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

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

Engineer/Principal Agent
Naidu Consulting (Pty) Ltd
P.O Box 2796
Westville
Durban
3635
031 - 265 6007 - Tel Number
031 - 265 6011 - Fax Number
Sherwyn.Bhana@naiduconsulting.com

Electrical Engineer
DNA Engineers & Project Managers
641 Peter Mokaba Rd
Morningside
Durban
4091
031 - 207 1576 - Tel Number
086 - 670 8703 - Fax Number
info@dnaengineers.co.za

Employer:
Head: Public Works
KZN Department of Public Works
Private Bag X 9041
PIETERMARITZBURG
3200
Tel Number: 033 - 355 5569
Fax Number: N/A

Region:
Head Public Works: Operations
KZN Department of Public Works
Private Bag X 9041
Pietermaritzburg
3200
Tel Number: 033 - 355 5569
Fax Number: N/A

Tender Number: ZNTU04194W
CIDB Grading: 4GB or higher
ECDP Number: N/A
Project Code: 063963
Document Date: 04 July 2023
Advertisement Date: 02-June-2023

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

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

THE TENDER

1. PART T1: TENDER PROCEDURES

		Page No.
T1.1	Tender Notice and Invitation to Tender	5
T1.2	Tender Data	4
T1.3	Annexure C - Standard Conditions of Tender	10

2. PART T2: RETURNABLE DOCUMENTS

T2.1	List of Returnable Documents	2
T2.2	Authority to Sign Tender (T2.2)	1
T2.3	Authority for Consortia or Joint Venture's to Sign Tender (T2.3)	2
T2.4	Special Resolution of Consortia or Joint Venture's (T2.4)	3
T2.5	Joint Venture Involvement Declaration (T2.5)	2
T2.6	Schedule of Proposed Sub-Contractors (T2.6)	1
T2.7	Capacity of Tenderer (T2.7)	3
T2.8	Financial Standing and other resources of Business Declaration (T2.8)	1
T2.9	Preference Points Claim Form and Documentary Proof (T2.9)@(T1.1)	8
T2.10	Site Inspection Certificate as proof for attendance of compulsory briefing meeting (T2.10)	1
T2.11	Bidder's Disclosure - SBD 4 (T2.11)	3
T2.12	Record of Addenda to Tender Documents (T2.12)	1
T2.13	Particulars of Electrical Contractor (T2.13)	1
T2.14	Schedule of Imported Materials and Equipment (T2.14)	1
T2.15a	Annual Financial Statement for past financial year (2.15)	1
T2.16	Equipment Schedules (T2.16)	5
T2.17	Contractor's Safety, Health and Environmental Declaration (T2.17)	1
T2.18	Compulsory Enterprise Questionaire (T2.18)	1
T2.19	Tax Compliance Status (TCS) PIN to verify on line Compliance Supplier Status via e-Filing (T2.19)	1
T2.20	Proof of Good Standing With the Compensation Commissioner (T2.20)	1
T2.21	Form of Offer and Acceptance (Bound into Section 1 of 2) (T2.21)	3
T2.21a	Confirm Receipt of Offer and Acceptance (T2.21a)	1
T2.22	Final Bill of Quantity (T2.22)	1
T2.23	Certified Proof of Paid Municipal Rates and Taxes (Attach) (T2.23)	1
T2.24	Proof of Unemployment Insurance Fund (2.24)	1
T2.25	The National Industrial Participation Programme (T2.25)	2
T2.26	Proof of Registration on the Central Supplier Database (CSD) (T2.26)	1
T2.27	Certified Proof of CIDB Registration Number (T2.27)	1
T2.28	Proof of Deposit (T.28)	1
T2.29	Contract Form - Purchase of Goods/Works - Part 1 (T2.29)	1
T2.30	Contract Form - Purchase of Goods/Works - Part 2 (T2.30)	1
T2.31	OHSE Plan Structure (T2.31)	1
T2.32	Client's specific requirements for the Contractor's detailed OHSE Plan (T2.32)	1
T2.33	Baseline Risk Assessment (T2.33)	1
T2.34	Tender Evaluation Criteria and Scoring Price and Specific Goals (T2.34)	1
T2.35	Invitation to Tender - SBD 1 (T2.35)	2
T2.36	Proof of Confirmation of Bridging Finance of at least 2.5% of Project Value - T2.36	1
T2.37	Letters of Credit Reference from Suppliers and Credit Limits with minimum combined Credit Limit of R500, 000.00 (minimum of 2 letters required). - T2.37	1
T2.38	Detailed Schedule Of Resources at all levels including submission of a detailed organogram of the company including listing on this organogram of the resources within the company that will be dedicated to this project. - T2.38	2
T2.39	Schedule of years of experience on similar projects. - T2.39	1
T2.40	Schedule projects of similar nature undertaken and successfully completed within the applicable CIDB grading of this Bid or one Grade lower in the past 5 years by the Bidding entity- Letters of award and practical completion certificates or final completion certificates for projects completed in the preceding 5 years. Minimum 2 project's data is required. -T2.40	1

THE CONTRACT

3. PART C1: AGREEMENT AND CONTRACT DATA

C1.1	Form of Offer and Acceptance	1
C1.2	Contract Data	8
C1.3	Form of Guarantee (C1.3)	3

4. PART C2: PRICING DATA

C2.1	Pricing Instructions	4
C2.2	Preliminaries for GCC for Construction Works, 2nd Edition - 2010	1 to 34
C2.3	Bills of Quantities	35 to 105

5. PART C3: SCOPE OF WORKS

C3.1	Scope of Works	7
C3.2	Specification for HIV/AIDS awareness	3
C3.3	HIV/STI Compliance report	2

6. PART C4: SITE INFORMATION

C4.1	Site Information	1
C4.2	Builders Lien Agreement - Refer to Annexure 8	1

7. DRAWINGS

C5.1	List of Drawings	2
C5.2	Provisional Site Plan (for information purposes only)	1
C5.3	Tabulated Scope of Works - Refer to Annexure 13	1

8. ANNEXURES

Annexure 1	Model Preambles for Trades 2008	1 to 49
Annexure 2	General Electrical Specifications	E/1 to E/21
Annexure 3	Lightning Protection Specifications	LP/1 to LP/6
Annexure 4	Map of Tender submission location	1
Annexure 5	Joint Venture Agreement	7
Annexure 6	Project Specific Health and Safety Specification	24
Annexure 7	Health and Safety Bill of Quantities	2
Annexure 8	Builders Lien Agreement	1
Annexure 9	Geotechnical Investigation Report (If applicable)	N/A
Annexure 10	EPWP Employment Contract	28
Annexure 11	Attendance Register - Infrastructure and Other projects	1
Annexure 12	EPWP Data Collection tool for Phase 3 system	5
Annexure 13	Scope of Work Matrix	3
Annexure 14	Structural Engineers Project Specification Drawings	26
Annexure 15	Electrical Engineers Specifications & Drawings	104
Annexure 16	Architect Specification & Drawings	50

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

THE CONTRACT

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C1 - AGREEMENT AND CONTRACT DATA

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FORM OF OFFER AND ACCEPTANCE

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

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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

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

C1.2 - CONTRACT DATA

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

CONTRACT DATA FOR:

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

Tender no: **ZNTU04194W**

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: ***N/A*** Fax: ***033 - 355 5569***

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

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

Agent's service:
Principal Agent/Programme Manager

Postal address:
P.O Box 2796
Westville, Durban
3635

Tel: ***031 - 265 6007*** Fax: ***031 - 265 6011***

Employers Agent 2
Hencon & Associates

Agent's service:
Quantity Surveyors

Postal address:
P.O. Box 20641
Durban North
4016

Tel: ***031 - 825 7562*** Fax: ***NA***

Employers Agent 3
Naidu Consulting (Pty) Ltd

Agent's service:
Structural and Civil Engineer

Postal address:
P.O Box 2796
Westville, Durban
3635

Tel: ***031 - 265 6007*** Fax: ***031 - 265 6011***

Employers Agent 4
DNA Engineers & Project Managers

Agent's service:
Electrical Engineer

Postal address:
641 Peter Mokaba Rd
Morningside
4091

Tel: ***031 - 207 1576*** Fax: ***086 - 670 8703***

Tender no:	ZNTU04194W	
	Employers Agent 5 ***[Agents Name]*** ***Agent's*** service: ***[Identify Agent's Service, e.g. 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, e.g. 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, e.g. 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, e.g. 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]	The documentation required before commencement with the Works execution are;	
[4.3]	Health and Safety Plan	The Contractor shall deliver his Health and Safety Plan of the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
[5.6]	Initial Programme	The Contractor shall deliver his programme of work within 10 calendar days after notice from the Employer, prior to the Commencement Date.
[6.2]	Guarantee	The Contractor shall deliver his chosen Guarantee (security) for this Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
[8.6]	Insurance	The Contractor shall deliver his insurance for the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Cash flow by contractor	The Contractor shall deliver his Cash flow for the Works within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Priced Bill of Quantity	The Contractor shall deliver his Priced Bill of Quantity within 14 calendar days after notice from the Employer, prior to the Commencement Date.
	Programme	The Contractor is required to submit his Programme of Works in terms of Clause 5.6.1 and 5.3.1 and the Principal Agent is required to approve this within 7 days in terms of Clause 5.6.3
	Other requirements	

[5.3.2]	The time to submit the documentation required before commencement with Works execution is:	14 calendar days
	Non-Working days	
[5.8.1]	Non-Working days	**Sundays**
	Special non- working days	**All Nationally Recognized Public Holidays and the year end break**
[5.8.1]	First Year end break - commences	***15-Dec-23***
	ends on	***9-Jan-24***
	Second Year end break - commences	***15-Dec-24***
	ends on	***9-Jan-25***
	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]	***6 Calendar Months***
[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: **ZNTU04194W** **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	NO
(ii) bank or insurance Performance Guarantee of 10 % of the Contract Price	NO
(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)	NO
(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)	NO
(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)	YES

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

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

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 ZNTU04194W	Project Code 063963

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

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means: N/A

Physical Address: _____

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

"Contractor" means: _____

"Engineer" means: _____

"Works" means: **PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID**

"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

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

PART C2 - PRICING DATA

C2.1 PRICING INSTRUCTIONS GCC FOR CONSTRUCTION WORKS (Second Edition 2010)			
Project title:	**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID**		
Tender no:	**ZNTU04194W**	**Project Code:**	**063963**

C2.1 Pricing Instructions

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

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

1 MASSES AND MEASURING UNITS

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

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

2 PRICES FOR VARIATIONS

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

3 SCALE

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

4 PROVISIONAL ITEMS

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

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

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

10 BROAD BASED BLACK ECONOMIC EMPOWERMENT

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

11 REGISTRATION ON THE CENTRAL SUPPLIERS DATABASE

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

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

12 TAX CLEARANCE REQUIREMENTS

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

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

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

Item No		Quantity	Rate	Amount

SECTION No. 1

BILL No. 1 : PRELIMINARY AND GENERAL

CPAP WORK GROUP NO. 190 UNLESS OTHERWISE STATED

(Applicable to all sections of the Works)

NOTES:

(i) The agreement is to be the General Conditions of Contract for Works of Civil Engineering Construction (2010) (Second Edition) , publishedby 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 above mentioned 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 thethree 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.

