforcement. ✓ Good site drainage.
		Soil Raft	<ul style="list-style-type: none"> ✓ As for S1.

8.9 Foundation Recommendations

8.9.1 Option 1 – Raft Foundation

Small, light, single or double storey buildings of block or brickwork may be constructed on a shallow reinforced concrete raft or grillage foundations. The raft foundation can be placed on the dense, clayey sand (residual soils), but will be preferable if the foundation footprint area is further compacted to minimum 93% Modified AASHTO maximum dry density with a smooth foot vibratory compaction roller prior to construction.

Table 4 below provides a summary of anticipated bearing pressures and settlement for rafts of varying loads and footprint areas.

Table 4: Summary of anticipated bearing pressures and settlements for raft foundations

UDL Load (kN)	Raft Area (m ²)	Nominal Bearing Pressure (kPa)	Total Settlement (mm)	Differential Settlement (mm)
700	120	5.8	15 – 20	8 – 12
	200	3.5	10 – 15	6 – 8
	300	2.3	5 – 10	3 – 6
1000	120	8.3	20 – 25	11 – 13
	200	5.0	15 – 20	8 – 12
	300	3.3	10 – 15	6 – 8
1500	120	12.5	30 – 35	17 – 20
	200	7.5	20 – 25	11 – 13
	300	5.0	15 – 20	8 – 12

Some cracking would be expected but could be controlled by the use of brickforce and reinforced concrete ring beams. An approved damp proof plastic should be provided below the entire raft, and the slab and beams should be cast as a single unit.

A provision for possible movements should also be allowed for in the design e.g. provision of construction joints as per Structural Engineer's detail.

All brickwork and foundation footings will need to be reinforced as determined by a Structural Engineer.

The raft foundation must be designed by a Structural Engineer to tolerate the anticipated differential movement and potential heave.

8.9.2 Option 2 – Reinforced Concrete (RC) Strip or Spread Footings

Reinforced concrete (RC) strip footing or spread footing foundations can also be used for the proposed building structure on site. All foundation loads should be placed on the dense, clayey sand (residual soils) at a minimum depth of 1.5 metres below EGL.

Should the above be adopted then a maximum nett allowable bearing pressure of 200kPa is considered applicable for design.

Total settlement is likely to be 8 - 12mm with differential settlement taken as 50% of the total settlement. **It is further recommended that the bottom of the foundation trenches/bases be compacted with a heavy rammer or similar to limit settlement.**

A provision for possible movements between floors and walls should be allowed for in the design e.g. provision of construction joints and use of appropriate softboard between walls and floors as per Structural Engineer's detail.

All brickwork and foundation footings will need to be reinforced as determined by a Structural Engineer. The use of movement joints should also be considered.

The surrounding ground should also be graded away from the structure to limit infiltration of water into the subsoils immediately beneath the buildings.

Blinding should be cast as soon as foundations have been inspected and approved by SGE.

8.10 Potential Heave

The most widely used empirical method (Van der Merwe, 1964) was used to calculate the potential heave characteristics of the residual clayey sand/sandy silty clay on site. It is common with residual soils derived from granite bedrock to display some expansive behaviour.

Considering a 2.0 metre thick layer of clayey sand/sandy silty clay, swelling at 2%, produces a heave of 40mm. Applying a depth factor of 0.7 (calculated at the centre of the layer), the potential heave of the clayey sand/sandy silty clay is approximately 30mm. This needs to be taken into consideration for the design of the foundations and surface beds.

8.11 Results of Percolation Test

The results of the percolation test are summarised in Table 5 below.

Table 5: Summary of results of percolation test

Time (Minutes)	PT1
	Drop in Water Level in mm
0	300
5	291
10	283
15	276
20	269
25	264
30	261
35	259
Depth of percolation test in metres below existing ground level (EGL)	1.0
Percolation rate – average time (minutes) for a 25mm fall in test water level	42.0
Rate of application of effluent to subsoils (l/m ² of soakpit wall area / day)	NA (Test Failed)
Subsoil Description	Reddish brown, clayey SAND to SANDY SILTY CLAY – RESIDUAL GRANITE

The results of PT1 show a percolation rate in the order of 25mm fall in water level in over 30.0 minutes. These results do not fall within the National Building Regulations minimum requirement of a 25mm fall in water level in 30 minutes or less.

With reference to the above, it can be deduced that **the subsoils are not suitable for disposal of stormwater/wastewater by subsoil percolation methods i.e. did not achieve a 25mm drop in water level in 30 minutes or less in accordance with SABS 0400.**

8.12 Drainage and Stormwater Disposal

The most important factor in the stable development of the site is the control and removal of both surface and groundwater from the site.

Earthworks and drainage measures should be designed in such a way as to prevent ponding of, or high concentrations of, stormwater or groundwater anywhere on the site, both during and after the development.

The terrace should be shaped to a gradient to prevent water ponding on the surface and should be graded to direct water away from the fill edges and foundations.

Due to the presence of clayey residual subsoils with poor permeability characteristics, the use of stormwater soakpits is not recommended for the proposed development. As such, all stormwater should be led to discharge to the road hardening in a controlled manner (attenuation tanks to Engineer's detail) or directly into the municipal stormwater system which should be designed to cater for such runoff.

9. CONCLUSIONS

This report details the results of a Geotechnical Investigation for the **“PROPOSED CONSTRUCTION OF A NEW ORTHOTICS AND PROSTHETICS CENTRE AT NGWELEZANE HOSPITAL (OPTION 4), UMHLATHUZE LOCAL MUNICIPALITY”**.

The study area is underlain by sandy fill and colluvial soils, clayey sand/sandy silty clay residual soils, and granite bedrock of the Hlobane Complex. Granite bedrock occurs at a depth typically in excess of 3.0 metres below EGL.

Groundwater seepage was not encountered during the course of the field investigation and it is anticipated that the permanent groundwater table occurs at a depth in excess of 10.0 metres below EGL.

It is considered that the site is stable and suitable for development provided that the recommendations given in this report are adhered to.

All earthworks should be carried out in a manner to promote stable development of the site. It is recommended that earthworks be carried out along the guidelines given in SANS 1200 (current version).

It is considered that the subsoils from 0.0 to 3.0 metres depth will be easily excavatable and classifies as SOFT in terms of SANS 1200DA criteria. It is anticipated that excavations from 3.0 to 5.0 metres will classify as INTERMEDIATE. Excavations below 5.0 metres classify as HARD and will require the use of pneumatic tools and possibly blasting.

The colluvial and residual soils classify as G9 in terms of TRH14, 1985 (good to fair subgrade materials).

According to the guidelines provided by the NHBRC, it is considered that the site classifies as **S1/S2 (potentially compressible, clayey sand of low plasticity)**.

Small, light, single or double storey buildings of block or brickwork may be constructed on a shallow reinforced concrete raft or grillage foundations. The raft foundation can be placed on the dense, clayey sand (residual soils), but will be preferable if the foundation footprint area is further compacted to minimum 93% Modified AASHTO maximum dry density with a smooth foot vibratory compaction roller prior to construction.

Reinforced concrete (RC) strip footing or spread footing foundations can also be used for the proposed building structure on site. **All foundation loads should be placed on the dense, clayey sand (residual soils) at a minimum depth of 1.5 metres below EGL.** Should the above be adopted then a maximum nett allowable bearing pressure of 200kPa is considered applicable for design.

Total settlement is likely to be 8 - 12mm with differential settlement taken as 50% of the total settlement. **It is further recommended that the bottom of the foundation trenches/bases be compacted with a heavy rammer or similar to limit settlement.**

Due to the presence of clayey residual subsoils with poor permeability characteristics, the use of stormwater soakpits is not recommended for the proposed development. As such, all stormwater should be led to discharge to the road hardening in a controlled manner (attenuation tanks to Engineer's detail) or directly into the municipal stormwater system which should be designed to cater for such runoff.

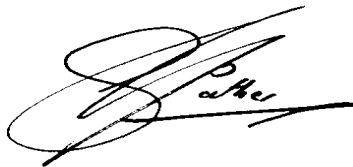
The ground conditions given in this report refer specifically to the field tests carried out on site. It is therefore possible that conditions at variance with those given in this report could be encountered elsewhere on site during construction. It is important that SGE be appointed to carry out periodic inspections during construction. Any change from the anticipated ground conditions could then be taken into account to avoid unnecessary expense.



Author: Y. Hansa (Pr.Sci.Nat.)

25 February 2021

Date



Reviewed: S. Pather (Pr.Sci.Nat.)

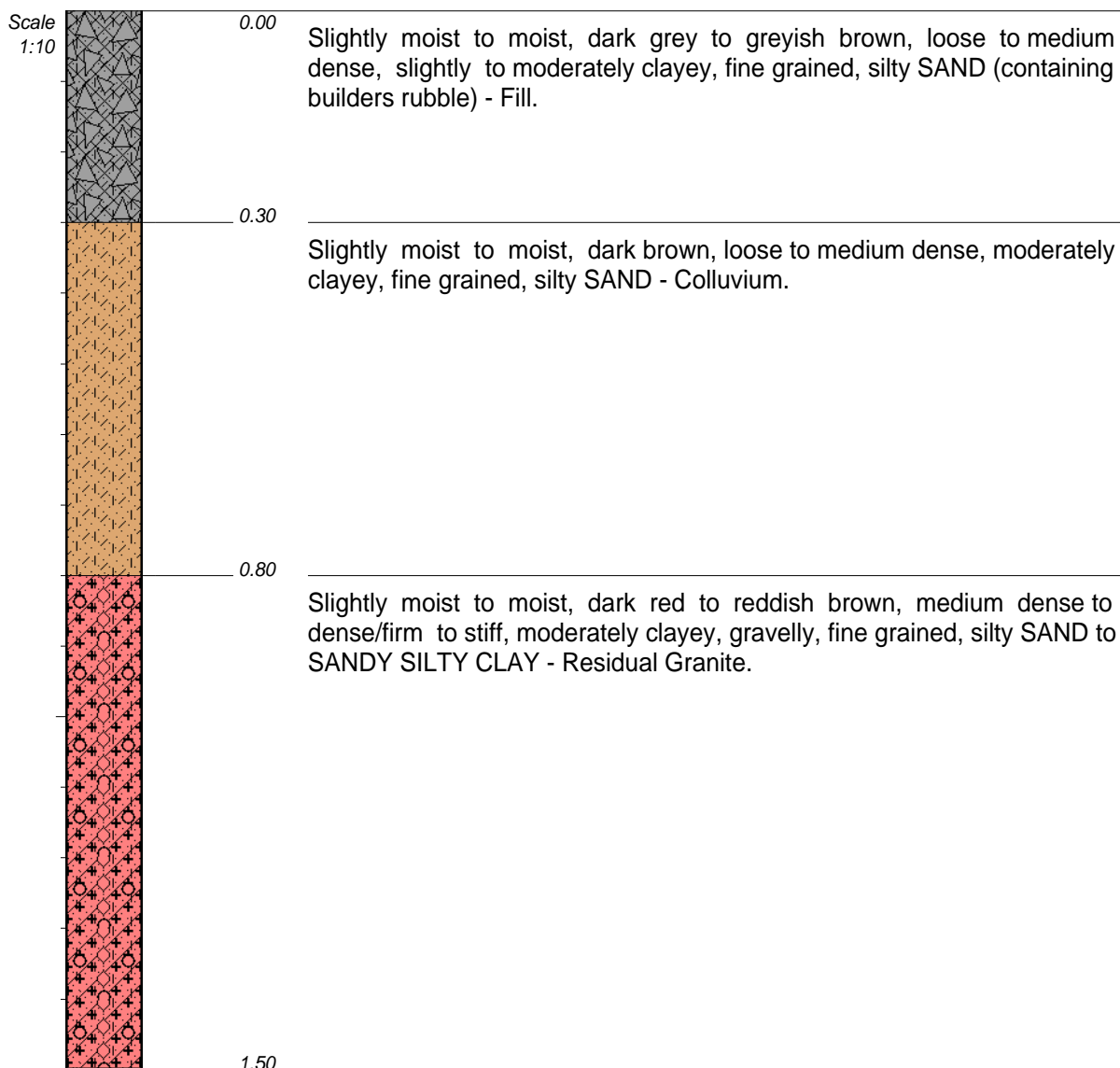
25 February 2021

Date

APPENDIX A

February 25, 2021

INSPECTION PIT LOG PROFILES



NOTES

- 1) Depth of water table: Not encountered.
- 2) Refusal depth at 1.50m.

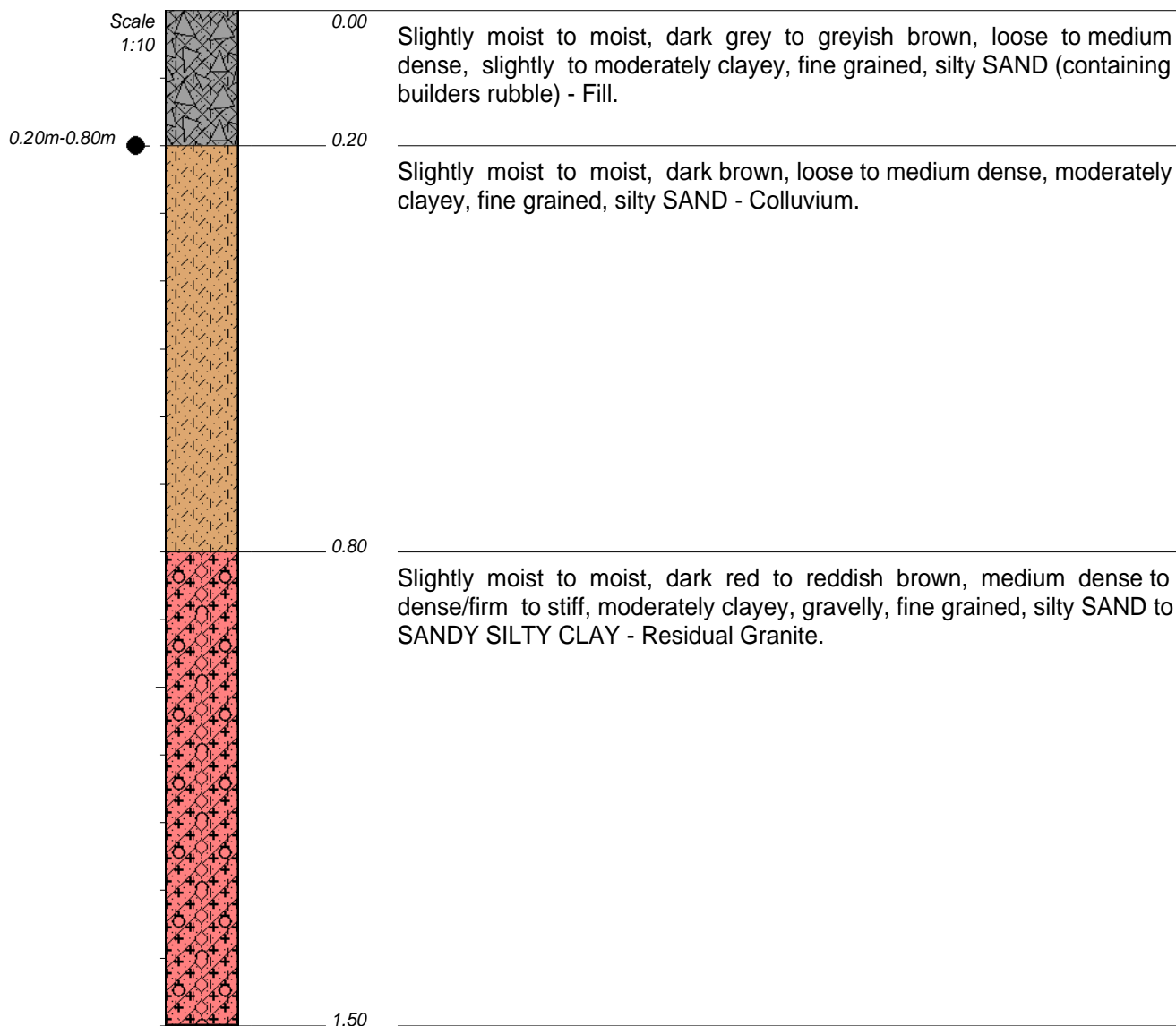
CONTRACTOR :
MACHINE : by Hand
DRILLED BY :
PROFILED BY : Y. Hansa

TYPE SET BY : K. Govender
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 18 January 2021
DATE : 18 January 2021
DATE : 24/03/2021 12:05
TEXT : C:\PERFLOGS\IPITS1.TXT

ELEVATION :
X-COORD : 28° 46' 37.2" S
Y-COORD : 31° 52' 02.2" E

HOLE No: IP 1



NOTES

- 1) Depth of water table: Not encountered.
- 2) Sample taken at:
S1 0.20m-0.80m (2 x Bulk).
- 3) Refusal depth at 1.50m.

