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

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

Engineer/Principal Agent
Ramgoolam (Pty) Ltd
P.O. Box 364

Dannhauser
3080
034 - 621 6600 - Tel Number
034 - 621 2194 - Fax Number
sanitation.education@ramgoolamgroup.com

Principal Agent
Ramgoolam (Pty) Ltd
P.O Box 364
Dannhauser

3080
034 - 621 6600 - Tel Number
034 - 621 2194 - Tel Number
sanitation.education@ramgoolamgroup.com

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

Region:
Regional Manager
KZN Department of Public Works
40 Shepstone Road
LADYSMITH
3370
Tel Number: 036- 638 8255
Fax Number: 036- 638 8099

Tender Number: **ZNTL 05828W**
CIDB Grading: **4GB or higher**
ECDP Number: **N/A**

Project Code: **070689**
Document Date: **28 September 2026**

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

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

THE CONTRACT

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

C1 - AGREEMENT AND CONTRACT DATA

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

FORM OF OFFER AND ACCEPTANCE

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

C.1.1 - FORM OF OFFER AND ACCEPTANCE

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

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

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

C1.2 - CONTRACT DATA

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

CONTRACT DATA FOR:

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

Tender no: **ZNTL 05828W**

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

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

CONTRACT VARIABLES

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

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

Part 1: CONTRACT DATA PROVIDED BY THE EMPLOYER:

PRE-TENDER INFORMATION

CONTRACTING AND OTHER PARTIES

[1.1.1.15] **Employer:**

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

Postal address:
Private Bag X 9041
PIETERMARITZBURG
3200

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

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

[1.1.1.16] **Employers Agent 1**
Ramgoolam (Pty) Ltd

Agent's service:
Principal Agent

Postal address:
P.O Box 364
Dannhauser
3080

Tel: ***034 - 621 6600*** Fax: ***034 - 621 2194***

Employers Agent 2
KZN Department of Public Works - Professional Services

Agent's service:
Quantity Surveyor

Postal address:
Private Bag X9963
LADYSMITH
3370

Tel: ***(036) 638 8067*** Fax: ***(036) 638 8099***

Employers Agent 3
Ramgoolam (Pty) Ltd

Agent's service:
Principal Agent

Postal address:
P.O Box 364
Dannhauser
3080

Tel: ***034 - 621 6600*** Fax: ***034 - 621 2194***

Employers Agent 4
Head: KZN Department of Public Works - Professional Services

Agent's service:
Civil Engineer

Postal address:
Private Bag X9041
PIETERMARITZBURG
3200

Tel: ***(033) 355 5527*** Fax: ***(033) 355 5604***

Tender no:	**ZNTL 05828W**
	Employers Agent 5 ***[Agents Name]*** ***Agent's*** service: ***[Identify Agent's Service, eg. Engineer]*** Postal address: ***[P.O. Box number]*** ***[Name of town]*** ***[Code]*** Tel: insert ***[Tel Number including Area Code]*** Fax: ***[Fax Number including Area Code]***
	Employers Agent 6 ***[Agents Name]*** ***Agent's*** service: ***[Identify Agent's Service, eg. Engineer]*** Postal address: ***[P.O. Box number]*** ***[Name of town]*** ***[Code]*** Tel: insert ***[Tel Number including Area Code]*** Fax: ***[Fax Number including Area Code]***
	Employers Agent 7 ***[Agents Name]*** ***Agent's*** service: ***[Identify Agent's Service, eg. Engineer]*** Postal address: ***[P.O. Box number]*** ***[Name of town]*** ***[Code]*** Tel: insert ***[Tel Number including Area Code]*** Fax: ***[Fax Number including Area Code]***
	Employers Agent 8 ***[Agents Name]*** ***Agent's*** service: ***[Identify Agent's Service, eg. Engineer]*** Postal address: ***[P.O. Box number]*** ***[Name of town]*** ***[Code]*** Tel: insert ***[Tel Number including Area Code]*** Fax: ***[Fax Number including Area Code]***
	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 6 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]	Schedule of projects in building construction undertaken and successfully completed within the applicable CIDB grading of this Bid or one grade lower in the past 7 years by the bidding entity- Attatch letters of award and practical completion certificates or final completion certificates for projects completed.(Minimum 4 projects is required. (T2.40)
[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.
	Cash flow by contractor: The Contractor shall deliver his Cash flow for the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Priced Bill of Quantity: The Contractor shall deliver his Priced Bill of Quantity within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Programme: The Contractor is required to submit his Programme of Works in terms of Clause 5.6.1 and 5.3.1 and the Principal Agent is required to approve this within 7 days in terms of Clause 5.6.3
	Other requirements:

[5.3.2]	The time to submit the documentation required before commencement with Works execution is:	14	calendar days

Non-Working days

[5.8.1]	Non-Working days	**Sundays**
	Special non- working days	**All Nationally Recognized Public Holidays and the year end break**
[5.8.1]	First Year end break - commences	***15-Dec-26***
	ends on	***09-Jan-27***
	Second Year end break - commences	***N/A***
	ends on	***N/A***
	Third Year end break - commences	***N/A***
	ends on	***N/A***
	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.

*The **Agreement comes into effect** on the date when;*
The tenderer receives one fully completed original copy of this document, including the Schedule of Deviations (if any)

The agreement ("this document") consists of;
1. Agreement and Conditions of Contract.
2. Form of Offer and Acceptance.
3. Contract Data.
4. Scope of Works.
5. Site Information.
6. Drawings & documents referred to in the 1 to 4 above.

(See Form of Offer and Acceptance)

[5.3.1] The contractor shall commence executing the Works within 7 calendar days from the Commencement Date.

[5.4.1] ***Possession of the* site** will be given within 10 calendar days after the **contractor** has fulfilled the conditions (4.3, 5.6, 6.2, 8.6) and received the notification from the Employer of Site Hand Over where the contractor will receive one fully signed copy of the Form of Offer and Acceptance from the **employer.**

[5.6.1] The Contractor shall deliver his programme of work within 10 calendar days after notice from the Employer, prior to the Commencement Date.

CONTRACT DETAILS

[1.1.1.33] ***Works*** description: Refer to document C3 – Scope of Work.

[1.1.1.30] ***Site*** description: Refer to document C4 – Site Information.

Specific options that are applicable to a **State** organ only
Where so :

[6.10.6.2]

1) Interest rate legislation:

(a) in respect of interest owed by the **employer**, the interest rate as determined by the Minister of Justice and Constitutional Development from time to time, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No. 55 of 1975), will apply; and

(b) in respect of interest owed to the **employer**, the interest rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply

2)	Lateral support insurance to be effected by the contractor:	***Yes***	***No X***
3)	Payment will be made for materials and goods	***Yes X***	***No***
4)	Dispute resolution by litigation	***Yes***	***No X***
5)	Extended **defects** liability period applicable to the following elements:	***N/A***	

[8.6.1.1.2] The Value of material, supplied by the Employer, and not included in the Contract Price, is: ***R0,00***

[8.6.1.1.3] The amount to cover Professional Fees, not included in the Contract Price, for repairing damage and loss to be included in the insurance:
30% of the Contract Price

[8.6.1.3] The limit for indemnity for liable insurance is: ***R10 000 000.00 minimum.***

[6.5.1.2.3] The percentage allowance to cover overhead charges for contractor and subcontractors, is: ***33,30%***

[1.1.1.14] **Practical Completion Date**

The Practical Completion date is: **6 months from the commencement date**

For the **works** as a whole:

The whole of the works shall be completed within:	***6***	*Months* *(which shall be deemed to include all Non – Working Days, Special Non – Working Days and the year-end Builders Annual Industry Holiday Periods).*
[5.5.1] The date for **practical completion** shall be	***To be determined***	
[5.13.1] The penalty per calendar day shall be :	***0.04% of the Contract Price, rounded to the nearest R10***	

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

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

(a) in respect of interest owed by the **employer,** the interest rate as determined by the Minister of Justice and Constitutional Development from time to time, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No. 55 of 1975), will apply; and

(b) in respect of interest owed to the employer, the interest rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply

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

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

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

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

[6.10.6.2] Replace *"at the prime overdraft rate, as charged by the Contractor's Bank,"* with *"..at the interest rate as determined by the Minister of Justice and Constitutional Development from time to time, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No. 55 of 1975).* "
Omit *",on all overdue payments from the date on which the same should have been paid..." and replace with " only after 30 calendar days from receiving written notice from the Contractor that the amount is overdue,.."*

SPECIAL CONDITIONS OF CONTRACT

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

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

[5.14.5.1] Omit entire clause 5.14.5.1

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

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

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

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

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

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

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

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

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

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

MANAGING PROJECT DURATION

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

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

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

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

INCLEMENT WEATHER AND CLAIMS FOR DELAYS IN PERFORMANCE

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

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

(i) The criteria to be used for WORK stoppages shall be for safety hazards or poor quality of work.

(ii) The Employer's site representative or the Employer's Principal Agent, if the site representative is not available shall be notified when the Contractor stops the work and intends to claim performance delays. The Employer representative shall inspect the situation together with the Contractor and give an immediate decision.

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

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

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

Tender no: **ZNTL 05828W** **Part 2: CONTRACT DATA PROVIDED BY THE CONTRACTOR:**

POST-TENDER INFORMATION

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

1 CONTRACT DETAILS

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

[1.2.1.2] Postal address:

.....

.....

.....

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

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

Physical address:

.....

.....

.....

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

.....

[Amount in words]

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

The preliminaries amounts shall be paid in terms of:

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

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

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

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

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

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

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

Alternative A

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

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

- An amount which shall not be varied.

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

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

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

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

10% of the amount shall not be varied

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

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

Sectional Completion : Subdivision of Preliminaries Costs

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

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

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

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

YES *yes / no*

or

Alternative B

The Contractor shall within 15 working days of the date of possession of the site provide the Principal Agent with a detailed breakdown of Preliminaries amounts for the works as a whole, or per section where applicable, including administrative and supervisory staff charges and for the use of construction equipment in terms of the programme.

NO *yes / no*

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

2 DOCUMENTS

Contract documents marked and annexed hereto:

Priced **Bills of Quantities:** **Yes** X **No**

Lump Sum document: **:** **Yes** **No** X

Guarantee Options:

Not applicable

2.2 DESIGN BRIEF

Not Applicable **YES**

2.3 DRAWINGS

See list of drawings/ Annexures attached to this document. **YES**

2.4 DESIGN PROCEDURES

Not applicable. **YES**

Contract drawings: **Yes** X **No**

Other documents**:**

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

GUARANTEE OPTIONS

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

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

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

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

(i) cash deposit of 10 % of the Contract Price	N/A
(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)	N/A
(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)	
(v) a payment reduction of 10% of the payment value certified in the payment certificate (excluding VAT) up to a maximum of 10% of the Contract Value (excluding VAT)	

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.

3 SIGNATURES OF THE CONTRACTING PARTIES

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

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

Capacity of signatory — as Witness.

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

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

Capacity of signatory — as Witness.

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

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 ZNTL 05828W	Project Code 070689

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

GUARANTOR DETAILS AND DEFINITIONS

N/A

"Guarantor" means: _____

Physical Address: _____

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

"Contractor" means: _____

"Engineer" means: _____

"Works" means: **DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION**

"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.

N/A

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.

N/A

Signed at _____

Date _____

Guarantor's signatory (1) _____

Capacity _____

Guarantor's signatory (2) _____

Capacity _____

Witness signatory (1) _____

Witness signatory (2) _____

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

PART C2 - PRICING DATA

C2.1 PRICING INSTRUCTIONS GCC FOR CONSTRUCTION WORKS (Second Edition 2010)			
Project title:	**DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION**		
Tender no:	**ZNTL 05828W**	**Project Code:**	**070689**

C2.1 Pricing Instructions

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

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

1 MASSES AND MEASURING UNITS

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

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

2 PRICES FOR VARIATIONS

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

3 SCALE

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

4 PROVISIONAL ITEMS

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

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

5 TIMELY ORDERING OF MATERIALS

The Contractor is warned to place all orders for materials or special articles as early as possible, as he will be held solely responsible for any delay in the delivery of such goods.

Nevertheless this tender is conditional upon no liability being attached to the Contractor if delivery of materials is rendered impossible by reason of any act of the Government.

6 ELECTRICAL LIGHTING, POWER AND WATER REQUIREMENTS

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

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

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

7 IMPORT PERMITS, DUTIES AND SURCHARGES.

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

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

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

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

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

Standard System of Measuring Builders Work (7th Edition)

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

9 PRICING OF ROCK EXCAVATIONS

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

BROAD BASED BLACK ECONOMIC EMPOWERMENT

1. It is the deliberate policy of the Provincial Administration of KwaZulu-Natal to foster and to encourage the economic empowerment of Black South Africans. This policy will be implemented without prescription and without prejudicing the principles and the integrity of the Provincial Administration of KwaZulu-Natal. Subject to these constraints and also subject to good business practise and commercial consideration, it is therefore considered appropriate that the Provincial Administration of KwaZulu-Natal should encourage business relationships with companies which actively pursue Affirmative Action and Black Economic Empowerment Programmes.

2. In responding to this tender you are therefore encouraged to devote attention to these two subjects of Affirmative Action and Economic Empowerment. In addition, in considering the appointment of sub-contractors, you are requested to extend the spirit of these policies.

3. The foregoing enunciations of this policy are not intended to be prescriptive nor to preclude any individual or operation from responding to this tender.

11 REGISTRATION ON THE CENTRAL SUPPLIERS DATABASE

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

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

12 TAX CLEARANCE REQUIREMENTS

It is a condition of tender that the taxes of the successful tenderer must be in order, or that satisfactory arrangements have been made with South African Revenue Service (SARS) to meet the 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.

1. In order to meet this requirement tenderers are required to apply via e-filing at any SARS branch office nationally. The Tax Complance Status (TCS) requirements are also applicable to foreign 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.	
	Security PIN Number	
	Company / Entity Tax Reference Number	

13 BILLS OF QUANTITIES/LUMP SUM DOCUMENT

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

14 VALUE ADDED TAX

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

15 FIXED PRICE CONTRACT

Should the Bills of Quantities/Lump Sum Document be a fixed price contract, the following clause must be inserted in the Pricing Instructions:

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.

KWAZULU-NATAL PROVINCE
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DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

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

C2.2 Preliminaries for GCC for Construction Works, 2nd Edition - 2010

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

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	Agrément certificates - CLAUSE 4.5 F:..... V:..... T:.....	N/A			
C3	Other services and facilities - CLAUSE 4.8 F:..... V:..... T:.....	Item			
C4	Recording of weather - CLAUSE 5.2 Schedule of projects in building construction undertaken and successfully compl	Item			
C5	Management meetings - CLAUSE 5.3 F:..... V:..... T:.....	Item			
C6	Daily records CLAUSE 5.6 F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

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

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

	SECTION E: SPECIFIC PRELIMINARIES	UNIT	QUANTITY	RATE	AMOUNT
E4	**SITE INSTRUCTIONS** Site Instructions issued on site are to be recorded in triplicate in a Site Instruction book which is to be maintained on site by the Contractor. F:..... V:..... T:.....	Item			
E5	**LABOUR RECORD** At the end of each week the Contractor shall provide the Engineer/Principal Agent with a written record, in schedule form, reflecting the number and description of tradesmen and labourers employed by him and all sub-contractors on the works each day. F:..... V:..... T:.....	Item			
	<u>Note</u> : 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.				
E6	**PLANT RECORD** At the end of each week the Contractor shall provide the Engineer/Principal Agent with a written record, in schedule form, reflecting the number, type and capacity of all plant, excluding hand tools, currently used on the works. F:..... V:..... T:.....	Item			
E7	**NON CESSION OF MONIES** The Contractor shall not cede nor assign his rights or claims to any monies due or to become due under this contract. F:..... V:..... T:.....	Item			
E8	**SECTIONAL COMPLETION** When it is required that the contract be executed in sections or portions, the tenderer shall allow for all costs in this regard as no claim for additional costs will be entertained. F:..... V:..... T:.....	Item			
E9	**LOCAL LABOUR** It is a general requirement of this contract that persons normally resident in the locality of the works (Local Labour) or unemployed parents whose children attend the specific school be given preference for employment on the contract. Provided, however, that should adequate and appropriate Labour not be available within the locality, others may be employed subject to satisfactory proof being provided that every reasonable endeavour has been made to employ Local Labour. The Contractor shall identify the local community leaders with the purpose of negotiating with them regarding the utilization of Local Labour in the construction process. In this regard, the Contractor shall furthermore give preference, wherever possible to the employment of single heads of households, women and youth. The Contractor shall, in general, maximize the involvement of the local community. All standard local labour employment forms (EPWP), local labour forms, together with the supporting documentation, certified copies of IDs, employment details, wage rates, proof of payment, period of employment and employment contracts must be submitted with the monthly payment certificates and submitted to the Engineer. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

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

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

		UNIT	QUANTITY	RATE	AMOUNT
	E12.4 EPWP REPORTING as per EPWP DATA FORM At the end of each month as part of site progress report and to be attached to every contractors' progress payment certificate; the contractor shall provide the principal agent & Public Works with a written records, as per EPWP data form; which will be reflecting, beneficiaries full name & surname; ID No and job description of labour employed by main contractor and sub-contractors on site. At the end of each month the contractor must submit the following documents to be attached to the Progress payment certificate: 1. EPWP monthly data collection form 2. Worker monthly payment upload 3. Worker monthly proof of payment i.e 3.1 Acknowledgement of receipt of payment or 3.2 Payslips 3.3 Bank statement highlighted the workers paid 4. Worker monthly training form 5. Monthly attendance register 6. Certified copies of ID's (once off) 7. ID size photos (once off) 8. Proof of UIF 9. Proof of COIDA F:..... V:..... T:.....	Item			
	E12.5 EPWP PROMOTION <u>12.5.1 EPWP signage board</u> EPWP Program at the project level shall always be promoted through have the projects signage board that embrace EPWP logo at the bottom, correct measurement for this signage board will be provided by the project leader during the site handing over meeting. the standard "HELVETIVA MEDUIM " letters are to be used . Professional title to be 10 mm above line . Line thickness to be 8 mm thick . Space between bottom of the line and bottom of the lettering below the line has to be 100 mm. Letter sizes are as follows : Helvetica meduim 100 mm black upper case to be for project name and owner . Helvetica meduim 75mm black upper case only to be used for professional titles.Project name and owner shall be black lettering on white background.board sizes are as follows : Board to be minomum 2000mm from ground level and to be constructed from reinforced formed chromadek panels minimum 0,6mm thick chromadek. The contractor is responsible for ensuring that the project board remains neatly and safely erected for the full duration including maintenance period,after which the project board and post are to be dismantled and handed to the client in good order. F:..... V:..... T:.....	Item	**N/A**		
	<u>12.5.2 Branding of labour apparel</u> Contractor & Sub-contractors' labourers shall be provided with EPWP branded Personal Protective Equipment (PPE), reflector vest with EPWP wording at the back is an ideal and cost effective means of promoting program on site. The contractor is then advised to price for both item 17.5.1 and 17.5.2 F:..... V:..... T:.....	Item	**N/A**		

	E12.6 COMMUNITY LIAISON OFFICER (CLO) UTILISATION OF A COMMUNITY LIAISON OFFICER In addition to the requirements of Clause E9, contained in this document; The Contractor shall allow for and pay any and all costs necessary for the engagement of the services of a Community Liaison Officer (CLO) for the full duration of this contract In the interest of providing a sound service to both the community and the Contractor, a CLO may only manage one project at a given time. A CLO will be identified by the local structures of the ward areas and appointed following fair and transparent interviewing process, to be conducted in the presence of local structures and the contractor representative, in order to assist the Contractor in the procurement of any local labour, etc. required for this project. The Contractor is to liaise with the CLO and afford him any assistance needed in ensuring sound working relations with the local community. **Key Responsibilities of the CLO are envisaged to include and not necessary be limited to:** 1. Assisting local leadership in conducting skills and resources audit which facilitates sourcing labour from within the ward or targeted areas for employment, as required by contractor. 2. Assisting in sourcing labour-only domestic sub-contractors and the procurement of materials from local resources, as required by the contractor. 3. Assisting the contractor by identifying areas of potential conflict and or threats to the project or to stakeholders in the project and recommend appropriate action to the contractor. 4. Assisting contractor and stakeholders in the project in the resolution of any conflict which may arise. 5. Establishing and ensuring that sufficient and open communication channels between the contractor and the work force are maintained. 6. Establish and ensuring that efficient and open communication channels between the contractor and the community are maintained 7. Identifying and reporting to the Contractor regarding issues where communication between stakeholder is necessary, recommend courses of action and facilitate such communications				
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	8. Assisting the Contractor and the work force in the establishment of grievance procedures and necessary recommenda-tion to the Contractor regarding the grievances and solution thereto. 9. Attending to site meetings and project implementation meetings as required by the Contractor and prepare periodic reports as may be required by the Contractor from time to time. 10. Attending to such other duties which are consistent with the functions of a CLO, as may be required by the Contractor from time to time. Tenderers are to price twice the rate of unskilled local labour rate against this item for any and all costs arising out of compliance with the foregoing and in the event of a Tenderer failing to price against this item or making inadequate financial provision against this item for compliance as aforesaid, then no claim for costs or additional cost incurred will be entertained by the Head: Works F:..... V:..... T:.....	Item			
	E12.7 SKILLS DEVELOPMENT ON SITE Contractor in conforming to the object of EPWP that its beneficiaries need to be capacitated with skills that will render them employable in the future. It is then the responsibility of the Contractor that mandatory life skills are provided to 100% of workforce on site and on the job training to labourers from whom the potential for further development has been identified. The latter is not mandatory to all as it covers technical skills. Contractor should also make provision for the possibility that there might be local youth that will need to be placed on the project with an intention to be provided support towards improving their level of competency and productivity. Contractor shall also provide all necessary on-the-job training to targeted labour to enable such labour to master and advance on techniques required to undertake the work in accordance with requirements of the contract in a manner that does not compromise workers health and safety. F:..... V:..... T:.....	Item	**N/A**		
	E12.8 LABOUR ONLY Sub Contracting for local emerging enterprises Tenderer's are advised that this contract is subject to the Expanded Public Works Programme (EPWP) and the following criteria will apply: <u>African Equity Ownership</u> a) The Tenderer is to allow for 5% of the total value of works to be undertaken by a Priority Population Group. This percentage excludes the costs of employing local unskilled labour. The allocation of this percentage from the Project, the screening of people, the selection of skills, will be for the Contractor to adjudicate. b) The Priority Population Group consists of women, youth and disabled people. c) The Contractor is to give first option for prospective PPG's from the surrounding areas of the Project. Should there be insufficient suitable people fitting the criteria of PPG's, the Contractor may hire people from further afield. This is to be done only after consultation with the Department of Works EPWP Co-ordinator and the Community Liaison Officer (CLO). d) A Mentor is to be employed by the Contractor, in consultation with the Department of Works for the purposes of quality control and liaison between the Contractor and the selected PPG's on site. The mentor will be responsible for ensuring an acceptable level of quality workmanship and that such work carried out by the PPG's is executed within the time frames stipulated. In so far as possible, the Contractor is encouraged to expand the PPG's skills, knowledge and performance levels. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	TENDERER'S TO NOTE CONDITIONS a) The contract to be entered into between the Contractor and the PPG's will be a LABOUR ONLY sub-contract. 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. c) The Contractor shall be responsible for the overall programming of the Works and he is to allow for monitoring the PPG's programme and progress. d) In conjunction with the Mentor, he is to allow for the supervision and mentoring (where necessary) of the PPG to ensure quality and adherence to standard building practice e) The Contractor is to allow for extra storage facilities on site for the PPG's tools and equipment. 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 g) Work requiring specialized tools will be provided free of chargeby the Contractor with the provision that these be returned upon completion of the Work. CO-ORDINATION The Contractor is to co-ordinate 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 as no claims for extras in this connection will be entertained. F:..... V:..... T:.....	Item	**N/A**		
	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. Where scaffolding is necessary for the use by any PPG and the Contractor has not erected any for his own use or has removed same after his own use, the Contractor shall supply sufficient scaffolding to the PPG to be erected and dismantled by the PPG and returned to the Contractor. This attendance upon PPG's to execute the work is to include for the scaffolding provisions as aforesaid and, in addition, is to include for co-operating to the fullest extent with all the parties, attending on off-loading materials, providing suitable storage for tools and materials used by the PPG's, use of general facilities such as latrines, etc., supply and cost of power, lighting, water and the like. F:..... V:..... T:.....	Item	**N/A**		
	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. F:..... V:..... T:.....	Item	**N/A**		
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	E12.10 EPWP SCOPE of WORK **Note:** Contractors are to price any item on the Bill of Quantities having below, bearing in mind that they are regarded as main sources of job creation, whether sub contracted or undertaken by the main contractor. Elements on the scope of work where application of Labour Intensive Construction methods as will indicated with letters (LI) are regarded feasible are as follows; i) Excavating trenches for foundations and any other civil works with the depth not more than 1.5 m ii) All masonry works which include concrete mixing on site; brickwork; plastering; screed works; jointing; etc. iii) Painting, Plumbing, Ironmongery; roof cladding; glazing; tilling; carpentry; flooring; waterproofing; etc. F:..... V:..... T:.....	Item	**N/A**		
	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. <u>Payment for the labour-intensive component of the works</u> Payment for works identified in the Scope of Work as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the Scope of Work. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict. <u>Linkage of payment for labour-intensive component of works to submission of project data</u> The Contractor's payment invoices shall be accompanied by labour information for the corresponding period in a format specified by the employer. If the contractor chooses to delay submitting payment invoices, labour returns shall still be submitted as per frequency and timeframe stipulated by the Employer. The contractor's invoices shall not be paid until all pending labour information has been submitted. <u>Applicable labour laws</u> The current Ministerial Determination (also downloadable at <u>www.epwp.gov.za</u>) Expanded Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice , shall apply to works described in the scope of work as being labour-intensive and which are undertaken by unskilled or semi-skilled F:..... V:..... T:.....	Item	**N/A**		
	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:.....	Item			
	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.				
E14	**OCCUPATIONAL HEALTH AND SAFETY ACT NO. 85 OF 1993** Tenderers are to allow for costs in providing a project specific ' Construction Phase Safety, Health and Environmental Plan' in accordance with "Section 2 - Specification Data associated with SANS 1921-1:2004" clause C4.18 in "Part C3 - Scope of Work"				
	F:..... V:..... T:.....	Item			
E15	**NOTICE BOARD, SITE OFFICE, ETC.** Tenderers are to allow for the provision and removal of a project notice board and a site office in accordance with the Principal Agent's requirements.				
	F:..... V:..... T:.....	Item			
E16	**IMPORTED MATERIALS AND EQUIPMENT** Where imported items are listed in the tender documents, the tenderer shall provide all information called for, failing which the price of any such item, material or equipment shall be excluded from currency fluctuations. (***Refer to T2.14 - Schedule of Imported Materials and Equipment***.				
	F:..... V:..... T:.....	Item			
E17	**CONTRACT DOCUMENTS** The drawings issues with these Tender documents do not comprise the complete set but serves as a guide only for tendering purposes and for indicating the scope of works to enable the Tenderer to acquaint him with the nature and extent of the works and the manner in which they are to be executed.				
	Should any part of the drawings not be clearly legible to the Tenderer he shall, before submitting his Tender, obtain clarification in writing from the principal agent.				
	F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
E18	**GENERAL PREAMBLES** The Document Preambles will be the "ASAQS Model Preambles for Trades – 2008" and is obtainable from the various Regional Office's of the Department of Public Works and shall be read in conjunction with the Bills of Quantities and be referred to for the full descriptions of work to be done and materials to be used. F:..... V:..... T:.....	Item			
E19	**TRADE NAMES** Wherever a Trade Name for any product has been described in the Bills of Quantities the Tenderer's attention is drawn to the fact that any other product of equal quality may be used subject to the written approval of the Principal Agent being obtained prior to the closing date for submission of Tenders. F:..... V:..... T:.....	Item			
E20	**EXISTING PREMISES OCCUPIED** Refer to Scope of Works Part C3 of this Tender Document for information on the occupation of existing buildings. F:..... V:..... T:.....	Item			
E21	**INACCURATE AND DEFECTIVE WORK EXECUTED UNDER PREVIOUS CONTRACT** The contractor shall, after taking possession of the site and before commencing the work, check all levels, liners, profiles and the like and satisfy himself as to the dimensional accuracy of all work executed under the previous contract which may affect his work. Should any inaccurate or defective work be found, the contractor shall immediately notify the principal agent in writing requesting his instructions with regard thereto and afford every facility to those rectifying such inaccurate or defective work. F:..... V:..... T:.....	Item			
E22	**VIEWING THE SITE IN SECURITY AREAS** If the site is situated in a security area and the 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 rigfht through his agents to test such supplies or request certificates confirming the grade and nature of the water supply. Relevant knowledge of the respective area will be an advantage.				
E28	Electricity Consumption The Contractor will be responsible to remunerate the school with an amount of R1,200.00/month for electricity used on the site during the construction period, from site handover until Works completion is reached and must make allowance in his Preliminaries for such Payment to the School on a monthly basis and if this is not paid, it will be deducted in the final account. The abovementioned electricity payments will only be applicable if the contractor makes use of the schools electricity. However the school is not oblidged to to supply the contractor with electricity, and if so the Contractor must provide his own electricity for construction purposes. Contractors also need to factor in the unavailability of electricity due to load shedding or any other disruptions will be entertained in respect of time or money. F:..... V:..... T:.....	Item			
	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	
Carried forward to Final Summary		R	

Section No. 1
Preliminary & General
Summary

PAGE NO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1		**BILL NO 2**				
1		**EMPLOYMENT AND TRAINING OF LABOUR ON THE EPWP BENEFICIARY INFRASTRUCTURE PROJECTS**				
1		**PREAMBLES**				
1		Tenderers are advised to study the Additional Specification SL: Employment and training of Labour on the Expanded Public Works Programme (EPWP) Infrastructure Projects as bound elsewhere in the Bills of Quantities and then price this Bill accordingly				
1		**TRAINING OF EPWP BENEFICIARY**				
1		(TARGET: 10 EPWP BENEFICIARY)				
1		Skills development and Technical training:				
1	1	Skills development and technical training for EPWP beneficiary for an average of 10 days (ref. SL11.01.01)	Item	1		
1	2	Penalty due to not meeting the target as in SL 11.01.02	Y/Work	R 2 000,00		
1		**TRAVELLING AND ACCOMMODATION DURING OFF SITE TRAINING:**				
1		Life skills training for duration of the project				
1	3	Travelling (based on 50km/EPWP beneficiary)	km	500		
1	4	Profit and attendance on Items 1, 2 & 3	%			
1		**EMPLOYMENT OF EPWP BENEFICIARY**				
1	5	Employment of EPWP beneficiary (10 youth) Existing blocks.	Item	1		`
1		The unit of measurement shall be the number of EPWP beneficiary at the statutory labour rates of R 100/day 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 training shall be excluded from this item. This item is based on 12 months appointment for EPWP beneficiary				
1	6	Employment of EPWP beneficiary(10 youth) [Parking garage]	Item	1		
		TOTAL CARRIED TO SUMMARY				

			UNIT	QUANTITY	RATE	AMOUNT
2		The unit of measurement shall be the number of EPWP beneficiary at the statutory labour rates of R /day 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 training shall be excluded from this item. This item is based on 12 months appointment for EPWP beneficiary				
2	7	Employment of EPWP beneficiary (10 youth) [Conference Centre & Canteen]	Item	1		
2		The unit of measurement shall be the number of EPWP beneficiary at the statutory labour rates of R /day 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 training shall be excluded from this item. This item is based on 12 months appointment for EPWP beneficiary				
2		**PROVISION OF EPWP DESIGNED OVERALLS TO YOUTH WORKERS**				
2	8	Supply EPWP designed overalls to EPWP beneficiary (ref. SL 11.05.01) for 5 or 10 workers	Item	1		
2	9	Profit and attendance on Items 5 - 8 (ref. SL 11.05.02)	%	7,5		
2		**PROVISION OF SMALL TOOLS FOR EPWP BENEFICIARY**				
2	10	Supply of small tools to EPWP beneficiary. Specification to be supplied by the EPWP-NYS Serviced Provider for the respective trades (ref. SL 11.06.01) for 5 or 10 workers	Item	1		
2	11	Profit and attendance (ref. SL 11.06.02)	%	7,5		
2		**APPOINTMENT OF YOUTH TEAM LEADERS**				
2	12	Appointment of EPWP beneficiary Team Leaders for the duration of the contract (ref. SL 11.07)	Item	1		
2	13	Liaison with Service Provider (ref. SL 11.08)	Hrs	30		
2	14	Profit and attendance on Items 12 & 13	%	7,5		
		FINAL TOTAL CARRIED TO PRELIMINARY AND GENERAL IN BILL OF QUANTITIES				

C12 to be expanded from C 12.1 to C12.10 as follows;

C 12 EPWP CONDITIONS AND SPECIFICATIONS	Unit	Quantity	Rate	Amount
C12.1(a) Employment Targets The contractor needs to provide a realistic estimate on the number of jobs that the project has a potential to create throughout the project duration as the project will be implemented using Labour Intensive Construction methods on elements where it is economical and feasible. F.....V.....T..... It is a general requirement of this contract that persons normally resident in the ward of the works (local labour) be given preference for employment on the contract. Provided, however, that **should adequate and appropriate labour not be available within the ward**, others may be employed subject to satisfactory proof being provided that every reasonable endeavour has been made to employ local labour **(Local Sub-contractor(s); Skilled; Semi-Skilled and Unskilled).** The contractor shall in consultation with the local community leaders (**Project Steering Committee**) with the purpose of negotiating with them regarding the utilization of local resources in the construction process. In this regard, the contractor shall furthermore give preference, wherever possible to the employment of single heads of households, women and youth as well as families declared as most indigent by War on Poverty/ Sukuma Sakhe program profiling process. The contractor should aim, in general, to maximise the involvement of the local community, however workers from other communities should not exceed 20% of all persons working on the project, where local employees possess skills at level of competency that meet contractors requirements	Item			
C12.1 (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 following employment requirements of the EPWP 1. 60 % of unskilled labour to be women 2. 55% of unskilled labour to be youth aged between 18 and 35 years 3. 3% of unskilled labour to be people with disability 100% unskilled labour utilized must reside within the boundaries of the Municipality Ward where this contract is executed, with preference to the local community closest or a 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			
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount

C12.1 (c)Labour rate and payment intervals The contractor should ensure that the labour rate paid to unskilled local labour is commensurate to the daily task. When determining the rate, consideration should be given to that EPWP beneficiaries are mostly bread winners in their families, as the program intends alleviating poverty. There should also be consideration that the labour rate promotes creation of expanded number of jobs created and person days of work. Contractors should make endeavours to ensure that labourers, particularly unskilled are remunerated on fortnight basis and prior notification be made should there be a shortfall on their wages. The labour rate for local unskilled shall also be determined in consideration of the location of the project, i.e. for projects implemented in urbanized municipalities will not be the same as that for rural municipalities. F.....V.....T.....	Item			
C12.2 (a)Labour Intensive Construction (LIC) method On site there must a person(s) having the competency in managing and implementing LIC methods. *Foreman @ NQF Level 4 the Unit Standard on Implementing LIC methods on site. *Site Agent/ Managers @ NQF level 5 the Unit Standard on Manage Labour-Intensive Skills Programme both must be CETA accredited. *The consultant @ NQF level 7 in both design and build contract as well in design by employer. (Consultants- The person responsible for the design and documentation of the labor-intensive works, must have completed the NQF level 7-unit standard "Develop and Promote Labour-Intensive Construction Strategies" or equivalent QCTO qualification). Curriculum Vitae of Key Personnel-Management to be attached. F.....V.....T.....	Item			
C12.2 (b) Labour Intensive Construction Method Those parts of the contract to be constructed using Labour Intensive methods will be marked in the BoQ with letter LI (indicating Labour Intensive) against every item so designated. Such works will only be constructed using the method so indicated. Reference to be made to Guidelines for the implementation of Labour Intensive Infrastructure projects under EPWP. "Scope of Work in Respect of Work Relating to the Expanded Public Works Programme (EPWP)" **Labour-intensive component** Due to the nature of the work involved, this type of project lends itself to be feasible as a labour Intensive project i.e. the construction activities will indeed require skilled/unskilled labour. The aim of the projects is to provide some form of economic benefit whilst generating and increasing the acquired skills shortage to improve sustainability in the local area. The following are potential focus areas where employment creation can be optimized per project:				

	TOTAL CARRIED TO SUMMARY			
	Unit	Quantity	Rate	Amount
(i) Trenching works not exceeding depth of 1.5m, including trenching for Foundation, Electrical, Water, Mechanical & Civil Services Works including backfilling where ground conditions permit (ii) Building Works; All masonry works (which include concrete mixing on site; brickwork; block work ; plastering; screed works; jointing; etc.); Painting, Plumbing, Ironmongery; roof cladding; glazing; tilling; carpentry; flooring; waterproofing; etc. (iii) Sewers works including Construction of manholes, laying of Sewer pipes, bedding, backfilling and compaction. (iv) Water Reticulation works including excavation, bedding, laying of pipes and compaction (v) Site Clearance Works (vi) Electrical Reticulation works. (vii) Stormwater water drainage using in-situ concrete (viii) Landscaping and Grassing of Sports Field (ix) Cleaning and Fencing Works The above identified activities are deemed suitable to be constructed using the LIC methods; to build, upgrade and maintain the social and economic of the underdeveloped area, promoting community participation, development of skills and creating more work opportunities. The above identified activities should be marked in the Bill of Quantities with the letter (LI). Contractor to price the above items in the Bill of Quantities bearing in mind that they are regarded as the main sources of job creation, whether sub contracted or undertaken by the main contractor. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letter LI are not necessarily an exhaustive list of all the activities which must be done by hand. Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which				

was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment. F.....V.....T.....	Item			
C12. 3 Record Keeping 12.3.1 Every employer must keep in the project site office the following minutes of site progress minutes; contractors' monthly site progress reports; accurately recorded attendance register; proof of payment as means to verify authenticity of data in the EPWP Beneficiary form submitted with payment certificates. Copies of submitted EPWP beneficiary data forms should also be kept in the site office. 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.				
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount
This should be safely kept for job creation data verifications and periodical audits on projects conducted by National and Provincial Department of Public Works after one (1) or two (2) quarters of submitting captured EPWP Data to the National EPWP coordinating Department. F.....V.....T.....	Item			
C12.4 EPWP Monthly Reporting documents: At the end of each month the contractor must submit: • EPWP monthly data collection form • Worker monthly payment upload • Worker monthly acknowledgement of receipt of payment • Worker monthly Payment register • Worker monthly training form • Monthly attendance Register • Worker Monthly pay slips • Unskilled labour certified ID copies (once off) • Beneficiary ID-size photos • Proof of UIF • Proof of COIDA F.....V.....T.....				
C12.5 EPWP Promotion	Item			

	12.5.1 EPWP signage board EPWP Program at the project level shall always be promoted through the provision of projects signage board that embraces EPWP logo at the bottom, correct measurement for this sign board will be provided by the project leader during the site handing over meeting. F.....V.....T.....	Item			
	12.5.2 Branding of labour apparel Contractor & Sub-contractors' labourers shall be provided with EPWP branded Personal Protective Equipment (PPE), reflector vest with EPWP acronym at the back as an ideal and cost effective means of promoting program on site. The contractor is advised to price for both items 12.5.1 and 12.5.2 F.....V.....T.....	Item			
	TOTAL CARRIED TO SUMMARY				
		Unit	Quantity	Rate	Amount

C12.6 COMMUNITY LIAISON OFFICER (CLO)

UTILISATION OF A COMMUNITY LIAISON OFFICER

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

A CLO will be identified by the local structures (Project Steering Committee) of the ward areas and appointed following fair and transparent interviewing process, to be conducted in the presence of local structures and the contractor representative, in order to assist the Contractor in the procurement of any local labour, etc. required for this project. The Contractor is to liaise with the CLO and afford him any assistance needed in ensuring sound working relations with the local community.

Key Responsibilities of the CLO are envisaged to include and not necessary be limited to:

1. Assisting local leadership in conducting skills and resources audit which facilitates sourcing labour from within the ward or targeted areas for employment, as required by contractor
2. Assisting in sourcing labour-only domestic sub-contractors and the procurement of materials from local resources, as required by the contractor.
3. Assisting the contractor by identifying areas of potential conflict and or threats to the project or to stakeholders in the project and recommend appropriate action to the contractor.
4. Assisting contractor and stakeholders in the project in the resolution of any conflict which may arise.
5. Establishing and ensuring that sufficient and open communication channels between the contractor and the work force are maintained.
6. Establish and ensuring that efficient and open communication channels between the contractor and the community are maintained
7. Identifying and reporting to the Contractor regarding issues where communication between stakeholder is necessary, recommend courses of action and facilitate such communications
8. Assisting the Contractor and the work force in the establishment of grievance procedures and necessary 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 and submit periodic reports as may be required by the Contractor from time to time.
10. Attending to such other duties which are consistent with the functions of a CLO, as may be required by the Contractor from time to time.

Tenderers are to price twice the rate of unskilled local labour rate for the Community Liaison Officer (CLO) ,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: Public Works

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

	Item			
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount

C12.7 SKILLS DEVELOPMENT

Skills development on site

The Contractor in conforming to the objectives of EPWP that allows for EPWP labours need to be capacitated with skills that will render them employable in the future. It is then the responsibility of the contractor that mandatory (Generic) life skills are provided to 100% of workforce on site. 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 work-placement, in service training and support towards improving their level of competency and productivity. Contractor shall also provide all necessary on-the-job training to targeted labour to enable such labour to master and advance on techniques required to undertake the work in accordance with requirements of the contract in a manner that does not compromise workers health and safety.

The contractor from grade three to provide accredited training to training to at least 1% of his unskilled labour force. As the project value increases, the variety of trainings and number of unskilled labour to be trained. | Item

PROVISION OF STRUCTURED TRAINING

Requirement for structured training:

1.2.1. Projects must have a minimum of professional fees of R5 million, excluding disbursements.

1.3. Contractor Targeted Training Opportunities for Skills programme, In-service Trainees, Apprentice, Artisans and Graduates in line with CIDB Skills Development Standards. The provision of training should be priced under Preliminary & General (P&G's).
1.3.1. Projects must have a minimum duration of twelve months and minimum construction cost of R20 million, excluding contingencies, allowances, and taxes.
1.3.2. Contractor must have a minimum CIDB Grading of 7 in the category of General Building and Civil Engineering Contracts.

Scope of structured training

Re
In order to avoid duplication of training programmes and training facilities, all structured training, shall be implemented, measured and paid for in accordance with the requirements of this section: Requirements of the Expanded Public Works Programme (EPWP).

The Employer's objectives include the training of local labour and Targeted Enterprises within a structured programme, in order to equip them with skills that will assist them in gaining future employment, and to facilitate targeted EPWP participants in gaining competencies and unit standard credits towards future full learnership qualifications.

Such training shall contain both theoretical and practical components and shall be conducted in accordance with the various laws and regulations contained in the South African Qualifications Authority (SAQA) statutes.

The Contractor shall be required to provide a training facility on the Site for Generic skills training, or in close proximity thereto, and to provide over the duration of the contract the following training for EPWP participants:

(a) Generic skills training;
(b) Entrepreneurial skills training;
(c) Construction skills training; and
(d) In-service training.

Generic skills training and in-service training shall be provided to all EPWP participants.

Entrepreneurial and construction skills training shall be provided to targeted EPWP

participants only.

Entrepreneurial skills training comprises both management skills training and business development skills training.

Construction skills training comprises specific on-task skills training.

NOTE TO COMPILER:
The compiler shall obtain from the Department's project manager the budget to be allowed for the implementation of the entire training function on the project.

Note that the training function includes all costs related to the training facility, the training provider and trainers, the training materials, the wages of the learners, COIDA, UIF, PPE, tools, transport, handling costs, etc, all as described in the various pay items at the end of this section.

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

C12.8 SUB-CONTRACTING FOR LOCAL EMERGING ENTERPRISES

The project can support the notion of one main contractor to be appointed whilst several subcontractors, possibly from the local EME group, are employed to undertake various smaller activities.

Two alternatives can be applied for setting out work for sub-contractors, i.e. full responsibility (provide their own plant, materials and labour) or secondly the main contractor remains responsible for the supply of plant and materials, while the sub-contractor is responsible for implementation, thus providing the skills and labour content only for the various construction activities. The contractor will be required to appoint a reasonable number of emerging sub-contractors to undertake work to the minimum of **30%** of the contract value on the various service areas but not limited to the following services;

Item	Description/Task/Activity
General Building works	Masonry
	Carpentry and joinery
	Floor finishes/Tilling
	Paint work
	Joinery fittings
	Plumbing (internal & external)
	Plastering
Civil works	Paving
	Landscaping

This percentage excludes the costs of employing local unskilled labour. A minimum of **15%** of the total number of the appointed emerging subcontractors must be owned by **females** who have more than **50.1%** ownership of their company/organization. EME represent an important vehicle to address the challenges of job creation, economic growth and equity in our country. EMEs are playing a critical role in absorbing labour, penetrating new markets and generally expanding economies in creative and innovative ways.

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

	Item			
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount
C12.8.1 Subcontractor Procedure				

The contractor to implement work packages as per the project designed and identified trades. 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 The Contractor shall without delay enter into contract with the successful tendering subcontractor based on their accepted tender submission. 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. F.....V.....T.....	Item			
C12.8.2 Subcontractor Mentoring Once the Subcontractors have been identified and engaged, the Contractor shall closely monitor their performance in the execution of their contracts. The Contractor will be responsible for drawing implementation plan that will assist in managing the development of sub-contractors undertaking Labour Intensive work. The Contractor will be responsible for management of the sub-contractors and to ensure that they comply with all EPWP requirements as set-out in this specification. The Contractor and sub-contractors will be required to compile monthly progress reports to be submitted with payment certificates. The reports shall include planned targets with regards to the works and employment, employment of EPWP beneficiaries and project expenditure. Failure to produce monthly reports will render payment certificates incomplete The contractor will be required to assist, train, mentor and monitor its Sub-contractors and report through monitoring tool on progress of each Sub-contractor. F.....V.....T.....	Item			
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount

C12.8.3 Portfolio of Evidence The Contractor is to develop and /or maintain a portfolio of evidence for each sub-contractor. The Portfolio of Evidence is a collection of proof of the training, coaching, guidance and monitoring inputs provided to the Sub-contractor. It is the document which records the development progress of the Sub-Contractor and will need to be updated continually throughout the duration of the contract. The Portfolio of Evidence should include but not limited to the following documentation: • The development path designed for each Sub-Contractor, • The Training course completed by the Sub-Contractor, • The hours of guiding, coaching and mentoring received for each activity listed in the developmental plan, • A list of outcomes achieved at each level for each activity. F.....V.....T.....	Item			
Performance and penalties The Contractor performance will be monitored throughout the contract. Should the Contractor fail to fulfil his obligation he will be liable for penalties. Payment of the penalty shall not absolve the Contractor of any claim, or relieve the Contractor of any of his duties, obligations or responsibilities under the contract. • Utilisation of the Sub-Contractors The Contractor's achievement of the targets will be measured quarterly to determine the progress made to date.				
C12.8.4 Local Suppliers Local material suppliers within the vicinity of the site to be utilise as long as their materials meets the required specification. However, quality and suitability would have to be checked by the employer, if the local suppliers are unable to meet the demand the nearest suitable suppliers are to be used. Production of materials should be done on site, where economies of scale allow e.g. concrete paving blocks should be encouraged which will enable employment creation and also allow for enterprise development. F.....V.....T.....	Item			
C12.8.5 TENDERER'S TO NOTE CONDITIONS a) The contract to be entered into between the Contractor and the Priority Population Group's (PPG's) will be a LABOUR ONLY sub-contract. b) The Contractor will be responsible for ensuring that all materials for use by the PPG's in the works are to be on site timeously. The Contractor shall liaise with The Mentor and PPG to determine the nature and extent of materials required and the lead time necessary. F.....V.....T.....	Item			
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount

c) The Contractor shall be responsible for the overall programming of the Works and he is to allow for monitoring the PPG's programme and progress. d)In conjunction with the Mentor, he is to allow for the supervision and mentoring (where necessary) of the PPG to ensure quality and adherence to standard building practice				
F.....V.....T.....	Item			
e) The Contractor is to allow for extra storage facilities on site for the PPG's tools and equipment.				
F.....V.....T.....	Item			
f) Basic tools shall be provided by the Priority Population Group's (PPG's) and where these are not available; the Contractor will supply him with the necessary tools and equipment and deduct the costs thereof from the interim claims made by the PPG. g) Work requiring specialized tools will be provided free of charge by the Contractor with the provision that these be returned upon completion of the Work.				
CO-ORDINATION AND SUPERVISION The Contractor is to co-ordinate and supervise the work of all the PPG's, Sub-Contractors and Nominated Sub- Contractors appointed directly by the Employer in such a manner and at all times as will suit the building programme and he is to allow adequate access, for the PPG's, where required, to carry out their work in an efficient manner and acceptable quality standards in accordance with the specifications as no claims for extras in this connection will be entertained.				
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. Where scaffolding is necessary for the use by any PPG and the Contractor has not erected any for his own use or has removed same after his own use, the Contractor shall supply sufficient scaffolding to the PPG to be erected and dismantled by the PPG and returned to the Contractor. This attendance upon PPG's to execute the work is to include for the scaffolding provisions as aforesaid and, in addition, is to include for co-operating to the fullest extent with all the parties, attending on off-loading materials, providing suitable storage for tools and materials used by the PPG's, use of general facilities such as latrines, etc., supply and cost of power, lighting, water and the like.				
F.....V.....T.....	Item			
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount

C12.9 EPWP contract for labour It is compulsory that shortly after the contractor and or sub contractor has appointed local labour, the employment contract should be signed by both parties, prior to commencement with works on site. The employment contract forms part of the Ministerial Determination or from the regional EPWP officials. F.....V.....T.....	Item			
C12.10 EPWP Scope of Work For This Project **Contractors are to price the items on the Bill of Quantities highlighted below, bearing in mind that they are regarded as main sources of job creation, whether sub contracted or undertaken by the main contractor.** **Elements of the scope of work where the application of Labour Intensive Construction methods are indicated with the letters (LI) are as follows;** i) Excavating trenches for foundations and any other civil works with the depth not more than 1.5 m ii) All masonry works which include concrete mixing on site; brickwork; plastering; screed works; jointing; etc. iii) Painting, Plumbing, Ironmongery; roof cladding; glazing; tilling; carpentry; flooring; waterproofing; etc. iv) External works such as landscaping; cleaning; paving; fencing; tarmac; etc. F.....V.....T.....	Item			
TOTAL CARRIED TO SUMMARY				

HEALTH AND SAFETY IMPLEMENTATION COSTING

Contractor to give a breakdown of his Health and Safety costs on this sheet.

ITEM	DESCRIPTION	UNIT	QUANTITY	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

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

PART C2.3 BILL OF QUANTITIES

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

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

Engineer/Principal Agent
Ramgoolam (Pty) Ltd
P.O. Box 364
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Dannhauser
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Employer:
Head: Public Works
KZN Department of Public Works
Private Bag X 9041
PIETERMARITZBURG
3200
Tel Number: 033 - 8971300
Fax Number: 033 - 8971399

Region:
Regional Manager
KZN Department of Public Works
40 Shepstone Road
LADYSMITH
3370
Tel Number: 036- 638 8255
Fax Number: 036- 638 8099

Tender Number: **ZNTL 05828W**
CIDB Grading: **4GB or higher**
ECDP Number: **N/A**

Project Code: **070689**
Document Date: **N/A**

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

Item No		Quantity	Rate	Amount

BILL NO. 1

EARTHWORKS (PROVISIONAL)

PREAMBLES

For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder

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SUPPLEMENTARY PREAMBLES

Nature of ground

The nature of the ground is assumed to be loose sandy material, therefore "earth", but possibly interspersed with "soft rock" or "hard rock"

The nature of the ground is assumed to be gravel, therefore "earth", but possibly interspersed with "soft rock" or "hard rock"

The nature of the ground is assumed to be silty clay with loose river boulders varying in size up to approximately 450mm diameter, all of which will be deemed as "earth", but possibly interspersed with "hard rock"

A soils investigation has been carried out on the site by the engineer and the report is annexed to these bills of quantities. The soils report indicates that the ground varies between silty sand, reworked soil of mixed origin and residual shale, all of which will be deemed as "earth". All very hard unweathered shale, ironstone, etc, the removal of which necessitates the use of explosives or heavy duty hydraulic percussion hammers (peckers), will be classified as "hard rock"

Carting away of excavated material

Descriptions of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations or, alternatively, from stock piles situated on the building site

Carried Forward R

	Brought Forward			R
	Filling			
	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			
	PRICES FOR FILLING ARE TO INCLUDE FOR ALL NECESSARY DENSITY TESTS IN ACCORDANCE WITH SABS 1200D			
	(CPAP WORK GROUP NO. 104) unless otherwise stated			
	SITE CLEARANCE, ETC.			
1	Digging up and removing rubbish, debris, vegetation, hedges, shrubs and trees not exceeding 200mm girth, bush, etc.	m2	283	
2	Stripping average 150mm thick layer of top soil and depositing material in prescribed stock piles on site	m2	283	
	EXCAVATION, FILLING, ETC.			
	Excavation in earth not exceeding 2m deep			
3	Trenches	m3	35	
4	Reduced levels under floors	m3	24	
5	Excavation for Pit exceeding 2m but not exceeding 4m deep	m3	145	
	Back excavation of vertical sides of excavations in earth for working space including backfilling compacted to 90% Mod AASHTO density			
6	Exceeding 1,5m and not exceeding 3,0m deep for placing and removing formwork to walls etc, against excavated face	m2	240	
	Extra over back excavation in earth for working space for excavation in soft rock			
7	Exceeding 1,5m and not exceeding 3,0m deep for building brickwalls 750mm away from excavated face	m2	24	
	Carried Forward			R

Section No. 4
Bill No. 1
Earthworks (Provisional)

	Brought Forward			R
	Extra over back excavation in earth for working space for excavation in hard rock			
8	Exceeding 1,5m and not exceeding 3,0m deep for building brick walls 750mm away from excavated face	m2	12	
	Extra over trench and hole excavations in earth for excavation in			
9	Soft rock	m3	18	
10	Hard rock	m3	9	
	Extra over all excavations for carting away			
11	Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor	m3	172	
	Risk of collapse of excavations			
12	Sides of trenches excavations not exceeding 1,5m deep	m2	84	
13	Sides of tank excavations exceeding 1,5m deep	m2	154	
	Keeping excavations free of water			
14	Keeping excavations free of all water other than subterranean water		Item	
	Earth filling obtained from the excavations and/or prescribed stock piles on site compacted to 95% Mod AASHTO density			
15	Backfilling to trenches	m3	18	
	Earth filling of G7 material supplied by the contractor, compacted to 95% Mod AASHTO density			
16	Under floors, tanks etc.	m3	53	
	1:3 Soilcrete: Mix the selected (imported) insitu material with cement at 1bag : 3 wheel barrows of insitu material.			
17	Under Pit	m3	11	
	Course river sand filling supplied by the contractor			
18	Under floors etc	m3	4	
	Carried Forward			R

Section No. 4
Bill No. 1
Earthworks (Provisional)

	Brought Forward			R
	Compaction of surfaces			
19	Compaction of ground surface under floors etc including scarifying for a depth of 100mm, breaking down oversize material, adding suitable material where necessary and compacting to 95% Mod AASHTO density	m2	142	
	Prescribed density tests on filling			
20	"Modified AASHTO Density" test	No	24	
	SOIL POISONING			
	Soil insecticide			
21	Under floors	m2	142	
22	To sides of trenches etc including forming and poisoning shallow furrows against foundation walls etc, filling in furrows and ramming	m2	175	
	BOULDERS			
23	Boulders Class A	m3		**Rate Only**
24	Boulders Class B	m3		**Rate Only**
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Bill No. 1
Earthworks (Provisional)

Item No		Quantity	Rate	Amount

BILL NO. 2

CONCRETE, FORMWORK AND REINFORCEMENT

PREAMBLES

For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder

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SUPPLEMENTARY PREAMBLES

Cost of tests

The costs of making, storing and testing of concrete test cubes as required under clause 7 "Tests" of SABS 1200 G shall include the cost of providing cube moulds necessary for the purpose, for testing costs and for submitting reports on the tests to the principal agent. The testing shall be undertaken by an independent firm or institution nominated by the contractor to the approval of the principal agent. **PRICES FOR CONCRETE ARE TO INCLUDE FOR ALL TEST**

Formwork

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

Formwork to soffits of solid slabs etc shall be deemed to be to slabs not exceeding 250mm thick unless otherwise described

Carried Forward R

	Brought Forward			R
	(CPAP WORK GROUP NO. 110) unless otherwise stated			
	UNREINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES			
	15MPa/19mm concrete			
1	Blinding to tank base	m3	5	
2	Surface blinding under surface beds and footings	m3	6	
	REINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES			
	25MPa/19mm concrete			
3	Strip footings	m3	7	
4	Aprons, ramps cast in panels	m3	11	
5	Surface beds cast in panels on waterproofing	m3	8	
	REINFORCED CONCRETE CAST ON/IN FORMWORK			
	25MPa/19mm concrete			
6	Filling to cavity of brick walls	m3	11	
7	Pit base slab	m3	28	
8	Slab over pit	m3	12	
	TEST BLOCKS			
9	Making and testing 150 x 150 x 150mm concrete strength test cube (Provisional)	No	36	
	CONCRETE SUNDRIES			
	Finishing top surfaces of concrete smooth with a wood float			
10	Surface beds, etc to falls and currents	m2	81	
11	Pit base slab	m2	70	
	Carried Forward			R

Section No. 4
Bill No. 2
Concrete, Formwork and Reinforcement

	Brought Forward			R
12	Pit slab	m2	58	
13	Aprons, ramps to falls	m2	71	
	(CPAP WORK GROUP NO. 111) unless otherwise stated			
	ROUGH FORMWORK (DEGREE OF ACCURACY II)			
	Rough formwork to sides			
14	Edges not exceeding 300mm high	m	63	
	Rough formwork to soffits			
15	Slabs propped up exceeding 1.5m and not exceeding 3.5m high	m2	58	
	Rough formwork to form			
16	450 x 600mm opening through 200mm slab (manhole)	No	6	
17	50mm Diameter opening through 200mm thick slab (urinal)	No	1	
18	250mm Diameter opening through 200mm thick slab (toilets)	No	12	
	SMOOTH FORMWORK (DEGREE OF ACCURACY II)			
	Smooth formwork to sides			
19	Sides of surface beds	m	76	
20	Edges of apron	m	73	
21	Edges, risers, ends and reveals not exceeding 300mm high or wide	m	60	
	MOVEMENT JOINTS ETC			
	Isolation joints with bitumen impregnated softboard between vertical concrete and brick surfaces			
22	20mm Joints not exceeding 300mm high	m	211	
	Carried Forward			R

Section No. 4
Bill No. 2
Concrete, Formwork and Reinforcement

	Brought Forward			R
	Joint forming material in movement joints			
23	20mm Bitumen impregnated fibre board built in vertically between brick skins	m	6	
	Saw-cut joints			
24	6 x 30mm Saw-cut joints in top of concrete	m	54	
	(CPAP WORK GROUP NO. 114) unless otherwise stated			
	REINFORCEMENT (PROVISIONAL)			
	Mild steel reinforcement to structural concrete work			
25	Bars not exceeding 10mm diameter	kg	325.00	
	High tensile steel reinforcement to structural concrete work			
26	Bars not exceeding 20mm diameter	kg	1 240.00	
	Fabric reinforcement			
27	Type 617 mesh reinforcement vertically in cavity of brickwalls	m2	93	
28	Type 193 fabric reinforcement in concrete aprons and surface beds	m2	128	
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Bill No. 2
Concrete, Formwork and Reinforcement

Item No			Quantity	Rate	Amount
	BILL NO. 3				
	PRECAST CONCRETE				
	PREAMBLES				
	For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder				
	SUPPLEMENTARY PREAMBLES				
	Sizes				
	Blocks, sills, etc measured linear shall be made in suitable lengths. Large size setting out drawings shall be prepared where necessary and submitted to the principal agent for approval before moulds are made				
	(CPAP WORK GROUP NO. 112) unless otherwise stated				
	PRECAST CONCRETE				
	590 x 590 Winblock and 590 x 590 Wingrid combination product code WB66/220				
1	Winblock and Wingrid	No	32		
	PRECAST CONCRETE LINTELS				
2	100 x 150mm High concrete lintel	m	52		
	Carried Forward to Summary of Section No. 4			R	
	Section No. 4 Bill No. 3 Precast Concrete				

Item No		Quantity	Rate	Amount

BILL NO. 4

MASONRY

PREAMBLES

For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder

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SUPPLEMENTARY PREAMBLES

BRICKWORK

Sizes in descriptions

Where sizes in descriptions are given in brick units, "one brick" shall represent the length and "half brick" the width of a brick

Bagged and sealed walls

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

Face bricks

Bricks shall be ordered timeously to obtain uniformity in size and colour

Pointing

Descriptions of recessed pointing to fair face brickwork and face brickwork shall be deemed to include square recessed, hollow recessed, weathered pointing, etc

Carried Forward R

	Brought Forward			R
	(CPAP WORK GROUP NO. 116) unless otherwise stated			
	BRICKWORK			
	FOUNDATIONS (PROVISIONAL)			
	Brickwork of NFX bricks (14 MPa nominal compressive strength) in class II mortar			
1	One brick walls	m2	43	
2	330mm walls of three half brick skins	m2	93	
	Pit wall lining (as specified by the engineer)			
3	On walls in depth exceeding 1.5m and not exceeding 3m deep	m2	17	
	SUPERSTRUCTURE			
	Brickwork of NFP bricks in class II mortar			
4	Half brick walls	m2	69	
5	Half brick walls in beamfilling	m2	19	
6	One brick walls of two half brick skins with inner skin bagged and sealed	m2	159	
	BRICKWORK SUNDRIES			
	Joint forming material in movement joints			
7	10mm Bitumen impregnated fibre board built in vertically around external pit brick wall.	m2	114	
	Galvanised Brickwork reinforcement			
8	75mm Wide reinforcement built in horizontally	m	818	
9	150mm Wide reinforcement built in horizontally	m	673	
	Turning pieces to lintels etc			
10	220mm Wide turning pieces	m	31	
	Carried Forward			R

Section No. 4
Bill No. 4
Masonry

	Brought Forward			R
	Galvanised hoop iron cramps, ties, etc			
11	30 x 1,6mm Roof tie 1,5m long with one end built into brickwork or cast in on top of concrete and other end fixed to timber	No	120	
	FACE BRICKWORK			
	"Corobrick Roan Satin FBX Clay or similar approved" face bricks pointed with half round horizontal and vertical joints			
12	Extra over brickwork for face brickwork	m2	176	
13	Extra over brickwork for brick-on-edge header course lintels one course high, pointed on face and 220mm soffit	m	29	
14	220mm Copings on top of one brick walls	m	6	
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Bill No. 4
Masonry

Item No			Quantity	Rate	Amount
	BILL NO. 5				
	WATERPROOFING				
	PREAMBLES				
	For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder				
	SUPPLEMENTARY PREAMBLES				
	Waterproofing				
	Waterproofing of roofs, basements, etc shall be laid under a ten year guarantee. Waterproofing to roofs shall be laid to even falls to outlets etc with necessary ridges, hips and valleys. Descriptions of sheet or membrane waterproofing shall be deemed to include additional labour to turn-ups and turn-downs				
	(CPAP WORK GROUP NO. 120) unless otherwise stated				
	DAMPPROOFING OF WALLS				
	One layer 375 micron embossed polyethylene dampproof course (SANS 952-1985 type B)				
1	In walls	m2	21		
	One layer 250 micron green polyethylene waterproof sheeting (SANS 952-1985 type C) sealed at laps with PVC self-adhesive tape				
2	Under surface beds, aprons etc	m2	97		
	Three layers 250 micron green polyethylene waterproof sheeting (SANS 952-1985 type C) sealed at laps with PVC self-adhesive tape				
3	On 330mm pit walls	m2	19		
	Carried Forward			R	

	Brought Forward			R
	One layer 375 micron green polyethylene waterproof sheeting (SANS 952-1985 type C) sealed at laps with PVC self-adhesive tape			
4	Under pit base slab	m2	70	
5	Vertically around walls	m2	166	
	SEALING STRIPS, JOINT SEALANTS, ETC			
	Two-part grey polysulphide sealing compound including backing cord, bond breaker, primer, etc			
6	20 x 15mm In isolation joints vertically in walls a etc including raking out expansion joint filler as necessary	m	13	
	Two-part grey polyurethen sealing compound including backing cord, bond breaker, primer, etc			
7	8 x 15mm in saw cut joints in floors including raking out expansion joints filler as necessary.	m	54	
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Bill No. 5
Waterproofing

Item No			Quantity	Rate	Amount
	BILL NO. 6				
	ROOF COVERINGS ETC				
	PREAMBLES				
	For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder				
	(CPAP WORK GROUP NO. 124) unless otherwise stated				
	PROFILED METAL SHEETING AND ACCESSORIES				
	0.8mm Z275 spelter embossed galvanised IBR profile troughed sheet steel in single lengths and accessories, with "Chromadek" finish on one side, fixed to timber purlins (elsewhere measured)				
1	Roof covering with pitches not exceeding 25 degrees with side laps sealed with 6 x 20mm closed cell bitumen impregnated polyurethane foam strips and seam stitched	m2	116		
2	Extra over roof covering for bending sheets to 45 degrees for a length of 20mm up at ridges, hips and valleys to form dam and down at eaves to form drip	m	42		
3	Ridge cappings 450mm girth	m	15		
4	Hip cappings 450mm girth	m	42		
5	Standard narrow and broad flute closers	m	82		
6	Standard narrow and broad flute closers raking at hips	m	42		
7	Standard narrow and broad rib polyethylene filler blocks	m	87		
8	Standard narrow and broad rib polyethylene filler blocks, raking at hips	m	84		
	Carried Forward			R	

	Brought Forward			R
	Extra over for intersections, joints etc of ridges, valleys, hips, flashings etc			
9	Two hips and one ridge cap	No	3	
	ROOF AND WALL INSULATION			
	Sisalation "420" or equal approved heavy duty industrial grade aluminium foil base insulation			
10	Insulation sheeting laid taut over purlins at approximately 1150mm centres and fixed concurrent with roof covering with minimum 150mm laps as per manufacturers specification	m2	109	
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Bill No. 6
Roof Coverings

Item No		Quantity	Rate	Amount

BILL NO. 7

CARPENTRY AND JOINERY

PREAMBLES

For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder

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SUPPLEMENTARY PREAMBLES

Fixing

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

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

(CPAP WORK GROUP NO. 126) unless otherwise stated

ROOFS ETC

PLATE NAILED TIMBER ROOF TRUSS CONSTRUCTION ETC

Tenderers are to make allowance in their rates for additional expenses in regard to treatment of timber against insect pest affecting softwood fixed permanently in the building

The design of prefabricated roof trusses, bracings and secondary members forming part of the total timber roof construction shall be prepared by a professional structural engineer- Truss System Engineer

A copy of letter reference TR1 and TR2 must be completed and signed by the Truss System Engineer and submitted to the Architect

Carried Forward R

	Brought Forward			R
	The tenderer is to allow in his rates for the roof trusses for the design, manufacture, supply, hoisting and fixing of the roof trusses and permanent bracings, any necessary temporary bracing, and for the costs of all inspections by the Truss System Engineer			
	SUPPLEMENTARY PREAMBLES			
	Trusses are at of minimum 680mm centres and purlins at maximum of 1200mm centres			
	Roof coverings are 0,8mm galvanised IBR profile sheets on 50 x 76mm purlins			
	Sawn treated softwood			
1	Design, manufacture, supply, hoist and fix including trusses, jack rafters, temporary and permanent bracings, purlins, wall plates, runners, gangboards, teco products, etc			
	Roof construction to double pitched roof with two hipped ends 9320 x 4890 x 1100mm high overall (25 degrees pitch) with 600mm overhang on all sides (Boys)	No	1	
2	Design, manufacture, supply, hoist and fix including trusses, jack rafters, temporary and permanent bracings, purlins, wall plates, runners, gangboards, teco products, etc			
	Roof construction to double pitched roof with two hipped ends 9670 x 4890 x 1100mm high overall (25 degrees pitch) with 600mm overhang on all sides (Girls)	No	1	
3	Extra over for wrought splayed purlins at eaves	m	87	
4	Extra over for wrought purlins at eaves	m	87	
5	Extra over for 600mm long wrought and shaped rafter foot	No	120	
	Sundries			
6	Two coats creosote on wall plate and exposed roof timbers	m2	48	
7	"Teco" two way hurricane clips	No	120	
	EAVES, VERGES, ETC			
	Carried Forward			R

Section No. 4
Bill No. 7
Carpentry and Joinery

	Brought Forward			R
	High density plain fibre-cement fascias			
8	12 x 275mm Fascias, including galvanised steel H-profile joiners	m	87	
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Bill No. 7
Carpentry and Joinery

Item No		Quantity	Rate	Amount

BILL NO. 8

IRONMONGERY

PREAMBLES

For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder

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SUPPLEMENTARY PREAMBLES

Proprietary items

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

Finishes to ironmongery

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

Carried Forward R

Section No. 4
Bill No. 8
Ironmongery

	Brought Forward			R
	(CPAP WORK GROUP NO. 132) unless otherwise stated			
	LOCKS			
	"Union" or similar approved			
1	50mm Padlock with two keys	No	2	
	LETTERS, NAMEPLATES, ETC			
	"Union" or similar approved			
2	150 x 150mm Black engraved brushed anodised aluminium plate with female symbol	No	1	
3	150 x 150mm Black engraved brushed anodised aluminium plate with male symbol	No	1	
	SUNDRIES			
	"Union" or equal approved			
4	38mm Diameter red rubber door stop, plugged	No	14	
	"Franke" stainless steel or equal approved			
5	Standard single toilet roll holder plugged and screwed to wall as per the architect's specification	No	12	
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Bill No. 8
Ironmongery

Item No			Quantity	Rate	Amount
	BILL NO. 9				
	METALWORK				
	PREAMBLES				
	For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder				
	SUPPLEMENTARY PREAMBLES				
	SUPPLEMENTARY PREAMBLES				
	Descriptions of bolts, anchors, etc				
	Descriptions of bolts shall be deemed to include nuts and washers				
	Descriptions of expansion anchors and bolts and chemical anchors and bolts shall be deemed to include nuts, washers and mortices in brickwork or concrete				
	Items described as "holed for bolt(s)" shall be deemed to exclude the bolts unless otherwise described				
	Items described as "plugged" shall be deemed to include screwing to fibre, plastic or metal plugs at not exceeding 600mm centres				
	(CPAP WORK GROUP NO. 136) unless otherwise stated				
	GALVANISED MILD STEEL GATES				
	Galvanised hot dipped mild steel with 16mm intermediate bars at 100mm centers				
1	Single gate for opening size 813 x 2032mm high of 30 x 30 x 3mm hollow section frame and middle horizontal rail filled in with 10mm square mild steel vertical bars at 125mm centres including hinges, padbolt and keep.	No	2		
	Carried Forward			R	

Section No. 4
Bill No. 9
Metalwork

	Brought Forward			R
	GALVANISED MILD STEEL DOOR			
2	2000 x 860mm door comprising 19x19x3mm galvanised mild steel frame covered on outside with 0.71mm galvanised mild steel sheet crossed-creased and lapped around edges and pop-rivetted at max 300mm centres with opening size 900mm to details on architect's drawing	No	12	
	STAINLESS STEEL MIRROR			
3	600 X 400mm highly polished stainless steel mirror fixed with dome head screws	No	9	
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Bill No. 9
Metalwork

Item No			Quantity	Rate	Amount
	BILL NO. 10				
	PLASTERING				
	PREAMBLES				
	For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder				
	(CPAP WORK GROUP NO. 142) unless otherwise stated				
	SCREEDS				
	TAL Screedmaster self-levelling screed to be laid on dry clean surface including relevant primers and bonding agents all in accordance with the manufacturer's specification				
1	On floors	m2	98		
	INTERNAL PLASTER				
	Cement plaster steel trowelled, on brickwork				
2	On walls	m2	331		
3	On walls in pit	m2	166		
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Bill No. 10
Plastering

Item No			Quantity	Rate	Amount

BILL NO. 11

TILING

PREAMBLES

For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder

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SUPPLEMENTARY PREAMBLES

Patterns

Unless otherwise described, tiles shall be laid with continuous joints in both directions

Fixing

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 approved tiling key-coat

Ceramic, porcelain, marble and granite tiles are to be fixed and grouted with suitable adhesives and grouts as recommended by the manufacturer of the tiles

(CPAP WORK GROUP NO. 144) unless otherwise stated

WALL TILING

Johnson or similar approved by Department - 150x150mm White glazed - "A" Grade Tiles, with white waterproof grout, laid 3 courses above basins & sinks

1	On walls	m2	4		

Carried Forward to Summary of Section No. 4 R

Section No. 4
Bill No. 11
Tiling

Item No		Quantity	Rate	Amount

BILL NO. 12

PLUMBING AND DRAINAGE (PROVISIONAL)

PREAMBLES

For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder

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SUPPLEMENTARY PREAMBLES

Wire gratings

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

Stormwater channels

Descriptions of channels shall be deemed to include necessary excavation, surface preparation, compaction, etc, and disposal of surplus material on site

Stainless steel basins, sinks, wash troughs, urinals, etc

Stainless steel for economy basins, domestic sinks and worktops shall be Type 430 (17/0)

Stainless steel for urinals, basins, quality sinks, wash troughs, institutional equipment, etc shall be Type 304 (18/8)

Stainless steel for laboratory sinks, photographic equipment, etc shall be Type 316 (18/8)

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

Sealing of edges

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

Carried Forward R

Brought Forward

R

uPVC pipes and fittings

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

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

uPVC pressure pipes and fittings

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

High density polyethylene (HDPe) pipes and fittings

Pipes shall be type IV and of the class specified with "Plasson" or "Alprene" compression fittings

Copper pipes

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

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

Carried Forward

R

Section No. 4
Bill No. 12
Plumbing and Drainage (Provisional)

Brought Forward R

Reducing fittings

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

Fixing of pipes

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

Disinfection of water pipework

Water pipework is to be disinfected at completion in accordance with SABS 1200L

"Densyl" petrolatum anti-corrosion tape as manufactured by Denso SA (Pty) Ltd.