Carried to Collection R

Section No. 1
Preliminaries
Bill No. 1
Preliminaries
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	(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				
1	A1.	General (Clause 1)			
		F:..... V:..... T:.....	Item		
2	A2.	Basis of the Contract (Clause 2)			
		F:..... V:..... T:.....	Item		
3	A3.	Engineer (clause 3)			
		F:..... V:..... T:.....	Item		
4	A4.	Contractor's General Obligation (clause 4)			
		F:..... V:..... T:.....	Item		
5	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		
6	A6.	Payment and Related Matters (clause 6)			
		F:..... V:..... T:.....	Item		
7	A7.	Quality and Related Matters (clause 7)			
		F:..... V:..... T:.....	Item		
		Carried to Collection		R	

Section No. 1
Preliminaries
Bill No. 1
Preliminaries
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
8	A8.	Risk and Related Matters (clause 8)			
		F:..... V:..... T:.....	Item		
9	A9.	Termination of Contract (clause 9)			
		F:..... V:..... T:.....	Item		
10	A10.	Claims and Disputes (clause 10)			
		F:..... V:..... T:.....	Item		
		SECTION B: SANS 1921-1-2004 (Edition 1): CONSTRUCTION AND MANAGEMENT FOR THE WORKS: PART 1			
		Refer to the SCOPE OF WORK for detail requirements			
11	B1.	Scope			
		F..... V:..... T:.....	Item		
12	B2.	Normative references			
		F:..... V:..... T:.....	Item		
13	B3.	Definitions			
		F:..... V:..... T:.....	Item		
14	B4.	Requirements for construction and management			
		F:..... V:..... T:.....	Item		
15	B4.1	General			
		F:..... V:..... T:.....	Item		
16	B4.2	Responsibilities for design and construction			
		F:..... V:..... T:.....	Item		
		Carried to Collection		R	

Item No			Quantity	Rate	Amount
17	B4.3	Planning, programme and method statements			
		F:..... V:..... T:.....	Item		
18	B4.4	Quality assurance			
		F:..... V:..... T:.....	Item		
19	B4.5	Setting Out			
		F:..... V:..... T:.....	Item		
20	B4.6	Management and disposal of Water			
		F:..... V:..... T:.....	Item		
21	B4.7	Blasting			
		F:..... V:..... T:.....	Item		
22	B4.8	Works adjacent to services and structures			
		F:..... V:..... T:.....	Item		
23	B4.9	Management of the Works and site			
		F:..... V:..... T:.....	Item		
24	B4.10	Earthworks			
		F:..... V:..... T:.....	Item		
25	B4.11	Testing			
		F:..... V:..... T:.....	Item		
26	B4.12	Materials, samples and fabrication drawings			
		F:..... V:..... T:.....	Item		
27	B4.13	Equipment			
		F:..... V:..... T:.....	Item		
		Carried to Collection		R	

Section No. 1
Preliminaries
Bill No. 1
Preliminaries
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
28	B4.14	Site Establishment			
		F:..... V:..... T:.....	Item		
29	B4.15	Survey Control			
		F:..... V:..... T:.....	Item		
30	B4.16	Temporary Works			
		F:..... V:..... T:.....	Item		
31	B4.17	Existing Services			
		F:..... V:..... T:.....	Item		
32	B4.18	Health and Safety			
		F:..... V:..... T:.....	Item		
33	B4.19	Environmental Requirements			
		F:..... V:..... T:.....	Item		
34	B4.20	Alterations, additions, extensions and modifications to existing works			
		F:..... V:..... T:.....	Item		
35	B4.21	Inspection of adjoining structures, services, buildings and property			
		F:..... V:..... T:.....	Item		
36	B4.22	Attendance on nominated and selected subcontractors			
		F:..... V:..... T:.....	Item		
		Carried to Collection		R	

Section No. 1
Preliminaries
Bill No. 1
Preliminaries
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	SECTION C: SCOPE OF WORK in accordance with SANS 10403				
	'(The reference to Clauses refer to Table B.1 of SANS 1921-1:2004)				
37	C1.	Certification by recognised bodies - CLAUSE 4.4			
		F..... V:..... T:.....	Item		
38	C2.	Agrément certificates - CLAUSE 4.5			
		F..... V:..... T:.....	N/A		
39	C3.	Other services and facilities - CLAUSE 4.8			
		F..... V:..... T:.....	Item		
40	C4.	Recording of weather - CLAUSE 5.2			
		F..... V:..... T:.....	Item		
41	C5.	Management meetings - CLAUSE 5.3			
		F..... V:..... T:.....	Item		
42	C6.	Daily records CLAUSE 5.6			
		F..... V:..... T:.....	Item		
43	C7.	Bond and guarantees - CLAUSE 5.7			
		F..... V:..... T:.....	Item		
44	C8.	Permits - CLAUSE 5.9			
		F..... V:..... T:.....	Item		
45	C9.	Proof of compliance with the law- CLAUSE 5.10			
		F..... V:..... T:.....	Item		
		Carried to Collection		R	

Section No. 1
Preliminaries
Bill No. 1
Preliminaries
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	SECTION D: SPECIFICATION DATA ASSOCIATED WITH SANS 1921-1:2004 (Table A.1)				
46	D1.	Requirements for drawings, information and calculations for which the contractor is responsible CLAUSE 4.1.7			
		F..... V:..... T:.....	Item		
47	D2.	The responsibility strategy assigned to the contractor for the works CLAUSE 4.2.1			
		F..... V:..... T:.....	Item		
48	D3.	The planning, programme and method statements - CLAUSE 4.3			
		F..... V:..... T:.....	Item		
49	D4.	Samples of materials, workmanship and finishes - CLAUSE 4.12.1			
		F..... V:..... T:.....	Item		
50	D5.	Fabrication drawings that the contractor is to provide and deliver to the employer - CLAUSE 4.12.2			
		F..... V:..... T:.....	Item		
51	D6.	Office for the foreman CLAUSE 4.14.3			
		F..... V:..... T:.....	Item		
52	D7.	Telephone - CLAUSE 4.14.3			
		F..... V:..... T:.....	Item		
53	D8.	Office for inspector of works - CLAUSE 4.14.3			
		F..... V:..... T:.....	Item		
		Carried to Collection		R	

Item No			Quantity	Rate	Amount
54	D9.	Telephone in office for inspector of works - CLAUSE 4.14.3			
		F..... V:..... T:.....	Item		
55	D10.	Sheds - CLAUSE 4.14.3			
		F..... V:..... T:.....	Item		
56	D11.	Provision and erection of signboards - CLAUSE 4.14.6			
		F..... V:..... T:.....	Item		
57	D12.	Termination, diversion or maintenance of existing services - CLAUSE4.17.1			
		F..... V:..... T:.....	Item		
58	D13.	Services which are known to exist - CLAUSE 4.17.3			
		F..... V:..... T:.....	Item		
59	D14.	Detection apparatus - CLAUSE 4.17.4			
		F..... V:..... T:.....	Item		
60	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

Carried to Collection R

Section No. 1
Preliminaries
Bill No. 1
Preliminaries
NAIDU CONSULTING

Item No		Quantity	Rate	Amount
	E1. PROPRIETARY BRANDED PRODUCTS			
61	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			
62	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			
63	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		
	E4. SITE INSTRUCTIONS			
64	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		
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	E5. LABOUR RECORDS			
65	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		
	Note: In the event that the contractor fails to satisfy the requirements of this specification, the Employer (Head: Public Works) may apply any of the sanctions provided in the contract. Sanctions may include the application of a financial penalty of .04% of the Contract Sum per calendar day of which the required report has not been submitted.			
	E6. PLANT RECORDS			
66	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. CESSION OF MONIES			
67	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		
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	E8. SECTIONAL COMPLETION			
68	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			
69	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 this 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 ie, Certified copies of ID Documents, Employment details, wage rates, proof of payments, period of employment and employment contracts, must be submitted with the monthly payment certificate to the Engineer.			
	F:..... V:..... T:.....	Item		
	Carried to Collection			R

Item No		Quantity	Rate	Amount
	E10. IMPORT PERMITS AND DUTIES			
70	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)			
71	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			
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	12.1 EMPLOYMENT TARGETS			
72	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		
73	E12.1 b Employment requirements Tenderers are advised that this contract will be subject to the Expanded Public Works Program (EPWP) aimed at alleviating and reducing unemployment. Tenderers must allow for any costs for the employment of unskilled labour as per the requirements of the EPWP program; 1. 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 boundaries of the Municipality Ward where this contract is executed, with preference to the local community closest or at the walking distance to the contract site. Wherever possible local skilled tradesmen are to be employed on this contract with the view to maximize utilization of local resources.(See E9) F:..... V:..... T:.....	Item		
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
74	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			
75	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:.....	N/A		
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
76	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 implementatio 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:.....	N/A		
	12.3 RECORD KEEPING			
77	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:.....	N/A		
78	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 to Collection		R	