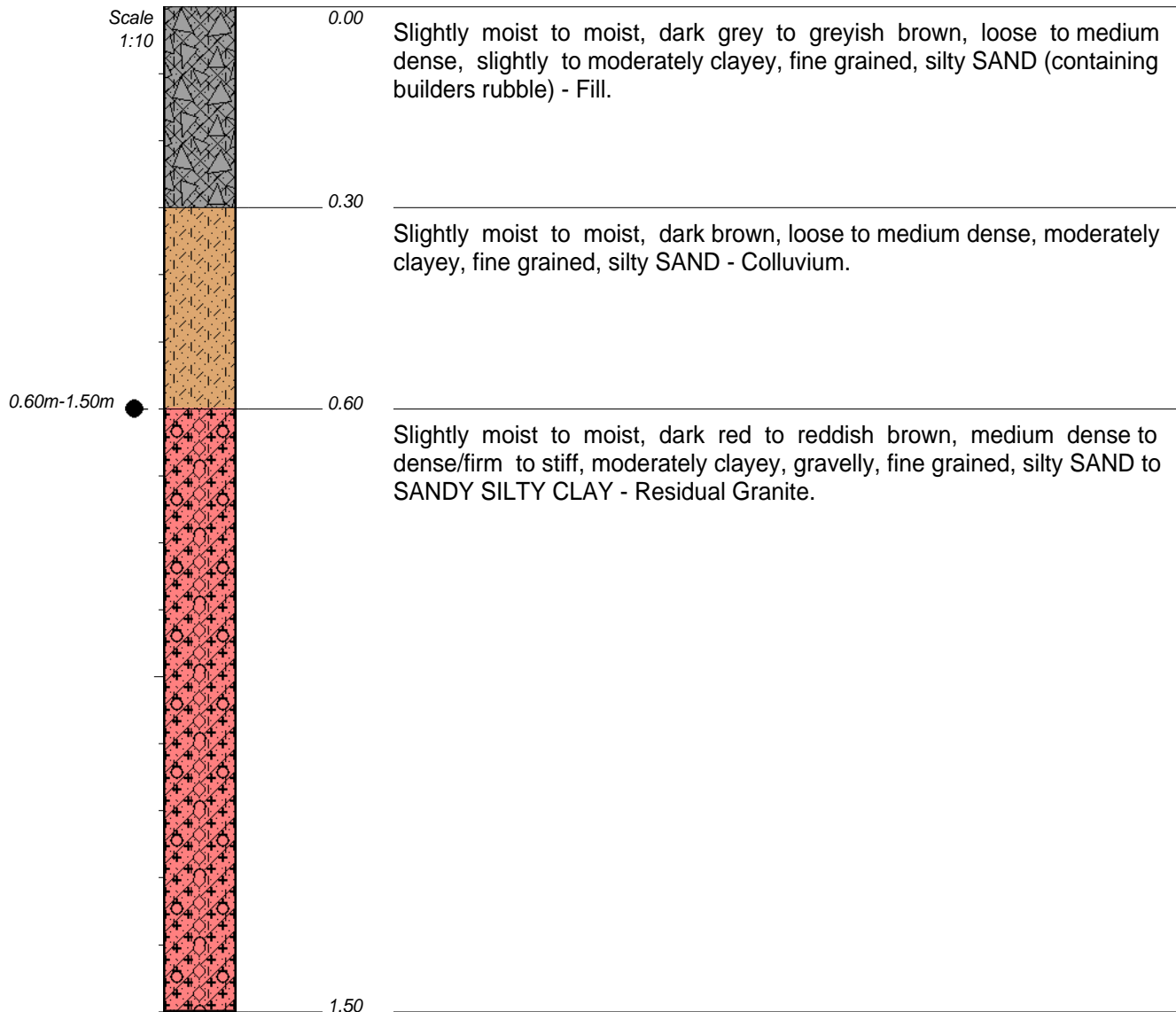
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MACHINE : by Hand
DRILLED BY :
PROFIED BY : Y. Hansa

TYPE SET BY : K. Govender
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 18 January 2021
DATE : 18 January 2021
DATE : 24/03/2021 12:05
TEXT : C:\PERFLOGS\IPITS1.TXT

ELEVATION :
X-COORD : 28° 46' 36.5" S
Y-COORD : 31° 52' 01.1" E

HOLE No: IP 2



NOTES

- 1) Depth of water table: Not encountered.
- 2) Sample taken at:
S1 0.60m-1.50m (2 x Bulk).
- 3) Refusal depth at 1.50m.

CONTRACTOR :
MACHINE : by Hand
DRILLED BY :
PROFIED BY : Y. Hansa

TYPE SET BY : K. Govender
SETUP FILE : STANDARD.SET

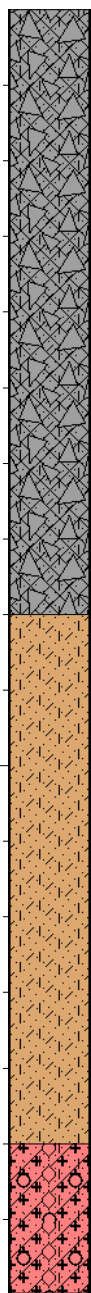
INCLINATION :
DIAM :
DATE : 18 January 2021
DATE : 18 January 2021
DATE : 24/03/2021 12:05
TEXT : C:\PERFLOGS\IPITS1.TXT

ELEVATION :
X-COORD : 28° 46' 37.7" S
Y-COORD : 31° 52' 01.1" E

HOLE No: IP 3



Scale
1:10



0.00

Slightly moist to moist, dark grey to greyish brown, loose to medium dense, slightly to moderately clayey, fine grained, silty SAND (containing builders rubble) - Fill.

0.80

Slightly moist to moist, dark brown, loose to medium dense, moderately clayey, fine grained, silty SAND - Colluvium.

1.50

Slightly moist to moist, dark red to reddish brown, medium dense to dense/firm to stiff, moderately clayey, gravelly, fine grained, silty SAND to SANDY SILTY CLAY - Residual Granite.

1.70

NOTES

- 1) Depth of water table: Not encountered.
- 2) Refusal depth at 1.70m.

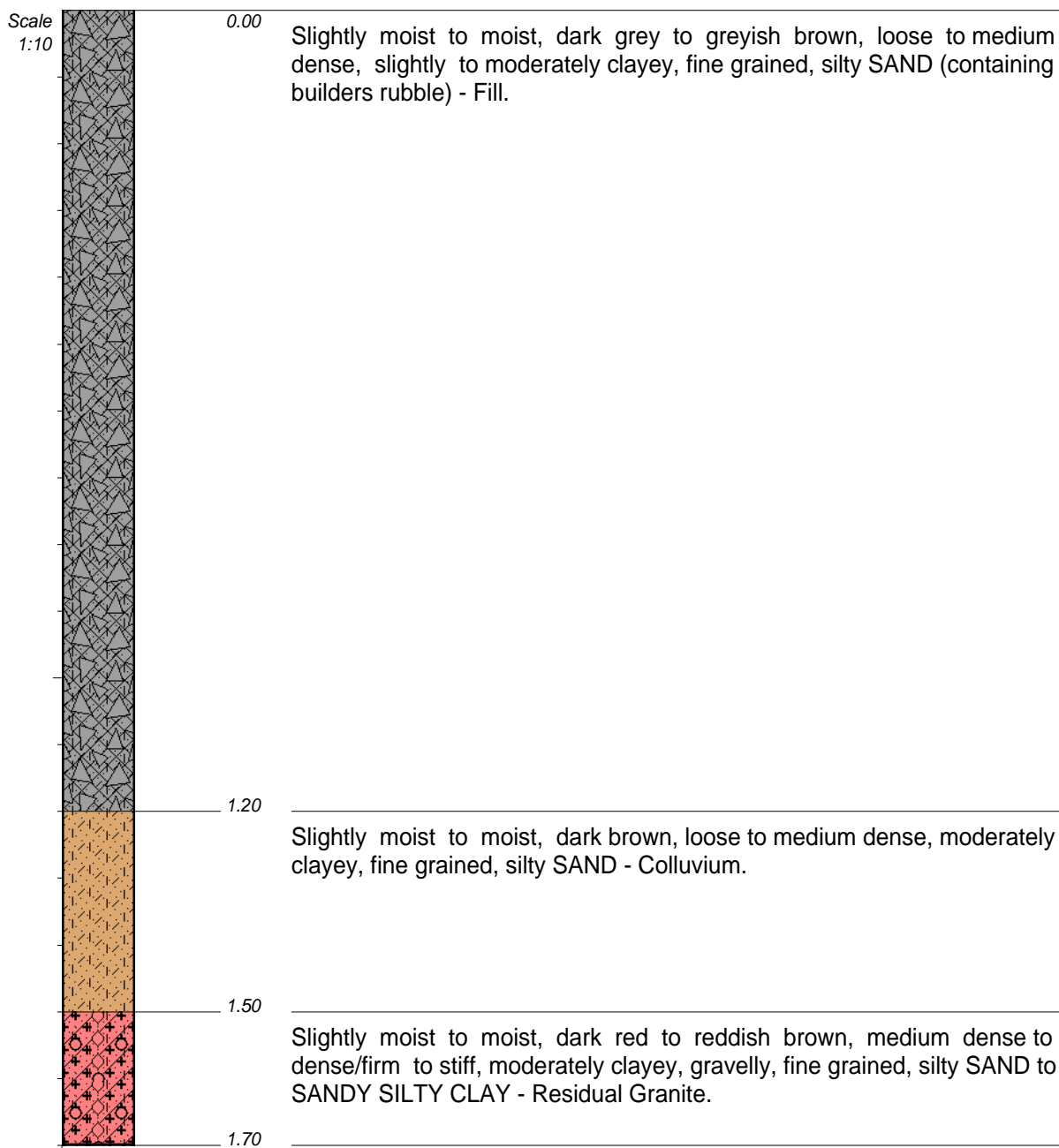
CONTRACTOR :
MACHINE : by Hand
DRILLED BY :
PROFILED BY : Y. Hansa

TYPE SET BY : K. Govender
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE : 18 January 2021
DATE : 18 January 2021
DATE : 24/03/2021 12:05
TEXT : C:\PERFLOGS\PIPS1.TXT

ELEVATION :
X-COORD : 28° 46' 38.3" S
Y-COORD : 31° 52' 01.4" E

HOLE No: IP 4



NOTES

- 1) Depth of water table: Not encountered.
- 2) Refusal depth at 1.70m.

CONTRACTOR :
 MACHINE : by Hand
 DRILLED BY :
 PROFILED BY : Y. Hansa

TYPE SET BY : K. Govender
 SETUP FILE : STANDARD.SET

INCLINATION :
 DIAM :
 DATE : 18 January 2021
 DATE : 18 January 2021
 DATE : 24/03/2021 12:05
 TEXT : C:\PERFLOGS\IPITS1.TXT

ELEVATION :
 X-COORD : 28° 46' 38.1" S
 Y-COORD : 31° 52' 00.3" E

HOLE No: IP 5

RESULTS OF CBR DYNAMIC CONE PENETROMETER (DCP) TESTS

Client: Ukuza Consulting (Pty) Ltd

Project: Orthotics and Prosthetics Centre (Option 4) - Ngwelezane Hospital

Latitude: S28° 46' 37,2"

Longitude: E31° 52' 02,2"

Ref.No.

SGE-003-2021

Date:

18 January 2021

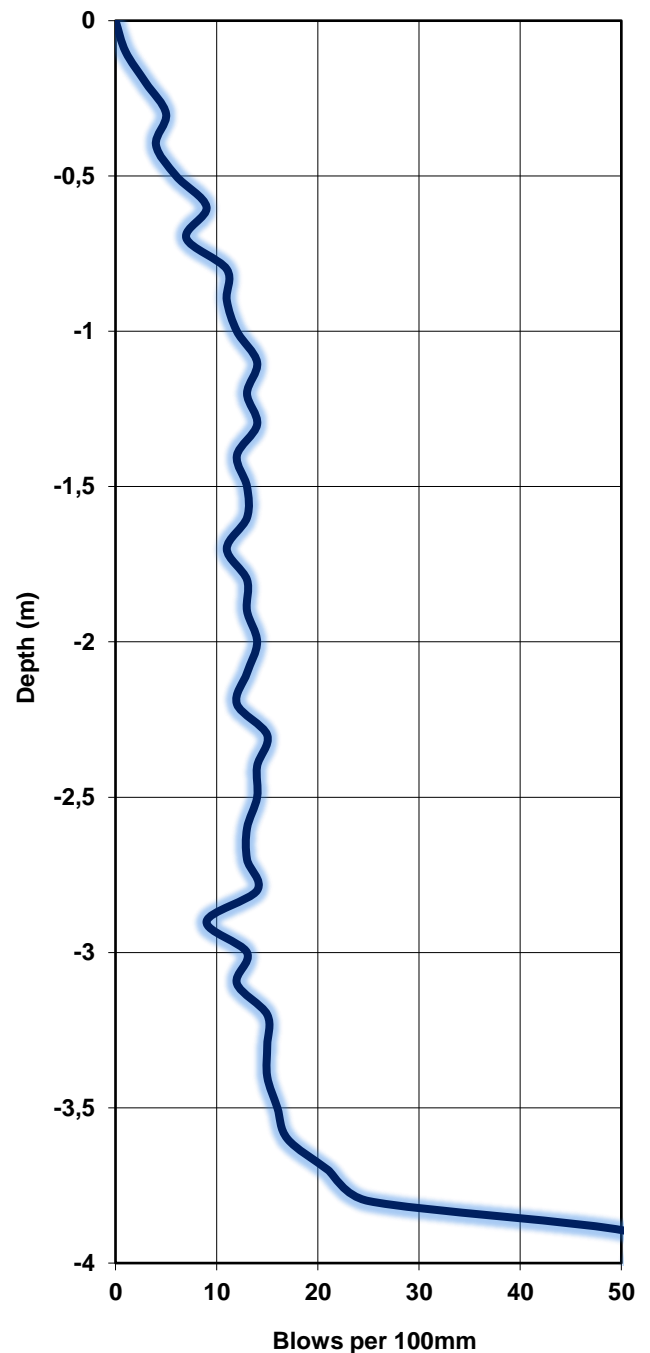
Operator:

Y. Hansa

Dynamic Cone Penetrometer (DCP) TEST NO: DCP1

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	1	Very Loose	<29 deg	2
0,2	3	Loose	<30 deg	5
0,3	5	Med.Dense	32 deg	8
0,4	4	Med.Dense	30 deg	7
0,5	6	Med.Dense	33 deg	10
0,6	9	Med.Dense	35 deg	15
0,7	7	Med.Dense	34 deg	12
0,8	11	Dense	36 deg	19
0,9	11	Dense	36 deg	19
1	12	Dense	36 deg	21
1,1	14	Dense	37 deg	25
1,2	13	Dense	37 deg	23
1,3	14	Dense	37 deg	25
1,4	12	Dense	36 deg	21
1,5	13	Dense	37 deg	23
1,6	13	Dense	37 deg	23
1,7	11	Dense	36 deg	19
1,8	13	Dense	37 deg	23
1,9	13	Dense	37 deg	23
2	14	Dense	37 deg	25
2,1	13	Dense	37 deg	23
2,2	12	Dense	36 deg	21
2,3	15	Dense	37 deg	27
2,4	14	Dense	37 deg	25
2,5	14	Dense	37 deg	25
2,6	13	Dense	37 deg	23
2,7	13	Dense	37 deg	23
2,8	14	Dense	37 deg	25
2,9	9	Med.Dense	35 deg	15
3	13	Dense	37 deg	23
3,1	12	Dense	36 deg	21
3,2	15	Dense	37 deg	27
3,3	15	Dense	37 deg	27
3,4	15	Dense	37 deg	27
3,5	16	Dense	37 deg	29
3,6	17	Dense	37 deg	31
3,7	21	Dense	38 deg	40
3,8	25	Very Dense	>38 deg	49
Refusal				



Client: Ukuza Consulting (Pty) Ltd

Project: Orthotics and Prosthetics Centre (Option 4) - Ngwelezane Hospital

Latitude: S28° 46' 36,5"

Longitude: E31° 52' 01,1"

Ref.No.