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, "Layflat" sheeting, securing of same, etc

Prices for wrapping of pipes shall include for all work as described to couplings in the length

Laying, backfilling, bedding, etc of pipes

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

Carried Forward R

Section No. 4
Bill No. 12
Plumbing and Drainage (Provisional)

	Brought Forward			R
	Where no manufacturers' instructions exist, pipes shall be laid in accordance with Clauses 5.1 and 5.2 of each of the following: SABS 1200L : Medium-pressure pipelines SABS 1200LD : Sewers SABS 1200LE: Stormwater drainage			
	Pipe trenches, etc shall be backfilled in accordance with Clauses 3, 5.5, 5.6, 5.7 and 7 of SABS 1200DB : 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 1200LB : Bedding (Pipes)			
	Unless otherwise described bedding of rigid pipes shall be Class B bedding			
	(CPAP WORK GROUP NO. 148) unless otherwise stated			
	RAINWATER DISPOSAL			
	Seamless aluminium prepainted gutters and rainwater pipes			
1	100 x 100 x 100mm seamless aluminium gutter with brackets	m	87	
2	Extra over gutter for angle	No	12	
3	Extra over gutter for outlet for 100 x 75mm pipe	No	6	
4	Extra over gutter for stopped end	No	12	
5	100 x 75mm Rainwater pipes	m	21	
6	Extra over rainwater pipe for shoe	No	3	
7	Extra over rainwater pipe for eaves or plinth offset	No	6	
	CONCRETE STORMWATER CHANNELS			
8	25Mpa concrete open surface water channel 900mm wide x 150mm thick reinforced with Ref 193 mesh reinforcement cast in 2m alternate panels with V-shaped channel 900 x 50mm deep formed in same, including all excavations, trimming and levelling of ground surfaces, compaction, filling, formwork, floating etc	m	83	
	Carried Forward			R

Section No. 4
Bill No. 12
Plumbing and Drainage (Provisional)

	Brought Forward			R
9	Extra over for angles, intersections, ends, dressing into sides of catchpits, etc	No	12	
10	Stone pitching of approximately 100mm diameter river stones staggered and bedded in concrete at approximately 150mm centres both directions	No	3	
	SOIL DRAINAGE			
	HDPE Pipes			
11	110mm black vent pipes	m	34	
	uPVC pipes			
12	110mm Pipes laid in and including trenches not exceeding 1m deep	m	39	
13	110m Pipes laid in and including trenches exceeding 1m and not exceeding 2m deep	m	15	
	Extra over uPVC soil and vent pipes for fittings			
14	110mm Bend	No	6	
15	110mm Access junction	No	12	
16	110mm Two way vent pipe	No	12	
	Cast iron covers etc			
17	450 x 600mm x 124kg Type double 8B seal manhole cover and frame	No	6	
18	Lifting key for manhole cover	No	6	
	French drains			
19	Excavate in earth for and build French drain 10,0m long x 0,60m wide x 2,0m deep with 110mm diameter slotted uPVC pipe wrapped in "Kaymat" U14 geofabric filter material, wrapped around slotted pipe and 40 - 75mm stone backfill to a height of 0,80m and backfill top with earth to ground level as per drawing	No	1	
	uPVC gulleys			
20	100mm Gulley exceeding 500mm and not exceeding 750mm deep	No	2	
	Carried Forward			R

Section No. 4
Bill No. 12
Plumbing and Drainage (Provisional)

	Brought Forward			R
	SANITARY PLUMBING			
	Atlas Plastic or similar approved and installed according to manufacturers specification			
21	Charlog christy wash hand basin with galvanised brackets and fittings, fixed to brickwork	No	9	
22	"Atlas plastic" or similar approved moulded polyehthylene 222AP, VIP 200 Pedestal with incorporated seat and cover.	No	12	
	Stainless steel			
23	4000mm wide Curved back urinal with standard integral automatic flush tray, drip cock and hinged domical grating	No	1	
	WATER SUPPLIES			
	Class 1 copper pipes with brass compression couplings			
24	15mm Pipes	m	30	
25	15mm Pipes chased into brickwork	m	51	
	Extra over Class 1 copper pipes for capillary fittings			
26	15mm Fittings	No	62	
	Extra over Class 1 copper pipes for brass compression fittings			
27	15mm Fittings	No	44	
	TESTING			
28	Testing water pipe system		Item	
	WASTE UNIONS ETC			
	"Cobra Watertech" or equal approved			
29	32mm 301 CP basin waste union	No	9	
	TRAPS ETC			
	Carried Forward			R

Section No. 4
Bill No. 12
Plumbing and Drainage (Provisional)

	Brought Forward			R
	Rubber			
30	38mm "P" or "S" trap	No	9	
	TAPS, VALVES, ETC			
	"Cobra Watertech" or equal approved			
31	15mm 1065-15CP fullway isolating ball valve	No	11	
32	15mm 111-15CP pillar tap	No	9	
	SANITARY PLUMBING uPVC pipes			
33	50mm Pipes	m	41	
	Extra over uPVC soil and vent pipes for fittings			
34	50mm Bend	No	28	
35	50mm Access bend	No	30	
	Testing			
36	Testing waste pipe system		Item	
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Bill No. 12
Plumbing and Drainage (Provisional)

Item No			Quantity	Rate	Amount
	BILL NO. 13				
	PAINTWORK				
	PREAMBLES				
	For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder				
	SUPPLEMENTARY PREAMBLES				
	PAINT SPECIFICATIONS				
	All paints shall be "Plascon" or similar approved and done in accordance with "Plascon" specifications or equal approved				
	COLOURS				
	Unless otherwise described all paintwork shall be deemed to have a colour value in excess of 7 on the Munsell system in accordance with SANS 1091				
	(CPAP WORK GROUP NO. 152) unless otherwise stated				
	PAINTWORK ETC TO NEW WORK				
	ON INTERNAL FLOATED PLASTER SURFACES				
	One PVA coat under coat colour white and two coats acrylic eggshell paint, colour to Architects approval				
1	Walls	m2	331		
	2-4mm Polyurethane epoxy floor coating on min. 25mm screed, to manufacturers specifications and instruction				
2	On floors	m2	98		
	One PVA coat under coat colour white and two coats acrylic eggshell paint, colour to Architects approval				
3	Wind blocks and wingrids	m2	16		
	Carried Forward			R	

Section No. 4
Bill No. 13
Paintwork

	Brought Forward			R
	ON FIBRE-CEMENT BOARD SURFACES			
	One coat alkali resistant primer and two coats superior quality acrylic emulsion paint			
4	Fascias and barge boards, including priming metal jointing strips	m2	50	
	Carried Forward to Summary of Section No. 4			R

Section No. 4
Bill No. 13
Paintwork

SECTION SUMMARY - Building Works

Bill No		Page No	Amount
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8	Ironmongery	55	
9	Metalwork	57	
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12	Plumbing and Drainage (Provisional)	66	
13	Paintwork	68	
	Carried to Final Summary		R

Section No. 4

Item No		Quantity	Rate	Amount

BILL NO. 1

ALTERATIONS

PREAMBLES

For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder

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SUPPLEMENTARY PREAMBLES

View site

Before submitting his tender the contractor shall visit the site and satisfy himself as to the nature and extent of the work to be done and the value of the materials contained in the buildings or portions of the buildings to be demolished. No claim for any variations of the contract sum in respect of the nature and extent of the work or of inferior or damaged materials will be entertained

General

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

Doors, fanlights, windows, fittings, frames, linings, etc which are to remain the property of the employer shall be carefully taken out, temporarily stored, transported over a distance to store and handed over to the employer

Carried Forward R

	Brought Forward			R
	Doors, fanlights, windows, fittings, frames, linings, etc which are to be re-used shall be thoroughly overhauled before refixing including taking off, easing and rehanging, cramping up, re-wedging as required and making good cramps, dowels, etc, and oiling, adjusting and repairing ironmongery as necessary, replacing any glass damaged in removal or subsequently and stopping up all nail and screw holes with tinted plastic wood to match timber, unless otherwise described. Re-painting or re-varnishing is given separately			
	Prices for taking out of doors, windows, etc shall include for removal of all beads, architraves, ironmongery, etc			
	Prices for taking out and removing doors and frames shall include for removing door stops, cabin hooks, etc			
	With regard to building up of openings in existing walls, cement screeds and pavings, granolithic, tops of walls, etc, shall be levelled and prepared for raising of brickwork			
	Making good of finishes shall include making good of the brick and concrete surfaces onto which the new finishes are applied, where necessary			
	The contractor will be required to take all dimensions affecting the existing buildings on the site and he will be held solely responsible for the accuracy of all such dimensions where used in the manufacture of new items (doors, windows, fittings, etc)			
	REMOVAL OF EXISTING WORK			
1	Linear low density polyyethylene vandal resistant waterless urinal with curtain valve self cleaning "Addicon Eco smell stop trap"	No	1	
2	Linear low density polyethylene vandal resistant wash hand basin including brackets fixed to wall	No	3	
3	Roto moulded HDPE pedstal with black safety dropper tube	No	4	
4	Vandal proof toilet roll holder plugged	No	4	
	Carried Forward			R

Section No. 5
Bill No. 1
Repairs and Renovations

	Brought Forward			R
5	Taking out and removing timber single door 44 x 813 x 2032mm including ironmongery and steel frame from half brick wall and build in new steel frame (elsewhere) (wall and floor finishes elsewhere)	No	4	
6	Taking out and removing galvanised door frame	No	4	
7	Glass from steel windows, including cleaning out rebates and preparing for new glass (Provisional)	m2	2	
8	Walls in patches (Provisional)	m2	3	
9	Roof coverings	m2	120	
	Making good and sealing external face brickwork (sealing of face brickwork measured elsewhere)			
10	Clean down existing face brick walls with high pressure water hose	m2	138	
11	Sealing facebrick walls as per Architect's specification	m2	5	
	SUPERSTRUCTURE			
12	One brick walls	m2	10	
13	Half brick walls in beamfilling	m2	2	
	BRICKWORK SUNDRIES			
14	10mm Bitumen impregnated fibre board built in vertically between brick skins not exceeding 300mm wide	m2	3	
15	150mm Wide reinforcement built in horizontally	m	52	
	FACE BRICKWORK			
16	Extra over brickwork in NFP bricks for face brickwork in beamfilling	m2	1	
17	Extra over brickwork in NFP bricks for face brickwork	m2	5	
	ROOF COVERINGS ETC			
	Carried Forward			R

Section No. 5
Bill No. 1
Repairs and Renovations

	Brought Forward			R
	PROFILED METAL SHEETING AND ACCESSORIES			
18	Roof covering with pitch not exceeding 25 degrees with sides laps sealead with 6 x 20mm closed cell impregnated polyurethane strips and seam stitched	m2	120	
19	Ridge capping 450mm girth	m	10	
20	Moulded rib polyethelene filler blocks at eaves and ridge	m	20	
21	Curved turn down at eaves edge	m	20	
22	Curved turn up at ridge edge	m	20	
	CARPENTRY AND JOINERY			
	SUPPLEMENTARY PREAMBLES			
	EAVES, VERGES, ETC			
23	12 x 275mm Fascia boards, including aluminium H-profile fascia joiners and fixed with hot dipped galvanised drive screws and washers	m	28	
24	10 x 80 x 225mm Barge boards including aluminium H-profile barge joiners and fixed with hot dipped galvanised drive screws and washers (no paint) (product number 721-800)	m	24	
	DOORS ETC			
25	Single door 813 x 2032mm high	No	4	
	IRONMONGERY			
	LOCKS			
26	50mm Padlock with two keys	No	3	
27	Four lever mortice lockset and satin chrome handles	No	4	
	BATHROOM FITTINGS			
28	Vandal proof toilet roll holder plugged	No	4	
	Carried Forward			R

Section No. 5
Bill No. 1
Repairs and Renovations

	Brought Forward			R
	SUNDRIES			
29	38mm Diameter rubber door stop plugged	No	4	
	LETTERS, NAMEPLATES, ETC			
	"Union" or similar approved			
30	150 x 150mm Black engraved brushed anodised aluminium plate with female symbol	No	1	
31	150 x 150mm Black engraved brushed anodised aluminium plate with male symbol	No	1	
32	150 x 150mm Black engraved brushed anodised aluminium plate with paraplegic symbol	No	1	
	METALWORK			
	GALVANISED BOLTS			
33	12mm Diameter bolt, nut and two washers 100mm long including hole through 76mm timber	No	8	
	GALVANISED MILD STEEL GATES			
34	Single gate for opening size1075 x 2375mm high of 30 x 30 x 3mm hollow section frame filled in with 10mm square mild steel vertical bars at 125mm centres including hinges, locking mechanisms, barrel bolts, etc	No	3	
	PRESSED STEEL DOOR FRAMES			
	GALVANISED PRESSED STEEL DOOR FRAMES			
35	Frame for door 813 x 2032mm high	No	4	
	GALVANISED STEEL WINDOWS			
36	Window type NE1, 533 x 654mm high	No	3	
	STEEL BURGLAR BARS			
37	Burglar bars to window 733 x 854mm high of 30 x 25 x 3mm mild steel hollow section frame filled in one vertical and one horizontal bars of 25 x 5mm mild steel flat sections, the frame eight times bolted through one brick wall with and including M10 bolts, nuts and washers	No	3	
	Carried Forward			R

Section No. 5
Bill No. 1
Repairs and Renovations

	Brought Forward			R
	PLASTERING			
	SCREEDS			
	TAL Screedmaster self-levelling screed to be laid on dry clean surface including relevant primers and bonding agents all in accordance with the manufacturer's specification			
38	On floors	m2	60	
	INTERNAL PLASTER			
39	On walls	m2	175	
40	On narrow widths	m2	8	
	Carried Forward			R

Section No. 5
Bill No. 1
Repairs and Renovations

	Brought Forward			R
	PLUMBING AND DRAINAGE (PROVISIONAL)			
	SOIL DRAINAGE			
	HDPE Pipes			
41	110mm black vent pipes	m	32	
	uPVC pipes			
42	110mm Pipes vertically to walls	m	5	
43	110mm Pipes laid in and including trenches not exceeding 1m deep	m	13	
44	110m Pipes laid in and including trenches exceeding 1m and not exceeding 2m deep	m	13	
	Extra over uPVC soil and vent pipes for fittings			
45	110mm Bend	No	5	
46	110mm Access junction	No	4	
47	110mm Two way vent pipe	No	4	
	SANITARY PLUMBING			
48	Charlog christy wash hand basin with galvanised brackets and fittings, fixed to brickwork	No	4	
49	CHARLOG 200 VIP pedstal c/w seat and pan (Code:222 AP C/W) with Altas 200 VIP Funnel (Code: 224 AP)	No	4	
	Stainless steel			
50	1800mm wide Curved back urinal with standard integral automatic flush tray, drip cock and hinged domical grating	No	1	
51	50mm Pipes	m	25	
	WATER SUPPLIES			
	Carried Forward			R

Section No. 5
Bill No. 1
Repairs and Renovations

	Brought Forward			R
	Class 1 copper pipes with brass compression couplings			
52	15mm Pipes	m	50	
53	15mm Pipes chased into brickwork	m	50	
	Extra over Class 1 copper pipes for capillary fittings			
54	15mm Fittings	No	75	
	Extra over Class 1 copper pipes for brass compression fittings			
55	15mm Fittings	No	44	
	TESTING			
56	Testing water pipe system		Item	
57	15mm Fittings	No	13	
	WASTE UNIONS ETC			
58	32mm 301 CP basin waste union	No	4	
	TRAPS ETC			
59	38mm "P" or "S" trap	No	4	
	TAPS, VALVES, ETC			
60	15mm 1065-15CP fullway isolating ball valve	No	3	
61	15mm 111-15CP pillar tap	No	4	
	RAINWATER DISPOSAL			
62	100 x 100 x 100mm Seamless Aluminium gutter with brackets	m	20	
63	Extra over 100 x 125mm eaves gutter for stopped end	No	10	
64	Extra over 100 x 125mm eaves gutter for outlet for 75mm diameter pipe	No	5	
65	50 x 75mm Diameter rainwater pipes fixed to walls with holder bats	m	15	
	Carried Forward			R

Section No. 5
Bill No. 1
Repairs and Renovations

	Brought Forward			R
66	Extra over 50 x 75mm diameter rainwater pipe for eaves offset 500mm projection	No	5	
67	Extra over 50 x 75mm diameter rainwater pipe for bend	No	5	
	CONCRETE STORMWATER CHANNELS			
68	25Mpa concrete open surface water channel 900mm wide x 150mm thick reinforced with Ref 193 mesh reinforcement cast in 2m alternate panels with V-shaped channel 900 x 50mm deep formed in same, including all excavations, trimming and levelling of ground surfaces, compaction, filling, formwork, floating etc	m	18	
69	Stone pitching of approximately 100mm diameter river stones staggered and bedded in concrete at approximately 150mm centres both directions	No	3	
70	Extra over for angles, intersections, ends, dressing into sides of catchpits, etc	No	4	
71	Stone pitching of approximately 100mm diameter river stones staggered and bedded in concrete at approximately 150mm centres both directions	No	1	
	GLAZING			
	TOPS, SHELVES, DOORS, MIRRORS, ETC			
72	Mirror 450 x 600mm high with four screws	No	4	
	GLAZING TO STEEL WITH PUTTY			
73	Panes not exceeding 0,1 m2	m2	5	
	PAINTWORK			
	PAINTWORK ETC TO NEW WORK			
	ON INTERNAL FLOATED PLASTER SURFACES			
	2-4mm Polyurethane epoxy floor coating on min. 25mm screed, to manufacturers specifications and instruction			
74	On floors	m2	60	
	Carried Forward			R

Section No. 5
Bill No. 1
Repairs and Renovations

	Brought Forward			R
	ON FIBRE-CEMENT BOARD SURFACES			
75	Fascias and barge boards, including priming metal jointing strips	m2	13	
	ON WOOD SURFACES			
76	Timber doors	m2	35	
	PAINTWORK, ETC TO PREVIOUSLY PAINTED WORK			
	ON INTERNAL FLOATED PLASTER SURFACES			
77	Walls	m2	350	
	ON METAL SURFACES			
78	Door frames	m2	10	
	Carried to Final Summary			R

Section No. 5
Bill No. 1
Repairs and Renovations

Item No			Quantity	Rate	Amount
	BILL NO. 1				
	DEMOLITIONS AND SITE CLEARANCE (PROVISIONAL)				
	SUPPLEMENTARY PREAMBLES				
	The SUPPLEMENTARY PREAMBLES applicable to the same trade in the preceding Sections, apply equally to this BILL				
	(CPAP WORK GROUP NO. 102) unless otherwise stated				
	DEMOLITIONS ETC				
	Breaking up, taking down and removing				
1	100mm Thick mesh reinforced concrete surface beds, paving, ramps, etc	m2	45		
2	Cast insitu concrete V-stormwater channels approximately 1200mm girth	m	25		
	DEMOLISHING AND REMOVING				
	Single storey buildings with pitched or flat roofs concrete surface beds, brick or concrete walls, roof coverings on trusses, grub up concrete foundations, etc				
3	Toilet block 9m x 4m on plan	No	1		
	REMOVAL OF TREES ETC				
	Cutting down and removing, grubbing up roots and filling in holes				
4	Tree exceeding 1.5m and not exceeding 3m girth	No	2		
	Carried Forward to Summary of Section No. 6			R	

Section No. 6
Bill No. 1
Demolitions and Site Clearance

Item No			Quantity	Rate	Amount
	BILL NO. 2				
	BULK EXCAVATION, FILLING, ETC				
	PREAMBLES				
	For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder				
	SUPPLEMENTARY PREAMBLES				
	The SUPPLEMENTARY PREAMBLES applicable to the same trade in the preceding Sections, apply equally to this BILL				
	(CPAP WORK GROUP NO. 104) unless otherwise stated				
	EXCAVATIONS ETC				
	Open face excavation in earth over sloping site				
1	Open face excavations to form platform	m3	112		
	Extra over bulk excavations in earth for excavation in				
2	Soft rock	m3	19		
3	Hard rock	m3	49		
	Extra over bulk excavations in earth for breaking up and removing				
4	Brickwork	m3	2		
5	Unreinforced concrete	m3	2		
6	Reinforced concrete	m3	2		
	Carried Forward			R	

	Brought Forward			R
	Extra over all excavations for carting away			
7	Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor	m3	88	
	FILLING ETC			
	Earth filling obtained from the excavations on site, compacted to 95% Mod AASHTO density			
8	Over site to form platforms	m3	18	
	Earth filling of G5 material supplied by the contractor, compacted to 95% Mod AASHTO density			
9	Over site to form platforms	m3	18	
	Earth filling of G7 material supplied by the contractor, compacted to 95% Mod AASHTO density			
10	Over site to form platforms	m3	18	
	Carried Forward to Summary of Section No. 6			R

Section No. 6
Bill No. 2
Bulk Excavation, Filling, etc

Item No			Quantity	Rate	Amount
	BILL NO. 3				
	EXTERNAL WATER RETICULATION				
	PREAMBLES				
	For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder				
	SUPPLEMENTARY PREAMBLES				
	The SUPPLEMENTARY PREAMBLES applicable to the same trade in the preceding Sections, apply equally to this BILL				
	(CPAP WORK GROUP NO. 148) unless otherwise stated				
	WATER TANK ON STANDS				
	WATER TANKS AND BASES				
1	5000 Litre circular low profile UPVC water tank as Jo-Jo or equal approved with openings for overflow and 75 x 100mm rainwater pipe and the tank to be placed on pedestal approximately 700mm above finished floor level	No	3		
2	Excavation in earth not exceeding 2m deep for trenches	m3	32		
3	Excavation in earth not exceeding 2m deep to reduce levels under floors	m3	7		
4	Extra over all excavations for carting away surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor	m3	37		
5	Risk of collapse of sides of trench excavations not exceeding 1,5m deep	m2	99		
6	Keeping excavations free of all water other than subterranean water		Item		
	Carried Forward			R	

	Brought Forward			R
7	Earth filling of G7 material supplied by the contractor compacted to 95% Mod AASHTO density under floors	m3	19	
8	Earth filling obtained from the excavations compacted to 93% Mod AASHTO density backfilling to trenches	m3	17	
9	15MPa/19mm concrete surface blinding under strip footings	m3	2	
10	25MPa/19mm Reinforced concrete in strip footings	m3	12	
11	25MPa/19mm Reinforced concrete to floor slab	m3	10	
12	Finishing top surface of concrete smooth with a wood float in surface beds	m2	46	
13	Smooth formwork to edge of floor slab not exceeding 300mm high	m	73	
14	Type 617 fabric reinforcement in floor slab	m2	66	
15	One brickwall of NFX bricks	m2	98	
16	150mm Wide brick reinforcement built in horizontally	m	417	
17	Extra over brickwork in NFX bricks for face brickwork in Corobrik Agate Satin FBX face bricks	m2	43	
18	High Tensile steel bars not exceeding 20mm diameter	kg	268.96	
	WATER CONNECTIONS FROM MAIN RETICULATION LINE TO BUILDINGS			
	"Polycop" polypropylene pipes with "Fast-fuse" thermoplastic couplings			
19	22mm Pipes laid in and including trenches not exceeding 1m deep	m	74	
20	28mm Pipes laid in and including trenches not exceeding 1m deep	m	150	
	Extra over "Polycop" polypropylene pipes for brass compression fittings			
21	22mm Fittings	No	12	
22	28mm Fittings	No	6	
	Carried Forward			R

Section No. 6
Bill No. 3
External Water Reticulation

	Brought Forward			R
	TAPS, VALVES, ETC			
	"Cobra Watertech" or equal approved			
23	30mm 1065-30CP fullway gate valve	No	16	
24	35mm 1065-35CP fullway gate valve	No	16	
	"Tommy Tap" or equal approved			
25	20mm plastic tap	No	4	
	Testing			
26	Testing domestic water pipe system		Item	
	Carried Forward to Summary of Section No. 6			R

Section No. 6
Bill No. 3
External Water Reticulation

Item No			Quantity	Rate	Amount
	BILL NO. 4				
	LANDSCAPING				
	PREAMBLES				
	For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder				
	(CPAP WORK GROUP NO. 104) unless otherwise stated				
	GRASSING				
	Ground preparation				
1	Cultivation and preparation of areas to be planted	m2	198		
	Selected topsoil obtained from stock piles on site, including spreading and levelling				
2	Kikuyi roots in rows at 250mm centres	m2	198		
	Carried Forward to Summary of Section No. 6			R	

Section No. 6
Bill No. 4
Landscaping

Item No			Quantity	Rate	Amount
	BILL NO. 5				
	RETAINING WALLS ETC (ALL TRADES)				
	PREAMBLES				
	For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder				
	(CPAP WORK GROUP NO. 104) unless otherwise stated				
	EXCAVATIONS ETC				
1	Excavate in earth not exceeding 2m deep for trenches	m3	54		
2	Carting away surplus material from excavations and/or stock piles on site to a dumping site located by the contractor	m3	54		
3	Risk of collapse to sides of trench excavations not exceeding 1.5m deep	m2	108		
4	Keeping excavations free of all water other than subterranean water		Item		
	INTERLOCKING PLANTER BLOCKS				
	"Loffelstein TB 300 or equal approved"precast concrete interlocking planter blocks finished smooth on exposed surfaces				
5	Retaining structures with stepped face and curves set on 700x400mm high concrete base, set as required to suit slope as per detail. 300x 460x170mm high type "L300" Loffelstein interlocking retaining blocks laid in FLOWNET "KAYMAT" U14 GEOFABRIC or similar approved with horizontal bed joints to 65 degree slope, including 100mm Diameter NETLON (Geo) pipe, 40-75mm loose stone and an average of 600mm thick earth filling compacted to 90% MOD. AASHTO behind the blocks and fill the blocks with garden soil lightly tampered as the work proceeds as per engineer as per drawing.	m2	207		
	Carried Forward			R	

	Brought Forward			R
	(CPAP WORK GROUP NO. 136) unless otherwise stated			
	GALVANISED MILD STEEL BALUSTRADES			
	"Steel studio" or equal approved horizontal rail system installed complete as per specialist.			
6	Three horizontal rail galvanised balustrade system 1000mm high above the retaining wall where the retaining wall reaches its highest point. Handrail to be 48,3 x 2mm DIA. galvanised mid steel hollow section pin mounted on galvanised mild steel balustrade, Extension rod to be 10mm DIA. mild steel rods, 48,3mm DIA. galvanised mild steel hollow sections Baluster with pre-drilled holes for horizontal rods to run through baluster. 40mm DIA. Hollow section horizontal rails and galvanised mild steel or aluminium cover plate 70mm DIA. Purpose made cover plate to cover core-drilled provision in wall at the base of the baluster as per the architect's details.	m	50	
	(CPAP WORK GROUP NO. 146) unless otherwise stated			
	Drainage uPVC pipes			
7	50mm Diameter uPVC weep pipes 250mm long built through one brickwall	No	31	
	Carried Forward to Summary of Section No. 6			R

Section No. 6
Bill No. 5
Site Screen, Retaining walls

Item No			Quantity	Rate	Amount
	BILL NO. 6				
	CONCRETE WALKWAYS AND RAMPS				
	PREAMBLES				
	The contractor is referred to the relevant Clause in the document Model Preambles for Trades as published by the Association of South African Quantity Surveyors (2008 edition)				
	(CPAP WORK GROUP NO. 104) unless otherwise stated				
	SITE CLEARANCE, ETC.				
	Site clearance				
1	Digging up and removing rubbish, debris, vegetation, hedges, shrubs, bush, etc	m2	72		
2	Stripping average 100mm thick layer of top soil and carting away	m2	72		
	Excavation in earth not exceeding 2m deep				
3	Reduced levels under floors	m3	20		
	Extra over all excavations for carting away				
4	Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor	m3	10		
	Earthfilling of G5 material supplied by contractor compacted to 95% Mod AASHTO density				
5	Under walkways	m3	10		
	Earth filling obtained from the excavations and /or prescribed stock piles on site compacted to 93% Mod AASHTO density				
6	Under walkways	m3	10		
	Carried Forward			R	

Section No. 6
Bill No. 6
Walkways

	Brought Forward			R
	Compaction of surfaces			
7	Compaction of ground surface under floors etc including scarifying for a depth of 100mm, breaking down oversize material, adding suitable material where necessary and compacting to 93% Mod AASHTO density	m2	72	
	Weedkiller (active ingredients metalaclor 102.8 g/l, terbitilasien 248.6 g/l and atrasien 248.6 g/l) mixed in the proportion of 100 ml weedkiller to 100 l water and applied at a rate of 10 l/m²			
8	Under floors (Certificate must be provided)	m2	72	
	(CPAP WORK GROUP NO. 110) unless otherwise stated			
	CONCRETE			
	UNREINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES			
	15MPa/19mm concrete			
9	Surface blinding under surface beds	m3	3	
	REINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES			
	25MPa/19mm concrete reinforced concrete cast on/in formwork			
10	Surface beds cast in panels on waterproofing	m3	10	
	Finishing top surfaces of concrete smooth with a wood float to a non-slip surface			
11	Surface beds to falls	m2	72	
	Carried Forward			R

Section No. 6
Bill No. 6
Walkways

	Brought Forward			R
	(CPAP WORK GROUP NO. 111) unless otherwise stated			
	FORMWORK			
	Smooth formwork to sides			
12	Edges, risers, ends and reveals not exceeding 300mm high or wide	m	110	
	MOVEMENT JOINTS ETC			
	Saw-cut joints			
13	6 x 30mm Saw-cut joints to top of concrete	m	37	
	(CPAP WORK GROUP NO. 112) unless otherwise stated			
	PRECAST CONCRETE			
14	100 x 65mm precast concrete mini kerbs	m	110	
	(CPAP WORK GROUP NO. 114) unless otherwise stated			
	REINFORCEMENT			
	Fabric reinforcement			
15	Type 193 fabric reinforcement in concrete surface beds	m2	72	
	(CPAP WORK GROUP NO. 120) unless otherwise stated			
	WATERPROOFING			
	One layer of 250 micron "Consol Plastics Gunplas USB Green" waterproof sheeting sealed at laps with PVC self-adhesive tape			
16	Under surface beds			
		m2	72	
	Carried Forward			R

Section No. 6
Bill No. 6
Walkways

	Brought Forward			R
	SEALING STRIPS,JOINT SEALANTS,ETC			
	Two-part grey polysulphide sealing compound including backing cord, bond breaker, primer, etc			
17	8 x 15mm In saw cut joints, sealant in floors including raking out isolation joint filler as necessary.	m	37	
	Carried Forward to Summary of Section No. 6			R

Section No. 6
Bill No. 6
Walkways

SECTION SUMMARY - External Works

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5	Site Screen, Retaining walls	88	
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	Carried to Final Summary		R

Section No. 6

Item No		Quantity	Rate	Amount
	BILL NO. 1			
	PROVISIONAL SUMS			
	PREAMBLES			
	For Preambles refer to the Standard Preambles to All Trades - WB20 - and the Supplementary Preambles SUP1 to SUP5 and any amplification/s stated hereunder			
	SUPPLEMENTARY PREAMBLES			
	Provisional sums are for material and equipment supplied and installed complete by firms of specialists			
	Profit			
	Where stated, the contractor may allow for profit if required			
	TEMPORARY CHEMICAL TOILETS			
1	Allow the Provisional Amount of R250,000.00 (Two Hundred and Fifty Thousand Rands) for chemical toilets executed complete	Item		250 000.00
2	Profit	Item		
3	Attendance	Item		
	DESLUDGING			
4	Provide the sum of R80,000.00 (Eighty Thousand Rand) for desludging existing ablution blocks complete	Item		80 000.00
5	Profit	Item		
6	Attendance	Item		
	Carried to Final Summary		R	

Section No. 7
Bill No. 1
Provisional Sums

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

PART C2.3 FINAL SUMMARY

FINAL SUMMARY

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1	Preliminaries	18		
	(i) Expanded Public Works Programme	32		
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2	Building Works	69		
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4	Provisional Sums	94		
	Sub Total		R	
	Add VAT @ 15%		R	
	Sub Total		R	
	Carried to Form of Tender		R	

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

PART C3. SCOPE OF WORKS

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

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

Project title:	**DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION**		
Tender no:	**ZNTL 05828W**	**Project Code:**	**070689**

SECTION 1

1 EXTENT OF THE WORKS

1.1 EMPLOYERS OBJECTIVES

The provision of ablution blocks within the Sanitation Programme which will comply with national health and DOE standards within the Midlands Region.

1.2 OVERVIEW OF THE WORKS

Remedy poor system performance and ensure optimal performance of sanitation services at Bhande High School.

1.3 EXTENT OF THE WORKS

The provision of ablution blocks within the Sanitation Programme. Bhande High School : The works include 2 New Blocks, Girl's and Boys: 12WC, 9Basin, 4Urinals. Renovations to Teachers Block. Demolitions to Existing Sub-structure Toilet. Walkways to New Blocks.

1.4 LOCATION OF THE WORKS

Bhande High School GPS Co-ordinates for the site is -28.68710 , 30.11690 Mhlumayo Rural Area, Ngcinalishone, Uthukela District.

1.5 TEMPORARY WORKS

All temporary work to comply with the Occupational Health and safety Act (Act 85 of 1993)

2 ENGINEERING

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 DESIGN PROCEDURES

Not applicable

3 PROCUREMENT

3.1 PREFERENTIAL PROCUREMENT PROCEDURES

This tender will be subject to the implementation of the Preferential Procurement Regulations, 2022, pertaining to the Preferential Procurement Policy Framework Act, Act Number 5 of 2000 and the relevant Supply Chain Management Legislation and the KwaZulu-Natal Supply Chain Management Policy Framework published by the KwaZulu-Natal Provincial Treasury. Tenderers are referred to www.kzntreasury.gov.za for access to the relevant documents.
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.

3.2 RESOURCE STANDARD PERTAINING TO TARGETED PROCUREMENT

NOTE : This project will be adjudicated as not exceeding R 50,000 000,00

3.3 SCOPE OF MANDATORY SUBCONTRACT WORK

Not applicable

3.4 PREFERRED SUBCONTRACTORS/SUPPLIERS

Not applicable

3.5 SUBCONTRACTING PROCEDURES

Not applicable

4 CONSTRUCTION

4.1 APPLICABLE SANS 2001 STANDARDS FOR CONSTRUCTION WORKS

The Contractor is referred to the "Model Preambles to Trades - 2008", any "Supplementary Preambles", the Electrical Specifications and Mechanical Specification for full descriptions of materials and methods referred to in these Bills of Quantities/Lump Sum documents, insofar as they apply. The Contractor is advised to study the "Standard Preambles to all Trades", any "Supplementary Preambles", the Electrical Specifications and Mechanical Specification, before pricing Bills of Quantities/Lump Sum documents.
Where the description in the Bills of Quantities/Lump Sum documents differ from those in the Standard Electrical Specifications, the descriptions in the Bills of Quantities/Lump Sum documents are to apply. No claim whatsoever will be allowed in respect of errors in pricing due to brevity of description of items in the Bills of Quantities/Lump Sum documents which are fully described when read in conjunction with the relevant Preambles and/or Specifications. Suppliers of materials and the like, whose quality systems apply with one or more of the SABS/SANS ISO 9000 Series should be used whenever possible in the absence of a particular SABS/SANS Specification Standard Mark.
Wherever the words "shall be deemed to be included in the description", "shall be stated" or other words having the same effect, appear in the Standard System, it shall be deemed that all descriptions in these Bills of Quantities/Lump Sum documents incorporated such inclusions and statements whether specifically stated or not.

The Contractor is hereby informed that where SABS/SANS Specifications are referred to in these Bills of Quantities/Lump Sums documents and Specifications thereto, then ONLY the Specification of Work Clauses will apply. The method of measurement and payment clauses will NOT apply to this Contract.

The Contractor is hereby informed that risk of collapse and keeping excavations free from water (excluding subterranean water) generally are deemed to be included in the descriptions unless accommodated in the system of measurement. Please refer to the Geotechnical Investigation report when included at the end of these tender documents.
Whenever reference is made to "Sub-Contractor", "Nominated Sub-Contractor" or the like in the specifications included or referred to in these Bills of Quantities/Lump Sums documents, it shall be deemed to mean "Contractor" as defined.

4.2 APPLICABLE NATIONAL AND INTERNATIONAL STANDARDS

See above 4.1

4.3 PARTICULAR / GENERIC SPECIFICATIONS

The Contractor is referred to the following documents whether attached to this document or not:

SPECIFICATION	PAGES
Specification for HIV/AIDS Awareness (CIDB)	HIV1 TO HIV3
Specific Construction, Safety, Health and Environmental Plan	
Model Preambles for Trades 2008	1 to 49
General Electrical Specification	E/1 to E/20
Lightning Protection Installation	LP/1 to LP/6

4.4 CERTIFICATION BY RECOGNIZED BODIES

Only contractors registered with the Electrical Contracting Board of South Africa in accordance with the Regulations of the Occupational Health and Safety Act will be accepted and permitted to do work under this contract.

4.5 AGRÉMENT CERTIFICATES

Not applicable

4.6 PLANT AND MATERIAL PROVIDED BY THE EMPLOYER

Not applicable

4.7 SERVICES AND FACILITIES PROVIDED BY THE EMPLOYER

Not applicable

4.8 OTHER SERVICES AND FACILITIES

The Contractor shall provide any artificial lighting which may be necessary or required for the proper execution of the works, and provide electric power and water required by all Sub-Contractors, Nominated Sub-Contractors and Sub-Contractors appointed directly by the Administration.
The Contractor shall give all notices and pay all fees in connection with temporary electrical and water connections and shall connect temporary Electrical and Water meters for and pay for all current and water consumed.
The Contractor is advised that the permanent light fittings and water points of any kind installed in the Works are not to be used to provide temporary lighting and supplement water requirements for construction purposes.

5 MANAGEMENT

5.1 APPLICABLE SANS 1921 STANDARDS

Tenderers are referred to
SECTION 2 : SPECIFICATION DATA ASSOCIATED WITH SANS 1921-1:2004 IN THIS DOCUMENT

5.2 RECORDING OF WEATHER

The Contractor shall keep record of abnormal climatic conditions to facilitate the adjudication of claims for extension of the contract period.

The Contractor shall allow in his programme for the following number of days for rain days (rain > 10mm per day) as per the table below:

CURRENT YEAR			YEAR + 1	YEAR + 2
January	*w/days*		3	3
February	*w/days*		3	3
March	*w/days*		3	3
April	*w/days*		3	3
May	*w/days*		3	3
June	*w/days*		3	3
July	*w/days*		3	
August	*w/days*		3	
September	*w/days*		3	
October	*w/days*		3	
November	*w/days*		3	
December	*w/days*	3	3	

5.3 MANAGEMENT MEETINGS

In order to facilitate the smooth functioning of the Works and to ensure the closest co-operation between all the parties concerned, the Employer will call for regular meetings (two meetings per month, one technical meeting and one progress meeting) 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 Schedule of projects in building construction undertaken and successfully completed within the CIDB grading 4 GB requirements of this Bid or one grade lower in the past 7 years by the bidding entity- Attatch 3 letters of award and final completion certificates for projects completed. (T2.40)

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.

5.7 BONDS AND GUARANTEES

Requirements will be in accordance with the Employers prescriptions.

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

4.3	**The planning, programme and method statement are to comply with the following:**
	N/A
4.12.1	**Samples of materials**
	The work is to be executed with materials of the best specified and in the most substantial and workmanlike manner under the inspection of the Employer and to his satisfaction. The Contractor shall furnish, without delay, such samples as called for or may be called for by the Employer, who may reject all materials or workmanship not corresponding with the approved sample. The samples of materials, workmanship and finishes that the Contractor is to provide and deliver to the employer are: - Tile sample. - Roof sheeting sample - Brick sample. - Gutter sample - Light fitting sample. - Door sample - Screed panel 2m x 2m impact test. - Ironmongery sample - Tested trial mix to be approved by the Engineer.
4.12.2	**Fabrication drawings that the contractor is to provide to the employer are:**
	None
4.12.3	**Office accommodation, equipment, accommodation for site meetings and other facilities for use by the employer and his agents are:**
	OFFICE FOR FOREMAN
	Provide, erect, maintain and remove at completion a suitable temporary office for the Contractor or his Foreman, perfectly secured, lighted and ventilated and having a desk with drawers.
	TELEPHONE
	The Contractor shall provide a telephone on the site for the use of the Contractor and all Sub-Contractors for the duration of the Contract, and must make the necessary application for connection, give all notices and pay all fees, rentals and charges for the service and also for all calls.
	OFFICE FOR INSPECTOR OF WORKS
	Provide, erect, maintain and remove at completion a well constructed temporary office for the Inspector of Works not less than 4 x 3 m on plan and 3 m high to eaves to the approval of the Employer. The office shall be constructed of wood framing covered externally with corrugated iron or corrugated asbestos and with a lean-to roof covered with the same material as the external wall covering. The office shall be lined internally with soft board or other approved material and a ceiling shall be provided of the same material as the internal lining. A suspended wood floor shall be provided and is to finish not less than 300 mm above the ground level. A lockable door and a window, which provides adequate light and ventilation, shall be fitted. An office constructed of 115 mm thick brick-work and provided with a screeded concrete floor and roofed and ceiled as above described may be accepted as an alterative but prior permission of the Employer will be necessary before construction of such an office is commenced and his requirements shall be stated and fulfilled by the Contractor. The office shall be fitted in an approved manner with a sloping topped desk of height and length suitable for the laying out and studying of drawings, a desk or table with not less than two lock-up drawers, shelves, seating and wash-stand, and the Contractor shall provide all necessary attendance.
	TELEPHONE IN OFFICE FOR INSPECTOR OF WORKS
	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.

	SHED
	Provide, erect, maintain and remove at completion, ample temporary sheds for the proper storage of materials and for the use of the workmen, and remove when no longer required.
4.14.6	**The requirement for provision and erection of signboards are:**
	Supply, erect, maintain and remove at completion a painted notice board, size overall 2800 x 2345 mm high sign written to detail as Drawing No. T9506 which drawing is available from offices of the Department of Public Works. Only the official notice board is to be displayed on the site and no Sub-Contractor's boards will be permitted. The Contractor, at his own cost, may provide a board on which all sub-contract firms' names may be sign written. The notice board is to be to the approval of the Employer and is to be maintained in first class condition and placed where directed at the entrance to the site and remain there for the duration of the Contract.
4.17.1	**Requirement for the termination, diversion or maintenance of existing services:**
	Should the Contractor come in contact with any underground cables or pipes during excavations, immediate notification must be made to the Employer and all work in the vicinity of such cables, pipes, etc., shall cease until authority to proceed has been obtained from the Employer. Should the Contractor damage underground cables or pipes resulting in a disruption of services to an existing institution such damage shall be repaired immediately.
4.17.3	**Services which are known to exist on the site:**
	Investigate and provide detail drawings.
4.17.4	**Requirement for detection apparatus**
	None
4.18	**ADDITIONAL HEALTH AND SAFETY REQUIREMENTS ARE:**
	By the submission of a tender, any 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. 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 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. The Contractor will be deemed to have satisfied himself with his obligations in terms of the Act and to have allowed for all costs arising from compliance with the Act as no claim for extra costs arising from compliance with, and obligations in terms of the Act will be entertained.
4.22	**WORK BY NOMINATED AND SELECTED SUBCONTRACTORS COMPRISE:**
	[Provide list of applicable contractors]

C3.2 - SPECIFICATION FOR HIV/AIDS AWARENESS

Project title:	**DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION**		
Tender no:	**ZNTL 05828W**	**Project Code:**	**070689**

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

Project title:	**DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION**		
Tender no:	**ZNTL 05828W**	**Project Code:**	**070689**

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

Project Code: **070689**

Payment Claim number: Period covered by payment claim:

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

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

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

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

5. HIV awareness programme (briefly describe action).

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

Name	Identity number	Trade / occupation	Name of employer

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

For Contractor:

Name: _____

Signature: _____

Date: _____

Employer's representative:

Name: _____

Signature: _____

Date: _____

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

PART C4. SITE INFORMATION

C4.1 SITE INFORMATION
GCC FOR CONSTRUCTION WORKS (2 Edition of 2010)

Project title:	**DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION**		
Tender No.	**ZNTL 05828W**	**Project Code:**	**070689**

C4.1 Site Information

C4.1 GENERAL

(a) The site is underlain by medium- to coarse-grained sandstone, grey micaceous shale and coal of the Vryheid Formating. Possibly interspersed with soft and hard rock.

(b) The site is an existing, operational school. Extreme care must be taken to ensure that construction areas are kept secure and not accessible to students. The contractor must take note that storage material on site would not be problematic and the contractor must provide to create a workable space which will not be disrupt the operation of the school or endanger the learners on the premises. The working area must be clearly demarcated and entrance to the Works must be controlled.

(c) The school is situated in a rural area in the Midlands Region.

The Tenderer is to note that various blocks that are currently in use, are required to be worked on. Planning and co-ordination therefore will be required by the Contractor to ensure that school activities are not interrupted, and under no circumstances will the Contractor be allowed to utilize any occupied buildings for any purpose other than the renovation of that building.

C4.2 GEOTECHNICAL INVESTIGATION REPORT

(a) Attached in the document. Refer to annexures.

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

PART C5 - DRAWINGS / ANNEXURES

C5.1 - LIST OF DRAWINGS/ANNEXURES

Project title:	**DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION**		
Tender No.:	**ZNTL 05828W**	**Project Code:**	**070689**

(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**
DAN - 100 -01	BOYS & GIRLS FLOOR PLAN, SECTION AND ELEVATIONS
DAN - 100 -02	CUSTOM STEEL DOOR AND GRILL GATE DETAILS
DAN - 100 -03	FINISHING SCHEDULE & TANK STAND DETAILD
DAN - 100 -04	SITE LAYOUT PLAN
1248 / S107/ 100001	LAYOUT
1248 / S107/ 100002	EARTHWORKS PLATFORMS SECTIONS
1248 / S107/ 100101	TYPICAL STRUCTURAL DETAILS 1 OF 2
1248 / S107/ 100102	TYPICAL STRUCTURAL DETAILS 2 OF 2
1248 / S107/ 100103	TYPICAL RETAINING WALL AND SOAKAWAY DETAILS
1248 / S107/ B10/ 200001	BOYS 4T+7U+3W
1248 /S107 / G10/ 200001	GIRLS 8T+6W
1248 /S107/ B10/ 200101	REINFORCEMENT DETAILS BOYS
1248 /S107/ B10/ 200102	REINFORCEMENT DETAILS BOYS
1248 /S107/ G10/ 200101	REINFORCEMENT DETAILS GIRLS
1248 /S107/ G10/ 200102	REINFORCEMENT DETAILS GIRLS

ANNEXURES	
Annexure 1	Model Preambles for Trades 2008
Annexure 2	General Electrical Specifications
Annexure 3	Lightning Protection Specifications
Annexure 4	Map of Tender submission location
Annexure 5	Joint Venture Agreement
Annexure 6	Project Specific Health and Safety Specification
Annexure 7	Health and Safety Bill of Quantities
Annexure 8	Builders Lien Agreement
Annexure 9	Geotechnical Investigation Report (If applicable)
Annexure 10	EPWP Employment Contract
Annexure 11	Attendance Register - Infrastructure and Other projects
Annexure 12	EPWP Data Collection tool for Phase 3 system
Annexure 13	Scope of Work Matrix

DAN 000 -100-1	00
NUMBER FOR PLAN AFRIQUE FILING REFERENCE ONLY	REVISION

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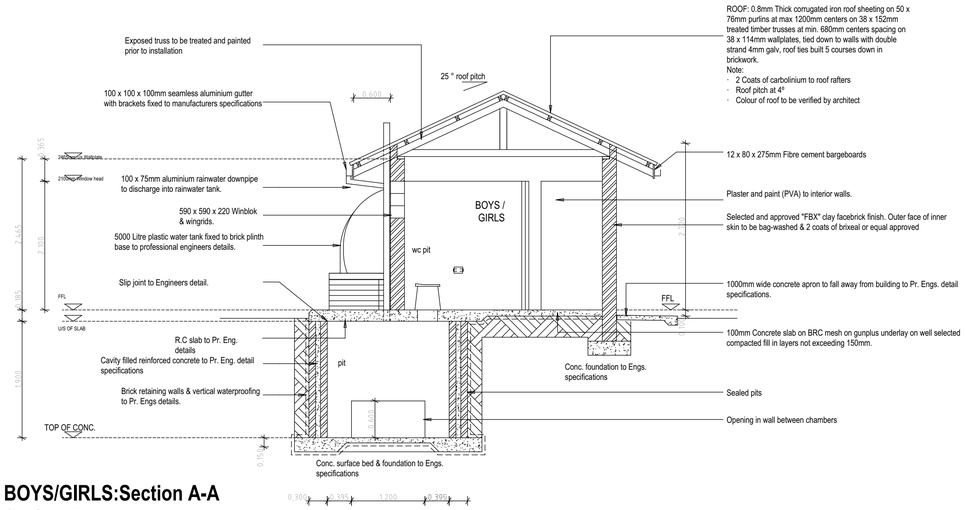
4. All relevant details, levels, dimensions must be checked on site before commencement of work. Any discrepancies to be reported to Plan Afrique office immediately.

Rev.	Init.	Date.	Desciption of Revision

RevID	ChID	Change Name	Date



BOYS/GIRLS:Section A-A
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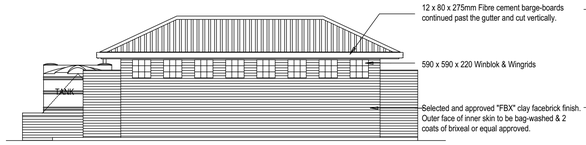
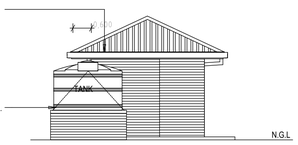


GIRLS:Elevation T1
Scale 1:100



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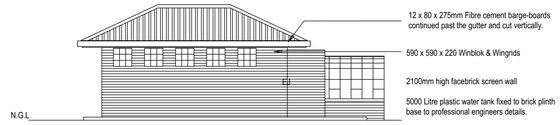

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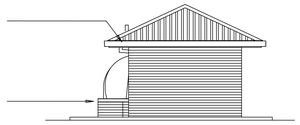

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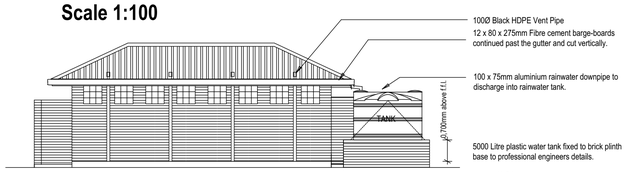
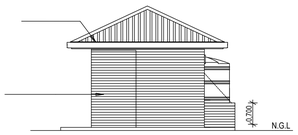
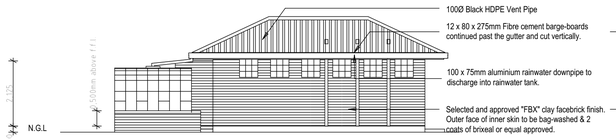


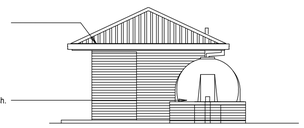
GIRLS:levation T2
Scale 1:100



EDUCATORS:Elevation T3
Scale 1:100



BOYS:levation T2
Scale 1:100



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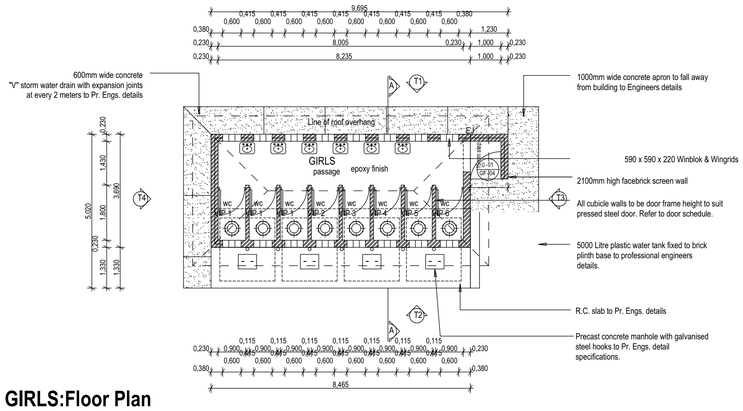
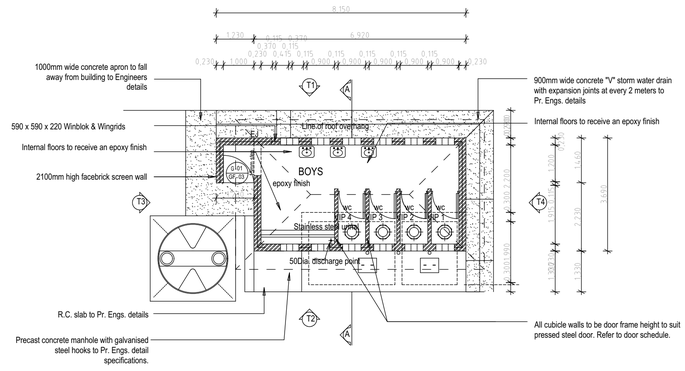


GIRLS:Floor Plan
Scale 1:100



BOYS:Floor Plan
Scale 1:100

Drawing Status

KWAZULU-NATAL PROVINCE
PUBLIC WORKS & INFRASTRUCTURE
REPUBLIC OF SOUTH AFRICA

RAMGOOLAM

SIVAGO ARCHITECTS

PROJECT NAME & CLIENT INFORMATION

SANITATION PROGRAMME
For Department of Public Works
on behalf of Department of Education
at Various Schools within Midlands Region

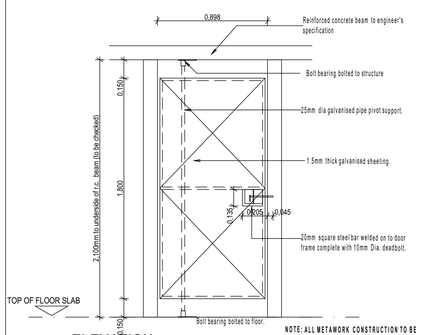
DRAWING DESCRIPTION

Working Drawing
BHANDE HIGH SCHOOL
BOYS & GIRLS FLOOR PLAN, SECTION AND ELEVATIONS

SCALE	DATE		DRAWN
As Shown	2026/06/09	A1	MN
PROJECT No - DRAWING NUMBER			REVISION
DAN - 100 - 01			

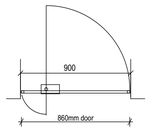
DAN 000 -100-1	00
NUMBER FOR PLAN AFRIQUE FILING REFERENCE ONLY	REVISION

D - DOORS



ELEVATION

NOTE: ALL METAWORK CONSTRUCTION TO BE ASSEMBLED OFF SITE UNDER CONTROLLED CONDITIONS AND HOT DIP GALVANISED. NO WELDING TO BE DONE ON SITE.



PLAN

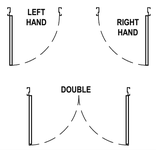
DESCRIPTION.

DOOR
- 2000 x 860mm door comprising 19x19x3mm galvanised mild steel frame covered on outside with 0.71mm galvanised mild steel sheet crossed-creased and lapped around edges and pop-rivetted at max 300mm centres.

NB: OPENING SIZE 900MM

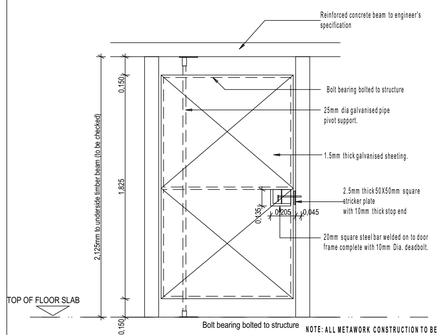
FINISH.

DOOR HANDING LEGEND



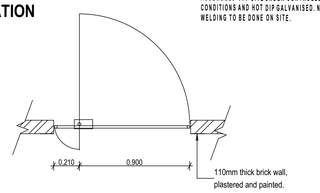
DOOR NO'S:	QUANTITY:		
REFER TO DETAILED DRAWINGS	Hand	Qty.	Total
	LH	-	-
REFER TO DETAILED DRAWINGS	RH	-	
IRONMONGERY:			

D - DOORS



ELEVATION

NOTE: ALL METAWORK CONSTRUCTION TO BE ASSEMBLED OFF SITE UNDER CONTROLLED CONDITIONS AND HOT DIP GALVANISED. NO WELDING TO BE DONE ON SITE.



PLAN

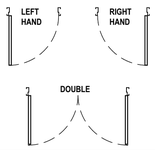
DESCRIPTION.

DOOR
- 2000 x 860mm door comprising 19x19x3mm galvanised mild steel frame covered on outside with 0.71mm galvanised mild steel sheet crossed-creased and lapped around edges and pop-rivetted at max 300mm centres.

NB: OPENING SIZE 900MM

FINISH.

DOOR HANDING LEGEND



DOOR NO'S:	QUANTITY:		
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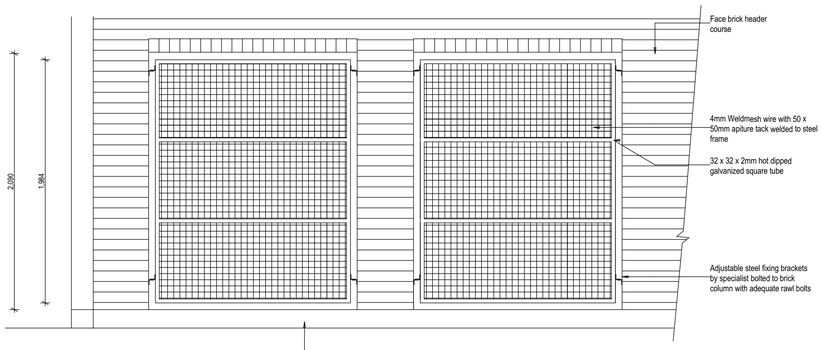
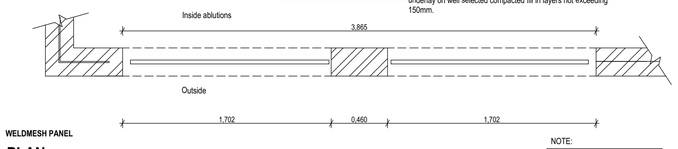
REFER TO DETAILED DRAWINGS	RH	-	
IRONMONGERY:			



ELEVATION
scale 1: 25



WELDMESH PANEL

PLAN
scale 1: 25

NOTE:
All steel work to be hot dipped galvanized

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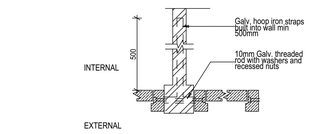
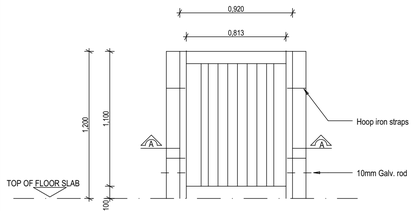
Rev.	Init.	Date.	Desciption of Revision

RevID	CNID	Change Name	Date

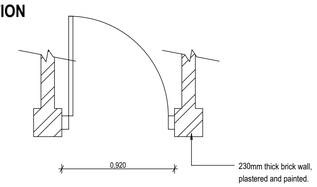
D - DOORS



SECTION A - A



ELEVATION



PLAN

DESCRIPTION.

DOOR
- 1700 X 813 X 44MM SOLID MERANTI HARDWOOD SINGLE FLEB INWARD OPENING DOOR
- STYLES TOP BOTTOM & MIDDLE RAILS & DIAGONAL BRACING, T & G VERTICAL BOARDING (22MM Thick)
- VARNISHING TO BOTH SIDES AND CONCEALED EDGES.
- ALL JOINTS TO BE MORTICE & TENON

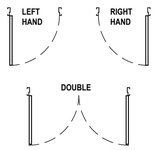
FRAME
- 90 X 70 REBATED MERANTI FRAME TO SUIT A 813MM SINGLE DOOR WITH NO SILL.
- TOTAL FRAME WIDTH = 925MM

NB: OPENING SIZE 813MM

FINISH: **PAINT TO ARCHITECTS SPECIFICATIONS.**

- **Back of frame to receive 2 x coats waterproofing primer.**
- Prepare and paint one universal undercoat and two coats gloss enamel paint on general surfaces of door, including top and bottom surfaces and reveals.

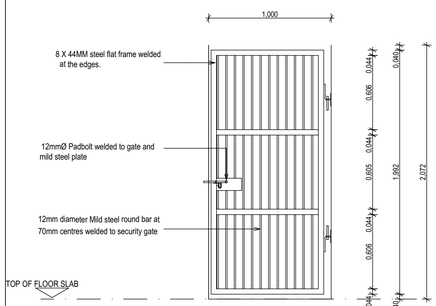
DOOR HANDING LEGEND



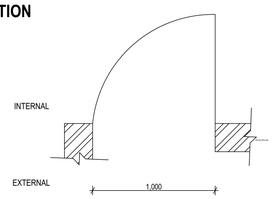
DOOR NO'S:	QUANTITY:		
-	Hand	Qty.	Total
	LH	-	-
REFER TO DETAILED DRAWINGS	RH	-	
IRONMONGERY:			

1 x E1511 EREBUS h/d adjustable roller catch - SC
1 x Formed 300 x 50mm stainless steel plate, formed over the top of the door, bent twice extending 50mm down top edge of door on both sides.
2 x 75 x 41mm SC on brass butt hinges.

G - GATES



ELEVATION



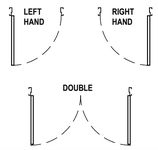
PLAN

DESCRIPTION.

GATE
- SINGLE GATE, FORMED OF 8 X 44MM STEEL FLAT FRAME WELDED AT ANGLES.
- DIVIDED INTO THREE SECTIONS WITH TWO 8 X 44MM CROSS RAILS.
- 12MM DIAMETER VERTICAL BARS AT 70MM CENTERS.
- HUNG ON PAIR OF SOCKETTED AND PINNED HINGES WITH PIN 18MM IN DIAMETER AND BOLTED TO BRICK WALL AND 200MM LOCKING BOLT WELDED ON.
- TO SUIT CLEAR OPENING SIZE OF 2170 X 877MM
- TO BE CONFIRMED ON SITE.

NOTES

DOOR HANDING LEGEND



DOOR NO'S:			
REFER TO DETAILED DRAWINGS	Hand	Qty.	Total
	LH	-	-
	RH	-	
IRONMONGERY:			

G - 07
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G - 01
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Drawing Status

KWAZULU-NATAL PROVINCE
PUBLIC WORKS & INFRASTRUCTURE
REPUBLIC OF SOUTH AFRICA

RAMGOOLAM

SIVAGO ARCHITECTS

PROJECT NAME & CLIENT INFORMATION

SANITATION PROGRAMME
For Department of Public Works
on behalf of Department of Education
at Various Schools within Midlands Region

DRAWING DESCRIPTION

Working Drawing
BHANDE HIGH SCHOOL
CUSTOM STEEL DOORS & GRILL GATE DETAILS

SCALE	DATE		DRAWN
As Shown	2026/06/09	A1	MN
PROJECT No - DRAWING NUMBER			REVISION
DAN - 100 - 02			

DAN 000 -100-1	00
NUMBER FOR PLAN AFRIQUE FILING REFERENCE ONLY	REVISION

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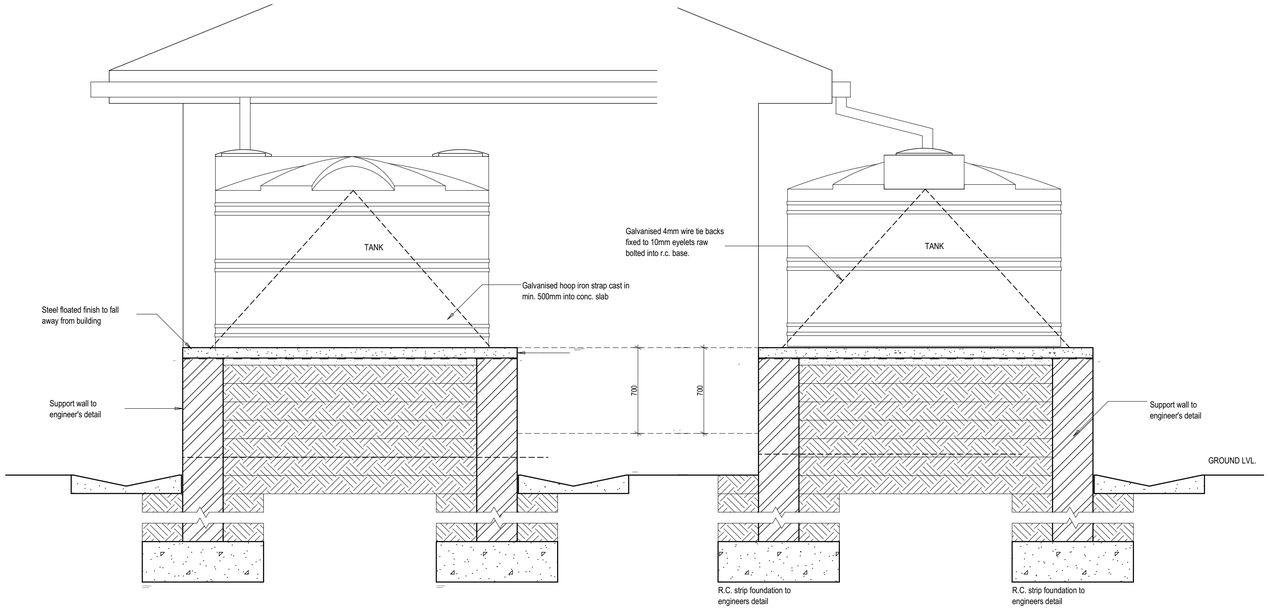
Rev.	Init.	Date.	Desciption of Revision

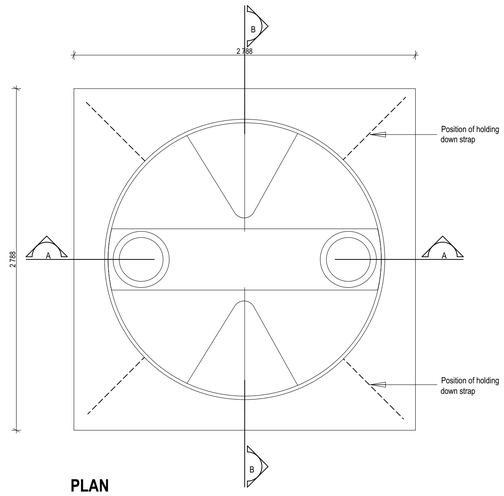
RevID	ChID	Change Name	Date



Section A-A
Scale 1:25

Section B-B
Scale 1:25

HORIZONTAL TANK STAND DETAILS

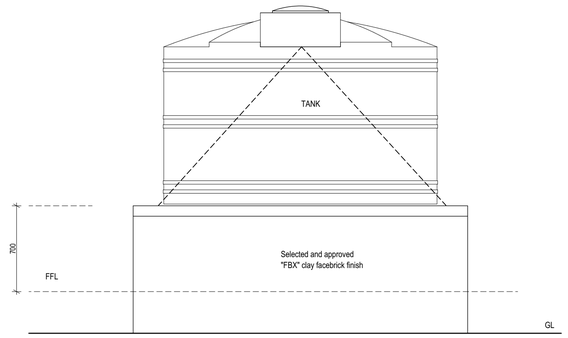


PLAN
Scale 1:50

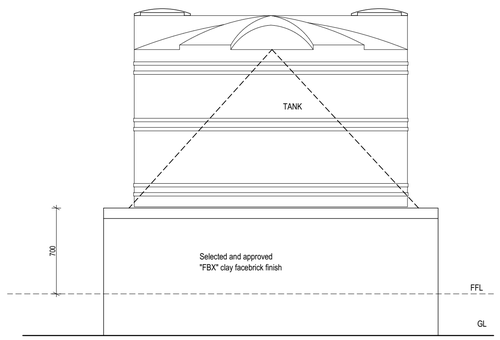
		DESCRIPTION	TOILETS: DISABLED A	LEARNERS B	EDUCATORS C		SPECIFICATION
FLOORS	1	TERMITE CONTROL	●	●	●	1	TERMITE POISON : TREAT ALL NEW AREAS UNDER BUILDINGS WITH SABS APPROVED POISON COVERED WITH A LAYER OF 50mm SAND
	2	POLYURETHANE - EPOXY	●	●	●	2	2 - 4mm POLYURETHANE EPOXY FLOOR COATING ON MIN. 25MM SCREED, TO MANUFACTURERS SPECIFICATIONS AND INSTRUCTIONS.
WALLS	3	FACE BRICK - EXTERNAL	●	●	●	3	SELECTED FACEBRICK LAID IN STRETCHER BOND WITH JOINTS POINTED WITH A 8mm JOINTING TOOL. FULL BRICKS ARE TO BE USED WHEREVER POSSIBLE.
	4	PAINT - EGGSHELL ENAMEL	●	●	●	4	APPROVED UNDERCOAT AND MIN. 2 COATS APPROVED EGGSHELL ENAMEL. PLASTER SURFACE TO BE SMOOTH, CLEAN & DRY PRIOR TO APPLICATION.
	5	SPLASH BACK TILES	●	●	●	5	JOHNSON OR SIMILAR APPROVED BY DEPARTMENT - 150 X 150mm WHITE GLAZED - 'A' GRADE TILES, WITH WHITE WATERPROOF GROUT, LAID 3 COURSES ABOVE BASINS & SINKS.
CILLS	6	PRECAST CONCRETE	●	●	●	6	OLD WORLD CONCRETE OR SIMILAR APPROVED BY DEPARTMENT - TYPE 7 WINDOW CILL INSTALLED AS PER MANUFACTURERS INSTRUCTIONS. CILLS TO BE SEALED WITH 'UROCHEM' OR SIMILAR APPROVED ACRYLIC EMULSION SEALER.