Item No		Quantity	Rate	Amount
	E12.4 EPWP REPORTING as per EPWP DATA FORM			
79	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		
	Carried to Collection			R

Item No		Quantity	Rate	Amount
	E12.5 EPWP PROMOTION			
80	12.5.1 EPWP signage board 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 Medium " 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 : Helvetian medium 100 mm black upper case to be for project name and owner . Helvetian medium 75mm black upper case only to be used for professional titles.Project name and owner shall be black lettering on white background board sizes are as follows : Board to be minimum 2000mm from ground level and to be constructed from reinforced formed chromadek panels minimum 0,6mm thick chromadek. The contractor is responsible for ensuring that the project board remains neatly and safely erected for the full duration including maintenance period, after which the project board and post are to be dismantled and handed to the client in good order. F:..... V:..... T:.....	N/A		
81	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 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:.....	N/A		
	E12.6 COMMUNITY LIAISON OFFICER (CLO)			
82	**UTILISATION OF A COMMUNITY LIAISON OFFICER** In addition to the requirements of Clause E9, contained in this document;			
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	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			
	Carried to Collection			R

Item No		Quantity	Rate	Amount
	7. Identifying and reporting to the Contractor regarding issues where communication between stakeholder is necessary, recommend courses of action and facilitate such communications			
	8. Assisting the Contractor and the work force in the establishment of grievance procedures and necessary recommendation to the Contractor regarding the grievances and solution thereto.			
	9. Attending to site meetings and project implementation meetings as required by the Contractor and prepare periodic reports as may be required by the Contractor from time to time.			
	10. Attending to such other duties which are consistent with the functions of a CLO, as may be required by the Contractor from time to time.			
	Tenderers are to price twice the rate of unskilled local labour rate against this item for any and all costs arising out of compliance with the foregoing and in the event of a Tenderer failing to price against this item or making inadequate financial provision against this item for compliance as aforesaid, then no claim for costs or additional cost incurred will be entertained by the Head: Works			
	F:..... V:..... T:.....	Item		
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	E12.7 SKILLS DEVELOPMENT ON SITE			
83	Contractor in conforming to the object of EPWP that its beneficiaries need to be capacitated with skills that will render them employable in the future. It is then the responsibility of the Contractor that mandatory life skills are provided to 100% of workforce on site and on the job training to labourers from whom the potential for further development has been identified. The latter is not mandatory to all as it covers technical skills. Contractor should also make provision for the possibility that there might be local youth that will need to be placed on the project with an intention to be provided support towards improving their level of competency and productivity. Contractor shall also provide all necessary on-the-job training to targeted labour to enable such labour to master and advance on techniques required to undertake the work in accordance with requirements of the contract in a manner that does not compromise workers health and safety. F:..... V:..... T:.....	Item		
	E12.8 LABOUR ONLY Sub Contracting for local emerging enterprises Tenderer's are advised that this contract is subject to the Expanded Public Works Programme (EPWP) and the following criteria will apply:			
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	AFRICAN EQUITY OWNERSHIP			
84	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 to Collection		R	

Item No		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 charge by the Contractor with the provision that these be returned upon completion of the Work.			
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	CO-ORDINATION			
85	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		
	ATTENDANCE			
86	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		
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	E12.9 EPWP CONTRACT FOR LABOUR			
87	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		
	E12.10 EPWP SCOPE OF WORK			
	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.			
88	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		
89				
	Note: It is a general requirement of this contract that persons noi ward of the works (local labour) be given preference for en contract. Provided, however, that should adequate and apı be available within the ward, others may be employed sub proof being provided that every reasonable endeavour has			
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	employ local labour (Local Sub-contractor(s); Skilled; Sem Unskilled). The contractor shall in consultation with the loc with the purpose of negotiating with them regarding the uti resources in the construction process. In this regard, the furthermore give preference, wherever possible to the emp heads of households, women and youth as well as families indigent by War on Poverty/ Sukuma Sakhe program profil contractor should aim, in general, to maximise the involver community, however workers from other communities shou all persons working on the project, where local employees of competency that meet contractors requirements.			
	Payment for the labour-intensive component of the works. 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.			
	Linkage of payment for labour-intensive component of works to submission of project data.			
	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.			
	Applicable labour laws			
	The current Ministerial Determination (also downloadable at www.epwp.gov.za) Expanded Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice , shall apply to works described in the scope of work as being labour-intensive and which are undertaken by unskilled or semi-skilled workers.			
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	F:..... V:..... T:.....	Item		
	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)			
90	E13.1 Provide and maintain a condom dispenser in terms of Clause 5.1a)			
	F:..... ... V:..... T:.....	Item		
91	E13.2 Provide and maintain HIV/AIDS awareness posters terms of Clause 5.1b)			
	F:..... V:..... T:.....	Item		
92	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		
93	E13.4 Arrange for workers to attend the HIV Awareness Programme in terms of Clause 5.2.1b)			
	F:..... V:..... T:.....	Item		
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	E13 HIV/AIDS AWARENESS			
94	E13.5 Reporting Prepare and attach to claims for payment a brief report in terms of Clause 5.3 (see also HIV/STI Compliance Report included with this document). F:..... V:..... T:..... Note: In the event that the contractor fails to satisfy the requirements of this specification, the employer (Head: Public Works) may apply any of the sanctions provided for in the contract. Sanctions may include the application of a financial penalty of .04% of the Contract Sum per calendar day of which the required reports has not been submitted.	Item		
	E14 OCCUPATIONAL HEALTH AND SAFETY ACT NO. 85 OF 1993			
95	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.			
96	Bidders 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		
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	E16 IMPORTED MATERIALS AND EQUIPMENT			
97	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			
98	The drawings issues with these Bid documents do not comprise the complete set but serves as a guide only for Biding purposes and for indicating the scope of works to enable the Bidder 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 Bidder he shall, before submitting his Bid, obtain clarification in writing from the principal agent. F:..... V:..... T:.....	Item		
	E18 GENERAL PREAMBLES			
99	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		
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	E19 TRADE NAMES			
100	Wherever a Trade Name for any product has been described in the Bills of Quantities the Bidder'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 Bids.			
	F:..... V:..... T:.....	Item		
	E20 EXISTING PREMISES OCCUPIED			
101	Refer to Scope of Works Part C3 of this Bid Document for information on the occupation of existing buildings.			
	F:..... V:..... T:.....	Item		
	E21 INACCURATE AND DEFECTIVE WORK EXECUTED UNDER PREVIOUS CONTRACT			
102	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			
103	If the site is situated in a security area and the Bidder must arrange with the Authorities to obtain permission to enter the site for Bidding purposes.			
	F:..... V:..... T:.....	Item		
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	E23 COMMENCEMENT OF WORKS IN SECURITY AREAS			
104	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			
105	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		
	E25 SECURITY CHECK OF PERSONNEL			
106	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		
	Carried to Collection		R	

Section No. 1
Preliminaries
Bill No. 1
Preliminaries
NAIDU CONSULTING

Item No		Quantity	Rate	Amount
	E26 PROHIBITION ON TAKING PHOTOGRAPHS			
107	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			
108	Water for Construction purposes must be obtained from alternative water sources (i.e. supply other than water that is produced and distributed by a regulated water service authority from a licenced water treatment works for human consumption), eg dams, rivers, boreholes, springs, rainwater harvesting, recycled sewerage water, etc. The alternative water source shall not be of an inferior quality / standard than that required for construction purposes. The client reserves the right through his agents to test such supplies or request certificates confirming the grade and nature of the water supply. Relevant knowledge of the respective area will be an advantage.			
	F:..... V:..... T:.....	Item		
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	E28 ELECTRICITY CONSUMPTION			
109	The contractor will be responsible to remunerate the school with an amount of R 1200.00/month for electricity used on the site during the construction period and from site handover until works completion is reached and must make allowance in their 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 above mentioned electricity payments will only be applicable if the contractor make use of the school's electricity. However the school is not obliged 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 and no claims with reference to any such disruptions will be entertained in respect of time or money.			
	F:..... V:..... T:.....	Item		
	Carried to Collection			R

Section No. 1

Preliminaries

Bill No. 1

Preliminaries

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
	13	
	14	
	15	
	16	
	17	
	18	
Carried Forward		R

Section No. 1

Preliminaries

Bill No. 1

Preliminaries

COLLECTION

	Page No	Amount
Brought Forward		R
Total Brought Forward from Page No.	19	
	20	
	21	
	22	
	23	
	24	
	25	
	26	
	27	
	28	
	29	
	30	
	31	
	32	
Carried to Final Summary		R

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

PART C2.3 BILL OF QUANTITIES

Item No		Quantity	Rate	Amount

SECTION No. 2

BILL No. 1 : ALTERATIONS

Key	Location Description
A	5 Classroom Block
B	3 Classroom Block
C	Administration
D	Ablutions

MODEL PREAMBLES

The tenderer is referred to the "Model Preambles for Trades 2008" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Existing Furniture, Equipment, etc

The Contractor shall not remove or damage any furniture, equipment or similar items that belong to the Department except when specifically described in the items to follow: The Contractor must give the Principal Agent sufficient notice if the removal of these items are required before any prescribed alterations can be done