SGE-003-2021

Date:

18 January 2021

Operator:

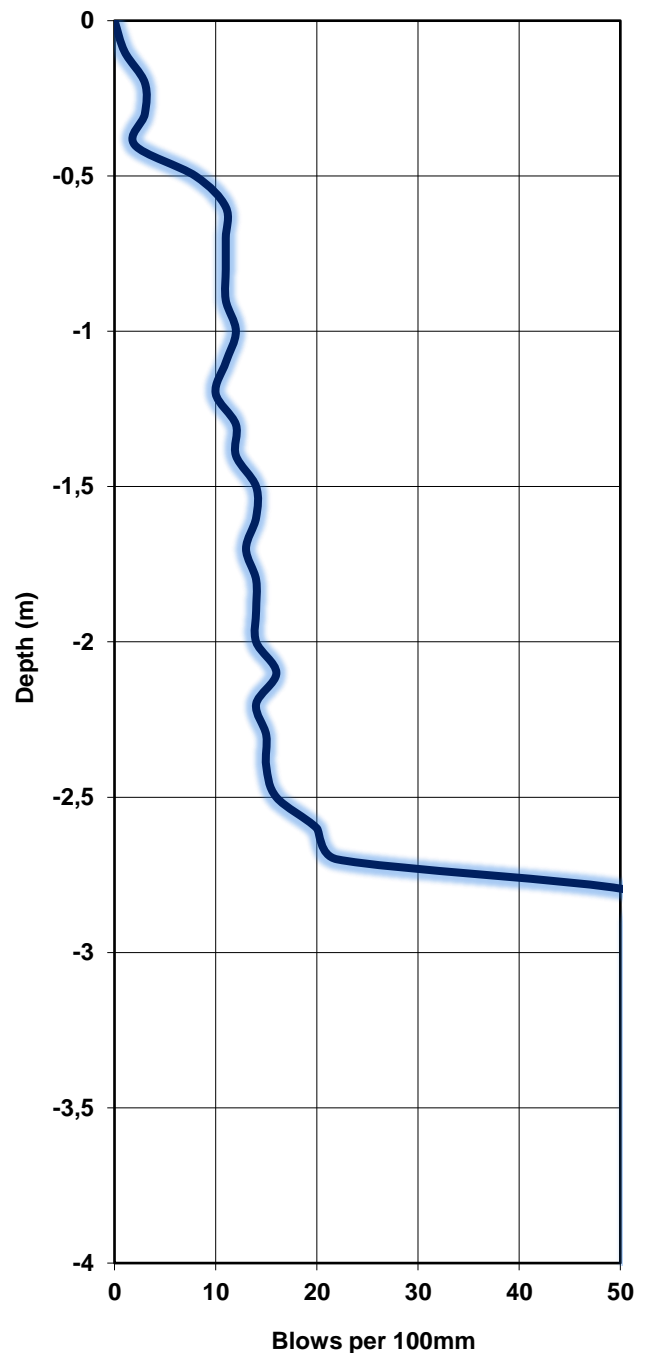
Y. Hansa

Dynamic Cone Penetrometer (DCP) TEST NO: DCP2

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	1	Very Loose	<29 deg	2
0,2	3	Loose	<30 deg	5
0,3	3	Loose	<30 deg	5
0,4	2	Loose	<30 deg	3
0,5	8	Med.Dense	35 deg	14
0,6	11	Dense	36 deg	19
0,7	11	Dense	36 deg	19
0,8	11	Dense	36 deg	19
0,9	11	Dense	36 deg	19
1	12	Dense	36 deg	21
1,1	11	Dense	36 deg	19
1,2	10	Med.Dense	36 deg	17
1,3	12	Dense	36 deg	21
1,4	12	Dense	36 deg	21
1,5	14	Dense	37 deg	25
1,6	14	Dense	37 deg	25
1,7	13	Dense	37 deg	23
1,8	14	Dense	37 deg	25
1,9	14	Dense	37 deg	25
2	14	Dense	37 deg	25
2,1	16	Dense	37 deg	29
2,2	14	Dense	37 deg	25
2,3	15	Dense	37 deg	27
2,4	15	Dense	37 deg	27
2,5	16	Dense	37 deg	29
2,6	20	Dense	38 deg	37
2,7	22	Dense	38 deg	42

Refusal



Client: Ukuza Consulting (Pty) Ltd

Project: Orthotics and Prosthetics Centre (Option 4) - Ngwelezane Hospital

Latitude: S28° 46' 37,7"

Longitude: E31° 52' 01,1"

Ref.No.

SGE-003-2021

Date:

18 January 2021

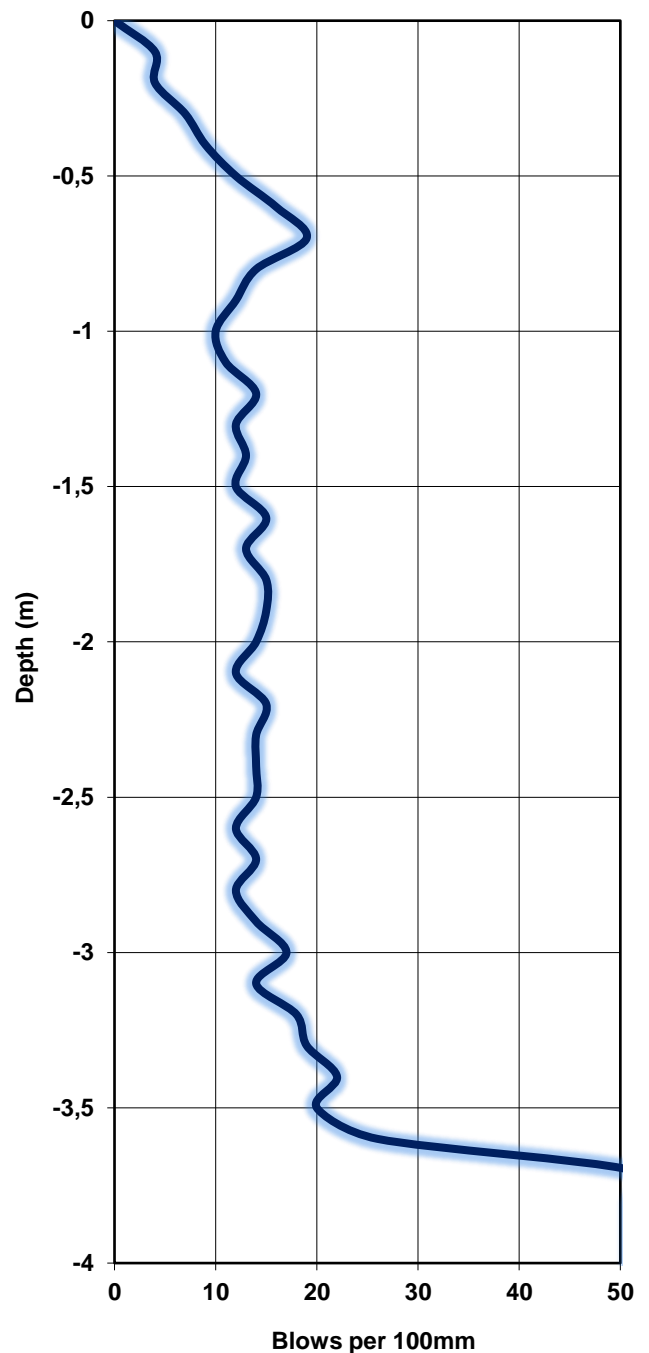
Operator:

Y. Hansa

Dynamic Cone Penetrometer (DCP) TEST NO: DCP3

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	4	Med.Dense	30 deg	7
0,2	4	Med.Dense	30 deg	7
0,3	7	Med.Dense	34 deg	12
0,4	9	Med.Dense	35 deg	15
0,5	12	Dense	36 deg	21
0,6	16	Dense	37 deg	29
0,7	19	Dense	37 deg	35
0,8	14	Dense	37 deg	25
0,9	12	Dense	36 deg	21
1	10	Med.Dense	36 deg	17
1,1	11	Dense	36 deg	19
1,2	14	Dense	37 deg	25
1,3	12	Dense	36 deg	21
1,4	13	Dense	37 deg	23
1,5	12	Dense	36 deg	21
1,6	15	Dense	37 deg	27
1,7	13	Dense	37 deg	23
1,8	15	Dense	37 deg	27
1,9	15	Dense	37 deg	27
2	14	Dense	37 deg	25
2,1	12	Dense	36 deg	21
2,2	15	Dense	37 deg	27
2,3	14	Dense	37 deg	25
2,4	14	Dense	37 deg	25
2,5	14	Dense	37 deg	25
2,6	12	Dense	36 deg	21
2,7	14	Dense	37 deg	25
2,8	12	Dense	36 deg	21
2,9	14	Dense	37 deg	25
3	17	Dense	37 deg	31
3,1	14	Dense	37 deg	25
3,2	18	Dense	37 deg	33
3,3	19	Dense	37 deg	35
3,4	22	Dense	38 deg	42
3,5	20	Dense	38 deg	37
3,6	26	Very Dense	>38 deg	51
Refusal				



Client: Ukuza Consulting (Pty) Ltd

Project: Orthotics and Prosthetics Centre (Option 4) - Ngwelezane Hospital

Latitude: S28° 46' 38,3"

Longitude: E31° 52' 01,4"

Ref.No.

SGE-003-2021

Date:

18 January 2021

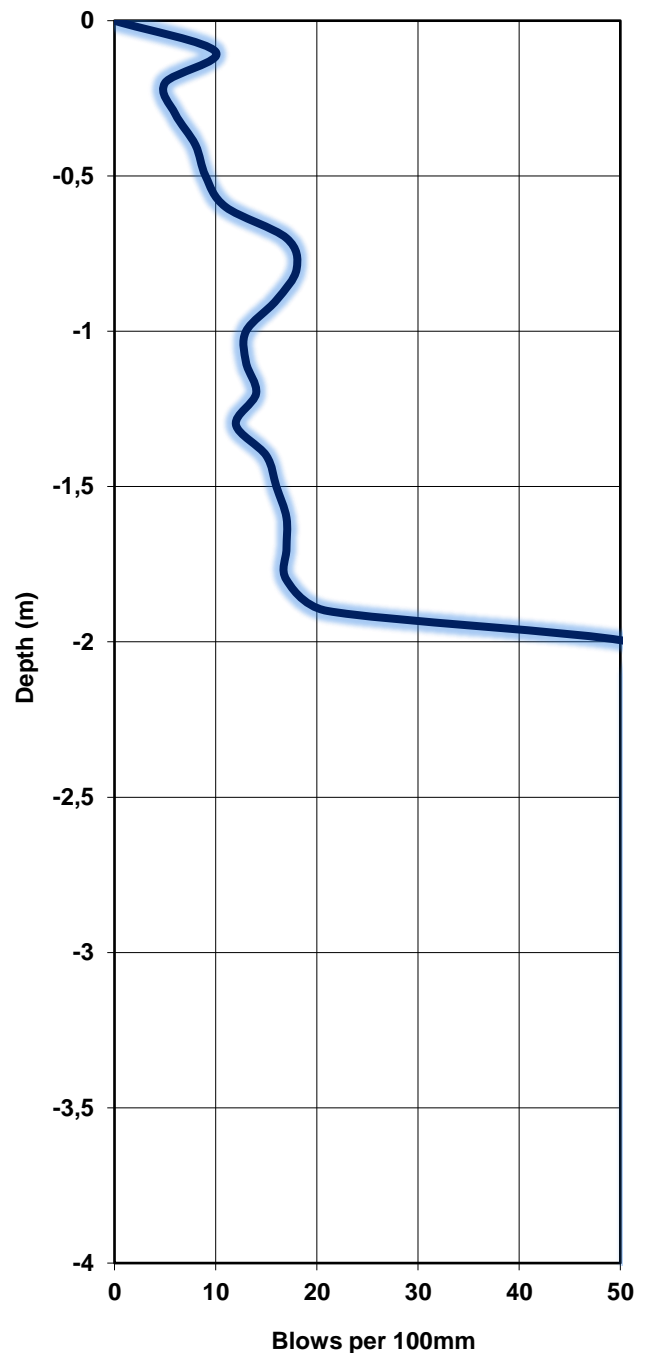
Operator:

Y. Hansa

Dynamic Cone Penetrometer (DCP) TEST NO: DCP4

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	10	Med.Dense	36 deg	17
0,2	5	Med.Dense	32 deg	8
0,3	6	Med.Dense	33 deg	10
0,4	8	Med.Dense	35 deg	14
0,5	9	Med.Dense	35 deg	15
0,6	11	Dense	36 deg	19
0,7	17	Dense	37 deg	31
0,8	18	Dense	37 deg	33
0,9	16	Dense	37 deg	29
1	13	Dense	37 deg	23
1,1	13	Dense	37 deg	23
1,2	14	Dense	37 deg	25
1,3	12	Dense	36 deg	21
1,4	15	Dense	37 deg	27
1,5	16	Dense	37 deg	29
1,6	17	Dense	37 deg	31
1,7	17	Dense	37 deg	31
1,8	17	Dense	37 deg	31
1,9	21	Dense	38 deg	40
	Refusal			



Client: Ukuza Consulting (Pty) Ltd

Project: Orthotics and Prosthetics Centre (Option 4) - Ngwelezane Hospital

Latitude: S28° 46' 38,1"

Longitude: E31° 52' 00,3"

Ref.No.

SGE-003-2021

Date:

18 January 2021

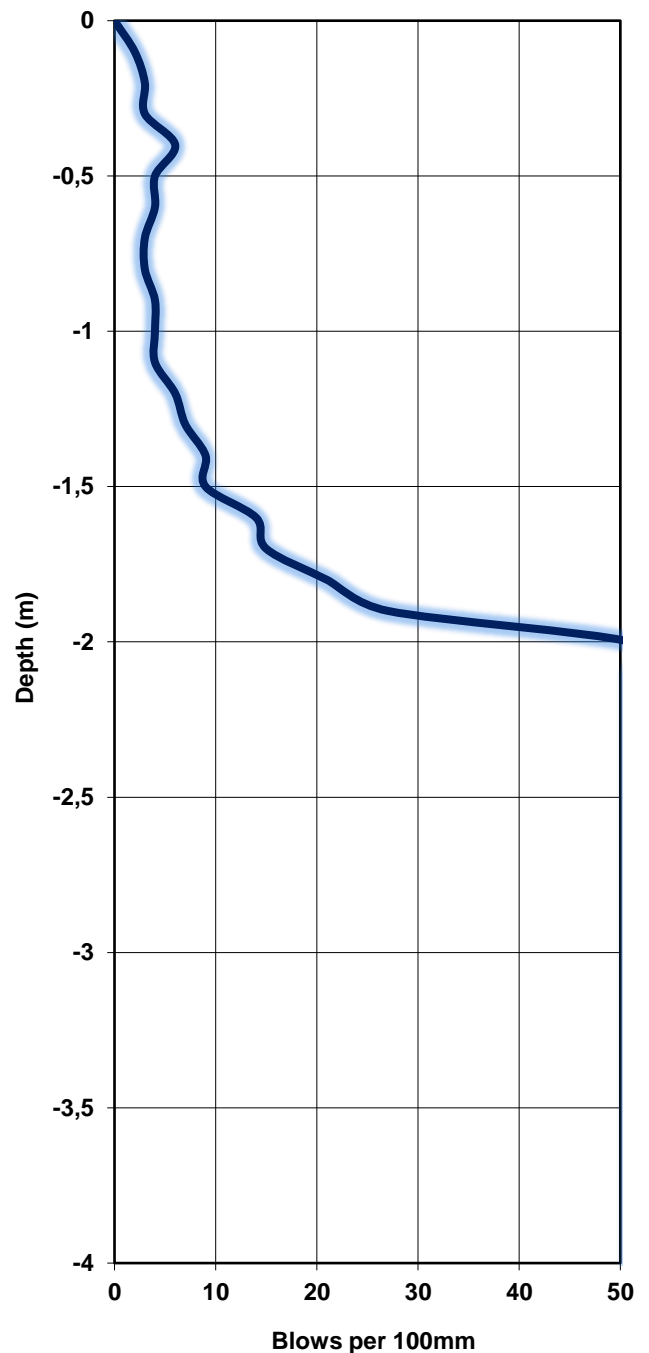
Operator:

Y. Hansa

Dynamic Cone Penetrometer (DCP) TEST NO: DCP5

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	2	Loose	<30 deg	3
0,2	3	Loose	<30 deg	5
0,3	3	Loose	<30 deg	5
0,4	6	Med.Dense	33 deg	10
0,5	4	Med.Dense	30 deg	7
0,6	4	Med.Dense	30 deg	7
0,7	3	Loose	<30 deg	5
0,8	3	Loose	<30 deg	5
0,9	4	Med.Dense	30 deg	7
1	4	Med.Dense	30 deg	7
1,1	4	Med.Dense	30 deg	7
1,2	6	Med.Dense	33 deg	10
1,3	7	Med.Dense	34 deg	12
1,4	9	Med.Dense	35 deg	15
1,5	9	Med.Dense	35 deg	15
1,6	14	Dense	37 deg	25
1,7	15	Dense	37 deg	27
1,8	21	Dense	38 deg	40
1,9	27	Very Dense	>38 deg	54
	Refusal			



Client: Ukuza Consulting (Pty) Ltd

Project: Orthotics and Prosthetics Centre (Option 4) - Ngwelezane Hospital

Latitude: S28° 46' 37,4"

Longitude: E31° 52' 00,5"

Ref.No.