506_SANITARY SCHEDULE

		DESCRIPTION	STAFF TOILETS	LEARNER TOILETS	GRADE R TOILETS	DISABLED TOILET	
SANITARY FITTINGS	1	STANDARD WC	●	●	●	●	"Atlas plastics" or similar approved moulded polyehthylene 222AP, VIP 200 Pedestal with incorporated seat.
	2	URINAL	●	●			"Franke" TV 102 or similar approved flat back wall mounted stainless steel urinal with built in tipping tank and adjustable drip cock. Lengths between 640mm & 1830mm.
	3	WHITE GLAZED PORCELAIN WHB	●			●	"Vaal" or similar approved Hibiscus, 510x430mm vitreous enamel whb 2x bolted to wall - colour white.
	4	POLYETHYLENE WHB		●	●		"4ever plastic products - Anneke" or similar approved, 510x430mm polyethylene was hand basin bolted to wall. colour - granite grey.
TAPS	5	TAPS					"Cobra' or similar approved standard brass wall mounted bib tap - 100 - 15.
	6	TAPS	●	●	●		"Cobra' or similar approved 111-15-cp pillar tap - cold water only.
	7	TAPS					"Cobra' or similar approved Capstan css 115/044 swan neck swivel sink mixer - cold water only.
	8	TAPS				●	"Cobra' or similar approved 503-21B elbow action pillar tap
ACCESSORIES	9	MIRRORS	●	●	●	●	600 x 400 highly polished stainless steel mirror fixed with dome head screws.
	10	ROLL HOLDER	●	●	●	●	Standard single toilet roll holder plugged & screwed to wall.
	11	HELPING HAND HARDWARE				●	Stainless steel grab rails - 32 Dia. - 1x Dogleg side rail with center flange. 1x 750mm long back rail.



SIDE ELEVATION
Scale 1:50



FRONT ELEVATION
Scale 1:50

Drawing Status

KWAZULU-NATAL PROVINCE
PUBLIC WORKS & INFRASTRUCTURE
REPUBLIC OF SOUTH AFRICA

RAMGOOLAM

SIVAGO ARCHITECTS

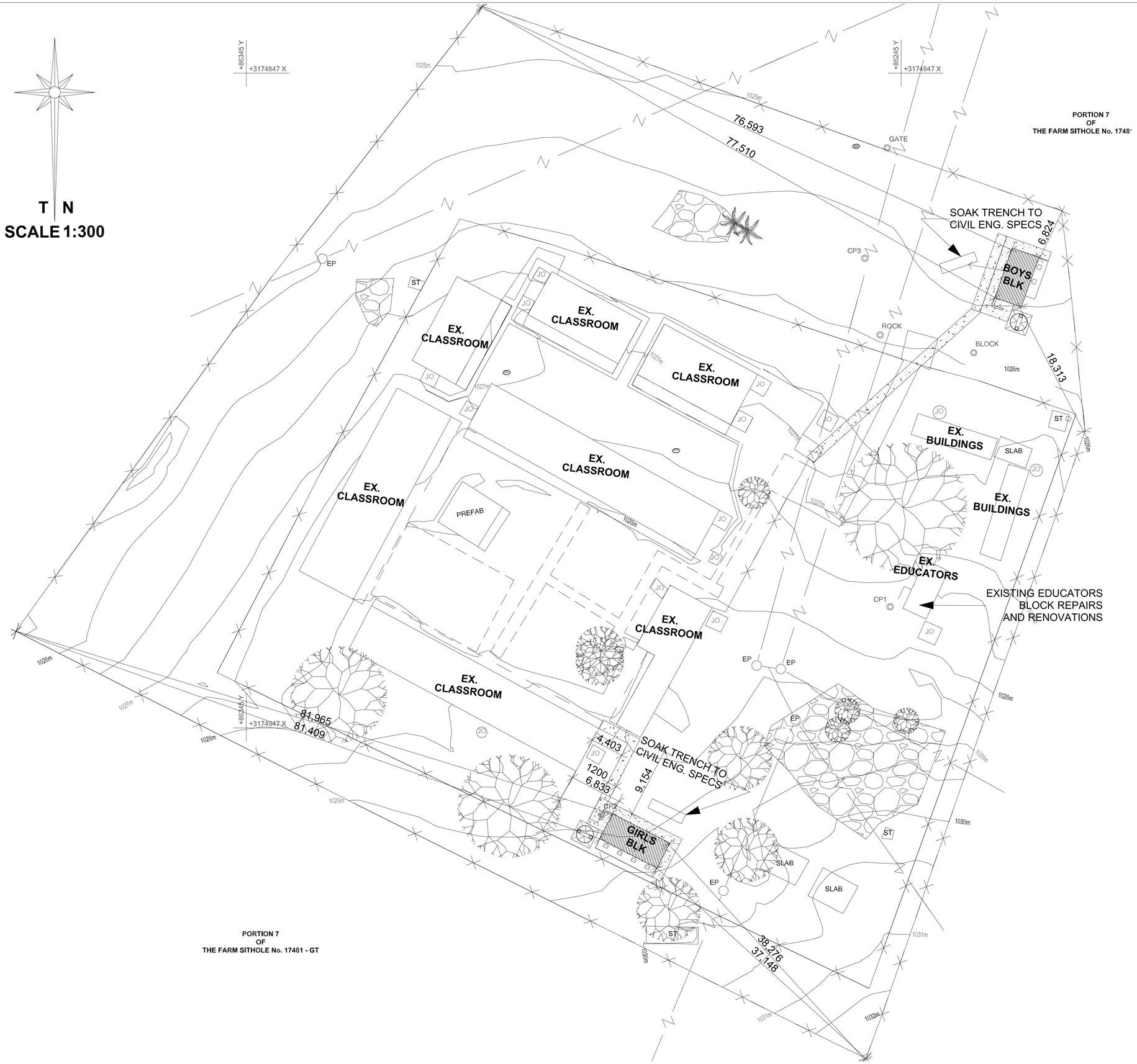
PROJECT NAME & CLIENT INFORMATION

SANITATION PROGRAMME
For Department of Public Works
on behalf of Department of Education
at Various Schools within Midlands Region

DRAWING DESCRIPTION

Working Drawing
BHANDE HIGH SCHOOL
FINISHING SCHEDULE & TANK STAND DETAILS

SCALE	DATE		DRAWN
As Shown	2026/06/09	A1	MN
PROJECT No - DRAWING NUMBER			REVISION
DAN - 100 - 03			



DAN 000 -100-1	00
NUMBER FOR PLAN AFRIQUE FILING REFERENCE ONLY	REVISION

NOTES:

1. The design on this drawing is copyright and remains the property of Plan Afrique.
2. All work to be carried out in strict accordance with local authority requirements, National Building Regulations, and the S.A.B.S standards.
3. This drawing may not be scaled. Only figured dimensions and levels may be used.
4. All relevant details, levels, dimensions must be checked on site before commencement of work. Any discrepancies to be reported to Plan Afrique office immediately.

Rev.	Init.	Date.	Desciption of Revision

RevID	ChID	Change Name	Date

Drawing Status

KWAZULU-NATAL PROVINCE
PUBLIC WORKS & INFRASTRUCTURE
REPUBLIC OF SOUTH AFRICA

RAMGOOLAM

SIVAGO ARCHITECTS

PROJECT NAME & CLIENT INFORMATION

SANITATION PROGRAMME

For Department of Public Works
on behalf of Department of Education
at Various Schools within Midlands Region

DRAWING DESCRIPTION

Working Drawing
BHANDE HIGH SCHOOL
SITE LAYOUT PLAN

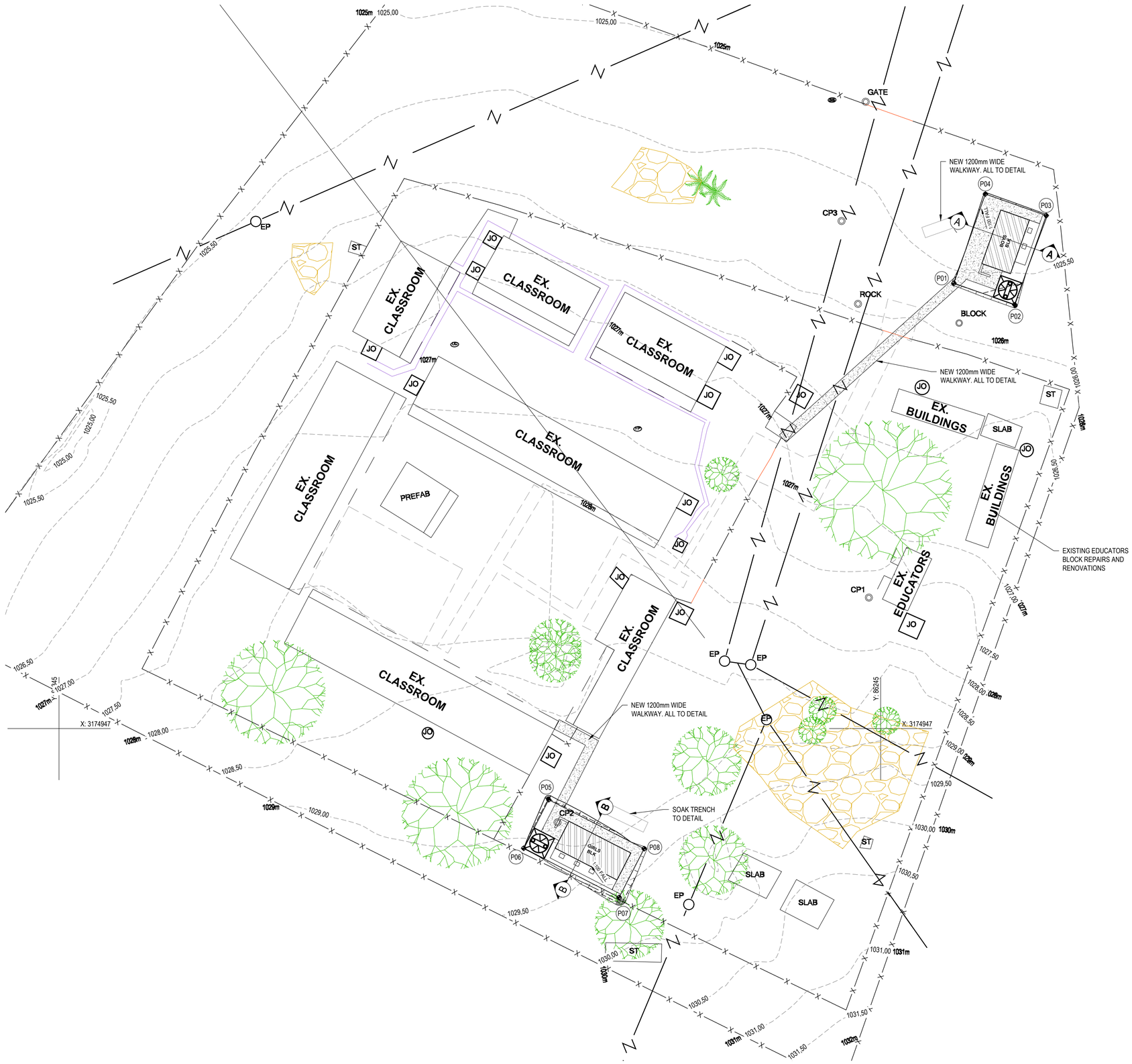
SCALE	DATE		DRAWN
As Shown	2026/06/09	A1	MN
PROJECT No - DRAWING NUMBER			REVISION
DAN - 100 - 04			

W-02 SITE PLAN 1:250

BLOCK TYPE No.	BLOCK TYPE	DISCRIPTION	DRAWING No.	No. OF BLOCKS
B10	Boys	EX(4T+4U+3W)	1248 / S107 / B10 / 200001	1
G10	Girls	8T+6W	1248 / S107 / G10 / 200001	1

PLATFORM SETTING OUT TABLE

POINT	Y COORDINATE	X COORDINATE	ELEVATION
P01	-86236.088249	-3174892.827720	1025.479
P02	-86228.683584	-3174895.444205	1025.523
P03	-86224.849645	-3174884.594136	1025.428
P04	-86232.254310	-3174881.977652	1025.384
P05	-86285.400631	-3174955.655416	1029.045
P06	-86288.443449	-3174961.557996	1029.075
P07	-86276.822974	-3174967.528989	1029.191
P08	-86273.787940	-3174961.614758	1029.161



0 50 100mm
ORIGINAL SCALE

BHANDE HIGH SCHOOL

NOTES:
1. FINAL POSITIONING OF NEW ABLUTION BLOCKS TO BE CONFIRMED WITH THE PRINCIPAL AND VERIFIED ON SITE BY THE ENGINEER PRIOR TO CONSTRUCTION.

FOR PLATFORM SECTIONS SEE DRAWING 100002

LEGEND

M	-	MALE ABLUTIONS
F	-	FEMALE ABLUTIONS
D	-	DISABLED ABLUTIONS
G	-	GIRLS ABLUTIONS
B	-	BOYS ABLUTIONS
R	-	GRADE R-ABLUTIONS
U	-	URINAL
T	-	TOILET SEAT
W	-	WASH BASIN
▭	-	NEW ABLUTION BLOCKS
⊕	-	CONTROL POINT

FOR CONSTRUCTION

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REV	DESCRIPTION	BY	DATE
00	FOR CONSTRUCTION	NGIH	09/06/2026

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APPROVED ON BEHALF OF DARTINGO CONSULTING ENGINEERS

CAPACITY : DIRECTOR

DATE :

Pr No : 200570114

PROJECT

KZN SCHOOLS WATER AND SANITATION

PHASE 7

DRAWING TITLE

BHANDE HIGH SCHOOL

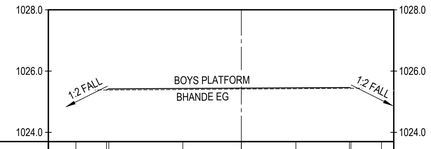
LAYOUT

EMIS No. : 500107966 WMIS No. : TBC

DESIGNED : TK	DATE : 09/06/2026
DRAWN : NGIH	SHEET : 01/01
CHECKED : TK	REV : 00
SCALE : AS SHOWN	

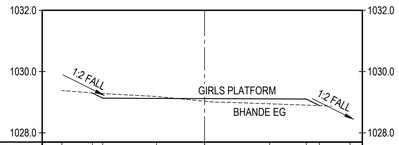
DRAWING No : 1248 / S107 / 100001

M:\1248_KZN Schools Sanitation - Phase 2\01-DESIGN STAGE\Drawings\05-Construction Drawings\Phase 2\2026 Phase 7\107 BHANDE HIGH SCHOOL\1248-S107 100001.dwg 100826



OFFSET	-5.401	-4.401	-4.325	-1.910	0	1.780	3.528	3.577	4.577
EXISTING GROUND ELEVATIONS	1025.382	1025.392	1025.362	1025.398	1025.41	1025.424	1025.439	1025.440	1025.450
PROPOSED PLATFORM ELEVATIONS		1025.382	1025.420	1025.433	1025.44	1025.454	1025.464	1025.440	
DEPTH (EXISTING - PROPOSED)		0.00	-0.04	-0.04	-0.031	-0.03	-0.02	0.00	

SECTION A-A
VERTICAL SCALE: 1:250
HORIZONTAL SCALE: 1:250



OFFSET	-4.659	-3.659	-3.324	-1.566	0	2.124	3.324	3.752	4.752
EXISTING GROUND ELEVATIONS	1029.362	1029.301	1029.282	1029.186	1029.03	1028.948	1028.904	1028.889	1028.853
PROPOSED PLATFORM ELEVATIONS		1029.301	1029.133	1029.125	1029.12	1029.108	1029.103	1028.889	
DEPTH (EXISTING - PROPOSED)		0.00	0.15	0.06	-0.084	-0.16	-0.20	0.00	

SECTION B-B
VERTICAL SCALE: 1:250
HORIZONTAL SCALE: 1:250

0 50 100mm
ORIGINAL SCALE

PLATFORM SECTIONS

FOR CONSTRUCTION

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REV	DESCRIPTION	BY	DATE
00	FOR CONSTRUCTION	NGIH	09/06/2026

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public works
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CAPACITY : DIRECTOR

DATE :

Pr No : 200570114

PROJECT

KZN SCHOOLS WATER AND SANITATION

PHASE 7

DRAWING TITLE

BHANDE HIGH SCHOOL

EARTHWORKS PLATFORM SECTIONS

EMIS No. : 500107966 WMIS No. : TBC

DESIGNED : TK	DATE : 09/06/2026
DRAWN : NGIH	SHEET : 01/01
CHECKED : TK	REV : 00
SCALE : AS SHOWN	

DRAWING No : 1248 / S107 / 100002

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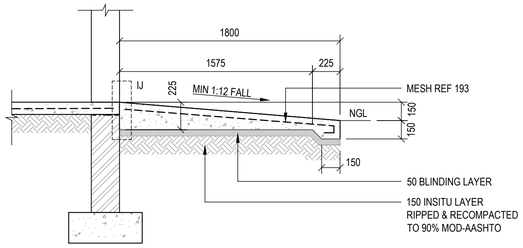
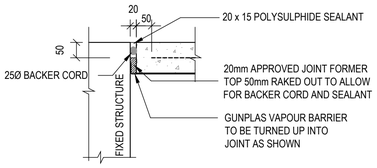
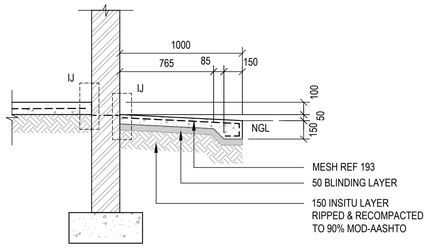


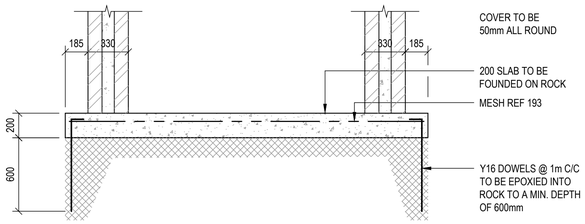
TYPICAL RAMP DETAIL
SCALE: 1:25



TYPICAL ISOLATION JOINT DETAIL
(IJ)
SCALE: 1:10



TYPICAL APRON SLAB DETAIL
SCALE: 1:25



FOUNDATION SLAB FOR
PITS ON ROCK
SCALE: 1:25

STRUCTURAL NOTES:

GENERAL:

1. THESE NOTES MUST BE READ IN CONJUNCTION WITH THE SPECIFICATIONS IN THE BILL OF QUANTITIES. WHERE DISCREPANCIES ARISE, SUCH DISCREPANCIES MUST BE DRAWN TO THE ATTENTION OF THE ENGINEER, IMMEDIATELY, IN WRITING.
2. ANY DISCREPANCIES IN DIMENSIONS AND SETTING OUT MUST BE REPORTED TO THE ENGINEER IMMEDIATELY, IN WRITING BEFORE CONSTRUCTION COMMENCES.
3. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH THE ARCHITECT'S DRAWINGS.
4. ALL WATER-PROOFING TO BE TO ARCHITECT'S DETAILS
5. ALL WORK TO BE IN ACCORDANCE WITH THE NATIONAL BUILDING REGULATIONS.
6. PLEASE NOTIFY ENGINEER FOR INSPECTION 24 HOURS BEFORE POURING OF CONCRETE.

FOUNDING:

1. FOUNDATIONS ARE SUBJECT TO ALTERATIONS AS EXCAVATIONS PROCEED.
2. N0 FOUNDATIONS ARE TO BE CAST OR REINFORCEMENT FIXED UNTIL EXCAVATIONS HAVE BEEN APPROVED BY THE ENGINEER.
3. DESIGN SOIL PRESSURE IS 75 kPa.

CONCRETE WORKS:

1. EXCEPT WHERE MENTIONED OTHERWISE ON DRAWING NOTES THE CONCRETE WORK MUST CONFORM WITH THE CONDITIONS SET OUT IN SANS 10100 PART 2 AND SANS 1200 SECTION G.
2. A SET OF THREE TEST CUBES MUST BE MADE OF EVERY 50m³ (OR PORTION THEREOF) OF EVERY GRADE OF CONCRETE POURED ON ANY SPECIFIC DAY CURED IN ACCORDANCE WITH THE METHODS SET OUT IN THE NBR AND TESTED BY LABORATORIES APPROVED BY THE ENGINEER.
3. NO CONCRETE IS TO BE POURED BEFORE THE ENGINEER HAS INSPECTED AND APPROVED THE FIXING OF THE REINFORCEMENT.
4. BREAKS IN CONCRETE AND CONSTRUCTION JOINTS ARE TO BE MADE ONLY WITH THE APPROVAL OF THE ENGINEER.
5. SHOULD THERE BE A BREAK OF MORE THAN 45 MINUTES AT ANY TIME IN THE POURING OF CONCRETE, THIS FACT MUST BE DRAWN TO THE ATTENTION OF THE ENGINEER.
6. SHUTTERING AND PROPPING MAY BE STRUCK ONLY AFTER THE LAPSE OF THE FOLLOWING TIMES, UNLESS OTHERWISE AUTHORISED:

SHUTTERING/PROPS	STRIKING TIMES (DAYS)
BEAM SIDES, WALLS AND UNLOADED COLS.	2
SLAB SOFFITS WITHOUT REMOVAL OF SLAB PROPS	4
BEAM SOFFITS WITHOUT REMOVAL OF BEAM PROPS	7
PROPS - UNLOADED SLABS	10
PROPS - UNLOADED BEAMS	14

7. CONCRETE COVER TO THE REINFORCEMENT TO BE:

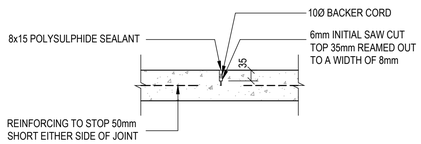
STRUCTURAL ELEMENT	MIN. COVER (mm)
RAFT FOUNDATIONS	50
STRIP FOOTINGS	50
COLUMNS	30
BEAMS	25
SLABS	25
WALLS	30
RC RETAINING WALLS	50

8. SPACER BLOCKS, APPROVED BY THE ENGINEER, ARE TO BE USED TO MAINTAIN THE NECESSARY CONCRETE COVER TO THE REINFORCEMENT.
9. CONCRETE STRENGTHS:
   CONCRETE WORKS CUBE STRENGTH AT 28 DAYS TO BE AS FOLLOWS:

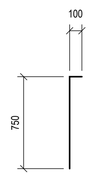
	MPa
BLINDING	15
FOUNDATIONS	25
COLUMNS	30
BEAMS AND SLABS	25

REINFORCING

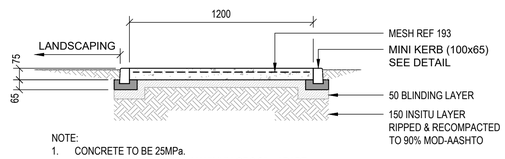
1. ALL REINFORCING TO BE HIGH TENSILE STEEL



TYPICAL SAW CUT JOINT DETAIL
(SJ)
SCALE: 1:10

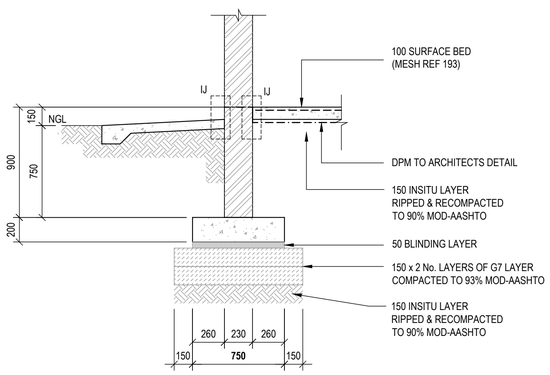


Y16 DOWELS
SCALE: 1:25

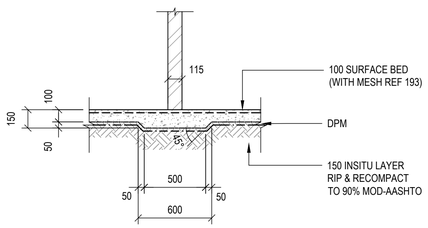


NOTE:
1. CONCRETE TO BE 25MPa.
2. SAW CUT JOINTS TO BE A MAXIMUM OF 2.25m APART
3. EXPANSION JOINTS TO BE A MAXIMUM OF 4.5m APART

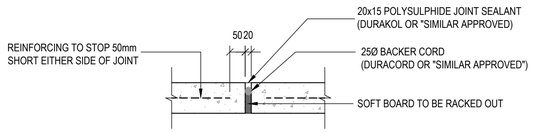
TYPICAL DETAIL OF FOOTPATH
SCALE: 1:20



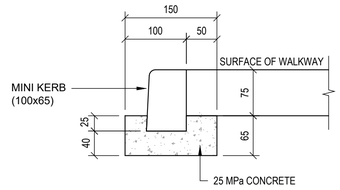
750 x 250 STRIP FOOTING DETAIL
SCALE: 1:25



SURFACE BED THICKENING DETAIL
SCALE: 1:25



TYPICAL ISOLATION JOINT DETAIL
(IJ)
SCALE: 1:10



NOTE:
HAUNCHING FOR FULL KERB LENGTH

TYPICAL MINI KERB (100x65) DETAIL
SCALE: 1:5

0 50 100mm
ORIGINAL SCALE

TYPICAL STRUCTRAL DETAILS 1 OF 2

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Email: admin@dartingo.co.za

APPROVED ON BEHALF OF DARTINGO CONSULTING ENGINEERS

CAPACITY : DIRECTOR

DATE :

Pr No : 200570114

PROJECT

KZN SCHOOLS
WATER AND SANITATION

PHASE 7

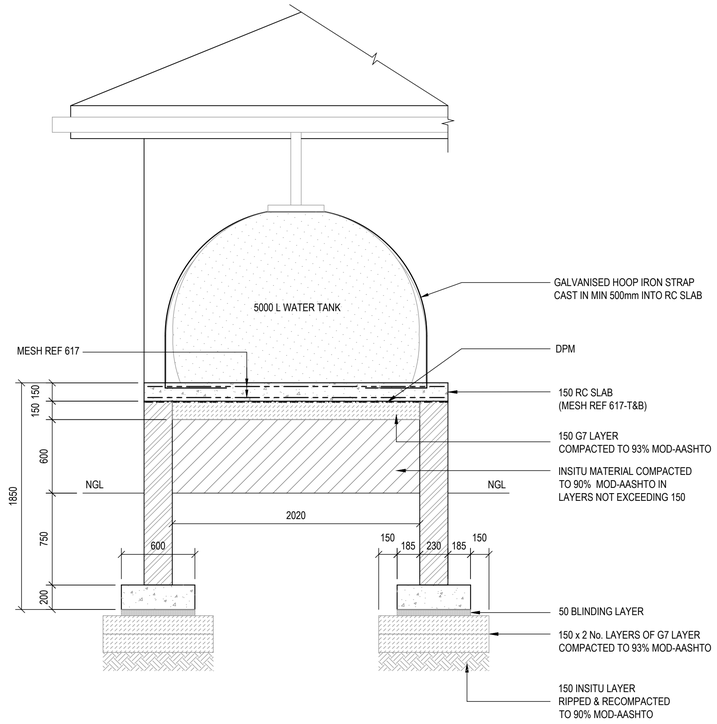
DRAWING TITLE

BHANDE HIGH SCHOOL

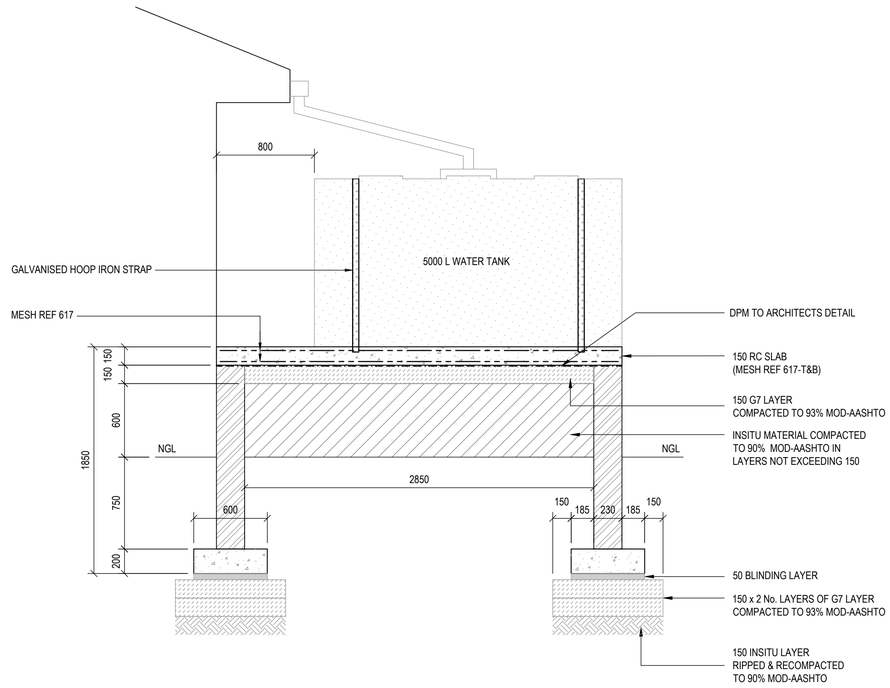
STRUCTURAL DETAILS

EMIS No. : 500107966	WMIS No. : TBC
DESIGNED : NN	DATE : 08/06/2026
DRAWN : NGIH	SHEET : 01/01
CHECKED : TK	REV : 00
SCALE : AS SHOWN	
DRAWING No : 1248 / S107 / 100101	

M:\1248_KZN Schools Sanitation - Phase 2\01-DESIGN STAGE\Drawings\05-Construction Drawings\Phase 2\2026 Phase 7\107 BHANDE HIGH SCHOOL\1248-S107 100101 TO 3.dwg 100626



SECTION A-A ON WATER TANK STAND
SCALE: 1:25



SECTION B-B ON WATER TANK STAND
SCALE: 1:25

STRUCTURAL NOTES:

GENERAL:

1. THESE NOTES MUST BE READ IN CONJUNCTION WITH THE SPECIFICATIONS IN THE BILL OF QUANTITIES. WHERE DISCREPANCIES ARISE, SUCH DISCREPANCIES MUST BE DRAWN TO THE ATTENTION OF THE ENGINEER, IMMEDIATELY, IN WRITING.
2. ANY DISCREPANCIES IN DIMENSIONS AND SETTING OUT MUST BE REPORTED TO THE ENGINEER IMMEDIATELY, IN WRITING BEFORE CONSTRUCTION COMMENCES.
3. ALL DRAWINGS TO BE READ IN CONJUNCTION WITH THE ARCHITECT'S DRAWINGS.
4. ALL WATER-PROOFING TO BE TO ARCHITECT'S DETAILS
5. ALL WORK TO BE IN ACCORDANCE WITH THE NATIONAL BUILDING REGULATIONS.
6. PLEASE NOTIFY ENGINEER FOR INSPECTION 24 HOURS BEFORE POURING OF CONCRETE.

FOUNDING:

1. FOUNDATIONS ARE SUBJECT TO ALTERATIONS AS EXCAVATIONS PROCEED.
2. N0 FOUNDATIONS ARE TO BE CAST OR REINFORCEMENT FIXED UNTIL EXCAVATIONS HAVE BEEN APPROVED BY THE ENGINEER.
3. DESIGN SOIL PRESSURE IS 75 kPa.

CONCRETE WORKS:

1. EXCEPT WHERE MENTIONED OTHERWISE ON DRAWING NOTES THE CONCRETE WORK MUST CONFORM WITH THE CONDITIONS SET OUT IN SANS 10100 PART 2 AND SANS 1200 SECTION G.
2. A SET OF THREE TEST CUBES MUST BE MADE OF EVERY 50m³ (OR PORTION THEREOF) OF EVERY GRADE OF CONCRETE POURED ON ANY SPECIFIC DAY CURED IN ACCORDANCE WITH THE METHODS SET OUT IN THE NBR AND TESTED BY LABORATORIES APPROVED BY THE ENGINEER.
3. NO CONCRETE IS TO BE POURED BEFORE THE ENGINEER HAS INSPECTED AND APPROVED THE FIXING OF THE REINFORCEMENT.
4. BREAKS IN CONCRETE AND CONSTRUCTION JOINTS ARE TO BE MADE ONLY WITH THE APPROVAL OF THE ENGINEER.
5. SHOULD THERE BE A BREAK OF MORE THAN 45 MINUTES AT ANY TIME IN THE POURING OF CONCRETE, THIS FACT MUST BE DRAWN TO THE ATTENTION OF THE ENGINEER.
6. SHUTTERING AND PROPPING MAY BE STRUCK ONLY AFTER THE LAPSE OF THE FOLLOWING TIMES, UNLESS OTHERWISE AUTHORISED:

SHUTTERING/PROPS	STRIKING TIMES (DAYS)
BEAM SIDES, WALLS AND UNLOADED COLS.	2
SLAB SOFFITS WITHOUT REMOVAL OF SLAB PROPS	4
BEAM SOFFITS WITHOUT REMOVAL OF BEAM PROPS	7
PROPS - UNLOADED SLABS	10
PROPS - UNLOADED BEAMS	14

7. CONCRETE COVER TO THE REINFORCEMENT TO BE:

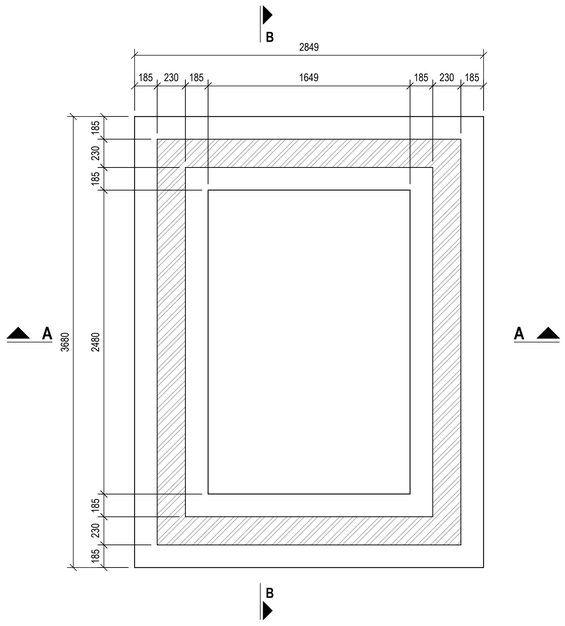
STRUCTURAL ELEMENT	MIN. COVER (mm)
RAFT FOUNDATIONS	50
STRIP FOOTINGS	50
COLUMNS	30
BEAMS	25
SLABS	25
WALLS	30
RC RETAINING WALLS	50

8. SPACER BLOCKS, APPROVED BY THE ENGINEER, ARE TO BE USED TO MAINTAIN THE NECESSARY CONCRETE COVER TO THE REINFORCEMENT.
9. CONCRETE STRENGTHS:
   CONCRETE WORKS CUBE STRENGTH AT 28 DAYS TO BE AS FOLLOWS:

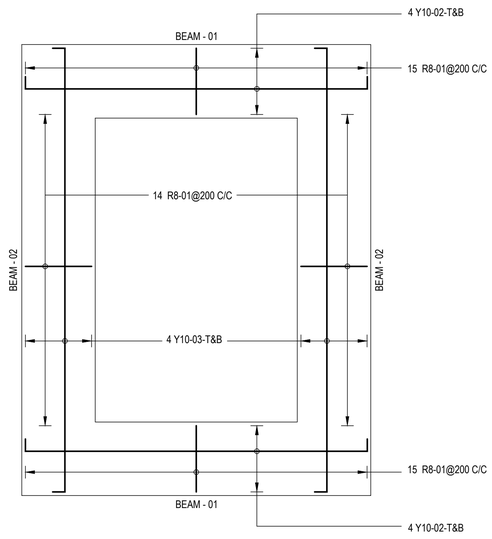
	MPa
BLINDING	15
FOUNDATIONS	25
COLUMNS	30
BEAMS AND SLABS	25

REINFORCING

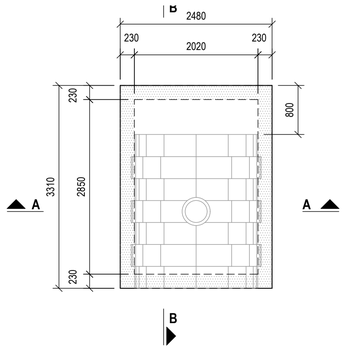
1. ALL REINFORCING TO BE HIGH TENSILE STEEL



FOUNDATION PLAN
SCALE: 1:25



FOUNDATION REBAR DETAIL
N.T.S.



PLAN ON WATER TANK STAND
SCALE: 1:50

STRIP FOOTINGS-BENDING SCHEDULE

MEMBER		REINFORCEMENT					BENDING					
UNIT	No.	Diameter	Mark	Unit	Total	Length	*Shape Code*	A	B	C	D	E/r
BEAM 01	2	R8	01	15	30	1560	*60*	540	140			
		Y 10	02	8	16	2990	*35*	2790				
BEAM 02	2	R8	01	14	28	1560	*60*	540	160			
		Y 10	03	8	16	3820	*35*	3620				

0 50 100mm
ORIGINAL SCALE

TYPICAL STRUCTRAL DETAILS 2 OF 2

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APPROVED ON BEHALF OF DARTINGO CONSULTING ENGINEERS

CAPACITY : DIRECTOR

DATE :

Pr No : 200570114

PROJECT

KZN SCHOOLS WATER AND SANITATION

PHASE 7

DRAWING TITLE

BHANDE HIGH SCHOOL

STRUCTURAL DETAILS

EMIS No. : 500107966 WMIS No. : TBC

DESIGNED : NN	DATE : 08/06/2026
DRAWN : NGIH	SHEET : 01/01
CHECKED : TK	REV : 00
SCALE : AS SHOWN	

DRAWING No : **1248 / S107 / 100102**

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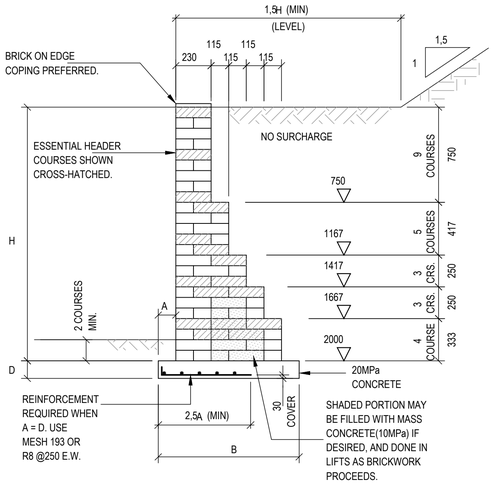
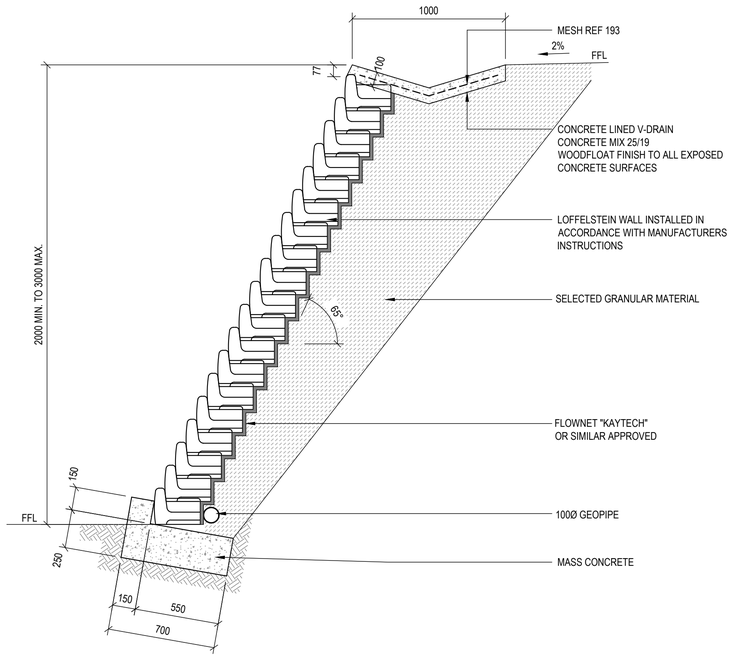


THICKNESS OF WALL AT BASE	A	B	D	H
230 (1 BRICK)	90	400	100	0 ~ 750
	130	600	130	750 ~ 1167
460 (2 BRICK)	170	800	130	1167 ~ 1417
	220	1000	150	1417 ~ 1667
690 (3 BRICK)	270	1200	150	1667 ~ 2000

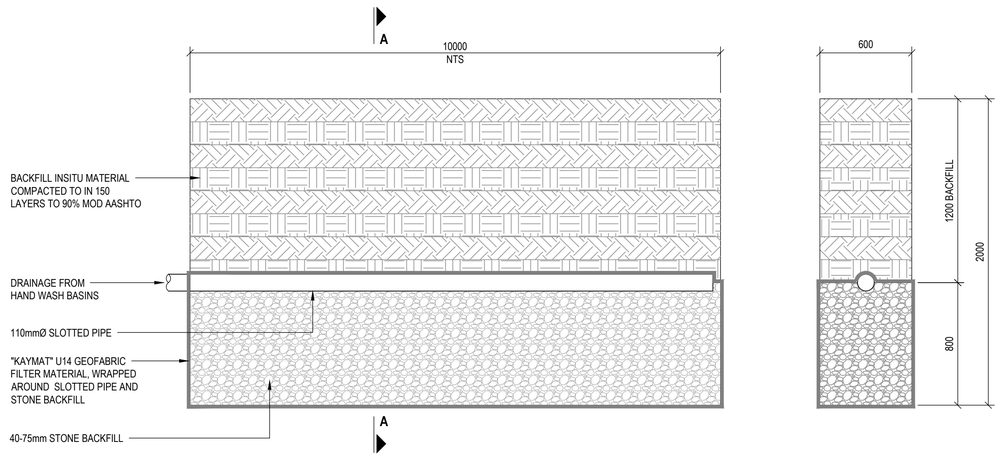
NOTES:

1. BONDING: HEADERS MUST BE LAID AS INDICATED. REMAINDER OF BRICKWORK MAY BE STRETCHERS. ALTERNATIVELY, WHOLE WALL TO BE LAID IN ENGLISH BOND.
2. MORTAR: 5 / 1 SAND CEMENT.
3. WEEPHOLES: MUST BE PROVIDED AND SUITABLY BACKED DEPENDANT ON NATURE OF GROUND. MIN.RECOMMENDED: 50Ø AT 1000c/c VERTICAL ANDAT 2000c/c HORIZONTAL.
4. SOIL TO BE WELL RAMMED BEFORE CASTING FOUNDATIONS.
5. EXPANSION JOINTS: 10mm GAPS TO BE PROVIDED IN BRICKWORK (BUT NOT IN FOUNDATIONS) AT APPROX. 15m CENTRES.
6. DESIGN CRITERIA: WEIGHT OF SOIL 16kN/m³. EQUIVALENT FLUID PRESSURE 5kN/m². MAX. FOUNDATION PRESSURE 50kN/m². MAX. TENSION IN BRICKWORK 0,07MPa.

TYPICAL SECTION THROUGH
BRICK RETAINING WALL UP TO 2 METERS HIGH
N.T.S



TYPICAL SECTION THROUGH
LÖFFELSTEIN RETAINING WALL
BETWEEN 2 METERS AND 3 METERS
N.T.S



LONGITUDINAL SECTION

CROSS SECTION A-A

TYPICAL SOAK AWAY DETAILS
SCALE: 1:20

0 50 100mm
ORIGINAL SCALE

TYPICAL RETAINING WALL AND SOAK AWAY DETAILS

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CAPACITY : DIRECTOR

DATE :

Pr No : 200570114

PROJECT

KZN SCHOOLS
WATER AND SANITATION

PHASE 7

DRAWING TITLE

BHANDE HIGH SCHOOL

STRUCTURAL DETAILS

EMIS No. : 500107966 WMIS No. : TBC

DESIGNED : NN	DATE : 08/06/2026
DRAWN : NGIH	SHEET : 01/01
CHECKED : TK	REV : 00
SCALE : AS SHOWN	

DRAWING No : **1248 / S107 / 100103**

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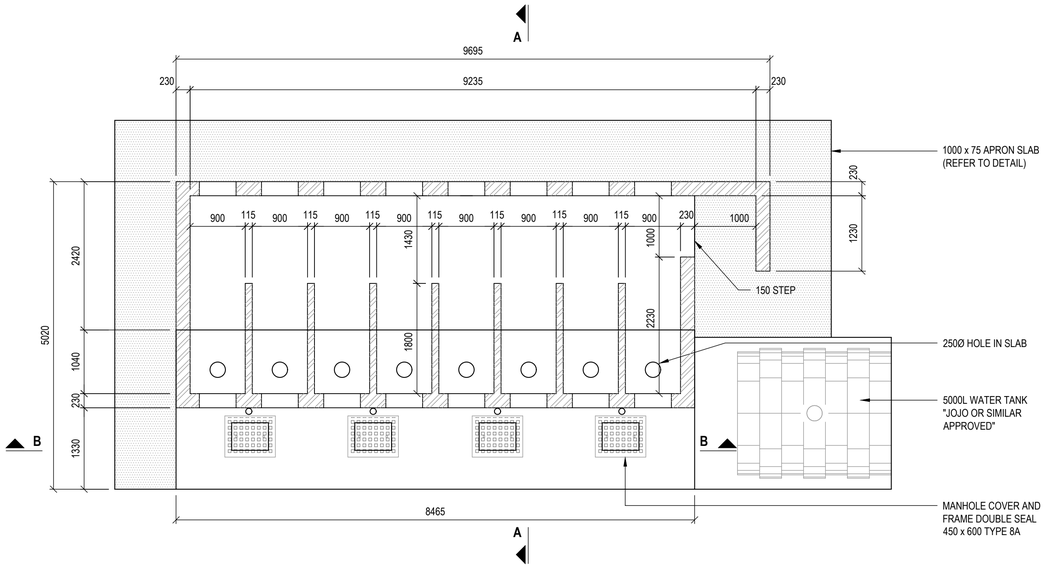
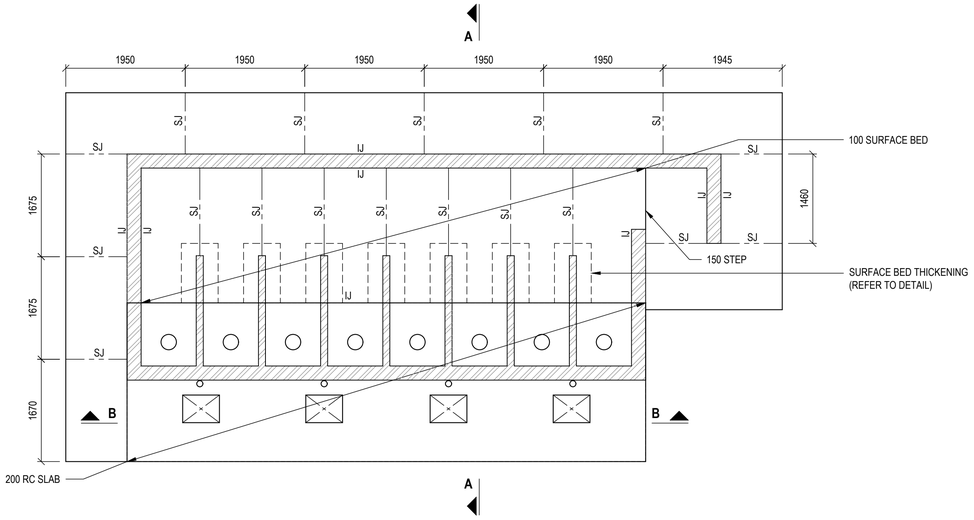


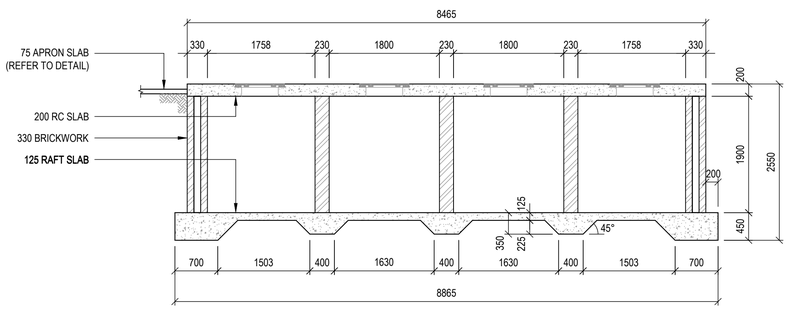
PLAN

SCALE: 1:50



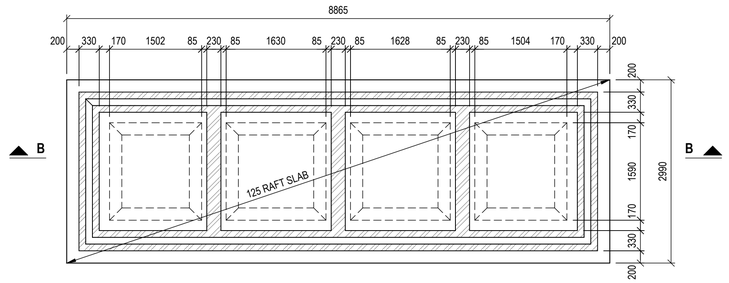
SURFACE BED LAYOUT

SCALE: 1:50



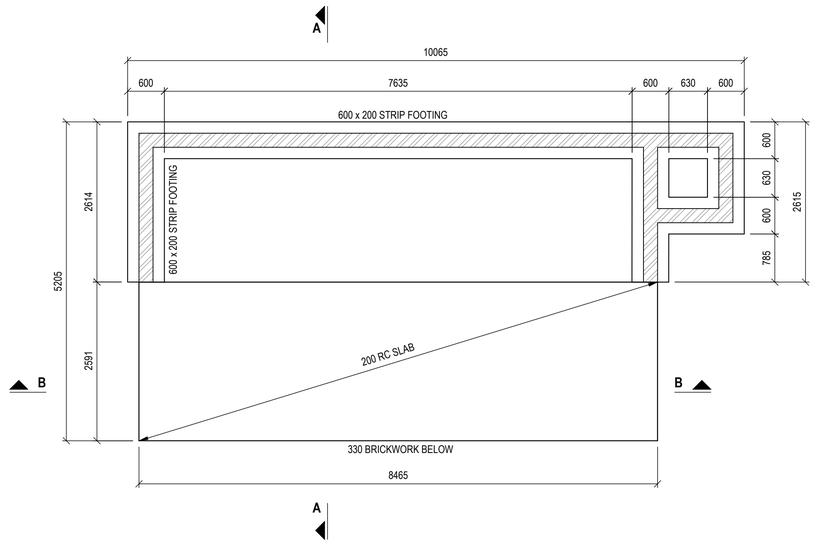
SECTION B-B

SCALE: 1:50



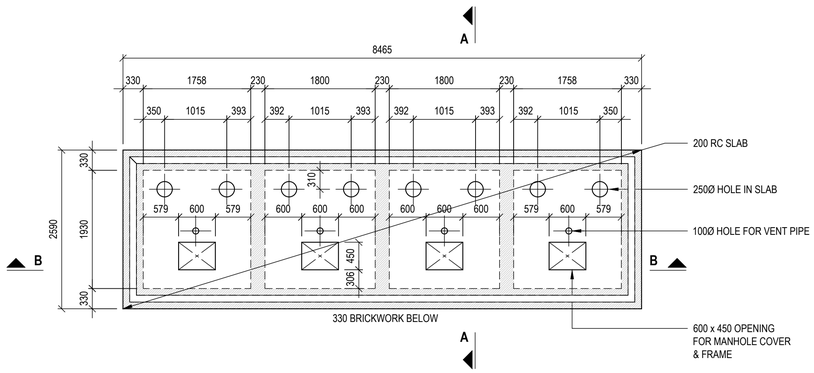
RAFT LAYOUT

SCALE: 1:50



FOUNDATION LAYOUT

SCALE: 1:50



PLAN ON PIT SLAB

SCALE: 1:50

NOTE:
FOR SECTION A-A, AND TYPICAL SLAB
DETAILS SEE DRAWING NO.
1248/S107/100101 AND 1248/S107/100102

NOTE:
FOR GENERAL NOTES, CONCRETE COVER &
CONCRETE STRENGTH
SEE DRAWING NO.: 1248/S107/100001

0 50 100mm
ORIGINAL SCALE

200001 GIRLS 8T+6W

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DATE :

Pr No : 200570114

PROJECT

KZN SCHOOLS WATER AND SANITATION

PHASE 7

DRAWING TITLE

BHANDE HIGH SCHOOL

BLOCK TYPE - B10

STRUCTURAL DETAILS

EMIS No. : 500107966 WMIS No. : TBC

DESIGNED : NN	DATE : 08/06/2026
DRAWN : NGIH	SHEET : 01/01
CHECKED : TK	REV : 00
SCALE : AS SHOWN	

DRAWING No : 1248 / S107 / B10 / 200001

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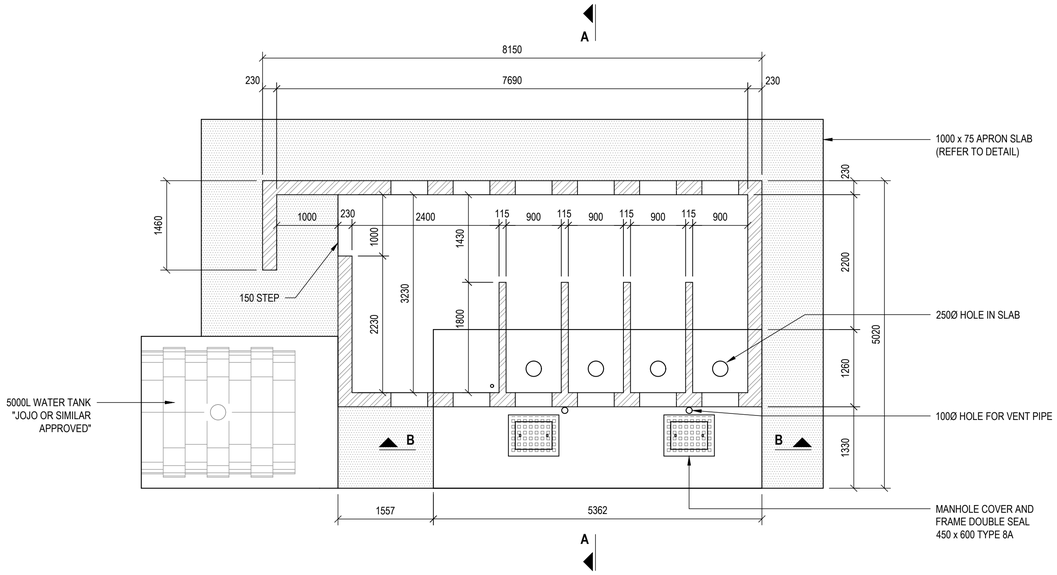
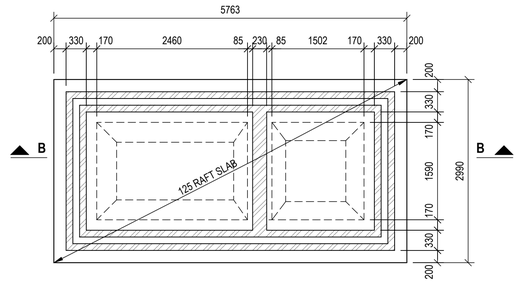


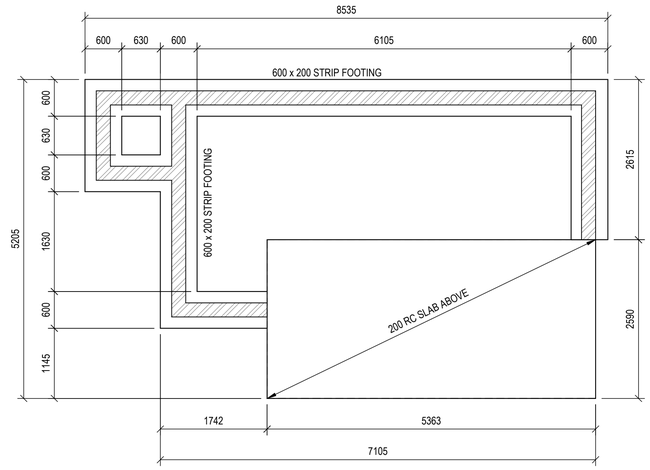
PLAN

SCALE: 1:50



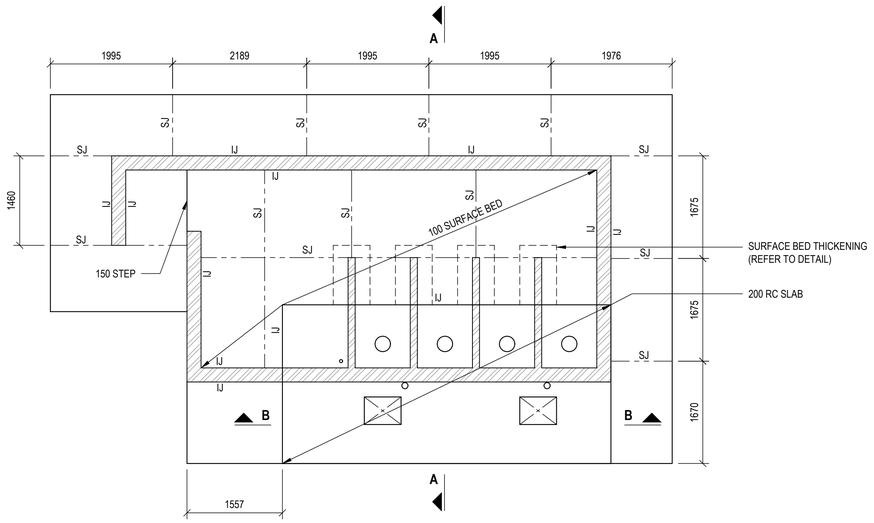
RAFT LAYOUT

SCALE: 1:50



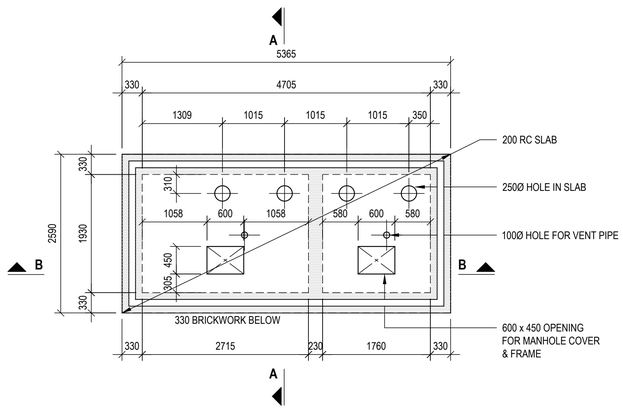
FOUNDATION LAYOUT

SCALE: 1:50



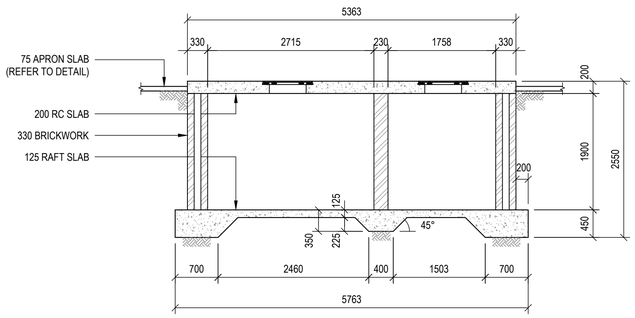
SURFACE BED LAYOUT

SCALE: 1:50



PLAN ON PIT SLAB

SCALE: 1:50



SECTION B-B

SCALE: 1:50

NOTE:
FOR SECTION A-A, AND TYPICAL SLAB DETAILS SEE DRAWING NO. 1248/S107/100101 AND 1248/S107/100102

NOTE:
FOR GENERAL NOTES, CONCRETE COVER & CONCRETE STRENGTH SEE DRAWING NO.: 1248/S107/100101

0 50 100mm
ORIGINAL SCALE

BOYS 4T+7U+3W

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KZN SCHOOLS WATER AND SANITATION

PHASE 7

DRAWING TITLE

BHANDE HIGH SCHOOL

BLOCK TYPE - B10

STRUCTURAL DETAILS

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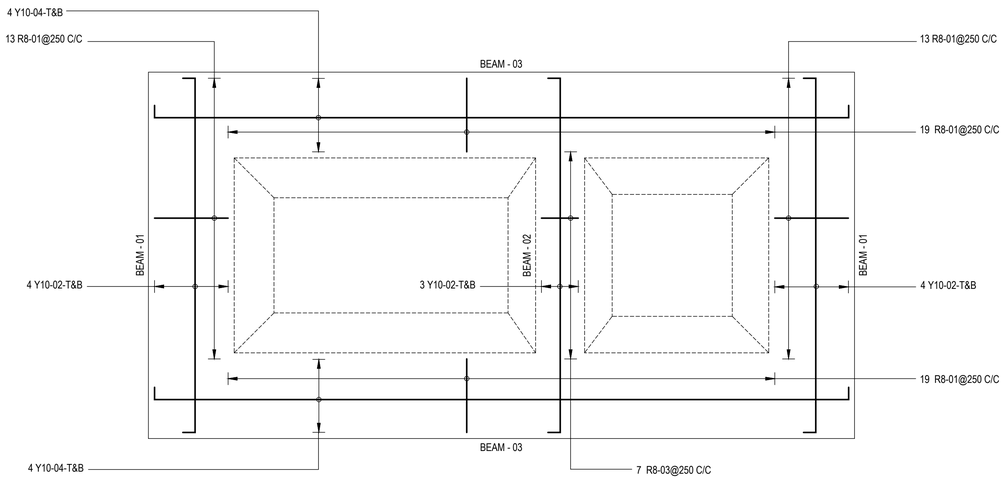
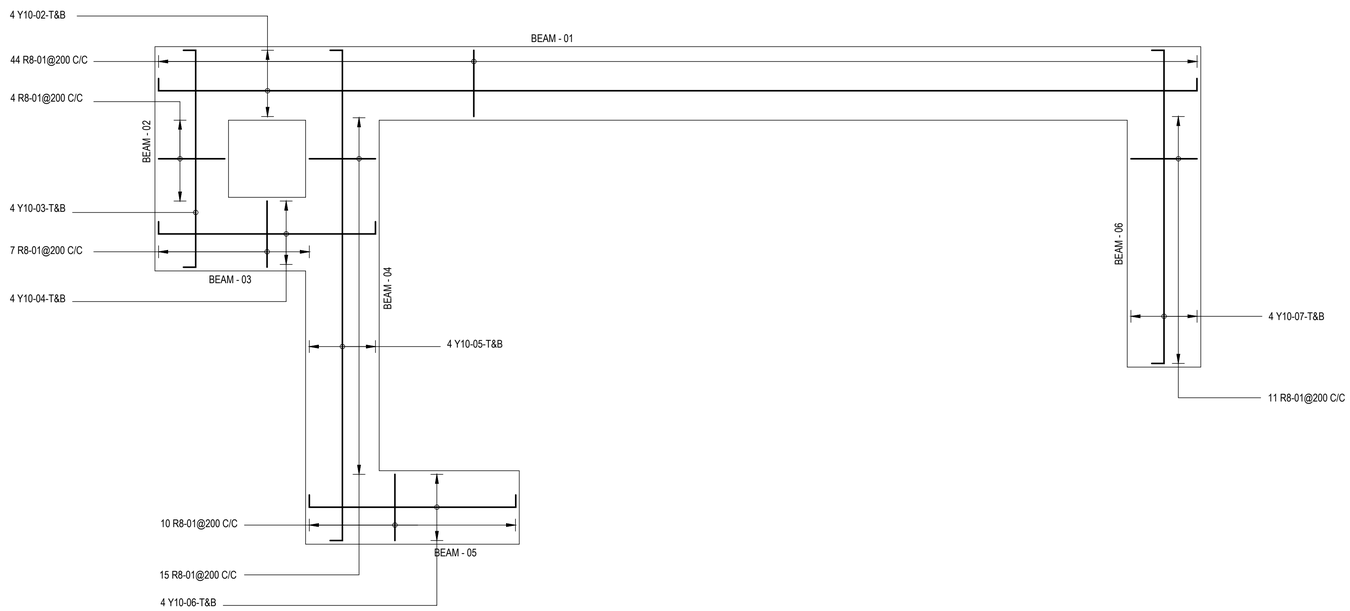


RAFT FOUNDATION REBAR DETAIL
N.T.S.



FOUNDATION REBAR DETAIL
N.T.S.

NOTE:
FOR GENERAL NOTES, CONCRETE COVER &
CONCRETE STRENGTH
SEE DRAWING NO.: 1248/S107/100101

0 50 100mm
ORIGINAL SCALE

BOYS 4T+7U+3W REBAR 1 OF 2

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KZN SCHOOLS WATER AND SANITATION

PHASE 7

DRAWING TITLE

BHANDE HIGH SCHOOL

BLOCK TYPE - B10

STRUCTURAL DETAILS

EMIS No. : 500107966 WMIS No. : TBC

DESIGNED : TK	DATE : 08/06/2026
DRAWN : NGIH	SHEET : 01/01
CHECKED : TK	REV : 00
SCALE : AS SHOWN	

DRAWING No : 1248 / S107 / B10 / 200101

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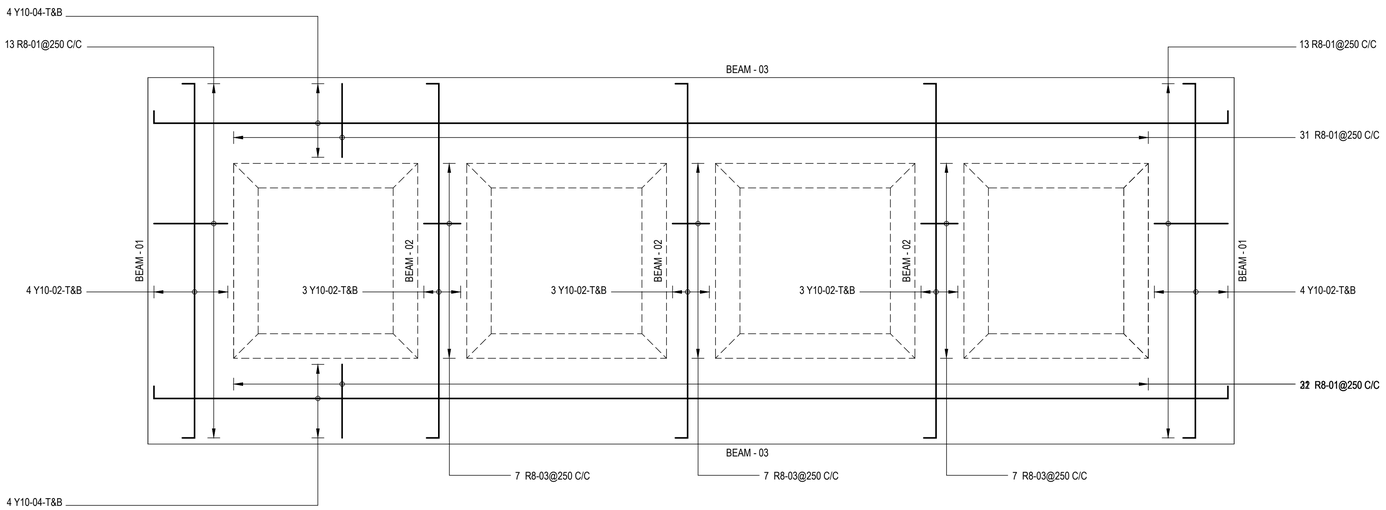
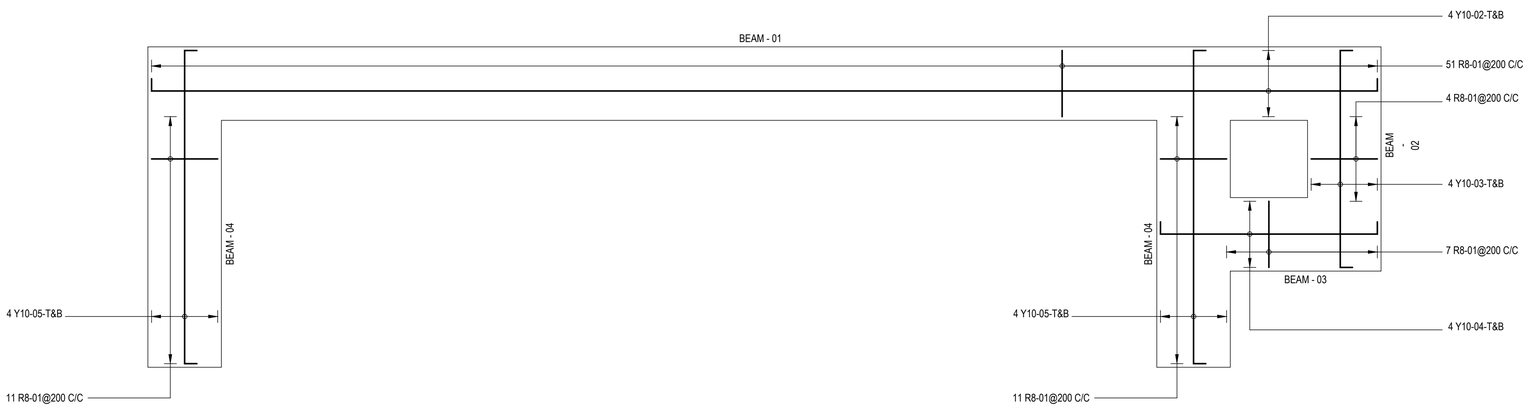


RAFT FOUNDATION REBAR DETAIL
N.T.S.