Carried to Collection R

Item No		Quantity	Rate	Amount
	Damage to existing finishes The Contractor will be held responsible for all damage however caused to existing finishes and fittings, etc. and he must make good all damage at his own expense to the approval of the Principal Agent. Breaking down, demolition and alteration activities and tasks, hacking off of exitsing plaster, etc. is to be executed with care so as to prevent damage to remaining floor and wall surfaces and finishes (where these are to be retained). Tenders will be deemed to include allowance for any necessary protection of exitsing surfaces and structures as may be necessary to effect the above, as the cost of repairing damage to existing surfaces and structures will be solely for the Contractors account **Responsibility for site** The Contractor is to note that upon possession of the site by himself, and extending until practical completion is achieved, he is solely responsible for the site, site security, general upkeep and cleaning of the site and all other responsibilities in maintaining a construction site in conformance with but not limited to, the Construction Regulations 2014, all local by-laws, all user client regulations, and all Client regulations and procedures. Tenderers are therefore urged to study all available material and to investigate the site fully and areas contiguous to the site, in order to determine the range and extent of responsibility. No additional monetary and/or time claims will be entertained in respect of the above **Explosives** No explosives whatsoever may be used for demolition purposes unless otherwise stated			
	Carried to Collection		R	

Item No		Quantity	Rate	Amount
	General The Contractor shall carry out the whole of the works with as little mess and noise as possible and with a minimum amount of disturbance to adjoining classroom blocks and their students. He shall provide proper protection of the works and provide, erect and remove when directed, any temporary tarpaulins that may be necessary during the progress of the works, all to the satisfaction of the Principal Agent Water supply pipes and other piping that may be encountered and found necessary to disconnect or cut, shall be effectually stopped off or grubbed up and removed, and any new connections that may be necessary shall be made with proper fittings, to the satisfaction of the Principal Agent Doors, fanlights, fittings, frames, linings, etc which are to be re-used shall be thoroughly overhauled before refixing including taking off, easing and rehanging, cramping up, re-wedging as required and making good cramps, dowels, etc, and easing, oiling, adjusting and repairing ironmongery as necessary, replacing any glass damaged in removal or subsequently and stopping up all nail and screw holes with tinted plastic wood to match timber, unless otherwise described. Re-painting or re-varnishing is given separately "**Taking out and removing doors, windows, etc**" implies that the door, etc is to be carefully taken down together with the fame, linings, architraves, window sills, etc complete and where brick lintels occur, it must be supported and propped until the openings are built up or new doors or windows built in position Prices for taking out and removing doors and frames shall include for removing door stops, cabin hooks, etc. and making good floor and wall finishes to match existing			
	Carried to Collection			R

Item No		Quantity	Rate	Amount
	"**Forming openings**" for doors or windows, etc implies that the plaster or any other covering is to be hacked off and an opening formed sufficient in size to receive the building in of the frame and cramps, and the forming of new dampproof courses, lintels, sills, etc. After building in of the new frame, the opening is to be built against the frame, plaster or faced brickwork to be made good both sides and reveals and floor screeds prepared for finishings to match existing			
	"**Making good**" implies that all necessary repairs are to be made to reinstate articles that may be damaged through the removal or otherwise, and the supplying of any new materials to match existing work, and is to include any necessary repairs to adjacent finishings such as floors, skirtings, plaster, painting, etc and such making good is to match adjoining work in all respects and in all trades			
	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)			
	The Contractor to acknowledge that sequencing of the work will be necessary to accommodate the operational aspects of the school. The Contractor to accordingly factor the above requirement in the construction programme and pricing			
	"**Breaking down and removing**" walls, etc implies that the wall is to be taken down to the extent shown on the drawings or as may be described and that all necessary shoring is to be provided and allowed for to ensure the safety of the building during the pulling down or until new walls are erected and all portions of the remaining walls where distrubed or affected by the removal are to be made good and left ready for plaster or other finishings as described			
	Where removal is included in the heading, sub-heading or item description, prices shall be deemed to include for the necessary costs of removal and appropriate disposal of materials including but not limited to labour, transportation and disposal costs. No further claims in this regard will be entertained			
	Carried to Collection		R	

Section No. 2
Alterations (Provisional)
Bill No. 1
Alterations
NAIDU CONSULTING

Item No		Quantity	Rate	Amount
	"**Building up openings**" implies that after the removal of any doors, windows or screens that may be decribed to be taken down, the opening is to be filled up solid (or to the tickness as shown) with new brickwork and is to include all necessary cutting away to form toothings to thoroughly bond to the new work and new finishes to both sides as described.			
	Removal of asbestos material			
	All preparatory work, alterations, etc., to existing asbestos cement roof sheeting, gutters, rainwater pipes, etc., is to be carried out strictly by an approved and certified specialist company and in accordance with statutory requirements (Occupational Health and Safety Act, 1993 - Asbestos Regulations 2001) and all necessary precautions must be taken when working with and disposing of asbestos cement products and the disposal of waste water resulting from cleaning operations, etc.			
	The following shall apply in respect of asbestos removal			
	The removal of asbestos shall be carries out by a certified entity, registered in accordance with the Occupational Health and Safety Act. 1993 and the Asbestos Regulations 2001			
	Asbestos in all forms/building elements that is to be removed, shall be carried out in strict accordance with aforementioned regulation and a certificate issued by the entity as contemplated in the above, shall be provided per block for the removal thereof, where the term block shall in this context refer to any single, free standing building structure, regardless of size or purpose			
	Carried to Collection		R	

Item No			Quantity	Rate	Amount
	Corresponding disposal certificates shall be issued by the facility at which the asbestos is disposed off, with said facility to, prior to the disposal of any asbestos material provide satisfactory proof that the facility is duly registered and fully compliant in terms of the act, to receive the asbestos material				
	Under no circumstances is the Contractor nor any of his duly authorised representatives to sell and/or give away asbestos material to any member/s of the school community, the community in general or the public at large. Should this be found to be occuring, the Contractor will be held responsible contractually and may further be prosecuted ciminally				
	The cost for complying with the above, and all requirements of regulation as reflected above is to be priced for in terms for removal of asbestos material. No further claims in this regard will therefore be entertained				
	(CPAP WORK GROUP NO. 102 UNLESS OTHERWISE STATED)				
	TEMPORARY BARRIERS, SCREENS, ETC				
	Temporary barriers, screens, etc including removal and allow for re-use				
1	SANS approved weld mesh type temporary barrier fencing 1,5m high fixed to and including 100mm diameter gum poles set securely min 300mm deep in ground at max 3m spacing including excavation, backfilling, etc A : 120 B : 0 C : 0 D : 0	m	120		
	DEMOLISH				
	Demolish & remove existing				
2	2540 x 2540 x 620mm High Tank Stand A : 2 B : 0 C : 0 D : 0	No	2		
	REMOVAL OF EXISTING WORK				
	Carried to Collection				R

Item No			Quantity	Rate	Amount
	Take out and remove doors, windows, etc from brickwork to remain				
3	Timber door and metal door frame 0,9 x 2,1m high M140 block wall A : 5 B : 3 C : 2 D : 4	No	14		
	Take down and remove glass & mirrors				
4	Glass from steel windows including cleaning out rebates & preparing for new glass (new glass elsewhere) A : 4 B : 10 C : 2 D : 0	m2	16		
	Take down and remove roofs, floors, panelling, ceilings, partitions, etc				
5	Existing IBR ceiling. A : 0 B : 236 C : 0 D : 0	m2	236		
6	Gypsum plasterboard ceilings including cornices, timber brandering, etc not exceeding 3,5m high A : 0 B : 0 C : 44 D : 0	m2	44		
7	Fascia boards and fixings A : 82 B : 0 C : 28 D : 19	m	129		
8	Barge boards and fixings A : 15 B : 0 C : 14 D : 11	m	40		
9	Rainwater gutters and fixings A : 82 B : 42 C : 28 D : 19	m	171		
10	Rainwater downpipes and fixings A : 18 B : 0 C : 6 D : 6	m	30		
	Hack up/off & remove grano, screed, plaster & prepare surface to receive new				
11	Screed from floors in patches A : 120 B : 0 C : 11 D : 0	m2	131		
12	Internal plaster to walls in patches A : 7 B : 14 C : 7 D : 0	m2	28		
	Carried to Collection			R	

Section No. 2
Alterations (Provisional)
Bill No. 1
Alterations
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
13	External plaster to wall in patches A : 23 B : 0 C : 5 D : 0	m2	28		
14	Vinyl flooring from floors in patches A : 0 B : 120 C : 0 D : 0	m2	120		
	Alter Openings				
15	Alter opening in one brick wall where 1 300 x 1 100mm high steel window removed to form opening for new kitchen roller shutter door size 2 500 x 1 115mm high overall by breaking out blockwork on both sides and bottom, including making good cement plaster into reveals and with Reinforced brick lintel. A : 0 B : 0 C : 1 D : 0	No	1		
	SERVICE				
	Windows				
16	Service steel window including lubricating ironmongery and leave in workable condition (replacement of damaged/ missing ironmongery measured elsewhere) A : 35 B : 21 C : 2 D : 0	No	58		
	Inspection and Repairs of Existing Roofs				
17	The contractor is to carry out an inspection of the existing roofs, remove and replace all loose metal sheets, remove and replace damaged sisalation, and roof screws with approved new (8mm diameter with 26mm washers and rubber gasket) including the re-fixing of all looses roof sheets, in accordance to the manufacturer's instructions. A : 459 B : 260 C : 48 D : 82	m2	849		
	SUNDRIES				
	Carried to Collection				R