SGE-003-2021

Date:

18 January 2021

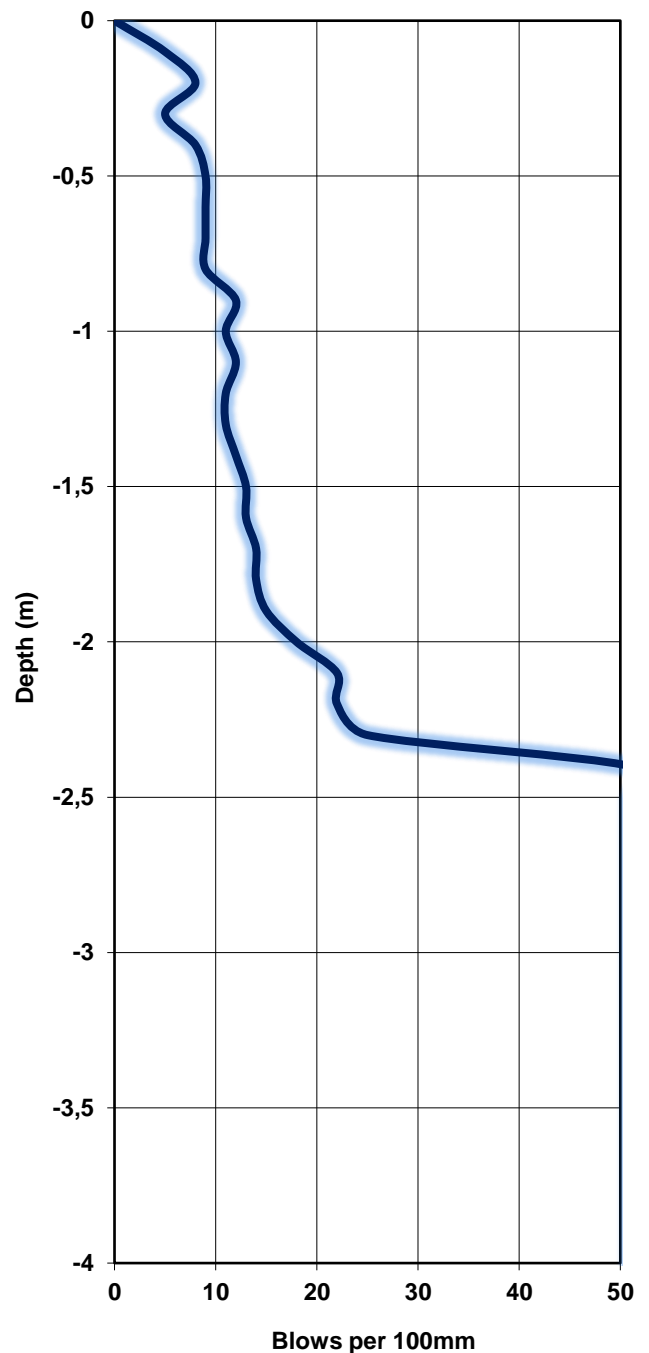
Operator:

Y. Hansa

Dynamic Cone Penetrometer (DCP) TEST NO: DCP6

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	5	Med.Dense	32 deg	8
0,2	8	Med.Dense	35 deg	14
0,3	5	Med.Dense	32 deg	8
0,4	8	Med.Dense	35 deg	14
0,5	9	Med.Dense	35 deg	15
0,6	9	Med.Dense	35 deg	15
0,7	9	Med.Dense	35 deg	15
0,8	9	Med.Dense	35 deg	15
0,9	12	Dense	36 deg	21
1	11	Dense	36 deg	19
1,1	12	Dense	36 deg	21
1,2	11	Dense	36 deg	19
1,3	11	Dense	36 deg	19
1,4	12	Dense	36 deg	21
1,5	13	Dense	37 deg	23
1,6	13	Dense	37 deg	23
1,7	14	Dense	37 deg	25
1,8	14	Dense	37 deg	25
1,9	15	Dense	37 deg	27
2	18	Dense	37 deg	33
2,1	22	Dense	38 deg	42
2,2	22	Dense	38 deg	42
2,3	25	Very Dense	>38 deg	49
Refusal				



Client: Ukuza Consulting (Pty) Ltd

Project: Orthotics and Prosthetics Centre (Option 4) - Ngwelezane Hospital

Latitude: S28° 46' 38,0"

Longitude: E31° 52' 01,8"

Ref.No.

SGE-003-2021

Date:

18 January 2021

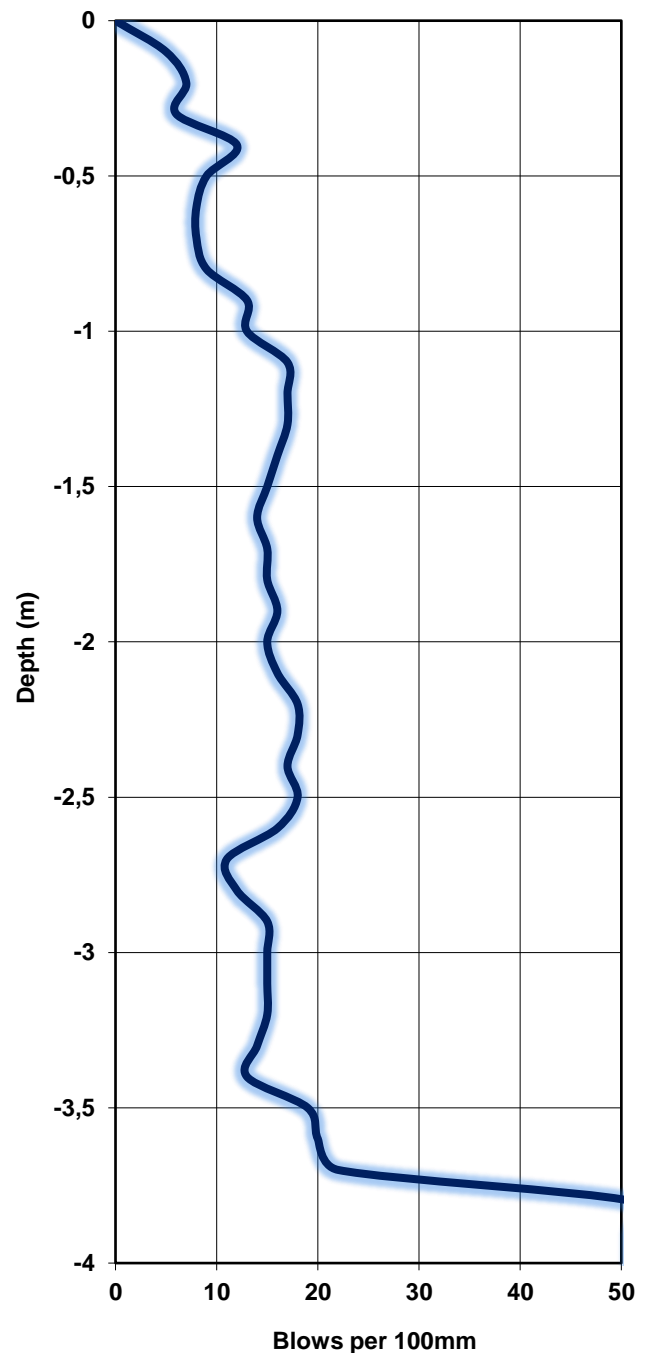
Operator:

Y. Hansa

Dynamic Cone Penetrometer (DCP) TEST NO: DCP7

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	5	Med.Dense	32 deg	8
0,2	7	Med.Dense	34 deg	12
0,3	6	Med.Dense	33 deg	10
0,4	12	Dense	36 deg	21
0,5	9	Med.Dense	35 deg	15
0,6	8	Med.Dense	35 deg	14
0,7	8	Med.Dense	35 deg	14
0,8	9	Med.Dense	35 deg	15
0,9	13	Dense	37 deg	23
1	13	Dense	37 deg	23
1,1	17	Dense	37 deg	31
1,2	17	Dense	37 deg	31
1,3	17	Dense	37 deg	31
1,4	16	Dense	37 deg	29
1,5	15	Dense	37 deg	27
1,6	14	Dense	37 deg	25
1,7	15	Dense	37 deg	27
1,8	15	Dense	37 deg	27
1,9	16	Dense	37 deg	29
2	15	Dense	37 deg	27
2,1	16	Dense	37 deg	29
2,2	18	Dense	37 deg	33
2,3	18	Dense	37 deg	33
2,4	17	Dense	37 deg	31
2,5	18	Dense	37 deg	33
2,6	16	Dense	37 deg	29
2,7	11	Dense	36 deg	19
2,8	12	Dense	36 deg	21
2,9	15	Dense	37 deg	27
3	15	Dense	37 deg	27
3,1	15	Dense	37 deg	27
3,2	15	Dense	37 deg	27
3,3	14	Dense	37 deg	25
3,4	13	Dense	37 deg	23
3,5	19	Dense	37 deg	35
3,6	20	Dense	38 deg	37
3,7	22	Dense	38 deg	42
Refusal				



Client: Ukuza Consulting (Pty) Ltd

Project: Orthotics and Prosthetics Centre (Option 4) - Ngwelezane Hospital

Latitude: S28° 46' 37,2"

Longitude: E31° 52' 01,4"

Ref.No.

SGE-003-2021

Date:

18 January 2021

Operator:

Y. Hansa

Dynamic Cone Penetrometer (DCP) TEST NO: DCP8

THE STRENGTH AND CBR VALUES ARE EMPIRICAL AND DEPEND ON FACTORS SUCH AS MOISTURE CONTENT WHICH HAVE NOT BEEN DETERMINED. THEY ARE THEREFORE INDICATIVE ONLY AND SHOULD BE VERIFIED BY TEST OR OBSERVATION

Depth metres	Blows per 100mm	Inferred Consistency	Shear Strength	CBR %
0				
0,1	7	Med.Dense	34 deg	12
0,2	8	Med.Dense	35 deg	14
0,3	8	Med.Dense	35 deg	14
0,4	7	Med.Dense	34 deg	12
0,5	10	Med.Dense	36 deg	17
0,6	13	Dense	37 deg	23
0,7	11	Dense	36 deg	19
0,8	13	Dense	37 deg	23
0,9	13	Dense	37 deg	23
1	15	Dense	37 deg	27
1,1	15	Dense	37 deg	27
1,2	14	Dense	37 deg	25
1,3	16	Dense	37 deg	29
1,4	21	Dense	38 deg	40
1,5	21	Dense	38 deg	40
	Refusal			



RESULTS OF PERCOLATION TEST

PERCOLATION TEST - RESULTS

PROJECT REFERENCE NO.: SGE-003-2021 DATE: 18 January 2021
 PROJECT NAME: Orthotics and Prosthetics Centre LOGGED BY: Mr Y. Hansa
 LOCATION: Ngwelezane Hospital

PERCOLATION TEST NO.: PT1

LATITUDE (S.)	28° 46' 37,4"
LONGITUDE (E.)	31° 52' 00,5"
DEPTH (m)	SUBSOIL DESCRIPTION
0,5	Dark red to reddish brown, clayey SAND to SANDY SILTY CLAY
1,0	

TIME (MINUTES)	DROP IN WATER LEVEL (mm)
0	300
5	291
10	283
15	276
20	269
25	264
30	261
35	259
Depth of percolation test in metres below existing ground level	1.0
Percolation rate - average time (minutes) for a 25mm fall in test water level	42.0
Rate of application of effluent to subsoils (l/m ² of soakpit wall area per day)	NA (Test Failed)



Syncline
 GEOTECHNICAL ENGINEERING (PTY) LTD
 Helping You Found On Solid Ground
 Geologists and Geotechnical Engineering Consultants

RESULTS OF LABORATORY TESTS

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD



CIVIL ENGINEERING MATERIALS TESTING LABORATORY

Reg. No. : 1965/09585/07

25 WESTMEAD ROAD - WESTMEAD P.O.BOX 15318 WESTMEAD 3608 KWAZULU - NATAL
TELEPHONE : 031 7004325 TELEFAX : 031 7001909 email : soilslab@mweb.co.za



T0213

Client : SYNCLINE GEOTECHNICAL ENGINEERING PTY LTD
Address : 417, MAZARS HOUSE
: 197 PETER MOKABA ROAD
: MORNINGSIDE
Client Reference :
Order No. :
Attention :
Date Received : 19/01/2021
Date Tested : 19/01/2021 - 02/02/2021
Date Reported : 03/02/2021
Project : NGWELEZANE HOSPITAL
Project No. : 2021-D-104
Report Status : **FINAL**

Herewith please find the test report(s) pertaining to the above project. All tests were conducted in accordance with prescribed test method(s). Information herein consists of the following:

Test(s) conducted / Item(s) measured	Qty.	Test Method(s)	Authorized By**	Page(s)
Moisture Density Relationship	2.000	SANS 3001: GR30	S Naidoo	3-5
Moisture Content as received	2.000	SANS 3001: GR20	S Naidoo	2, 6
Atterberg Limits <0.425mm	2.000	SANS 3001: GR10-GR12	S Naidoo	2, 5
Sieve Analysis 0.075mm	2.000	SANS 3001: GR1	S Naidoo	2, 5
California Bearing Ratio (CBR)	2.000	SANS 3001: GR40	S Naidoo	5
Hydrometer Analysis	2.000	SANS 3001: GR3	S Naidoo	2

Any test results contained in this report and marked with * in the table above are " Not SANAS Accredited ", and are Not included in the Schedule of Accreditation for this Laboratory.

Any information contained in this test report pertain only to the areas and / or samples tested. Documents may only be reproduced or published in their full context. Any information in relation to the client and associated test results, gained by the laboratory prior, during or after the test process will be treated as confidential and will not be reproduced or disclosed to any person or organization, without the prior written consent from the client, unless required by law or covered by legally enforceable, signed confidentiality undertakings (i.e. SANAS Assessors or Internal Auditors). If the arrangement is not suitable to you, our client, please contact the management of Soilco Materials Investigations (Pty) Ltd.

While every care is taken to ensure that all tests are carried out in accordance with recognised standards, neither Soilco Materials Investigations (Pty) Ltd nor its employee's shall be liable in any way whatsoever for any error made in the execution or reporting of tests or any erroneous conclusions drawn therefrom or for any consequences thereof.

All interpretations, Interpolations, Opinions and/or Classifications contained in this report falls outside our scope of accreditation.

The following parameters, where applicable, were excluded from the classification procedure: Chemical modifications, Additional fines, Fractured Faces, Soluble Salts, pH, Conductivity, Coarse Sand Ratio, Durability (COLTO: G4-G9).

The following parameters, where applicable, were assumed: Rock types were assumed to be of an Arenaceous nature with Siliceous cementing material.

Unless otherwise requested or stated, all samples will be discarded after a period of 3 months.

Deviation from Test Method : - Moisture Contents Dried Overnight at 105°C to 110°C.

For Soilco : **S Naidoo**

Technical Signatory

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD



CIVIL ENGINEERING MATERIALS TESTING LABORATORY

Reg. No. : 1965/09585/07

25 WESTMEAD ROAD - WESTMEAD P.O.BOX 15318 WESTMEAD 3608 KWAZULU - NATAL
TELEPHONE : 031 7004325 TELEFAX : 031 7001909 email : soilslab@mweb.co.za

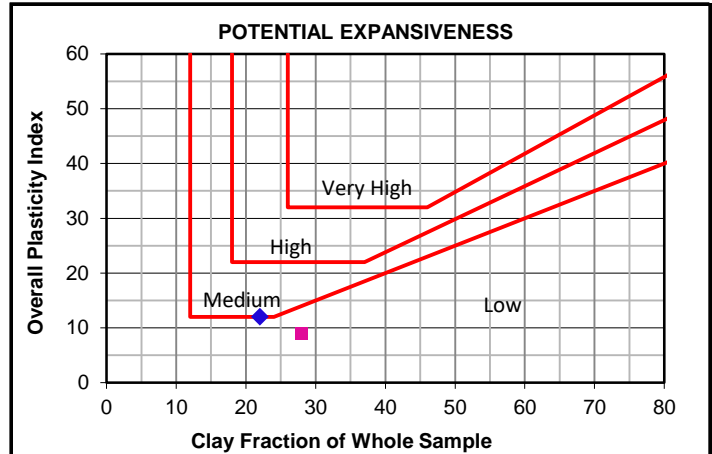


T0213

Client :	SYNCLINE GEOTECHNICAL ENGINEERING PTY LTD	Date Received:	19/01/2021
Project :	NGWELEZANE HOSPITAL	Date Reported:	02/02/2021
Project No :	2021-D-104	Page No. :	2 of 7

FOUNDATION INDICATOR

Laboratory Number	1	2
Field Number		
Client Reference	IP2	IP3
Depth (m)	0.2 - 0.8	0.6 - 1.5
Position		
Coordinates	X	
	Y	
Description	Moderate Brown Clayey Sand - Colluvium	Reddish Brown Clayey Sand - Residual
Additional Information		
Calcrete / Crushed Stabilizing Agent	Natural	Natural

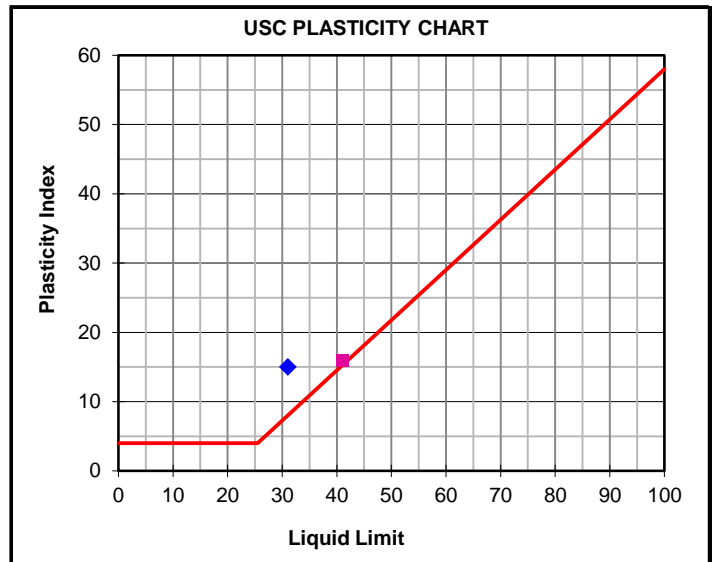


Moisture Content & Relative Density SANS 3001: GR30

Moisture Content (%)	18.5	22.0
Relative Density (S.G.)		