FOUNDATION REBAR DETAIL
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NOTE:
FOR GENERAL NOTES, CONCRETE COVER &
CONCRETE STRENGTH
SEE DRAWING NO.: 1248/S107/100001

0 50 100mm
ORIGINAL SCALE

GIRLS 8T+6W REBAR 1 OF 2

FOR CONSTRUCTION

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REV	DESCRIPTION	BY	DATE
00	FOR CONSTRUCTION	NGIH	08/06/2026

CLIENT

191 PRINCE ALFRED STREET
PEITERMARITZBURG
3200

TEL.: (033) 260-4052
FAX.: (039) 682-1720

public works
Department:
Public Works
REPUBLIC OF SOUTH AFRICA

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APPROVED ON BEHALF OF DARTINGO CONSULTING ENGINEERS

CAPACITY : DIRECTOR

DATE :

Pr No : 200570114

PROJECT

KZN SCHOOLS
WATER AND SANITATION

PHASE 7

DRAWING TITLE

BHANDE HIGH SCHOOL

BLOCK TYPE - G10

STRUCTURAL DETAILS

EMIS No. : **500107966** WMIS No. : **TBC**

DESIGNED : **TK**	DATE : **08/06/2026**
DRAWN : **NGIH**	SHEET : **01/01**
CHECKED : **TK**	REV : **00**
SCALE : **AS SHOWN**	
DRAWING No :	**1248 / S107 / G10 / 200101**

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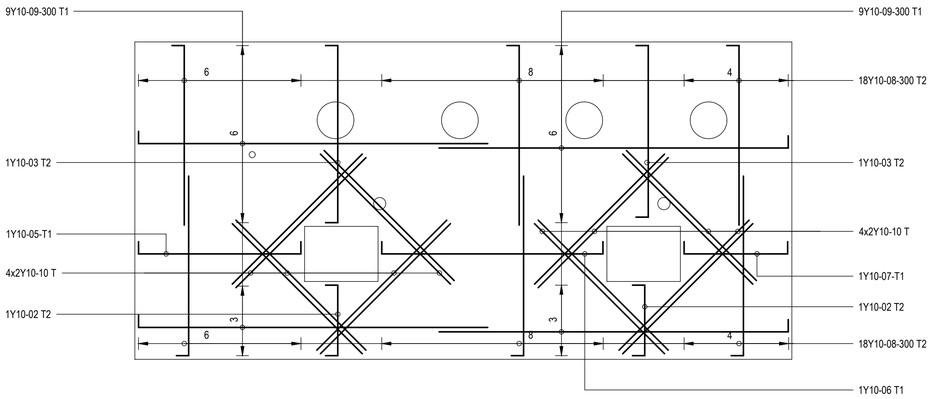
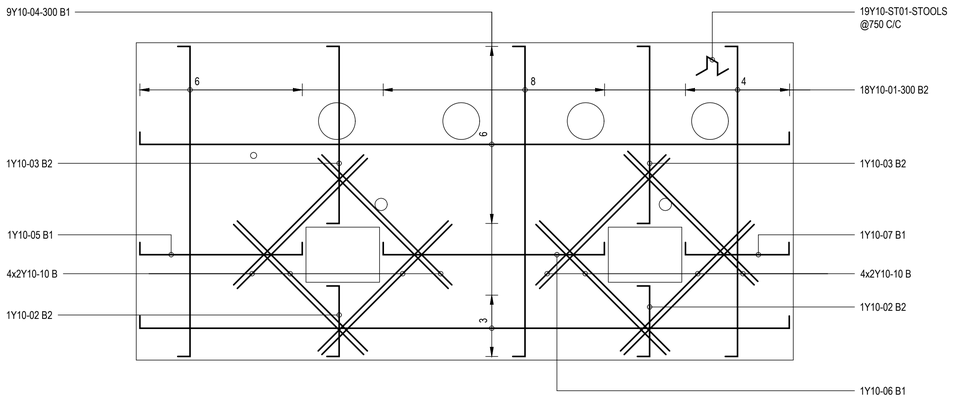


PIT SLAB REBAR DETAIL
TOP STEEL
N.T.S.



PIT SLAB REBAR DETAIL
BOTTOM STEEL
N.T.S.

NOTE:
FOR GENERAL NOTES, CONCRETE COVER &
CONCRETE STRENGTH
SEE DRAWING NO.: 1248/S107/100101

0 50 100mm
ORIGINAL SCALE

BOYS 4T+7U+3W REBAR 2 OF 2

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APPROVED ON BEHALF OF DARTINGO CONSULTING ENGINEERS

CAPACITY : DIRECTOR

DATE :

Pr No : 200570114

PROJECT

KZN SCHOOLS
WATER AND SANITATION

PHASE 7

DRAWING TITLE

BHANDE HIGH SCHOOL

BLOCK TYPE - B10

STRUCTURAL DETAILS

EMIS No. : **500107966** WMIS No. : **TBC**

DESIGNED : **TK**	DATE : **08/06/2026**
DRAWN : **NGIH**	SHEET : **01/01**
CHECKED : **TK**	REV : **00**
SCALE : **AS SHOWN**	

DRAWING No : 1248 / S107 / B10 / 200102

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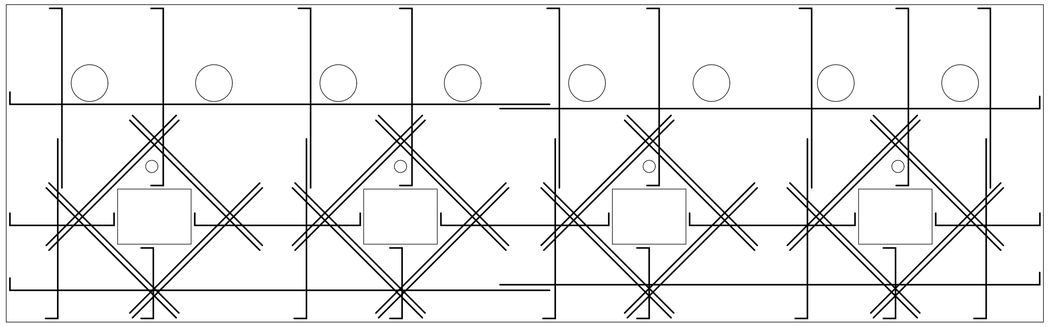
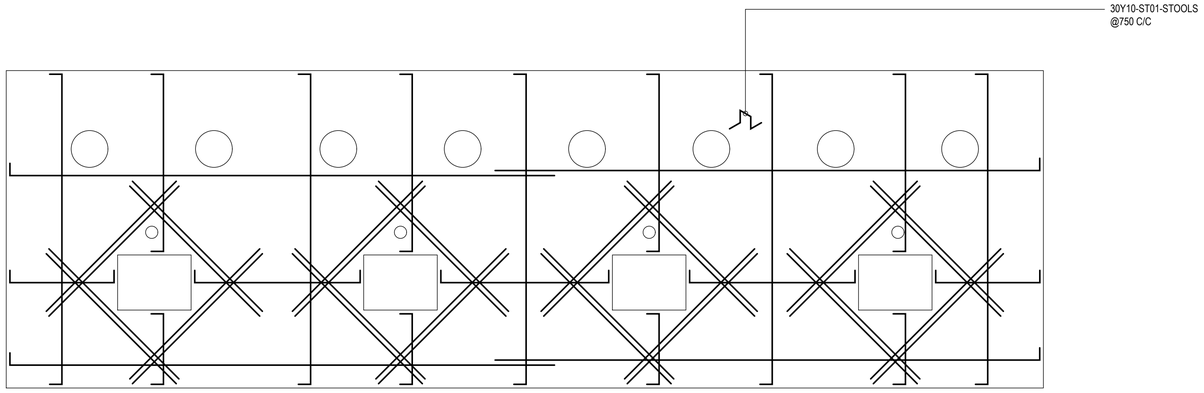


PIT SLAB REBAR DETAIL
TOP STEEL
N.T.S.



PIT SLAB REBAR DETAIL
BOTTOM STEEL
N.T.S.

NOTE:
FOR GENERAL NOTES, CONCRETE COVER &
CONCRETE STRENGTH
SEE DRAWING NO.: 1248/S107/100001

0 50 100mm
ORIGINAL SCALE

GIRLS 8T+6W REBAR 2 OF 2

FOR CONSTRUCTION

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CAPACITY : DIRECTOR

DATE :

Pr No : 200570114

PROJECT

KZN SCHOOLS
WATER AND SANITATION

PHASE 7

DRAWING TITLE

BHANDE HIGH SCHOOL

BLOCK TYPE - G10

STRUCTURAL DETAILS

EMIS No. : **500107966** WMIS No. : **TBC**

DESIGNED : **TK**	DATE : **08/06/2026**
DRAWN : **NGIH**	SHEET : **01/01**
CHECKED : **TK**	REV : **00**
SCALE : **AS SHOWN**	
DRAWING No :	**1248 / S107 / G10 / 200102**

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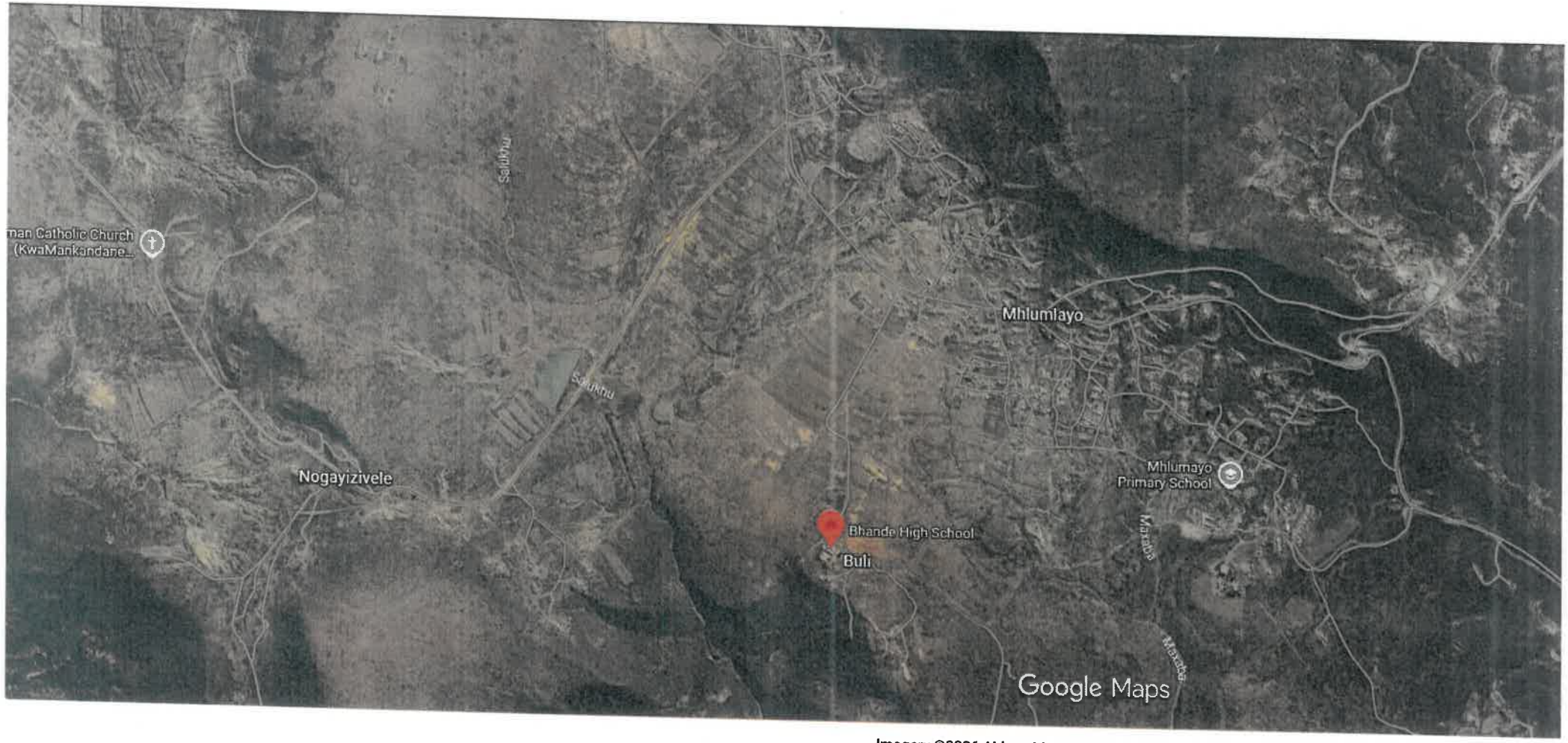
KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

PART C5.2 - PROVISIONAL SITE PLAN

Google Maps

Bhande High School



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KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

PART C5.3 - TABULATED SCOPE OF WORKS

REFER TO ANNEXURE 13

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

ANNEXURES

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

ANNEXURE 1
Model Preambles for Trades 2008

STANDARD PREAMBLES TO ALL TRADES

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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.

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 backacting 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 tyred front-end loader of approximately 15 t 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 0,10 kW 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 0,03 m^3 and 20 m^3 in a matrix of softer material or smaller boulders. *Note:* - Excavation of solid boulders or lumps of size exceeding 20 m^3 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 0,03 m^3 and 20 m^3 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 Director 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 Director shall, subject to the relevant provisions of the contract, be final and binding.

Should the Contractor consider that the excavation is other than "soft excavation" he must notify the Director immediately in order that an inspection be made and a decision arrived at by the Director 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 Director, 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 Director 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.
Excavations 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 Director'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 Director.
Depths of excavations as approved shall be checked and recorded by the Works Supervisor or Inspector of Works 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 Director, 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 750 mm 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 500 mm, 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 1,5 m 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 1,5 m 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 pavings 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 Director. 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 for 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 Director.

COMPACTION OF FILLING ETC.: -All filling and backfilling is to be done in layers not exceeding 200 mm 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 a moisture content not more than 5 % above or below the Mod. A.A.S.H.O. optimum moisture content. 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 Director. These tests are to be undertaken by an independent testing authority nominated by the Contractor to the approval of the Director. 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, from 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 SABS 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 Director.

The Director 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 50 mm 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 50 mm 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 75 mm 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 75 min 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 25 mm 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 Director.
(d) The soil insecticide is 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 is to be carned out in accordance with SABS 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 1 m 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 demolitions.
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: - Grass is to be "Cape Kweek" or "Umgeni" grass scientifically known as *Cynodon dactylon* or other local fine grass approved by the Director. 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 Director obtained before Kikuyu grass is planted. The planting of Kikuyu grass on hockey fields is to be avoided wherever possible.

Grass Planting To Level Areas: - The areas to eceive 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 top soil. The planting of grass is to be carried out in continuous root planting in rows 200 mm 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 top soil as before described. Turfing of banks is to be carried out with 25 mm thick maximum 500 x 1000mm weed-free grass sods, of grass as before described, and as approved by the Director. 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 250 mm 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 500 x 1 000 x 25 mm 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 Director. The fitting, tampering, 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 400kg 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 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 respreading of top soil.
A sample of the existing to p soil or the top soil to be respread 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 Provincial Works Branch and the cost thereof is

included in a Provisional Sum elsewhere in these Bills of Quantities. The application of this treatment is to be undertaken by the Contrador and his rates for grassing, etc., must include for same.

Weed killer: - "Weedmaster Turfmaster" 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 p lace during wet weather. Weather conditions should be such as to allow a minimum of two hours for 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 for 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 Director.
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 the grassed or 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 Provincial Works Branch.
Note: - All stages of grass planting and turfing are to be supervised on a full time basis by a competent person with the necessary knowledge and experience.It shall be the responsibility of the Contractor to advise the Director 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 Director shall have the right to instruct the Contractor to repeat the operation at his own expense.

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 SABS 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 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 SABS Specification 1200 G refers. All references to the Engineer shall be deemed to mean the Director.

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 SABS Specification 471.
- Portland blast-furnace cement to SABS Specification 626.
- Portland cement 15 to SABS, Specification 831.

Nevertheless, no cement other than ordinary Portland cement shall be used without the approval of the Director. Cement containing more than 15 % blast-furnace slag will not be permitted in columns nor in members less than 50 mm thick.
In addition (for the above mentioned items) where Ordinary Portland cement is used, blast-furnace slag (from separate containers) may 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 Director, 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 Director.

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 Director, 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 SABS 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 Director. The onus for proof of satisfaction to the Director 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 SABS Specification 920.
(b) Type C Class 2 hot rolled high yield stress Grade 1 deformed bars to SABS Specification 920.
(c) Type D Grade 1 cold worked deformed bars to SABS Specification 920.
(d) Welded steel fabric to SABS Specification 1024 manufactured from plain hard -drawn mild steel wire.

A sample reinforcing rod, approximately 600 mm 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 Director.

REINFORCEMENT

Bending - Reinforcing bars shall be cut and bent to the dimensions shown on the working drawings and in accordance with SABS 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 Director, hot bending of bars of diameter at least 32 mm shall be permitted, provided that the bars do not depend for their strength on cold working. When hot bending is app roved, the bars shall be heated slowly to a cherry red heat (not above 840 ^{0}C) and after bending shall be allowed to cool slowly in air. Quenching with water shall not be permitted.

Fixing: - All steel reinforcement shall, at the time of placing of the concrete, be free from loose rust, scale, oil and other coating which might 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 Director, 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 1,25 mm diameter annealed wire or by the use of suitable clips or, if permitted by the Director, by welding in accordance with BS 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 Director.
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 Director 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 Director.

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 Director.

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

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

FORMWORK

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 Director, 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 2 mm per metre of span, all to the approval of the Director 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 isnecessary 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 Director 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 Director 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 form work 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 Director 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 Director 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 Director.
Formwork shall be removed carefully so that shock and damage to the concrete are avoided.

TABLE A – REMOVAL OF FORMWORK (MINIMUM TIMES IN DAYS (24h)

1	2	3	4	5	6	7	8	9	10
Type of structural member or formwork	Type of cement used								
	Portland cement and Portland cement 15			Rapid-hardening Portland cement* and rapid hardening Portland cement 15			Portland blast-furnace cement		
	Weather								
	Hot or normal	Cool	Cold	Hot or normal	Cool	Cold	Hot or normal	Cool	Cold
(a) Beam sides, walls, and unloaded columns	0.75	+	1.5	0.5	+	1	2	+	4
(b) Slabs with props left underneath	4	+	7	2	+	4	6	+	10
(c) Beam soffits with props left underneath, and ribs of a ribbed-floor construction	7	+	12	3	+	5	10	+	17

(d) Slab props including Cantilevers	10	+	17	5	+	9	10	+	17
(e) Beam props including Cantilevers	14	+	21	7	+	12	14	+	21

* Shorter period may be used for sections of thickness 300 mm 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 Director.

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 Director 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 (hirty-five) days before the first concrete is placed, or as otherwise agreed with the Director, the Contractor shall submit samples of the aggre gates which he proposes to use on the works to the Director.

The Contractor, under the supervision of the Director, 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 Director.

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

No structural concrete work shall be poured until trial mix procedure has been properly followed and satisfactory 7 (seven) day compression strengths achieved. (Equivalent 28 (twenty eight) day strength =4/3 x 7 day strength +5 MPa).

Thereafter, the materials, preparation of and method of manufacture of subsequent concrete shall conform accurately to those used in the accepted trial mixes. If materials vary in the course of the Contract from the samples first submitted, the Contractor shall, on the instructions of the Director, 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 SABS 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	26,5	
50/19		19,0	
45/26	45	26,5	
45/19		19,0	
40/26	40	26,5	
40/19		19,0	
35/26	35	26,5	
35/19		19,0	
30/37	30	37,5	
30/26		26,5	mechanical
30/19		19,0	(see clause
30/13		13,2	"Compaction")
25/37	25	37,5	
25/26		26,5	
25/19		19,0	

25/13		13.2	
20/37	20	37,5	
20/26		26,5	
20/19		19,0	
20/13		13,2	
15/37	15	37,5	Non-mechanical (see clause "Compaction")
15/26		26,5	
15/19		19,0	
10/37	10	37,5	
10/26		26,5	
10/19		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 Contractor's expense.
If, in the opinion of the Director, 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 Contractor's 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 25 mm 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	0.43
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 SABS 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 Director
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
	Slump, mm			
Type of construction	Non-mechanical compaction		Mechanical compaction	
	max.	min.	max.	min.
Paving and precast 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 Director. This approval may be withdrawn on 24 (twenty-four) hours notice to the Contractor if at any time it does not conform to the requirements of this Specification. Ready-mixed concrete shall also comply with the requirements of SABS Specification 878. Details of the mix ingredients and tests thereon, the mix designs and relevant tests shall be forwarded to the Director 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 Director, concrete shall not be pumped into its final position.
The Contractor must provide suitable rumways 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 steel reinforcement.
Placing:- Unless otherwise agreed with the Director, the Contractor shall give the Director at least 24 (twenty-four) hours notice of his intention to place concrete and no concrete shall be placed without the prior approval of the Director and without a representative of the Director 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 vertically 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 450 mm 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 500 mm. Vibrators shall be inserted at about 500 mm 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 30 mm of the face of the formwork in the case of formed finishes, nor within 75 mm 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 Director, 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 Director 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 24 h 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 24 h 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 10 mm 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 24 h before the mortar and new concrete are placed.
(d) Construction joints at tops of columns. The procedure for brushing or cleaning speci fied 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 2^0C;
(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 ^{0}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 Director 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 Director.

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 Director. The clear space between any such pipes and the clear distance between such a pipe and any reinforcement shall be at least 25 mm or the maximum size of the coarse aggregate plus 5 mm, whichever is greater. The amount of concrete cover over pipes and fittings shall be at least 25 mm.

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 Director, make good the defect at his own cost, by either removing and replacing the defective concrete, or by patching, all as approved by the Director and to the standard of finish required. No remedial work shall be carried out by the Contractor without the prior approval of the Director.

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 Director.

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 5 m^3 of concrete placed in columns, and from each 30 m^3 or part thereof of concrete placed elsewhere, but in either case, nevertheless at least once a week. A group of at least three 150 mm 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 Director, a grading analysis shall be made for each 40 m^3 of fine aggregate to be used, and for each 75 m^3 of the coarse aggregate to be used. The analysis shall be made by the method given in SABS 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 SABS Method 862 with samples taken in accordance with SABS 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 Director. The Contractor shall arrange with the Authority that copies of the results of all tests are sent direct to the Director.

ACCEPTANCE CRITERIA FOR STRENGTH 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 Director 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.

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 Director, to have the results assessed statistically. In such a case, the average of all the test results of a specific grade 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 Director, and for the account of the Contractor, to determine the acceptability or otherwise of the concrete in that particular part of the structure:

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

Where load tests are, in the opinion of the Director, 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 Director replace or strengthen by approved means (a) each portion that failed or contains concrete that failed, as relevant, and (b) any other portion, irrespective of strength, the functional purpose of which is affected by the portion or concrete referred to in (a) above.

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

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	7	37.5	1	4	8
B	15	19.0	1	3	5
C	20	19.0	1	2.5	3.5

Cement and aggregates shall be mixed by volume and the contents of a 50kg sack of cement shall be taken to be 0,033 m^3
The cement/water ratios and the maximum and minimum slumps for concrete shall be as previously listed in Tables C and D.

The Director 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 Director 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 l9mm aggre gate (1:8 - 19 mm 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 Director.
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 26,5 mm ring from a minimum which passes a 4,75 mm mesh. The finer materi als 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 m^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 those concrete surface finishes developed using formwork and whose standard of finish in each class shall be as described.
The Director 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 Director. 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 Director and to the standard of finish required.
Class Fl Ordinary Finish: - Formwork panels shall be of such quality that upon removal, the concrete istrue and even, free from fins and recesses greater than 5 mm size, honeycombing, large air holes and the like. Bolt holes shall be filled if so required by the Director.

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 panels in a regular pattern approved y the Director. Joints between panels shall be watertight, but the use of sealing tape which will mark 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 Director 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 form work.

Class Ul 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 rescreeding after removing or tamping down the offending aggregate.

Class U2 Wood Float Finish: -The concrete surface shall first be brought to the standard Class Ul 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 w en he floated surface has hardened sufficiently to prevent any more excess fine material from being drawn to the surface, trowelling with a steel trowel. Trowelling 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 5 mm over any 3 m. 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 UI 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 2 mm in 600 mm. 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 refers. Unless otherwise agreed by the Director, Degree of Accuracy I 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.
(e) The construction and stripping of formwork.
(f) The production of samples, test cubes, slump and other tests.

GENERAL

Measurement and Payment - The provisions of 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.
No deductions have been made for pipes not exceeding 200 mm 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 20 m^2 or as may be directed.
The Contractor is to allow in his pricing of the concrete for all construction joints.

Striking off and Curing: - of concrete slabs and surface beds has been measured separately. The rates for all other items of concrete including stairs and landings and concrete blindings, 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 cuttings, splayed edges, intersections, notchings 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, lintols and the like are to include for horsing exceeding 1,5 m and not exceeding 4,5 m high unless otherwise stated in the items. Rates for formwork to soffits of stairs and landings are to include for all necessary horsing.

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

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

Rates for Steel Bar Reinforcement: - are to include for all cutting, bending, hooked ends, wiring together at passing points, hoisting or lowering to the required levels, fixing in accordance with the detail drawings, cover blocks and maintaining in position during placing of concrete. The mass of mild and high yield stress steel bars shall be based on

the values shown in Table EI of SABS 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.

BRICKWORK

SAND: -shall comply with the requirements of SABS Specification 1090, washed where necessary and screened through a 2360 micrometre mesh sieve.

CEMENT -shall be Portland cement of normal setting quality complying with SABS Specification 471 or Portland cement 15 complying with SABS Specification 831. Cement containing more than 15 % blast furnace slag will not be permitted to be used.

LIME: -shall be hydrated lime complying with SABS Specification 523.

WATER:-shall be clean and free from injurious amounts of acids, alkalis, and other organic substances. If so required by the Director, 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-1 of SABS 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 a 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.

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 Director. A group of three 70 x 70 x 70 mm test cubes shall be made from each sample for testing at 28 days age. Each group of 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 Director. An item for the testing of mortar cubes has been provided elsewhere in these Bills of Quantities.

BURNT CLAY COMMON BRICKS: - shall comply with SABS 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 Director 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 Director.

FACING BRICKS, PAVING BRICKS, QUARRY TILES, ETC.: -Facing bricks shall comply with SABS 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 Director.
Special care must be taken to preserve the arrisses and faces of facing bricks, paving bricks, quarry tiles, etc., during transit and handling.

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 galvanised crimped wire wall ties in accordance with SABS Specification 28. The wire ties are to be of sufficient length to allow not less than 75 mm of each end to be built into brickwork, built into every fourth course and spaced at 450 mm 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 the perpends flushed up solid and each course is to be laid on a solid bed of mortar. No false headers are to be used. Whole bricks are to be used except where bats or closers are legitimately required to form bond.

Unless otherwise described one brick walls are taken at a nominal thickness of 230 mm. 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 be built more than 1,2 m 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.

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 SABS Specification 23, of sufficient length to allow not less than 75 mm of 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 SABS Specification 28 with one end embedded 75 mm deep into concrete and other end built into the bri ck joints and spaced not less than seven ties per square metre.

REINFORCED BRICK LINTOLS: - unless otherwise detailed are to be constructed in accordance with N.P.A. Type Drawing.

PRECAST PRESTRESSED CONCRETE LINTOLS: -where specified, are to be of approved manufacture and the Contractor is to provide the Director with a certificate issued by the manufacturer certifying that the lintols are adequate for the purpose in terms of span, loading and number of courses and construction of brickwork above the llintol. 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 recast prestressed concrete lintols 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 crev ices.

CRAMPS: - for timber door frames shall be 1,6 mm thick galvanised hoop iron 32 mm wide with one end turned up 50 mm and twice screwed to stile of frame and built 450 mm 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 330 mm from top and bottom of stile and intermediately at not exceeding 825 mm.

TIES TO WALL PLATES, RAFTERS, ETC.: - shall be 1,6 mm thick galvanised hoop iron 32 mm wide and at least 1 500 mm long with one end turned up and built in not less than ten courses deep into brickwork or embedded in concrete beam or slab and with other end left projecting and wrapped around timber rafter and spiked to timber wall plate. Where ties are embedded in concrete beam or slab they must be wrapped around the bottom steel bar re-inforcement of the beam or slab.

WELDED MESH BRICK REINFORCEMENT: -shall be 55, 80, 155 or 235 mm wide consisting of two 3,55 mm main high tensile steel wires at 50, 75, 150 or 230 mm centres respectively with 2,80 mm high t ensile steel cross wires electrically welded at 300 mm, centres, lapped 150mm,at end joints, 75 mm at angles and built 110 mm 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.

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 6 mm deep formed with a square jointing tool. All pepends 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 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 Director.

PAVING BRICKS AND QUARRY TILES: -unless otherwise described are to be pointed as the work proceeds with 6 mm wide keyed-in joints. Paving bricks and quarry tile pavings, cills, 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 Director.

ASBESTOS CEMENT CILLS: - 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 pavings, 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 cills, 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, cills, 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:

Asbestos Cement Cills: - Rates are to include for all square cutting and 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.

WATERPROOFING

GENERAL :- All measurements are net - 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 Director by skilled and qualified workmen and in accordance with the methods prescribed in SABS 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 which may damage the waterproofing materials being used.

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

MASTIC ASPHALT ROOFING:- is to conform to SABS Specification 297 and is to be laid hot in two or three layers, as stated, with each layer of minimum 10 mm 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 10^0 slope is to be laid in two layers on and including one layer of approved reinforced waterproof building paper lapped 75 mm at all edges. Rates are to include for all cutting and waste on building paper.
Mastic asphalt to surfaces exceeding 10^0 and not exceeding 20^0 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 20^0 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 300 mm 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.
Angle 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 Director 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 450 g/m^2, 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 1,8 kg/m^2.

Chopped strand glass-fibre mat reinforcement is to comply with the requirements of SABS Specification 419.
All unsaturated polyester resins are to be suitable for their intended use and comply with SABS Specification 713 and are to be ultra-violet ray stabilised.
All flexible glass-fibre reinforced polyster 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 Director 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 SABS Specification 110. Type 2, well compacted into joint and neatly pointed.
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 instructi ons.

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 10 degrees from the horizontal.

ROOF COVERINGS

"MARSEILLES" PATTERN CLAY ROOFING TILES: - shall conform to SABS Specification 632. The tiles are to be of the colour specified and are to be even in thickness, uniform in shape and colour and free from cracks and blemishes. The tiles are to be laid to "broken bond" 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, tiles in every course on each side of hips and valleys and all half and full tiles at verges shall be secured with 1,60 mm copper wire passed through catch holes in ribs and wound around the battens or wound around copper clout headed nails driven into battens. Where catch 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 have spigoted and socketed ends and are to be bedded, jointed, pointed and torched up over top of roofing tiles in 1:3 cement mortar tinted to match the tiles. Each tile of hip capping and every fourth tile of ridge cappings is to be drilled for and secured with copper clout headed nails.

CONCRETE ROOFING TILES: - shall conform to SABS Specification. *542.* The tiles are to be of pattern and colour specified and are 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 SABS 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 SABS 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 torched
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 bargeboards or bearers (elsewhere measured).

RATES:-for roof tiling are to include for all necessary half tiles at verges and for all square cutting and waste at verges, abutments, top and bottom edges and to both sides of ridges.
Rates for cappings, etc., are to include for all short lengths, cutting and waste and fitting at intersections.
All measurements are net. No allowance has been made for laps.

CARPENTRY AND JOINERY

NOMENCLATURE OF TIMBERS: -Timber described as "softwood" is to be South African soft wood of the relevant type, grade, etc., specified.
The names used for imported timbers are those given in Supplement No.1 to SABS Code of Practice 02 under "Nomenclature of Standard Trade Names of Imported Commercial Timbers used in South Africa" and the Co ntractor 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 4 mm for each wrot face off the sizes shown has been made.
Doors, fanlights, 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 10 mm.
Tolerances in nominal dimensions for imported timber shall not exceed the following: -

(a) For nominal dimensions up to 76 mm the actual dimension may be 2,5 mm under for each 25mm
(b) For nominal dimensions 76 mm and over the actual dimension may be 1,6 mm under for each 25 mm.

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 Con tractor will be held responsible for any delay in delivery.

PRETREATMENT OF TIMBERS: - All permanent timbers installed in the building are to be treated against borer, cryptotermes, termites, and all wood-destroying agencies with an approved preventative, all in accordance with SABS 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 Director has the right to remove samples of the treated timber to have testscarried 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 timer 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 disco loured by the pretreatment must be replaced by the Contractor at his own expense, if so directed by the Director.

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

STRUCTURAL TIMBER: - for carpentry is to be South African softwood in accordance with SABS 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 regraded and stamped with the respective SABS 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 AND BATTENS: - of cross-sectional size 50 x 50 mm and under shall be South African softwood in accordance with SABS Specification 653 and branded accordingly.

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

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 Director.
Adhesives used must meet the requirements of the current BS 1204 for external use
The surface appearance of members shall be Class C (Constructional) or Class S (Selected) as defined in SABS Specification 876 and as stated in the items.

FINGER-JOINTED TIMBERS: - are to be manufactured in accordance with SABS Code of Practice 096-"The manufacture of finger-jointed structural timber".

Contractors wishing to use finger-jointed timber must supply a guarantee that the fingerjointing 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 76 mm 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 900 mm 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 points of support.

HARDWOODS: - (Red Meranti and Sapele) are to be best quality, specially selected and well seasoned, free from all sapwood to the approval of the Director 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 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 System Engineer) strictly in accordance with SABS Code of Practice 0163 for the Design of Timber Structures.
Wind and superimposed loadings are to comply with SABS 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 Director 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 fom 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 stresse s, as well as timber sizes and grades and detailed plate sizes and positions.

(b) BRACING: Bracing must be designed to withstand the forces specified in SABS Code of Practice 0163 clauses 6 and 7.
If the bracing 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 Director 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 Director. It will be the Contractor's responsibility to ensure that information is presented to the Director 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 Director, 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 Direct or. 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 galvanised metal spike connectors applied simultaneously to both sides of every joint by use of a mechanical press in accordance with SABS

Code of Practice 0163.
Permissible deviations in fabrication of trusses are to be as specified in SABS Code of Practice 0155.
The following will not be permitted at joints: -

a) knots, splits or finger joints,
b) varying member thicknesses,
c) plates not fully pressed into timber,
d) gaps between members exceeding 1,5 mm 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 in 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 Ltd. and the National Timber Research Institute-CSIR.
Where the overall length of trusses exceeds 13 m, complete braced bays are to be assembled on level ground and lifted into position suspended at maximum 3 m 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 Director 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 Director 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.

CORRUGATED ASBESTOS CEMENT ROOFING, CLADDING AND FITTINGS:-are to be of an approved brand conforming to SABS Specification *685*.
Roofing, etc., shall be lapped half a corrugation at sides and 300 mm at ends, unless other-wise specified. Roofing, etc., shall be fixed to timber purlins, rails, etc., unless other specified, with standard galvanised drive screws 120 mm long and to steel purlins, rails, etc., with 8 mm galvanised hook bolts of the lengths stated. Each fixing screw or bolt shall be fitted with washers as recommended by the roofing manufacturer and shall be spaced not less than two screws or bolts to the width of each sheet to each purlin or rail.
Rates for roofing, cladding and fittings are to include for: -

a) Fixing as described and in accordance with the manufacturer's instructions.
b) Bedding washers in an approved mastic sealing compound.
c) Coating projecting ends of hook bolts and nutswith bitumen after fixing.
d) All square notches, square cutting and waste, laps, fitting, mitring and drilling. No punched holes will be permitted.

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

CORRUGATED IRON ROOFING, CLADDING AND FITTINGS: - are to be of an approved brand and are to be manufactured from galvanised steel sheets of the thickness specified after galvanising and having a galvanised coating of "Iscor Coating Designation Z275" for inland areas and "Z600" for coastal areas as specified.
Roofing, etc., shall be lapped one and a half corrugations at sides and 300 mm at ends, unless otherwise specified.
Roofing, etc., shall be fixed to timber purlins, rails, etc., with standard galvanised drive screws 65 mm long and to steel purlins, etc., with 8 mm galvanised 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 net. No allowance has been made for laps.

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

(a) Galvanised steel sheets and fittings: - are to be manufactured from galvanised steel having a galvanised coating of "Iscor Coating Designation Z275" for inland areas and of "Z600" for coastal areas as specified, with the sheets having a plain galvanised finish and the fittings an embossed galvanised finish
Roofing, etc., shall be fixed to timber purlins, rails, etc., with standard drive screws of the lengths stated and to steel purlins, rails, etc., with 8 mm galvanised 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 galvanised drive screws 50 mm long and to steel rails with 6 mm diameter x 25 mm long galvanised 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 galvanised steel sheets and fittings: - are to be manufactured from unpassivated galvanised steel having a galvanised coating of "Iscor Coating Designation Z275", and finished, where described in the items, with approved factory applied baked enamel finish of colours to be selected by the Director.
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 8 mm 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 50 mm long and to steel rails with 6 mm diameter x 25 mm 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 12 m these have been measured separately.
Roofing, etc., shall be lapped one flute at sides and 230 mm at ends unless otherwise specified.
Fixings to 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 every alternate trough to each rail.
Fittings, unless otherwise specified, are to be lapped a minimum of 150 mm 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 450 mm centres with 6 mm diameter x 25 mm long sheet bolts or with 20 mm 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 340 mm centres
(d) Sealing side and end laps of sheeting and end laps of fittings with one continuous strip of approved 5 mm diameter preformed 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 net. No allowance has been made for laps.

FLUTED ALUMINIUM ROOFING, CLADDING AND FITTINGS: - are to be approved mill finish aluminium sheeting and fittings conforming to SABS Specification 903.
The sheeting is to be manufactured from 3103-R8 aluminium and the fittings from 1200-H4 aluminium, unless otherwise specified, and of the thickness specified.
Roofing, etc., shall be fixed to timber purlins, rails, etc., with aluminium drive screws 90 mm long and to steel purlins, rails, etc., with 8 mm diameter aluminium hook bolts of the lengths stated. Each screw or bolt is to 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 aluminium drive screws 50 mm long and to steel rails with 6 mm diameter x 25 mm long aluminium 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.
Where sheet lengths are in excess of 12,5 m these have been measured separately.
Roofing, etc., shall be lapped one flute at sides and 230 mm at end ,
Fixings unless otherwise specified. to roofing sheets are to be spaced one every crest along purlins at to and bottom edges of roof slopes and one to every alternate crest along every intermediate purlin. Fixings to vertical cladding are to be spaced one to every alternate trough to each rail.
Fittings, unless otherwise specified, are to be lapped a 'minimum of 150 mm 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) Painting both surfaces of all laps with one coat of approved bituminous aluminium paint.
(c) Seam bolting side laps at not exceeding 450 mm centres with 6 mm diameter x 20 mm long aluminium sheet bolts or with 20 mm X No.14 aluminium self-tapping screws. Each bolt or screw shall be fitted with washers as recommended by the manufacturer of the roofing.
(d) Fixing of fittings where described as fastened to roofing, cladding, etc., with sheet bolts or self-tapping screws as above described and spaced at not more than 250 mm centres.
(e) Sealing all side and end laps of sheeting and all end laps of fittings with one continuous strip of approved 20x7 mm preformed flexible sealant strip.
(f) All square notches, square cutting and waste, laps, fitting and drilling. No punched holes will be permitted.

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

BOARD AND STRIP FLOORING: - Softwood flooring is to be in accordance with SABS Specification 629 with splayed or end-matched heading joints as specified.

Hardwood flooring is to be in accordance with SABS Specification 281 with splay-type tongues and grooves, unless otherwise specified, with end-matched heading joints.
Flooring is to be stacked on site for at least fourteen days before being fixed and shall be well protected from the weather.
Flooring is to be secret nailed to joints with cut flooring brads, and splay-type heading joints are to occur over points of support. All heading joints are to be well staggered and flooring is to be neatly fitted against adjoining floors, thresholds, etc., all in accordance with SABS Code of Practice 043.
Rates for flooring are to include for cleaning down to a smooth even surface with a sand- p ape ring machine and all square notches, square cutting and waste and, unless otherwise specified, sealing with a coat of approved wax polish well rubbed in.

INSULATION MATERIAL FOR CEILINGS: - shall be resin bonded glass wool or mineral wool thermal insulation blanket complying with SABS Specification 1381 of the thickness specified, delivered to the site in unopened rolls in its original factory wrappings.

INSULATION, WATERPROOFING AND DUSTPROOFING MATERIAL FOR ROOFS:-shall be an approved aluminium foil faced both sides laminated kraft paper and synthetic reinforced material fixed in accordance with the manufacturer's instructions, lapped 150 mm at all edges unless otherwise specified.

GYPSUM PLASTERBOARD: - is to be in accordance with SABS Specification 266.

GYPSUM COVED CORNICES: - are to be in accordance with SABS Specification 622.

ASBESTOS CEMENT SHEETS: - are to be in accordance with SABS Specification *685.*

ASBESTOS CEMENT CELLULOSE SHEETS: - are to be in accordance with SABS Specification 803.

HARDBOARD: - is to be in accordance with SABS Specification 540. Tempered and untempered 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, sap wood 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.

UNVENEERED CHIPBOARD: - is to be controlled density composite wood/resin boarding bonded under heat and hydraulic pressure complying with SABS specification 1300.

VENEERED CHIPBOARD: - is to be long grain three-ply boarding with controlled density composite wood/resin chipboard core 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.

BATTENBOARDING:- is to be long grain three-ply boarding manufactured with kiln-dried South African softwood core formed of laminations not exceeding 45 mm 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.

BLOCKBOARD: - is to be long grain five-ply boarding manufactured with kiln-dried South African softwood core

formed of laminations not exceeding 35 mm wide crossbanded on both sides with hardwood veneers and faced on both sides with selected face veneers as described; bonded under beat and hydraulic pressure with water-resistant synthetic resin adhesive and sanded to a smooth finish.

DECORATIVE LAMINATE LININGS: - are to be 1,2 mm 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 notchings, 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 to 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 SABS Specification 820. Mild steel and brass screws are to be round headed, countersunk, etc., as appropriate and are to be in accordance with SABS 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, etc.

CARPENTRY: - Timbers are to be the best of their respective kinds, free from sap, shakes, large, loose or dead knots, wany 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 birdsmouth cutting, housing, halving, scarfing, cutting timbers to the required lengths, spiking and clinching and for 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.

FLUSH PLASTERED CEILINGS: - are to be formed of gypsum plaster board of the thickness stated, generally in 1200 mm widths and long lengths, fixed grey side down to timber brandering, bearers, etc., as described, with butted joints between the boards covered with 65 mm wide strips of galvanised 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 hemihydrate gypsum plaster applied in accordance with the manufacturer's instructions to a finished thickness of not less than 6 mm, including pressing into scrim over joints and finished to a smooth polished surface.

SUSPENDED CEILINGS: - are to be of the types described 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 galvanised and are to be at suitable 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 galvanised fixing cleat fixed to the structure. Fixing points must be agreed to by the Director before any power shot fixings are made. Hangers must not be suspended from air-conditioning ducts.
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 Director.
Rates for ceilings are to include for hangers, suspension systems, ceiling panels, for con structing 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 Director, 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.
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.

FLUSH DOORS: - Hollow core, semi-solid and solid laminated flush doors are to be of approved manufacture complying with SABS Specification 545.
The doors are to be finished on both sides 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 B S 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.

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 mortice 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 arris rounded unless specified to be angle rounded.
"Arris rounded" denotes that the sharp edges are slightly rounded off and that no mitring is required.
"Angle rounded" denotes rounded from 3 mm to 10 mm 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 wit tongued and grooved battens are to have the tongues and grooves well sealed before assembling. The sealer used shall be compatible with the finish ing 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 carcase 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 re placed by new joinery at the Contractor's expense.
Only brass screws may be used for hardwood joinery.
The Contractor is to allow for cross-tongueing all solid wood sections unobtainable in single widths.
No joinery is to be primed until it has been inspected and approved by the Director.
All joinery liable to injury must be protected to the satisfaction of the Director. 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.

DEMOUNTABLE PARTITIONS: - 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 1200 mm 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.
Intermediate posts are to be fitted with vinyl feature strips of approved colour.
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 rails and end posts are to be fitted with continuous removable access plates.
Solid panelling is to be approved solid chipcore 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.
Louvre panels where specified are to be approved natural finish anodised aluminium adjustable louvre sets each comprising head and cill weather bars and two jamb strips each fitted with louvre brackets with spring loaded clips for and fitted with and including louvres 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 louvre blades an alternate head weather bar must be provided to suit a fixed louvre blade of the required width. The louvre sets are to be fitted with the jamb strips positioned horizontally so that the louvres will be fixed vertically.
Partitions are to be in 1 200mm modules, unless otherwise specified, except at ends where the odd lengths are to be made up by a narrow panel 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 SABS 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 25 mm 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 102 mm 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 mortice locks used elsewhere in the Contract.
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.
All work is to be executed by a firm specialising in this type of work and all to the approval of the Director.

FLOOR COVERINGS, PLASTIC LININGS, ETC.

HARDWOOD BLOCK FLOORING:- is to comply with SABS Specification 281.

WOOD MOSAIC FLOORING: -is to comply with SABS Specification 928.

FLOOR TILES AND 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 Director.

Thermoplastic floor tiles: - with a bituminous or resinous binder are to comply with SABS Specification 586.

Semi-flexible vinyl asbestos floor tiles or sheeting: - are to comply with SABS Specification 581. **Fully-flexible vinyl floor tiles or sheeting:** - are to comply with SABS Specification 786.

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

ANTI-STATIC WELDED VINYL TILE FLOORING: - is to be of an approved manufacture and of the size and thickness specified with colour, pattern, graining, etc., consistent throughout all to the approval of the Director, and is to be laid with the joints welded together to form a seamless floor, impervious to water. The tiles are to be sealed down with an approved conduc tive adhesive all in accordance with the manufacturer's instructions.

Anti-static welded tile flooring is to be laid by specialists to the approval of the Director, and is to conform to SABS Code of Practice 051 for the Prevention of Explosive and Electrical Hazards in Hospitals.

The Contractor is to carry out tests on all anti-static floors at completion to ensure that the resistance of the flooring conforms to SABS Code of Practice 051. Should the floor not comply with the Code of Practice the Contractor will be required to make the necessary rectification at his own expense to ensure compliance.

In this connection the Contractor is advised to allow for laying a sample panel size approxi mately 1 800 >< 1 800 mm where directed, for testing, on site prior to the laying of floors.

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 Director.

LAYING:- All floor coverings, wall linings, etc., are to be laid by workmen experienced in laying the particular type of floor covering, wall lining, etc., in strict accordance with the instructions issued by the manufacturer of the materials being used and to the approval of the Director.

All adhesives used must be the correct adhesives as supplied or recommended by the manufacturer of the material being used.

The floor coverings, wall linings, etc., are, except where otherwise specified, to be laid on cement screeds or plaster backings, All cement screeds and plaster or other backings have been measured elsewhere.

Tiles are to be laid with close butt joints and to approved patterns with no cut tiles less than half a tile wide and tiles are to be fully bonded to the backing surfaces.

Sheeting is to be cut to fit the areas accurately and neatly and is to be so disposed as to have a minimum number of seams set out to the approval of the Director and all seams are to be perfectly tight and practically invisible. No piecing of short ends will be allowed. The sheeting is to be fully bonded to the backing surfaces and is to be rolled as necessary to remove all air bubbles and to ensure completion adhesion.

Welded sheet flooring or wall linings are to have the seams welded together by approved process to form a seamless floor or lining.

Patterned sheet flooring or wall linings are to be matched at joints.

Vinyl skirtings, stair nosings, edging strips, etc. are to be fully bonded to the backing surfaces.

Wood block and wood mosaic flooring is to be laid in accordance with SABS Code of Practice 043.

CLEANING, ETC. - All floor coverings are to be cleaned down to the approval of the Director. Cleaning of thermoplastic, vinyl and similar floor coverings shall, unless otherwise stated, be done with an approved waterbound floor stripper in order to achieve a standard of cleanliness acceptable to the Administration. Any foreign matter such as paint, stain, tar, etc., which may not respond satisfactorily to the cleaning process shall be removed by means of a scraper, steel wool, etc.

Wood block and wood mosaic finishes are to be sanded to a smooth even surface with a sandpapering machine, sealed with one coat of penetrating sealer and finished with a coat of approved wax polish well rubbed in.

METALLISED FLOOR DRESSING: - where specified, vinyl sheet flooring and floor tiles shall be cleaned down with an approved water-based floor stripper, and finished with two coats of an approved sealer and two coats of an approved metallised floor dressing applied in accordance with the manufacturer's instructions.

RATES: for all floor coverings are to include for laying as described, for cleaning down backing surfaces before laying and for all square and raking cutting and waste and fitting, fair cutting at edges where no skirtings occur, protecting from injury, and for cleaning down, etc., as described, at completion.

Rates for all wall finings 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 300 mm 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 for this.
Rates for skirtings, stair nosings, edging strips, etc., are to include for fixing as described, cutting to lengths, fitting at intersections, mitres, ends, etc., and for cleaning down at completion.

IRONMONGERY

Ironmongery is to be to the approval of the Director and rates are to include for fixing with 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 mortice locks are to be used.
Mortice locks, cylinder locks, cupboard locks, etc., are to differ so that no key will pass a second lock, unless otherwise specified.
Where mortice locks, cylinder 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 key 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 chromium plated or satin chrome finish are, unless otherwise specified, to be chromium plated or satin chrome finish on solid brass.
Items of ironmongery specified as 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 morticing and drilling required and receive all information necessary regarding ironmongery. Preparation of steel door frames for ironmongery has been measured elsewhere.
Where items 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 40 mm diameter x 3 mm 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 5 mm 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 headed brass screws. Unless otherwise described, the signs are to be 50 mm high with 30 mm high engraved letters or numerals and are to allow a minimum margin of 25 mm at both ends. All signs are to be equal to sample to be submitted to and approved by the Director.
Pictorial plastic signs are to be of 5 mm 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 for and fixed to soft wood 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 Director.

STRUCTURAL STEELWORK

GENERALLY: -The fabrication, assembly and erection of structural steelwork is to be executed in accordance with SABS 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 to be the project specification and are the "Portion 2" referred to in Clause 2.2.

DEFINITIONS:-Clause 2.3 of SABS Specification 1200H refers. All references to the Engineer shall be deemed to mean the Director.

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 dra wings 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 BS 4360.
b) Hollow sections to BS 4848 Part 2 and BS 6323.
c) Cold rolled sections to BS 2994.
d) Black bolts and nuts to SABS 135.
e) Precision bolts and nuts to SABS 136.
f) High-strength friction-grip bolts and nuts to SABS 1282.
g) Flat and tapered washers to SABS 1149.
h) Electrodes for welding to SABS 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 SABS 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 Director 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 Director. 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 ceilings, airconditioning ducts, pipe installations, etc., to the structural steelwork are to be approved by the Director before work on such installations commences.

FABRICATION, ASSEMBLY AND ERECTION

Welding: - shall be carried out in accordance with SABS Code of Practice 044 and the relevant recommendations of SABS Code of Practice 0162 and BS 5135, and in any case of conflict, the SABS 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 SABS Code of Practice 044. Should the Director so request, proof of the classification shall be produced.

Unless otherwise specified all welds are to be continuous fillet welds of 6 mm 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 Director 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 Director, 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 Director.

INSPECTION AND TESTING

Facility for Inspection: - The Contractor shall afford to the Director 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 Director.

Cost of Tests: - The cost of all tests required by the Director 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 Director the Contractor shall also demonstrate by means of tests at his own cost that all like members meet the requirements of the Specification.

PRIMING OF STRUCTURAL STEELWORK

General

(a) Painting conditions.

No painting shall be undertaken when one or more of the following conditions exist: -

i) the atmospheric or steel temperature is below 10 °C,
ii) the atmospheric or steel temperature is expected to fall below 7 °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 undried 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 trade mark, date of manufacture and the relevant SABS 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 require d 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 SABS 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 SABS 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 2.5 to give minimum peak to valley profile of 50 micrometres when measured by SABS 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 micrometres 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 2.5 to give maximum peak to valley profile of 50 micrometres when measured by SABS 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

micrometres 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 of 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, fitting, assembling, welding and filing smooth, preparation and priming coats as specified, and for hoisting, temporary bracing, and fixing in position.

METALWORK

PROPRIETARY MATERIALS:-Where proprietary materials are specified, the materials used are to be of the type specified or other approved by the Director.

RATES:-For all metalwork, unless otherwise stated, are to include for 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.

WELDING AND BRAZING: -Where items are described as welded or brazed, rates must include for neatly 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 galvanised mild steel pipe members are to be "medium" pipes complying with BS 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 galvanised, are to be cleaned in accordance with SABS 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 accord ance with SABS Specification 909 prior to despatch from the works.

GALVANISING OF STEELWORK:- All steel surfaces described to be galvanised are to be thoroughly sand, grit or steel shot blasted to white metal in accordance with SABS Code of Practice 064 and fluxed ready for galvanising, and the completed unit is to be hot dip galvanised after fabrication in accordance with SABS 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 galvanised to the approval of the Director.

If requested by the Director, 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 6 mm, by means of wire, to an article being galvanised, and subjecting the test piece to the same cleaning, fluxing and galvanising treatment as the article being galvanised, 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 SABS 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 to and approved by the Director.

PRESSED STEEL DOOR FRAMES: - shall be manufactured from mild steel sheet 1,60 mm thick for single rebated frames and 1,20 mm thick for double rebated frames. Rebates shall be suitable for 42 mm 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 1,6Omm 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 230 mm 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 chromoate priming coat in accordance with SABS Specification 909 before leaving the manufacturer's works, unless specified to be hot dip galvanised, and rates are to include for touching up where necessary with similar primer after building in.
Where frames are specified to be galvanised they are to be hot dip galvanised after manufacture in accordance with the relevant provisions of SABS 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 100 mm five-knuckle loose pin steel hinges, unless otherwise specified for each door or each leaf of double door and with one pair of 75 mm 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 100 mm double bronze washered brass butts for each door or leaf of double door, unless otherwise described, and one pair of 75 mm brass butts for each fanlight, with one leaf of each butt secured to the frame or transom by means of 6 mm diameter, countersunk headed brass set screws screwed to and including a 3 mm 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 100 mm 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 6 mm diameter countersunk headed stainless steel set screws screwed to and including a 3 mm 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 6 mm 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 for all items of ironmongery, other than butts, has been measured separately and the rates against these items are to include for all drilling, morticing, 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 are 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 m high above finished floor.
Door and fanlight sizes are given to the nearest 10mm. The building in of frames has been measured separately.

PRESSED STEEL CUPBOARD DOOR FRAMES:- shall be manufactured from 1,20 mm thick mild steel sheet standard sections, having rebates for 42 mm thick doors, and fitted with transoms and/or mullions where required and with cill section allowing the cupboard doors to be taken down to general floor level with the floor level inside cupboards not less than 12 mm above general floor level. The frames are to be 102 mm 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 1,60 mm thick steel angle sections. Transoms, mullions and cills 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 cill 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 SABS Specification 909 before leaving the manufacturer's works, unless specified to be hot dip galvanised, and rates are to include for touching up where necessary with similar primer after building in.
Where frames are specified to be galvanised they are to be hot dip galvanised after manufacture in accordance with the relevant provisions of SABS Specification 763 for general applications on the relative thicknesses of metal.
Frames are to be fitted with one pair of 100 mm five-knuckle loose pin steel hinges for each lower door or each leaf of lower double door and with one pair of 75 mm 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 10 mm. Building in of the frames has been measured separately.

STEEL WINDOWS AND DOORS:- shall be in accordance with SABS 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 90^0, horizontally pivot hung sashes to at least 80^0. and bottom hung sashes to 30^0. 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 and doors 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 sections shall be constructed of standard 25 mm steel sections and of metal not less than 3 mm thick.

Stock and purpose made. industrial type steel windows shall be constructed with main frames of standard 35 mm steel sections and of metal not less than 3 mm thick and with sashes of standard 25 mm steel sections and of metal not less than 3 mm thick.
"Universal" sections, where specified, shall be not less than 33 mm wide (measured over one opening section only) and of metal not less than 4 mm 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 1,60 mm mild steel sheet fixed with metal beads. Frames of outward opening doors shall be fitted with bottom cills of door framing section (stepped cills) and of inward opening doors with metal ties welded to frames for embedding in threshold flush cills)

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 longarm 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 longarm 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 mortice lockset 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 Louvre Sets: - are to be natural anodised aluminium louvre sets of approved manufacture consisting of head and cill weather strips complete with neoprene gaskets and two jamb strips each fitted with louvre brackets with springloaded clips for the specified width of glass louvre blades complete with tilt bars and operating lever handles. Where openings are not of a height to suit standard width louvre blades an alternate head section with static clips must be provided to take a fixed louvre blade of the required width. The louvre sets are to be screwed to the steel window frame with stainless steel self-tapping screws and all portions of the louvre 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 5 mm 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.

Flyscreens: - are to be standard type flyscreens suitable for residential opening-out type steel windows, unless otherwise described, and are to be constructed of stove enamelled pressed steel frames fitted with 0,25 mm thick mosquito-proof mesh glass-fibre gauze. The flyscreens 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 SABS Specification 909 before leaving the manufacturer's works, unless specified to be hot dip galvanised, 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 galvanised they are to be hot dip galvanised in accordance with the relevant provisions of SABS 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 over hauled 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 10 mm. 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 Director.
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 arris rounded and all internal angles are to be radiussed.
All stainless steel work is to be of the highest quality and executed by specialists in this type of workand to the approval of the Director.

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 BS 1476, extruded tube and hollow sections with the relevant clauses of BS 1474, and sheet and strips with the relevant clauses of BS 1470. All alloys to be anodised are to be of anodising quality.
All aluminium is to be free from flaws, hammer marks, die markings and other imperfections.
Anodising of aluminium is to be carried out in accordance with SABS Specification 999. by an approved process.
The average anodic film thickness shall be 25 micrometres, and at no point should the anodic film thickness fall below 22 micrometres or be thicker than 30 micrometres.
Prior to anodising, all surfaces are to be de-greased and cleaned, all irregularities removed and finished off smooth and buffed where necessary.
All anodised aluminium must be coated with a suitable "non-yellowing" methcrylate lacquer film, approved by the Director, over the entire surface. The lacquer film must be continuous and of a uniform average thickness not less than 10 micrometres. 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 Director 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 SABS Specification 999. If required, tests on the anodic film are to be carried out at the works of the anodiser to verify that the work conforms with SABS 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 B51476/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 Director 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 satisfactory 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 Director. 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 33 mm over one opening section and not less than 4 mm thick through the flanges and not less than 4,75 mm 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 Director.
Welds are to be electrically flash butt resistance welded, properly ground and cleaned off to give a uniform appearance.
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 cills 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 750 mm apart intermediately each side of frame. Frames more than 900 mm wide are to be provided with similar fixings to top and bottom and not more than 750 mm 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 25 x 115 mm in section manufactured from 3 mm thick aluminium.

The Contractor must submit drawings showing details of sections he proposes to use and these drawings are to be approved by the Director 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 weatherproof 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 longarm 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 cill 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 longarm or hand 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 lockset 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 Louvre Sets: - are to be approved anodised aluminium adjustable louvre sets consisting of head and

cill weather strips fitted with neoprene gaskets and two jamb strips each fitted with louvre brackets with sping loaded clips for the specified width of glass louvre blades and complete with tilt bars and operating lever handles. Where the openings are not of a height to suit standard width louvre blades an alternate head section with static clips must be provided to take a fixed louvre blade of the required width. The louvre sets are to be tap screwed to the window frame with stainless steel selfdapping screws.

Burglar Bars: - are to be standard type burglar bars formed of 20 x 5 mm 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 Director that the tape he proposes to use can be easily stripped after long exposure to sunlight, and rates are to include for 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 Director.
All glass and glazing has been elsewhere measured. All sashes and openings, unless othewise 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 permitted) 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 10 mm.

BURGLAR-RESISTING SAFES:-must comply in all respects with SABS Specification 751. The safes shall be "Office Safe, Category 1" as laid down in SABS 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 12 mm 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 keysfor any safe must be forwarded by the supplier under registered cover direct to the Director, and the supplier must clearly indicate the institution in which the safe (or safes) is being installed.

RIFLE SAFES:-must comply in all respect with SABS Specifcation 751 Category 1. Each safe is to be provided internally with one removable shelf and racking for twelve "BSA *12/15"* or similar target rifles. Each safe is to be fixed in position with and including two steel bolts cut and pinned to brickwork and two steel bolts grouted into and including mortices in concrete floor. Each safe is to be provided with two keys and the keys must be forwarded by the supplier under registered cover direct to the Director, and the supplier must clearly indicate the institution in which the safe (or safes) is being installed.

RECORDS ROOM DOORS:-must comply in all respects with SABS 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 Director, and the supplier. must clearly indicate the institution in which the door (or doors) is being installed.

STRONGROOM DOORS FOR SCHOOL CADET ARMOURIES:- must comply in all respects with SABS Specification 949 Category 2. Each door is to be provided with two keys and the keys must be forwarded by the supplier under registered cover direct to the Director, and the supplier must clearly indicate the institution in which the door (or doors) is being installed.

VITREOUS ENAMELLED CHALKBOARDS: - are to be formed with approved vitreous enamelled steel panels with flanged edges and non-glaring permanent olive green finish complete with fixing lugs and approved vitreous enamelled or extruded aluminium chalk rail.
Rates are to include for hanging the panels to fixing lugs spaced at approximately 450 mm centres and for securing fixing lugs and chalk rails to brickwork with special screws and plastic plugging compound as supplied by the. manufacturer of the panels, drilling mortices for wall plugs, rounding off front corners of each end of chalk rail to 25 mm radius, protecting from injury and cleaning down at completion, all in strict accordance with the manufacturer's instructions.

ADJUSTABLE LOUVRE GEAR SETS: - are to be approved natural anodised aluminium adjustable louvre sets consisting of head and cill weather strips fitted with neoprene gaskets and two jamb strips and fitted with louvre brackets with spring loaded clips for the specified width of glass louvre blades and complete with tilt bars and operating lever handles. Where the openings are not of a height to suit standard width louvre blades an alternate head section with static clips must be provided to take a fixed louvre blade of the required width.
Rates are to include for fixing in accordance with the manufacturer's instructions, for screwing head and cill weather strips and jamb strips with stainless steel screws to frames (elsewhere measured) and for oiling and easing at completion.

PLASTERING

MATERIALS

Stone Chippings: - are to be approved clean stone chippings of the sizes stated complying with SABS Specification 1083.

River Sand: -for floor finishes and screeds is to be clean, sharp, coarses and free from all impurities, washed if so directed and complying with SABS Specification 1090.

Plaster Sand: - is to be clean, sharp, free from all impurities, washed if so directed and is to comply with SABS Specification 1090.

Cement:-unless otherwise specified is to be Portland cement of normal setting quality, is to comply with SABS 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 SABS 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, SCREEDSAND 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 Director.

FLOOR SCREEDS, ETC.: -Cement screeds are to consist of one part cement and three parts sand, unless otherwise described, and are to be steel trawled, unless otherwise stated, to true smooth and even surfaces, free from tool marks to the satisfaction of the Director to receive the finishes stated in the items.

GRANOLITHIC FINISH TO CONCRETE FLOORS, ETC.: -Float up to within 6mm of finished surface with layers of concrete approximately 10 mm thick, composed of one part cement, two and a half parts concrete sand 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 particles which will pass a 6 mm 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 exceeding 6 m^2 in area or as shown on drawings or described in the Bills of Quantities.
Thin strips of wood or other suitable materials are to be laid between panels to break contact.
Where granolithic is described to be tinted, the requisite quantity of oxide of iron or other colouring materials is to be mixed with the finishing thickness.
Where granolithic is described to be green tinted, the requisite quantity of green magnesite and cement black is to be mixed with the finishing thickness.
All granolithic floors', etc., are to be covered up and protected from injury and discoloration 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.

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 Director.
No distinction has been made for brick or concrete surfaces.

Cement plaster

External cement plaster to walls is to consist of 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 of one part cement and three parts sand.
One coat cement plaster to walls shall not be less than 13 mm or more than 16 mm in thickness, and one coat cement plaster to ceilings shall not be less than 10 mm or more than 13 mm in thickness, unless otherwise described.
Where plaster is described as undecorated, the same type of approved sand and 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 13 mm thick consisting of one part cement and five parts sand, and the second coat 6 mm thick consisting of one part cement and five parts Barium Sulphate.
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, pavings, 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 50 mm 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 50 mm girth.
Rates for rounded angles, fair edges and arisses 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 500 mm wide, narrow widths not exceeding 500 mm 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.

TILING

MATERIALS

River Sand:- is to be clean, sharp, coarse sand, free from all impurities, washed if so directed and complying with SABS Specification 1090.

Plaster Sand: - for wall backings is to be clean, sharp, free from impurities, washed if so directed and complying with SABS Specification 1090.

Cement:-unless otherwise specified, is to be Portland cement of normal setting quality complying with SABS Specification471 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 manufacturer's 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 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 Director.

GLAZED CERAMIC WALL TILES AND FITTINGS: - shall comply with SABS 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 Director 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 Director.
Floor tiles are to be laid with maximum 10 mm wide joints continuous in both directions on and including a 15 mm 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 fiting, protecting from damage and cleaning down at completion.
Rates for tiles are also to include for laying, beddng, jointing and pointing as described and in accordance with SABS Code of Practice 0107 where applicable.
Rates for treads, risers, cills, copings, cappings, skirtings, etc., are to include for pointing to exposed edges and projecting soffits.
No distinction has been made for brick or concrete surfaces.

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 drainlayers 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 SABS Specification 921 and shall be jointed in accordance with the manufacturer's instructions.

Filter fabric shall be non-woven, spunbonded, needle punched, continuous polyester fabric, resistant to the effects of alkalis, acids, saline solution and sunlight.

STORMWATERAND SOIL DRAIN PIPES

Reinforced concrete non-pressure pipes shall comply with SABS Specification 677 and must be TypeSC of the class specified with spigoted and socketed 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 SABS mark. Joints shall be made in accordance with SABS Code of Practice 058.

Unplasticised polyvinyl chloride (UPVC) drain and sewer pipes and fittings shall comply with SABS Specification 791. Joints shall be made with fittings in accordance with SABS Code of Practice 058.

Cast Iron pipes and fittings shall comply with SABS Specification 746. Pipes must be Type B with spigoted and socketed joints and each pipe or fitting must be badged with the manufacturer's name or trade name and must be coated internally and externally with an approved bituminous preservative solution Jointsshall be made with tarred hemp and lead caulked into joint until socket is filled.

Heavy duty cast iron pipes and fittings shall comply with BS 78 and must be as before described for cast iron pipes and fittings.

Vitrified clay pipes and fittings shall comply with SABS Specification 559. Socketed pipes shall be fitted and jointed together in accordance with SABS Code of Practice 058 or with factory applied mechanical compression joints comprising socket liner and spigot collar or spigot seal ring of suitable resilient material to form a permanent watertight seal. Pipes with plain ends must be jointed with approved polypropylene couplings in accordance with the manufacturer's instructions.

Asbestos cement sewer pipes shall comply with SABS Specification 819 and must be of the class specified. Pipes must be marked with the manufacturer's name, trade name or registered trade mark, the date of manufacture, the nominal bore, class and the SABS mark.
Fittings must be from the same manufacturer as the pipes.

CONCRETE BEDS AND ENCASEMENT TO DRAIN PIPES:-Where pipes are required to be bedded on concrete, the bed of concrete Class B shall be a minimum of 500 mm 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 150 mm 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 SABS 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 SABS Code of Practice 0112.
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 190 mm diameter cast iron gulley grating complying with SABS 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 150 mm at any one part, carried up 75 mm 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 verified 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 150 mm at any one part, carried up 75 mm 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 SABS 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 150 mm at any one part, carried up 75 mm 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 50 mm 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 trowelled to a smooth even surface with all angles rounded, cast in lengths not exceeding 2 m and laid to falls, including necessary excavation and formwork.

CAST IRON GRATINGS FOR GULLEYS AND STORMWATER DRAINS AND CAST IRON SURFACE BOXES AND MANHOLE COVERS AND FRAMES: - Cast iron gratings for gulleys and stormwater drains shall comply with SABS Specification 1115.

Cast iron surface boxes and manhole covers and frames shall comply with SABS Specification 558.
All cast iron gratings, cast iron surface boxes and cast iron manhole covers and frames 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.

STORMWATER 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 150 mm thick concrete Class C bottom and finished on top with an 85 mm thick precast 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 grating 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 1 m shall have an internal dimension of 470 x 700 mm and those exceeding 1 m shall have an internal dimension of 920 x 920 mm. Where the invert of the manhole exceeds 1 m, a 150 mm thick reinforced concrete Class C corbel slab, reinforced as detailed, with opening size 470 x 700 mm formed in same and finished smooth off the formwork, is to be built into the brick sides at a height not exceeding 1,5 m above the concrete bottom with the reduced manhole shaft built off the top of the corbel slab. Cast iron step irons spaced at 300 mm 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 precast reinforced concrete manhole ring sections with walls a minimum of 50 mm thick, precast reinforced concrete cover slabs and spacer pieces complying with SABS 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 100 mm 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 25 mm 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 125 mm thick precast reinforced concrete cover slab, rebated on underside to suit ring sections and with opening size 600 x 600 mm 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 precast 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, pointed with flush joints, and finished on top with an 85 mm thick precast 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.

SOAK PITS: - shall be of the lengths and widths specified and shall be a minimum of 900 mm deep below the invert of the inlet pipe. A perforated pitch-fibre drain pipe jointed to the inlet pipe and with other end capped is to be laid level in a 19 mm stone packing of a minimum thickness of 150 mm below and at sides of pipe and a minimum thickness of 50 mm above the top of the pipe. The remainder of the soak pit is to be filled with stone graded from 50 mm to 75 mm to a level of 50 mm above the top of the pipe. The stone is to be covered with corrugated asbestos cement sheets extending 150 mm beyond the walls of the soak pit all round. 'The trench shall be backfilled above the sheeting to a minimum depth of 300 mm lightly rammed with the final 100 mm of backfilling being approved top soil 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 l5Omm thick concrete Class C bottom laid to falls A half brick baffle wall finished 75 mm below underside of concrete cover slab and with opening size 150 X l5Omm high formed in wall, is to be built in 1:3 cement mortar on the concrete bottom. A 115 mm 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 450 mm 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 85 mm thick precast concrete Class C cover slab, reinforced as detailed and rebated for and fitted with 600 x 450 mm 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, l9mm thick, with an approved waterproofing compound added, with all internal angles coved to 50 mm radius. Inlet and outlet chambers attached at either end of the septic tank shall be size 600 x 450 mm 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 150 mm thick, or where extended above the top of the septic tank cover, built off the cover and finished on top with 85 mm thick precast 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 *450* mm 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 300 mm 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 base 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 40 mm is indicated, after which, without further pumping, the pressure shall not drop below 25 mm 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 1,5 m and

not more than 3,5 m. After allowing a 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 2,5 litres for 100 mm diameter pipe and 3,75 litres for 150 mm diameter pipe for 100 m 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 lines 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 5 mm 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, to the satisfaction of the Director. 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 75 mm at ends and 150 mm 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 40^0.

(a) Galvanised sheet iron shall be of an approved brand of the thickness specified after galvanising and having a galvanised coating of "Iscor Coating Designation 24 50". Corroded or otherwise defective sheets shall not be used. All nailing or screwing shall be done with galvanised 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 unsup ported or semi self-supported work shall be of halfhard 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 BS Specification 1178.

LININGS TO VALLEYS:- shall be of the material specified, lapped 200 mm 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 100 mm up vertical surfaces and dressed 250 mm up roof slope and on to purlin or batten at edge.

SOAKERS: - to slate covered roofs shall be of galvanised sheet iron or sheet copper of 0,6 mm thickness, 450 mm wide to closed valleys and 250 mm wide to raking intersections of roofs with vertical wall and chimney stack abutments and turned 75 mm up vertical surfaces. Soakers shall be 75 mm longer than the gauge of the slate roofing.

UNDER-FLASHINGS: - to all iron roofs and where specified to slate or tiled roofs shall be 0,6 mm thickness galvanised 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 0,6 mm thickness and aluminium flashings shall be formed from 1200-H4 quality sheet of 0,6 mm thickness. Lead flashings, where specified, shall be formed from sheet having a mass of 24 kg/m^2.