Section No. 2
Alterations (Provisional)
Bill No. 1
Alterations
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	Desludging				
	Debris and rubble covering the access to the pit latrine must be cleared and disposed of at a registered landfill site. The pit latrine is to be accessed by the removable cover or removal of the access concrete slab. The solids that cannot be pumped out must be dug out by mechanical means. When the contents of the pit or tank are to be pumped out and the sludge is too firm or dry it must be jetted with a high pressure hose and agitate the mixture of sludge and water with the end of the suction hose before pumping begins. After pumping out the contents of the pit, the tanker must be driven to a legally authorised safe-disposal site, such as an off-site sewage treatment works, where the contents can be emptied. Dry pits or pits containing large quantities of solid materials incluidng stones, sticks, plastic bags, debris, etc. must be cleaned by individuals with hand held mechanical machinery with the appropriate protective gear in terms of the OHS Act as well as certified to work in confined spaces. Contractors are to ensure that the vacuum tankers are suitable to manoeuvre close to latrines without compromising the integrity of the pit latrine				
18	Clean out pit latrine by desludging. Contractor to price per toilet seat approximately 2KI in volume	No	16.00		
	Temporary Accommodation				
	Provide temporary accommodation units (park homes) for Educational Facilities during construction in phases as herewith measured including leveling of area, positioning on site and connected electrical supply including issue of electrical compliance certificate. Park homes to be standard size class room size and needs to be minimum 7 x 7m or nearest standard size				
19	Rental of temporary accommodation approximate size 7 x 7m wide, including standard windows, burglar bars, curtains and tracks, two tier steps for access, light fittings, electrical certificate of compliance, for a period of six (6) calendar months A : 3 B : 0 C : 0 D : 0	No	3		
	Carried to Collection				R

Section No. 2
Alterations (Provisional)
Bill No. 1
Alterations
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
20	Two tier steps for six (6) Calendar months A : 3 B : 0 C : 0 D : 0	No	3		
21	Transportation and establishment on site and de-establishment on completion temporary accommodation units approximate size 7 x 7m wide A : 3 B : 0 C : 0 D : 0	No	3		
	Temporary Ablutions				
22	Rental of temporary plastic ablutions approximate size 1,2 x 1,2 x 2,3m high for the sole use by the school, for 3 months inclusive of servicing on a regular basis. Ablutions are to be kept clean and in operation for the duration A : 0 B : 0 C : 0 D : 8	No	8		
23	Transportation and establishment on site and de-establishment on completion temporary ablutions approximate size 1,2 x 1,2 x 2,3m high A : 0 B : 0 C : 0 D : 8	No	8		
	Carried to Collection				R

Section No. 2
Alterations (Provisional)
Bill No. 1
Alterations
NAIDU CONSULTING

Section No. 2

Alterations (Provisional)

Bill No. 1

Alterations

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	35	
	36	
	37	
	38	
	39	
	40	
	41	
	42	
	43	
	44	
Carried to Final Summary		R

Item No		Quantity	Rate	Amount

SECTION No. 3

BILL No. 1 : ROOF COVERINGS

Key	Location Description
A	5 Classroom Block
B	3 Classroom Block
C	Administration
D	Ablutions

MODEL PREAMBLES

The tenderer is referred to the "Model Preambles for Trades 2008" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Sheeting

The roof sheeting shall be 0,55mm AZ150 ZincAl or equal approved IBR 686 profile roll-formed in continuous lengths and cut to length by a pneumatic cut-off process from certified Z275 galvanized steel complying with ISQ 550 (3T). A certificate verifying compliance shall be issued by the manufacturer.

Finish for AZ150 Zincalume

The profile shall be supplied with a paint finish G550 consisting of a full top coat "Colourplus" or equal approved silicone modified polyester Colour: To match existing on one side and Cool Grey backing to other

Carried to Collection R

Item No		Quantity	Rate	Amount
	Assembly			
	The AZ150 ZincAl sheets shall be fixed to every purlin strictly in accordance with manufacturer's specifications. Holes through sheeting are to be drilled and NO punching of holes are allowed. 8mm Diameter x 75mm long fixing screws with 26mm diameter washer and rubber gasket are to be used. Every precaution shall be taken to prevent damage to roof sheets during all stages of construction. Duck boards should be used when necessary to protect the sheeting from damage. Sheeting which has become deformed or damaged in any way, shall be replaced			
	Flashings			
	ROOF COVERING			
	(CPAP WORK GROUP NO. 125 UNLESS OTHERWISE STATED)			
	PROFILED METAL SHEETING AND ACCESSORIES			
	0,55mm Zincalume IBR 686 sheeting and accessories with "Colorplus" finish (colour : Standard colour on one side and CoolGrey backing to other), in long lengths fixed using Class 3 Climaseal screws (8mm diameter with 26mm diameter washer and rubber gasket) as per manufacturer's recommendations for coastal areas to 50 x 76mm treated SA Pine purlins @ 900mm centres on Sisalation elsewhere measured			
1	Ridge covering 650mm girth, screwed through sheet to purlins	m 62		
	Carried to Collection		R	

Item No			Quantity	Rate	Amount
2	Color coded metal angle flashing made from the same roofing sheet material and the same color with size 200 x 100mm and inner drip edges as well as outer drip edge, bent at 2.5 degrees respectively, fixed to fascia through the roof sheeting to the purlins.	m	85		
3	Moulded narrow and broad rib polyethelene filler blocks	m	131		
4	Moulded Sondor Metal Polyclosures for IBR roof sheeting profile color coated.	m	85		
	Carried to Collection			R	

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 1
Roof Coverings
NAIDU CONSULTING

Section No. 3

New Works to Existing Structures (Provisional)

Bill No. 1

Roof Coverings

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	46	
	47	
	48	
		R

Carried Forward to Summary of Section No. 3

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 1
Roof Coverings
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	SECTION No. 3				
	BILL No. 1 : CARPENTRY & JOINERY				
	Key	**Location Description**			
	A	5 Classroom Block			
	B	3 Classroom Block			
	C	Administration			
	D	Ablutions			
	MODEL PREAMBLES				
	The tenderer is referred to the "Model Preambles for Trades 2008" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	CARPENTRY AND JOINERY				
	(CPAP WORK GROUP NO. 126 UNLESS OTHERWISE STATED)				
	EAVES, VERGES, ETC				
	Sawn Softwood				
1	76 x 114mm false rafter fixed to rafter ends to receive fascia boards (measured elsewhere)		m	171	
	A : 82	B : 42 C : 28 D : 19			
	Approved fibre cement				
2	12 x 225mm Fascias to match existing including H-profile jointing strips		m	169	
	A : 82	B : 40 C : 28 D : 19			
3	50 x 50mm Eaves closer purlins		m	29	
	A : 7	B : 7 C : 7 D : 7			
4	Hurricane clips		No	315	
	A : 35	B : 210 C : 70 D : 0			
		Carried to Collection			R

Item No			Quantity	Rate	Amount
	DOORS ETC				
	Contractor to confirm door size on site prior to purchasing as any adjustment required to be made to the doors should be made by the manufacturer and not carried out on site				
	SANS approved Meranti				
5	44mm Framed ledged braced door with 44 x 146mm top rail and stiles, 22 x 108mm braces, 22 x 146mm lock rail, 22 x 222mm bottom rail, 22 x 70mm tongue in groove and v-jointed boarding Size 813 x 2 032mm high A : 5 B : 3 C : 2 D : 4	No	14		
	Carried to Collection			R	

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 2
Carpentry & Joinery
NAIDU CONSULTING

Section No. 3

New Works to Existing Structures (Provisional)

Bill No. 2

Carpentry & Joinery

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	50	
	51	
		R

Carried Forward to Summary of Section No. 3

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 2
Carpentry & Joinery
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	SECTION No. 3				
	BILL No. 2 : CEILINGS, PARTITIONS & ACCESS FLOORING				
	Key **Location Description**				
	A 5 Classroom Block B 3 Classroom Block C Administration D Ablutions				
	MODEL PREAMBLES				
	The tenderer is referred to the "Model Preambles for Trades 2008" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	SUPPLEMENTARY PREAMBLES				
	Descriptions:				
	Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins or shot pinned to brickwork or concrete				
	Trade Names				
	Where trade names are specified equal materials approved by the Principal Agent may be used				
	CEILINGS				
	(CPAP WORK GROUP NO. 128 UNLESS OTHERWISE STATED)				
	CEILING INSULATION				
	Approved flexible non-combustible lightweight insulation				
1	100mm Insulation loosely laid on top of brandering between roof timbers etc strictly in accordance with the manufacturer's detail and specification A : 300 B : 236 C : 44 D : 0	m2	580		
	Carried to Collection				R

Item No			Quantity	Rate	Amount
	NAILED UP CEILINGS				
	9mm "Rhino" or equal approved gypsum plasterboard with taped & skimmed joints				
2	Ceilings including 38 x 38mm sawn softwood brandering at 400mm centres in both directions, fixed to 38 x 38mm vertical timber supports bolted to truss, not exceeding 1m below timber trusses A : 300 B : 236 C : 44 D : 0	m2	580		
3	Extra over ceiling for 600 x 600mm trap door A : 5 B : 3 C : 1 D : 0	No	9		
	Gypsum Plasterboard Cornice				
4	75mm Coved cornice A : 0 B : 65 C : 27 D : 0	m	91		
	Carried to Collection			R	

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 3
Ceilings & Partitions
NAIDU CONSULTING

Section No. 3

New Works to Existing Structures (Provisional)

Bill No. 3

Ceilings & Partitions

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	53	
	54	
		R

Carried Forward to Summary of Section No. 3

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 3
Ceilings & Partitions
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	Section No. 3				
	Bill No. 3 : FLOOR COVERINGS, WALL LININGS, ETC				
	Key **Location Description**				
	A 5 Classroom Block B 3 Classroom Block C Administration D Ablutions				
	MODEL PREAMBLES				
	The tenderer is referred to the "Model Preambles for Trades 2008" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	SUPPLEMENTARY PREAMBLES				
	Proprietary products in descriptions:				
	Proprietary products shall be used as specified. Substitute products of similar quality and specification may only be used with prior approval by the Principal Agent.				
	Cleaning:				
	Rates for floor covering shall include for proper cleaning on completion.				
	VINYL FLOOR COVERINGS				
	2.5mm thick x 300mm x 300mm wide semi- flexible vinyl floor tiles laid in acrylic adhesive spread with trowel having 1.5mm x 1.5mm x 1.5mm triangular notches at 4.00mm centres as per Architectural and Manufacturers specifications:				
1	On smooth screeded floors. A : 0 B : 120 C : 0 D : 0	m2	120		
	POLISH, SEALERS, ETC				
	Carried to Collection			R	