Sieve Analysis (Wet Prep) SANS 3001: GR1

Percentage Passing	100 mm	100	100
	75 mm	100	100
	63 mm	100	100
	50 mm	100	100
	37.5 mm	100	100
	28 mm	100	100
	20 mm	100	100
	14 mm	100	100
	5 mm	96	85
	2 mm	91	72
	1 mm	91	72
	0.425 mm	77	58
	0.250 mm	69	56
	0.150 mm	57	51
0.075 mm	45	45	
Grading Modulus		0.87	1.25



Hydrometer Analysis SANS 3001: GR3

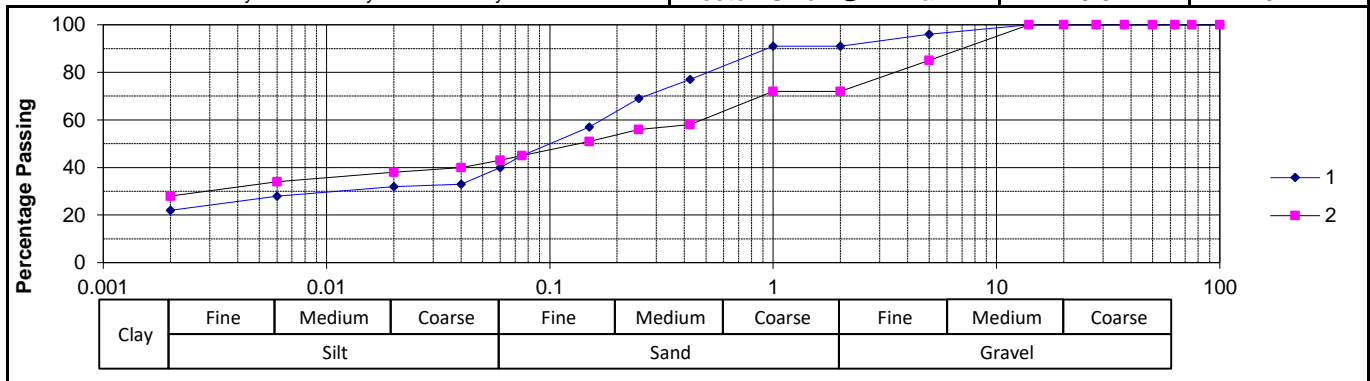
Percentage Passing	0.060 mm	40	43
	0.040 mm	33	40
	0.020 mm	32	38
	0.006 mm	28	34
	0.002 mm	22	28
Gravel	%	9	28
Sand	%	51	29
Silt	%	18	15
Clay	%	22	28

Note: An assumed S.G. may be used in Hydrometer Analysis calculations

Laboratory Number		1	2
Atterberg Limits -425µ		SANS 3001: GR10-GR12	
Liquid Limit	%	31	41
Plasticity Index	%	15	16
Linear Shrinkage	%	7.0	8.0
Overall PI	%	12	9

Classifications

HRB (AASHTO)	A-6(3)	A-7-6(4)
Unified (ASTM D2487)	SC	SC
Weston Swell @ 1 kPa	0.3	0.2



SOILCO MATERIALS INVESTIGATIONS (PTY) LTD



CIVIL ENGINEERING MATERIALS TESTING LABORATORY

Reg. No. : 1965/09585/07

25 WESTMEAD ROAD - WESTMEAD P.O.BOX 15318 WESTMEAD 3608 KWAZULU - NATAL
TELEPHONE : 031 7004325 TELEFAX : 031 7001909 email : soilslab@mweb.co.za



T0213

Client :	SYNCLINE GEOTECHNICAL ENGINEERING PTY LTD	Date Received:	19/01/2021
Project :	NGWELEZANE HOSPITAL	Date Reported:	02/02/2021
Project No:	2021-D-104	Page No. :	3 of 7

MOISTURE DENSITY RELATIONSHIP

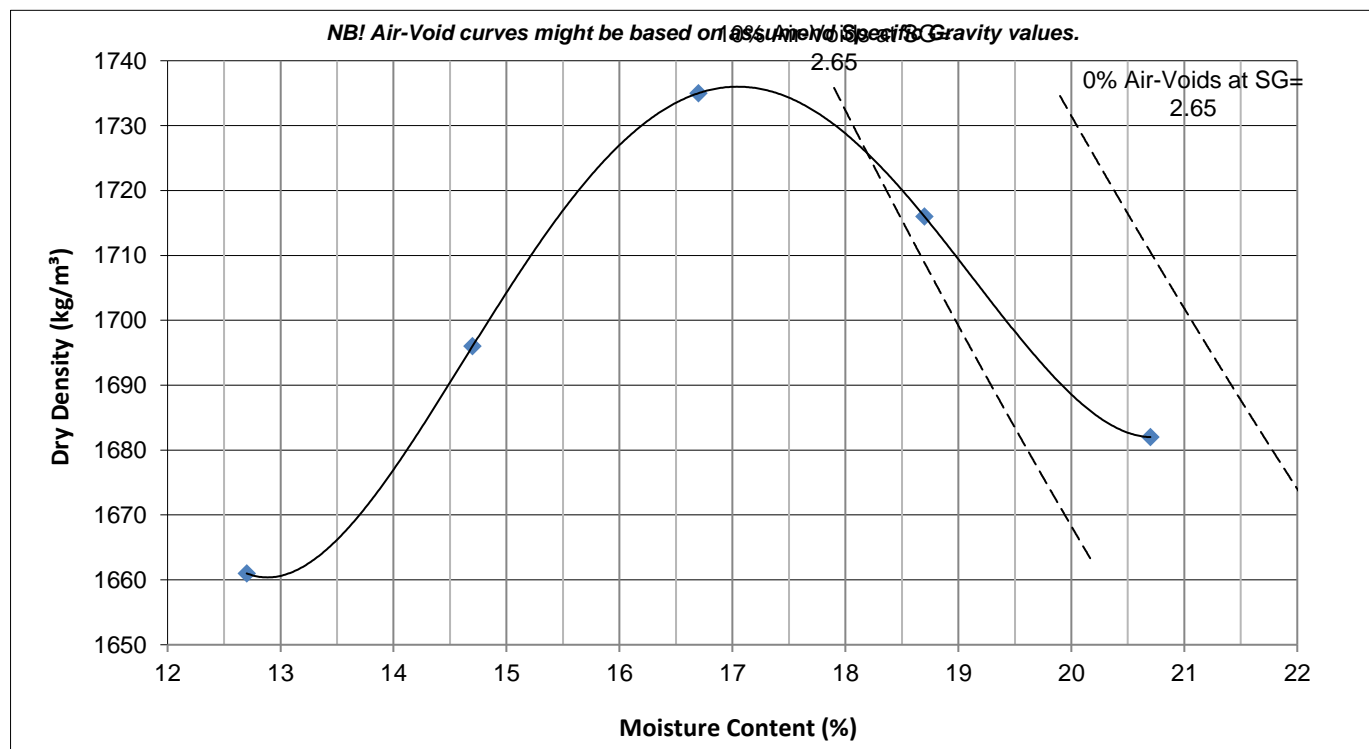
Laboratory Number		1	
Field Number			
Client Reference		IP2	
Depth (m)		0.2 - 0.8	
Position			
Coordinates	X		
	Y		
Description		Moderate Brown Clayey Sand - Colluvium	
Additional Information			
Calcrete / Crushed			
Stabilizing Agent		Natural	

Maximum Dry Density & Optimum Moisture Content - SANS 3001: GR30

Compactive Effort:			
--------------------	--	--	--

Dry Density	kg/m ³	1661	1696	1735	1716	1682	
Moisture Content	%	12.7	14.7	16.7	18.7	20.7	

Max. Dry Density	kg/m ³	1736
Optimum Moisture	%	17.1



SOILCO MATERIALS INVESTIGATIONS (PTY) LTD



CIVIL ENGINEERING MATERIALS TESTING LABORATORY

Reg. No. : 1965/09585/07

25 WESTMEAD ROAD - WESTMEAD P.O.BOX 15318 WESTMEAD 3608 KWAZULU - NATAL
TELEPHONE : 031 7004325 TELEFAX : 031 7001909 email : soilslab@mweb.co.za



T0213

Client :	SYNCLINE GEOTECHNICAL ENGINEERING PTY LTD	Date Received:	19/01/2021
Project :	NGWELEZANE HOSPITAL	Date Reported:	02/02/2021
Project No:	2021-D-104	Page No. :	4 of 7

MOISTURE DENSITY RELATIONSHIP

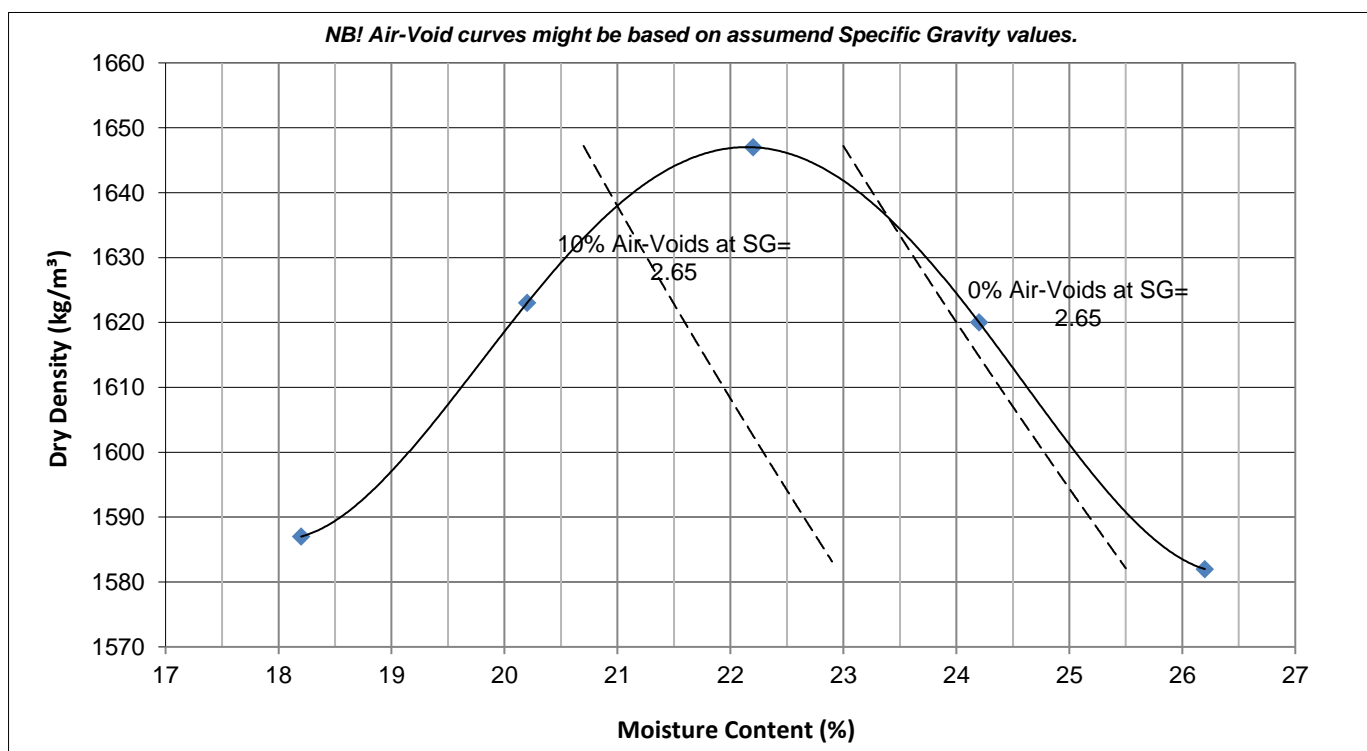
Laboratory Number		2	
Field Number			
Client Reference		IP3	
Depth (m)		0.6 - 1.5	
Position			
Coordinates	X		
	Y		
Description		Reddish Brown Clayey Sand - Residual	
Additional Information			
Calcrete / Crushed			
Stabilizing Agent		Natural	

Maximum Dry Density & Optimum Moisture Content - SANS 3001: GR30

Compactive Effort:			
--------------------	--	--	--

Dry Density	kg/m ³	1587	1623	1647	1620	1582	
Moisture Content	%	18.2	20.2	22.2	24.2	26.2	

Max. Dry Density	kg/m ³	1647
Optimum Moisture	%	22.1



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T0213

Client : SYNCLINE GEOTECHNICAL ENGINEERING PTY LTD Date Received : 19/01/2021
Project : NGWELEZANE HOSPITAL Date Reported : 02/02/2021
Project No : 2021-D-104 Page No. : 5 of 7

MATERIALS TEST REPORT

Laboratory Number	1	2		
Field Number				
Client Reference	IP2	IP3		
Depth (m)	0.2 - 0.8	0.6 - 1.5		
Position				
Coordinates	X			
	Y			
Description	Moderate Brown Clayey Sand - Colluvium	Reddish Brown Clayey Sand - Residual		
Additional information				
Calcrete/Crushed Stabilizing Agent	Natural	Natural		

Sieve Analysis (Wet preparation)

SANS 3001: GR1

Percentage Passing	Sieve Analysis (wet preparation)			Sieve Analysis (dry)		
		100 mm	100	100		
		75 mm	100	100		
		63 mm	100	100		
		50 mm	100	100		
		37.5 mm	100	100		
		28 mm	100	100		
		20 mm	100	100		
		14 mm	100	100		
		5 mm	96	85		
		2 mm	91	72		
		1 mm	91	72		
		0.425 mm	77	58		
	0.075 mm	45	45			
Grading Modulus		0.87	1.25			

Soil Mortar Analysis

Coarse Sand	2.0-0.425	15	19		
Coarse Fine Sand	0.425-0.250	8	3		
Medium Fine Sand	0.250-0.150	13	6		
Fine Fine Sand	0.150-0.075	13	9		
Silt and Clay	<0.075	50	62		

Atterberg Limits

SANS 3001: GR10-GR12

Liquid Limit	%	31	41		
Plasticity Index	%	15	16		
Linear Shrinkage	%	7	8		

Maximum Dry Density & Optimum Moisture Content

SANS 3001: GR30

Max. Dry Density	kg/m ³	1736	1647		
Optimum Moisture	%	17.1	22.1		

CBR SANS 3001: GR40

UCS

ITS

Test Type	CBR (%)	UCS (kPa)	ITS (kPa)	CBR (%)	UCS (kPa)	ITS (kPa)	CBR (%)	UCS (kPa)	ITS (kPa)	CBR (%)	UCS (kPa)	ITS (kPa)
Interpolated Data												
@ 100%	24.6			29.3								
@ 98%	17.3			20.4								
@ 97%	14.5			17								
@ 95%	10.2			11.8								
@ 93%	7.2			8.2								
@ 90%	4.3			4.8								
Value @ Mod. AASHTO effort												
Swell (%) @ Mod. AASHTO effort	0.2			0.1								

Classifications

HRB	A-6(3)	A-7-6(4)		
COLTO	Less than G9	Less than G9		
TRH14	G9	G9		

[illegible]

SOILCO MATERIALS INVESTIGATIONS (PTY) LTD



CIVIL ENGINEERING MATERIALS TESTING LABORATORY

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TELEPHONE : 031 7004325 TELEFAX : 031 7001909 email : soilslab@mweb.co.za



T0213

Client	: SYNCLINE GEOTECHNICAL ENGINEERING PTY LTD	Date Received	: 19/01/2021
Project	: NGWELEZANE HOSPITAL	Date Reported	: 03/02/2021
Project No	: 2021-D-104		

SAMPLING PLAN and METHODS

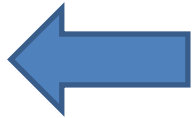
Lab. No.	Field No.	Sample Type/ Delivery	Client Ref. No.	Position	Description	Additional Information	Sampling			Remarks, Deviations etc.	Image
	Depth (m)						Method	Date	Time		
1	0.2 - 0.8		IP2		Moderate Brown Clayey Sand - Colluvium		Sample Delivered by Customer				
2	0.6 - 1.5		IP3		Reddish Brown Clayey Sand Residual		Sample Delivered by Customer				

FIGURE 1

February 25, 2021

SITE PLAN

NORTH



Test Position	Latitude (S)	Longitude (E)
IP1/DCP1	S28° 46' 37.2"	E31° 52' 02.2"
IP2/DCP2	S28° 46' 36.5"	E31° 52' 01.1"
IP3/DCP3	S28° 46' 37.7"	E31° 52' 01.1"
IP4/DCP4	S28° 46' 38.3"	E31° 52' 01.4"
IP5/DCP5	S28° 46' 38.1"	E31° 52' 00.3"
DCP6	S28° 46' 37.4"	E31° 52' 00.5"
DCP7	S28° 46' 38.0"	E31° 52' 01.8"
DCP8	S28° 46' 37.2"	E31° 52' 01.4"
PT1	S28° 46' 37.4"	E31° 52' 00.5"



IP1 – Approximate position of Inspection Pit

DCP1 – Approximate position of CBR Dynamic Cone Penetrometer (DCP) Test

PT1 – Approximate position of Percolation Test

Image sourced from Google Earth 2021		
Latitude:	S28° 46' 37.2"	
Longitude:	E31° 52' 02.2"	
Scale:	As shown on image	



PROJECT: Orthotics and Prosthetics Centre (Option 4) - Ngwelezane Hospital	
CLIENT: Ukuza Consulting (Pty) Ltd	
DATE: 25 February 2021	PROJECT REFERENCE NUMBER: SGE-003-2021
DRAWN BY: K. Govender	FIGURE NUMBER: 1 – Site Plan
CHECKED BY: S. Pather	REVISION: 0



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 10

EPWP - Additional Specification

ADDITIONAL SPECIFICATION - EPWP

SL EMPLOYMENT AND TRAINING OF EPWP BENEFICIARY ON THE EXPANDED PUBLIC WORKS PROGRAMME (EPWP) Infrastructure Projects:

CONTENTS

SL 01	SCOPE
SL 02	TERMINOLOGY AND DEFINITIONS
SL 03	APPLICABLE LABOUR LAWS
SL 04	EXTRACTS FROM MINISTERIAL DETERMINATION REGARDING EPWP
SL 05	EMPLOYER'S RESPONSIBILITIES
SL 06	PLACEMENT OF RECRUITED EPWP BENEFICIARY
SL 07	TRAINING OF YOUTH WORKERS
SL 08	BENEFICIARY (EPWP BENEFICIARY) SELECTION CRITERIA
SL 09	CONTRACTUAL OBLIGATIONS IN RELATION TO EPWP BENEFICIARY
SL 10	PROVINCIAL RATES OF PAY
SL 11	MEASUREMENTS AND PAYMENT
EXAMPLE	EPWP EMPLOYMENT AGREEMENT

SL 01 SCOPE

This project is part of the Expanded Public Works Programme aims to train young people and provide them with practical work experience as part of this programme. Youth aged between 18 and 35 will be recruited and trained in skills relevant to the work to be done on this project. These youth will have to be employed by the contractor as part of this project so that they can gain their work experience on these projects. The training of the youth will be coordinated and implemented by a separate service provider. This service provider will provide the contractor with a list of all the youth and the training each of these youth have received. The Contractor will be required to employ all of these youth for a minimum period of 6 months. Furthermore the Contractor will be required to supervise these youth to ensure that the work they perform is of the required standard.