COVER FLASHINGS: -shall be either galvanised sheet iron, copper or aluminium, as specified, of 0,6 mm thickness fitted over under-flashing, stepped where required on rake and with top edge bent and wedged 25 mm 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 0,6 mm galvanised 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 p stand, riveted and soldered at joint and at base to apron. The top of the conical upstaged is to be fixed around the pipe with 25 x 3 mm galvanised mild steel strap wrapped around the pipe and fixed with a galvanised steel gutter bolt.

(b) Pipes through asbestos cement roofing shall be flashed around with 24 $kg'm^2$ lead apron dressed into corrugations, bedded in mastic and bolted to roof sheeting with galvanised 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/m^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 prepainted 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 waterpro ofing is to be finished in a colour to match that of the roofing material.

RAINWATER PIPES

(a) **Galvanised sheet iron rainwater pipes**, offsets and shoes shall be formed from 0,6 mm thickness sheet, seamed at back and jointed with soldered slip joints. Pipes must be fixed 25 mm clear of finished wall face on brackets at not exceeding 2 m centres formed of 1,6 mm x 25 mm galvanised mild steel wrapped around pipe and bolted to 3 mm x 25 mm galvanised mild steel U-shaped brackets holed for and screwed to plugs in wall. Rainwater pipes fixed in recesses must have galvanised sheet iron ears soldered on across the pipe and screwed to plugs in wall.

(b) **Copper rainwater pipes**, offsets and shoes shall be as described in (a) above but formed from 0,6 mm thickness cold rolled sheet copper of half hard temper and fixed on brackets formed of hard copper strip as described above.

(c) **Asbestos cement rainwater pipes**, offsets and shoes shall be of approved manufacture with spigot and socketed ends, jointed with tarred hemp rope gasket caulked into each joint and the joint filled with approved bitumen compound and finished off with a neat trowelled fillet of 1:3 cement mortar. The pipes must be fixed clear of the finished wall face on approved aluminium alloy brackets with tails driven in or cut and pinned in 1:3 cement mortar.

(d) **Unplasticised polyvinyl chloride (UPVC) rainwater pipes** and accessories, shall comply with SABS Specification 967 and must be fixed clear of the finished wall face on stock pattern brackets in accordance with the manufacturer's instructions.

(e) **Galvanised mild steel rainwater pipes**, shall be medium quality screwed and socketed normalised welded mild steel pipes, galvanised inside and outside, and shall comply with SABS Specification 62.
Fittings for galvanised mild steel pipes shall comply with SABS 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 galvanised cast iron hinged holderbats built into walls at not exceeding 2 m centres in 1:3 cement mortar.

(f) **Cast iron rainwater pipes**, shall comply with SABS Specification 746 and shall be spun-cast with spigot and socketed ends jointed with gaskin and lead or approved jointing compound caulked in until the socket is completely filled. The pipes must be fixed clear of the finished wall face with cast iron hinged holderbats build into walls at not exceeding 2 m centres in 1:3 cement mortar.

EAVES GUTTERS

(a) **Galvanised sheet iron gutters, rainwater heads, etc.**, shall be formed from 0,6 mm sheet and must have beaded edges with all laps riveted and soldered. Corners must be reinforced with 0,6 mm x 50 mm wide galvanised sheet iron strips and must be soldered across the inside of the angles.
Gutters must be laid to even falls on approved galvanised mild steel gutter brackets screwed to roof timbers at approximately 1 m centres. Half round pattern gutters shall be bolted to each bracket with 6 mm galvanised gutter bolt fitted close to the beaded edge. Rectangular pattern gutters shall be fixed at each bracket with galvanised mild steel long-screw with 1 mm thick galvanised sheet iron spacer tube.

(b) **Asbestos cement gutters and accessories** shall be of approved manufacture, not less than 6 mm thick, with spigot and socketed 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) **Sheet copper gutters** shall be formed from 0,6 mm sheet copper of half-hard temper unless otherwise specified, and must have beaded edges with all laps riveted and soldered. Gutters must be laid to falls on 5 x 40 mm hard copper brackets screwed to roof timbers at approximately 1 m centres.

(d) **Unplasticised polyvinyl chloride (UPVC) gutters and accessories** shall comply with SABS 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-SYPHON PIPES

(a) **Galvanised mild steel pipes** shall be medium quality screwed and socketed normalised welded mild steel pipes, galvanised inside and outside, and shall comply with SABS Specification 62. Fittings shall be brass or galvanised malleable cast iron complying with SABS Specification 509 and where accessible, shall have inspection eyes with spanner headed brass caps with washers, threaded and screwed into position. Screwed joints shall be made with red lead paint and hemp or thread sealing tape, with the cut ends of pipes reamed out to remove burrs. Pipes shall be fixed clear of walls with galvanised malleable iron brackets for pipes up to and including in 80 mm diameter and with galvanised cast iron hinged holderbats fastened with brass pins or bolts for pipes exceeding 80 mm diameter, all built into walls at not exceeding 2 m centres in 1:3 cement mortar. Pipes slung to slab soffits shall be fixed to falls on approved metal hangers at not exceeding 1,2 m centres. Pipes shall be fixed to timber work with approved galvanised mild steel pipe clips screwed on.

(b) **Cast iron pipes and fittings** shall be of approved manufacture, badged with the manufacturer's name and trade name and coated inside and outside with an approved bituminous preservative solution and shall

be either spun cast spigot and socket pipes complying with SABS Specification 746 or spun cast plain ended pipes. Spigot and socket pipes shall be jointed with gaskin and lead or approved jointing compound caulked in until the socket is completely filled. Plain ended pipes shall be joined with approved stainless steel pipe coupling with neoprene rubber gasket or with approved cast iron coupling with neoprene rubber gasket bolted on. The pipes must be fixed clear of the finished wall face with cast iron hinged holderbats built into walls at not exceeding 2 m centres in 1:3 cement mortar.

(c) **Unplasticised polyvinyl chloride (UPYC) 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 SABS Specification 967. Joints shall be made with injection moulded fittings in accordance with the manufacturer's instructions and SABS 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.

(d) **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.

SANITARY FITTINGS: - All glazed ceramic sanitaryware shall comply with SABS Specification 497.

Wash hand basins shall be of white glazed fireclay or vitreous china of the type and size specified. Basins shall have an integral overflow and be fitted with 32 mm chromium plated waste union with flange and grating, rubber plug on chromium plated brass chain and, where necessary, tap hole stopper cemented in.

W.C. 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 mortar.

Glazed ceramic urinals of the bowl or stall type shall be of white glazed fireclay or vitreous china. Bowl urinals shall be fitted with 40 mm chromium plated waste union, with flange and domical grating and with spreader with flush pipe connector. Stall urinals shall be fitted with 75 mm 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 SABS Specification 821, each with body and cover. Cisterns shall be 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. Connections for flush pipe, inlet and overflow pipe must be provided in the body. Cisterns shall be fitted with 15 mm brass ball valve with copper, PVC or polystyrene ball and with either chromium plated operating lever handle or galvanised steel pull chain and handle. A galvanised, 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 W.C. pans is to be fixed to the inlet of the pan with an approved patent adaptor. From the overflow connection on each cistern a 22 mm copper overflow pipe, bent as required, shall be taken through wall to discharge externally, with end splay cut and projecting 50 mm beyond wall face, or where this is not possible, bent to discharge into W.C. 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, 40 mm 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 sheet s with complete drainage to outlets and each bowl is to be fitted with integral built in overflow with chromium plated brass grating and 40 mm 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 140 mm deep. Drainers are to be pressed out of single sheets and are to have pressed flutes to give complete drainage.

(a) For domestic use and for schools-Sinks shall comply with SABS Specification 242 and shall be manufactured from A.I.S.I. Type 430 stainless steel 0,8 mm thick for units not exceeding 2,4 m long and from stainless steel 1,2 mm thick for units exceeding 2,4 m long.

(b) For hospital use and school laboratories-Sinks shall be manufactured from A.I.S.I. Type 304 stainless steel 0,9 mm thick for units not exceeding 2,4 m long and from stainless steel 1,2 mm thick for units exceeding 2,4 m long.

Stainless steel wash hand basins and wash troughs shall be of the types and sizes specified complying with SABS 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 is to be fitted with integral built in overflow with chromium plated brass grating and 40 mm 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 SABS Specification 924, and shall be manufactured from A.I.S.I. Type 304 stainless steel, 1,2 mm 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 125 mm wide and half round in section with all corners radiused and shall fall to ensure complete drainage to 75 mm recessed outlet with chromium plated domed hinged grating and frame.

RATES FOR SANITARYWARE: - 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 SABS Specification 966. Pipes must be of the class specified and must be marked with the manufacturer's name, trade name or registered trade mark, nominal diameter, class reference and the SABS 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 SABS Specification 533 and shall be of the class specified, laid and jointed in accordance with the manufacturer's instructions. Piping must be jointed with compressi on fittings with compression rings and coupling nuts.

Fibre-reinforced cement pressure piping shall be of approved manufacture, complying with SABS Specification 1223 for Constant Outside Diameter Type and for Constant Inside Diameter Type.
Pipes must be of the class specified and must be marked with the manufacturer's name' trade name or registered trade mark, nominal diameter, class reference and the SABS mark.
Fittings for fibre-reinforced cement pressure pipes must be of grey cast iron and comply with SABS Specification *546*
Each fitting must be legibly marked with the manufacturer's name, trade name or registered trade mark, the nominal diameter and the SABS mark. Pipes shall be laid and jointed in accordance with the manufacturer's instructions.

Polypropylene piping shall be of approved manufacture, complying with SABS Specification 1315, laid and jointed in accordance with the manufacturer's instructions. Piping must be jointed with compression fittings with compression rings and coupling nuts.

Copper piping shall be of approved manufacture complying with SABS Specification 460 and shall be of Class 2, laid and jointed in accordance with the manufacturer's instructions. Pipes must be jointed with brass compression fittings with compression rings and coupling nuts complying with SABS Specification 1067 Part I Type A. Copper piping must be bent, where required, with an approved bending machine.

ABOVE GROUND WATER SUPPLIES

Galvanised mild steel piping for water supplies shall be medium quality screwed and socketed normalised welded mild steel pipe, galvanised inside and outside, and shall com ply with SABS Specification 62.

Fittings to galvanised mild steel piping shall be steel pipe fittings complying with SABS Specification 62 or malleable cast iron fittings complying with SABS Specification 509.

Copper piping shall be of approved manufacture, complying with SABS Specification 460 and shall be of Class I, fixed and jointed in accordance with the manufacturer's instructions. Unless otherwise described copper piping must be jointed with brass compression fittings with compression rings and coupling nuts comp in with SABS Specification 1067 P art I Type A. Where so described, capillary copper in 5 complying with SABS Specification 1067 Part II must be used strictly in accordance with the manufacturer's instructions. Hard drawn copper piping of class 0 may be used where de scribed but bending of the pipe will not be permitted.

Stainless steel piping shall be of approved manufacture, complying with BS 4127 and shall be A.I.S.I. Type 304 L. Fittings to stainless steel piping not exceeding 50 mm nominal bore shall be brass compression fittings with compression rings and coupling nuts.
Piping exceeding 50mm nominal bore shall be welded piping with *1,5* mm wall thickness, unless otherwise stated, arid 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 galvanised mild steel slip-on flanges, drilled to Table D, complete with galvanised 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 and wheelvalves shall be of approved manufacture complying with SABS Specification 226.

Ball valves with brass valve and copper or plastic ball float shall be of approved manufacture complying with SABS Specification 1056. Plastic floats when supplied, must comply with SABS Specification 1006.
Gate valves shall be of approved manufacture complying with SABS Specification 664. Valves shall be clockwise closing with non-rising, cap-fitted spindles and flanged connections and of the class specified.
Pressure reducing valves shall be of approved manufacture complying with SABS Specification 198.

FIXING OF WATER PIPES: - Galvanised mild steel water piping shall be fixed, unless otherwise described, to walls or ceilings with galvanised malleable iron holderbats (schoolboard pattern), built into walls in 1:3. cement mortar. Pipes shall be fixed to timber work with galvanised 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. (schoolboard pattern) built into walls in 1:3 cement mortar Pipes shall be fixed to timber work with brass or copper pipe clips screwed on.

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 pipe-lines may only commence after the installation of all anchor blocks, valves and fittings has been completed.
Testing shall be carried out between installed sluice valves whenever possible. Where this is not possible the ends of the pipes shall be sealed with end caps properly held in place with temporary props.
The tests shall be carried out on lengths not exceeding 300 metres.
The pipeline shall be filled from the lowest end in order to expel the air at the upper end through special taps or through service connections, stand pipes, etc. When full the line shall be allowed to stand for 24 hours and any further accumulated air shall be expelled. The full test pressure shall then be applied and maintained for one hour, during which time the line will be examined for any leaks, movement at anchors and other defects.
Any defective work is to be taken out and replaced at the Contractor's expense and the whole retested until found satisfactory.
The Contractor shall provide all necessary testing apparatus, temporary end caps, plugs, stoppers, special taps and any other materials that may be required, and all labour for carrying out the tests.

EXCAVATIONS FOR PIPE TRENCHES: - Excavations for pipe trenches, gulley traps, manholes, inspection chambers, valve chambers, 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 100 mm deeper than required for the grade and be backfilled with well rammed earth.
The Contractor is to notify the Director 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 water-logged or otherwise spoilt after approval, shall be cleaned out and reformed at the Contractor's expense and to the satisfaction of the Director before any piping or sand or concrete beds are laid.
Depths of excavations as approved shall be checked and recorded by the Works Supervisor or Inspector of Works 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 *0,75* mm deep shall be taken *0,5* m wider than the internal diameter of the pipe. This width shall be increased by 75 mm for each successive depth of 0,75 m to a maximum of 1 m wider than the internal diameter of the pipe.

BACKFILLING: - No trench shall be backfilled until the Director is satisfied that the works therein have been satisfactorily completed, tested and are ready for backfilling.
The backfilling around and 300 mm 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. Top soil 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 up, as and when necessary, until the end of the maintenance period.

SIZES OF PIPES:-The diameters stated for galvanised 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 Director.

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 SABS Specification 889 and fixed in position on wall brackets screwed to and including 2Omm thick chamfered and oiled wrot hardwood backboard, size 450 x 100 mm screwed to plugs in wall.
Where specified, dry powder type fire extinguishers shall be of 10 litre capacity, complying with SABS Specification and fixed as before described on backboard size 1000 x 200mm.

FIRE HOSE REELS: - shall be non-swinging rotary fire hose reels, complying with SABS Specification 543, with solid side discs and 25 mm waterway at bracket incorporating rotary pressure joint to hose connection at hub and fitted with 25 mm 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 30 m length of 20 mm internal diameter best quality reinforced red rubber non-kinkable hose with one end fixed to wheel hub connection and the other end fitted with 20 mm 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.

FIRE HYDRANTS: - shall be of the wheel valve pattern with instantaneous coupling outlets, size 63,5 mm or 70 mm 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. Materials used in the manufacture of the hydrants shall be as laid down for the manufacture of couplings, branch pipes, etc., in SABS Specification 1128, and the various requirements of instantaneous couplings and dimensions for 70 mm outlets shall comply with the requirements for Morris instantaneous pattern couplings.

The valve spindle shall have a minimum diameter of 22 mm with swivelling clack at one end fitted with first quality dexine or other approved washer, bedded on to a raised seat not less than 6 mm wide, and the other end shall be machined to form a square shank of 15 mm 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 8Omm 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 95 mm in the case of 63,5 mm outlets or 100 mm in the case of 70 mm outlets.
The valve handwheel shall have an overall diameter of 165 mm 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".

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 mirrors are to comply with SABS Specification 1236 Class A. Toughened safety glass is to be "Armourplate" 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.

GLAZING:-The glazing and fixing of glass in buildings shall be in accordance with SABS Code of Practice 0137.
Glass panes shall have adequate glazing clearance between edges of glass and the rebates.
Putty for glazing shall comply with SABS Specification 680 Type I for glazing in wood and Type II for glazingin steel. Putty for glazing in natural finished wood shall be tinted to match the colour of the wood. Putty for glazing in aluminium windows shall be tinted to match the aluminium or anodised aluminium.
All rebates, other than 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 3 mm 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.

PAINTING

MATERIALS: - Proprietary materials where specified are to be of the brand specified or other approved by the Director.
All primers, emulsion paints, enamels, stains, varnishes, etc., are to comply with the relevant SABS 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 Director shall at all times be permitted to take samples for testing purposes from open con tainers of any brand of paint being used on the work.
All materials, if and when required by the Director, 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 Director.

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 Director 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 SABS Code of Practice 064 to remove rust, scale, grease, oil, etc., and the surface brought to a bright metallic condition.
Galvanised iron and zinc shall be cleaned in accordance with SABS 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 waterpaper and white spirit.
Woodwork to be painted shall have all knots and resinous areas treated with an approved knot ting, 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 discolourations 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 repainting is commenced.

Previously distempered or lime washed surfaces to receive any other type of paint, are to have the existing distemper or limewash completely removed by scraping or wirebrushing and the surfaces treated with an approved bonding liquid.
Where existing paint filmsare 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 rinsable 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 Director.

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 Director.
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 Director, 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 Director and all work must be finished to the approved colours.
Backs of wood door and similar frames and the surfaces of other new or refixed 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 bargeboards.

RATES:-Rates for painting, etc., are to include for all preparatory work, and where spraying is employed, are to include for 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 Director at the Contractor's own expense.

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 Director.

SUB-GRADE: - All materials placed in the sub-grade layer which is defined as being the 150 mm 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 2 mm sieve	= 12
	less than 30% passes the 2 mm 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 150 mm and recompacting 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 450 mm by ripping or blasting and then sized by rolling or knapping until the maximum dimension of any spall shall be not more than 300 mm. 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 blind the surface.

Compaction shall be achieved by means of a vibratory roller until the Director 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 500 m^2 of sub-grade area or not more than 50 m 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 Director may, at his 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 weedkiller 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 150 mm 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	50 %	70 %
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 micrometre sieve shall not exceed	25 %	
Minimum relative compaction in place	95 % Mod. A.A.S.H.O. density	
Combined coarse and fine sand fractions shall exceed.35 % of the soil mortar		

Unless otherwise specified, the responsibility for obtaining material that conforms with 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 Director before the material is delivered on site. Further control tests will be required by the Director 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 Director. 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 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 20 mm 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 200 m^2 of surface shall not be less than

150 mm and at any point not less than 130 mm.
The surface finish when measured under a 3 m 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 Director at his discretion, may arrange for independent check tests to be onducted, 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 SABS Specification 824.
The rate of application shall conform to the design rate and all materials to be stabilised shall be approved by the Director 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 lme 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 Director 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.R.O. optimum plus 2%.
The efficiency of the spreading and mixing shall be measured by the Lime Determination Test according to A.S.T.M.D. test number 3155/1973 or the California Test Method No. 338-B July 1966. Only where the result from every 15 tests at locations selected by the Director indicate that more than 90 % of the layer has a lime 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 100 m^2 of surface area, but shall not be spaced greater than 20 m 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 meet the following specifications.

Sieve Size	% Passing
37.5 mm	100
26.5 mm	82-95
19.1 mm	70-85
13.2 mm	58-75
4.75 mm	34-55
2.00 mm	22-40
0.425 mm	10-25
0.075 mm	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 micrometre 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 SABS 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 micrometre 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 SABS Specification 308 (150/200 Pen.)
M.C. 800 Bitumen to SABS Specification 308 *(150/200* Pen.)
RTH 45/50 Tar to SABS Specification 748

Spray grade 60% emulsion where approved or specified by the Director. 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 work shall be washed 13,2 mm nominal sized crushed stone in accordance with SABS Specification 647.

The Aggregate Crushing Value shall not exceed 15.

The 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/m^2 followed immediately afterwards by the spreading of a cover aggregate of 13,2 mm stone at the rate of 125 m^2/m^3. The aggregate is to be spread by means of an approved chip spreader, hand 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/m^2 followed immediately by the spreading of 6,7 mm stone chips at the rate of 150 m^2/m^3. This stone aggregate shall then be drag-b roomed and rolled as previously described.

A seal spray having a net bitumen content of 0,7 litre/m^2 shall then be applied to the surface when this coat has dried completely and shall be rolled to firmly bed any loose aggregate.

If the surface is to be opened early to traffic, it shall be covered very lightly with sand or crusher dust distributed evenly with a hessian drag and back rolled with wet wheels before opening to traffic.

SLURRY SEAL SURFACING-The aggregate for slurry seal shall conform to the following grading: -

Sieve Size (mm)	*Percentage Passing*
4,75	100
2,36	90-100
1,18	65-95
0,600	42-72
0,300	23-48
0,150	10-27
0,075	5-12

Slurry sand shall be crusher sand with a minimum sand equivalent of 35.
Binder-Stable grade emulsion (60%)
- Anionic to SABS Specification 309
- Cationic to SABS Specification 548

Consistency of the slurry shall consist of 90 % crusher sand, cement filler not less than 1 % and net binder content of not less than 9 % by weight. Water to be added as required. As a guide approximately 300 litres of emulsion and 160 litres of water are required per cubic metre of slurry.
The slurry shall be machine mixed and wherever possible applied by means of a spreader box. The rate of application shall be $170m^2/m^3$. The slurry shall be of a creamy, homogeneous mixture, free of lumps, and if the mixture shows signs of breaking before application to the surface it shall be discarded.
After the first seal has been approved by the Director but before the application of the slurry, a fog spray comprising of a solution of 1 part emulsion to 3 parts water shall be applied at a rate of 0,8 litre/m^2 to cover the aggregate. The application of the slurry may commence when the fog spray has completely dried.
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 pneumatictyred 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. 30 cut-back bitumen.
Tar Primer R.T.R. 3/P.
Emulsion Primer (60%).

The rate of application of the primer shall be within the range 0,65-1,0 litre/m^2, the actual rate to be determined by test and observation on site. Where emulsion primer is used the application rate shall be increased to give the required net 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 Director, and shall conform with the following specification:-

	Screen Size mm	A Hot Mix	B Cold Mix	C (Kerbs)
	26.5	100	-	-
	19.0	100	-	-
	13.2	80-100	100	-
	9.5	70-90	80-95	100
Aggregate Grading	6.7	-	60-75	90-100
	4.75	50-70	45-60	65-75
Per Cent Passing	2.36	35-50	28-42	52-62
	1.18	27-40	18-30	50-60
	0.600	19-30	7-20	45-55
	0.300	13-23	2-10	30-40
	0.150	8-16	0-5	9-19
	0.075	4-10	0-4	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 SABS Specification 307.
Cut-back bitumen to comply with SABS Specification 308.
Maximum heating temperature of bitumen 170 °C.
Delivery temperature at the paver for hot mixes 130-160°C.

For every 500 m^2 of area paved the Contractor shall produce an extraction test result from a sample taken during laying operations showing grading and bitumen content of the premix carpet. The test as specified or any further tests to prove compliance with the specification shall be at the Contractor's expense.
In order that the stone and binder shall be properly mixed, this operation must be carried out in a pug-mill mixer or by hand with shovels in 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 rain 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 12 kg 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 Kerbs
Premix kerbs are to be Type C as specified above and constructed to give the following compacted size: -

Width at top	125 mm
Width at base	230 mm
Height	150 mm

PRECAST CONCRETE PAVING BLOCKS: - shall be of the type, class and thickness specified, of approved colour and shall comply with SABS 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 Director.
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 of adjacent blocks.

Paving blocks shall be one of the following classes as specified:
Class 25: - average compressive strength of at least 25 MPa.
Class 35: - average compressive 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 SABS 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 1,18 mm sieve and shall contain 10-50 % of material that passes a 0,075 mm sieve.
Spaces constituting less than 25 % of a full block unit and of 25 mm 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.

Precast Concrete Kerbs
Precast concrete kerbs are to be of concrete Class 20 (20 MPa) and of the sizes described in the items, cast generally in 1 m 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 10 mm 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.

FENCING AN D GATES

GENERALLY: - The Director 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 fencing, 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 Director, 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 500 mm wide on either side.
Trees, rocks or other items of horticultural or archaeological interest which are not to be removed will be indicated by the Director.

Straini ng posts shall be erected at ends, corners and intermediately at not exceeding 45m centres with standards or intermediate posts erected between posts at not exceeding 3 m 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) shall be sited 350 mm back from the boundary line so that the end of the overhang is exactly on the boundary line.

Chain link wire mesh fencing and wire shall comply with SABS Specifications *675* and 1373 and shall be as specified , either Type 1 which is to be fully galvanised to Class A, or Type 2 which is to be lightly galvanised to Class C and PVC coated.

Chain link wire mesh fencing shall have a mesh size of *50* mm and be of the height and type specified. Type 1 galvanised wire mesh fencing shall be woven from 2,5 mm diameter wire, and Type 2 PVC coated wire mesh fencing shall be woven from 2,5 mm diameter core wire PVC coated to an overall diameter of 3,3 mm. The edges of wire mesh rolls shall be clinched and each roll shall have a durable label attached indicating the manufacturer's name, type and description, nominal diameter of wire, nominal width and length of roll and size of mesh. Wire for lacing of wire mesh to posts, gate framing, etc., must be identical to the wire forming the wire mesh fencing. The wire mesh fencing shall be tied at *450*mm centres to straining wires with binding or tie wire.

Straining wire shall be as specified, either Type 1 galvanised 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 where pecified shall be 2,50 mm diameter A.I.S.I. Type 304 stainless steel. The bottom straining wire shall in all cases be fixed 50mm above levelled ground and each straining wire shall be strained between posts and tied to same 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 tie 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.

Galvanised 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 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 SABS 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 exterior surfaces fully coated.

Mild steel tubing for fencing and gate components shall comply with SABS Specification 657 Part I. The diameters specified are the nominal external diameters of the tube.

Galvanised mild steel tubular straining, gate and intermediate posts, stays and standards shall comply with CKS 82 unless otherwise described. Posts and stays shall be fitted with base plates of the sizes stated, welded on at bottom with each base plate holed 25 mm diameter in centre to permit intrusion of galvanising. Tubular posts, etc., not exceeding 51 mm external diameter are to be fitted at top with a machined steel plug pressed or welded into end of post. The top end of posts, etc., exceeding51mm external diameter are to be capped with a 1,60 mm thick pressed mild steel domed cap welded on. Gate posts are to be drilled and fitted with mild steel ferrules welded into position to receive 20 mm diameter mild steel hinges. Stays shall have the top end flattened, bent as required and holed 12 mm diameter for bolting to post. Threaded 12 mm diameter studs or approved stay collars are to be welded on to the posts to locate and secure the top ends of stays. Gate and corner posts shall each be fitted with one stay and straining posts fitted with two stays unless otherwise specified. Overhangs to tubular posts, where specified for security fencing, shall extend 350 mm on plan from the centre line of the post at an angle of 450 The overhang shall be formed of the same diameter mild steel tube as the post, mitre cut and welded on. The end of the mild steel tubular overhang shall be capped as previously described for posts.

Precast prestressed concrete posts and stays shall have a minimum 28 day compressive strength of 35 MPa. Aggregates used in the concrete mix shall comply with SABS Specification 1083 and cement shall comply with SABS Specifications 471,626 and 831. The coarse aggregate shall be 13,2 mm stone. Posts and stays shall be mechanically vibrated in steel moulds and uniformly stressed by means of four 5 mm stressing wires complying with BS 5896 and having a concrete cover of 20 mm with a tolerance of 3 mm, to give a final compression of between 5,5 MPa and 6,9 MPa. The initial prestressing force shall not be higher than 70 % of the ultimate tensile strength of the wire. The prestressing force shall not be transferred to the concrete until the latter has attained 75 % of its 28 day compressive strength. Curing of concrete must be for a minimum period of 7 days using an approved method as laid down in SABS Specification 1200G. Where the ends of the prestressing wires are exposed the face of the concrete shall be cut back, immediately on removal from the mould, to expose the presetressing wires and the ends of the wires cut back and the recesses filled with 1:3 cement grout.

The resistance to loading on precast prestressed concrete posts and stays shall be as laid down in CKS 451 and posts and stays shall be capable of withstanding, without signs of cracking, a bending moment acting in either axial plane of at least 1 500 Nm for straining, corner and gate posts, 700 Nm for intermediate posts and 450 Nm for stays.
Precast prestressed straining and gate posts shall be 100 x 100 mm in section and intermediate standards and stays 75 x 75 mm in section, each of the length specified. Top ends of stays shall be splayed and bonded to posts with an approved epoxy adhesive.

Where overhangs to the precast prestressed concrete posts are specified for security fencing they shall extend 350 mm on plan from the centre line of the post at an angle of 450 and shall be of the same dimensions as the post. Sufficient prestressing wire shall be provided beyond the prestressing point to reinforce the full length of the overhang which shall be cast at a later stage using the same methods and materials as for the post without prestressing.

The finish of the precast prestressed concrete posts, stays and overhangs shall be such that, upon removal from the moulds, no further treatment shall be necessary to provide a straight, smooth and uniform finish, free from all honeycombing, holes, pittances and blemishes and equal to that normally obtained from properly manufactured steel moulds.

Concrete bases for posts and standards other than Y-section steel standards shall be Class B (1:3:5-19 mm stone) size 400 x 400 x 500 mm deep, unless otherwise specified, with tops of bases 100 mm below ground level.

FENCING

1,20m High four strand wire fencing with mild steel posts

Fencing shall be formed of four straining wires of the type specified, spaced 400 mm apart, with galvanised mild steel Y-section fencing standards, each 1,80 m long with a mass of not less than 4,54kg, driven 520 mm deep into the ground at 3,00 m centres between straining posts and with two galvanised mild steel ridgeback droppers, each 1,20 m long with a mass of not less than 0,68kg, to each bay between standards or standards and posts. The straining wires shall be tied at every intersection with standards and droppers with binding wire.
Galvanised mild steel straining and gate posts shall be 76 mm diameter x 3 mm wall thickness mild steel tube, each 1,80 m long, with domed ca p at top and 150 X 150 x 5 mm thick mild steel base plate welded on at bottom. Stays shall be 51mm diameter x 2 mm wall thickness mild steel tube, each 1,70 m long overall, with flattened top end and 150 x 150 x 5 mm thick mild steel base plate welded on at bottom.

1,20 m High four strand wire fencing with precast concrete posts

Fencing shall be formed of four straining wires of the type specified, spaced 400 mm apart, with precast prestressed concrete standards erected between the straining posts and two galvanised mild steel ridgeback droppers, each 1,20 m long with a mass of not less than 0,68kg, to each bay between standards or standards and posts. The straining wires shall be tied at every intersection with standards and droppers with binding wire.
Precast concrete straining and gate posts shall be 1,80 m long, intermediate standards 1,80 m long, and stays 1,60 m long.

1,20 m High chain link wire mesh fencing

Fencing shall be as before described for four strand fencing with mild steel or precast concrete posts, as specified, but without mild steel droppers and with 1,20m high chain link wire mesh fencing, of the type specified, tied to straining wires and laced to posts.

1,50 m High chain link wire mesh fencing with mild steel posts or precast concrete posts

Fencing shall be formed of four straining wires of the type specified spaced 400 mm apart, and two rows of galvanised barbed wire spaced 150 mm apart and above the top straining wire. The straining wires and barbed wire shall be tied at every intersection with the intermediate standards. Two barbed wire braces are to be wired on to the two rows of barbed wire and top straining wire in each bay between standards or standards and posts.

Chain link wire mesh fencing 1,20m high, of the type specified, shall be tied to the straining wires and laced to posts.

Galvanised mild steel straining and gate posts shall be 76 mm diameter x 3 mm wall thickness mild steel tube, each 2,l0m long with domed cap at top and 150 x 150 x 5 mm thick mild steel base plate welded on at bottom.
Intermediate standards shall be 51 mm diameter x 2 mm wall thickness mild steel tube, each 2,10 m long with flat cap at top and 150 x 150 x 5 mm thick mild steel base plate welded on at bottom. Stays shall be 51mm diameter x 2 mm wall thickness mild steel tube, each l,93m long overall, with flattened top end and 150 x 150 x 5 mm thick mild steel base plate welded on at bottom.
Precast concrete straining and gateposts shall be 2,10 m long, intermediate standards 2,10 m long and stays 1,83 m long.

3,00 m High chain link wire mesh fencing with mild steel or precast concrete posts

Fencing shall be formed of seven straining wires of the type specified, spaced 500 mm apart, and tied at every intersection with the intermediate standards.

Chain link wire mesh fencing 3,00 m high, of the type specified, shall be tied to the straining wires and laced to posts.

Galvanised mild steel gate and straining posts shall be 102 mm diameter x 2,8 mm wall thickness mild steel tube each 3,60 m long with domed cap at top and 200 x 200 x 5 mm thick mild steel base plate welded on at bottom. Intermediate standards shall be 60 mm diameter x 2,8 mm wall thickness mild steel tube, each 3,60m long, with domed cap at top and 150 x 150 x 5 mm thick mild steel base plate welded on at bottom. Stays shall be 60 mm diameter x 2 mm wall thickness mild steel tube, each 3,60 m long overall, with flattened top end and 150 x 150 x 5 mm thick mild steel base plate welded on at bottom.
Precast concrete gate and straining posts, intermediate standards and stays shall be 3,60m long.

SECURITY FENCING

1,80m High chain link wire mesh security with mild steel posts or precast concrete posts and overhang Fencing shall be formed of five straining wires of the type specified, spaced 450 mm apart, with
overhang comprising three rows of galvanised barbed wire spaced 150 mm apart. The straining wires and barbed wire shall be tied at every intersection with the intermediate standards. Two barbed wire braces are to be wired on the three rows of barbed wire and top straining wire in each bay between standards or standards and posts.
Chain link wire mesh fencing 1,80m high of the type specified shall be tied to the straining wires and laced to posts.
Galvanised mild steel gate posts and cranked straining posts shall be 102 mm diameter x 2,8 mm wall thickness mild steel tube, each 2,80m long overall, with domed cap at top and 200 x 200 x 5 mm thick mild steel base plate welded on at bottom. Cranked intermediate standards shall be 51 mm diameter x 2 mm wall thickness mild steel tube, each 2,80 m long overall with flat cap at top and 150 x 150 X

5mm thick mild steel base plate welded on at bottom. Stays shall be 60 mm diameter x 2mm wall thickness mild steel tube, each 2,60m long overall, with flattened top end and 150 x 150 x 5mm thick mild steel base plate welded on at bottom.
Precast concrete gate and cranked straining posts shall be 2,80 m long, cranked intermediate standards 2,80 m long and stays 2,50 m long.

2,40 m High chain link wire mesh security fencing with mild steel posts or precast concrete posts and overhang
Fencing shall be formed of seven straining wires of the type specified, spaced 400 mm apart, with overhang comprising three rows of galvanised barbed wire spaced 150 mm apart. The straining wires and barbed wire shall be tied at every intersection with the intermediate standards. Two barbed wire braces are to be wired on to the three rows of barbed wire and top straining wire in each bay between standards or standards and posts.
Chain link wire mesh fencing 2,40 m high of the type specified shall be tied to the straining wires and laced to
posts.
Galvanised mild steel gate posts and cranked straining posts shall be 102 mm diameter x 2,8 mm wall thickness mild steel tube, each 3,40 m long overall, with domed cap at top and 200 x 200 x 5 mm thick mild steel base plate welded on at bottom. Cranked intermediate standards shall be 51 mm diameter x 2 mm wall thickness mild steel tube, each 3,40 m long overall, with flat cap at top and 150 x 150 X 5 mm thick mild steel base plate welded on at bottom. Stays shall be 60 mm diameter x 2 mm wall thickness mild steel tube, each 3,40m long, with flattened top end and 150 x 150 x 5 mm thick mild steel base plate welded on at bottom.
Precast concrete gate and cranked straining posts, cranked intermediate standards and stays shall be 3,40 m long overall.

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.

Gates shall be hung on 20 mm diameter adjustable eye bolt hinges wrapped around gate framing with collar welded on to gate framing above eye bolt hinge. Each hinge shall be fitted with two nuts and two washers.
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 diameter x 140 mm mild steel hex-head bolts and with each plate holed to receive 20 mm diameter gate hinge.

Each single gate and one leaf of each double gate shall be fitted with gate latch formed of 25 x 6mm mild steel bracket, 550 mm girth, twice bent to U-shape with centre section l5Omm 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 padbolt, shall be welded to inside of bracket. The sliding padbolt shall be formed of 12 mm diameter mild steel rod, 220mm long, with 25 x 6mm mild steel flat bar 60mm 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 padbolt. In addition, fittings to each leaf of double gate shall comprise 50 x 6mm mild steel locking bar, 80nim long, holed 2Omm diameter for shackle of padlock and welded to locking stile of gate and dropbolt formed of l6mm diameter mild steel rod, 575 mm girth, once bent to L-shape, fitted through and including 2Omm 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 diame ter 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 hard steel shackle and two keys.

Gates for 1,20 m high fencing

Single gates shall be size 1,00 x 1,20m high, each hung on one pair of hinges and formed of 32 mm diameter x 2 mm wall thickness mild steel tubular framing all round. Each gate shall be fitted with locking padbolt with brass padlock.
Double gates shall be in two equal leaves with each leaf size 2,25 x 1,20 m high, hung on one pair

of hinges and 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.

Gates for 1,50 m high fencing

Single gates shall be size 1,00 x 1,20 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. 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 1,20 m high all as described for double gates for 1,20 m high fencing but with each stile of each leaf extended 330 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 38mm 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 2,00 m high, each hung on one pair of hinges 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 padbolt with brass padlock.
Chain link wire mesh fencing shall be carried over 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 3,00m high, hung on one and a half pairs of hinges 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 padbolt, locking bars with brass padlock, drop bolts and gate stop blocks.

Gates for 1,80m high security fencing

Single gates shall be size 1,00 x 1,80m high, each hung on one pair of hinges 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 padbolt with brass padlock.
Single gates shall be hung on mild steel tubular gate posts with cranked overhang 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 1,80m high, hung on one and a half pairs of hinges 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 to p 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 padbolt, 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 ends of barbed wire overhang.

Gates for 2,40 m high security fencing

Single gates shall be 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 2,40m with the barbed wire overhang carried across between the gate posts.
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 w ire mesh fencing to receive ends of barbed wire overhang.

PRECAST CONCRETE FENCING

Precast concrete fencing shall comply with the requirements of SABS Specification 1372. Precast concrete fencing components shall have a minimum 28 day compressive strength of 30MPa.
Aggregates used in the concrete mix shall comply with SABS Specification 1083 and cement shall comply with SABS Specifications 417, 626 and 831. The coarse aggregate shall be 13,2 mm stone.
Posts and panels shall be mechanically vibrated in steel moulds and reinforced as specified. The curing of the concrete must be for a minimum period of 7 days using an approved method as laid down in SABS Specification 1200G.
The finish of the precast concrete fencing components shall be such that, upon removal from the moulds, no further treatment shall be necessary to provide a straight, smooth and uniform finish free from all honeycombing, holes, pittances and blemishes and equal to that normally obtained from properly manufactured steel moulds.
Where overhangs to the precast concrete fencing are specified they shall extend 350 mm on plan from the centre line of the post at an angle of 45 degrees and shall be cast on at a later stage with a 10 mm diameter deformed reinforcing bar bent as required and cast into top of post. The overhang shall comprise three rows of galvanised barbed wire spaced .150 mm apart, strained and tied to overhang on each post through holes formed in the precast concrete overhang.
At any change in direction of the fence line two precast concrete posts shall be erected with bottom ends embedded in a common concrete base.

Concrete bases for precast concrete posts shall be Class B (1:3:5-19 mm stone) size 400 x 400 x 600 mm deep, unless otherwise specified, with tops of bases 100 mm below ground level.

Precast concrete post and panel fencing shall be of the height specified and shall comprise 125 >< 135 mm precast concrete posts, reinforced with eight 4,5 mm galvanised high tensile steel wires, erected at 1 570 mm centres with precast concrete panels fitted into vertical grooves in concrete posts and grouted up solid in 1:3 cement mortar.
Precast concrete panels shall each be 1 440 mm long, 300 mm high and maximum 65 mm thickness at bottom edge tapering to 55 mm at top edge and reinforced with "Reference 193" welded mesh reinforcement mat. The bottom panel shall in each case be levelled and supported at each end on a brick embedded in top of the concrete base to the post and protruding 100 mm above base.

Precast prestressed concrete post and pale fencing shall be of the height specified and shall comprise precast concrete posts erected at 2 m centres, each twice slotted for and including two horizontal precast concrete rails and nine precast concrete pales spaced equidistantly between posts, bolted through preformed holes to rails with and including 8 mm diameter galvanised mild steel bolts 140 mm long with nut and washer and with bitumastic felt or PVC washer fitted between pale and rail.
Precast prestressed concrete components of post and pale fencing shall be manufactured as previously specified for "precast prestressed concrete posts and stays" unless otherwise described.
Precast concrete posts shall be 3000 mm long, 225 mm thick and 140 mm wide at back, tapering on both sides to 80 mm wide at front edge, with both front edges rounded, and reinforced with six 5 mm stressing wires. Each post shall be twice slotted 95 mm wide and 165 mm high for horizontal rails with top end of each post twice splayed. Precast concrete horizontal rails shall be 1980 mm long, 80 mm wide and 150 mm high, reinforced with four 5 mm stressing wires and each nine times holed for bolts with recesses for nuts formed in back of rails. The ends of the rails shall be grouted up solid in 1:3 cement grout in the slots formed in the posts and the recesses in the backs of the horizontal rails shall be similarly grouted up only on completion of the fencing.
Precast concrete pales shall be 2370 mm long, 75 mm thick and 100.mm wide at back, tapering on both sides to 80 mm wide at front edge, with both front edges rounded and reinforced with four 5 mm stressing wires. The pales shall each be twice holed for bolts with recesses formed in face for head of bolt. The top and bottom ends of each pale shall be twice splayed.
Precast concrete blanking plates shall be 1 700 mm long, 40 mm wide and 300 mm high reinforced with two 5 mm stressing wires. Blanking plates are to be embedded in ground with the top of the blanking plate 100 mm below ground level and with the ends of the blanking plate embedded in the side of the concrete base to the precast concrete post.
Where overhangs to the precast concrete post and pale fencing are specified they shall be formed on the pale, extended 350mm on plan from the centre line of the pale at an angle of 45 degrees and be of the same dimensions as the pale. Sufficient prestressing wire shall be provided beyond the prestressing point to reinforce the full length of the overhang which shall be cast at a later stage.

PAINTING OF POSTS, GATES, ETC.: -

Where gate posts, straining posts, intermediate posts, stays, standards, and gate framing are described as galvanised and used in conjunction with Type I chain link wire mesh fencing they shall be painted, before erection, with two coats of approved bituminous aluminium paint. Where these items are used in conjunction with Type 2PVCcoated chain link wire mesh fencing or precast concrete fencing they shall be painted, before erection, with one coat of calcium plumbate primer as SABS Specification 912, one undercoat as SABS Specification 681 Type II, and two finishing coats of high gloss enamel as SABS Specification 630 Type I.
After erection, any bared or damaged surfaces are to be made good to approval.

RATES FOR FENCING, ETC.:-

Rates for fencing shall include for clearing all fence lines, excavating in all types of materials for fence lines, concrete bases, blanking plates, etc., and any formwork necessary to concrete bases.
Rates for gate posts, straining posts, intermediate posts, stays, standards,etc., are to include for embedding ends in and including concrete bases and for painting as specified.
Rates for gates are to include for setting up in position and hanging and for painting tubular framing as specified.

SUBMISSIONS FOR PREFABRICATED TIMBER ROOF TRUSSES

Letter Ref. TR1

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. TR2

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:

HEAVY DUTY 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 contractor shall carry out the necessary tests to confirm that all materials use in the construction of roadworks comply with the relative material requirements listed hereunder.
The results of all material tests shall be submitted to the Director for acceptance, together with duplicate samples for check testing when required.

EARTHWORKS

Fill Materials Below Subgrade:-

Material used in the construction of the various embankment layers shallbe as provided for hereunder, unless otherwise required by the Director.

Depth Below Finished Road Level	Minimum C.B.R. at 90% MAASHTO density.
0 mm - 300 mm (or as otherwise specified)	Pavement layers (see sections 2.3.0 and 2.4.0)
300 mm - 500 mm (or as otherwise specified)	Selected Subgrade (Section 2.2.3)
500 mm - 1 metre (or as otherwise specified)	3 (max swell 1,5 %)
Over 1 metre	As required by Engineer (max swell 4,0%)

Where rock occurs in the road prism selection shall be exercised to provide for the placing of excavated rock in the base of embankments, unless otherwise required by the Director.

For fill material 1 metre below grade the minimum density in place as a percentage of the MAASHTO density at optimum moisture content shall be 90 %. This criterion shall be deemed to have been complied with provided at least 75 % of the test results on a section, submitted for acceptance control, exceeds 90 % of MAASHTO density and no single result falls below 85 % of MAASHTO density.

Subsoil Drainage Filter Criteria:-

The material used as filter media shall satisfy the following criteria:

(a) The 15 % Passing Size of the filter material divided by the 15 % Passing Size for the fill material shall be greater than or equal to 5 for permeabili ty..

(b) The 15 % Passing Size of the filter material divided by 85 % Passing Size of the fill material shall be less than or equal to 5 to prevent clogging.

Graded filters at the two embankments shall comprise several layers of filter material each of which satisfies the above criteria.

If filter fabric is used, filter media shall be any approved concrete sand.

SUBGRADE

Seleted Subgrade (denoted by codes G5, G6, G7, G8 and G9)

(a) Minimum CBR at 93 % MAASHTO density; G5 = 30; G6 - 25; G7 = 15; G8 = 10; G9 = 7. In the case of G5, a CBR of 45 at 95 % MAASHTO density is also required. If selected subgrade is stabilised the minimum CBR at 93 % compaction after stabilisation = 30.

(b) Maximum CBR swell G5= 0,5 %; G6= 1,0 %; G7, G8, G9+ 1,5 % at 100 % MAASHTO density.

(c) Maximum Plasticity Index: G5 = 10; G6, G7, G8, G9 = 12, Except in the case of G5 material, the Director may approve higher PI based on formula:
Max. PI = 3.GM + 10 where PI = Plasticity Index, GM = Grading Modules = $\frac{P2 + P425 + P75}{100}$ where

P2, P425 and P75 are percentages retained on 2,0 0,425 and 0,075 mm sieves respectively.

(d) Maximum particles size in place: G5 and G6, 63 mm or 2,3rd layer thickness, whichever is smaller. G7, G8, G9, 2/3rd layer thickness.

(e) Grading Modulus: (Minimum) G5 = 1,5, G6 = 1,2, G7 = 0,75.

(f) The minimum density in place as a percentage of the MAASHTO density at optimum moisture content shall be 93 %. For cohesionless sands the minimum compaction shall be 100 % of MAASHTO density. The criterion shall be deemed to have been complied with provided at least 75 % of test results on a section, submitted for acceptance control, exceeds 93 % of MAASHTO density and no single result falls below 88 % of MAASHTO density.

(g) The layer thickness shall not be less than 90% of the specified thickness at any one point, and the mean of 15 values on a section shall not be less than the specified thickness.

Lower Subgrade (denoted by code G10):-

In the lower subgrade (600 mm - 1000 mm below grade or as otherwise specified) the material shall have a minimum CBR of 3 at 90 % MAASHTO density and a maximum swell of 1,5 %.

STABILISED SUBBASE

The subbase material shall comprise of two standards denoted by the code C3 and C4 and shall comply after compaction and stabilisation with the following requirements (a) to (m).

(a) Lime shall comply with SABS 824 and cement shall comply with SABS 471 or SABS 626.

(b) Minimum CBR at 95 % MAASHTO density } C3 = 80
(Provided that the minimum CBR, before }C4 = 50
stabilising, at 95 % MAASHTO density, = 20 }

(c) Maximum CBR swell after stabilisation = 1.0%

(d) The minimum UCS at 100% MAASHTO compaction } C3 = 1,5 MPa
cured for 24 hours at 75 degrees centigrade } C4 = 0,75 MPa
and soaked for 4 hours (for lime) or after }
7 days curing at 25 degrees centigrade and 4 }
hours soaking at 100 % MAASHTO compaction }
(for cement)

(e) Maximum Plasticity Index after stabilisation = 6

(f) Maximum Size of Particle = 2/3rd of layer thickness or 63 mm whichever is smaller.

(g) Maximum percentage passing No.75 micron sieve (before stabilisation) = 25

(h) Grading of Modulus (before stabilisation) = 1,5

(i) The minimum density in place as a percentage of MAASHTO density at optimum moisture content shall be 95 %. This criterion shall be deemed to have been complied with provided at least 75 % of the test results on a section, submitted for acceptance control, exceeds *95* % of MAASHTO density and no single test result falls below 91 % of MAASHTO density.

(j) The moisture content used for field compaction shall not exceed the MAASHTO optimum plus 2,0 %.

(k) The stabiliser content of a section shall be such that 90 % of the samples tested exceed 60 % of the nominal content specified and the coefficient of variation does not exceed 25 % consecutive samples tested.

(1) The pH after stabilisation should be 11 min, unless the lime content is proved to be adequate by the I.C.L test.

(m) The layer thickness shall not be less than 90 % of the specified thickness at any one point and the mean of 15 values on a section shall not be less than the specified thickness.

BASECOURSE

Stabilised Basecourse:-

(Lime or cement stabilised - denoted by Codes CI, C2 or C3)(derived from stabilising G3, G4, G5, G6 or G7 material).

Stabilised basecourse material shall comply after stabilisation and compaction with the following requirements:-

(a) Lime shall comply with SABS 824 and cement shall comply with SABS 471 or SABS 626.

(b) Minimum CBR at 98% MAASHTO density (Provided that }CI N/A
the minimum CBR, before stabilising, }C,2 = 150
at 95 % MAASHTO density, = 30) }C3 = 300

(c) Maximum CBR swell after stabilisation = 0,5 %

(d) The minimum UCS at 100 % MAASHTO compaction cured for 24 hours }C1=6,0MPa
at 75 degrees celcius and soaked for 4 hours (forlime) or after 7 days }C2 = 3,0MPa
curing compaction (for cement) }C3 =1,5MPa

(e) Maximum Plasticity Index after stabilisation = 4.

(f) Maximum Size of Particle = 2/3rds of layer thickness or 63 mm whichever is smaller.

(g) Maximum percentage passing No.75 micron sieve (before stabilisation) = 25.

(h) Grading Modulus (before stabilisation) = 1,75

(i) The minimum density in place as a percentage of the MAASHTO density at optimum moisture content shall be 98 %. This criterion shall be deemed to have been complied with provided at least *75 %* of the test results on a section, submitted for acceptance control, exceeds 98 % of MAASHTO density and no single result falls below 94 % MAASHTO density.

(j) The moisture content used for field compaction shall not exceed the MAASHTO optimum plus 2 %.

(k) The stabiliser content of a section shall be such that 90% of the samples tested exceed 60 % of the nominal content specified and the coefficient of variation does not exceed 25 % of 15 consecutive samples tested.

(l) The pH after stabilisation should be a minimum of 11, unless the lime content is proved to be adequate by the I.C.L test.

(m) The layer thickness shall not be less than 90 % of the specified thickness at any one point, and the mean

of 15 values on a section shall not be less than the specified thickness.

Crushed Rock Basecourse (denoted by Code G1 or G2)

NOTE: G2 differs from GI in that G2 contains fines from other material than the parent rock.

Crushed rock shall comply with SABS 1083 in general and the following in particular:

(a) Plasticity index (maximum) G1 4* } see note
G2 6* }

*NOTE: If percentage passing 0,075 sieve exceeds 9 % then GI must be non plastic, and max. P1 of G2 = 4.

(b) Maximum Flakiness Index of the - 26,5 mm + 13,2 mm material = 35 %

(c) Maximum Aggregate Crushing Value = 29%

(d) The crushed rock shall he sound, free from shale, weathered and decomposed rock, clay and other deleterious matter, and shall meet one of the following grading envelopes whichever is specified in the Project Specification. The grading shall follow a smooth curve parallel to the grading envelope and irregular ('armchair' or 'hump') grading will not be accepted.

Sieve Size (mm)	Percentage Passing (Mass)	
	37,5 mm Max. Size	26,5 Max. Size
37,5	100	100
26,5	84 –94	100
19,0	71-84	85-95
13,2	59-75	71-84
4,75	36-53	42-60
2,00	23-40	27-45
0,425	11-24	13-27
0,075	4-12	5-12

(e) The minimum compacted density expressed as a % of solid or maximum theoretical density shall be 88 % except that where two base layers are constructed, the lower layer may be 86 %. These criteria shall be deemed to have been complied with provided at least 80 % of the test results on a section submitted acceptance control exceeds 88 % or 86% of solid density, as applicable and no single test result fall below 84 % for upper base, or 82% for lower base.

(f) Where fines from a source other than the parent rock are used in G2 material, such fines shall be approved by the Director, before blending.

(g) The layer thickness shall not be less than 90% of the specified thickness at any one point, and the mean of 15 values on a section shall not be less than the specified thickness.

*Lime or Cement Treated Crushed Rock Basecourse (denoted by Codes CI, C2 or C3) (Derived from stabiling G1 or G2 material):*All requirements for Crushed Rock Basecourse as set out above shall apply, except for Clause (e) therein. In addition, the following provisions of Clauses (a), (b), (e), (i), (j) and (k) of the previous section relating to Stabilised Basecourse shall apply.

Crushed Gravel or Lower Quality Stone Basecourse (denoted by G3 or G4): -

G3 and G4 materials may be used either stabilised or unstabilised. When stabilised with lime or cement the provisions of Clauses (a), (b), (c), (d), (e), (i), (j), (k), (l) and (m) of the section relating to Stabilised Basecourse shall apply. G3 and G4 materials wither laid unstabilised or before stabilising shall comply with the following requirements.

(a) Grading: G3 material shall comply with Clause (d) of the section relating to Crushed Rock Basecourse.

G4 material shall comply with the following grading:

Sieve Size (mm)	Percentage Passing (Mass)
53,0	100
37,5	85-100
19,0	60-90
4,75	30-65
2,0	20-50
0,425	10-30
0,075	5-15

(b) Maximum plasticity index shall be 6, maximum liquid limit 25 and maximum linear shrinkage 3 %.

(c) Minimum CBR after soaking: 80 at 98 % MAASHTO, and maximum swell 0,2 % at 100 % MAASHT'O. When G4 is used as unstabilised base the grading shall follow a smooth curve parallel to the grading envelope, and irregular ("armchair" or "hump") grading will not be accepted. Unstabilised G3 and G4 base shall be compacted as for GI or G2 Crushed Rock Basecourse, and the provisions of Clauses (e), (f) and (g) shall apply, in respect of density, additional fines, and layer thickness.

BITUMEN OR TAR BOUND BASE COURSE/BITUMEN BOUND WEARING COURSE

Coarse aggregate:-

Shall be hard, durable and sound crushed unweathered rock free from deleterious material conforming to SABS 1083 in general and to the following requirements in particular when tested before mixing:

(i) The aggregate crushing value shall not exceed 25 for wearing course and 29 for basecourse.

(ii) The flakiness index shall not exceed 35.

(iii) The maximum absorption of the aggregate shall be 1,0 % when tested in accordance with SABS test method 843.

(iv) The grading of the aggregate shall comply with the following requirements before mixing:

Sieve Size (mm)	Percentage Passing Sieve (mm)			
	Nominal Aggregate Size (mm)			
	26,5	19,0	13,2	9,5
37.50	100			
26.50	85-100	100		
19.00	0-50	85-100	100	
13.20	0-25	0-50	85-100	100
9.50	0-5	0-25	0-55	85-100
6.70		0-5	0-25	0-55
4.75			0-10	0-25

Fine Aggregate.

(i) Fine aggregate shall consist of a blend of crusher dust and clean, hard, non-plastic sand. Continuous and semi-gap graded mixes shall contain a minimum of 15 % of crusher dust, (expressed as a percentage of the total aggregate in the mix). The grading shall generally fall within the following limits when tested before mixing

Sieve Size (Microns)	Percentage Passing Sieve (mass)	
	Sand	Crusher Dust
9500	-	100
4750	-	90-100
2360	100	70-90
1180	90-100	40-70
600	80-100	30-50
300	60-80	20-40
150	30-50	10-25
75	8-20	8-16

(ii) The mean Sand Equivalent of 5 random samples from the batch tested shall not be less than 35. If two or more sands are blended, the minimum sand equivalent of any one sand shall be 25.

(iii) The maximum water absorption of the sand shall not exceed 0,5 % when tested in accordance with TMHI method BI5.

Filler:-

The filler shall consist of milled blast furnace slag, limestone dust, or cement in accordance with the requirements for filler material of BS 594 specification. The type of filler shall not be varied during the contract.

Combined Aggregate (Final) Grading:-

A grading of the combined aggregates, submitted by the Contractor, shall be approved by the Director prior to laying from the envelopes given below. During construction the material laid shall conform to the approved grading subject to the tolerances specified under heading Composition of Mix.

Sieve Size	Percentage Passing Sieve (Mass)						
	Base or Wearing Course				Wearing Course		Kerbs
	Semi Gap		Continuous		Gap		Continuous
	26mm. TS;BS; AS.	I9mm TS;BS; AS.	I9mm BC;TC	I3mm AC	Low Stone AG(l)*	High Stone AG(h)*	
37,5	100						
26,5	90-100	100	100		100	100	
19,0	80-95	92-100	85-95	100	90-100	90-100	100
13,2	65-85	82-92	71-84	85-100	80-100	80-100	85-100
9,5	60-80	73-86	62-78	70-90	50-85	40-80	
4,75	45-60	45-60	42-60	50-70	50-60	35-50	65-80
2,36	40-52	40-52	30-48	35-50	50-60	35-50	50-65
1,18	36-47	36-47	22-38	25-40	50-60	35-50	
0,60	32-42	32-42	18-20	40-55	40-55	30-50	
0,30	24-34	24-34	12-20	12-20	20-45	20-45	18-30
0,15	10-20	10-20	8-15	8-15	10-30	10-30	
0,075	5-10	5-10	5-10	5-10	5-10	5-10	5-10

* Not more than 8 % of material shall pass the 4,75 mm sieve and be retained on the 1,18 mm sieve.

Binder: The Binder shall be 40/50 or 60/70 penetration bitumen conforming to the latest SABS 307 Specification or RTH 50/55 tar conforming to latest SABS 748 Specification.

COMPOSITION OF MIX: BITUMEN OR TAR BOUND BASECOURSE AND WEARING COURSE

Final Composition:

The final composition of the mixture laid on the road shall conform to the approved grading or to such amended aggregate or binder contents as may be ordered by the Director, subject to the following limits:

Material	Tolerance (% Mass of total mix)	
	75 % of all results	All results
Course Aggregate (% mix retained 2,36 mm Sieve)	plus/minus 4	plus/minus 6
Fine Aggregate (% Mass passing 2,36 mm retained)	plus/minus 4	plus/minus 6
Filler (% Mass material passing 0,075 mm Sieve)	plus/minus 1,5	plus/minus 2
Bitumen	plus/minus 0,3	plus/minus 0,5
Tar R.T.H. 50/55 + 11/2 % PVC	plus/minus 0,3	plus/minus 0,5

Ant deficiency in filler content of the mix shall be made up with filler meeting the requirements of BS 594 specification.

Mix Proportions and Marshall Design Criteria

These shall fall within the following limits:

Property	Limits				
	Base or Wearing Course			Wearing Course	Kerbs
	Gap	Semi-Ga	Continuous	Open	Continuous
Binder Content (nominal %) bitumen	5,5-7,0	5,2-6,2	4,8-5,8	5,5-6,5	5,5-6,5
tar	-	6,5	6,0	-	-
Active filler (min%)	1	-	-	1	-
Stability at 60 degrees celcius (min kN)	5	5	5	3,5	3,5
Flow (mm2-4	2-4	2-4	-	2-4	
Stability/Flow min kN/mm)	2,5	2,5	2-5	-	-
Air Voids (%)	3-7	3-7	3-7	15 min	3-7
Immersion Index (min %)	75	75	75	-	-

Compaction:-

The minimum density as a percentage of the theoretical maximum density = 92.

Temperature Controls/ degrees Celcuis:-

These shall be as follows: -

Type	Material and Construction Stage					
	Bituminous	Binders		Aggregates	Bituminous Mixes	
	In Storage	Immediately before mixing		Immediately before mixing	Continuous Semi-gap or graded	Open Graded
	min. max. min. max.		min. max	min. max. min. max		
Bitumen				except for drum mixed		
40/50 pen.	145 195	150 180		)	)	
60/70	135 185	140 170		)	)	
80/100	125 175	130 160		)120 160	)120 160	110 130
150/200	115 165	120 150		)	)	
Road Tars						
RTH45/5O	95 110	90 110		)80 115	)80 115	-
50/55	10 110	90 110				

Variations:- The Contractors attention is drawn to the right of the Director to amend the specification in any respect, subject to the provisions for adjusted measurement and payment.

PRECOATED AGGREGATE SURFACING

Aggregate:-

The aggregate shall be hard, durable and sound crushed unweathered rock, free from deleterious material, conforming to SABS 1083 in general. The nominal size shall be 19 mm or 16 mm and comply with the following requirements when tested before coating:-

(a) The aggregate crushing value shall not exceed 21 % when tested in accordance with TMH 1 Method B1.

(b) The flakiness index shall not exceed 20 (the shape of the individual aggregate shall be as near cubical as possible).

(c) Grading requirements of chips shall be as follows:-

Sieve Size (mm)	Percentage Passing Sieve by Mass		
	19mm	I6mm	I3mm

26,5	100		
19,0	85-100	100	
16,0	-	85-100	100
13,2	0-30	0-60	85-100
9,5	0-5	0-5	0-30
4,5	-	-	0-5

(d) The PSV (polished stone value - SABS 848) shall not be less than 50.

Precoating: The aggregate shall be precoated using approximately 1 % by mass of the binder used in the wearing course. During wet weather, stockpiles must be covered with tarpaulins or similar protective coverings.

SURFACE TREATMENTS

Aggregates:-

The aggregates shall be hard, durable and sound, crushed unweathered rock, free from deleterious material, conforming to SABS 1083 in general and the following in particular:-

(a) The Aggregate Crushing Value shall not exceed 21.

(b) Grading and flakiness requirements shall be as follows:-

Sieve Size	Percentage Passing Sieve by Mass Nominal Aggregate Size (mm)				
	19	16	13,2	9,5	6,7
26,5	100				
19,5	85-100	100	100		
16,5		85-100			
13,2	0-30	0-60	85-100	100	
9,5	0-5	0-5	0-30	85-100	100
6,7			0-5	0-30	85-100
4,75				0-5	0-30
3,75					0-5
Flakiness Index(ma	25	25	25	35	N.A.

(c) The percentage fines passing the 0,075 mm sieve shall be less than 0,5.

(d) The P.S.V. (polished stone value - SABS 848) shall not be less than 50.

KERBS

Generally

The kerbs are to be laid before the base course is commenced to the lines and positions as shown on the drawing. 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 consolidating bottom under kerbs and for filling and ramming to secure the kerbs in position.

Precast Concrete Kerbs

Precast concrete kerbs are to be of concrete Class 20 (20 MPa) and of the sizes described in the items, cast generally in I m 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 arid pointed with a keyed-in joint on top edge and exposed sides.

SUPPLEMENTARY PREAMBLES

The following Supplementary Preambles are to be read in conjunction with the "Standard Preambles to all Trades WB20" included herebefore 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.

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 Director) 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 Director 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 Director 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 Director 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, airconditioning, gas and telephone installations, etc. is included elsewhere in this document.

The Contractor must take the emergencies of the Hospital Service into consideration. Liaison is to be carried out through the offices of the Secretary for Works, with referrals to the Chief Director: Professional and Technical Services 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 Director in writing before they are put in hand.

CONCRETE, FORMWORK AND REINFORCEMENT

Cement is to comply with:

SABS ENV 197 (1 to 2)
SABS ENV 413 (1 to 2)
SABS ENV 196 (1 to 7)
SABS ENV 196 (21)

as applicable. and replaces the following SABS Specifications in the Standard Preambles:

SABS 471 Portland cement (ordinary, rapid hardening and sulphate resisting)
SABS 626 Portland blast furnace cement.
SABS 831 Portland cement 15 (ordinary and rapid hardening)

MASONRY

Masonry is to comply with SABS Code of Practice *0249* and 0164 as applicable.

ROOF COVERINGS, ETC.

The installation of roof coverings and side claddings is to comply with SABS Code of Practice 0237 as applicable.

CARPENTRY AND JOINERY

Reference must also be made to the appropriate Standard Preambles and SABS requirements far 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 SABS 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 a moisture content of 12%, and is to comply with SABS 1099 as applicable.

Hardboard is, unless otherwise described, to be 3 mm untempered hardboard for floor units and 6 mm

tempered hardboard for wall units.

Chipboard is, unless otherwise described, to be 16 mm thick.

Melamine faced chipboard is to be 16 mm thick with a white melamine impregnated finish on both sides. Melamine faced chipboard in adjustable shelving is to be of the width as described with white plastic pre glued edge strips, or fixed with contact adhesive, or similar, to both edges and ends of the shelves. The number of shelves is stated in descriptions.

Materials generally are to comply with the following specifications and requirements as applicable:

MATERIAL	SABS Specification	Grade or Class
Softwood structural timber	1783)	
S6ftwood engineering timber	1783)	
Softwood studs for timber frames in building	1783)	Parts 1, 2, 3.4
Softwood brandering and battens	1783)	
Softwood joinery timber	1783)	
Softwood flooring boards	629	Flooring grade Heavy flooring board
Hardwood joinery timber	1099	Knotty grade
Hardwood strip flooring	281	As specified
Wooden ceiling and panelling boards	1039	As specified
Laminated timber (glulam)	1460	As specified
Gypsum, plasterboard	266	
Wood fibreboard	540	As specified
Wood wool panels (cement bonded)	637	- -
Fibre cement sheets : profiled and flat	685	As specified
Fibre cement boards	803	As specified
Plywood and composite board	929	As specified
Particle board : highly moisture resistant exterior and flooring type	EN 312)	Parts 1 to 7
Particle board : interior type	EN 312)	
Decorative laminates	SABS ISO 4586 and)	High pressure
Decorative Melamine Faced Boards	SABS 1405 1763)	

MATERIAL	SABS Specification	Grade or Class

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	SABS Code of

Practice

CEILINGS AND PARTITIONS

Refer to Joinery Fittings regarding specifications and requirements of materials.

IRONMONGERY

Materials

i Locks are to comply with SABS 4 as applicable

ii Door closers are to comply with SABS 1510 as applicable

iii Symbolic safety signs are to comply with SABS 1186 as applicable All ironmongery, unless

otherwise described, is fixed to timber.

Sheet steel furniture to comply with SABS 757 as applicable

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.

Electro-plating is to comply with SABS ISO 1456 as applicable.

Aluminium Windows and Doors

NOTE:

Glazed aluminium alloy windows and sliding doors for external use are to comply with SABS 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 SABS 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 wih SABS CKS 55 and BS 952 as applicable.

Safety and security glazing materials for buildings is to comply with SABS 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 elsewhere.

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 300 mm beyond the line of the alteration on the existing structure.

TILING

Ceramic Wall and Floor Tiles are to comply with SABS 1449 as applicable.

PLUMBING AND DRAINAGE

Water Supply and Drainage for Buildings is to comply with SABS Code of Practice *0252* as applicable.

Water Supply and Distribution System Components is to comply with SABS 1808 as applicable.

Electrical Water Heater - Storage Heaters to comply with SABS 151.
- Instantaneous Heaters to comply with SABS 1356 and IEC 335(2-35).

GLAZING

Glass is to comply with BS 952.

Glass for glazing is to comply with SABS CKS 55.

Safety and security materials are to comply with SABS 1263 as specified.

Laminated safety glass is to carry a written five year guarantee.

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

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.

Each draw box is to be fitted with slip-on lid with a 13 mm skirt. The box shall be 75 mm deep, shall be rectangular in shape and the size of conduits entering or leaving the box. Conduits shall be fixed to the box by means of couplings and brass male bushes or lock nuts and brass bush-nuts.

Conduit droppers shall be neatly cut into timber wall plates and set to face the right direction. All sets must be uniform. Conduits may be set at angles only where droppers or ceiling points are within 230 mm of roof members.

No conduits are to be run over the top of gangplanks or trapdoors.

Draw-in boxes with metal covers shall be provided where required and shall be installed near the gangplanks, if any. All inspection conduit fittings in open roof spaces shall face upwards to facilitate wiring and to permit easy inspection. Three-way conduit boxes shall be used for tee-off purposed in open roof spaces. Inspection tees are not to be used except where otherwise agreed or specified.

All conduits extended into a roof space with a roof clearance of more than 900 mm shall be set onto the beam and extended into the roof for a distance where there is sufficient clearance. Under flat roofs or where there is less than 900 mm clearance, the conduit shall be installed as specified for tubing in concrete slabs, right angle bends should be kept to a minimum and the shortest route taken.

Where false ceilings occur they shall be tubed as called for in the detailed specification. Conduits in restricted spaces and run as for concrete slabs must however, be installed in a neat and orderly manner.

Conduits to ceiling points for all types of fittings must be firmly supported and shall terminate in a back entry conduit box. The conduit box shall be taken through to the face of the ceiling and finish flush. Where the ceiling brandering interferes with the installation of the ceiling point specified, the Contractor must trim the brandering to allow the conduit box to be taken through to the face of the ceiling as specified. Luminaires must be bonded to the conduit box by means of metal threaded screws.

2.3 In Concrete Slabs

In order not to delay building operations, the Contractor must ensure that all conduits and conduit fittings, which are to be cast in concrete, are laid in good time. The Contractor shall have a competent Electrical Artisan standing by during casting of concrete, etc, to ensure that the conduit boxes are not damaged during casting of concrete.

Draw boxes, expansion joints boxes and round conduit boxes are to be provided where necessary.

Deep type conduit boxes shall be used for side entering conduits and normal shallow boxes may be used for back entry conduits. No elbows, bends or sharp sets will be allowed in concrete slabs except in cases of conduits of 40 mm diameter or when larger sweeping bends will be permitted.

Common drawn and/or inspection boxes shall be used where there is more than one circuit involved. They shall be installed in lavatories, storerooms, or other inconspicuous places. Covers shall be of hardboard neatly finished to match the finished ceiling or wall surface, and shall be fitted parallel to the wall or ceiling.

All boxes, etc. are to be securely fixed to the shuttering to prevent displacement when concrete is cast. All conduits must be laid off the deck, supported and secured at regular intervals and installed as close as possible to the neutral axis of concrete beams and slabs.

Expansion joints shall be shown on layout drawings and shall consist of a metal box in which one conduit is fixed and the other capable of movement with the building's expansion and contraction. Earth continuity of these joints shall be maintained by means of stranded copper conductors bonded to the conduits in the box as shown on the drawing.

Earth conductors and clamps buried in concrete are not permitted.

Conduits must be spaced sufficiently apart to allow for proper concreting. All joints shall be painted with an approved metal primer after completion of the tubing installation, prior to the concreting. All exposed parts of the conduit installation shall be suitably, protected against corrosion at the discretion of the Head : Works.

Before any concrete slab is cast, all conduit droppers to switchboards shall be neatly spaced and rigidly fixed.

2.4 Surface Work

All conduit must be plumbed and leveled and only straight lengths shall be used.

In cases where doorframes are out of plumb, or fittings, beams etc, are out of level, the conduit shall be run parallel with the doorframes, fittings, beams etc.

No threads shall be visible when the conduit installation is complete, except on running couplings.

Running couplings shall only be used where unavoidable and shall be fitted with a sliced coupling as a lock nut.

No inspection or normal bends are to be used on surface work, except with the approval of the Works Inspector and where conduits of 32 mm diameter or larger are used. Conduits shall be set uniformly and inspection couplings shall be used where necessary.