Item No			Quantity	Rate	Amount
	Clean by stripping and sealing and apply three coats water based copolymer emulsion or other approved sealer:				
2	On vinyl flooring. A : 0 B : 120 C : 0 D : 0	m2	120		
	Carried to Collection			R	

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 4
Floor Covering
NAIDU CONSULTING

Section No. 3

New Works to Existing Structures (Provisional)

Bill No. 4

Floor Covering

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	56	
	57	
		R

Carried Forward to Summary of Section No. 3

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 4
Floor Covering
NAIDU CONSULTING

Item No		Quantity	Rate	Amount

SECTION No. 3

BILL No. 4 : IRONMONGERY

Key	Location Description
A	5 Classroom Block
B	3 Classroom Block
C	Administration
D	Ablutions

MODEL PREAMBLES

The tenderer is referred to the "Model Preambles for Trades 2008" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates

SUPPLEMENTARY PREAMBLES

Keys/Locks

Each lock is to be distinctly numbered with consecutive numbers and each key is to be stamped with the corresponding number to the lock that it controls. All locks are to have two keys

Trade Names

Where trade names are specified other ironmongery approved by the Principal Agent may be used

Fixing

Fixing of ironmongery is deemed to be fixed to timber unless otherwise described

IRONMONGERY

(CPAP WORK GROUP NO. 132 UNLESS OTHERWISE STATED)

HINGES, BOLTS, ETC

Carried to Collection R

Item No			Quantity	Rate	Amount
	SABS approved				
1	75 x 102mm Stainless steel hinge A : 10 B : 6 C : 2 D : 8	No	26		
2	150mm Stainless steel cabin hook A : 5 B : 3 C : 2 D : 4	No	14		
	LOCKS				
	SABS approved				
3	Three lever mortice lockset and furniture to external door A : 5 B : 3 C : 2 D : 4	No	14		
	HANDLES				
	SABS approved				
4	"AL5515-111 BBAS Dove" Set of two 111mm pull handles fixed back to back A : 5 B : 3 C : 1 D : 4	No	13		
	PINNING BOARDS, WRITING BOARDS, PROJECTION SCREENS, ETC (Provisional)				
5	2400 x 1200mm High, wall mounted aluminium framed pinning board. A : 5 B : 3 C : 1 D : 0	No	9		
6	2420 x 1220mm fixed projection white board (non reflective) aluminium framed, magnetic surface (centre board) complete with (x2) 1210 x 1220mm swing leaf aluminium framed magnetic chalk boards (without any lines or graphics, etc) with heavy duty hinges and 2250mm one complete aluminium pen tray to the centre board. A : 5 B : 3 C : 0 D : 0	No	8		
	Carried to Collection			R	

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 5
Ironmongery
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
7	Magnetic Starter Pack (x1 Full Complete Set) consisting of: 4 x White board markers (Red, Green, Black, Blue) 1 x Cleaning Cloth 1 x Magnetic Eraser 1 x Cleaning Fluid 250ml 4 x Moulded magnets d day A : 5 B : 3 C : 0 D : 0	No	8		
	WINDOW FITTINGS				
	SABS approved				
8	Ref B3680 Brass plated sliding stay to existing steel window A : 8 B : 5 C : 1 D : 0	No	13		
9	Ref B3681 Brass plated sash fastner to existing steel window A : 5 B : 3 C : 1 D : 0	No	9		
10	Ref B3676 Brass plated casement stay to existing steel window A : 5 B : 3 C : 0 D : 0	No	8		
11	Brass plated window handle to existing steel window A : 10 B : 6 C : 1 D : 0	No	17		
	SUNDRIES				
	SABS approved				
12	38mm Diameter rubber floor/wall mounted door stop A : 5 B : 3 C : 2 D : 0	No	10		
	PUSH PLATES AND KICKING PLATES				
	Carried to Collection			R	

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 5
Ironmongery
NAIDU CONSULTING

Item No		Quantity	Rate	Amount
	"Solid"			
13	800mm x 200mm high x 2mm aluminium screw mounted kick plate. A : 10 B : 6 C : 4 D : 8	No 28		
	Carried to Collection			R

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 5
Ironmongery
NAIDU CONSULTING

Section No. 3

New Works to Existing Structures (Provisional)

Bill No. 5

Ironmongery

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	59	
	60	
	61	
	62	

Carried Forward to Summary of Section No. 3 R

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 5
Ironmongery
NAIDU CONSULTING

Item No		Quantity	Rate	Amount
	SECTION No. 3			
	BILL No. 5 : METALWORK			
	Key **Location Description** A 5 Classroom Block B 3 Classroom Block C Administration D Ablutions			
	MODEL PREAMBLES			
	The tenderer is referred to the "Model Preambles for Trades 2008" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates			
	METALWORK			
	(CPAP WORK GROUP NO. 136 UNLESS OTHERWISE STATED)			
	GALVANIZED PRESSED STEEL DOOR FRAMES			
	1,6mm galvanised mild steel standard pressed jamb lining with double rebates to suit one brick wall:			
1	Frame for door 813 x 2032mm high. A : 5 B : 3 C : 2 D : 4	No	14	
	GALVANISED MILD STEEL GATES			
	Carried to Collection			R

Item No			Quantity	Rate	Amount
	Gate constructed from hot-dipped galvanized mild steel, consisting of 40 x 30 x 2mm thick rectangular hollow section to outer frame and horizontal rails. Infill to be 8 No. continuous 10mm diameter galvanised mild steel rods passing through and welded to horizontal rails and welded to outer frame. Lock housing to be formed of (2 Off) 10 x 180 x 3mm galvanised mild steel plates welded to finish flush with each face of the gate and is to have the necessary cut-outs for the lock deadbolt and Euro Profile cylinder.Frame stile to hinge side to be 30 x 30 x 2mm thick galvanised mild steel hollow square section 2m long, bolted to wall with (4 Off) expansion bolts. 30 x 30 x 2mm thick galvanised mild steel hollow square section 260mm long, twice bolted to wall as lock keep. End caps to be provided to both the frame stile and the lock keep.1,5 pairs galvanised mild steel pintle hinges welded to gate and frame stile. Pin of top hinge to be inverted. (1 Off) N302 Union Euro Profile Cylinder Gate Lock with LH5240-N302 housing and 2 x 18SC Union double cylinder. (1 Off) Halstead 166SC cabin hook and eye with cabin hook screwed to 100 x 70 x 32mm Meranti block plugged and screwed to wall, and eye welded to leading edge of gate outer frameGate is to be cleaned down on completion and left unpainted				
2	Single gate size 1 000 x 2 000mm complete fixed to blockwork A : 5 B : 3 C : 2 D : 0	No	10		
	GALVANIZED STEEL BURGLAR BARS				
	4,7mm x 19mm galvanised mild steel burglar bars welded to window frame over both opening and fixed sections of window horizontally				
3	Bars at 150mm centres to suit window 1,0 x 1,25m high A : 286 B : 0 C : 18 D : 0	m	304		
	Carried to Collection			R	

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 6
Metalwork
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	GAS CAGES				
4	Gas cage size 800 x 1500 x 1800mm high complete including concrete base with opening gate and lock. A : 0 B : 1 C : 0 D : 0	No	1		
	ROLLER SHUTTER DOORS				
	Steel roller shutter doors:				
	Note: The contractor is to check on site measurements before placing of order.				
5	Push-up hot dip galvanised steel roller shutter door to suit opening size 2,500 x 1,115mm high, with overhead box, with 0.8mm thick slats, 75mm wide side guides and two barrel bolts including extruded aluminium T-bar formed of 40 x 40mm angle iron, with rubber seal. A : 0 B : 0 C : 1 D : 0	No	1		
	GALVANISED MILD STEEL POSTS, ETC				
	Posts				
6	75 x 75 x 3600mm High posts including base plates and slotted to suite beam A : 4 B : 2 C : 2 D : 0	No	8		
	Sundries:				
7	10 x 180mm Mild steel bolts and nuts A : 16 B : 8 C : 8 D : 0	No	32		
	PROVISIONAL SUMS				
8	Provide an amount of R120,000.00 (One Hundred and Twenty Thousand Rand) for the supply and install of one (1) smart interactive board (screen) to be installed in the team teaching or general multi-purpose classroom or standard classroom. A : 1.00 B : 0.00 C : 0.00 D : 0.00	Item			120,000.00
9	Allow for profit and general attendance			%	
	Carried to Collection			R	

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 6
Metalwork
NAIDU CONSULTING

Item No		Quantity	Rate	Amount
10	Provide an amount of R10,000.00 (Ten Thousand Rand) for training to be given on the functioning of the smart interactive screen. A : 1.00 B : 0.00 C : 0.00 D : 0.00	Item		10,000.00
11	Allow for profit and general attendance		%	
	Carried to Collection		R	

Section No. 3

New Works to Existing Structures (Provisional)

Bill No. 6

Metalwork

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	64	
	65	
	66	
	67	
		R

Carried Forward to Summary of Section No. 3

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 6
Metalwork
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	SECTION No. 3				
	BILL No. 6 : PLASTERING				
	Key **Location Description**				
	A 5 Classroom Block B 3 Classroom Block C Administration D Ablutions				
	MODEL PREAMBLES				
	The tenderer is referred to the "Model Preambles for Trades 2008" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	PLASTERING				
	(CPAP WORK GROUP NO. 142 UNLESS OTHERWISE STATED)				
	GRANOLITHIC				
	Granolithic screeds on concrete				
	Chip loose material away untill a dense uniform surface of concrete is obtained. Feathered edges shall be saw cut to form surfaces perpendicular to the concrete (minimum 20mm). All loose material and dust to be removed by water. The cavity shall then be filled with a non-shrink cementitious grout				
1	30mm Screed on floors in patches A : 120 B : 0 C : 11 D : 0	m2	131		
	INTERNAL PLASTER				
	Cement plaster trowelled smooth on brickwork				
2	On walls in small areas A : 25 B : 0 C : 3 D : 0	m2	28		
	EXTERNAL PLASTER				
	Carried to Collection			R	