If necessary the contractor's staff will be required to assist and mentor the youth to ensure that they are able to perform the type of work they need to do to the satisfactory standards required. The contractor will not be required to employ all youth in the programme at the same time, but may rotate the youth on the project, as long as all youth are employed for the minimum duration stated earlier.

This specification contains the standard terms and conditions for workers employed in elementary occupations and trained on a Expanded Public Works Programme (EPWP) for the Infrastructure Programme.

SL 02 TERMINOLOGY AND DEFINITIONS

SL 02.01 TERMINOLOGY

- (a) EPWP The Code of Good Practice for Expanded Public Works Programmes, which has been gazetted by the Department of Labour, and which provides for special conditions of employment for these EPWP projects. In terms of the Code of Good Practice, the workers on these projects are entitled to formal training, which will be provided by training providers appointed (and funded) by the Department of Labour. For projects of up to six months in duration, this training will cover life-skills and information about other education, training and employment opportunities.
- (b) EPWP Expanded Public Works Programme, a National Programme of the government of South Africa, approved by Cabinet.
- (c) UYF Umsobumvu Youth Fund.
- (d) DOL Department of Labour.

SL 02.02 DEFINITIONS

- (a) "employer" means the contractor or any party employing the worker / beneficiary under the EPWP Programme.
- (b) "client" means the Department of Public Works.
- (c) "worker / trainee" means any person working or training in an elementary occupation on a EPWP.

SL 03 APPLICABLE LABOUR LAWS

In line with the Expanded Public Works Programme (EPWP) policies, the Ministerial Determination, Special Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of labour in government Notice No. R63 of 25 January 2002, of which extracts have been reproduced below in clauses SL 04 shall apply to works described in the scope of work and which are undertaken by unskilled or semi-skilled workers. The Code of Good Practice for Employment and Conditions of Work for Expanded Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice No. R64 of 25 January 2002 shall apply to works described in the scope of work and which unskilled or semi-skilled workers undertake.

SI 04 EXTRACTS FROM MINISTERIAL DETERMINATION REGARDING EPWP

SL 04.01 DEFINITIONS

- (a) "department" means any department of the State, implementing agent or contractor;
- (b) "employer" means any department that hires workers to work in elementary occupations on a EPWP;
- (c) "worker" means any person working in an elementary occupation on a EPWP;
- (d) "elementary occupation" means any occupation involving unskilled or semi-skilled work;
- (e) "management" means any person employed by a department or implementing agency to administer or execute a EPWP;
- (f) "task" means a fixed quantity of work;
- (g) "task-based work" means work in which a worker is paid a fixed rate for performing a task;
- (h) "task-rated worker" means a worker paid on the basis of the number of tasks completed;
- (i) "time-rated worker" means a worker paid on the basis of the length of time worked
- (j) "Service Provider" means the consultant appointed by Department to coordinate and arrange the employment and training of labour on EPWP infrastructure projects.

SL 04.02 TERMS OF WORK

- (a) Workers on a EPWP are employed on a temporary basis.
- (b) A worker may NOT be employed for longer than 24 months in any five-year cycle on a EPWP.
- (c) Employment on a EPWP does not qualify as employment and a worker so employed does not have to register as a contributor for the purposes of the Unemployment Insurance Act 30

SL 04.03 NORMAL HOURS OF WORK

- (a) An employer may not set tasks or hours of work that require a worker to work—
 - (i) more than forty hours in any week
 - (ii) on more than five days in any week; and
 - (iii) for more than eight hours on any day.
- (b) An employer and a worker may agree that the worker will work four days per week. The worker may then work up to ten hours per day.

- (c) A task-rated worker may not work more than a total of 55 hours in any week to complete the tasks (based on a 40-hour week) allocated to him.

Every worker is entitled to a daily rest period of at least eight consecutive hours. The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next day.

SL 04.04 MEAL BREAKS

- (a) A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.
- (b) An employer and worker may agree on longer meal breaks.
- (c) A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.

SL 04.05 SPECIAL CONDITIONS FOR SECURITY GUARDS

- (a) A security guard may work up to 55 hours per week and up to eleven hours per day.
- (b) A security guard who works more than ten hours per day must have a meal break of at least one hour duration or two breaks of at least 30 minutes duration each.

SL 04.06 DAILY REST PERIOD

Every worker is entitled to a daily rest period of at least eight consecutive hours. The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next day.

SL 04.07 WEEKLY REST PERIOD

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

SL 04.08 WORK ON SUNDAYS AND PUBLIC HOLIDAYS

- (a) A worker may only work on a Sunday or public holiday to perform emergency or security work.
- (b) Work on Sundays is paid at the ordinary rate of pay.
- (c) A task-rated worker who works on a public holiday must be paid –
 - (i) the worker's daily task rate, if the worker works for less than four hours;
 - (ii) double the worker's daily task rate, if the worker works for more than four hours.
- (d) A time-rated worker who works on a public holiday must be paid –
 - (i) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday;
 - (ii) double the worker's daily rate of pay, if the worker works for more than four hours on the public holiday.

SL 04.09 SICK LEAVE

- (a) Only workers who work four or more days per week have the right to claim sick-pay in terms of this clause.
- (b) A worker who is unable to work on account of illness or injury is entitled to claim one day's paid sick leave for every full month that the worker has worked in terms of a contract.
- (c) A worker may accumulate a maximum of twelve days' sick leave in a year.
- (d) Accumulated sick-leave may not be transferred from one contract to another contract.

- (e) An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.
- (f) An employer must pay a time-rated worker the worker's daily rate of pay for a day's sick leave.
- (g) An employer must pay a worker sick pay on the worker's usual payday.
- (h) Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is –
 - (i) absent from work for more than two consecutive days; or
 - (ii) absent from work on more than two occasions in any eight-week period.
- (i) A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity.
- (j) A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Diseases Act.

SL 04.10 MATERNITY LEAVE

- (a) A worker may take up to four consecutive months' unpaid maternity leave.
- (b) A worker is not entitled to any payment or employment-related benefits during maternity leave.
- (c) A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.
- (d) A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.
- (e) A worker may begin maternity leave –
 - (i) four weeks before the expected date of birth; or
 - (ii) on an earlier date –
 - (1) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or
 - (2) if agreed to between employer and worker; or
 - (iii) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.
- (f) A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth.
- (g) A worker who returns to work after maternity leave, has the right to start a new cycle of twenty-four months employment, unless the EPWP on which she was employed has ended.

SL 04.11 FAMILY RESPONSIBILITY LEAVE

- (a) Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances –
 - (i) when the employee's child is born;
 - (ii) when the employee's child is sick;

- (iii) in the event of the death of –
 - (1) the employee's spouse or life partner
 - (2) the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling

SL 04.12 STATEMENT OF CONDITIONS

- (a) An employer must give a worker a statement containing the following details at the start of employment –
 - (i) the employer's name and address and the name of the EPWP;
 - (ii) the tasks or job that the worker is to perform;
 - (iii) the period for which the worker is hired or, if this is not certain, the expected duration of the contract;
 - (iv) the worker's rate of pay and how this is to be calculated;
 - (v) the training that the worker may be entitled to receive during the EPWP.
- (b) An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement.
- (c) An employer must supply each worker with a copy of the relevant conditions of employment contained in this specification.
- (d) An employer must enter into a formal contract of employment with each employee. A copy of a pro-forma is attached at the end of this specification.

SL 04.13 KEEPING RECORDS

- (a) Every employer must keep a written record of at least the following –
 - (i) the worker's name and position;
 - (ii) in the case of a task-rated worker, the number of tasks completed by the worker;
 - (iii) in the case of a time-rated worker, the time worked by the worker;
 - (iv) payments made to each worker.
- (b) The employer must keep this record for a period of at least three years after the completion of the EPWP.

SL 04.14 PAYMENT

- (a) A task-rated worker will only be paid for tasks that have been completed.
- (b) An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer. Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.
- (c) A time-rated worker will be paid at the end of each month and payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.
- (d) Payment in cash or by cheque must take place –
 - (i) at the workplace or at a place agreed to by at least 75% of the workers; and
 - (ii) during the worker's working hours or within fifteen minutes of the start or finish of work;
- (e) All payments must be enclosed in a sealed envelope which becomes the property of the worker.
- (f) An employer must give a worker the following information in writing –
 - (i) the period for which payment is made;
 - (ii) the number of tasks completed or hours worked;
 - (iii) the worker's earnings;

- (iv) any money deducted from the payment;
- (v) the actual amount paid to the worker.
- (g) If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it.
- (h) If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

SL 04.15 DEDUCTIONS

- (a) An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.
- (b) An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.
- (c) An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned.
- (d) An employer may not require or allow a worker to –
 - (i) repay any payment except an overpayment previously made by the employer by mistake;
 - (ii) state that the worker received a greater amount of money than the employer actually paid to the worker; or
 - (iii) pay the employer or any other person for having been employed.

SL 04.16 HEALTH AND SAFETY

- (a) Employers must take all reasonable steps to ensure that the working environment is healthy and safe and that all legal requirements regarding health and safety are strictly adhered to.
- (b) A worker must:
 - (i) work in a way that does not endanger his/her health and safety or that of any other person;
 - (ii) obey any health and safety instruction;
 - (iii) obey all health and safety rules;
 - (iv) use any personal protective equipment or clothing issued by the employer;
 - (v) report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

SL 04.17 COMPENSATION FOR INJURIES AND DISEASES

- (a) It is the responsibility of employers to arrange for all persons employed on a EPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.
- (b) A worker must report any work-related injury or occupational disease to their employer or manager.
- (c) The employer must report the accident or disease to the Compensation Commissioner.
- (d) An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

SL 04.18 TERMINATION

- (a) The employer may terminate the employment of a worker provided he has a valid reason and after following existing termination procedures.
- (b) A worker will not receive severance pay on termination.
- (c) A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement.
- (d) A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.
- (e) A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

SL 04.19 CERTIFICATE OF SERVICE

- (a) On termination of employment, a worker is entitled to a certificate stating –
 - (i) the worker's full name;
 - (ii) the name and address of the employer;
 - (iii) the SPWP on which the worker worked;
 - (iv) the work performed by the worker;
 - (v) any training received by the worker as part of the EPWP;
 - (vi) the period for which the worker worked on the EPWP;
 - (vii) any other information agreed on by the employer and worker.

SL 05 EMPLOYER'S RESPONSIBILITIES

The employer shall adhere to the conditions of employment as stipulated in the *Code of Good Practice for Employment and Conditions of Work for Expanded Public Works Programmes*. Over and above the conditions stipulated above, he shall be responsible to:

- (a) formulate and design a contract between himself/ herself and each of the recruited EPWP beneficiary, ensuring that the contract does not contravene any of the Acts stipulated in South African Law, e.g. Basic Conditions of Employment Act, etc. (A copy of a pro-forma contract is attached at the end of this specification);
- (b) screen and select suitable candidates for employment from the priority list of EPWP beneficiary provided by the Umsobumvu Youth Fund (UYF);
- (c) ensure that the recruited EPWP beneficiary are made available to receive basic life skills training which will be conducted and paid for by the Umsobumvu Youth Fund;
- (d) ensure that all EPWP beneficiary receive instruction on safety on site prior to them commencing with work on site;
- (e) ensure that all EPWP beneficiary are covered under workmen's compensation for as long as they are contracted to the contractor. Payment to the Compensation Commissioner shall be the responsibility of the contractor;
- (f) assist in the identification and assessment of potential EPWP beneficiary to undergo advanced technical training in respective trades;
- (g) test and implement strict quality control and to ensure that the health and safety regulations are adhered to;
- (h) provide all EPWP beneficiary with the necessary protective clothing as required by law for the specific trades that they are involved in.
- (i) provide overall supervision and day-to-day management of EPWP beneficiary and/or sub-contractors; and
- (j) ensure that all EPWP beneficiary are paid their wages on time through a pre-agreed payment method as stipulated in the contract with the EPWP beneficiary.

SL 06 PLACEMENT OF RECRUITED EPWP BENEFICIARY

Employers will be contractually obliged to:

- (a) employ EPWP beneficiary from targeted social groups from the priority list provided by the Service Provider/ Umsobumvu Youth Fund.
- (b) facilitate on-the-job training and skills development programmes for the EPWP beneficiary;
- (c) achieve the following minimum employment targets:
 - (i) 55% people between the ages of 18 and 35
 - (ii) 55% women;
 - (iii) 2% people with disabilities.
- (d) brief EPWP beneficiary on the conditions of employment as specified in sub clause SL 04.09 above;
- (e) enter into a contract with each EPWP beneficiary, which contract will form part of the Employment Agreement;
- (f) allow EPWP beneficiary the opportunity to attend life skills training through DOL. This shall be arranged at the beginning of the contract;
- (g) ensure that payments to EPWP beneficiary are made as set out in sub clauses SL 04.14 and SL 04.15 above.
- (h) set up of personal profile files as prescribed by EPWP beneficiary and as set out in sub clause SL 04.13 above.
- (i) in addition to (h)
 - a copy of the I.D;
 - qualifications;
 - career progress;
 - EPWP Employment Agreement, and
 - list of small trade tools;

must be included in the EPWP beneficiary's personal profile file.

SL 07 TRAINING OF EPWP BENEFICIARY

Three types of training are applicable, namely

- Life skills;
- On the job training and
- Technical Skills training.

Training will be implemented by training instructors accredited by DOL and/or CETA :

- EPWP beneficiary shall be employed on the projects for an average of 6 months.
- EPWP beneficiary shall be deployed on projects in the vicinity of their homes. The same arrangements as for other workers regarding accommodation, subsistence and travel shall be applicable to EPWP beneficiary.

(a) Life skills training

All EPWP beneficiary are entitled to undergo life skills training. Training of this module will be flexible enough to meet the needs of the employer. Training should take place immediately after site hand-over and during the period of site establishment and pre-planning before actual construction starts, alternatively this will be spread over the duration of the contract period. The contractor will be required to work closely with the person to schedule the training sessions so that the timing of the training is aligned with the contractors work schedule and his demand for workers.

(b) On-the job training

The Employer shall provide EPWP beneficiary with on-the-job training to enable them to fulfil their employment requirements. The employer shall also be expected to closely monitor the job performance of EPWP beneficiary and shall identify potential EPWP beneficiary for skills development programmes.

- (c) Technical skills training
The Employer shall assist in identifying EPWP beneficiary for further training. These EPWP beneficiary will undergo further technical training to prepare them for opportunities as semi-skilled labourers.

Such training will comprise of an off-site theoretical component and practical training on-site.

The contractor will be responsible for on-site practical work under his supervision. EPWP beneficiary who graduate from the first phase of the training programme will be identified and given opportunities to register for skills development programmes. These can ultimately result in a accredited qualification. The programme will consist of theoretical instruction away from the construction site as well as on-site practical work under the supervision of the employer. Candidates will be entitled to employment to complete all training modules.