Fittings, tees, boxes, couplings, etc, are to be cut into the surface to allow the conduit to fit flush against the surface or alternatively spacer bar saddles may be used. Conduit is to be bedded into any irregularities to avoid gaps between the surface and the conduit.

Double sets, where used, shall be parallel with no twists and shall be as short as possible. All conduits, which terminate at metal trays, boxes, industrial switches and plugs shall do so by means of couplings and male bushes. No couplings will be permitted in droppers of lengths less than 3.6 m.

Where crossings of conduits is unavoidable, purpose made metal boxes shall be used. The length of the box is to be 8 times the diameter of the largest conduit, the width one and half times the sum of the diameter of al the conduits, and the depth one and half times the diameter of the largest conduit with a minimum depth of 50 mm. The box shall be fitted with a neatly fitting cover and the finish shall be in keeping with the general layout.

Where a number of conduits are to be installed in parallel they shall be evenly spaced and grouped under one purpose made saddle. Conduit spacing shall not exceed 10 mm. The purpose made saddle shall be made of 25 x 2 mm galvanised steel strip or other approved material, formed to suit the curvature of the various conduits and shall be drilled and fixed by means of screws between. Saddles shall be spaced at intervals not exceeding 1.8 m, except for conduit droppers, which shall be saddled centrally between ceiling and accessory box. All saddles are to be secured to the wall by means of black japan or brass rounded head screws. Distribution boards, draw boxes, industrial switches and plugs, etc, shall be neatly recessed into the surface of plastered walls to avoid double sets or alternatively spacer bar saddles may be used. On face brick walls the conduit shall be tightly set into the switch or plug.

In situations where there are not ceilings, the conduits are to be run along the wall plates and tie beams.

No wiring is to be carried out until the tubing has been inspected and approved.

Where spacer bar saddles are used, these shall be installed at centers of 1 m for horizontal and 1.5 m for vertical runs.

All conduits shall be painted with an approved enamel paint to match the background colour.

2.5 Future Extensions

In roof spaces with a minimum clearance of 900 mm, switch and plug drips for future use are to be set 300 mm in the correct direction and shall be threaded and fitted with plugged couplings. Where the roof over a slab is to be removed for future expansions, conduits for future use are to terminate 40 mm above tie beams and shall be threaded and fitted with plugged couplings.

Where future extensions are to be below slabs, all switch, socket outlet and other conduit droppers are to terminate 130 mm below slabs or beams with conduit ends threaded and fitted with plugged couplings.

Where provision is made for future extensions to a concrete slab, all conduits required for future use are to project 130 mm from the slab. Conduit projections are to be painted with an approved anti-corrosive paint and must be fitted with plugged couplings.

All switch, plug and other outlet boxes required for future use shall be fitted with approved blank cover plates.

Unused lighting outlet boxes are to be fitted with round hardboard or plastic covers with brass cover screws, which shall fit flat on the finished ceiling.

2.6 Fixing of Conduits

Conduits shall be fixed to switch and socket outlet boxes by means of couplings and brass male bushes or lock nuts and brass bush nuts. Couplings and male bushes to be used on all surface work.

2.7 Chases and Building Work

Except where otherwise specified conduits, switch boxes, plug boxes and distribution boards are to be built into the brick walls by the Contractor. It will, however, remain the responsibility of the Contractor to ensure that the above-mentioned boxes and distribution boards are correctly built in and are firmly bedded and cemented into the walls, plumb and square.

The Contractor shall, unless otherwise specified, do all necessary chasing and cutting of bricks. All electrical materials (e.g. conduits up to 40 mm for UG cables, conduits, conduit boxes, distribution boards etc) must be supplied by the Contractor who must arrange to have these on site, and positioned when required for the building work. A competent Electrical Artisan must be in attendance and ensure that the conduits etc are correctly installed and positioned.

The Contractor is to ensure that tubing installed in chases is securely nailed and covered by a layer of 5:1 mixture of coarse sand and cement, finished flush with brickwork and that switch and plug boxes finish flush with the finished wall surface.

The Contractor is to ensue that below distribution boards connected by means of underground cables, a 230 mm wide by 115 mm deep cavity in the wall from the cable pipe to the distribution board is to be provided by the Contractor, or alternatively, cable sleeves as specified.

3. PLUGGING OF WALLS

Only approved plastic plugs shall be used to secure conduit or equipment up to 5kg mass. The use of round-headed screws only will be permitted.

Heavier equipment shall be secured by means of approved expansion bolts.

Wood plugs and any plugs in the joints in brick walls are not permitted.

4. FIXING TO CONCRETE CEILINGS

Ceilings mounted equipment other than luminaires shall be secured to concrete ceilings by means of expansion bolts, shot bolts or "Robot" tools bolts or as expressly specified for the service.

5. WIRING

5.1 PVC Insulated Single Core Medium Voltage Conductor

The conductor is to be of high conductivity copper wire insulated with Polyvinyl Chloride. The cable shall be finished in the required colours and shall be in accordance with SABS 1507 and 1574.

Circuit wiring shall be of the Loop-in system and no wiring joints in the conduit or conduit fittings will be permitted. Not more than two conductors of a kind will be allowed at any outlet point. the end strands of cables, whether single or looped which have to be connected to terminals of switched, plugs, lamp-holders, fittings and distribution boards, etc, are to be tightly twisted together. Cutting away of wire strands of any cable will not be allowed. Only one circuit in any one conduit will be permitted unless otherwise specified.

Conductor sizes shall be as follows except where otherwise specified:

Lighting circuits	1,5 mm²	
Bells circuits	1,5 mm²	
Clock circuits	1,5 mm²	
Incinerator circuits	2,5 mm²	
Ironing circuits	2,5 mm²	with 2,5 mm² insulated earth wire
Plug circuits	4,0 mm²	with 2,5 mm² insulated earth wire
Geyser circuits	4,0 mm²	with 2,5 mm² insulated earth wire
Heater circuits	4,0 mm²	with 2,5 mm² insulated earth wire
Stove	10 mm²	with 6,0 mm² insulated earth wire
Motor circuits		
Up to 4kW single phase	4,0 mm²	with 2,5 mm² insulated earth wire
Up to 11kW three phase	4,0 mm²	with 2,5 mm² insulated earth wire

To avoid deformation of PVC insulated cables at temperatures in excess of 57° C, they shall not be brought directly on to the terminals of appliances such as electric heaters, or any other electrical appliances or apparatus (including luminaires) which have a temperature in excess of 57° C. They shall terminate in a suitable terminal box as near to the appliance or fittings as possible and connect up from thereon, with heat resistant conductor.

6. MOUNTING AND POSITIONING OF LUMINAIRES

Luminaires and installation to comply with SABS 1464 Parts 1 to 22 and IEC 598-1 and IEC 60598 as applicable.

The contractor shall, in the case of board and acoustic tile ceilings (i.e. as opposed to concrete slabs), ensure that the luminaires are symmetrically positioned with regard to the ceiling pattern.

The layout of the luminaires as indicated on the drawings shall be adhered to as far as possible. The exact positions must be confirmed on site with the Head : Works.

Except where otherwise specified, pendant luminaires are to be mounted with the bottom of the fittings 2,5 m above finished floor level, mounted on either metal discs or wood blocks.

Under no circumstances shall cover strips be cut to accommodate wood blocks. Wood blocks must be neatly slotted to fit over cover strips and are to be secured by a minimum of two screws, which shall penetrate at least 25 mm into solid wood. Ceiling cover strips shall be neatly cut to accommodate fluorescent luminaires.

Where ceilings are raked, all incandescent luminaires are to be mounted on shaped leveling wood blocks securely fixed to the ceiling. Batten holders shall be secured to woodblocks by suitable brass screws. Fluorescent luminaires are to be mounted direct on raked ceiling without leveling blocks.

Fluorescent luminaires to be mounted on concrete ceilings shall be screwed to the outlet boxes and additionally supported by means of 50 x 6 mm expansion bolts. The bolts are to be ¾ of the length of luminaires apart.

Where a number of luminaires are installed end to end, outlet points must be provided after every second luminaire unless otherwise indicated on the drawing.

The luminaires are to be joined together by means of 20 mm conduit nipples, lock nuts and male brass bushes, and the wiring led through the channels of the luminaires. The Contractor shall ensure that all such rows are correctly lined up and that the rows are parallel with the relevant building line.

The luminaires are to be jointed together by means of 20 mm conduit nipples, lock nuts and male brass bushes, and the wiring led through the channels of the luminaires. The Contractor shall ensure that all such rows are correctly lined up and that the rows are parallel with the relevant building line.

Incandescent luminaires are to be screwed directly to outlet boxes in concrete slabs and in board ceilings. In board ceilings the conduit box and the conduit shall be secured to the timberwork of the ceiling in such a manner that it shall support any incandescent luminaire, which is designed to be fixed to a normal conduit box.

Fluorescent luminaires shall be secured to board ceilings by means of the conduit box and 6 mm bolts passing through the boards and brandering.

7. BATTEN HOLDERS

B.C. batten holders shall be of brass or moulded plastic reinforced type complete with shade ring. The batten holders shall comply with SABS IEC 60238 and SABS IEC 61184. All lamp holders are to have brass terminals with screw type connection.

8. LAMP HOLDERS

Edison screw lamp holders	:	SABS IEC 60238
Bayonet lamp holders	:	SABS IEC 61184
Lamp holders for tubular fluorescent lamps	:	SABS IEC 60400

B.C. screwed lamp holders shall be of brass 20 mm E.T. complete with shade ring and shall comply with SABS IEC 60238 and SABS IEC 61184 with screw type connection terminals.

9. SWITCHES AND SOCKET OUTLETS

Switches SABS IEC 60669 as applicable and socket outlets SABS IEC 60884 as applicable shall be of the most modern manufacture and bear the SABS mark.

Flush switch and plug cover plates shall, unless otherwise specified, be of anodized aluminium of thickness not less than 0,9 mm, satin or other approved finish as directed and otherwise to be fully in accordance with SABS IEC 1084 for cover plates and SABS 1085 for wall boxes.

10. POSITIONS OF SWITCHES AND SOCKET OUTLETS

Except where otherwise specified, lighting switches and socket outlets are to be installed 1,4 m above finished floor level.

All mounting heights specified are to be measured from finished floor level to the bottom of the outlet box.

Where the lower portion of the wall consists of face brickwork and the upper portion of plastered finish, switches and socket outlets are to be mounted in the plastered surface, provided that the lower edge of the plasterwork does not exceed a height of 1,5 m above finished floor level in which case the switches or socket outlets are to be installed in the face brick dado.

Where socket outlet and switch boxes have been installed with fixing lugs below finished wall surface, only approved distance pieces required to compensate for the recess shall be used. The lengths of distance pieces are not to exceed 15 mm.

Unless otherwise approved, light switches adjacent to doors are to be installed at the lock side of the door. Where the lock position is not indicated on the drawings, its position shall be ascertained before the switch box is installed. Switches are to be installed 150 mm from the reveal, or centrally if there is a fitting near the door.

All switch and socket outlet boxes shall be installed plumb, and built into the wall with a 1:1 mixture of cement and sand.

Industrial type switches and socket outlets shall be neatly recessed into the surface of plastered walls to avoid sets or alternatively spacer bar saddles may be used.

Deep type boxes may be used where switches or socket outlets are back to back, but where one side only is to be utilized at the time and the other is for future use, the side for future use shall be suitably covered with a metal cover plate.

11. LOW TENSION SWITCHBOARDS

Low Voltage switch gear and control gear to comply with SABS 1473 and SABS IEC 60947 and SABS 60349.

Where switchboards are to be installed in switch rooms or switch cupboards, the Contractor must ensure that the boards are manufactured to suit the dimensions of the rooms or cupboards.

Low tension switchboards shall be specified in detail for each service, but shall generally conform to the following:

They are to be of strong and rigid construction, with suitable angle, channel or folded steel framework. They are to be flush fronted and totally enclosed with sheet steel panels suitably formed at the edges and reinforced to prevent distortion. Unless otherwise directed, all front panels must be at least 2 mm thick and all other panels at least 1.6 mm thick. Panels are to be secured to the framework with studs and chromium plated dome nuts (self-tapping and similar screws are not permitted).

Switches, etc, are to be mounted on metal frames within the boards to give flush front panels. Equipment of normally surface mounted types such as energy meters, time switches and contractors, are to be mounted on inner metal trays behind hinged front panels. In the case of supply authority meters the hinged front panels must have transparent inserts.

All metal work of the boards must be thoroughly degreased, primed with PA 10 self etching primer and finished with one coat of undercoat and two coats of electrical orange high gloss enamel, unless otherwise specified.

All accessible current carrying parts, bus-bars, connecting strips, collector bars, etc, are to be adequately insulated in phase colours and suitably braced to withstand projected fault currents.

Connecting strips and collector bars must be of sufficient cross sectional area to carry full rated current of the switches served, irrespective of the fuse of trip rating.

The complete distribution board including bus-bars must be suitably constructed to withstand fault currents specified.

Connections to bus-bars are to be made by means of lugs suitably bolted and locked with high tensile bolts and connections to lugs must be effected by means of a crimping tools.

Incoming and outgoing bus-bar studs, where required, must be suitably insulated where they pass through panels of the board, and firmly supported within the board.

Where applicable, incoming and outgoing collector bars for cables in parallel must so arrange that the multiple cable ends can be connected to the bars with reasonably short tails which do not have to cross.
Cable supports must be placed at suitable heights having regard to the bending radius of the cables concerned and convenience in making off.

Wall-mounting and floor-standing back to wall type boards must be provided with full easy access to all equipment and wiring without any necessity of disconnecting or removing of any of the equipment mounted in the board.

Clear visible indication of all switch positions must be provided and the switches must be clearly labeled as directed by the Head : Works.

The details of construction proposed, and the Head : Works must approve all equipment of switchboards: Works before manufacture is commenced.

12. DISTRIBUTION BOARDS

12.1 Approval

The Head : Works must approve the details of construction proposed and all equipment within distribution boards: Works before manufacture is commenced.

12.2 Flush Mounting Distribution Boards

These shall be generally manufactured in accordance with SABS 1765. The board shall consist of two panels fitted side by side with common bonding tray and attached to a common architrave. One panel shall accommodate all single phase MCB's and the second panel shall accommodate the main isolator, main bus-bars and the triple pole MCB's. Chassis shall be of rigid channel section rust proofed steel with clip-on trays for the single pole MCB's. The main isolator is to be mounted at the bottom of the second panel with the triple pole circuit breakers above.

12.3 Surface Mounting Distribution Boards

These shall be generally manufactured in accordance with SABS 1765, with two panels as for flush boards.

12.4 **Single Phase Distribution Boards**

Single Phased boards shall be generally constructed as three phase boards except they shall have a single panel. Single phase boards shall be mounted with the bottom of the architrave 1,5 m above finished floor level unless specifically directed otherwise.

12.5 **Distribution Board – In Roof Spaces**

Where distribution boards are installed below a roof space, a minimum of 2 x 20 mm and 1 x 25 mm spare conduits are to be run from the distribution board into the roof space.

13. **METER BOXES**

The meter box shall be mounted with the top 1,7 m above finished ground level. Surface mounted meter boxes shall be secured by at least 4 x 10 mm expansion bolts.

Service cables entering the meter box shall be protected by means of a suitably sized galvanised pipe extended 450 mm below the ground surface and securely saddled to the wall and bonded to the meter box.

14. **CONNECTIONS TO OUTLETS**

14.1 **General**

Where connectors are used to connect to the wiring of luminaires and other appliances, the connectors shall comply with SABS Specification 1239.

14.2 **Connection to Stoves**

14.2.1 **General**

The connection to an electric stove, unless otherwise specified shall consist of 2 x 10 mm² conductors and a 6 mm² insulated earth wire in 25 mm conduit. The stove shall be controlled by a 60 Amp micro gap switch of approved make and the connection shall be by means of a 45 Amp 3 pin stove plug of the "Cape Town" type. Cable ends, which are to be connected to the stove, shall be equipment with suitable soldered or crimped lugs. The connection between the stove plug and stove shall be by means of flexible conduit.

Except for high school domestic science unit kitchens (see Clause 14.2.2), the conduit shall be chased into the wall and fitted with a switchbox for housing the micro gap switch and a 25 mm circular conduit box over which the stove plug will be mounted. The stove plug shall be fitted with an adaptor plate and shall be screwed directly to the conduit box by means of round head metal screws. The plug outlet shall face downward.

The stove plug and switch shall be mounted 430 mm and 1,4 m respectively above finished floor level unless otherwise specified or indicated on the drawings.

14.2.2 Stove Connections in High School Domestic Science Unit Kitchens

Connections to stoves in High School Domestic Science Unit Kitchens, where the stoves are situated in front of a fitting, shall be generally as specified in Clause 14.2.1 except that the 25 mm diameter conduit shall be run in the floor slab, from the distribution board to a position to the right of the stove. A pedestal, which is complete with a 45 Amp 3 pin "Cape Town" type cooker plug, mounted on the back, shall be fitted over the conduit and securely bolted to the floor by means of expansion bolts. The plug circuit, which passes through the pedestal, is to be on a separate circuit.

14.3 Connections to Hot-water Cylinders

The connections to hot-water cylinders not exceeding 3kW loading shall consist of 2 x 4 mm^2 PVC conductors and 1 x 2,5 mm^2 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 mm^2 unless otherwise specified.

14.5 Underground Service Connection

This clause refers to underground service connections not provided by the Supply Authority.

The service cable and earth wire to be connected at the supply point in accordance with Clause 15.8 of this specification, and unless otherwise specified, shall be aid 600 mm below ground level throughout and otherwise fully in accordance with Clause 15 and all applicable sub-clauses thereof. Cable entries to meter boxes shall be in accordance with Clause 13 and other entries shall be by pipe or duct as directed.

14.6 Connections to Outbuildings

Connections to outbuildings shall be made by means of underground cable only, laid in accordance with Clause 15 and all applicable sub-clauses.

Where the cable is run from the roof space of the main building, it shall be enclosed in suitably sized galvanised pipe built into the wall or run surface as directed. Surface run pipes shall be securely saddled at 1,8 m centers. Where the cable connects to the conduit in the roof space, a suitable joint box shall be provided or alternatively the cable may be taken through the roof space, a suitable joint box shall be provided or alternatively the cable may be taken through the roof space with fixings at regular intervals, and down to the main board. At the outbuildings, the cable shall be enclosed in a suitably sized galvanised sleeve pipe built into the wall or run surface and terminated in the distribution board tray.

14.7 Connection and Mounting of Cable Fed Street/Site Lighting

Street/site lights shall in all cases, except where otherwise specified, be fed by underground cable. Unless otherwise directed, a suitable terminal board shall be provided in the base of the lighting pole for the connection of the incoming and outgoing cables, the feeds from the terminal board to the fitting shall be as specified.

"Surfix" cable and compression glands shall be installed between terminal board and cross arm/bracket mounted luminaires. The terminal board shall also accommodate a miniature circuit-breaker in the phase connection to the fitting. Poles intended for mounting directly in ground are to be provided with a 300 x 300 mm base plate.

15. UNDERGROUND CABLES

1000 volt PVC SWA and 110 Volt PILCA cable and accessories shall be in accordance with the relevant SABS specifications to SABS 1507.

The storage, transportation, handling and laying of underground cables shall be according to the manufacturer's requirements and the Contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to cables during such operation. All cable pipes and ducts entering buildings are to be sealed against the ingress of vermin, water, etc.

15.1 Trenching

Cables, unless otherwise specifically directed, shall be laid at a depth of 600 mm below ground level. Trenches shall not be less than 300 mm wide for one to three cables, and the width shall be increased where more than three cables are to be laid together so that the cables may be placed at least 75 mm throughout the run.

The Contractor shall take all necessary precautions to prevent trenching work being in any way a hazard to the public and to safeguard all structures, roads, sewer works, or other property from risk of subsidence and damage.

15.2 **Cable Joints**

Joints in underground cable runs will not be permitted unless unavoidable and at the discretion of the Head : Works. Where cable joints are unavoidable, the cable jointer is to work efficiently and cleanly and so that each end of the cables to be joined may have a minimum of 0,9 m of slack disposed in a loop without stress. Back-filling under joints must be firmly tamped to prevent any subsequent settling.

15.3 **Bedding**

In trenches made in intermediate, hard rock, or boulder material, the cables shall be laid on a 75 mm thick bed of earth and be covered with a 150 mm layer of earth before the trench is filled in. The Contractor to supply all earth required for trench filling.

15.4 **Laying**

Cables shall be removed from the cable drum in such a way that no twisting, tension or mechanical damage is caused, and must be adequately supported at short intervals during the whole operation. Particular care must be exercised where it is necessary to draw cables through pipes and ducts, to avoid abrasion, elongation or distortion of any kind. The ends of such pipes and ducts shall be sealed to approval after the drawing in of the cables.

15.5 **Back Filling**

Back filling after bedding (see Clause 15.3) is to be carried out with a proper grading of the material to ensure settling without voids, and the material is to be tamped down after the addition of every 150 mm. The surface is to be made good a required.

Back filling of cable trenches must not be commenced until after the cable trenches and laid cable(s) have been inspected by the Head : Works. Where a Contractor fails to observe this requirement he may, at the discretion of the Head : Works, be required to re-open such cable trenches for inspection at his own expense.

15.6 **Protection of Cables**

Where so directed by the Head : Works, concrete or other warning covers shall be placed over cables above the top bedding layer. Cable pipes when directed are to be installed at road and other crossings.

15.7 **Marking of Cables**

Cable marking tape is to be supplied by the Contractor and is to be laid 150 mm below ground over a cable run and as may be directed by the Head : Works to give early indication of underground cable runs.

15.8 **Joints and Termination of Cables**

Joints in underground cables and terminations shall be made by means of "Scotch Cast" or other approved epoxy-resin pressure type jointing kits. Low tension PVC cables are to be made off with sealing glands and materials designed for this purpose, which must be of approved make.

15.9 **Sealing of Paper Insulated Cable Ends**

Where cables are cut and not immediately made off, the ends must be sealed without delay. If cables are cut and the ends not immediately made off or sealed, the cable may be rejected and the Contractor will be required to replace it at his own expense.

15.10 **Earth Wires**

Except where specifically directed otherwise, earth continuity conductors are to be run with all underground cables constituting part of a low tension distribution system. Such earth continuity conductors shall be bare copper wire of a cross sectional area in accordance with the Code of Practice 0142 but shall not be less than 4 mm^2 nor more than 70 mm^2. 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 mm^2 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

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

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.

4.6 Joints Above Ground

Circular section aluminium conductors shall be jointed by aluminium ferrules or lugs which are securely crimped into place. Aluminium lugs must be bolted together using 10 mm diameter aluminium bolts and washers. The material specification for these components must conform with that laid down in paragraph 4.1. Alternatively heavily tinned copper lugs and ferrules may be used. The lugs should be joined together by means of 10 mm diameter copper, brass or bronze bolts and washers. Care should be taken to inhibit corrosion where dissimilar metals are used by thoroughly cleaning the surfaces of the metal before assembly and subsequently sealing the joint with an inert tenacious compound or tape.

Flat section aluminium conductors shall be joined by double riveting, using aluminium rivets which comply with the material specification laid down in 4.1. Alternatively 2 x 6 mm diameter stainless steel bolts, nuts and washers may be used. Fold over type bends will not be permitted.

Down-conductors are to be terminated approximately 200 mm above finished ground level. Circular section aluminium is to be jointed to a 50 mm^2 (35 mm^2 in the case of domestic dwellings) stranded copper conductor by securely crimping in place two heavily tinned lugs and bolting these together using 10 mm diameter copper, brass or bronze nuts, bolts and washers.

N.B. : Under no circumstances shall aluminium conductors be buried in the ground.

4.7 Joints Below Ground

A joint in the stranded copper conductor which forms part of the earthing system must be made by using a crimped copper ferrule clamping (not lugs) using two copper line taps of suitable dimensions, or exothermic welding. The copper earth conductor must be joined to an earth rod by either clamping, using a standard earth rod clamp or copper line tap or by exothermic welding. Joints which are made between dissimilar metals (i.e. copper conductor to galvanized steel water main), must be thoroughly cleaned before assembly. They shall be rendered watertight using waterproof adhesive tape on a suitable compound for a minimum distance of 200 mm in all directions from the joint.

4.8 Bonds

Where it is necessary to bond the aluminium conductor to any other metallic surface, this must be done by bolting or riveting. When attaching aluminium to a dissimilar metal the joints are to be thoroughly cleaned and sealed to prevent corrosion.

5. GENERAL INSTALLATION PROCEDURE

5.1 Air Terminals for Non-metallic Pitched Roofs

Aluminium conductors are to be installed along all ridges of roofs and projections such as dormer windows, etc., terminating at the ends with conductors running downwards over the surface of the roof and the eaves. Non-metallic chimneys must be protected by means of a finial of sufficient length to cover the chimney within a 45° angle struck downwards from its point. Alternatively it should have a conductor installed in the form of a closed loop upon the upper surface. The conductors are to follow the outer contour of the stack and must be bonded at a convenient point to the nearest component of the air terminal system.

N.B. : This bond may run in a horizontal or downward direction, but under no circumstances must any part of it run above horizontal.

Conductors may be dead-ended (i.e. have one end free and unbonded), providing that the length of such a conductor does not exceed 10 metres and that the unbonded end is either at the same level or higher than the bonded end. This technique may be used where ridge conductors are installed over dormer windows, etc.

In all cases where metallic gutters have been installed along the eaves of a pitched roof, these must be bonded to the air terminal system. Where metallic gutters do not exist, however, a conductor must be installed over the surface of the roof at eaves level to which the remainder of the air terminal system is to be bonded, with the following exceptions :

(a) Where the maximum distance from the ground level to the eaves of the building is less than 4 metres and the pitch of the roof is more than 1 in 2 (27° from the horizontal).

(b) Where the maximum distances from ground level to the eaves is less then 7 metres and the pitch of the roof is more than 1 in 1,5 (34° from the horizontal).

(c) Where the distance from the ground level to the eaves is more than 7 metres and the pitch of the roof is more than 1 in 1 (i.e. the included angle at the apex of the roof is less than 90°).

Under these circumstances eaves conductors need not be installed.

Any non-metallic objects which protrude above the general roof lines, such as Cape Dutch gable ends, must be protected as described above with a suitable air terminal system. Any metallic objects which protrude above the general roof line, such as hot water expansion pipes must be bonded as directly as possible to the nearest eaves conductor, gutter or other part of the lightning system.

N.B. : These bonding conductors must run in a horizontal or preferably a downward direction, from the vent pipe, etc., to the lightning protection system.

5.2 Air Terminals for Metallic Pitched Roofs

Buildings with roofs covered with electrically continuous metal sheets do not require separate air terminals but must be earthed via down conductors generally as described in 5.6 and 5.7. Any non-metallic objects projecting above the general roof line must be separately protected as described in 5.1 and bonded to the metal roof covering.

5.3 Air Terminals for Non-metallic flat or Mono-pitched Roofs

For flat or mono pitched roofs of non-metallic construction the air terminal system must consist of aluminium alloy conductors installed around the outer perimeter of each section of the roof structure. These conductors must be installed on top of parapet walls if these exist. Lift motor rooms, tank rooms, penthouses, etc., which protrude above the general roof line must have air terminal conductors installed around the outer perimeter of each roof slab or parapet wall. Any metallic objects which protrude above the roof line, such as expansion pipes, signs, flag poles, handrails, etc., must be bonded directly to the nearest component of the lightning protection system as described in 5.1.

N.B. : It is not permissible for the ends of conductors to be bonded directly to the perimeter air terminal system if the latter is installed upon a parapet wall having a height exceeding 500 mm above roof slab level. In these circumstances the conductors are to be bonded directly to the down conductors.

5.4 Air Terminals for Metallic flat or Mono Pitched Roofs

Metallic flat or mono pitched roofs do not require separate air terminal conductors, providing that there is electrical continuity between the metallic roofing sheets, (see 5.2). A metallic roof surrounded by a non-metallic parapet wall shall have conductors installed at the top of the parapet wall and these must be bonded to the metallic roof at intervals not exceeding 20 metres. If the parapet wall is clad with metal over its upper surface or a handrail is installed which affords good electrical continuity, separate air terminal conductors need not be installed. Under these circumstances the metal handrail or cladding must be bonded to the metal roof covering at intervals not exceeding 20 metres.

All non-metallic covering such as slates, tiles, asbestos cement sheeting, etc., supported by a steel structure being electrically continuous throughout may be treated as being of a complete metal construction. In these circumstances no separate air terminal system need be installed providing the steel roof structure is bonded to earth at intervals given in 5.5.

5.5 Down Conductors for Non-metallic Structures

Down conductors must be installed at regular intervals around structures and to run as directly as possible between the air terminal and earthing system. They must, where practicable, be positioned at the external corners of the structure. The maximum separating distance between down conductors around the perimeter of the structure must not exceed 30 metres. In the case of very tall buildings having a slender base (i.e. chimney stacks, water towers, etc.), a minimum of two down conductors must be installed.

The lower ends of down conductors are to be terminated and bonded to the earthing system approximately 200 mm above finished ground level. Under no circumstances must aluminium conductors be buried underground. Test joints must be provided between the down conductors and earthing system. Down conductors must run vertically between the air terminal and earthing systems. Where this is impracticable, their course may be deviated to run at any angle up to and including horizontal.

Where it is necessary to run conductors horizontally over the upper surface of a structural protrusion, such as an exposed concrete slab, the conductor may run down vertically over the edge of the slab and return to the main structure, so that the distance between the upper and lower conductors exceeds one third of the length of the horizontal run. Looped down conductors are not permitted. Down conductors must not run over the underside of large overhangs which are less than 6 metres above ground level, or other areas where people are likely to be present during a thunderstorm.

External or internal metallic rainwater pipes may be used as down conductors providing these are of substantial section and are jointed by screwing one length into another or welding. Thin gauge galvanized steel pipes whose sections are held together by friction, rivets or screws must not form part of a lightning protection system.

5.6 Down conductors for reinforced concrete framed structures

The steel reinforcement of this type of structure may be used in place of down conductors. Where the reinforcing system is used, the air terminal system must be bonded to it at a maximum of 30 metre intervals using steel clamps. This bond may be achieved by clamping, with a steel clamp, a steel conductor to a selected reinforcing bar, the opposite end of this conductor must terminate at a corrosion resistant metallic terminal such as Grade 316 stainless steel.

The reinforcing system of prefabricated concrete buildings must not be used unless special provision is made for bonding the various prefabricated sections together.

The terminals should be mounted flush with the face of the concrete. An aluminium alloy bond must then be taken from the air terminal system and be connected to the stainless steel terminal by means of a heavily tinned crimp lug for circular section aluminium, or a suitable bi-metallic joint in the case of flat section aluminium. A similar system must be used to bond the reinforcing system at ground level to the earthing system at points directly below the air terminal bonds. Here copper conductors must be used as the external bonding material.

Under no circumstances must copper, or other non-ferrous material be allowed to come into contact with steel reinforcing bars, as this may cause severe corrosion and subsequent structural damage. The lightning protection system must not be bonded to any part of the structure which is electrically isolated from the remainder of the building, i.e. cantilevered sections. In these circumstances, or where it is otherwise impracticable to use the reinforcing system, external down conductors must be installed as described in 5.5.

5.7 Down conductors for steel framed structures

Where the framework of a building is constructed of structural steel columns, these may be used in place of down conductors providing the separating distance between them does not exceed 30 metres. The upper ends of the columns must be bonded to the air terminal systems and the lower ends to the earthing system.

5.8 Earthing by means of vertically installed rod type electrodes

Rod-type electrodes must be driven into the ground at a position directly below each down connector. The maximum earthing resistance of each electrode or number of electrodes bonded to any one down conductor shall not exceed N X 30 ohms, where N equals the total number of down conductors which are bonded to a common air terminal system, or 200 ohms whichever is the lower value.

The minimum horizontal separating distance between rod-type electrodes bonded together must not be less than their installed depth. The upper ends of installed rod-type electrodes are to be terminated approximately 500 mm below finished surface level. A 50 mm^2 copper bonding conductor must be installed to run between each earthing electrode system and the lower ends of the adjacent down conductors. A joint is to be made between each of these bonding conductors and the down conductors at a position approximately 200 mm above finished ground level. These bonding conductors must be installed in P.V.C. conduit securely affixed to the wall (see 3.4). The length of this P.V.C. conduit must be approximately 600 mm and must be installed so that approximately 200 mm protrudes above ground level, the remainder being buried into the soil.

5.9 Earthing by means of metallic water mains

Where two or three down conductors are installed the water mains may serve as an earth terminal for one of these. Where three of more down conductors are installed the water mains may serve as an earth terminal for two of these. Regardless of whether the water mains are used as an earth terminal or not, the incoming metal water pipe must be bonded to the lightning protection earthing system underground.

5.10 Earthing by means of trench type electrodes

Where the soil conditions prevent the satisfactory installation of rod-type electrodes, a trench earth system must be installed. This method is to comprise a 50 mm^2 stranded copper conductor installed horizontally into a trench at a depth of 500 mm below finished ground level. The conductor is to follow the general outline of the structure to be protected and be installed 1 metre away from the outside walls. Where the building stands on rocky ground, the trench earth may be attached to the lower part of the wall in areas where rock protrudes through the soil. The conductor must, however, be buried wherever possible as described above.

Each down conductor must be bonded to the trench earth system as directly as possible by means of a copper conductor.

Trench earth systems must have a maximum earth resistance of 30 ohms. An isolated length of trench earth mat must be bonded to the down conductor system in such a way as to reduce the length of dead-ends to the minimum.

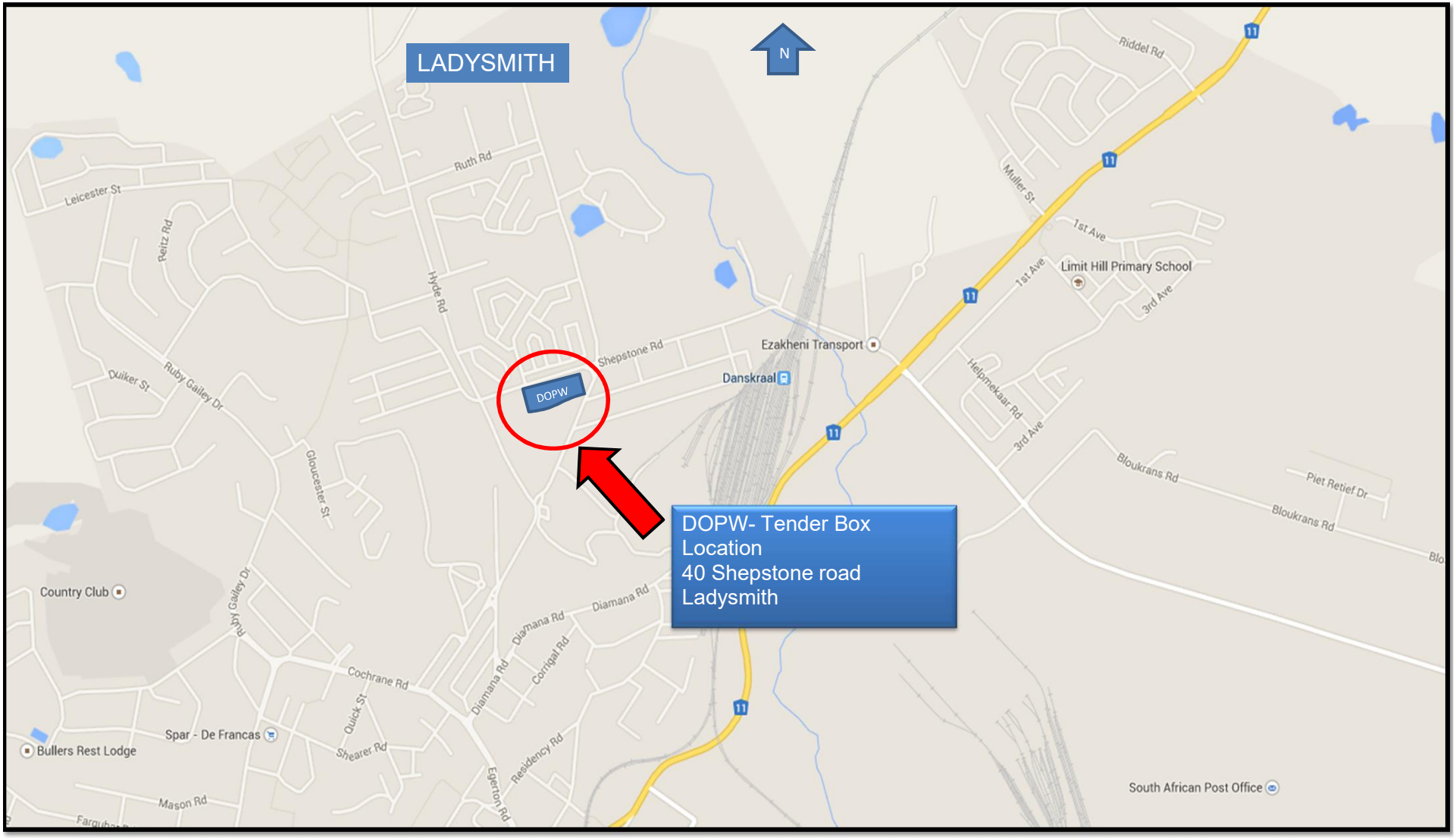
Should trench earths be installed beneath pathways where people are likely to be present during a thunderstorm, a plastic, bitumastic or ceramic pipe must be installed having a length similar to the width of the pathway and the trench earth conductor run inside it.

N.B. : The maximum useful length of a dead-ended trench earth is 80 metres.

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

ANNEXURE 4
Map of Tender Submission Location


LADYSMITH
N
DOPW
DOPW- Tender Box
Location
40 Shepstone road
Ladysmith
Ruth Rd
Leicester St
Reitz Rd
Hyde Rd
Shepstone Rd
Ezakheni Transport
Danskraal
Riddel Rd
Muller St
1st Ave
Limit Hill Primary School
3rd Ave
Helpmekaar Rd
Bloukrans Rd
Piet Retief Dr
Quiker St
Ruby Gailey Dr
Gloucester St
Country Club
Diamana Rd
Corrigal Rd
Cochrane Rd
Quick St
Shearer Rd
Spar - De Francas
Bullers Rest Lodge
Residency Rd
Egerton Rd
Mason Rd
South African Post Office

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

ANNEXURE 5
Joint Venture Agreement

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Annexure 5

Joint Venture Agreement

(March 2004)
(First Edition of CIDB document 1017)

1. **PREAMBLE**

This agreement is made and entered into by and between

_____

_____

_____

of the first part and

_____

_____

_____

of the second part and

_____

_____

_____

of the third part.

(allow for additional parties as necessary).

Whereas the foregoing parties have resolved to form a Joint Venture under the title of

_____

_____

_____

for the exclusive purposes of securing and/or executing the Contract to be awarded by

(name of Employer)

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

for *(brief description of Contract)*

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

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 `
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, unless otherwise decided by 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 or one grade lower in the past 7 years by the bidding entity- Attatch letters of award and practical completion certificates or final completion certificates for projects completed.(Minimum 4 projects is required. (T2.40)

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.

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
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
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

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

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

ANNEXURE 6
Project Specific Health and Safety Specification

Annexure 6

Occupational Health and Safety Specification

(OHSE SPEC)

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Project Name:	**DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION**

Project Code:	**070689**
Agent Name:	**Ms. L. Ntuli (Head Office)**
Region:	**Midlands Region**
District:	**Ladysmith**
Ward no.:	**2**

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1. Introduction

The *KwaZulu Natal Department of Public Works* is deemed as the" **Client"** in terms of the definitions of Construction Regulations of 2014as published in *Government Gazette No. 37305*.TheConstruction Regulations of 2014under *CR (5) (1)* stipulates that that the client must prepare a suitable, sufficiently documented and coherent site specific Occupational Health and Safety Specification for the intended construction work based on the baseline risk assessment.

The purpose of this Occupational Health and Safety Specification document (which hereinafter will be referred to as OHSE Spec)is to provide designers and the successful tenderer with essential OHS information to ensure effective safety management during the design and construction phase of the project.

This OHSE Spec forms an integral part of the contract between the Client and the Principal Contractor, so as to ensure compliance with the Occupational Health and Safety Act, Act 85 of 1993 and its applicable regulations and must serve as the basis for the Principal Contractor to develop his/her Project Safety, Health and Environmental Management Plan. As with any other plan for it to be implemented and managed effectively it requires the allocation of sufficient funds to achieve the objectives set out in the plan. In line with this requirement Construction Regulation 5(1)(g) requires the Client to ensure that the Principal Contractor has made adequate provisions for the cost of Health and Safety Measures in their tenders.

It must be noted that this OHSE Spec as much as it is detailed it is not exhaustive and the onus is on the Principal Contractors to ensure that they comply with Section 8 of the OHS Act, Act 85 of 1993 which states that *"Every Employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees."* this means that Principal Contractors as they are employers in their own right must at all times ensure continuous assessments are done for continued provision and maintenance of a healthy and safe working environment.

2. Definitions

For the purpose of the OHSE Spec, the abbreviations or definitions given hereunder shall apply and the reference to on gender will also apply to the other gender.

"CR" refers to the Construction Regulations 2014

"Agent (*Pr.CHSA*)" means a competent person who acts as a representative for a Client in terms of regulation (5)5.

"Client" means Department of Public Works

"Competent person" means a person who-

(a) Has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable, qualifications, specific for that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualifications Framework Act, 2000 (Act No.67 of 2000), those qualifications and that training must be regarded as the required qualifications and training; and

(b) Is familiar with the OHS Act, Act 85 of 1993 and with the applicable regulations made under the Act;

"ConstructionManager (*Site Agent*)" means a competent person responsible for the management of the physical construction processes and the coordination, administration and management of resources on a construction site;

"Construction Site" means a work place where construction work is being performed;

"Construction Supervisor" means a competent person responsible for supervising construction activities on a construction site;

"Construction Vehicle" means a vehicle used as a means of conveyance for transporting persons or material, or persons and material, on and off the construction site for the purposes of performing construction work;

"Construction work" means any work in connection with –

(a) The construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure; or
(b) the construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving of earth, clearing of land, the making of excavation, piling, or any similar civil engineering structure or type of work;

"Construction Work Permit" means a document issued in terms of regulation 3 of the Construction Regulations 2014;

"Contractor" means an employer who performs construction work;

"Demolition Work" means a method to dismantle, wreck, break, pull down or knock down of a structure or part thereof by way of manual labour, machinery, or the use of explosives;

"Fall Protection Plan" means a documented plan, which includes and provides for-

(a) All risks relating to working from a fall risk position, considering the nature of work undertaken;

(b) The procedures and methods to be applied in order to eliminate the risk of falling; and

(c) A rescue plan and procedures;

"Health and Safety File" means a file, or other record containing the information in writing required by these Regulations;

"Health and Safety Plan" means a site, activity or project specific documented plan in accordance with the client's health and safety specification;

"Health and Safety Specification" means a site, activity or project specific document prepared by the client pertaining to all health and safety requirements related to construction work;

"Medical Certificate of Fitness" means a certificate contemplated in regulation 7(8) of Construction Regulations 2014;

"Principal Contractor" means an employer appointed by the client to perform construction work;

"Safety Officer" – a person deemed competent by SACPCMP under the relevant category of registration.

"Professional Engineer or Professional Certificated Engineer" means a person holding registration as either a Professional Engineer or Professional Certificated Engineer in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000);

3. Scope of Application

This OHSE Specification document stipulates the minimum Occupational Health, Safety, and Environmental requirements that the tenderer need to address in his/her OHSE Plan. This Specification also addresses legal compliance, hazard identification, risk assessment, risk control, and the promotion of a Health and Safety culture amongst those working on the project.

This Specification also makes provision for the protection of persons other than employees. This OHSE Spec is exclusively applicable to the following project pending any change of scope which may necessitate changes to the OHSE Specification;

WATER AND SANITATION PROGRAMME FOR DEPARTMENT OF EDUCATION

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 (Replace T2.6)***

d) Ensure that the Principal Agent as the Professional Service Provider appointed by the Department to manage the project on its behalf in terms of the Conditions of Contract applicable to this project ensures that the contents of this document and the attached Baseline Risk Assessment are taken into consideration during design by all professions appointed and that the OHSE Specification is incorporated into the tender documents. ***See Annexure D***

4. Contractual Issues

Acceptance by the Principal Contractor of the contract with KZN DOPW shall constitute acknowledgement that the Principal Contractor has familiarised him/herself with the contents of the OHSE Spec and that he/she will comply with all its obligations in respect thereof.

Due to fact that this document is based on legislative requirements, the Client requires that all Contractors comply with the requirements of this document and all other relevant legislative requirements not covered by this document.

The Client or its duly appointed Construction H&S Agent reserves the right to stop any Principal Contractor or Sub-Contractors from working whenever Safety, Health or Environmental requirements are being violated as required by regulation 5(1)(q). Any resultant costs of such work stoppages will be for the relevant Contractor's account.

The requirements as specified by the Client in this document must not be deemed to be exhaustive and the Client reserves the right to make changes as and when the Client deems fit to address issue of OHSE Compliance.

The Client will not entertain any claim of any nature whatsoever which arises as a result of costs incurred or delays being experienced due to the Contractor not complying with the requirements of this document and/or any other applicable legislative requirements imposed on the Contractor.

5. Administrative Requirements

a) Notification of Construction Work

The successful tenderer must at least within 07 working days before commencing with construction work notify the Provincial Director in writing using **Annexure "2"**. A copy of the notification once stamped by a DoL Official must be submitted to the client prior to commencing with construction work.

6. Appointment of a Fulltime/ Part time Safety Officer

The Principal Contractors will have to appoint a competent Construction H&S Officer as per the following criteria;

- *Full Time Safety Officer shall be appointed and will be onsite at all times*

Annexure A

Structure of the Detailed OHSE Plan

A detailed OHSE Plan is to be submitted by the successful tenderer as per section 8 above. The following are the minimum standard legal documentation that must form part of the OHSE Plan based on the risks attached in executing this project –

WATER AND SANITATION PROGRAMME FOR DEPARTMENT OF EDUCATION

1. The notification to commence with construction work made to the Provincial Director of Labour using Annexure 2.(*Filled in only to be submitted on approval of the Safety Plan*)
2. Letter of Good Standing with Compensation Commissioner or Compensation insurer
3. The Contractor's Health, Safety &Environmental Policy, signed by the chief executive officer, which outlines the Contractor's OHSE compliance objectives and how they will be achieved.
4. Pre-Construction risk assessment
5. Relevant checklists and registers.
6. Site specific OHSE Organogram
7. Preliminary Induction Program
8. Environmental Management Plan
9. Demolition Plan (Where applicable)
10. Proof of competency for the following legal appointees;

10.1. Construction Manager –(Detailed CV reflecting qualification, relevant experience and references from previous clients)

10.2. Construction Work Supervisor - Detailed CV reflecting qualification, relevant experience and references from previous clients.

10.3. Construction H&S Officer – proof of registration with SACPCMP will be required

10.4. Risk Assessor – SAMTRAC or equivalent

10.5. Fall Protection Planner - SAQA US 229994 or equivalent

10.6. Electrician – wireman's licence

Legal appointments to be appointed	
Prior Site Handover	**After Site Handover on commencement with Construction work**
• Construction Manager • Construction Work Supervisor • Assistant Construction Work Supervisors • Construction H&S Officer • Risk Assessor • Fall Protection Planner • Demolition Work Supervisor	• Scaffold Erectors • Scaffold Inspectors • Excavation inspector • Explosive actuated fastening device controller • First Aider • Emergency co-ordinator • Fire Marshalls • Fire team members • Portable Electrical tool inspector • Hand tools inspector • Housekeeping inspector • Stacking and storage inspector • Temporary electrical installation inspector • Temporary works inspector • Mobile plant Operator • Flammable liquids Storage Inspector • Hazardous substance storage inspector

Annexure B

Client Specific Requirements

Items	Client Specific Requirements
Site Office location	• The location of the site office should be in an area that will not require visitors to pass through or enter area where construction work is active and will not require the re-location of the office as the project progresses.
Public Safety	• When working in a occupied facility the 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 and make provisions for the implementation of all reasonably practicable measures to ensure the health and safety of the occupants of the building.
Extreme weather conditions	• If the weather condition poses a threat to the health & safety of employees be it extreme heat, cold, lighting or any adverse weather condition appropriate safety measures have to be taken.
Change to scope of work	• Should there be changes to the original scope of work, the Principal Agent must inform appointed Construction Health and Safety Agent to effect changes to the OHSE Specification.
Safety Plan Submission	• The successful Tenderer must submit a copy of the detailed OHSE Plan for approval and keep the original for onsite use during construction. The principal Contractor will not be allowed to start site establishment before his/her SHE Plan has been approved in writing.
Bylaws	• ThePrincipal Contractor must incorporate any aspects of the Local Municipal bylaws which affect the, Safety and Environmental wellbeing of the employees and the public into his/her OHSE Plan and ensure compliance to such bylaws.
Risk assessment for construction work	• To comply with CR(9) and to also address environmental issues *See the attached baseline risk assessment to be considered by both the designer and the principal contractor.*
Fall protection	• To comply with CR (10), • Edge protection and protection of floor openings need to be of such a manner as to properly protect employees from falling off elevated positions or falling into floor openings
Structures	• To comply with CR (11)
Temporary work	• To comply with CR (12)
Excavations	• To comply with CR(13) and the following; • If the risk exists of a person in an excavation being enclosed in an event of a collapse the following will apply; shoring sufficient to prevent enclosure, any excavatedmaterial must be placed at least 1metre from the edge and at the maximum angle of repose to the horizontal. • No excavation may affect the stability of any adjoining structure or road unless steps have been taken as identified by an Engineer or a Technologist. • Adequate provisions must be made to ensure that water is drained from excavations where water may enter such excavations as a result of

	seepage or rain • All excavations made by the Principal or Sub Contractors must be barricaded by means of solid barricading and barricading tape may only be used to make such barricading more visible
Scaffolding	• To comply with CR(16) and the following; • Scaffolding Inspectors and Scaffolding Erectors must be different individuals. • Scaffold Harness must be used on Scaffolding, normal Harnesses may not be used on scaffolding • Sufficient Scaffolding material e.g., tags, trapdoors etc. need to be on site as determined by the activities on site • Scaffold bases may not be supported by materials such as bricks and chipboard. Suitable material needs to be used as per SANS 10085
Explosive actuated fastening device	• To comply with CR (21)
Construction vehicles and mobile plant	• To comply with CR (23) and the following;
Electrical installations and machinery on construction sites	• To comply with **CR (24)**
Use and temporary storage of flammable liquids on construction sites	• To comply with **CR (25)**
Water environments	• To comply with **CR (26)**
Housekeeping and general safeguarding on construction sites	• To comply with CR (27) and the following; • Contractor to designate areas for placing refuse and rubble prior to being removed from site • Contractor must implement a daily task site clean-up for all activities these should cover work areas, stairways, walkways etc. to free of any construction debris obstruction. • Refuse to be separated for recycling purposes • Hazardous materials such as asbestos may not be included in general rubble and need to be disposed of as per applicable legislative requirements
Stacking and storage on construction sites	• To comply with CR (28)
Fire precautions on construction sites	• To comply with CR (29) and the following; • No smoking may be permitted on site except in designated smoking areas

Construction employees' facilities	• To comply with CR (30) and the following; • Gender signs to be placed at appropriate locations • All welfare facilities to be kept in a hygienic condition at all times • Employees to be trained in good hygiene practices
Public Safety & Signage	• The Principal Contractor engaged in construction work must ensure that each person working on or visiting a site, and the general public in the vicinity of the construction site, shall be made aware of the dangers likely to arise from onsite activities and the precautions to be observed to avoid or minimise those dangers. • Appropriate signage shall be posted at conspicuous points within and around the perimeter of the site. The steps to comply with this requirement must be outlined in the OHSE Plan. • The public or visitors may only be permitted on site if they go through an appropriate health and safety induction detailing hazards and risks they may be exposed to and what measures are in place to control these hazards and risks • The entire project site must be secured against unauthorized access and provided with appropriate warning signage. Where roadways or walkways must be encroached or closed due to work, adequate barriers shall be installed to safely redirect the flow of vehicles and pedestrians and protect them from construction activities. • Whenever it is necessary to maintain public use of work areas (such as sidewalks, ramps, entrances to buildings, corridors, or stairways), the public shall be protected with appropriate guardrails, barricades, temporary fences, overhead protection, or temporary partitions and hoarding. The public must also be adequately protected from any work created hazards, such as excavations. Appropriate warnings, signs, warning lights and instructional safety signs shall be conspicuously posted and placed where necessary. • The public must also be protected from falling debris and objects from the project site. Overhead protection shall be provided that will fully protect the public and be capable of withstanding the maximum forces that could be applied from potential falling objects. Special attention shall also be given to developing adequate means to protect against wind-blown debris and construction-related materials.
On Site Health and Safety Training & Induction	• The Principal Contractor shall ensure that all site personnel and visitors undergo a risk-specific health & safety induction training session before starting work or being permitted to enter the site. A record of attendance shall be kept in the health & safety file. • The Principal Contractor shall ensure that, on site periodic toolbox talks take place at least once per week. These talks should deal with risks relevant to the construction work at hand. A record of attendance shall be kept in the health & safety file. The above should also cover all sub-contractors that are onsite. • All Contractors have to comply with this minimum requirement. Environmental issues to be included in toolbox talks where required.
General Record Keeping	• The Principal Contractor and all Sub Contractors must keep and maintain Health and Safety records to demonstrate compliance with this Specification, The OHS Act 85/1993; and with the Construction Regulations of 2014. The Principal Contractor shall ensure that all

	records of incidents/accidents, training, inspections; audits, etc. are kept in a health & safety file held in the site office, which must be present on site at all times. The Principal Contractor must ensure that every Sub Contractor opens its own health & safety file, maintains the file and makes it available on request.
Health &Safety Audits, Monitoring and reporting	• The Client or its duly appointed Agent shall conduct monthly health & safety audits. The Principal Contractor is obligated to conduct similar audits on all Sub Contractors appointed by them at least once a month. Detailed audit reports must be presented and discussed at all levels of project management meetings and a copy of such audit will be provided to the Client or its duly appointed Agent within 7 working days of such audit. Copies of the Client's audit reports shall be kept in the Principal Contractors Health & Safety File.
Emergency Procedures	• The Principal Contractor shall submit a detailed Emergency Plan for approval by the Client prior to commencement on site. The plan shall detail the response procedure including the following key elements: 1. List of key competent personnel; 2. Details of emergency services; 3. Actions or steps to be taken in the event of the specific types of emergencies; 4. Information on hazardous material/situations.
First Aid Boxes and First Aid Equipment	• The appointed First Aider(s) to be in possession of a valid first aid training certificate Level 2. Valid certificates are to be kept in the Site Safety File. All Sub Contractors with more than 5 employees shall supply their own first aid box, except if otherwise agreed upon between Principal and Sub- Contractor in writing.
Accident / Incident Reporting and Investigation	• Injuries are to be categorised into Near miss, first aid, LTI, fatal etc. Fatal accidents to be reported in addition to applicable legislative requirements to the Client or its duly appointed Agent with immediate effect. The Principal Contractor must stipulate in its construction phase OHSE Plan how it will handle each of these categories. When reporting injuries to the Client, these categories shall be used. The Principal Contractor shall investigate all injuries, with a report being forwarded to the Client immediately. All Sub- Contractors have to report on the abovementioned categories of injuries to the Principal Contractor at least monthly. All categories of incidents/accidents must be in the Statistics Section of the Monthly Audit Reports, submitted to the Client or it's duly appointed Agent.
Hazards and Potential Situations	• The Principal Contractor shall immediately notify other Sub Contractors as well as the Client of any hazardous or potentially hazardous situations that may arise during performance of construction activities. • Should a hazardous situation require work stoppages, the work must be stopped and corrective steps taken such as the issue of Written Safe Work Procedures and the issue of Personal Protective Equipment.
Personal Protective Equipment (PPE) and Clothing	• The Principal Contractor must ensure that all workers are issued with the required PPE as required by the risks associated with the activities they perform .The minimum PPE to be worn on site will be Safety Shoes/Boots, Hard Hats, Overalls. No Visitors may enter the site without Safety Shoes/Boots and Hardhats. The Principal Contractor and all Sub Contractors shall make provision and keep adequate quantities of SABS approved PPE on site at all times.All employees issued with PPE to be trained in correct use, records of training and issue to be kept in the Site

	SHE File .Procedure to be in place to deal with: • 1 Lost or stolen PPE; • 2 Worn out or damaged PPE replacement. • 3. Employees not utilising PPE as required • The above procedure applies to Principal Contractors and their appointed Sub- Contractors, as they are all employers in their own right.
Permits	1) The Principal Contractor shall prepare and issue the required written permits relating to but not limited to the following: • Hot Work • Roof Work; and • Electrical work (both temporary and permanent) • Confined Space Entry 2) The Principal Contractor must ensure that where permits are required that they are properly implemented and adhered to.
Speed Restrictions and Protections	Unless otherwise stipulated, the maximum speed limit on sites must be limited to 10 km/h. 1) Vehicle movement routes on site must be clearly indicated where applicable. 2) Signage to ensure the safe movement of vehicles on site, as well as to ensure the health and safety of all employees and visitors on site, must be displayed in strategic locations.
Hazardous Chemical Substances (HCS)	1) To comply with Hazardous Chemical Substances Regulations as published in Government Notice No. R. 1179 dated 25 August 1995. 2) In addition to the abovementioned, Material Safety Data Sheets must be kept on site for all materials, which may contain hazardous chemical substances
Vessels under Pressure (VUP)	To comply with Pressure Equipment Regulations as published in Government Notice R. 734 dated 15 July 2009.
Fire Extinguishers and Fire Fighting Equipment	1) The Principal Contractor and Sub-Contractors must allow for and provide adequate provision of regularly serviced temporary fire fighting equipment located at strategic points on site, specific for the classes of fire likely to occur. 2) The appropriate notices and signs must be allowed for and be erected as required 3) Contractors may not utilize fire protection equipment belonging to the Client without prior consent
Ladders and Ladder Work	1) The Principal Contractor must allow for and ensure that all ladders are inspected at least monthly, are in a good safe working order, are the correct height for the task, extend at least 1m above the landing, are fastened and secured and are placed at a safe angle. 2) Records of inspections must be kept in a register on site.
General Machinery	To comply with Driven Machinery Regulations as published in Government Notice No. R. 1010 dated 18 July 2003
Portable Electrical Tools and Hand Tools	1) The Principal Contractor shall ensure that all electrical tools, electrical distribution boards, extension leads, and plugs are kept in a safe working order. 2.) The Principal Contractor shall ensure that all portable electrical Equipment, is clearly numbered, inspected by a Competent appointed person and records of such inspections to be kept on record in an appropriate register on the site SHE file

	3) The Principal Contractor shall allow for and ensure the following in relation to hand Tools: That a "Competent Person" undertakes routine inspections and records are kept on site. That only authorized trained persons use the tools. That safe working procedures apply. That PPE is provided and used.
High Voltage Electrical Equipment Installations and Equipment	1) All Employees must be made aware of the presence and location of High Voltage Equipment such as underground cables and overhead lines, and ensure that the necessary precautionary steps are taken where work has to be executed in the vicinity of such equipment. 2) Precautionary measures such as Isolation and Lock-Out of electrical systems or the use of electrically isolated tools must be used.
Adequate Lighting	All Contractors must allow for and ensure that adequate lighting is provided to allow for work to be carried out safely.
Transportation of Workers	1) In addition to CR 23 the following will apply The Principal Contractor and Sub-Contractors shall not: • Transport persons together with goods or tools unless there is an appropriate area or section of the vehicle in which to store such goods. • Transport persons on the back of trucks except if a proper canopy (properly covering the sides and top) has been provided with suitable seating areas. • Permit workers to stand or sit on the edge of the transporting vehicle. • Transport workers in LDVs unless they are closed/covered and have the correct number of seats for the passengers • No driver may transport more than six people on the back of a 1 Ton LDV and more than four passengers on the back of a ½ Ton LDV. 2) The driver of any LDV may not permit more than two passengers to occupy the cab of any LDV. 3) Drivers of such vehicles must have a valid driver'slicense for the code of vehicle being driven by them. 4) No servicing of vehicles will be permitted on a Construction Site.No Vehicles or machinery leaking oil will be permitted on site due to the risk posed to the environment. 5) Any oil or diesel spilled on site must be cleaned up as per accepted environmental practice In the event that Earth Moving Machinery is present on site the following must be adhered to: • Drivers of vehicles must be instructed to avoid parking behind earth moving machinery in order to ensure that their vehicles are visible to the operators of earth moving machinery. • Rightof way must be afforded to earth moving machinery at all times. • Vehicles must only be permitted to park, where possible, in designated areas

Occupational Hygiene	1) Occupational exposure is a major problem and all Contractors must ensure that proper health and hygiene measures are put in place to prevent exposure to these hazards. 2) All Contractors must prevent inhalation, ingestion and absorption of any harmful chemical or biological agents 3) Water to be utilized for drinking purposes may only be drawn from taps designated for drinking water purposes. Fire hydrants and fire hose reels may not be utilized for drinking water purposes.
Environmental Management	• The Principal Contractor and Sub-Contractors must comply with the requirements of NEMA Act..... • The Principal Contractor must develop a waste management plan, implement and maintained it onsite • Cement mixing to be done at a predetermined location on site which must include a solid, slab, and bunded edges to prevent runoff • Contaminated run off water from the site must be treated such as to ensure that it does not pose a risk to the environment • Any material which may have a harmful effect when disposed of by normal means must be disposed of in an appropriate manner to eliminate its harmful effect on the environment after disposal. • The Principal Contractor must allow for and ensure that adequate procedures are implemented and maintained to ensure that waste generated is placed in suitable receptacles and removed from the site promptly. • Plans to deal with spillages must be in place and maintained. • No waste materials (liquid or solid) may be disposed of in drains. • No burning of waste material may take place on site as such material being burned may result in pollution of the air or give off toxic vapours which could be harmful to the health of employees or any other person present on site.
Alcohol and other Drugs	• No alcohol and other drugs will be allowed on site without the express permission of the Principal Contractor • No person may be under the influence of alcohol or any other drugs while on the construction site. • Any person on the construction site who is on prescription drugs must inform his/her Employer accordingly and the Employer shall in turn report this to the Principal Contractor immediately. • Any person on the construction site who is suffering from any illness/condition that may have a negative effect on his/her safety performance must report this to his/her Employer, who in turn must report this to the Principal Contractor forthwith. • Any person on the construction site who is suspected of being under the influence of alcohol or other drugs must be removed from site immediately and be instructed to report back the next day for a preliminary inquiry. A full disciplinary procedure must be followed by the Contractor concerned and a copy of the disciplinary action must be forwarded to the Principal Contractor for his records.
Combating and or mitigating measures	"Section 8(2) (b) requires such steps as may be reasonable practicable to eliminate or mitigate any hazards before resorting to Personal Protective

to Prevent COVID 19 Virus pandemic	Equipment (PPE). • Contractor must conduct hazard identification and risk assessment (HIRA) to determine the level of risk & exposure of the virus. In addition a safe working procedure to mitigate or eliminate the virus must be communicated to all workers. • All employees and visitors to undergo a pre-screening process on the symptoms of COVID 19 before entering the site which is not limited to those developed by Department of Health. • Isolation of employees from work area by keeping a distance of 1.5 metres apart, increasing the ventilation rates in the work area. • Cleaning and Disinfection of worker's transport regularly on daily basis. • Provide resources and a work environment that promotes personal hygiene through issuing of Hand soap and portable clean water, 70% containing alcohol based- hand rub sanitizer, disinfectants, disposable bins, etc. • Provision of PPE including gloves, face shield, goggles, face masks, etc • Trainings and display of awareness post would be essential.

Annexure C

CONTRACTOR'S SAFETY, HEALTH AND ENVIRONMENTAL DECLARATION FOR TENDERS

INTRODUCTION

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

DECLARATION

1. I the undersigned hereby declare and confirm that I am fully conversant with the Occupational Health and Safety Act, Act 85 of 1993, the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specification attached in the tender document.

2. I hereby declare that my company and its employees has the necessary competency and resources to safely carry out the construction work under this contract in compliance with the Occupational Health and Safety Act, Act 85 of 1993,the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specification.

3. I hereby confirm that adequate provisions has been made in my tender to cover the cost of all Safety, Health and Environmental duties and responsibilities imposed on me by the Occupational Health and Safety Act, Act 85 of 1993, the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specification.

4. I confirm that I may not commence with any part of construction work under the contract until my Construction Safety, Health and Environmental Plan has been approved in writing by the Client.

5. I hereby confirm that copies of the following documentation will be kept on site for viewing and inspection purposes for the duration of the construction work:

   a) Client's Construction Safety, Health and Environmental Specification
   b) Approved Construction Safety, Health and Environmental Plan
   c) Occupational Health and Safety Act, Act 85 of 1993, and
   d) Construction Regulations of February 2014.

6. I agree that my failure to complete and execute this declaration to the satisfaction of the Client will mean that I am unable to comply with the requirements of the Occupational Health and Safety Act, Act 85 of 1993 and Construction Regulations 2014, and accept that my tender will be rejected.