Item No			Quantity	Rate	Amount
	Cement plaster trowelled smooth on brickwork				
3	On walls in small areas A : 25 B : 0 C : 3 D : 0	m2	28		
	Carried to Collection				R

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 7
Plastering
NAIDU CONSULTING

Section No. 3

New Works to Existing Structures (Provisional)

Bill No. 7

Plastering

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	69	
	70	
		R

Carried Forward to Summary of Section No. 3

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 7
Plastering
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	SECTION No. 3				
	BILL No. 7 : PLUMBING AND DRAINAGE				
	Key **Location Description**				
	A 5 Classroom Block B 3 Classroom Block C Administration D Ablutions				
	MODEL PREAMBLES				
	The tenderer is referred to the "Model Preambles for Trades 2008" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	PLUMBING AND DRAINAGE				
	(CPAP WORK GROUP NO. 148 UNLESS OTHERWISE STATED)				
	RAINWATER DISPOSAL				
	Seamless aluminium				
1	150 x 150mm Box gutters with white baked enamel finish fixed with concealed brackets A : 82 B : 42 C : 28 D : 19	m	171		
2	100 x 76mm Fluted aluminium downpipes with white baked enamel finish A : 18 B : 0 C : 6 D : 6	m	30		
3	Extra over eaves gutter for stopped end A : 4 B : 0 C : 4 D : 4	No	12		
4	Extra over eaves gutter for drop box suitable for 150 x 150mm box gutter A : 6 B : 0 C : 2 D : 2	No	10		
5	Extra over rainwater downpipe for bends A : 12 B : 0 C : 4 D : 4	No	20		
	Carried to Collection			R	

Item No			Quantity	Rate	Amount
6	Extra over rainwater downpipe for shoes A : 1 B : 0 C : 0 D : 0	No	1		
	SABS approved				
7	5 000 Litre Vertical polyethylene water storage tank complete, fitted with and including 20mm PVC Ball Valve and 90° Angle HDPE spout on concrete tank stand (elsewhere measured) and tying down with 4mm diameter galvanised wire looped through 15mm hose enclosed steel link chain and secured to each corner of tank stand with a Y10 reinforcing rod twice bent and cast into concrete. A : 3 B : 1 C : 1 D : 1	No	6		
8	2 500 Litre Vertical polyethylene water storage tank complete, fitted with and including 20mm plastic ball valve and 90 deg HDPE Spout suitable for padlocking and setting in position on concrete tank stand (elsewhere measured) and tying down with 4mm diameter galvanised wire looped through 15mm hose enclosed steel link chain and secured to each corner of tank stand with a Y10 reinforcing rod twice bent and cast into concrete A : 0 B : 0 C : 0 D : 2	No	2		
9	Hole through top of tank lid for 75mm diameter rainwater pipe A : 6 B : 0 C : 1 D : 1	No	8		
	Carried to Collection			R	

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 8
Plumbing & Drainage
NAIDU CONSULTING

Section No. 3

New Works to Existing Structures (Provisional)

Bill No. 8

Plumbing & Drainage

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	72	
	73	

Carried Forward to Summary of Section No. 3 R

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 8
Plumbing & Drainage
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	SECTION No. 3				
	BILL No. 8 : GLAZING				
	Key **Location Description**				
	A 5 Classroom Block B 3 Classroom Block C Administration D Ablutions				
	MODEL PREAMBLES				
	The tenderer is referred to the "Model Preambles for Trades 2008" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates				
	GLAZING				
	(CPAP WORK GROUP NO. 150 UNLESS OTHERWISE STATED)				
	GLAZING TO STEEL WITH PUTTY				
	6,00mm Toughened clear safety glass secured into galvanized window with a compatible UV resistant sealant				
1	Panes exceeding 0,1m2 and not exceeding 0,5m2 A : 3 B : 10 C : 1 D : 0	m2	14		
2	Issue of Glazing Certificate.		Item		
	Carried Forward to Summary of Section No. 3			R	

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 9
Glazing
NAIDU CONSULTING

Item No		Quantity	Rate	Amount
	SECTION No. 3			
	BILL No. 9 : PAINTWORK			
	Key **Location Description** A 5 Classroom Block B 3 Classroom Block C Administration D Ablutions			
	MODEL PREAMBLES			
	The tenderer is referred to the "Model Preambles for Trades 2008" for supplementary and comprehensive expansion of descriptions, appropriate provision for which shall be deemed to have been included in all relevant rates			
	SUPPLEMENTARY PREAMBLES			
	Trade Names			
	Where trade names are specified it will read "or equal approved"			
	(CPAP WORK GROUP NO. 152 UNLESS OTHERWISE STATED)			
	PAINTWORK TO PREVIOUSLY PAINTED WORK			
	ON FLOATED PLASTER			
	Prepare and brush surface to remove all loose contaminants and apply one coat PP700 gypsum and plaster primer and two coats approved emulsion paint for interior use			
1	On internal walls A : 426 B : 144 C : 186 D : 208	m2 963		
	Carried to Collection			R

Item No			Quantity	Rate	Amount
	Prepare and brush surface to remove all loose contaminants and apply one coat alkali resistant primer, and two coats approved emulsion paint for external use				
2	On external walls A : 223 B : 0 C : 93 D : 0	m2	316		
	ON WOOD				
	Prepare and brush surface to remove all loose contaminants and apply two coats approved carbolineum anti-corrosive coal tar paint				
3	On roof timbers at eaves and verges A : 122 B : 69 C : 14 D : 6	m2	211		
	ON METAL				
	Prepare and brush surface to remove all loose contaminants and apply one coat galvanized iron primer, one universal undercoat and two coats super enamel paint				
4	On door frames A : 6 B : 0 C : 2 D : 3	m2	11		
5	On window frames A : 126 B : 76 C : 25 D : 0	m2	227		
	PAINTWORK TO NEW WORK				
	ON FLOATED PLASTER				
	Prepare and brush surface to remove all loose contaminants and apply one coat PP700 gypsum and plaster primer and two coats approved emulsion paint for interior use				
6	On internal walls A : 14 B : 7 C : 7 D : 0	m2	28		
	Carried to Collection			R	

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 10
Paintwork
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	Prepare and brush surface to remove all loose contaminants and apply one coat alkali resistant primer, one undercoat and two coats PVA emulsion paint for external use				
7	On external walls A : 18 B : 7 C : 3 D : 0	m2	28		
	ON PLASTER BOARD				
	Prepare, brush surface to remove all loose contaminants and apply one coat approved alkali resistant primer, and two coats approved washable super acrylic PVA Colour: White				
8	On ceilings and cornices A : 312 B : 244 C : 44 D : 0	m2	600		
	ON FIBRE CEMENT				
	Prepare and brush surface to remove loose contaminants and apply one coat professional gypsum & plaster primer PP700, and two coats approved emulsion paint				
9	On fascias & barge boards A : 25 B : 15 C : 6 D : 9	m2	55		
	Prepare, brush surface to remove all loose contaminants, stain and apply one coat "Woodcare Pretreatment (WWP 1)" or equal approved , and three coats "Woodcare Wood Preservative (FPR1)" or equal approved preservative strictly in accordance with the Manufacturer's instructions				
10	On doors A : 18 B : 11 C : 4 D : 14	m2	46		
	Carried to Collection			R	

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 10
Paintwork
NAIDU CONSULTING

Section No. 3

New Works to Existing Structures (Provisional)

Bill No. 10

Paintwork

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	76	
	77	
	78	

Carried Forward to Summary of Section No. 3 R

Section No. 3
New Works to Existing Structures (Provisional)
Bill No. 10
Paintwork
NAIDU CONSULTING

Section No. 3

New Works to Existing Structures (Provisional)

SECTION SUMMARY - New Works to Existing Structures (Provisional)

Bill No		Page No	Amount
1	Roof Coverings	49	
2	Carpentry & Joinery	52	
3	Ceilings & Partitions	55	
4	Floor Covering	58	
5	Ironmongery	63	
6	Metalwork	68	
7	Plastering	71	
8	Plumbing & Drainage	74	
9	Glazing	75	
10	Paintwork	79	

Carried to Final Summary R

Section No. 3
New Works to Existing Structures (Provisional)
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	SECTION No. 4				
	BILL No. 1 : EARTHWORKS				
	(CPAP WORK GROUP NO. 104 UNLESS OTHERWISE STATED)				
	EXCAVATION, FILLING, ETC OTHER THAN BULK				
	Earth berm				
1	Create earth berm for stormwater control with in situ material 1,5m wide at base x 500mm high	m	50		
	Headwall				
2	Construct headwall outlet (comprising of 630 x 200 x 4300mm long reinforced ref. 245 concrete footing with 1000mm high 230mm brick-wall including all form-work, excavation, filling, ramming, soil poisoning) for storm water from above v-drain elsewhere measured, as per drawing.	No	1		
	Soak Away				
3	Excavate for and create 15sqm of 300mm thick gabion/reno mattress (as per drawing)	No	1		
	Carried Forward to Summary of Section No. 4			R	

Section No. 4
Siteworks (Provisional)
Bill No. 1
Earthworks
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	SECTION No. 4				
	BILL No. 2 : V DRAINS & APRONS				
	REMOVAL OF EXISTING WORK				
	Break up and Remove				
1	Hacking off concrete stormwater channel	m2	8		
	SURFACE DRAINAGE				
	Precast or in-situ Ref 193 mesh reinforced concrete (25MPa) open stormwater channels having V-shaped waterway formed in top, finished smooth on all exposed surfaces in 3:1 cement plaster trowelled smooth and with angles rounded, cast in suitable lengths not exceeding 3m, including all formwork, moulds, shallow excavation, filling and ramming, laying to falls, bedding and pointing in 3:1 cement mortar				
2	V- shaped concrete channel 600mm wide and 100mm thick concrete lining with wood finish on exposed surfaces laid to falls in panels not exceeding 1.80m long, with 12mm softboard movement joints including all excavations, formwork, cart away as per drawing	m	125		
3	Extra for 600mm angle	No	3		
4	Extra for 600mm T-intersection	No	1		
5	Extra for forming 150mm thick 600mm wide spreader fanning out to 2 600mm width at furthest end with cement grouted stone pitching cast in ass diffusers including working off concrete to a smooth finish	No	1		
6	10mm Thick polystyrene joint forming material in expansion joint between concrete and concrete surfaces in narrow widths not exceeding 300mm high	m	61		
	Carried to Collection				R