SL 08 BENEFICIARY (EPWP BENEFICIARY) SELECTION CRITERIA

SL 08.01 PREAMBLE

The *Code of Good Practise for Employment and Conditions of Work for Expanded Public Works Programmes* encourages:

- optimal use of locally-based labour in a Expanded Public Works Programme (EPWP);
- a focus on targeted groups which consist of namely youth, consisting of women, female-headed households, disabled and households coping with HIV/AIDS; and
- the empowerment of individuals and communities engaged in a SPWP through the provision of training.

SL 08.02 BENEFICIARY (EPWP BENEFICIARY) SELECTION CRITERIA

- (a) The EPWP beneficiary of the programmes should preferably be non-working individuals from the most vulnerable sections of disadvantaged communities who do not receive any social security pension income. The local community must, through all structures available, be informed of and consulted about the establishment of any EPWP
- (b) In order to spread the benefit as broadly as possible in the community, a maximum of one person per household should be employed, taking local circumstances into account.
- (c) Skilled artisans from other areas may be employed if they have skills that are required for a project and there are not enough persons in the local communities who have those skills or who could undergo appropriate skills training. However, this should not result in more than 20% of persons working on a programme not being from local communities.
- (d) Programmes should set participation targets for employment with respect to youth, single male- and female-headed households, women, people with disabilities, households coping with HIV/AIDS, people who have never worked, and those in long-term unemployment.
- (e) The proposed targets as set out in sub clause SL 06 (c)
- 55% youth from 18 to 35 years of age;
 - 60% women;
 - 2% disabled.

SL 09 CONTRACTUAL OBLIGATIONS IN RELATION TO YOUTH LABOUR

The EPWP beneficiary to be employed in the programme (EPWP) shall be directly contracted to the employer. Over and above the construction and project management responsibilities, the employer will be expected to perform the tasks and responsibilities as set out in clause SL 05 above.

SL 10 PROVINCIAL RATES OF PAY

It is stipulated that youth workers on the EPWP receive a minimum of R 1 000 per month whilst working and R 600 per month whilst on training in ALL provinces. Should EPWP beneficiary be attending training whilst employed by the contractor, the contractor will still be responsible for payment to the EPWP beneficiary whilst at training.

SL 11 MEASUREMENTS AND PAYMENT

The number of EPWP beneficiary specified for this contract that will receive life skills training is 50 and technical training is 50

SL 11.01 PAYMENT FOR TRAINING OF EPWP BENEFICIARY (TARGET:- 50 EPWP BENEFICIARY)

SL 11.01.01 Skills development and Technical training for EPWP beneficiary for an average of 10 days(Prov.Sum).....Unit: R/EPWP beneficiary

The above item is only applicable if DoL does not fund the Technical Training PRIOR to site handover.

SL 11.01.02 Penalty due to not meeting the target as in SL 11.01.01.....Unit: EPWP beneficiary LESS R 2000 per EPWP beneficiary

SL 11.02 PAYMENT FOR TRAVELLING AND ACCOMMODATION DURING OFF-SITE TRAINING

SL 11.02.01 Life skills training for 26 days:

- 01 Travelling (based on 50 km/EPWP beneficiary)Unit: km
- 02 Accommodation.....(Prov.Sum).....Unit: R/EPWP beneficiary
- 03 Profit and attendance..... Unit: %

SL 11.02.02 Skilled development and Technical training:

- 01 Travelling (based on 50 km/EPWP beneficiary).....Unit: km
- 02 Accommodation.....(Prov.Sum)....Unit: R/EPWP beneficiary
- 03 Profit and attendance Unit: %

The units of measurement for sub items SL 11.02.01 (01) and SL 11.02.02 (01) above shall be the distance travelled in km by the EPWP beneficiary trained off site. The tendered rate shall include full compensation to safely transport the youth workers to and from the training venue/s.

The unit of measurement for sub items SL 11.02.01 (02) and SL 11.02.02 (02) above shall be the amounts in Rand expended for accommodation and daily meal allowances for the EPWP beneficiary trained off site that must be arranged by the contractor. Amounts quoted shall be corrected according to re-measurement based on actual invoices.

The tendered percentages under sub items SL 11.02.01 (03) and SL 11.02.02 (03) will be paid to the contractor on the value of each payment pertaining to the accommodation and advance meal allowances to cover his expenses in this regard.

SL 11.03 ALTERNATIVE WORKERS FOR THE PERIOD OF OFF-SITE TRAINING

SL 11.03.01 Life skills training for 26 days Unit: worker-days

SL 11.03.02 Skilled development and Technical training for EPWP beneficiary for (.....) days..... Unit: worker-days

The unit of measurement shall be the number of EPWP beneficiary replaced while in training multiplied by the number of days absent from the site.

The rates tendered shall include full compensation for additional replacement labour during periods of off-site training.

SL 11.04 EMPLOYMENT OF EPWP BENEFICIARY

SL 11.04.01 Employment of EPWP beneficiary.....(Prov.Sum)¼.Unit: R/ worker-month

SL 11.04.02 Employment of EPWP beneficiary.....(Prov.Sum)¼.Unit: R/ worker-month

The unit of measurement shall be the number of EPWP beneficiary at the statutory labour rates of R multiplied by the period employed in months and the rate tendered shall include full compensation for all costs associated with the employment of EPWP beneficiary and for complying with the conditions of contract. The cost for the training shall be excluded from this item. This item is based on 6 months appointment for EPWP beneficiary.

SL 11.05 PROVISION OF EPWP DESIGNED OVERALLS TO EPWP BENEFICIARY

SL 11.05.01 Supply EPWP designed overalls to EPWP beneficiary (Prov.Sum).....Unit: R

EPWP beneficiary overalls should be orange (top and bottom) as per EPWP specification with the exception of Correctional Services contracts where the EPWP beneficiary top would be blue and the bottom orange.

SL 11.05.02 Profit and attendance..... Unit: %

An amount has been provided in the Schedule of Quantities under sub item SL 10.05.01 for the supply of EPWP designed overalls, as per the specification provided by the EPWP unit, arranged by the Service Provider. The Engineer will have sole authority to spend the amounts or part thereof. The tendered percentage under sub items SL 10.05.02 will be paid to the contractor on the value of each payment pertaining to the supply of overalls to cover his expenses in this regard.

SL 11.06 PROVISION OF SMALL TOOLS FOR EPWP BENEFICIARY

SL 11.06.01 Provide all EPWP beneficiary with prescribed tools for their respective trades. Specification for the mentioned tools to be provided by the EPWP Service Provider. These tools will become the property of the EPWP beneficiary after the completion of the programme.....(Prov.Sum)....Unit: R 500-00 /youth worker

SL 11.06.02 Profit and attendance..... Unit: %

SL 11.07 APPOINTMENT OF EPWP BENEFICIARY TEAM LEADER/S

SL 11.07.01 Appointment of (____) EPWP beneficiary team leader/s for the duration of the contract.....(Prov.Sum)..... Unit: R / EPWP beneficiary team leader

The EPWP beneficiary Team Leader will act as CLO/PLO to facilitate the project work between the EPWP beneficiary and the contractor. Umsobumvu Youth Fund can assist with the sourcing of EPWP beneficiary Team Leader for employment by the contractor.

SL 11.08 LIAISON WITH SERVICE PROVIDER.....Unit: hours

The tendered rate shall include full compensation for the cost of liaising with the Service Provider and Social Facilitators on all issues regarding the works.



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 11

EPWP Scope of Works

SCOPE OF WORKS IN RESPECT OF WORK RELATING TO THE EXPANDED PUBLIC WORKS PROGRAMME (EPWP)			
Project title:	Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area		
Project Code:	070638	EPWP NO:	0

Introductory notes:

1. The works, or parts of the works will be constructed using labour-intensive methods only in terms of this specification. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letters **LI** are not necessarily an exhaustive list of all the activities which must be done by hand, and this clause does not over-ride any of the requirements in the generic labour intensive specification in the Scope of Works.
2. Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment.

DESCRIPTION OF THE WORKS

Employer's objectives

The employer's objectives are to deliver public infrastructure using labour-intensive methods in accordance with EPWP Guidelines.

Labour-intensive works

Labour-intensive works comprise the activities described in the Labour-Intensive Specification. Labour-intensive works shall be constructed/maintained using local workers who are temporarily employed in terms of the scope of work.

LABOUR-INTENSIVE COMPETENCIES OF SUPERVISORY AND MANAGEMENT STAFF

Contractors shall only engage supervisory and management staff in labour-intensive works that have completed the skills programme including Foremen/ Supervisors at NQF level 4 "National Certificate: Supervision of Civil Engineering Construction Processes" and Site Agent/ Manager at NQF level 5 "Manage Labour-Intensive Construction Processes" or equivalent QCTO qualifications (See Appendix C). at NQF outlined in Table 1. (See GUIDELINES FOR THE IMPLEMENTATION OF LABOUR-INTENSIVE INFRASTRUCTURE PROJECTS UNDER THE EXPANDED PUBLIC WORKS PROGRAMME (EPWP) -THIRD EDITION 2015)

Emerging contractors shall have personally completed, or be registered on a skills programme for the NQF level 2 unit standard. All other site supervisory staff in the employ of emerging contractors must have completed, or be registered on a skills programme for the NQF level 2 unit standards or NQF level 4 unit standards. Table 1: Skills programme for supervisory and management staff.

Table 1: Skills programme for supervisory and management staff

Personnel	NQF level	Unit standard titles	Skills programme description
Team leader / supervisor	2	Apply Labour-Intensive Construction Systems and Techniques to Work Activities	This unit standard must be completed, and any one of these 3 unit standards
		Use Labour-Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	
		Use Labour-Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour-Intensive Construction Methods to Construct, Repair and Maintain structures	

Personnel	NQF level	Unit standard titles	Skills programme description
Foreman/supervisor	4	Implement Labour-Intensive Construction Systems and Techniques	This unit standard must be completed, and
		Use Labour-Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	any one of these 3 unit standards
		Use Labour-Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour-Intensive Construction Methods to Construct, Repair and Maintain structures	
Site Agent /Manager (i.e. the contractor's most senior representative that is resident on the site)	5	Manage Labour-Intensive Construction Processes	Skills Programme against this single unit standard
Details of these skills programmes may be obtained from the CETA ETQA manager (e-mail :gerard@ceta.co.za , tel: 011-265 5900)			

EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR-INTENSIVE WORKS

- 1.1 Requirements for the sourcing and engagement of labour.
 - 1.1.1 Unskilled and semi-skilled labour required for the execution of all labour-intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour.
 - 1.1.2 The rate of pay set for the SPWP per task or per day will be an acceptable rate determined by the Department of Labour.
 - 1.1.3 Tasks established by the contractor must be such that:
 - a) the average worker completes 5 tasks per week in 40 hours or less; and
 - b) the weakest worker completes 5 tasks per week in 55 hours or less.
 - 1.1.4 The contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of 1.1.3.
 - 1.1.5 The Contractor shall, through all available community structures, inform the local community of the labour-intensive
 - a) where the head of the household has less than a primary school education;
 - b) that have less than one full time person earning an income;
 - c) where subsistence-agriculture is the source of income.
 - d) that who are not in receipt of any social security pension income
 - 1.1.6 The Contractor shall endeavour to ensure that the expenditure on the employment of unskilled and semi-skilled workers is in the following proportions:
 - a) 60% women;
 - b) 55% youth who are between the ages of 18 and 35; and
 - c) 2% on persons with disabilities.
- 1.2 Specific provisions pertaining to SANS 1914-5
 - 1.2.1 Definitions

Targeted labour: Unemployed persons who are employed as local labour on the project.
 - 1.2.2 Contract participation goals
 - 1.2.2.1 There is no specified contract participation goal for the contract. The contract participation goal shall be measured in the performance of the contract to enable the employment provided to targeted labour to be quantified.
 - 1.2.2.2 The wages and allowances used to calculate the contract participation goal shall, with respect to both time-rated and task rated workers, comprise all wages paid and any training allowance paid in respect of agreed training programmes.
 - 1.2.3 Terms and conditions for the engagement of targeted labour

Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.
 - 1.2.4 Terms and conditions for the engagement of targeted labour

Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.
 - 1.2.5 Variations to SANS 1914-5
 - 1.2.5.1 The definition for net amount shall be amended as follows:

Financial value of the contract upon completion, exclusive of any value added tax or sales tax which the law requires the employer to pay the contractor.
 - 1.2.5.2 The schedule referred to in 5.2 shall in addition reflect the status of targeted labour as women, youth and persons with disabilities and the number of days of formal training provided to targeted labour.

1.3 Training of targeted labour

- 1.3.1 The contractor shall provide all the necessary on-the-job training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the contract in a manner that does not compromise worker health and safety.
- 1.3.2 The cost of the formal training of targeted labour, will be funded by the local office of the Department of Labour. This training will take place as close to the project site as practically possible. The contractor must access this training by informing the relevant regional office of the Department of Labour in writing, within 14 days of being awarded the contract, of the likely number of persons that will undergo training and when such training is required. The Employer and the Department of Public Works (Fax: 012 3258625/ EPWP Unit, Private Bag X65, Pretoria 0001) must be furnished with a copy of this request.
- 1.3.3 The contractor shall do nothing to dissuade targeted labour from participating in training programmes and shall take all reasonable steps to ensure that each beneficiary is provided with two days of formal training for every 22 days worked.
- 1.3.4 An allowance equal to 100% of the task rate or daily rate shall be paid by the contractor to workers who attend formal training, in terms of the above.
- 1.3.5 Proof of compliance with the above requirements must be provided by the Contractor to the Employer prior to submission of the final payment certificate.

GENERIC LABOUR-INTENSIVE SPECIFICATION

1 Scope

This specification establishes general requirements for activities which are to be executed by hand involving the following:

- a) trenches having a depth of less than 1.5 metres
- b) storm water drainage
- c) low-volume roads and sidewalks

2 Precedence

Where this specification is in conflict with any other standard or specification referred to in the Scope of Works to this Contract, the requirements of this specification shall prevail.

3 Hand excavatable material

Hand excavatable material is material:

a) Granular materials:

- i) whose consistency when profiled may in terms of table 1 be classified as very loose, loose, medium dense, or dense; or
- ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 15 blows of a dynamic cone penetrometer is required to penetrate 100mm;

b) Cohesive materials:

- i) whose consistency when profiled may in terms of table 1 be classified as very soft, soft, firm, stiff and stiff / very stiff; or
- ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 8 blows of a dynamic cone penetrometer is required to penetrate 100mm;

Note:

1) A boulder, a cobble and gravel is material with a particle size greater than 200mm, between 60 and 200mm.

2) A dynamic cone penetrometer is an instrument used to measure the in-situ shear resistance of a soil comprising a drop weight of approximately 10 kg which falls through a height of 400mm and drives a cone having a maximum diameter of 20mm (cone angle of. 60 degrees with respect to the horizontal) into the material being used.

Table 2: Consistency of materials when profiled

GRANULAR MATERIALS		COHESIVE MATERIALS	
CONSISTENCY	DESCRIPTION	CONSISTENCY	DESCRIPTION
Very loose	Crumbles very easily when scraped with a geological pick.	Very soft	Geological pick head can easily be pushed in as far as the shaft of the handle.
Loose	Small resistance to penetration by sharp end of a geological pick.	Soft	Easily dented by thumb; sharp end of a geological pick can be pushed in 30-40 mm; can be moulded by fingers with some pressure.

Medium dense	Considerable resistance to penetration by sharp end of a geological pick.	Firm	Indented by thumb with effort; sharp end of geological pick can be pushed in up to 10 mm; very difficult to mould with fingers; can just be penetrated with an ordinary hand spade.
Dense	Very high resistance to penetration by the sharp end of a geological pick; requires many blows for excavation.	stiff	Can be indented by thumb-nail; slight indentation produced by pushing geological pick point into soil; cannot be moulded by fingers.
Very dense	High resistance to repeated blows of a geological pick.	Very stiff	Indented by thumb-nail with difficulty; slight indentation produced by blow of a geological pick point.

4 Trench excavation

All hand excavatable material in trenches having a depth of less than 1,5 metres shall be excavated by hand.

5 Compaction of backfilling to trenches (areas not subject to traffic)

Backfilling to trenches shall be placed in layers of thickness (before compaction) not exceeding 100mm. Each layer shall be compacted using hand stampers

- to 90% Proctor density;
- such that in excess of 5 blows of a dynamic cone penetrometer (DCP) is required to penetrate 100 mm of the backfill, provided that backfill does not comprise more than 10% gravel of size less than 10mm and contains no isolated boulders, or
- such that the density of the compacted trench backfill is not less than that of the surrounding undisturbed soil when tested comparatively with a DCP.

6 Excavation

All hand excavatable material including topsoil classified as hand excavatable shall be excavated by hand. Harder material may be loosened by mechanical means prior to excavation by hand.

The excavation of any material which presents the possibility of danger or injury to workers shall not be excavated by hand.

7 Clearing and grubbing

Grass and small bushes shall be cleared by hand.

8 Shaping

All shaping shall be undertaken by hand.