Signature:..... Date:.....
(*Person duly authorised to sign on behalf of Tenderer*)

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:	WATER AND SANITATION PROGRAMME FOR DEPARTMENT OF EDUCATION								
REF N0				RISK ASSESSOR	S.C. MKHIZE	REVISION	1	DATE	12/10/2022

Likelihood		Consequence	
Rare	1	Negligible	1
Unlikely	2	Minor	2
Possible	3	Moderate	3
Likely	4	Major	4
Almost certain	5	Severe	5

RISK VALUE= LIKELYHOOD X CONSEQUENCE

RISK RANKING	
Score	RANKING
0-5	1
6-10	2
11-16	3
17-20	4
21-25	5

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

MAIN ACTIVITY	Site establishment								
REF NO 1	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
1.1	Clearing of vegetation including cutting of trees (manually)	1.Venomous snakes/ insects 2.Poisonous Vegetation 3. Sharp objects 4.Hot climatic conditions etc.	1.Snake bites, death 2. Skin rashes. Death 3. cuts, abrasions 4. Heat exhaustion etc.	None	None	3x5=15	HIRA, Appointed Competent Supervision and Management, Training, PPE, Method Statements, regular water intake etc.	1X5 =5	1
1.2	Clearing vegetation including cutting of trees (Mechanically)	1.Venomous snakes, and insects 2.Poisonous vegetation 3.Hot Climatic conditions, 4.Dust 5.Noise 6.Vibration 7.Moving vehicles 8. HCS etc.	1.Snake bites ,skin rashes death, 2. Skin rashes. 3. Heat exhaustion 5.Dust inhalation 6. Work related upper limb disorder 7.Fractures, death, damage 8. Dermatitis etc.	None	None	3x5-15	HIRA, Appointed Competent Supervision and Management, Training, PPE,Flagmen, Method Statements, regular breaks etc.	1X5 =5	1

1.3	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. Dermatitis 5. Cuts 6.Vehicle/property Equipment 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**	**2**
1.4	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.Brusing, fractures 4.Crushing ,cuts 5.Lower back injuries 6. Dermatitis etc.	1.Contamination of resources due to spillage of HCS 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**

REF NO	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
1.5	Fencing/ Hoarding the site	1.ManualHandling 2.Struck by 3.Sharp edges 4.Physical exertion 5.Tripping & Fall 6. Hidden services , etc.	1. Muscular strain 2.Brusing, fractures 3.Cuts, abrasion 4.Dehydration 5.Fractures, grazing 6. Electrocution, death 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**	**1**
1.6	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 Equipment 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**	**2**

REF NO 1	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
1.7	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	**2**
1.8	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	**1**

MAIN ACTIVITY	CONSTRUCTION OF NEW ABLUTION FACILITIES								
REF NO 2	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
2.1	Site Clearance Setting Out and Levelling	1.Tripping, 2.struck by object, 3.bumping against 4.Snake Bites ,	1.Backstrain 2. dust inhalation 3.cuts and abrasions 4.injuries	none	none	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work, Medical Fitness Certificates, training. PPE etc.	2x1=2	1
2.2	Excavation for Ablution Pit and (mechanical)	1.Noise 2.Dust 3. Heated surfaces 4.HCS 5.Moving Machinery 6.Underground Services, etc.	1.Noise induced hearing Loss 2.Dust inhalation 3.Burns 4.Dermatitis 5.Electricution 6.Fractures , death etc.	1.Contamination of resources – fuel and oil spillage etc.	Noise exposure, dust inhalation	4x5=20	HIRA, identification of existing services through Pre-Design investigation findings or Report, Engineer's Approval, 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

REF NO 2	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
2.3	Excavation for Sub-structure Trenching (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 , continuous housekeeping signage, barricading, training. PPE etc.	**2x2=4**	**1**
2.4	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**

REF NO 2	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
2.5	Soil poisoning	1.HCS 2.Hot climatic conditions etc.	1.HCS ingestion, inhalation and absorption 2. Heat exhaustion etc.	1.Spillage of HCS-contamination of natural resources	1.Exposure to HCS due to poor control and work procedures and possible medical reaction	**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**
2.6	Steel Reinforcement	1.Physical exertion 2. Cuts, 3.Fracture 4. Poor working posture	1.Muscular strain 2.Dematitis 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**

REF NO 2	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
2.4	Formwork	1.Physical exertion 2. Cuts, 3.Fracture 4. Poor working posture 5.Wood dust	1.Muscular strain 2.Dematitis 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**
2.5	Cement mixing & Concrete pouring	1.HCS, 2. Physical exertion 3.Repetitive motion, 4.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**
2.6	Brickwork	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**

REF NO	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
2.7	Scaffold erection and use	1.Physical exertion 2.Elevated work, 3. Hot climatic conditions 3. Struck by etc.	1.Muscular strain 2. Fractures, death 3.Heat exhaustion, 4.Cuts etc.	None	Struck by falling material, tripping etc.	**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.	**2x2=4**	**1**
2.8	Plaster on Walls	1.Abrasive surfaces 2.Poor working posture 3.Hot climatic conditions 4.Falls 5. Cement Dust 6.HCS etc.	1. Abrasions 2.Muscular strain 3.Heat exhaustion 4.Dermatitis 5.Lung infection 6. Fracture and Death etc.	1.Discarding of unused cement-contamination of natural resources	None	**3x4=12**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**3x2=6**	**2**

REF NO	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
2.9	Installation of Roof trusses, Purlins and Roof Sheeting	1.Falls 2.Struck by falling objects 3.sharp edges 4. Climatic conditions 5.Manual Handling	1.Muscular strain, 2.Muscular strain 3.Cuts 4.Heat exhaustion 5. Facture and Death 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. Suspend work on gables and roof on extremely windy days and clear all personnel	3x3=9	2
2.10	Formwork for Walkways	1.Physical exertion 2. Cuts, 3.Fracture 4. Poor working posture 5.Wood dust	1.Muscular strain 2.Dematitis 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

	Cement mixing & Concrete pouring on walkways	1.HCS, 2. Physical exertion 3.Repetitive motion, 4.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**

4	Finishes								
REF NO 4	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
4.1	Fitting of Door and Window frames	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	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
4.2	Hanging of doors on the door frame	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	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
4.3	Mirror Fitting	1.Glass particles 2.Sharp Objects 3.falling items 4.hands caught in between	1.Eye infection 2.Cuts 3.Severe injuries 4.Abrasion	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.	3x1=3	1

4.4	Fitting of Facia/ Badge Boards& Securing of gutters	1.Elevated work 2.Slippery surface 3.Over extension 4.Incorrect positioning 5. Climatic conditions etc.	1.Fractures, death 2. Heat exhaustion , etc.	None	1.Struck by falling material ,tripping etc.	**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.	**2x2=4**	**1**
4.5	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**	**1**
	Fitting of Facia and Badge Boards	1.Elevated work 2.Slippery surface 3.Over extension 4.Incorrect positioning 5. Climatic conditions etc.	1.Fractures, death 2. Heat exhaustion , etc.	None	1.Struck by falling material ,tripping etc.	**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.	**2x2=4**	**1**

	Ladder usage	1.Elevated work 2.Slippery surface 3.Over extension 4.Incorrect positioning 5.Hot climatic conditions etc.	1.Fractures, death 2. Heat exhaustion , etc.	None	1.Struck by falling material ,tripping etc.	**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.	**2x2=4**	**1**
	Scaffold erection and use	1.Physical exertion 2.Elevated work, 3. Hot climatic conditions 3. Struck by etc.	1.Muscular strain 2. Fractures, death 3.Heat exhaustion, 4.Cuts etc.	None	Struck by falling material, tripping etc.	**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.	**2x2=4**	**1**

DEMOLITION OF EXISTING ABLUTION FACILITIES

REF NO 5	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
5.1	Desludging or Emptying of Septic Tank	1.Physical Exertion 2.Sewer Fumes 3. Manual Handling 4. Moving Vehicles	1.Muscular strain 2.Cuts, lacerations 3. Hepatitis B 4.Abrasions 5.Heat exhaustion 6. Bruising	Contamination of natural resources due to waste split	None	3x3= 9	HIRA, Competent Supervision, safe systems of work, Tools and equipment inspections, Competent Operators Medical Fitness Certificates, housekeeping signage, barricading, training. PPE etc.	1x2= 2	1
5.2	Hoarding Off the Demolition structure	1.Manual Handling 2.Elevated Platform 3.Falling Objects 4.Hidden Services	1.Muscular Strain 2.Factures 3.Injuries 4.Electricution	None	None	2x2=4	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.,	2x2=4	5
5.3	Striping and Lowering of Roof	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, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.,	1x1=1	1

REF NO 5	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
5.4	Scaffolding	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, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.,	**2x2=4**	**1**
5.5	Demolition of existing Brick or Block Structure	1.Falls from height, 2.Dust 3.Noise 4. Caught in between Demolished structure	1.Fractures & Death 2.Lung infection 3.NIHL 4.Injuries & Fatality	Noise & Dust	Noise & Dust		HIRA, Demolition Plan, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.,		

MAIN ACTIVITY	Plumbing								
REF NO 6	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
6.1	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	1
6.2	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	1

MAIN ACTIVITY	REPAIRS TO EXISTING ABLUTIONS								
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	Cutting, grinding & chiselling on walls	1.Unidentified power lines 2.Flying particles 3.Dust 4. Noise	1.Electricution 2.Eye injuries 3.Lung infection 4.NIHL	None	Noise & Dust	2x3=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	1
7.2	Brick Work	1.Abrasive surfaces 2.Poor working posture 3.Hot climatic conditions 4.Cement Dust 5.HCS etc.	1. Abrasions 2.Muscular strain 3.Heat exhaustion 4.Dermatitis 5. Lung Infectionetc.	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

7.3	Scaffold erection and use	1.Physical exertion 2.Elevated work, 3. Hot climatic conditions 3. Struck by etc.	1.Muscular strain 2. Fractures, death 3.Heat exhaustion, 4.Cuts etc.	None	Struck by falling material, tripping etc.	**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.	**2x2=4**	**1**
7.4	Plaster on Walls	1.Abrasive surfaces 2.Poor working posture 3.Hot climatic conditions 4.Falls 5. Cement Dust 6.HCS etc.	1. Abrasions 2.Muscular strain 3.Heat exhaustion 4.Dermatitis 5.Lung infection 6. Fracture and Death etc.	1.Discarding of unused cement-contamination of natural resources	None	**3x4=12**	HIRA, Competent Management, Competent Supervision, safe systems of work. Tools and equipment inspections, Medical Fitness Certificates, continuous housekeeping signage, training. PPE etc.	**3x2=6**	**2**
7.5	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**	**1**

INSTALLATION OF PORTABLE WATER BOREHOLE

REF NO 8	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
8.1	Setting out of Borehole	1.Tripping, 2 struck by, 3 bumping against,	1.Backstrain, 2. Dust inhalation, 3. Cuts and abrasions	none	none	3x2=6	HIRA, Competent Management, Competent Supervision, safe systems of work, Medical Fitness Certificates, training. PPE etc.	2x1=2	1
8.2	Drilling	1.Struck by flying objects, 2.Electricity, 3.Hazardous substance 4. Dust & noise	1.Electrocution, 2.Lung Infection, 3. Noise induced hearing loss, 4. Muscle strain, 5. Eyes Injuries	Contamination of natural resources (spillages)	dust , noise	3x3= 9	HIRA, Competent Supervision, safe systems of work, Tools and equipment inspections, Competent Operators Medical Fitness Certificates, housekeeping signage, barricading, training. PPE etc.	1x2= 2	1
8.3	Installation of the unit	1.Struck by items, 2.Hands caught between areas, 3. Falling items, 4. Sharp edges	1.Cuts, 2.Abrasions, 3 Fractures, 4.Severe injuries, death	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	1

GENERAL SITE ACTIVITIES

REF NO 6	SUB ACTIVITY	HAZARDS SHE	HEALTH RISK	ENVIRO MENTAL RISK	PUBLIC RISK	PURE RISK	RECOMMENDED RISK CONTROL MEASURE	RESIDUAL RISK	Risk Prioritisation Number
6.1	Housekeeping	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
6.2	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	1
6.3	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	1
6.4	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

6.5	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**
6.6	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**
6.7	Extension cords	1.Electricity 2.Tripping hazards	1.Electrocution , 2.Fractures etc	none	None	**1x2=2**	HIRA, Training, Supervision, PPE etc.	**1x1=1**	**1**
6.8.	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**
6.9	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**

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

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	QUANTITY	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

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

ANNEXURE 8
Builders 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): **DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION**

Site: Region: Uthukela District Municipality

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
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

ANNEXURE 9
Geotechnical Investigation Report (If applicable)

Page 1 of 1

GEO-SOL GEOTECHNICAL CONSTRUCTION TESTING
Geotechnical Solutions (PTY) LTD
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24 Arizona Crescent – Northcliff – Cresta - Johannesburg – Gauteng - 4001
Cell – 071 560 8058 – 072 660 8445 – 082 889 2823 - Email – geosollab@gmail.com
Registration No.- K2011/115681/07 – Tax No.- 9127374/18/0 – SAHPRA Authority No.- 2962/23/1062

REPORT TO RAMGOOLAM GROUP ON THE RESULTS OF A GEOTECHNICAL INVESTIGATION FOR THE PROPOSED SANITATION BLOCK UPGRADES AT BHANDE HIGH SCHOOL, KWAZULU-NATAL

PROJECT REF: GG025-26.R01

REVISION 0

04 June 2026

Prepared For:

Ramgoolam Group

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Document Control and Approvals		
Report Date:	04 June 2026	
Project Reference	GG025-26.R01	
Geotechnical Practitioner	SACNASP No	Signature
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Documents Issued:	Electronically	
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Table of Abbreviations

Abbreviation	**Definition**
begl	Below natural ground level
CBR	California Bearing Ratio
DCP	Dynamic Cone Penetrometer
ITS	Intensile Strength
km	kilometre(s)
kN/m²	kiloNewtons per square metre
kPa	Kilopascals
m	metre(s)
mm	millimetre(s)
MPa	Mega Pascal
N/A	Not Applicable
No.	number
SANS	South African National Standards
TP	Test Pit
TLB	Tractor Loader Backhoe
TRH	Technical Recommendations for Highways
UCS	Unconfined Compressive Strength

1. TERMS OF AGREEMENT AND SCOPE OF SERVICES

Geotechnical Solutions (Pty) Ltd was requested by Ramgoolam Group to carry out a geotechnical investigation for the proposed sanitation upgrade at Bhande High School in KwaZulu-Natal.

The scope of the project involved the following:

- ✓ Excavation of test pits.
- ✓ Dynamic Cone Penetrometer (DCP) tests.
- ✓ Profiling of test pits.
- ✓ Collection of soil samples for testing.
- ✓ Preparation of a material testing report.

This geotechnical report, **GG025-26.R01,** provides the results of the material investigation, and basic recommendations and comments are given regarding the use of material for the proposed layerworks.

2. CODES OF PRACTICE AND STANDARDS

The services were carried out in accordance to the current level of geotechnical standards practiced by professionals in Southern Africa.

The document referenced for use is *"Site Investigation Code of Practice, 1st Edition, South African Institution of Civil Engineering – Geotechnical Division, January, 2010"*

The nature of geotechnical engineering is such that variations in soil conditions may occur even where sites seem to be consistent. Variations from what is reported here may become evident during construction and it is thus imperative that an appropriately qualified and experienced competent person inspects all critical stages of development including, but not limited to 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.

It is possible that certain indications of ground stability, contamination, or groundwater levels were latent or otherwise not visible. Opinions are based on what was visible at the time the investigation was conducted.

3. REFERENCED INFORMATION

The following information was used for the project:

i. Regional geological map titled *"2830 Richards Bay"*, dated 1988 and prepared by the Council for Geoscience to a scale of 1:250 000.

ii. Low-resolution satellite imagery sourced from Google Earth (2026).

4. INVESTIGATION ACTIVITIES

The field portion of the investigation was carried out 27 May 2026 and comprised the following:

a. Excavation of test pits; and
b. CBR Dynamic Cone Penetrometer (DCP) testing.
c. Percolation Test.

4.1 Test Pitting and Profiling

Approximately 04 No. test positions were investigated at selected points along the proposed development area, and have been designated by prefixes TP01 to TP04 and were excavated to approximate refusal depths in the range 0.4m to 1.0m below existing ground level (begl). (Refer to test pits profiles for detailed information).

The test pits were profiled in accordance to the South African Geoterminology Guidelines (Brink and bruin, 2002). The test pit profiles are given in Appendix A at the end of this report.

4.2 DCP Testing

A DCP test was carried out adjacent each test pit on site and a total of 06 No. DCP tests were completed. The DCP tests have been designated by prefixes DC01 to DC06 and extended to approximate refusal depths in the range 0.3m to 0.8m begl. The DCP Test results are given in Appendix B at the end of this report.

4.3 Percolation Test

Two percolation tests were carried out on site, designated PT01 and PT02 and was done in accordance with SABS 0400 (1990) which is to determine subsoil percolation rates for the disposal of wastewater effluent by percolation methods.

The percolation pits were profiled in accordance to the South African Geoterminology Guidelines (Brink and bruin, 2002). The test pit profiles are given in Appendix A at the end of this report.

5. DESCRIPTION OF THE STUDY AREA

Bhande High School is located is a rural land setting that has undulating terrain. The latitude and longitude of the site is 28.68673 S and 30.11777 E. The school has existing buildings and ablutions and parking area. The school comprises very rocky terrain with some vegetation and trees. Access to the site is along a gravel road that links to the P349 in the north.

The locality of the sites is shown in Figure 1, with the general layout of the site with field test positions are given in Figure 2. Photographs 1 to 4 provide general views of the site.

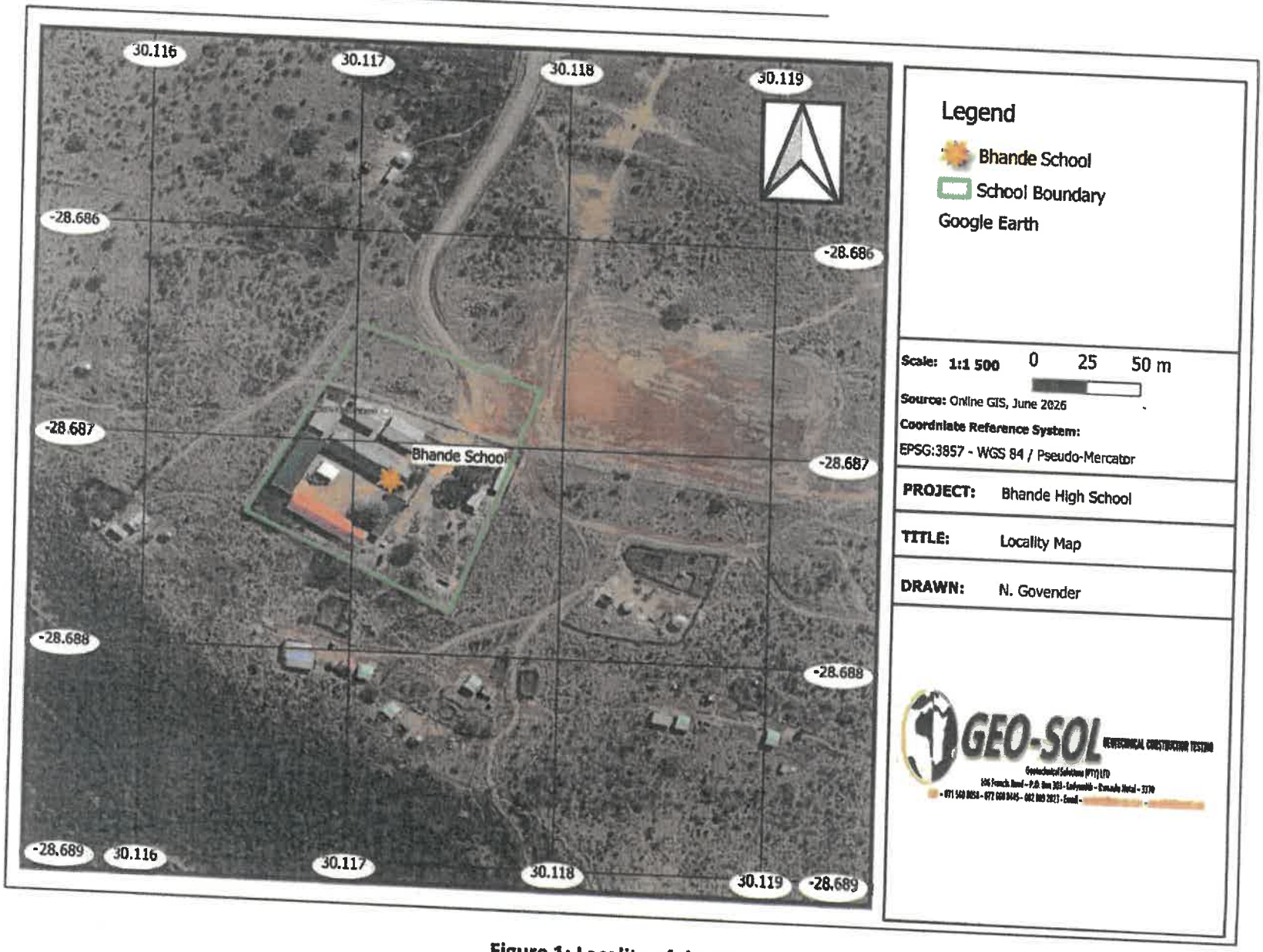

Figure 1: Locality of the Site

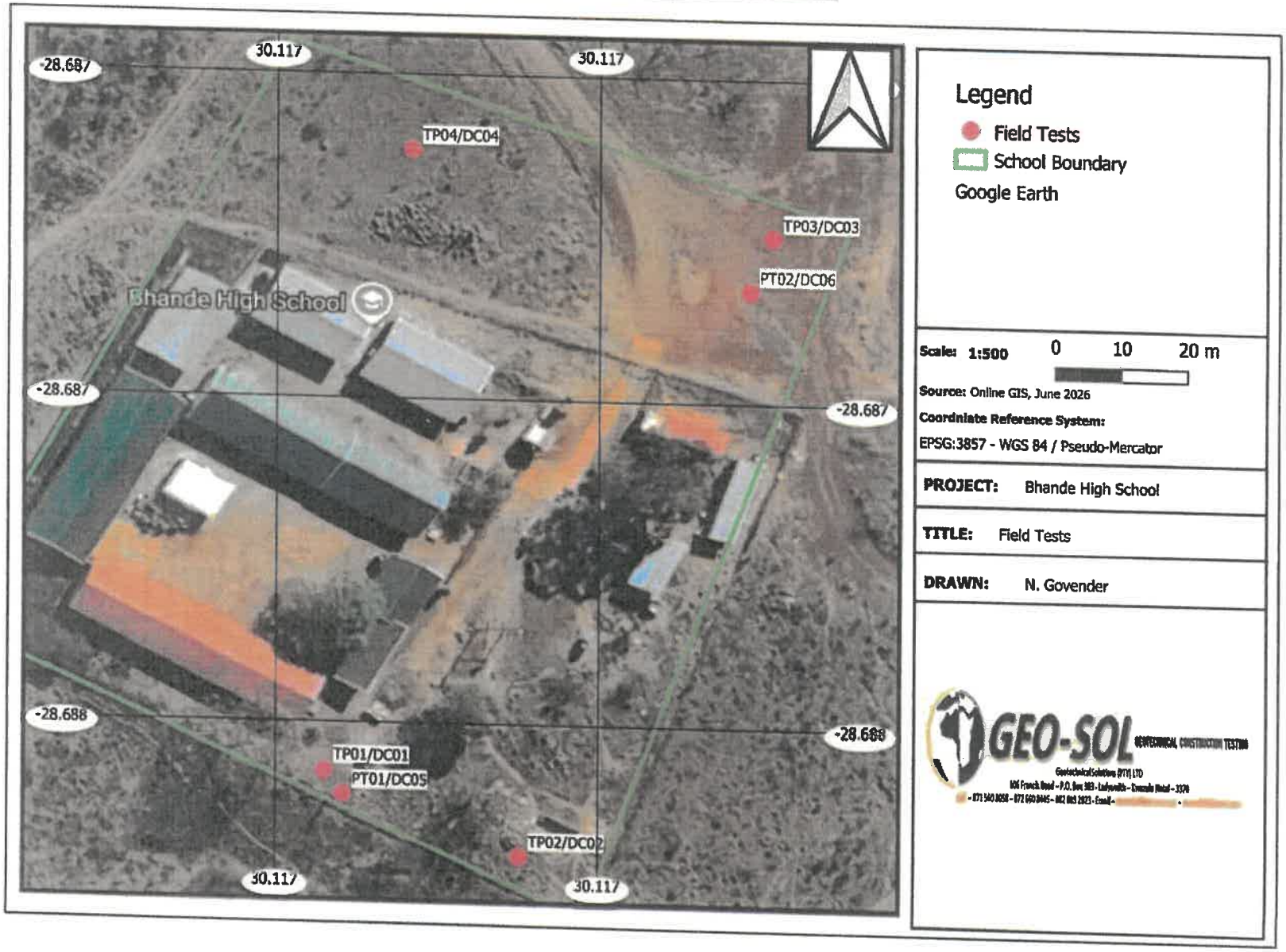

Figure 2: Field Test Positions

Photograph 1: General View of the Site

Photograph 2: General View of the site

Photograph 3: General View of the site

Photograph 4: General View of the Site

6. GENERAL GEOLOGY AND INFERRED SUBGRADE CONDITIONS

According to the Geological Map Sheet *"2830 Richards Bay"* as shown in Figure 3, the site is underlain dolerite rock of Jurassic age.

The positions investigated on site encountered mainly residual soils overlying weathered dolerite rock. The subsoil can be described as follows:

- **Residual** – the residual material can be described as slightly moist, dark brown to dark reddish brown, loose to medium dense, fine to medium grained with gravel, gravelly SAND with roots and rock fragments. The residual material extended to approximate depths in the range 0.4m to 1.0m begl.

- **Weathered Rock** – Test pits TP01 and TP02 encountered rock only. The rock can be described as pink to greyish brown with orange streaks, highly weathered, fine grained, highly fractured, soft rock. The weathered rock was encountered at approximate depths in the range 0.45m to 0.7m begl.

The southern portion of the site is underlain by very shallow rock and northern portion of the site comprises more gravelly SAND soils with bedrock at depth.

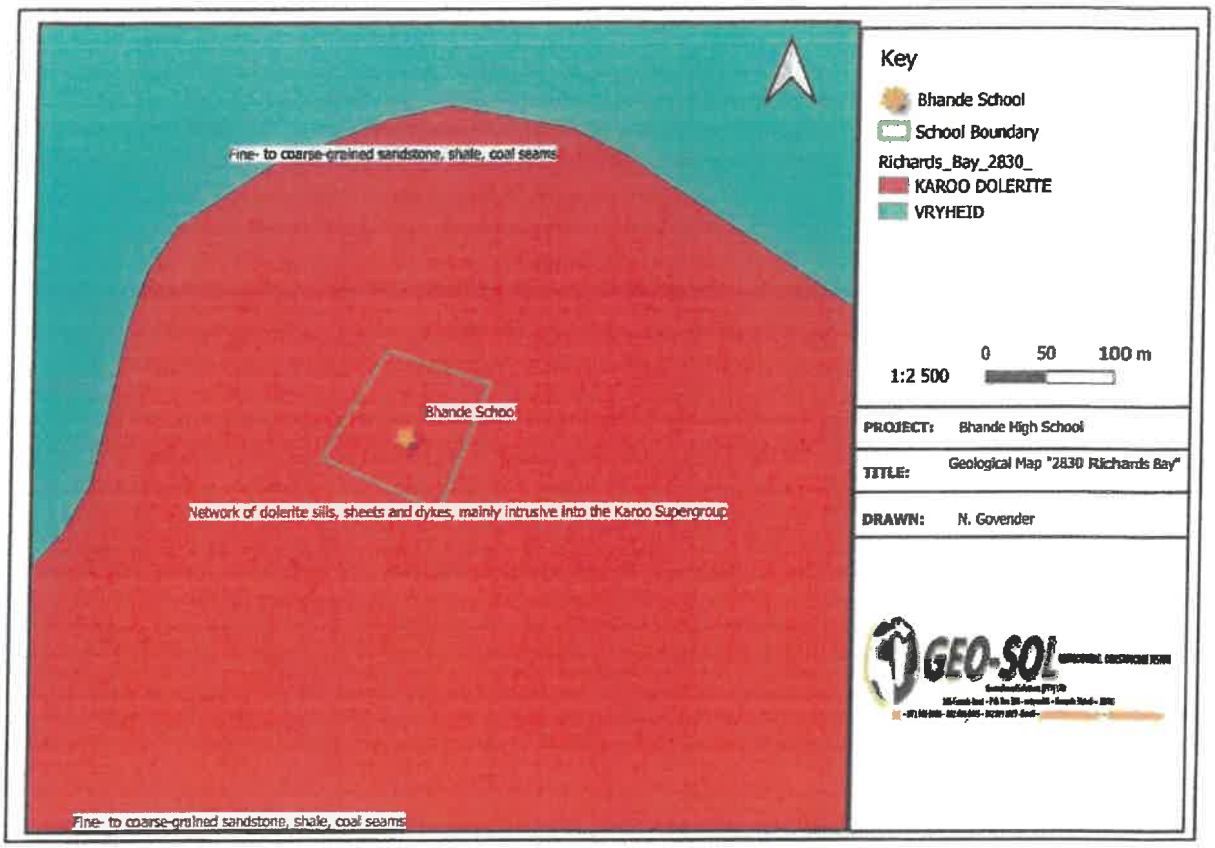

Figure 3: Geological Map "2930 Richars Bay"

Photograph 5: Subsoil in TP01

Photograph 6: Subsoil in PT01

Photograph 7: Subsoil in TP03

Photograph 8: Subsoil in PT02

7. GROUNDWATER

No Groundwater seepage was encountered on site.

It must be noted that groundwater activity is, however, generally expected across the entire site on an intermittent / periodic basis and is also likely to fluctuate as a result of seasonal rainfall patterns.

It is therefore recommended that the appropriate measures be implemented to counteract the potential groundwater activity on site, i.e. subsurface drainage.

8. SOIL LABORATORY RESULTS

To evaluate the engineering properties and the suitability of the in-situ soils and bedrock for construction use, the following laboratory tests were conducted on soil and rock samples retrieved from the site:

i) Grading Analysis, Atterberg Limits.
ii) CBR
iii) Modified AASHTO.
iv) Moisture Content.
v) pH and Conductivity.

The results of the laboratory tests are given in Appendix C and summarized in Tables 1 and 2.

Table 1: Summary of Results of Grading Analysis, Atterberg Limit Determinations, and Material Classifications for materials

Sample No.	TP01	TP02	TP03	TP04
Depth (m).	0,3-0,45	0,4-0,7	0,2-0,4	0,35-1,0
Description of Sample	Residual	Residual	Residual	Residual
Classification	Jennings			
CLAY	12,00	10,00	14,00	10,00
SILT	27,00	25,00	38,00	29,00
SAND	48,00	50,00	39,00	48,00
GRAVEL	13,00	15,00	9,00	13,00
LL%	28,60	29,80	30,70	27,00
P.I.	12,00	11,00	13,00	10,00
LS%	6,00	5,00	0,90	5,00
Van Der Merwe Swell	Medium	Medium	Medium	Medium
Clay Activity Index (AI)	1,00	1,10	0,90	1,00
Moisture Content (%)	12,40	11,80	10,30	10,30
GM	1,20	1,20	0,90	1,20
COLTO	G9	G9	G10	G8
USCS	SM-GP	SM-GP	SM-GP	SM-GP
AASHTO	A-2	A-2	A-2	A-2
Degree of Corrosivity				
pH	6,2	6,80	6,9	6,8
EC (S/m)	0,0384	0,0092	0,0156	0,0188
Resistivity (ohms/cm)	2604	10870	6410	5319
Corrosivity	Highly Corrosive	Mildly Corrosive	Moderately Corrosive	Moderately Corrosive

Corrosivity is calculated using the conductivity of the sample. The results are converted to Ohms for resistivity and corrosivity is determined based on the wenner four pin method (ASTM G57 / SABS 0199-1985)

LL - Liquid Limit
PI - Plasticity Index
LS - Linear Shrinkage
SM - Unified Soil Classification
OMC - Optimum Moisture Content
MDD - Maximum Dry Density
G10 - Classification in Terms of COLTO
GM - Grading Modulus
CBR - California Bearing Ratio
A-4 - AASHTO Classification

9. DISCUSSION

9.1 Proposed Development

It is understood that the proposed development will comprise new ablution facilities that are single storey.

It is anticipated to have a bearing pressure of between 30kN/m^2 and 50kN/m^2. The exact details of the structures are not known at present and should be made available for further comment when completed. These are pit latrines, which means a pit will need to be excavated at least 2.0m begl.

9.2 Site Stability

No signs of inherent ground instability such as slip scars, tension cracks or major sloughing of the mantle of transported soils were evident during the fieldwork. In addition, no known landslides were noted to occur on the site at the time of the investigation.

The site is generally considered to be stable, and the proposed development does not appear to pose a risk to the current stability. However, it is recommended that good sound engineering practices be carried out for the proposed development.

To maintain the stability of the site, it is imperative that adequate site drainage measures are implemented.

The soils on site are considered susceptible to erosion/sloughing by uncontrolled stormwater runoff and it is important that adequate erosion prevention controls are implemented at the site.

Although the site in general is classified as stable, documented inspections by a geotechnical professional should be carried out to confirm stability of excavations.

9.3 General Earthworks

Earthwork activities will need to be carried out strictly in accordance with the current SANS 1200 guidelines (Current version) to ensure safe working procedures and maintain stability of the site.

Where possible, the lowering of ground levels is to be avoided to reduce the risk of encountering problematic shallow groundwater seepage anticipated to occur

intermittently within 1.0m begl. Where this is not feasible, allowance is to be made for suitable subsoil drainage to engineer's detail.

Placement of fill layers should be undertaken in layers not exceeding 150mm thick. When placed loose and compacted using suitable compaction plant to achieve 93% of Modified AASHTO maximum dry density.

If natural ground slopes are steeper than 9 degrees, the fill must be benched into the slope.

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.

Acceptance and process density control testing of placed fill material should be undertaken at regular intervals during fill construction as part of process and acceptance quality assurance monitoring.

Cut and fill slopes in soils should be formed to batters not exceeding 26° and to a height not greater than 2 metres where retaining walls are not provided.

Engineered fill slopes should be over constructed and thereafter trimmed back to the required position.

Cut and fill heights greater than the heights and configurations specified above would need to be inspected and approved by an engineering geologist or geotechnical engineer.

Workers should not enter any excavations deeper than 1.5m that are not shored or battered back as described above, as sidewalls in the low strength soils resembling those encountered on site will be prone to collapse. All excavations must be inspected daily by a competent person and records must be kept. It remains the responsibility of the Contractor/Developer to comply with the current requirements of the Occupational Health and Safety Act.

9.4 The Trechability/Excavatability on Site

The excavations have been assessed based on SANS 1200 (Latest version). Based on the results of the field investigation, it is inferred that the subsurface classifies as soft excavation down to the final depths of the field tests (TP and DCP results refers).

In such instances, it is considered that the material may be easily excavated by a tractor loader backhoe (TLB).

However, due to likely geological variations, such as rock fragments, boulders and harder rock, it is also possible that intermediate to hard excavations may be encountered at a shallower depth. Therefore, a contingency amount is recommended in the construction budget.

Based on field testing, the southern portion of the site has shallower rock which is not feasible for pit latrines as the refusal depths of tests were between 0.5m and 0.8m begl. The northern portions of the site comprises more residual material and are more feasible, although the gravel also hinder easy excavation. Thus, at depths greater than 1.0m is considered more intermediate to hard excavations may exist.

A generally excavatability rating is given based on Table 3.

Table 2: Summary of the Excavatability of the Site (SANS 1200)

Class of Excavation	Definition
Soft	Material that can be efficiently excavated, without prior ripping by the following equipment: ✓ Bulldozer with a mass of at least 22 tons and an engine developing approximately 145 kW at the flywheel. ✓ A tractor-scraper unit with a mass of at least 28 tons and an engine developing approximately 245 kW at the flywheel, pushed by a bulldozer during loading (35 tons, 220 kW). ✓ Track-type front end loader with a mass of at least 22 tons and an engine developing approximately 140 kW at the flywheel.
Intermediate	Material that can be efficiently ripped by a bulldozer with a mass of at least 35 tons when fitted with a single tine ripper and an engine developing approximately 220 kW at the flywheel.

Class of Excavation	Definition
Hard	Material that cannot be efficiently ripped by a bulldozer equivalent to that described for Intermediate Excavation and requires blasting.
Boulder Class A	Material containing in excess of 40% by volume of boulders between 0.03 m^3 and 20 m^3 in size, in a matrix of softer material or smaller boulders.
Boulder Class B	Materials containing 40% or less by volume of boulders ranging from 0.03 m^3 to 20 m^3 in size, in a matrix of soft material or smaller boulders

9.5 Classification of Material and Recommended Usage

The subgrade materials underlying the existing site have been classified in terms of their suitability for use in construction based on field observations.

During the construction of any layerworks design, the required material is usually G6 of better quality.

The materials on site classified as G8 to G10, which are good to fair subgrade material.

Based on the materials quality at the site, it is advised that material for construction be taken from a commercial source for the required subgrade from the engineer.

9.6 Geotechnical Parameters

The geotechnical parameters provided here are based on literature for similar soils and the current field investigations. As majority of the material across the site are sandy, these are non cohesive soils and the soil strength is the angle of friction (Φ) and the following applies (based on G.Byrne & A.D.Berry, 2008) (to be used as a guideline only):

Loose material: Φ of 26° to 28°

Medium Dense material: Φ of 29° to 30°

Soft rock bearing capacity: 150 kPa to 200 kPa

9.7 Founding characteristics of the site

The founding conditions encountered on site are inferred to comprise the following:

a) A thick sequence of soils.

b) Shallow bedrock encountered on site and some areas no bedrock encountered.

c) Soils that are potentially collapsible and compressible by nature.

d) The risk of an elevated groundwater table, particularly during the wet season.

9.8 Foundation Solution

The southern portions of the site comprise shallow dolerite rock which were encountered between 0.45m and 0.7m begl. The northern portions of the site comprise deeper residual material.

The DCP tests indicate that the residual materials are at least medium dense and thus have a limited bearing capacity.

Taking into consideration the above, consideration will need to be given to two foundation solutions:

- Foundations on Weathered Rock, and
- Foundations on residual material.

Should these solutions not be feasible for the engineers, alternatives will need to be discussed once preliminary designs of the foundations are available.

I. Foundations on Weathered Rock

Should weathered rock be encountered at depths less than 3.0m begl. Then it is recommended that all foundations be placed on the weathered rock, where a maximum net allowable bearing pressure of between 150 kPa and 200 kPa (150 kN/m^2 to 200 kN/m^2) is considered applicable. Rock depths vary across the site.

It is estimated that total settlements for a foundation on soft rock are likely to be less than 5mm with differential settlement taken as 50% of total settlement.

It is a requirement that prior to casting any concrete in the foundation trenches, all loose material needs to be removed.

In order to confirm that all foundation is placed on weathered rock, it is a requirement that all foundation are inspected and approved by a geotechnical specialist.

All foundations will need to be designed and constructed strictly to engineers detail.

II. Foundations on Residual Material

Foundations maybe taken down and placed on at least medium dense soils at a depth of 0.8m where a maximum nett allowable bearing pressure of up to 60 kN/m^2 is considered applicable.

Total settlement is likely to be up to 15mm with differential settlement taken as 50% of total settlement.

It is a requirement that prior to casting any concrete in the foundation trenches, all loose material needs to be removed.

III. General

The materials on site are also moderately corrosive towards steel and concrete and this should be considered in the engineering designs.

It is a requirement that prior to casting any concrete in the foundation trenches, all loose material needs to be removed.

It is a requirement that all foundations are inspected and approved by a geotechnical specialist.

All foundations will need to be designed strictly to engineers' detail and adequately reinforced taking into consideration the founding conditions of the site.

Should the above foundation solutions not be considered feasible by the engineer, then the geotechnical engineer can advise on alternative solutions. However, the design and load of the structure will need to be provided.

10. DRAINAGE AND EROSION CONTROLS

It is essential, for the stable development of the site, to protect the structure, and any earthworks from damage by surface and groundwater flows.

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 sites, both during and after the development.

Terraces 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.

It is imperative that the anticipated groundwater condition be taken into account during design and construction of the proposed structure. It is considered most likely that dewatering of excavations will be required during construction.

11. PERCOLATION TEST RESULTS

The results of the percolation tests are summarized in Table 4. The percolation test positions are shown in Figure 2.

Table 3: Summary of Percolation Test Results

Time (Minutes)	Drop in Water Level in mm	Drop in Water Level in mm
	PT01	PT02
0	300	300
5	290	285
10	280	275
15	265	265
20	255	250
25	245	240
30	230	235
35	225	230
Depth of percolation test (m begl)	0.3-0.6	0.3-0.6
Percolation rate – average time (minutes) for a 25 mm fall in test water level	12	14
Rate of application of effluent to subsoils (l/m² of soakpit wall area / day)	73	65

The soils evaluated are considered suitable in terms of the soil percolation rate for on-site disposal of stormwater by subsoil percolation as per requirements of SABS 0400 (1990).

12. PIT LATRINE STRUCTURE

The percolation tests have been carried out between 0.3m and 0.6m begl due to bedrock and dense material being encountered on site. Although the results are showing positive signs for infiltration, these are restricted to the abovementioned depths. The design of the pit latrines will need to be modified to cater for the ground conditions on site. The option of raised structure and/or evapotranspiration bed will need to be considered. The more suitable location is along the southern portion of the site as the residual material is thicker and rock is deeper.

13. CONCLUDING REMARKS

i. The ground conditions identified on site are described based on the field test information and are subject to variations.

ii. The subsurface profile comprises sandy residual soils and weathered dolerite rock.

iii. Groundwater seepage was not encountered on site, however, given the nature of the terrain, there is a risk for an elevated groundwater profile.

iv. Trenchability and excavatability along the proposed route are provided in Section 9.4. In general, soft excavations are possible down to final depths of the test pits.

v. Foundation recommendations are given in Sections 9.7 and 9.8.

The ground conditions given in this report refer specifically to the field tests carried out on site. It is therefore, quite possible that conditions at variance with those given in this report may be encountered elsewhere on site during construction.

It is therefore important that Geotechnical Solutions or a geotechnical practitioner be appointed to carry out periodic inspections during construction.

To this end, it is important that regular process control and acceptance control testing be carried out during road construction. Any change from the anticipated ground conditions could then be taken into account to avoid unnecessary expense.

14. REFERENCES

1. Brink, A., & Bruin, R. (2002). Guidelines for Soil and Rock Logging in South Africa. Proceedings of the Geoterminology Workshop. South Africa: Association of Engineering Geologists, South African Institute of Civil Engineering and South African Institute for Engineering and Environmental Geologists.

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6. G.Byrne & A.D.Berry, 2008. A Guide to Practical Geotechnical Engineering in South Africa. s.l.: Franki

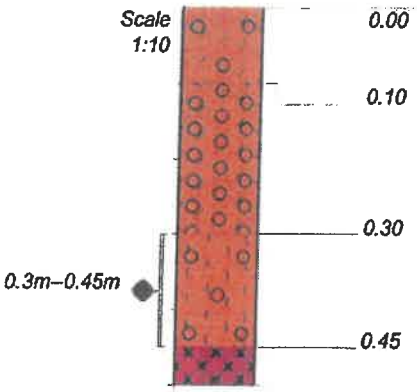
7. South African Bureau of Standards. (1990). Standard Specification for Civil Engineering Construction, D: Earthworks. South Africa: South African Bureau of Standards.

APPENDIX A: TEST PIT PROFILES

Ramgoolam and Associates
Bhande High School

HOLE No: TP01
Sheet 1 of 1

JOB NUMBER: : GG025-26



0.00	Slightly moist, dark brown, loose to medium dense, fine to medium grained, Clayey Gravelly SAND - Residual.
0.10	Slightly moist, dark reddish brown, loose to medium dense, fine to medium grained with gravel, Gravelly Clayey SAND - Residual.
0.30	Slightly moist, light brownish red, loose to medium dense, fine to medium grained with rock fragments, Gravelly Silty SAND - Residual.
0.45	Pink greyish brown streaky orange, highly weathered, fine grained, highly fractured, soft rock, Dolerite.
0.50	

NOTES

1) Refusal at 0.5m.

2) Sample taken at 0.3m–0.45m.

3) No groundwater seepage encountered.

CONTRACTOR :
MACHINE : Hand Tools
DRILLED BY :
PROFILED BY : N. Govender

TYPE SET BY : C.S.J. Holder
SETUP FILE : STANDARD.SET

D0F5 Gevorkyan Geophysics (Pty) Ltd

INCLINATION : Vertical
DIAM :
DATE : 02/06/2026
DATE : 02/06/2026

DATE : 04/06/2026 14:34
TEXT : ..2526BhandeHighSchool.TXT

ELEVATION : 1024m
X-COORD : 30.11707
Y-COORD : -28.68756

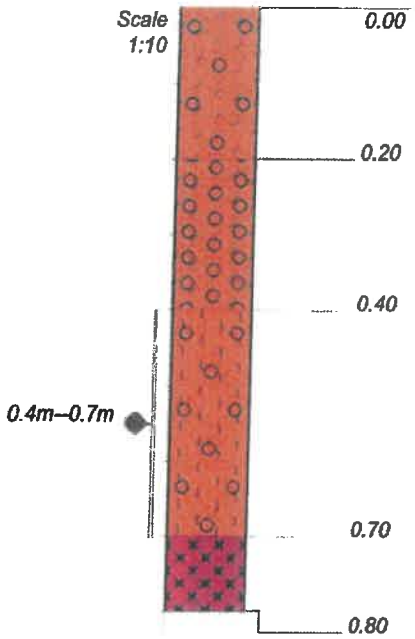
HOLE No: TP01

dotPLOT 7022 PBpH67

Ramgoolam and Associates
Bhande High School

HOLE No: TP02
Sheet 1 of 1

JOB NUMBER: : GG025-26



Slightly moist, dark brown, loose to medium dense, fine to medium grained, Clayey Gravelly SAND - Residual.

Slightly moist, dark reddish brown, loose to medium dense, fine to medium grained with gravel, Gravelly Clayey SAND - Residual.

Slightly moist, light brownish red, loose to medium dense, fine to medium grained with rock fragments, Gravelly Silty SAND - Residual.

Pink greyish brown streaky orange, highly weathered, fine grained, highly fractured, soft rock, Dolerite.

NOTES

1) Refusal at 0.8m.

2) Sample taken at 0.4m–0.7m.

3) No groundwater seepage encountered.

CONTRACTOR :
MACHINE : Hand Tools
DRILLED BY :
PROFILED BY : N. Govender

INCLINATION : Vertical
DIAM :
DATE : 02/06/2026
DATE : 02/06/2026

ELEVATION : 1033m
X-COORD : 30.11731
Y-COORD : -28.68769

HOLE No: TP02

TYPE SET BY : C.S.J. Holder
SETUP FILE : STANDARD.SET

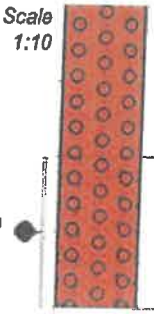
DATE : 04/06/2026 14:34
TEXT : ..2526BhandeHighSchool.TXT

Ramgoolam and Associates
Bhande High School

HOLE No: TP03
Sheet 1 of 1

JOB NUMBER: : GG025-26

Scale 1:10



0.00 Slightly moist, dark orangish brown, loose to medium dense, fine to medium grained with gravel, Sandy GRAVEL - Residual.

0.20 Slightly moist, dark reddish brown, loose to medium dense, fine to medium grained with gravel, Clayey Gravelly SAND - Residual.

0.40

NOTES

1) Refusal at 0.4m.

2) Sample taken at 0.2m--0.4m.

3) No groundwater seepage encountered.

CONTRACTOR :
MACHINE : Hand Tools
DRILLED BY :
PROFILED BY : N. Govender

TYPE SET BY : C.S.J. Holder
SETUP FILE : STANDARD.SET
D0F5 Gevorkyan Geophysics (Pty) Ltd

INCLINATION : Vertical
DIAM :
DATE : 02/06/2026
DATE : 02/06/2026

DATE : 04/06/2026 14:34
TEXT : ..2526BhandeHighSchool.TXT

ELEVATION : 1024m
X-COORD : 30.11777
Y-COORD : -28.68673

HOLE No: TP03

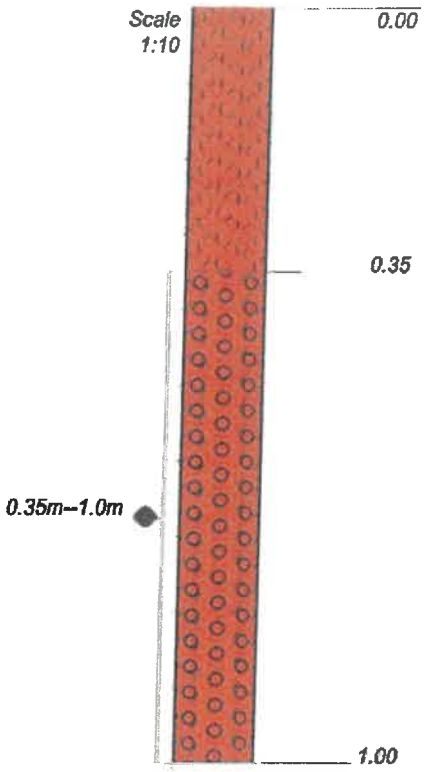
dotPLOT 7022 PBpH67

Ramgoolam and Associates
Bhande High School

HOLE No: TP04
Sheet 1 of 1

JOB NUMBER: : GG025-26

Scale 1:10



0.00 Slightly moist, dark brownish red, loose, fine grained, Clayey Silty SAND - Residual.

0.35 Slightly moist, dark reddish brown, loose to medium dense, fine to medium grained with gravel, Gravelly Clayey SAND - Residual.

1.00

NOTES

1) Refusal at 1.0m.

2) Sample taken at 0.35m--1.0m.

3) No groundwater seepage encountered.

CONTRACTOR :
MACHINE : Hand Tools
DRILLED BY :
PROFILED BY : N. Govender

TYPE SET BY : C.S.J. Holder
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM :
DATE : 02/06/2026
DATE : 02/06/2026

DATE : 04/06/2026 14:34
TEXT : ..2526BhandeHighSchool.TXT

ELEVATION : 1024m
X-COORD : 30.11720
Y-COORD : -28.68661

HOLE No: TP04

Ramgoolam and Associates
Bhande High School

HOLE No: Perc Test 01
Sheet 1 of 1

JOB NUMBER: : GG025-26

Scale 1:10

0.00	Slightly moist, dark brown, loose to medium dense, fine to medium grained, Clayey Gravelly SAND - Residual.
0.10	Slightly moist, dark reddish brown, loose to medium dense, fine to medium grained with gravel, Gravelly Clayey SAND - Residual.
0.25	Slightly moist, light brownish red, loose to medium dense, fine to medium grained with rock fragments, Gravelly Silty SAND - Residual.
0.45	Pink greyish brown streaky orange, highly weathered, fine grained, highly fractured, soft rock, Dolerite.
0.60	

NOTES

1) Refusal at 0.6m.

2) No sample taken.

3) No groundwater seepage encountered.

CONTRACTOR :
MACHINE : Hand Tools
DRILLED BY :
PROFILED BY : N. Govender

TYPE SET BY : C.S.J. Holder
SETUP FILE : STANDARD.SET
D0F5 Gevorkyan Geophysics (Pty) Ltd

INCLINATION : Vertical
DIAM :
DATE : 02/06/2026
DATE : 02/06/2026

DATE : 04/06/2026 14:34
TEXT : ..2526BhandeHighSchool.TXT

ELEVATION : 1033m
X-COORD : 30.11710
Y-COORD : -28.68760

HOLE No: Perc Test 01

dotPLOT 7022 PBpH67

Ramgoolam and Associates
Bhande High School

HOLE No: Perc Test 02
Sheet 1 of 1

JOB NUMBER: : GG025-26

Scale 1:10

0.00 Slightly moist, dark orangish brown, loose to medium dense, fine to medium grained with gravel, Sandy GRAVEL - Residual.

0.60

NOTES

1) Refusal at 0.6m.

2) No sample taken.

3) No groundwater seepage encountered.

CONTRACTOR :
MACHINE : Hand Tools
DRILLED BY :
PROFILED BY : N. Govender

TYPE SET BY : C.S.J. Holder
SETUP FILE : STANDARD.SET

INCLINATION : Vertical
DIAM :
DATE : 02/06/2026
DATE : 02/06/2026

DATE : 04/06/2026 14:34
TEXT : ..2526BhandeHighSchool.TXT

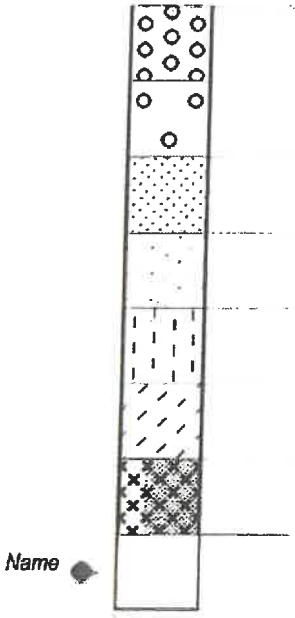
ELEVATION : 1026m
X-COORD : 30.11773
Y-COORD : -28.68682

HOLE No: Perc Test 02

Ramgoolam and Associates
Bhande High School

LEGEND
Sheet 1 of 1

JOB NUMBER: : GG025-26



GRAVEL	{SA02}
GRAVELLY	{SA03}
SAND	{SA04}
SANDY	{SA05}
SILTY	{SA07}
CLAYEY	{SA09}
DOLERITE	{SA18}{SA42}
DISTURBED SAMPLE	{SA38}

CONTRACTOR :
MACHINE :
DRILLED BY :
PROFILED BY :

TYPE SET BY : C.S.J. Holder
SETUP FILE : STANDARD.SET

INCLINATION :
DIAM :
DATE :
DATE :

DATE : 04/06/2026 14:34
TEXT : ..2526BhandeHighSchool.TXT

ELEVATION :
X-COORD :
Y-COORD :

LEGEND
SUMMARY OF SYMBOLS

APPENDIX B: DCP Test Results

CBR Dynamic Cone Penetrometer (DCP) Test

Project:	Bhande High School	Date of Fieldwork:	2-Jun-26
		Operator:	Nishen Govender
Project Reference:	GG025-26	DCP No.	1
Location:	Ladysmith		

The calculations provided are based on empirical calculations and are approximate values. These are indicative guides only.

DEPTH metres below existing ground level	BLOWS per 100mm	INFERRED CONSISTENCY	CBR %	INFERRED NET ALLOWABLE BEARING PRESSURE (kPa)
0				
0.1	15	Dense	27	125
0.2	10	Med.Dense	17	85
0.3	12	Dense	21	100
0.4	14	Dense	25	115
0.5	19	Dense	35	>150
	REF			

CBR Dynamic Cone Penetrometer (DCP) Test

Project:	Bhande High School	Date of Fieldwork:	2-Jun-26
		Operator:	Nishen Govender
Project Reference:	GG025-26	DCP No.:	2
Location:	Ladysmith		

The calculations provided are based on empirical calculations and are approximate values. These are indicative guides only.

DEPTH metres below existing ground level	BLOWS per 100mm	INFERRED CONSISTENCY	CBR %	INFERRED NET ALLOWABLE BEARING PRESSURE (kPa)
0				
0.1	12	Dense	21	100
0.2	11	Dense	19	90
0.3	12	Dense	21	100
0.4	14	Dense	25	115
0.5	15	Dense	27	125
	REF			

CBR Dynamic Cone Penetrometer (DCP) Test

Project:	Bhande High School	Date of Fieldwork:	2-Jun-26
		Operator:	Nishen Govender
Project Reference:	GG025-26	DCP No.:	3
Location:	Ladysmith		

The calculations provided are based on empirical calculations and are approximate values. These are indicative guides only.

DEPTH metres below existing ground level	BLOWS per 100mm	INFERRED CONSISTENCY	CBR %	INFERRED NET ALLOWABLE BEARING PRESSURE (kPa)
0				
0.1	12	Dense	21	100
0.2	13	Dense	23	110
0.3	10	Med.Dense	17	85
0.4	14	Dense	25	115
	REF			

CBR Dynamic Cone Penetrometer (DCP) Test

Project:	Bhande High School	Date of Fieldwork:	2-Jun-26
		Operator:	Nishen Govender
Project Reference:	GG025-26	DCP No:	4
Location:	Ladysmith		

The calculations provided are based on empirical calculations and are approximate values. These are indicative guides only.

DEPTH metres below existing ground level	BLOWS per 100mm	INFERRED CONSISTENCY	CBR %	INFERRED NET ALLOWABLE BEARING PRESSURE (kPa)
0				
0.1	7	Med.Dense	12	60
0.2	7	Med.Dense	12	60
0.3	9	Med.Dense	15	75
0.4	9	Med.Dense	15	75
0.5	10	Med.Dense	17	85
0.6	12	Dense	21	100
0.7	15	Dense	27	125
0.8	12	Dense	21	100
	REF			

CBR Dynamic Cone Penetrometer (DCP) Test

Project:	Bhande High School	Date of Fieldwork:	2-Jun-26
		Operator:	Nishen Govender
Project Reference:	GG025-26	DCP No:	5
Location:	Ladysmith		

The calculations provided are based on empirical calculations and are approximate values. These are indicative guides only.

DEPTH metres below existing ground level	BLOWS per 100mm	INFERRED CONSISTENCY	CBR %	INFERRED NET ALLOWABLE BEARING PRESSURE (kPa)
0				
0.1	15	Dense	27	125
0.2	12	Dense	21	100
0.3	16	Dense	29	130
	REF			

CBR Dynamic Cone Penetrometer (DCP) Test

Project:	Bhande High School	Date of Fieldwork:	2-Jun-26
		Operator:	Nishen Govender
Project Reference:	GG025-26	DCP No.:	6
Location:	Ladysmith		

The calculations provided are based on empirical calculations and are approximate values. These are indicative guides only.

DEPTH metres below existing ground level	BLOWS per 100mm	INFERRED CONSISTENCY	CBR %	INFERRED NET ALLOWABLE BEARING PRESSURE (kPa)
0				
0.1	12	Dense	21	100
0.2	10	Med.Dense	17	85
0.3	11	Dense	19	90
0.4	12	Dense	21	100
0.5	12	Dense	21	100
	REF			

APPENDIX C: LABORATORY TEST RESULTS

GEO-SOL GEOTECHNICAL CONSTRUCTION TESTING

Geotechnical Solutions (PTY) LTD
106 Francis Road – P.O. Box 303 - Ladysmith – Kwazulu Natal – 3370
24 Arizona Crescent – Northcliff – Cresta - Johannesburg – Gauteng - 4001
Cell – 071 560 8058 – 072 660 8445 – 082 889 2823 - Email – geosollab@gmail.com
Registration No.- K2011/115681/07 – Tax No.- 9127374/18/0 – SAHPRA Authority No.- 2962/23/1062

TEST REPORT - MATERIAL CLASSIFICATION

Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Sample No:	TP01A
Depth of Sample Taken (mm):	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Dark brown silty sandy clay with gravelly pebbles

Sieve Analysis (mm) (SANS 3001-GR1)	100,00	100,0
	75,00	100,0
	37,50	100,0
	28,00	100,0
	20,00	100,0
	14,00	100,0
	5,00	96,0
	2,00	87,0
	0,43	58,8
	0,25	46,0
	0,15	45,0
	0,075	38,6
Hydrometer Analysis (mm) (ASTM-D422)	0,060	12,7
	0,050	11,9
	0,004	7,8
	0,002	7,2

MECHANICAL ANALYSIS	JENNINGS	%
CLAY	11,950	12
SILT	26,650	27
SAND	48,400	48
GRAVEL	13,000	13

ATTERBERG LIMIT (SANS 3001-GR10, GR12)	LL%	28,60
	P.I.	12,00
	LS%	6,00
GRADING MODULUS (SANRAL)	GM	1,2

	AASHTO	USCS	COTO
SOIL CLASSIFICATION	A-2	SM-GP	G9

Liability: Data Reported above relates to sample tested.

GEO-SOL GEOTECHNICAL CONSTRUCTION TESTING

Geotechnical Solutions (PTY) LTD
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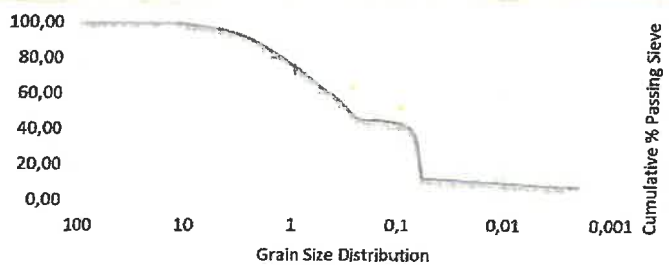
24 Arizona Crescent – Northcliff – Cresta - Johannesburg – Gauteng - 4001
Call – 071 560 8058 – 072 660 8445 – 082 889 2823 - Email – geosollab@gmail.com
Registration No.- K2011/115681/07 – Tax No.- 9127374/18/0 – SAHPRA Authority No.- 2962/23/1062

TEST REPORT - MATERIAL CLASSIFICATION

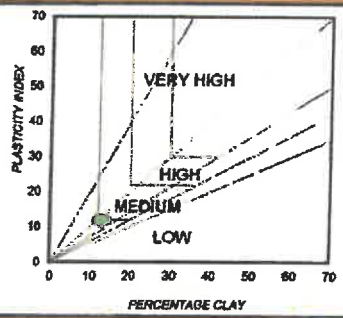
Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Excavation No.	TP01A
Depth of Sample Taken:	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Dark brown silty sandy clay with gravelly pebbles

PARTICLE GRAIN SIZE DISTRIBUTION



POTENTIAL EXPANSIVENESS - (VDM)



POTENTIAL HEAVE - (VDM)

Low	
Moderate	X
High	

CLAY ACTIVITY INDEX (AI) - (ASTM D5890-19)

		0-1,4	**Inactive Soils**
AI	1,0	**>1,4**	**Active Soils**

NATURAL MOISTURE CONTENT (%) - (SANS 3001-GR20)

Dry Sample: 500g	**Container + Sample (Wet)**	660
	Container + Sample (Dry)	578
	Moisture %	12,4

PH - EC - TDS - TEMP (°C) - (ASTM D4962-19) / COMPACTIBILITY FACTOR - (SABS 0120 LB3)

pH	6,2	**Height (mm)**	150
EC (µS/cm)	384	**Distance Compacted (mm)**	
TDS (ppm)	492	**Compactibility Factor**	0,00
Temp (°C)	11,2	**Organic or Waste**	Soft Rock

Liability: Data Reported above relates to sample tested.

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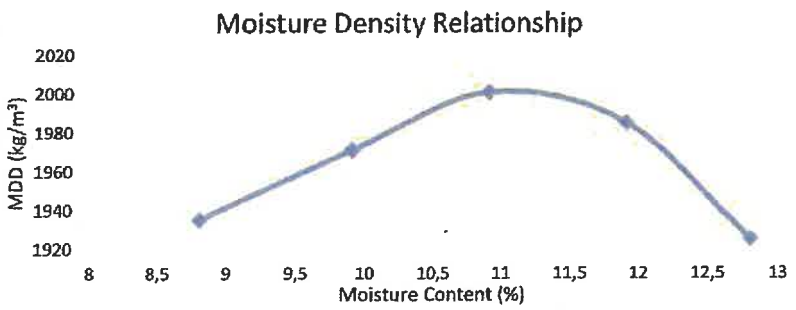
Registration No.- K2011/115681/07 – Tax No.- 9127374/18/0 – SAHPRA Authority No.- 2962/23/1062

TEST REPORT - MATERIAL CLASSIFICATION

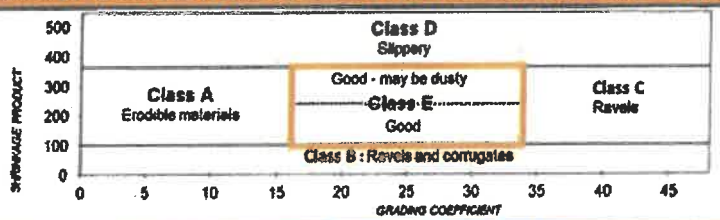
Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Excavation No.	TP01A
Depth of Sample Taken:	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Dark brown silty sandy clay with gravelly pebbles

TEST METHOD	MOD AASHTO - (SANS 3001-GR30)
OPTIMUM MOISTURE CONTENT (OMC) (%)	MAXIMUM DRY DENSITY (MDD) (Kg/m³)
10,9	2001



PERFORMANCE AS GRAVEL WEARING COURSE - DEPARTMENT OF TRANSPORT (2009)



GENERAL SUBGRADE RATING - (AASHTO M145)

AASHTO M 145	Excellent to Good	X
	Fair to Poor	

COMPRESSIBILITY AND COLLAPSIBILITY - (ASTM D4546-21)

Low Compressibility	X	Medium Compressibility	
High Compressibility		Collapsible Soils	

Liability: Data Reported above relates to sample tested.

GEO-SOL GEOTECHNICAL CONSTRUCTION TESTING

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24 Arizona Crescent – Northcliff – Cresta - Johannesburg – Gauteng - 4001
Cell – 071 560 8058 – 072 660 8445 – 082 889 2823 - Email – geosollab@gmail.com
Registration No.- K2011/115681/07 – Tax No.- 9127374/18/0 – SAHPRA Authority No.- 2962/23/1062

TEST REPORT - MATERIAL CLASSIFICATION

Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Excavation No.	TP01A
Depth of Sample Taken:	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Dark brown silty sandy clay with gravelly pebbles

MATERIAL UTILIZATION - EARTHWORKS CLASSIFICATION - (ECN N-S 1076)	
Group A - Granular Soils	
Group B - Low Plasticity Soils	
Group C - High Plasticity Soils	
Group D - Durable Rock	
Group E - Degradable Rock	X
Group F - Topsoil	
Group G - Organic Soils	

CBR FINAL RESULTS	CBR (%) - (SANS 3001-GR40)
CBR @ 100% Compaction	29
CBR @ 98% Compaction	22
CBR @ 97% Compaction	16
CBR @ 95% Compaction	11
CBR @ 93% Compaction	9
CBR @ 90% Compaction	7
Swell @ 100% Compaction	1

CLASSIFICATION	COTO	G9
STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE WORKS FOR SOUTH AFRICAN ROAD AUTHORITIES - COTO		
Max Size 2/3 Layer - Min CBR 3@93% - 90% Mod AASHTO	G10	Gravel/Soils
Max Size 2/3 Layer - PI<12 - Min CBR 7@93% - Swell <1,5%	G9	Gravel/Soils
Max Size 2/3 Layer - PI<12 - Min CBR 10@93% - Swell <1,5%	G8	Gravel/Soils
Max Size 2/3 Layer - PI<12 - Min CBR 15@93% - Swell <1,5%	G7	Gravel/Soils
Max Size 63mm - PI<12 - Min CBR 25@95% - Swell <1,0%	G6	Natural Gravel
Max Size 63mm - PI<10 - Min CBR 45@95% - Swell <0,5%	G5B	Natural Gravel
Max Size 37,5mm - PI<6 - Min CBR 80@98% - Swell <0,2%	G4B	Natural Gravel/Crushed
Max Size 37,5mm - PI<6 - 98-100% Mod AASHTO	G3	Dense Graded Crushed Stone
Max Size 37,5mm - PI<6 - 100-102% Mod AASHTO	G2	Dense Graded Crushed Stone
Max Size 37,5mm - PI<4	G1	Dense Graded Crushed Stone

Liability: Data Reported above relates to sample tested.

GEO-SOL GEOTECHNICAL CONSTRUCTION TESTING

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24 Arizona Crescent – Northcliff – Cresta - Johannesburg – Gauteng - 4001
Cell – 071 560 8058 – 072 660 8445 – 082 889 2823 - Email – geosollab@gmail.com
Registration No.- K2011/115681/07 – Tax No.- 9127374/18/0 – SAHPRA Authority No.- 2962/23/1062

TEST REPORT - MATERIAL CLASSIFICATION

Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Sample No:	TP02B
Depth of Sample Taken (mm):	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Dark brown silty sandy clay with gravelly pebbles

Sieve Analysis (mm) (SANS 3001-GR1)	100,00	100,0
	75,00	100,0
	37,50	100,0
	28,00	100,0
	20,00	100,0
	14,00	100,0
	5,00	95,4
	2,00	85,4
	0,43	55,2
	0,25	41,0
	0,15	40,2
	0,075	35,4
Hydrometer Analysis (mm) (ASTM-D422)	0,060	10,9
	0,050	10,2
	0,004	6,5
	0,002	5,9

MECHANICAL ANALYSIS	JENNINGS	%
CLAY	10,240	10
SILT	25,160	25
SAND	50,000	50
GRAVEL	14,600	15

ATTERBERG LIMIT (SANS 3001-GR10, GR12)	LL%	29,80	
	P.I.	11,00	
	LS%	5,00	
GRADING MODULUS (SANRAL)	GM	1,2	
SOIL CLASSIFICATION	AASHTO	USCS	COTO
	A-2	SM-GP	G9

Liability: Data Reported above relates to sample tested.

GEO-SOL GEOTECHNICAL CONSTRUCTION TESTING

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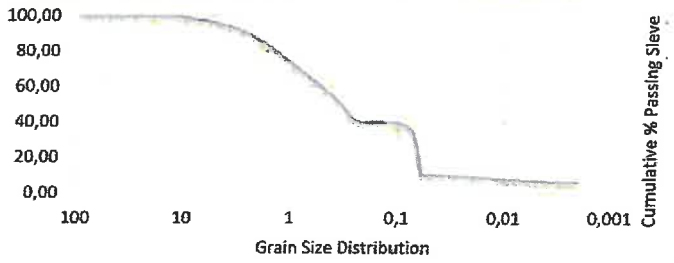
Registration No.- K2011/115681/07 – Tax No.- 9127374/18/0 – SAHPRA Authority No.- 2962/23/1062

TEST REPORT - MATERIAL CLASSIFICATION

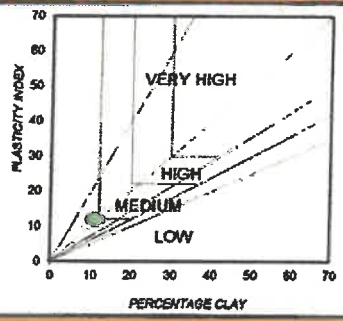
Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Excavation No.	TP02B
Depth of Sample Taken:	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Dark brown silty sandy clay with gravelly pebbles

PARTICLE GRAIN SIZE DISTRIBUTION



POTENTIAL EXPANSIVENESS - (VDM)



POTENTIAL HEAVE - (VDM)

Low	
Moderate	X
High	

CLAY ACTIVITY INDEX (AI) - (ASTM D5890-19)

		0-1,4	**Inactive Soils**
AI	1,1	**>1,4**	**Active Soils**

NATURAL MOISTURE CONTENT (%) - (SANS 3001-GR20)

Dry Sample: 500g	**Container + Sample (Wet)**	660
	Container + Sample (Dry)	582
	Moisture %	11,8

PH - EC - TDS - TEMP (°C) - (ASTM D4962-19) / COMPACTIBILITY FACTOR - (SABS 0120 LB3)

pH	6,8	**Height (mm)**	150
EC (µS/cm)	92	**Distance Compacted (mm)**	
TDS (ppm)	43	**Compactibility Factor**	0,00
Temp (°C)	11,4	**Organic or Waste**	Soft Rock

Liability: Data Reported above relates to sample tested.

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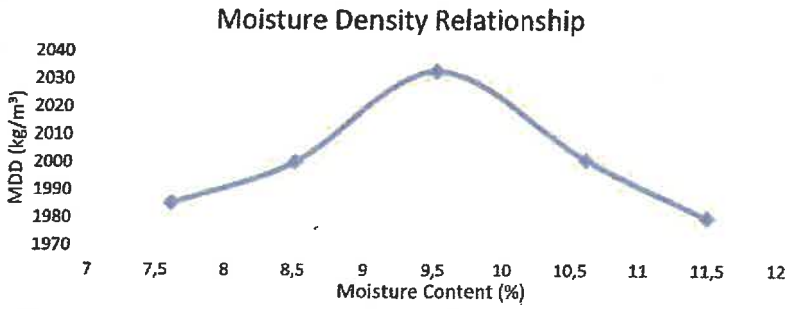
Registration No.- K2011/115681/07 – Tax No.- 9127374/18/0 – SAHPRA Authority No.- 2962/23/1062

TEST REPORT - MATERIAL CLASSIFICATION

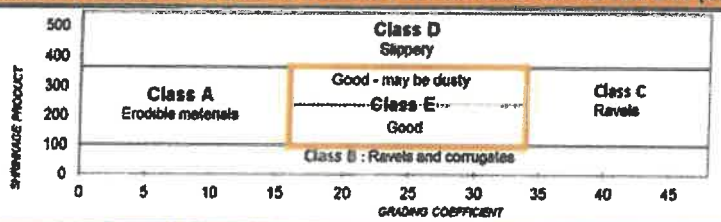
Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Excavation No.	TP02B
Depth of Sample Taken:	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Dark brown silty sandy clay with gravelly pebbles

TEST METHOD	MOD AASHTO - (SANS 3001-GR30)
OPTIMUM MOISTURE CONTENT (OMC) (%)	MAXIMUM DRY DENSITY (MDD) (Kg/m³)
9,5	2033



PERFORMANCE AS GRAVEL WEARING COURSE - DEPARTMENT OF TRANSPORT (2009)



GENERAL SUBGRADE RATING - (AASHTO M145)

AASHTO M 145	Excellent to Good	X
	Fair to Poor	

COMPRESSIBILITY AND COLLAPSIBILITY - (ASTM D4546-21)

Low Compressibility	X	Medium Compressibility	
High Compressibility		Collapsible Soils	

Liability: Data Reported above relates to sample tested.

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TEST REPORT - MATERIAL CLASSIFICATION

Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Excavation No.	TP02B
Depth of Sample Taken:	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Dark brown silty sandy clay with gravelly pebbles

MATERIAL UTILIZATION - EARTHWORKS CLASSIFICATION - (ECN N-S 1076)	
Group A - Granular Soils	
Group B - Low Plasticity Soils	
Group C - High Plasticity Soils	
Group D - Durable Rock	
Group E - Degradable Rock	X
Group F - Topsoil	
Group G - Organic Soils	

CBR FINAL RESULTS	CBR (%) - (SANS 3001-GR40)
CBR @ 100% Compaction	39
CBR @ 98% Compaction	28
CBR @ 97% Compaction	22
CBR @ 95% Compaction	15
CBR @ 93% Compaction	9
CBR @ 90% Compaction	8
Swell @ 100% Compaction	0,5

CLASSIFICATION	COTO	G10
STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE WORKS FOR SOUTH AFRICAN ROAD AUTHORITIES - COTO		
Max Size 2/3 Layer - Min CBR 3@93% - 90% Mod AASHTO	G10	Gravel/Soils
Max Size 2/3 Layer - PI<12 - Min CBR 7@93% - Swell <1,5%	G9	Gravel/Soils
Max Size 2/3 Layer - PI<12 - Min CBR 10@93% - Swell <1,5%	G8	Gravel/Soils
Max Size 2/3 Layer - PI<12 - Min CBR 15@93% - Swell <1,5%	G7	Gravel/Soils
Max Size 63mm - PI<12 - Min CBR 25@95% - Swell <1,0%	G6	Natural Gravel
Max Size 63mm - PI<10 - Min CBR 45@95% - Swell <0,5%	G5B	Natural Gravel
Max Size 37,5mm - PI<6 - MIn CBR 80@98% - Swell <0,2%	G4B	Natural Gravel/Crushed
Max Size 37,5mm - PI<6 - 98-100% Mod AASHTO	G3	Dense Graded Crushed Stone
Max Size 37,5mm - PI<6 - 100-102% Mod AASHTO	G2	Dense Graded Crushed Stone
Max Size 37,5mm - PI<4	G1	Dense Graded Crushed Stone

Liability: Data Reported above relates to sample tested.

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TEST REPORT - MATERIAL CLASSIFICATION

Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Sample No:	TP03C
Depth of Sample Taken (mm):	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Red brown silty sandy clay with gravelly pebbles

Sieve Analysis (mm) (SANS 3001-GR1)	100,00	100,0
	75,00	100,0
	37,50	100,0
	28,00	100,0
	20,00	100,0
	14,00	100,0
	5,00	97,0
	2,00	90,8
	0,43	67,2
	0,25	54,8
	0,15	54,2
	0,075	51,6
Hydrometer Analysis (mm) (ASTM-D422)	0,060	14,9
	0,050	13,9
	0,004	8,7
	0,002	8,7

MECHANICAL ANALYSIS	JENNINGS	%
CLAY	13,880	14
SILT	37,720	38
SAND	39,200	39
GRAVEL	9,200	9

ATTERBERG LIMIT (SANS 3001-GR10, GR12)	LL%	30,70
	P.I.	13,00
	LS%	7,00
GRADING MODULUS (SANRAL)	GM	0,9

	AASHTO	USCS	COTO
SOIL CLASSIFICATION	A-2	SM-GP	G10

Liability: Data Reported above relates to sample tested.