9 Loading

All loading shall be done by hand, regardless of the method of haulage.

10 Haul

Excavation material shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150 m.

11 Offloading

All material, however transported, is to be off-loaded by hand, unless tipper-trucks are utilised for haulage.

12 Spreading

All material shall be spread by hand.

13 Compaction

Small areas may be compacted by hand provided that the specified compaction is achieved.

14 Grassing

All grassing shall be undertaken by sprigging, sodding, or seeding by hand.

15 Stone pitching and rubble concrete masonry

All stone required for stone pitching and rubble concrete masonry, whether grouted or dry, must be collected, loaded, off loaded and placed by hand.

Sand and stone shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150m.

Grout shall be mixed and placed by hand.

16 Manufactured Elements

Elements manufactured or designed by the Contractor, such as manhole rings and cover slabs, precast concrete planks and pipes, masonry units and edge beams shall not individually, have a mass of more than 320kg. In addition, the items shall be large enough so that four workers can conveniently and simultaneously acquire a proper handhold on them.



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 12

EPWP Employment Contract



(Insert Your Company Logo)

(This shall serve as the cover page on employment contracts for local labour)

EMPLOYMENT AGREEMENT

BETWEEN

[CONTRACTOR NAME].....

AND

[WORKER NAME].....

1. PARTIES

The Parties to this Agreement are -

1.1. Contractor: _____

herein represented by: _____

duly authorised thereto

And

1.2. Mr / Me: _____
[worker's name]

2. DEFINITIONS AND INTERPRETATION

2.1. In this Agreement and any Annexure thereto, unless inconsistent with or otherwise indicated by the context-

“Agreement” means the contents of this Agreement.

“Company” means the company that employs the worker

“Department” means the Department of Public Works

“Worker” is a person that performs a specific or necessary task or who completes tasks in a certain way

“EPWP” The Expanded Public Works Programme is a government programme aimed at the alleviation of poverty and unemployment. The programme ensures the full engagement on Labour Intensive Methods of Construction (LIC) to contractors for skills development. The EPWP focuses at reducing unemployment by increasing economic growth by means of improving skills levels through education and training and improving the enabling environment for the industry to flourish.

3. PURPOSE

The purpose of this agreement is to:-

Ensure that the agreement is binding to both the Worker and the Employer.

4. TERMS AND CONDITIONS

- The worker will have no entitlement to the benefits of a full time employee, namely;

- The worker should not have the expectation that this contract will be renewed or extended.
- The worker will be subject to all laws, rules, policies, codes and procedures applicable to the;

- The worker must meet the standards and requirements of the contractor
- The worker must render his/her services during normal working hours of minimum of forty to fifty five hours in any week; which comprise of an eight-hour working day in a five-day week.

5. REMUNERATION

The worker will receive compensation to the amount of R_____00 which must be paid by the 25th or on the last day of each month.

6. ROLES AND RESPONSIBILITIES

6.1 Employer / Worker

- Work for _____ in terms of the period as specified in the employment agreement contract.
- Be available for and participate in all learning and work experience required by the company.
- Comply with workplace policies and procedures.
- Complete any attendance or any written assessment tools supplied by the contractor to record relevant workplace experience.
- Demonstrate willingness to grow and learn through work experience.

Provide the following documentation to the employer,

- Certified identity document not longer than 3 months
- ID size photos
- Sign employment contract

6.2 Employer

- Employ the worker for a period specified in the agreement.
- Provide the worker with appropriate work based experience in the work environment.
- Facilitate payments of wages / stipends.
- Keep accurate records of workers.
- Where a worker/ learner is disabled, the employer will have to provide in the additional needs e.g. special materials, learning aids and in some cases physical or professional support (such aids remain the property of the employer).
- Keep up to date records of learning and discuss progress with the intern on a regular basis.
- Apply fair disciplinary, grievance and dispute resolution procedures to the worker.
- Prepare an orientation/ induction course to introduce worker/ learner to the workplace and specific workplace requirements.
- Ensure the daily attendance register is signed by the worker.

7. DURATION.

This agreement commences on: _____

and

expires on: _____

8. BREACH.

If either party commits any breach of the terms of this contract (and fails to rectify it within 30 days of receipt of a written notice calling it to do so, then) the other party shall be entitled to terminate the contract or to claim specific performance without prejudice to any of its other legal rights, including its rights to claim damages.

9. CONDITIONS OF EMPLOYMENT

9.1. Meal Breaks

9.1.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.

9.1.2 An employer and worker may agree on longer meal breaks.

9.1.3 A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.

9.1.4 A worker is not entitled to payment for the period of a meal break. However, a worker who is paid on the basis of time worked must be paid if the worker is required to work or to be available for work during the meal break.

9.2. Special Conditions for Security Guards (Only applicable to security Guards)

9.2.1 A security guard may work up to 55 hours per week and up to eleven hours per day.

9.2.2 A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each.

9.3. Weekly Rest Period

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

9.4. Work on Sundays and Public Holidays

9.4.1 A worker may only work on a Sunday or public holiday to perform emergency or security work.

9.4.2 Work on Sundays is paid at the ordinary rate of pay.

9.4.3 A task-rated worker who works on a public holiday must be paid;

- (a) the worker's daily task rate, if the worker works for less than four hours;
- (b) double the worker's daily task rate, if the worker works for more than four hours.

9.4.4 A time-rated worker who works on a public holiday must be paid

- (a) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday;
- (b) double the worker's daily rate of pay, if the worker works for more than four hours on the public holiday.

9.5 Sick leave

- 9.5.1 Only workers who work more than 24 hours per month have the right to claim sick-pay in terms of this clause.
- 9.5.2 A worker who is unable to work on account of illness or injury is entitled to claim one day's paid sick leave for every full month that the worker has worked in terms of a contract.
- 9.5.3 A worker may accumulate a maximum of twelve days' sick leave in a year.
- 9.5.4 Accumulated sick-leave may not be transferred from one contract to another contract.
- 9.5.5 An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.
- 9.5.6 An employer must pay a time-rated worker the worker's daily rate of pay for a day's sick leave.
- 9.5.7 An employer must pay a worker sick pay on the worker's usual payday.
- 9.5.8 Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is
- (a) absent from work for more than two consecutive days; or
 - (b) absent from work on more than two occasions in any eight-week period.
- 9.5.9 A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity.
- 9.5.10 A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Diseases Act.

9.6. Maternity Leave

- 9.6.1 A worker may take up to four consecutive months' unpaid maternity leave.
- 9.6.2 A worker is not entitled to any payment or employment-related benefits during maternity leave.
- 9.6.3 A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.
- 9.6.4 A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.
- 9.6.5 A worker may begin maternity leave as follows;
- (a) four weeks before the expected date of birth; or
 - (b) on an earlier date
 - (i) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or
 - (ii) if agreed to between employer and worker; or
 - (c) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.

- 10.6 A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth.

9.7. Family responsibility leave

- 9.7.1 Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances;

- (a) when the employee's child is born;
- (b) when the employee's child is sick;
- (c) in the event of a death of
 - (i) the employee's spouse or life partner;
 - (ii) the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling.

9.8. Keeping Records

- 9.8.1 Every employer must keep a written record on site for the duration of the project and three (3) year after completion records should consists of at least the following;

- (a) the worker's name and position;
- (b) copy of an acceptable worker identification
- (c) in the case of a task-rated worker the number of tasks completed by the worker;
- (d) in the case of a time-rated worker, the time worked by the worker;
- (e) payments made to each worker in a form of Proof of Payment, Payroll registers and the acknowledgement of payment receipt signed by the worker.

- 9.8.2 The employer must keep this record for a period of at least three years after the completion of the EPWP.

9.9. Payment

- 9.9.1 An employer must pay all wages at least monthly in cash or by cheque or into a bank account.

- 9.9.2 A worker may not be paid less than the Ministerial Determination wage rate.

- 9.9.3 A task-rated worker will only be paid for tasks that have been completed.

- 9.9.4 An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer.

- 9.9.5 A time-rated worker will be paid at the end of each month.

- 9.9.6 Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.

- 9.9.7 Payment in cash or by cheque must take place

- (a) at the workplace or at a place agreed to by the worker;
- (b) during the worker's working hours or within fifteen minutes of the start or finish of work;

- (c) in a sealed envelope which becomes the property of the worker.

9.9.8 An employer must give a worker the following information in writing

- (a) the period for which payment is made;
- (b) the numbers of tasks completed or hours worked;
- (c) the worker's earnings;
- (d) any money deducted from the payment;
- (e) the actual amount paid to the worker.

9.9.9 If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it.

9.9.10 If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

9.10. Inclement weather

If no work has begun on site, and if an employee has reported for work, the employee will be paid for four hours. Should work be stopped after the first four hours, the employee will be paid for the hours worked. Where the employer has given employees notice on the previous working day that no work will be available due to inclement weather, then no payment will be made.

9.11. Deductions

9.11.1 An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.

9.11.2 An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.

9.11.3 An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement of Law; court order or arbitration

9.11.4 It is the responsibility of the employers to arrange for all persons employed on a Project to be covered in terms of the Unemployment Insurance Fund Contributions Act, 2002 (Act No. 4 of 2002)

9.11.5 An employer may not require or allow a worker to

- (a) repay any payment except an overpayment previously made by the employer by mistake;
- (b) state that the worker received a greater amount of money than the employer actually paid to the worker; or
- (c) pay the employer or any other person for having been employed.

9.12. Health and Safety

9.12.1 Employers must take all reasonable steps to ensure that the working environment is healthy and safe.

9.12.2 A worker must;

- (a) work in a way that does not endanger his/her health and safety or that of any other person;

- (b) obey any health and safety instruction;
- (c) use any personal protective equipment or clothing issued by the employer;
- (d) report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

9.13. Compensation for Injuries and Diseases

- 9.13.1 It is the responsibility of the employers to arrange for all persons employed on a Project to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993 as amended by COIDA Act 61, 1997.
- 9.13.2 A worker must report any work-related injury or occupational disease to their employer or manager.
- 9.13.3 The employer must report the accident or disease to the Compensation Commissioner.
- 9.13.4 An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

9.14. Termination

- 9.14.1 The employer may terminate the employment of a worker for good cause after following a fair procedure.
- 9.14.2 A worker will not receive severance pay on termination.
- 9.14.3 A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement.
- 9.14.4 A worker **who is absent for more than three consecutive days** without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available.
- 9.14.5 A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available.

Notice procedure is as follows;

- One week if employed for four weeks or less
- Two weeks if employed for more than four weeks but not more than a year
- Four weeks if employed for one (1) year or more

9.15. Certificate of Service

- 9.15.1 On termination of employment, a worker is entitled to a certificate stating;
- (a) the worker's full name;
 - (b) the name and address of the employer;
 - (c) the Project on which the worker worked; the work performed by the worker;
 - (d) any training received by the worker;
 - (e) the period for which the worker worked on the Project; and
 - (f) any other information agreed on by the employer and worker.

9.16. DOMICILE

The address to which notices and all legal documents may be delivered or served are as follows:

Employee Details

Name & Surname: _____

ID No: _____

Residential Address: _____

Contact No: _____

Date of Employment: _____

To be supervised by:

Main Contractor:
or Sub Contractor:

Category of employment:

Skilled:
Semi-skilled:
Unskilled:

For Skilled & Semi-skilled state the trade: _____

Period of employment: Fixed for until when your services are still required on site

I confirm that I have been inducted and fully understand the condition of my appointment.

Employee Signature: _____

Witness by SGB/CLO: _____

Signature by Witness: _____

Employer Details

Name & Surname: _____

Designation: _____

Contact No: _____ Signature: _____



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 13

EPWP Attendance Register



EXPANDED PUBLIC WORKS PROGRAMME

The Attendance Register for on-site Workers

Reporting month: _____

Cell No: _____

Surname: _____

First Name: _____

Project Name: **Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area**

Project Code: **070638**

Tender No **ZNTU04138W**

IDENTITY NUMBER: _____

Day	Date	Time In	Signature	Time Out	Signature	Report On Any Formal Training Provided In The Reporting Month
WEEK 1						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
WEEK 2						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
WEEK 3						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
WEEK 4						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
WEEK 5						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
Total Days worked						



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 14

Registration and Business Form

BUSINESS PLAN

Reference No	
Profile ID	
Project Name	
Project Details	
Project Name	
Project Reference Number	
Project description	
Project Start Date	
Project End Date	
Estimated Budget	
Project Location	
Province	
District/Metro Municipality	
Local Municipality/Metro Region	
Latitude (in decimal format)	
Longitude (in decimal format)	
Public Body Details	
Public body sphere	
Reporting public body that is the project owner (and will report on the project)	
Implementing public body type	
Public body that will implement the project	
IDP reference number allocated to the project	
EPWP Details	
EPWP Sector	
EPWP Program	
EPWP Sub programme	
Budget Amount	
April 2014/March 2015	
April 2015/March 2016	
Total Budget Amount	
Wages	
UIF	
COIDA	
Training	
Administration	
Equipment and materials	
Other	
Describe other	
Outputs and Training	
Output	
Description	
Target Quantity	
Number of persons to be trained	
Contact person	
Title	
Initials	
First Name	
Surname	
Email	
Tel (Office)	
Fax Number	
Cell Number	
Physical Address 1	
Physical Address 2	
Physical Address 3	
Physical Address 4	
Postal Address 1	
Postal Address 2	
Postal Address 3	
Postal Address 4	



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Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 15

Beneficiary Monthly Capture Form

KZN PUBLIC WORKS
Monthly Data collection for LOCAL Labour



Name of Contractor:

Project Code: 070638

Project location name (area):

Name of Project:

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

Reporting month:

Project location (Ward No.):

No	First Name	Initial	Surname	Beneficiary Details				Experience/Literacy										Location Details			Household Details				
				ID number	D.O.B	Gender F/M	Disability Y/N	Start Date on the current month	End Date on the current month	Total days worked	Job description	Registered on UIF (Y/N)	Registered with COIDA (Y/N)	Are you receiving any Gov grant? (Y/N)	1st Language	Other Language 1	Other Language 2	Education Level (See Codes below)	Highest Level of Education	Address	Ward No.	Cell No.	Nationality	No. of people in Household	No. of Dependents in Household
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									

• Education Levels – use the codes (1,2,3) on the excel spreadsheet

- o (1) Unknown (3) Grade 1-3 (Sub A – Std 1)
- o (2) No Schoc (4) Grade 4 (Std 2) ABET 1
- (5) Grade 5-6 (Std 3-4) ABET 2
- (6) Grade 7-8 (Std 5-6) ABET 3
- (7) Grade 9 (Std 7) ABET 4
- (8) Grade 10-11 (Std 8-9)
- (9) Grade 12 (Std 10)
- (10) Post Matric

Contractor sign: _____

DPW Official/Consultant sign: _____ EPWP Official sign: _____

Designation: _____

Designation: _____

Date: _____

Date: _____

Contact no: _____

Contact no: _____



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 16

Workers Monthly Payment Upload

KZN PUBLIC WORKS

Worker payment capture form for LOCAL Labour



Name of Contractor: _____

Project Code: **070638**

Name of Project: **Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area**

Reporting month: _____

Payment Upload

No.	First Name	Initials	Surname	Identity No.	D.O.B	Job Description	Daily Wage Rate	Total Paid Days	Total Amount Paid	Total days Worked Days
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										

Contractor sign: _____

Designation: _____

Date: _____

Contact no: _____

DPW Official/Consultant sign: _____

Designation: _____

Date: _____

Contact no: _____

EPWP Official sign: _____

Designation: _____

Date: _____

Contact no: _____



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 17

Workers Monthly Training Form

KZN PUBLIC WORKS

Worker Training capture form for LOCAL Labour



Name of Contractor:
Name of Project:

**Ngwelezane Hospital: Construction of New Orthotics and
Prosthetics Centre with Parking Area**

Project Code:

070638

Reporting month:

Training														
No	Name	Surname	ID No.	Job description	Course Name	Was training Accredited or Non - accredited by a relevant SETA	Start date on current month	End date on current month	Training Days Paid	Training Days Not Paid	Total Number of Training Days	Cost per trainee	Is training complete or on - going	Name of Training Provider
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														

Contractor sign: _____

DPW Official/Consultant sign: _____

EPWP Official sign: _____

Designation: _____

Designation: _____

Designation: _____

Date: _____

Date: _____

Date: _____

Contact no: _____

Contact no: _____

Contact no: _____



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 18

Site Location

Location	
Locality Name	Empangeni
Municipality	uMhlathuze Local Municipality
Subplace	Ngwelezane
Ward	Ward 28
Government Facility	Hospital
Latitude	Latitude: 29°51'3.70"S
Longitude	Longitude: -28.7795563
Physical Address/Location	Ngwelezane Thandisiwe Road, ERF A1241





KWAZULU-NATAL PROVINCE

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Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 19

Architecture Drawings



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Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 20

Civil and Structural Engineer Drawings



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Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 21

Electrical Engineer Drawings



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Ngwelezane Hospital: Construction of New Orthotics and Prosthetics Centre with Parking Area

ANNEXURE 22

Fire Engineer Drawings



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ANNEXURE 23

Mechanical Engineer Drawings



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ANNEXURE 24

Wet Service Engineer Drawings