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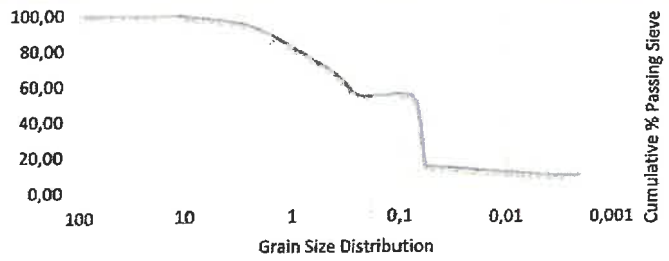
TEST REPORT - MATERIAL CLASSIFICATION

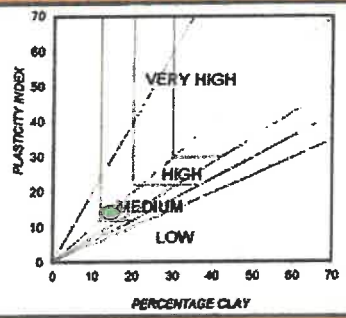
Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Excavation No.	TP03C
Depth of Sample Taken:	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Red brown silty sandy clay with gravelly pebbles

PARTICLE GRAIN SIZE DISTRIBUTION



POTENTIAL EXPANSIVENESS - (VDM)



POTENTIAL HEAVE - (VDM)

Low	
Moderate	X
High	

CLAY ACTIVITY INDEX (AI) - (ASTM D5890-19)

AI	0,9	**0-1,4**	**Inactive Soils**
		>1,4	**Active Soils**

NATURAL MOISTURE CONTENT (%) - (SANS 3001-GR20)

Dry Sample: 500g	**Container + Sample (Wet)**	660
	Container + Sample (Dry)	592
	Moisture %	10,3

PH - EC - TDS - TEMP (°C) - (ASTM D4962-19)		COMPACTIBILITY FACTOR - (SABS 0120 LB3)	
pH	6,9	**Height (mm)**	150
EC (µS/cm)	156	**Distance Compacted (mm)**	
TDS (ppm)	148	**Compactibility Factor**	0,00
Temp (°C)	11,4	**Organic or Waste**	Soft Rock

Liability: Data Reported above relates to sample tested.

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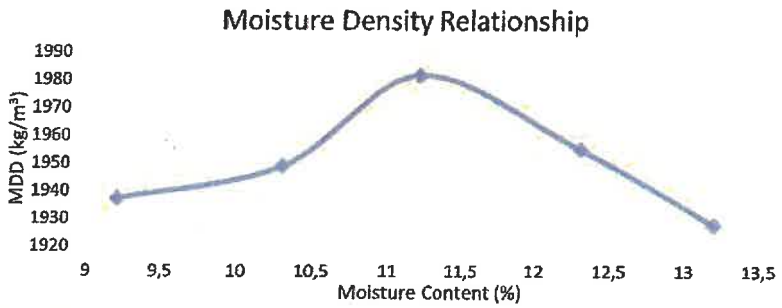
TEST REPORT - MATERIAL CLASSIFICATION

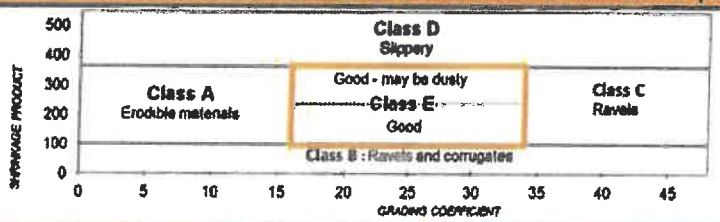
Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Excavation No.	TP03C
Depth of Sample Taken:	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Red brown silty sandy clay with gravelly pebbles

TEST METHOD	MOD AASHTO - (SANS 3001-GR30)
OPTIMUM MOISTURE CONTENT (OMC) (%)	MAXIMUM DRY DENSITY (MDD) (Kg/m³)
11,2	1982



PERFORMANCE AS GRAVEL WEARING COURSE - DEPARTMENT OF TRANSPORT (2009)



GENERAL SUBGRADE RATING - (AASHTO M145)

AASHTO M 145	**Excellent to Good**	X
	Fair to Poor	

COMPRESSIBILITY AND COLLAPSIBILITY - (ASTM D4546-21)

Low Compressibility	X	**Medium Compressibility**	
High Compressibility		**Collapsible Soils**	

Liability: Data Reported above relates to sample tested

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TEST REPORT - MATERIAL CLASSIFICATION

Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Excavation No.	TP03C
Depth of Sample Taken:	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Red brown silty sandy clay with gravelly pebbles

MATERIAL UTILIZATION - EARTHWORKS CLASSIFICATION - (ECN N-S 1076)	
Group A - Granular Soils	
Group B - Low Plasticity Soils	
Group C - High Plasticity Soils	
Group D - Durable Rock	
Group E - Degradable Rock	X
Group F - Topsoil	
Group G - Organic Soils	

CBR FINAL RESULTS	CBR (%) - (SANS 3001-GR40)
CBR @ 100% Compaction	21
CBR @ 98% Compaction	15
CBR @ 97% Compaction	11
CBR @ 95% Compaction	9
CBR @ 93% Compaction	5
CBR @ 90% Compaction	3
Swell @ 100% Compaction	1,2

CLASSIFICATION	COTO	G10
STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE WORKS FOR SOUTH AFRICAN ROAD AUTHORITIES - COTO		
Max Size 2/3 Layer - Min CBR 3@93% - 90% Mod AASHTO	G10	Gravel/Soils
Max Size 2/3 Layer - PI<12 - Min CBR 7@93% - Swell <1,5%	G9	Gravel/Soils
Max Size 2/3 Layer - PI<12 - Min CBR 10@93% - Swell <1,5%	G8	Gravel/Soils
Max Size 2/3 Layer - PI<12 - Min CBR 15@93% - Swell <1,5%	G7	Gravel/Soils
Max Size 63mm - PI<12 - Min CBR 25@95% - Swell <1,0%	G6	Natural Gravel
Max Size 63mm - PI<10 - Min CBR 45@95% - Swell <0,5%	G5B	Natural Gravel
Max Size 37,5mm - PI<6 - Min CBR 80@98% - Swell <0,2%	G4B	Natural Gravel/Crushed
Max Size 37,5mm - PI<6 - 98-100% Mod AASHTO	G3	Dense Graded Crushed Stone
Max Size 37,5mm - PI<6 - 100-102% Mod AASHTO	G2	Dense Graded Crushed Stone
Max Size 37,5mm - PI<4	G1	Dense Graded Crushed Stone

Liability: Data Reported above relates to sample tested.

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TEST REPORT - MATERIAL CLASSIFICATION

Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Sample No:		TP04D
Depth of Sample Taken (mm):		Insitu
Material Class:		Natural Gravel
Earthworks Classification:		Degradable Rock
Description of Sample		Dark brown silty sandy clay with gravelly pebbles
Sieve Analysis (mm) (SANS 3001-GR1)	100,00	100,0
	75,00	100,0
	37,50	100,0
	28,00	100,0
	20,00	100,0
	14,00	100,0
	5,00	96,6
	2,00	86,6
	0,43	57,6
	0,25	42,0
	0,15	39,0
	0,075	38,4
Hydrometer Analysis (mm) (ASTM-D422)	0,060	10,3
	0,050	9,6
	0,004	7,0
	0,002	6,3

MECHANICAL ANALYSIS	JENNINGS	%
CLAY	9,550	10
SILT	28,850	29
SAND	48,200	48
GRAVEL	13,400	13

ATTERBERG LIMIT (SANS 3001-GR10, GR12)	LL%	27,00	
	P.I.	10,00	
	LS%	5,00	
GRADING MODULUS (SANRAL)	GM	1,2	
SOIL CLASSIFICATION	AASHTO	USCS	COTO
	A-2	SM-GP	G8

Liability: Data Reported above relates to sample tested

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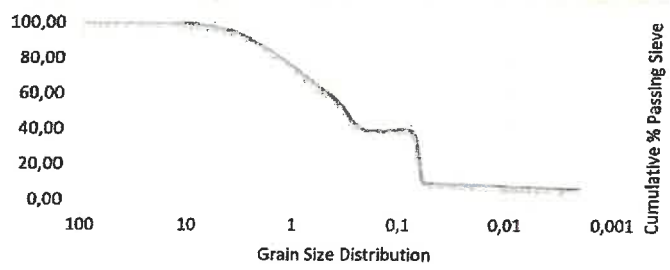
TEST REPORT - MATERIAL CLASSIFICATION

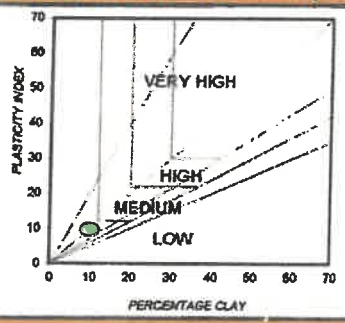
Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Excavation No.	TP04D
Depth of Sample Taken:	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Dark brown silty sandy clay with gravelly pebbles

PARTICLE GRAIN SIZE DISTRIBUTION



POTENTIAL EXPANSIVENESS - (VDM)



POTENTIAL HEAVE - (VDM)

Low	
Moderate	X
High	

CLAY ACTIVITY INDEX (AI) - (ASTM D5890-19)

AI	1,0	**0-1,4**	**Inactive Soils**
		>1,4	**Active Soils**

NATURAL MOISTURE CONTENT (%) - (SANS 3001-GR20)

Dry Sample: 500g	**Container + Sample (Wet)**	660
	Container + Sample (Dry)	592
	Moisture %	10,3

PH - EC - TDS - TEMP (°C) - (ASTM D4962-19)		COMPACTIBILITY FACTOR - (SABS 0120 LB3)	
pH	6,8	**Height (mm)**	150
EC (µS/cm)	188	**Distance Compacted (mm)**	
TDS (ppm)	44	**Compactibility Factor**	0,00
Temp (°C)	25,5	**Organic or Waste**	Soft Rock

Liability: Data Reported above relates to sample tested.

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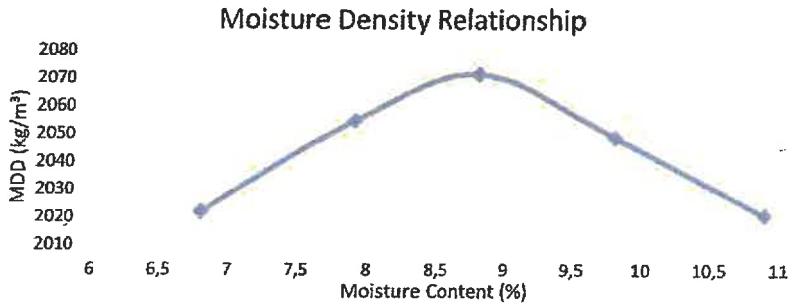
TEST REPORT - MATERIAL CLASSIFICATION

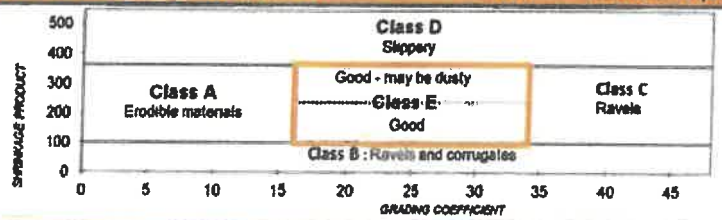
Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Excavation No.	TP04D
Depth of Sample Taken:	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Dark brown silty sandy clay with gravelly pebbles

TEST METHOD	MOD AASHTO - (SANS 3001-GR30)
OPTIMUM MOISTURE CONTENT (OMC) (%)	MAXIMUM DRY DENSITY (MDD) (Kg/m³)
8,8	2072



PERFORMANCE AS GRAVEL WEARING COURSE - DEPARTMENT OF TRANSPORT (2009)



GENERAL SUBGRADE RATING - (AASHTO M145)

AASHTO M 145	**Excellent to Good**	X
	Fair to Poor	

COMPRESSIBILITY AND COLLAPSIBILITY - (ASTM D4546-21)

Low Compressibility	X	**Medium Compressibility**	
High Compressibility		**Collapsible Soils**	

Liability: Data Reported above relates to sample tested.

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TEST REPORT - MATERIAL CLASSIFICATION

Client Name:	Ramgoolam	**Ref:**	GG025_26
Area:	Kwazulu Natal, South Africa	**Date Analysed:**	03/06/2026
Project Name:	Bhade Secondary School	**Technical Signatory:**	Richard Malungani

Excavation No.	TP04D
Depth of Sample Taken:	Insitu
Material Class:	Natural Gravel
Earthworks Classification:	Degradable Rock
Description of Sample	Dark brown silty sandy clay with gravelly pebbles

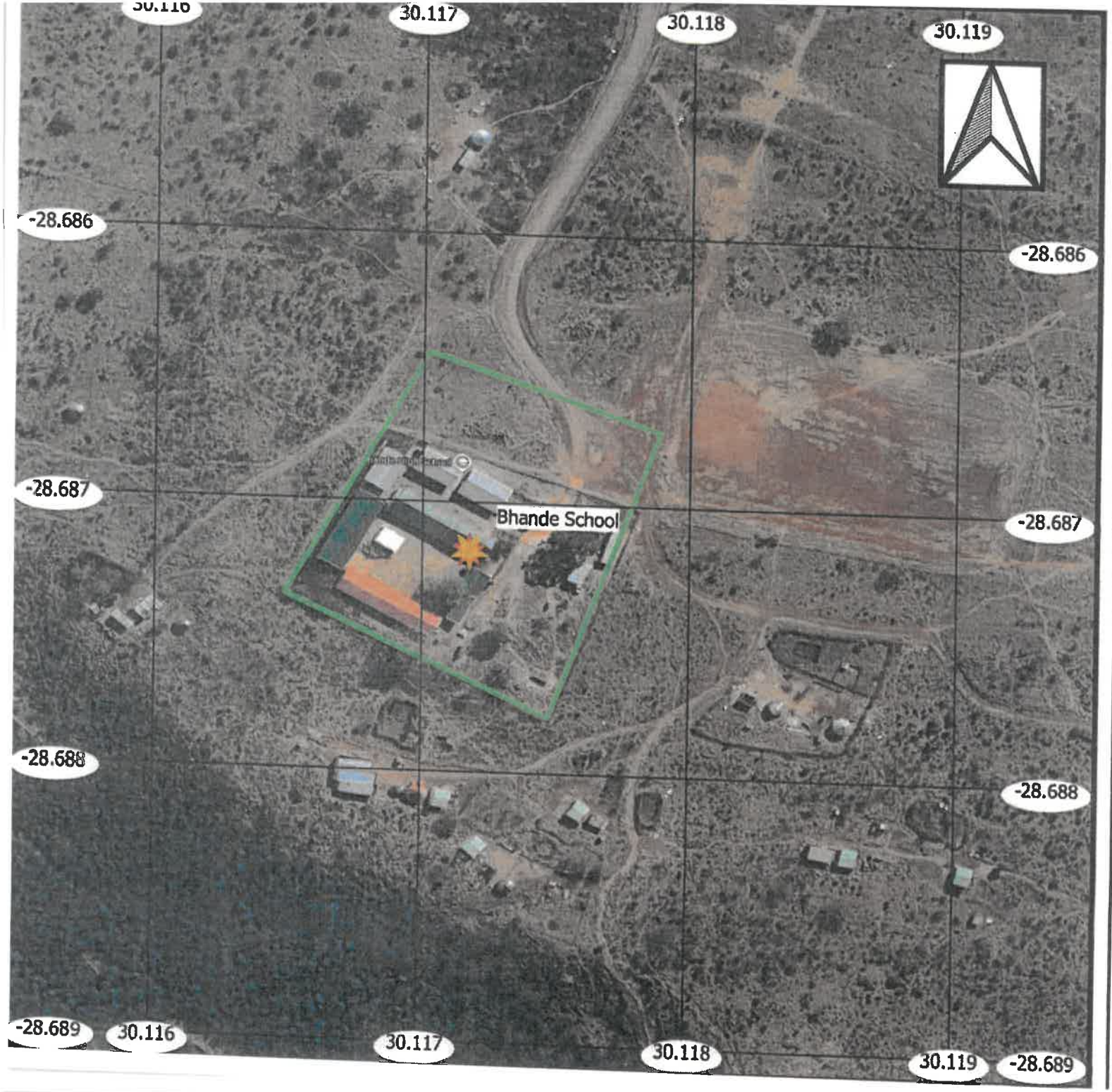
MATERIAL UTILIZATION - EARTHWORKS CLASSIFICATION - (ECN N-S 1076)	
Group A - Granular Soils	X
Group B - Low Plasticity Soils	
Group C - High Plasticity Soils	
Group D - Durable Rock	
Group E - Degradable Rock	
Group F - Topsoil	
Group G - Organic Soils	

CBR FINAL RESULTS	CBR (%) - (SANS 3001-GR40)
CBR @ 100% Compaction	39
CBR @ 98% Compaction	29
CBR @ 97% Compaction	22
CBR @ 95% Compaction	18
CBR @ 93% Compaction	12
CBR @ 90% Compaction	10
Swell @ 100% Compaction	0,5

CLASSIFICATION	COTO	G8
STANDARD SPECIFICATIONS FOR ROADS AND BRIDGE WORKS FOR SOUTH AFRICAN ROAD AUTHORITIES - COTO		
Max Size 2/3 Layer - Min CBR 3@93% - 90% Mod AASHTO	G10	Gravel/Soils
Max Size 2/3 Layer - PI<12 - Min CBR 7@93% - Swell <1,5%	G9	Gravel/Soils
Max Size 2/3 Layer - PI<12 - Min CBR 10@93% - Swell <1,5%	G8	Gravel/Soils
Max Size 2/3 Layer - PI<12 - Min CBR 15@93% - Swell <1,5%	G7	Gravel/Soils
Max Size 63mm - PI<12 - Min CBR 25@95% - Swell <1,0%	G6	Natural Gravel
Max Size 63mm - PI<10 - Min CBR 45@95% - Swell <0,5%	G5B	Natural Gravel
Max Size 37,5mm - PI<6 - Min CBR 80@98% - Swell <0,2%	G4B	Natural Gravel/Crushed
Max Size 37,5mm - PI<6 - 98-100% Mod AASHTO	G3	Dense Graded Crushed Stone
Max Size 37,5mm - PI<6 - 100-102% Mod AASHTO	G2	Dense Graded Crushed Stone
Max Size 37,5mm - PI<4	G1	Dense Graded Crushed Stone

Liability: Data Reported above relates to sample tested.

APPENDIX D: MAPS



Legend

- Bhande School
- School Boundary
- Google Earth

Scale: 1:1 500 0 25 50 m

Source: Online GIS, June 2026

Coordniate Reference System:

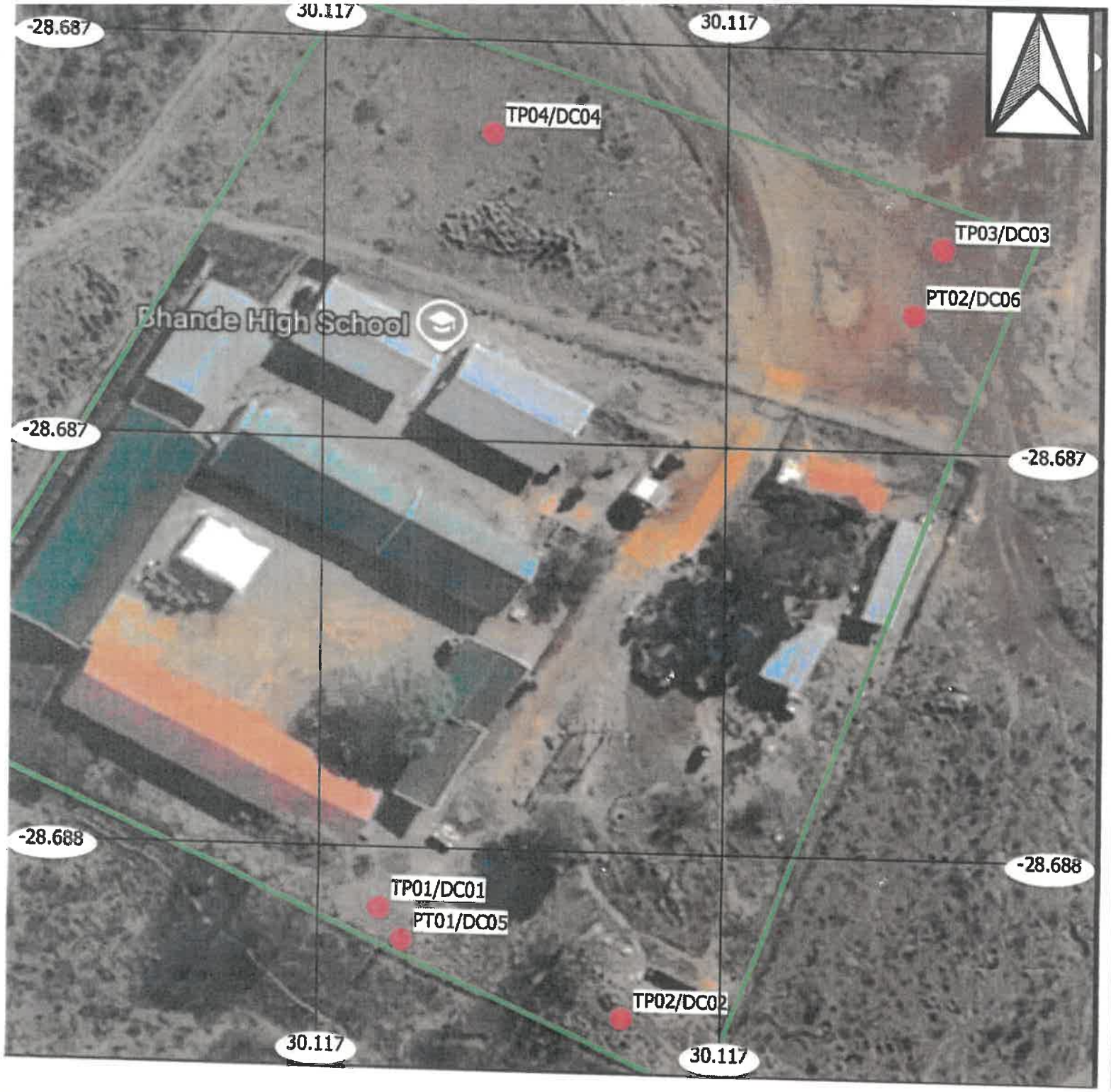
EPSG:3857 - WGS 84 / Pseudo-Mercator

PROJECT: Bhande High School

TITLE: Locality Map

DRAWN: N. Govender

GEO-SOL GEOTECHNICAL CONSTRUCTION TESTING
Geotechnical Solutions (PTY) LTD
106 Francis Road - P.O. Box 303 - Ladysmith - Kwazulu Natal - 3370
- 071 560 8058 - 072 660 8445 - 082 889 2823 - Email -



Legend

- Field Tests
- School Boundary
- Google Earth

Scale: 1:500 0 10 20 m

Source: Online GIS, June 2026

Coordniate Reference System:

EPSG:3857 - WGS 84 / Pseudo-Mercator

PROJECT: Bhande High School

TITLE: Field Tests

DRAWN: N. Govender

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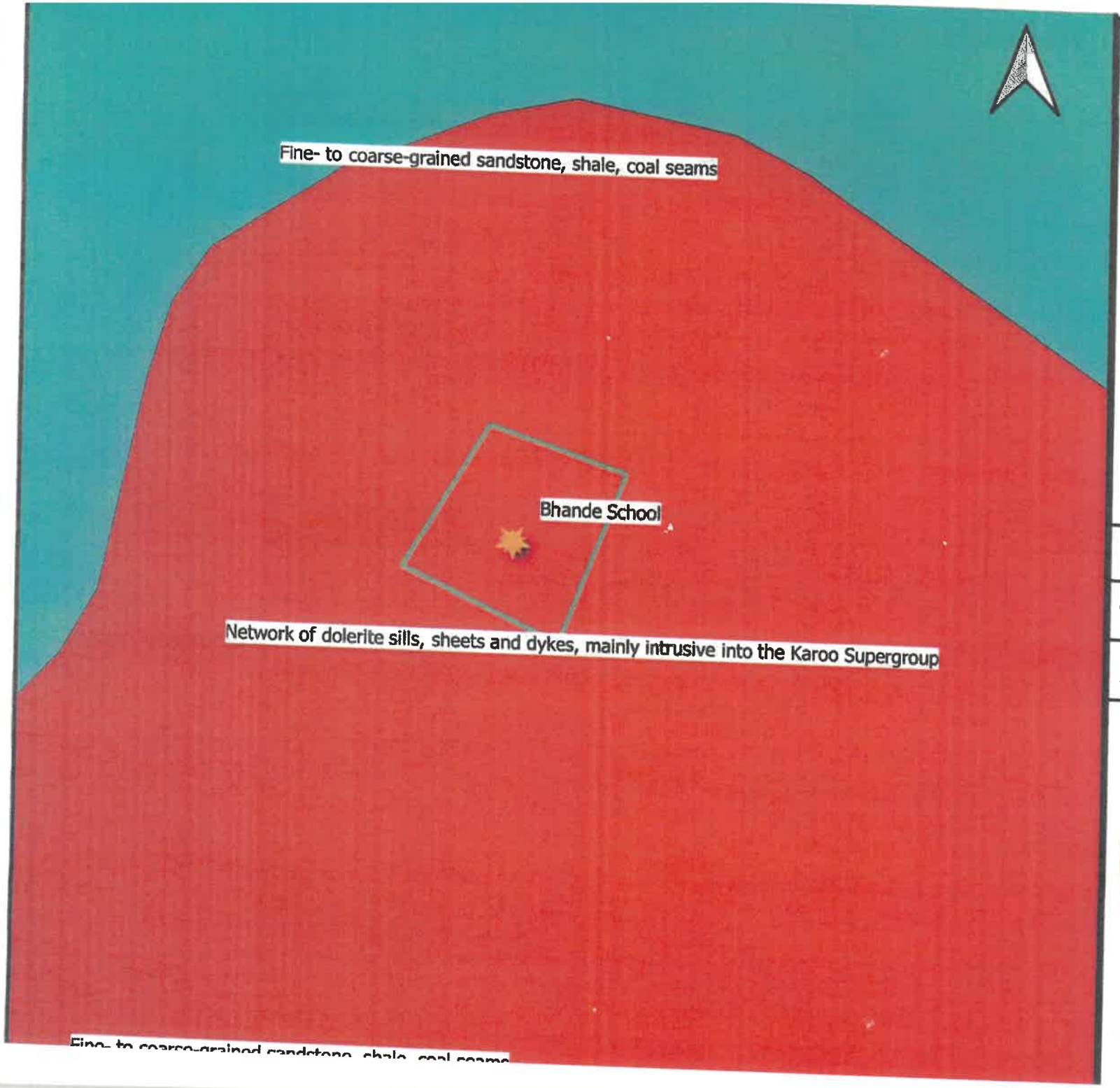
Tel - 071 560 8058 - 072 660 8445 - 082 889 2823 - Email -



Key

- Bhande School
- School Boundary

Richards_Bay_2830_

- KAROO DOLERITE
- VRYHEID

1:2 500

0 50 100 m

PROJECT: Bhande High School

TITLE: Geological Map "2830 Richards Bay

DRAWN: N. Govender

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106 Francis Road - P.O. Box 303 - Ladysmith - Kwazulu Natal - 3370
- 071 560 8058 - 072 660 8445 - 082 889 2823 - Email -

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

ANNEXURE 10
EPWP Employment Contract

SCOPE OF WORKS IN RESPECT OF WORK RELATING TO THE EXTENDEND PUBLIC WORKS PROGRAMME (EPWP)			
Project title:	**DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION**		
Project Code:	**070689**	**EPWP NO:**	**N/A**

Introductory notes:

1. The works, or parts of the works will be constructed using labour-intensive methods only in terms of this specification. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letters **LI** are not necessarily an exhaustive list of all the activities which must be done by hand, and this clause does not over-ride any of the requirements in the generic labour intensive specification in the Scope of Works.

2. Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment.

DESCRIPTION OF THE WORKS
Employer's objectives
The employer's objectives are to deliver public infrastructure using labour-intensive methods in accordance with EPWP Guidelines.

Labour-intensive works
Labour-intensive works comprise the activities described in the Labour-Intensive Specification. Labour-intensive works shall be constructed/maintained using local workers who are temporarily employed in terms of the scope of work.

LABOUR-INTENSIVE COMPETENCIES OF SUPERVISORY AND MANAGEMENT STAFF
Contractors shall only engage supervisory and management staff in labour-intensive works that have completed the skills programme including Foremen/ Supervisors at NQF level 4 "National Certificate: Supervision of Civil Engineering Construction Processes" and Site Agent/ Manager at NQF level 5 "Manage Labour-Intensive Construction Processes" or equivalent QCTO qualifications (See Appendix C). at NQF outlined in Table 1. (See GUIDELINES FOR THE IMPLEMENTATION OF LABOUR-INTENSIVE INFRASTRUCTURE PROJECTS UNDER THE EXPANDED PUBLIC WORKS PROGRAMME (EPWP) -THIRD EDITION 2015)

Emerging contractors shall have personally completed, or be registered on a skills programme for the NQF level 2 unit standard. All other site supervisory staff in the employ of emerging contractors must have completed, or be registered on a skills programme for the NQF level 2 unit standards or NQF level 4 unit standards. Table 1: Skills programme for supervisory and management staff.

Table 1: Skills programme for supervisory and management staff

Personnel	NQF level	Unit standard titles	Skills programme description
Team leader / supervisor	2	Apply Labour-Intensive Construction Systems and Techniques to Work Activities	This unit standard must be completed, and
		Use Labour-Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	any one of these 3 unit standards
		Use Labour-Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour-Intensive Construction Methods to Construct, Repair and Maintain structures	

Personnel	NQF level	Unit standard titles	Skills programme description
Foreman/supervisor	4	Implement Labour-Intensive Construction Systems and Techniques	This unit standard must be completed, and
		Use Labour-Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	any one of these 3 unit standards
		Use Labour-Intensive Construction Methods to Construct and Maintain Water an Sanitation Services	
		Use Labour-Intensive Construction Methods to Construct, Repair and Maintain structures	
Site Agent /Manager (i.e. the contractor's most senior representative that is resident on the site)	5	Manage Labour-Intensive Construction Processes	Skills Programme against this single unit standard
Details of these skills programmes may be obtained from the CETA ETQA manager (e-mail :gerard@ceta.co.za , tel: 011-265 5900)			

EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR-INTENSIVE WORKS

1.1 Requirements for the sourcing and engagement of labour.

1.1.1 Unskilled and semi-skilled labour required for the execution of all labour-intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour.

1.1.2 The rate of pay set for the SPWP per task or per day will be an acceptable rate determined by the Department of Labour.

1.1.3 Tasks established by the contractor must be such that:

a) the average worker completes 5 tasks per week in 40 hours or less; and
b) the weakest worker completes 5 tasks per week in 55 hours or less.

1.1.4 The contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of 1.1.3.

1.1.5 The Contractor shall, through all available community structures, inform the local community of the labour-intensive works and

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) 55% 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

a) to 90% Proctor density;
b) such that in excess of 5 blows of a dynamic cone penetrometer (DCP) is required to penetrate 100 mm of the backfill, provided that backfill does not comprise more than 10% gravel of size less than 10mm and contains no isolated boulders, or
c) such that the density of the compacted trench backfill is not less than that of the surrounding undisturbed soil when tested comparatively with a DCP.

6 Excavation

All hand 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 undertaking by sprigging, sodding, or seeding by hand.

15 Stone pitching and rubble concrete masonry

All stone required for stone pitching and rubble concrete masonry, whether grouted or dry, must be collected, loaded, off loaded and placed by hand.

Sand and stone shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150m.

Grout shall be mixed and placed by hand.

16 Manufactured Elements

Schedule of projects in building construction undertaken and successfully completed within the applicable CIDB grading of this Bid or one grade lower in the past 7 years by the bidding entity- Attatch letters of award and practical completion certificates or final completion certificates for projects completed.(Minimum 4 projects is required. (T2.40)

PAGE NO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1		**BILL NO 2**				
1		**EMPLOYMENT AND TRAINING OF LABOUR ON THE EPWP BENEFICIARY INFRASTRUCTURE PROJECTS**				
1		**PREAMBLES**				
1		Tenderers are advised to study the Additional Specification SL: Employment and training of Labour on the Expanded Public Works Programme (EPWP) Infrastructure Projects as bound elsewhere in the Bills of Quantities and then price this Bill accordingly				
1		**TRAINING OF EPWP BENEFICIARY**				
1		(TARGET: 10 EPWP BENEFICIARY)				
1		Skills development and Technical training:				
1	1	Skills development and technical training for EPWP beneficiary for an average of 10 days (ref. SL11.01.01)	Item	1		
1	2	Penalty due to not meeting the target as in SL 11.01.02	Y/Work	R 2 000,00		
1		**TRAVELLING AND ACCOMMODATION DURING OFF SITE TRAINING:**				
1		Life skills training for duration of the project				
1	3	Travelling (based on 50km/EPWP beneficiary)	km	500		
1	4	Profit and attendance on Items 1, 2 & 3	%			
1		**EMPLOYMENT OF EPWP BENEFICIARY**				
1	5	Employment of EPWP beneficiary (10 youth) Existing blocks.	Item	1		
1		The unit of measurement shall be the number of EPWP beneficiary at the statutory labour rates of R 100/day 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 training shall be excluded from this item. This item is based on 12 months appointment for EPWP beneficiary				
1	6	Employment of EPWP beneficiary(10 youth) [Parking garage]	Item	1		
		TOTAL CARRIED TO SUMMARY				

			UNIT	QUANTITY	RATE	AMOUNT
2		The unit of measurement shall be the number of EPWP beneficiary at the statutory labour rates of R /day 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 training shall be excluded from this item. This item is based on 12 months appointment for EPWP beneficiary				
2	7	Employment of EPWP beneficiary (10 youth) [Conference Centre & Canteen]	Item	1		
2		The unit of measurement shall be the number of EPWP beneficiary at the statutory labour rates of R /day 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 training shall be excluded from this item. This item is based on 12 months appointment for EPWP beneficiary				
2		**PROVISION OF EPWP DESIGNED OVERALLS TO YOUTH WORKERS**				
2	8	Supply EPWP designed overalls to EPWP beneficiary (ref. SL 11.05.01) for 5 or 10 workers	Item	1		
2	9	Profit and attendance on Items 5 - 8 (ref. SL 11.05.02)	%	7,5		
2		**PROVISION OF SMALL TOOLS FOR EPWP BENEFICIARY**				
2	10	Supply of small tools to EPWP beneficiary. Specification to be supplied by the EPWP-NYS Serviced Provider for the respective trades (ref. SL 11.06.01) for 5 or 10 workers	Item	1		
2	11	Profit and attendance (ref. SL 11.06.02)	%	7,5		
2		**APPOINTMENT OF YOUTH TEAM LEADERS**				
2	12	Appointment of EPWP beneficiary Team Leaders for the duration of the contract (ref. SL 11.07)	Item	1		
2	13	Liaison with Service Provider (ref. SL 11.08)	Hrs	30		
2	14	Profit and attendance on Items 12 & 13	%	7,5		
		FINAL TOTAL CARRIED TO PRELIMINARY AND GENERAL IN BILL OF QUANTITIES				

C12 to be expanded from C 12.1 to C12.10 as follows;

C 12 EPWP CONDITIONS AND SPECIFICATIONS	Unit	Quantity	Rate	Amount
C12.1(a) Employment Targets The contractor needs to provide a realistic estimate on the number of jobs that the project has a potential to create throughout the project duration as the project will be implemented using Labour Intensive Construction methods on elements where it is economical and feasible. F.....V.....T..... It is a general requirement of this contract that persons normally resident in the ward of the works (local labour) be given preference for employment on the contract. Provided, however, that **should adequate and appropriate labour not be available within the ward**, others may be employed subject to satisfactory proof being provided that every reasonable endeavour has been made to employ local labour **(Local Sub-contractor(s); Skilled; Semi-Skilled and Unskilled).** The contractor shall in consultation with the local community leaders (**Project Steering Committee**) with the purpose of negotiating with them regarding the utilization of local resources in the construction process. In this regard, the contractor shall furthermore give preference, wherever possible to the employment of single heads of households, women and youth as well as families declared as most indigent by War on Poverty/ Sukuma Sakhe program profiling process. The contractor should aim, in general, to maximise the involvement of the local community, however workers from other communities should not exceed 20% of all persons working on the project, where local employees possess skills at level of competency that meet contractors requirements	Item			
C12.1 (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 following employment requirements of the EPWP 1. 60 % of unskilled labour to be women 2. 55% of unskilled labour to be youth aged between 18 and 35 years 3. 3% of unskilled labour to be people with disability 100% unskilled labour utilized must reside within the boundaries of the Municipality Ward where this contract is executed, with preference to the local community closest or a 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			
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount

C12.1 (c)Labour rate and payment intervals The contractor should ensure that the labour rate paid to unskilled local labour is commensurate to the daily task. When determining the rate, consideration should be given to that EPWP beneficiaries are mostly bread winners in their families, as the program intends alleviating poverty. There should also be consideration that the labour rate promotes creation of expanded number of jobs created and person days of work. Contractors should make endeavours to ensure that labourers, particularly unskilled are remunerated on fortnight basis and prior notification be made should there be a shortfall on their wages. The labour rate for local unskilled shall also be determined in consideration of the location of the project, i.e. for projects implemented in urbanized municipalities will not be the same as that for rural municipalities. F.....V.....T.....	Item			
C12.2 (a)Labour Intensive Construction (LIC) method On site there must a person(s) having the competency in managing and implementing LIC methods. *Foreman @ NQF Level 4 the Unit Standard on Implementing LIC methods on site. *Site Agent/ Managers @ NQF level 5 the Unit Standard on Manage Labour-Intensive Skills Programme both must be CETA accredited. *The consultant @ NQF level 7 in both design and build contract as well in design by employer. (Consultants- The person responsible for the design and documentation of the labor-intensive works, must have completed the NQF level 7-unit standard "Develop and Promote Labour-Intensive Construction Strategies" or equivalent QCTO qualification). Curriculum Vitae of Key Personnel-Management to be attached. F.....V.....T.....	Item			
C12.2 (b) Labour Intensive Construction Method Those parts of the contract to be constructed using Labour Intensive methods will be marked in the BoQ with letter LI (indicating Labour Intensive) against every item so designated. Such works will only be constructed using the method so indicated. Reference to be made to Guidelines for the implementation of Labour Intensive Infrastructure projects under EPWP. "Scope of Work in Respect of Work Relating to the Expanded Public Works Programme (EPWP)" **Labour-intensive component** Due to the nature of the work involved, this type of project lends itself to be feasible as a labour Intensive project i.e. the construction activities will indeed require skilled/unskilled labour. The aim of the projects is to provide some form of economic benefit whilst generating and increasing the acquired skills shortage to improve sustainability in the local area. The following are potential focus areas where employment creation can be optimized per project:				

	TOTAL CARRIED TO SUMMARY			
	Unit	Quantity	Rate	Amount
(i) Trenching works not exceeding depth of 1.5m, including trenching for Foundation, Electrical, Water, Mechanical & Civil Services Works including backfilling where ground conditions permit (ii) Building Works; All masonry works (which include concrete mixing on site; brickwork; block work ; plastering; screed works; jointing; etc.); Painting, Plumbing, Ironmongery; roof cladding; glazing; tilling; carpentry; flooring; waterproofing; etc. (iii) Sewers works including Construction of manholes, laying of Sewer pipes, bedding, backfilling and compaction. (iv) Water Reticulation works including excavation, bedding, laying of pipes and compaction (v) Site Clearance Works (vi) Electrical Reticulation works. (vii) Stormwater water drainage using in-situ concrete (viii) Landscaping and Grassing of Sports Field (ix) Cleaning and Fencing Works The above identified activities are deemed suitable to be constructed using the LIC methods; to build, upgrade and maintain the social and economic of the underdeveloped area, promoting community participation, development of skills and creating more work opportunities. The above identified activities should be marked in the Bill of Quantities with the letter (LI). Contractor to price the above items in the Bill of Quantities bearing in mind that they are regarded as the main sources of job creation, whether sub contracted or undertaken by the main contractor. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letter LI are not necessarily an exhaustive list of all the activities which must be done by hand. Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which				

was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment. F.....V.....T.....	Item			
C12. 3 Record Keeping 12.3.1 Every employer must keep in the project site office the following minutes of site progress minutes; contractors' monthly site progress reports; accurately recorded attendance register; proof of payment as means to verify authenticity of data in the EPWP Beneficiary form submitted with payment certificates. Copies of submitted EPWP beneficiary data forms should also be kept in the site office. 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.				
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount
This should be safely kept for job creation data verifications and periodical audits on projects conducted by National and Provincial Department of Public Works after one (1) or two (2) quarters of submitting captured EPWP Data to the National EPWP coordinating Department. F.....V.....T.....	Item			
C12.4 EPWP Monthly Reporting documents: At the end of each month the contractor must submit: • EPWP monthly data collection form • Worker monthly payment upload • Worker monthly acknowledgement of receipt of payment • Worker monthly Payment register • Worker monthly training form • Monthly attendance Register • Worker Monthly pay slips • Unskilled labour certified ID copies (once off) • Beneficiary ID-size photos • Proof of UIF • Proof of COIDA F.....V.....T.....				
C12.5 EPWP Promotion	Item			

12.5.1 EPWP signage board EPWP Program at the project level shall always be promoted through the provision of projects signage board that embraces EPWP logo at the bottom, correct measurement for this sign board will be provided by the project leader during the site handing over meeting. F.....V.....T.....	Item			
12.5.2 Branding of labour apparel Contractor & Sub-contractors' labourers shall be provided with EPWP branded Personal Protective Equipment (PPE), reflector vest with EPWP acronym at the back as an ideal and cost effective means of promoting program on site. The contractor is advised to price for both items 12.5.1 and 12.5.2 F.....V.....T.....	Item			
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount

C12.6 COMMUNITY LIAISON OFFICER (CLO)

UTILISATION OF A COMMUNITY LIAISON OFFICER

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

A CLO will be identified by the local structures (Project Steering Committee) of the ward areas and appointed following fair and transparent interviewing process, to be conducted in the presence of local structures and the contractor representative, in order to assist the Contractor in the procurement of any local labour, etc. required for this project. The Contractor is to liaise with the CLO and afford him any assistance needed in ensuring sound working relations with the local community.

Key Responsibilities of the CLO are envisaged to include and not necessary be limited to:

1. Assisting local leadership in conducting skills and resources audit which facilitates sourcing labour from within the ward or targeted areas for employment, as required by contractor
2. Assisting in sourcing labour-only domestic sub-contractors and the procurement of materials from local resources, as required by the contractor.
3. Assisting the contractor by identifying areas of potential conflict and or threats to the project or to stakeholders in the project and recommend appropriate action to the contractor.
4. Assisting contractor and stakeholders in the project in the resolution of any conflict which may arise.
5. Establishing and ensuring that sufficient and open communication channels between the contractor and the work force are maintained.
6. Establish and ensuring that efficient and open communication channels between the contractor and the community are maintained
7. Identifying and reporting to the Contractor regarding issues where communication between stakeholder is necessary, recommend courses of action and facilitate such communications
8. Assisting the Contractor and the work force in the establishment of grievance procedures and necessary 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 and submit periodic reports as may be required by the Contractor from time to time.
10. Attending to such other duties which are consistent with the functions of a CLO, as may be required by the Contractor from time to time.

Tenderers are to price twice the rate of unskilled local labour rate for the Community Liaison Officer (CLO) ,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: Public Works

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

Item			
TOTAL CARRIED TO SUMMARY			
Unit	Quantity	Rate	Amount

C12.7 SKILLS DEVELOPMENT

Skills development on site

The Contractor in conforming to the objectives of EPWP that allows for EPWP labours need to be capacitated with skills that will render them employable in the future. It is then the responsibility of the contractor that mandatory (Generic) life skills are provided to 100% of workforce on site. 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 work-placement, in service training and support towards improving their level of competency and productivity. Contractor shall also provide all necessary on-the-job training to targeted labour to enable such labour to master and advance on techniques required to undertake the work in accordance with requirements of the contract in a manner that does not compromise workers health and safety.

The contractor from grade three to provide accredited training to training to at least 1% of his unskilled labour force. As the project value increases, the variety of trainings and number of unskilled labour to be trained. | Item

PROVISION OF STRUCTURED TRAINING

Requirement for structured training:

1.2.1. Projects must have a minimum of professional fees of R5 million, excluding disbursements.

1.3. Contractor Targeted Training Opportunities for Skills programme, In-service Trainees, Apprentice, Artisans and Graduates in line with CIDB Skills Development Standards. The provision of training should be priced under Preliminary & General (P&G's).
1.3.1. Projects must have a minimum duration of twelve months and minimum construction cost of R20 million, excluding contingencies, allowances, and taxes.
1.3.2. Contractor must have a minimum CIDB Grading of 7 in the category of General Building and Civil Engineering Contracts.

Scope of structured training

Re
In order to avoid duplication of training programmes and training facilities, all structured training, shall be implemented, measured and paid for in accordance with the requirements of this section: Requirements of the Expanded Public Works Programme (EPWP).

The Employer's objectives include the training of local labour and Targeted Enterprises within a structured programme, in order to equip them with skills that will assist them in gaining future employment, and to facilitate targeted EPWP participants in gaining competencies and unit standard credits towards future full learnership qualifications.

Such training shall contain both theoretical and practical components and shall be conducted in accordance with the various laws and regulations contained in the South African Qualifications Authority (SAQA) statutes.

The Contractor shall be required to provide a training facility on the Site for Generic skills training, or in close proximity thereto, and to provide over the duration of the contract the following training for EPWP participants:

(a) Generic skills training;
(b) Entrepreneurial skills training;
(c) Construction skills training; and
(d) In-service training.

Generic skills training and in-service training shall be provided to all EPWP participants.

Entrepreneurial and construction skills training shall be provided to targeted EPWP

participants only.

Entrepreneurial skills training comprises both management skills training and business development skills training.

Construction skills training comprises specific on-task skills training.

NOTE TO COMPILER:
The compiler shall obtain from the Department's project manager the budget to be allowed for the implementation of the entire training function on the project.

Note that the training function includes all costs related to the training facility, the training provider and trainers, the training materials, the wages of the learners, COIDA, UIF, PPE, tools, transport, handling costs, etc, all as described in the various pay items at the end of this section.

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

C12.8 SUB-CONTRACTING FOR LOCAL EMERGING ENTERPRISES

The project can support the notion of one main contractor to be appointed whilst several subcontractors, possibly from the local EME group, are employed to undertake various smaller activities.

Two alternatives can be applied for setting out work for sub-contractors, i.e. full responsibility (provide their own plant, materials and labour) or secondly the main contractor remains responsible for the supply of plant and materials, while the sub-contractor is responsible for implementation, thus providing the skills and labour content only for the various construction activities. The contractor will be required to appoint a reasonable number of emerging sub-contractors to undertake work to the minimum of **30%** of the contract value on the various service areas but not limited to the following services;

Item	Description/Task/Activity
General Building works	Masonry
	Carpentry and joinery
	Floor finishes/Tilling
	Paint work
	Joinery fittings
	Plumbing (internal & external)
	Plastering
Civil works	Paving
	Landscaping

This percentage excludes the costs of employing local unskilled labour. A minimum of **15%** of the total number of the appointed emerging subcontractors must be owned by **females** who have more than **50.1%** ownership of their company/organization. EME represent an important vehicle to address the challenges of job creation, economic growth and equity in our country. EMEs are playing a critical role in absorbing labour, penetrating new markets and generally expanding economies in creative and innovative ways.

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

Item	Unit	Quantity	Rate	Amount
TOTAL CARRIED TO SUMMARY				

12.8.1 Subcontractor Procedure

The contractor to implement work packages as per the project designed and identified trades. 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 The Contractor shall without delay enter into contract with the successful tendering subcontractor based on their accepted tender submission. 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. F.....V.....T.....	Item			
C12.8.2 Subcontractor Mentoring Once the Subcontractors have been identified and engaged, the Contractor shall closely monitor their performance in the execution of their contracts. The Contractor will be responsible for drawing implementation plan that will assist in managing the development of sub-contractors undertaking Labour Intensive work. The Contractor will be responsible for management of the sub-contractors and to ensure that they comply with all EPWP requirements as set-out in this specification. The Contractor and sub-contractors will be required to compile monthly progress reports to be submitted with payment certificates. The reports shall include planned targets with regards to the works and employment, employment of EPWP beneficiaries and project expenditure. Failure to produce monthly reports will render payment certificates incomplete The contractor will be required to assist, train, mentor and monitor its Sub-contractors and report through monitoring tool on progress of each Sub-contractor. F.....V.....T.....	Item			
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount

C12.8.3 Portfolio of Evidence The Contractor is to develop and /or maintain a portfolio of evidence for each sub-contractor. The Portfolio of Evidence is a collection of proof of the training, coaching, guidance and monitoring inputs provided to the Sub-contractor. It is the document which records the development progress of the Sub-Contractor and will need to be updated continually throughout the duration of the contract. The Portfolio of Evidence should include but not limited to the following documentation: • The development path designed for each Sub-Contractor, • The Training course completed by the Sub-Contractor, • The hours of guiding, coaching and mentoring received for each activity listed in the developmental plan, • A list of outcomes achieved at each level for each activity. F.....V.....T.....	Item			
Performance and penalties The Contractor performance will be monitored throughout the contract. Should the Contractor fail to fulfil his obligation he will be liable for penalties. Payment of the penalty shall not absolve the Contractor of any claim, or relieve the Contractor of any of his duties, obligations or responsibilities under the contract. • Utilisation of the Sub-Contractors The Contractor's achievement of the targets will be measured quarterly to determine the progress made to date. **C12.8.4 Local Suppliers** Local material suppliers within the vicinity of the site to be utilise as long as their materials meets the required specification. However, quality and suitability would have to be checked by the employer, if the local suppliers are unable to meet the demand the nearest suitable suppliers are to be used. Production of materials should be done on site, where economies of scale allow e.g. concrete paving blocks should be encouraged which will enable employment creation and also allow for enterprise development. F.....V.....T.....	Item			
C12.8.5 TENDERER'S TO NOTE CONDITIONS a) The contract to be entered into between the Contractor and the Priority Population Group's (PPG's) will be a LABOUR ONLY sub-contract. b) The Contractor will be responsible for ensuring that all materials for use by the PPG's in the works are to be on site timeously. The Contractor shall liaise with The Mentor and PPG to determine the nature and extent of materials required and the lead time necessary. F.....V.....T.....	Item			
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount

c) The Contractor shall be responsible for the overall programming of the Works and he is to allow for monitoring the PPG's programme and progress. d)In conjunction with the Mentor, he is to allow for the supervision and mentoring (where necessary) of the PPG to ensure quality and adherence to standard building practice				
F.....V.....T.....	Item			
e) The Contractor is to allow for extra storage facilities on site for the PPG's tools and equipment.				
F.....V.....T.....	Item			
f) Basic tools shall be provided by the Priority Population Group's (PPG's) and where these are not available; the Contractor will supply him with the necessary tools and equipment and deduct the costs thereof from the interim claims made by the PPG. g) Work requiring specialized tools will be provided free of charge by the Contractor with the provision that these be returned upon completion of the Work.				
CO-ORDINATION AND SUPERVISION The Contractor is to co-ordinate and supervise the work of all the PPG's, Sub-Contractors and Nominated Sub- Contractors appointed directly by the Employer in such a manner and at all times as will suit the building programme and he is to allow adequate access, for the PPG's, where required, to carry out their work in an efficient manner and acceptable quality standards in accordance with the specifications as no claims for extras in this connection will be entertained.				
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. Where scaffolding is necessary for the use by any PPG and the Contractor has not erected any for his own use or has removed same after his own use, the Contractor shall supply sufficient scaffolding to the PPG to be erected and dismantled by the PPG and returned to the Contractor. This attendance upon PPG's to execute the work is to include for the scaffolding provisions as aforesaid and, in addition, is to include for co-operating to the fullest extent with all the parties, attending on off-loading materials, providing suitable storage for tools and materials used by the PPG's, use of general facilities such as latrines, etc., supply and cost of power, lighting, water and the like.				
F.....V.....T.....	Item			
TOTAL CARRIED TO SUMMARY				
	Unit	Quantity	Rate	Amount

C12.9 EPWP contract for labour It is compulsory that shortly after the contractor and or sub contractor has appointed local labour, the employment contract should be signed by both parties, prior to commencement with works on site. The employment contract forms part of the Ministerial Determination or from the regional EPWP officials. F.....V.....T.....	Item			
C12.10 EPWP Scope of Work For This Project **Contractors are to price the items on the Bill of Quantities highlighted below, bearing in mind that they are regarded as main sources of job creation, whether sub contracted or undertaken by the main contractor.** **Elements of the scope of work where the application of Labour Intensive Construction methods are indicated with the letters (LI) are as follows;** i) Excavating trenches for foundations and any other civil works with the depth not more than 1.5 m ii) All masonry works which include concrete mixing on site; brickwork; plastering; screed works; jointing; etc. iii) Painting, Plumbing, Ironmongery; roof cladding; glazing; tilling; carpentry; flooring; waterproofing; etc. iv) External works such as landscaping; cleaning; paving; fencing; tarmac; etc. F.....V.....T.....	Item			
TOTAL CARRIED TO SUMMARY				

KWAZULU-NATAL
DEPARTMENT
OF PUBLIC WORKS

EXPANDED PUBLIC WORKS PROGRAMME

EPWP Logo for protective clothing to be on the LHS of the front of the dust coat.

Contractor logo to be on the RHS of the front of the dust.

EPWP

a) Dust coats to be penton in colour.
b) Coats to be branded with EPWP acronym at the back with the font size of at least 200 in caps.

FRONT - OVERALL

BACK - OVERALL

95mm x 30mm

KWAZULU-NATAL DEPARTMENT OF PUBLIC WORKS

EXPANDED PUBLIC WORKS PROGRAMME

176mm x 45mm = 200 font

EPWP

220mm x 55mm = 250 font

EPWP

Hard hat

THE GENERIC EMPLOYMENT CONTRACT FOR COMMUNITY LIAISON OFFICER (CLO)

1. Introduction

This contract binds the contracting parties who are the Employer (Contractor) and the Employee referred to as Community Liaison Officer (CLO). The CLO shall be employed at the category of the semi-skilled labour and will be referred to as the employee whose employment contract should lapse on practical completion of the contract. The CLO shall be serving under supervision of the site foremen/ manager whom the CLO needs to regard as the mentor, for the duration of the employment contract. The Site Manager / foremen shall provide support on the exit option preferred by the CLO on completion of the employment contract; which could be further learning (Learnerships; interships and or Bursary); self-employment and or formal employment. It is important to highlight as well that the CLO should regard him /herself as an understudy of the site foremen / manager in order to realize the ambitions in the construction career and that shall effectively coordinate information to ensure meaningful community participation and empowerment in the project throughout the contract duration. This shall be effectively realized when the CLO constantly displays impartiality; commitment in striving to perform duties in the job description with due diligence; a positive attitude towards learning and application of new skills and ideas lastly the mutual working relations between the CLO and the employer.

This contract of employment is fully in compliant to the appropriate provisions of the following legislations;

- ✓ Constitution of the Republic of South Africa Act No108 of 1996
- ✓ Basic Conditions of Employment Act No 75 of 1997
- ✓ Labour Relations Act No 66 of 1995
- ✓ Employment Equity Act No55 of 1998
- ✓ Skills Development Act No 97 of 1998
- ✓ Occupational Health & Safety Act No 85 of 1993
- ✓ Compensation for Occupational Injuries and Diseases Act No 130 of 1993
- ✓ Unemployment Insurance Act No63 of 2001

2. Condition of employment

The fact that the CLO is the youth and an ambitious employee on site then he / she will need to be capacitated on all aspects within the construction site; that could include; technical; administrative and or supervisory aspects with the view to identify the key areas of exit interest. It needs to be noted though that CLO's involvement on these aspects does not lead to the CLO having to regularly perform duties or the task, that is designated for the employment unskilled local labour.

The contract is entered into between:

.....

(Herein after referred to as "The Employer")

In my capacity as the:.....

Name of the Company in full .....

Physical Address

.....

.....

.....

And

.....

(Herein after referred to as "The Employee")

ID No..... **Contact No:.....**

1.Nameof the Project:.....

2. Commencement

This contract will begin on ..... and continue until terminated

3. Location of the site: Area..... Ward No.....

4. Job description

4.1 The site foremen and the CLO need to develop the plan on how to ensure that maximized community benefit from project is realized, benefits in the form of Job creation; skills development; Local SMME empowerment and regularEPWP reporting.

4.2 In consultation with local leadership the CLO needs to conduct the local skills and resources audit and establish a database on all resources and skills appropriate for projects implementation, such report need to be submitted for the contractor's attention during project resources planning.

4.3 Structuring formal labour requisitions issued by the contractor and sub-contractors to ensure that EPWP Targets on Women; Youth and for People with Disability as well as spreading the benefit equitable in the targeted areas.

4.4 Ensuring that there are no delays in recruiting, inducting and contracting of local labour in terms of the contractor being provided with necessary documentation on time; to benefit targeted beneficiaries of poverty alleviation.

4.5 The CLO needs to provide support to leadership and local labour where translation of contracts and other documentation is required in order to ensure that there is effective and meaningful participation.

4.6 Ensuring that all available; constructive and progressive approaches are applied in dealing with conflicts; grievances and problems, prior to the onsite strikes and or work stoppages.

4.7 Application of principles that promote transparency and accountability the CLO shall on monthly basis provide written reports to relevant parties which include the contractor (Employer) as part of the contractor's site progress report presented during site meetings; Local leadership and Department of Public Works- EPWP section as an attachment to contractors monthly payment certificate.

4.8 The CLO plays a integral role among the project team members, therefore it is recommended that CLO's attends all site progress meetings; attending site progress meeting also contribute to the CLO's learning process.

4.9 Additional duties may include issues of material, plant & tools and labour records keeping; support on safety and first aid as well as task and wage records keeping.

4.10 Supports the main contractor on issues of termination of service for local labourers; disciplinary measures; grievances; skills development and ensuring the application of the stipulated labour rates for unskilled labourers.

4.11It is also vital for the CLO to announce opportunities availed by the main contractor on skilled; labour only sub-contracting and any other community upliftment opportunities to the ward at large promptly.

4.12The CLO as the communication and an intermediate between contractor, sub-contractors and the community through leadership structures need to be learning and be kept informed on project details and EPWP related information as well as to update the contractor on community dynamics that may affect the project progress.

5 Working hours

The working hours are as per the stipulation of the Basic Conditions of Employment Act No 75 of 1997.

5.1 The employee during normal working days will work for the maximum of 9 hours a day, totaling to 45hours per week, which means during the day the CLO need to start working as from 07:00 am – 16:30 pm from Monday –Friday.

5.2 Both parties must have made prior arrangements for working overtime; the arrangement must be for working beyond the stipulated number of hours during the working days and working on weekends and holidays.

5.3 Working after normal hours constitute the overtime and the employee needs to be compensated accordingly; i.e. one & half – double pay as stipulated in the BCE Act.

6 Remuneration

The CLO is employed for the duration of the contract period, the rate of remuneration will be R ..... per.....The scale will be determined based on experience and qualifications of the CLO. An annual increment in line with the CPI will be applied. All bonuses if any will be paid at the contractor's discretion and are not mandatory.

7 Deductions

7.1 An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law e.g. UIF.

7.2 An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.

7.3 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

7.4 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.

8 Meal Intervals

Tea time shall be the maximum of fifteen (15) minutes and the lunch break to the maximum of thirty (30) minutes.

8.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.

8.2 An employer and worker may agree on longer meal breaks.

8.3 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.

8.4 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. **Health and Safety**

9.1 Employers must take all reasonable steps to ensure that the working environment is healthy and safe.

9.2 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) obey all health and safety rules of the EPWP;
(d) use any personal protective equipment or clothing issued by the employer;
(e) report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

10.Compensation for Injuries and Diseases

10.1 It is the responsibility of the employers (other than a contractor) 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.

10.2 A worker must report any work-related injury or occupational disease to their employer or manager.

10.3 The employer must report the accident or disease to the Compensation Commissioner.

10.4 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

11.Skills development & training

The CLO will be regarded as an understudy of the site foremen / manager therefore it is recommended that the site manager gives exposure to administrative, technical and supervisory aspects of the project, throughout the period of their employment. The site foremen can also impart or facilitate imparting any skills to the CLO that are deemed appropriate in paving his/her preferred exit option.

12. Keeping Records

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 time-rated worker, the time worked by the worker;
(d) payments made to each worker.

The employer must keep this record for a period of at least three years after the completion of the EPWP project.

13. Sick Leave

13.1 You are entitled to 1 day sick leave for every full month worked equivalent to your normal daily working hours, should you be unfit to work due to medical reasons.

13.2 You are obliged to submit as soon as possible, but not later than the return day

to work, a medical certificate signed by a recognized medical practitioner and with a practice number or proof of illness for any period of absence greater than two consecutive days, failing which you will not be entitled to any payment in respect of days of absence.

14. Family Responsibility Leave

14.1 You are entitled to *(3) three – days* leave with full pay which is equivalent to your normal working day to attend to family responsibilities.

14.2 "Family responsibilities refer to the birth or illness of your child and death of your spouse/life partner, parent, adoptive parent, grandparent, child, adoptive child, grandchild or sibling.

14.3 You will have to request leave in writing and obtain permission to leave at least one day prior to going on leave or as soon as reasonably practical to do so.

14.4 You are obliged to submit reasonable proof of the event for which leave is required failing which you will not be entitled to any payment in respect of the day (s) of absence.

14.5 Family responsibility leaves lapses at the end of the contract.

15. Maternity Leave

15.1 An employee may take up to four (4) consecutive months unpaid maternity leave

15.2 An employee is not entitled to any payment or employment related benefits during maternity leave.

15.3 An employee must give her employer reasonable notice of when she will start maternity leave and when she will return to work.

16.Disciplinary procedures

Disciplinary processes against any labourer for a particular misconduct shall be dealt with fairly; respect for Human rights and in a manner promoting justice for all. The punishment should be commensurate to the offence committed and that each case needs to be treated on its own merit.

It is the prerogative of the contractor to involve local leadership prior to passing on the judgment; however they will actively participate throughout disciplinary process.

17. Termination of the contract

The employer may terminate the employment of a worker for good cause after following a fair procedure.

17.1A worker will not receive severance pay on termination.

17.2 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.

17.3 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.

17.4 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.

A worker who shall be absent on for more than three (3) consecutive days will have his employment terminated if there is no indication that he/she will return to work.

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 f employed for one (1) year or more.

A worker who wishes to resign should advice the employer in advance to allow the employer to find replacement on time.

18. Service certificate

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 EPWP on which the worker worked; the work performed by the worker;
(e) any training received by the worker as part of the EPWP;
(f) the period for which the worker worked on the EPWP;
(g) any other information agreed on by the employer and worker.

19. Signing of the contract

ACKNOWLEDGEMENT

The employee / Community Liaison Officer (CLO) acknowledge by his/her signature hereto that he/she understands the contents of this contract and signifies acceptance thereof.

DATE OF SIGNING THE CONTRACT _____

EMPLOYER SIGNATURE: _____

EMPLOYEE NAME: _____

EMPLOYEE SIGNATURE: _____

WITNESS: _____

"Note that both parties need to jointly sign the last page and initial each and every page on this 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

9.1.2 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 of 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

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

ANNEXURE 11
Attendance Register - Infrastructure and Other projects

KWAZULU-NATAL DEPARTMENT OF PUBLIC WORKS **EXPANDED PUBLIC WORKS PROGRAMME**

The Attendance Register for on-site Workers

Reporting month: _____ Cell No: _____

Surname: _____ First Name: _____

Project Name: **DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION**

Project Code: **070689** Tender No **ZNTL 05828W**

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						
FRIDAY						
Total Days worked						

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

ANNEXURE 12
EPWP Data Collection tool for Phase 3 system

KZN PUBLIC WORKS

Monthly Data collection for LOCAL Labour

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

EXPANDED PUBLIC WORKS PROGRAMME

Name of Contractor: _____

Project Code: **070689**

Project location name (area): _____

Name of Project: DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

Reporting month: _____

Project location (Ward No.): _____

Beneficiary Details																	Experience/Literacy				Location Details				Household Details		
No	First Name	Initial	Surname	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 Dependants in Household	No. of Children attending school
1																											
2																											
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											

Education Levels – use the codes (1,2,3) on the excel spreadsheet

- (1) Unknowr (3) Grade 1-3 (Sub A – Std 1)
- (2) No Scho (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: _____
Designation: _____
Date: _____
Contact no: _____

DPW Official/Consultant sign: _____
Designation: _____
Date: _____
Contact no: _____

EPWP Official sign: _____
Designation: _____
Date: _____
Contact no: _____

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	
Despription	
Target Quantity	
Number of persons to be trained	
Contact person	
Title	
Initials	
First Name	
Surname	
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	

KZN PUBLIC WORKS

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

EXPANDED PUBLIC WORKS PROGRAMME

Worker payment capture form for LOCAL Labour

Name of Contractor: _____

Project Code: **070689**

Name of Project: **DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION**

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:_____

KZN PUBLIC WORKS

Worker Training capture form for LOCAL Labour

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

EXPANDED PUBLIC WORKS PROGRAMME

Name of Contractor:

Name of Project: DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

Project Code: 070689

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: _____

Designation: _____

Date: _____

Contact no: _____

DPW Official/Consultant sign: _____

Designation: _____

Date: _____

Contact no: _____

EPWP Official sign: _____

Designation: _____

Date: _____

Contact no: _____

Location	
Locality Name	
Municipality	
Subplace	
Ward	
Government Facility	
Latitude	
Longitude	
Physical Address/Location	

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF EDUCATION: WATER AND SANITATION PROGRAMME: UPGRADES AND ADDITIONS: BHANDE HIGH SCHOOL: MIDLANDS REGION

ANNEXURE 13
Scope of Work Matrix

1. INTRODUCTION

This assessment report provides a formal evaluation of the proposed infrastructure enhancements at Bhande High School. The primary objective of the project is to mitigate current deficiencies in sanitation and water provision, thereby ensuring that the school infrastructure aligns with national health and safety regulations, as well as the Department of Basic Education's Minimum Norms and Standards.

2. CURRENT INFRASTRUCTURE STATUS

Sanitation Facilities

The existing sanitation infrastructure at the school is insufficient and comprises six chemical toilets. Furthermore, the available ventilated pit toilets designated for educators do not comply with contemporary occupational health and safety standards.

Water Supply

The institution currently utilizes rainwater harvesting as its sole source of water for utility purposes. There is no sustainable supply of potable water on-site; however, a municipal water main is located approximately 50 meters from the property boundary, representing a viable opportunity for connection.

3. WATER SUPPLY ANALYSIS

Existing Water Source

The school relies primarily on rainwater harvesting, which is categorized as an intermittent and unreliable water source for a facility of this size.

Proposed Water Solutions

To ensure water security, it is recommended that a formal municipal connection be established to augment existing rainwater harvesting capabilities. This integrated approach will provide a consistent supply for sanitation and general utility requirements.

4. SANITATION INFASTRUCTURE REVIEW

Existing Sanitation

The school currently has 6 chemical toilets for use.
The current facilities include one combined toilet block designated for educators and persons with disabilities.

Proposed New Facilities

Construction of three new toilet blocks conforming to DBE Minimum Norms & Standards and SANS 10400 standards:
Comprehensive refurbishment of the existing educator and paraplegic toilet facilities.
Construction of one new toilet block for female learners.
Construction of one new toilet block for male learners.

Technology Choice

The technical selection for this project is Ventilated Improved Pit (VIP) Latrines.

5. SANITATION TECHNOLOGY JUSTIFICATION

Proposal to be Considered

Ventilated Improved Pit Latrines have been selected as the most appropriate technology given the localized water availability and long-term maintenance considerations. Water-borne sanitation with conservancy tanks was deemed unfeasible due to the inconsistent municipal water supply in the region.

6. CAPACITY AND COMPLIANCE

Capacity Requirements (DBE & SANS 10400):
Facilities are designed to accommodate the current and projected student population, including gender-specific and special needs provisions.

Design Considerations

No toilet seats for Grade R learners.
Adequate wash basins and urinals are included to promote hygiene.
Facilities are designed to meet or exceed capacity standards.

7. COST ESTIMATE AND BUDGET

As per Estimate

8. PROJECT CONDITIONS AND RECOMMENDATIONS

External Conditions

No other projects are currently underway at the school. The project's success depends on geotechnical assessments to confirm soil suitability.

Future Considerations

The sanitation technology may require adjustments based on geotechnical findings and changing water/sewer infrastructure conditions.

Implementation Phases

The project will proceed to detailed design and geotechnical assessment before finalizing technology and construction planning.

Current Enrollment

Boys	318
Girls	216
Grade R	0
Male Staff	8
Female Staff	12
Total	534

Existing Infrastructure

	Number of Toilet Currently
Boys	0
Girls	0
Grade R	N/A
Male Staff	2 Urinals , 1 Seat
Female Staff	3 Seats

Proposed Infrastructure

	Number of Toilet Seats & Urinals
Boys	4 Seats, 4Urinals, 3 Whb
Girls	8 Seats, 6 Whb
Grade R	N/A
Male Staff	Complete Renovations
Female Staff	Complete Renovations

Norms Calculator

EMIS No.	SCHOOL NAME
500154549	BHANDE HIGH SCHOOL

ENROLMENT	No. of Grade R learners:	0	No. of learners Grade 1 - 12:	534

TABLE 1: DBE Minimum Norms and Standards

SANITATION FACILITIES	The facilities shown below are the minimum requirement as per DBE Minimum Norms and Standards and have been extrapolated from the National Building Regulations (SANS 10400-P:2010): Table 6 (Personnel) and Table 7 (Learners)								
	Norm			Actual			Required		
	Toilet Seats	Urinals	Wash Basins	Toilet Seats	Urinals	Wash Basins	Toilet Seats	Urinals	Wash Basins
Girls' facilities	8		6	0		0	8		6
Boys' facilities	4	4	3				4	4	3
Female Teachers' facilities	2		1	2			0		1
Male Teachers' facilities	1	2	1	1			0	2	1
Disabled Toilets (Unisex toilet.)	1		1	1			0		1
Grade R Toilets	0		0				0		0
Grade R Teachers' Toilets	0		0				0		0
TOTALS	16	6	12	4	0	0	12	6	12

Norm Ratios		Actual Ratios	
Learner:Toilet/Urinal	Learner: Washbasin	Learner:Toilet/Urinal	Learner: Washbasin
31.41	53.40	534.00	0.00

TABLE 2: NBR (SANS 10400-P-2010) Comparative Norms

SANITATION FACILITIES	The facilities shown below are the minimum requirement as per the National Building Regulations (SANS 10400-P:2010): Table 6 (Personnel) and Table 7 (Learners)								
	Norm			Actual			Required		
	Toilet Seats	Urinals	Wash Basins	Toilet Seats	Urinals	Wash Basins	Toilet Seats	Urinals	Wash Basins
Girls' facilities	12		6				12		6
Boys' facilities	3	7	3				3	7	3
Female Teachers' facilities	2		1				2		1
Male Teachers' facilities	1	1	1				1	1	1
Disabled Toilets (Min.1 unisex toilet.)	2		2				2		2
Grade R Toilets	0		0				0		0
Grade R Teachers' Toilets	0		0				0		0
TOTALS	20	8	13	0	0	0	20	8	13

Norm Ratios	Actual Ratios

Site Assessments Photos

9. CONCLUSION

The technical assessment confirms that the existing sanitation infrastructure is in a state of critical deterioration. Significant structural defects were identified in the roofing, masonry, and joinery. This condition constitutes a breach of the standards mandated by the Department of Education and poses a demonstrable risk to user health and safety.

It is the conclusion of this report that the proposed upgrades to the water and sanitation infrastructure at Bhande High School are essential for regulatory compliance and institutional functionality. The implementation of Ventilated Improved Pit Latrines is recommended as a sustainable, cost-effective, and technically sound solution for the school's specific context.