Item No			Quantity	Rate	Amount
7	Rake out 10mm wide expansion joint material for a depth of 10mm and point with UV and chemical resistant polysulphide sealant	m	61		
	SOIL POISONING				
	Soil insecticide inclusive of a written guarantee				
8	Under floors etc including forming and poisoning shallow furrows against foundation walls etc, filling in furrows and ramming	m2	75		
	CONCRETE APRONS AND CLASS VERANDAH WALKWAYS				
	EARTHWORKS				
	SITE CLEARANCE ETC				
	Site clearance				
9	Clear the area to be paved of all grass, roots, rubbish, etc.	m2	34		
	EXCAVATION, FILLING, ETC OTHER THAN BULK				
	Excavation in earth not exceeding 2m deep				
10	Reduced levels under floors.	m3	7		
	EARTH FILLING, ETC.				
	Coarse river sand filling supplied by the contractor:				
11	Under floors etc. (Provisional).	m3	2		
	COMPACTION				
	Carried to Collection			R	

Item No			Quantity	Rate	Amount
	Compaction of surfaces				
12	Scarify in-situ material for a depth of 150mm and compact to obtain 95% Mod AASHTO dry density	m2	34		
	SOIL POISONING				
	Soil insecticide inclusive of a written guarantee				
13	Under floors etc including forming and poisoning shallow furrows against foundation walls etc, filling in furrows and ramming	m2	34		
	CONCRETE, FORMWORK AND REINFORCEMENT				
	REINFORCED CONCRETE				
	25MPa/19mm Concrete				
14	Surface beds, slabs, etc to falls and currents	m3	5		
	CONCRETE SUNDRIES				
	Finishing top surfaces of concrete with a woodfloat finish				
15	Surface beds laid in panels to falls and true non-slip wood float finish including slightly rounded edges to panels	m2	34		
	TEST BLOCKS				
16	Prepare a set of six concrete cubes each cube size 150 x 150 x 150mm for strength cubes and deliver to an approved laboratory for testing and pay all charges in connection therewith	No	3		
	ROUGH FORMWORK (DEGREE OF ACCURACY II)				
	Carried to Collection				R

Item No			Quantity	Rate	Amount
	Rough formwork to sides				
17	Apron slabs, paving and ramps not exceeding 300mm high	m	68		
	Expansion joints with 10mm softboard between vertical concrete and brick surfaces				
18	10mm Joints not exceeding 300mm high	m	34		
	STEEL REINFORCEMENT (PROVISIONAL)				
	Mesh reinforcement				
19	Ref 193 welded mesh fabric reinforcement cast into concrete pavings, etc	m2	34		
	WATERPROOFING				
	DAMP-PROOFING OF WALLS AND FLOORS				
	One layer of 250 micron USB Green waterproof sheeting sealed at laps with Pressure Sensitive Tape				
20	Under surface beds	m2	34		
	JOINT SEALANTS, ETC				
	SANS approved two-part grey polysulphide sealing compound (UV and chemical resistent) including backing chord, bond breaker, primer, etc				
21	Rake out 10mm wide expansion joint material for a depth of 10mm and point with polysulphide sealant	m	34		
	SCREEDS				
	1:5 Cement plaster screeds wood floated on concrete				
22	Average 35mm thick on floors to falls	m2	34		
	Carried to Collection				R

Section No. 4

Siteworks (Provisional)

Bill No. 2

V Drains & Aprons

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	82	
	83	
	84	
	85	

Carried Forward to Summary of Section No. 4 R

Section No. 4
Siteworks (Provisional)
Bill No. 2
V Drains & Aprons
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	SECTION No. 4				
	BILL No. 3 : TANK STANDS				
	EXCAVATION, FILLING, ETC OTHER THAN BULK				
	Excavation in earth not exceeding 2m deep				
1	Trenches	m3	30		
	Extra over all excavations for carting away:				
2	Surplus material from excavations and/or stock piles on site to a dumping site to be located by the contractor.	m3	17		
	Risk of collapse of excavations				
3	Sides of excavations not exceeding 1,5m deep	m2	92		
	Keeping excavations free of water				
4	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 97% Mod AASHTO density				
5	Backfilling to trenches, holes	m3	15		
	Earth filling (G7 material) supplied by the contractor compacted to 95% Mod AASHTO density:				
6	Under floors, steps, pavings, etc	m3	5		
	Carried to Collection			R	

Item No			Quantity	Rate	Amount
	Compaction of surfaces				
7	Compaction of ground surface under pavings etc including scarifying for a depth of 150mm, breaking down oversize material, adding suitable material where necessary and compacting to 98% Mod AASHTO density	m2	74		
	SOIL POISONING				
	Soil insecticide inclusive of a written guarantee				
8	Under floors etc including forming and poisoning shallow furrows against foundation walls etc, filling in furrows and ramming	m2	168		
	CONCRETE, FORMWORK AND REINFORCEMENT				
	UNREINFORCED CONCRETE CAST AGAINST EXCAVATED SURFACES				
	25MPa/19mm Concrete				
9	Strip footings	m3	10		
	REINFORCED CONCRETE				
	25MPa/19mm Concrete				
10	Surface beds cast in panels	m3	5		
	CONCRETE SUNDRIES				
	Finishing top surfaces of concrete with a woodfloat finish				
11	Surface beds, slabs, etc	m2	48		
	Carried to Collection				R

Section No. 4
Siteworks (Provisional)
Bill No. 3
Tank Stands
NAIDU CONSULTING

Item No			Quantity	Rate	Amount
	TEST BLOCKS				
12	Making and testing set of three 150 x 150 x 150mm concrete strength test cube (Provisional)	No	16		
	STEEL REINFORCEMENT (PROVISIONAL)				
	Mesh reinforcement				
13	Steel mesh reinforcement reference No. 193 in concrete slabs, etc. including all laps, bending, cutting, etc. (Measured net).	m2	74		
	BRICKWORK				
	Brickwork of NFX bricks (14 MPa nominal compressive strength) in Class I mortar:				
14	One brick walls in foundations.	m2	40		
	Brickwork of NFP bricks (14 MPa nominal compressive strength) in Class II mortar:				
15	One brick walls in superstructure.	m2	48		
	Bagging and sealing the outer face of the inner skin of walls with 1:3 cement and sand mixture and seal with two coats "Brixeal" bitumen emulsion waterproofing coating:				
16	To walls (Provisional).	m2	48		
	Brickwork reinforcement:				
17	150mm Wide reinforcement built in horizontally.	m	328		
	FACE BRICKWORK				
	SABS approved face bricks in stretcher bond with ruled joints and perpends externally:				
18	Extra over brickwork for face brickwork externally.	m2	48		
	Carried to Collection				R

Item No			Quantity	Rate	Amount
	Brick-on-edge header course copings, sills, etc, of approved face bricks pointed with recessed joints on all exposed faces, 220mm wide sill set sloping and slightly projecting:				
19	230mm Wide header course to top of one brick wall bedded and jointed in cement mortar and pointed on top and both sides as described.	m	80		
	METALWORK				
	Sundry items				
20	30mm Approved brass padlock	No	8		
21	400mm Long x 50mm wide x 3mm thick hot dipped galvanized three times holed steel plate twice bolted to concrete with and including 8mm masonry anchors	No	8		
	PLUMBING AND DRAINAGE				
	PVC				
22	20mm PVC sleeve 365mm long cast in concrete for water pipes (elsewehere)	No	8		
	Polycop				
23	15mm Pipe fixed to wall with and including proprietary brackets	m	12		
24	Extra on polycop piping for 15mm fittings	No	40		
25	Extra over for PVC Ball valve	No	8		
26	Extra for 90 deg HDPE spout	No	8		
	Carried to Collection			R	

Section No. 4

Siteworks (Provisional)

Bill No. 3

Tank Stands

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	87	
	88	
	89	
	90	

Carried Forward to Summary of Section No. 4 R

Section No. 4
Siteworks (Provisional)
Bill No. 3
Tank Stands
NAIDU CONSULTING

Section No. 4

Siteworks (Provisional)

SECTION SUMMARY - Siteworks (Provisional)

Bill No		Page No	Amount
1	Earthworks	81	
2	V Drains & Aprons	86	
3	Tank Stands	91	

Carried to Final Summary R

Item No			Quantity	Rate	Amount
	SECTION No. 5				
	BILL No. 1 : ELECTRICAL INSTALLATION (PROVISIONAL)				
	(CPAP WORK GROUP NO. 160 UNLESS OTHERWISE STATED)				
	Tenderers are to note that the sum included in the amount column for this Section of the Bills of Quantities, should be the total of all priced items in the Electrical Installation, Bill of Quantities as attached.				
	Note: Tenderers are to include for all Preliminary and General costs of the electrical contractor, in the rates.				
	P8000 Galvanised Trunking C/W enclosure				
1	Supply	m	300		
2	Install	m	300		
	20mm Conduit				
3	Supply	m	500		
4	Install	m	500		
	20mm PVC round boxes complete with lids & mounting screws				
5	Supply	No	120		
6	Install	No	120		
	100 x 100 x 50 mm deep mounted for isolators / SSO units				
7	Supply	No	40		
8	Install	No	40		
	Carried to Collection			R	

Item No				Quantity	Rate	Amount
	100 x 50 x 50 mm deep mounted for light switches					
9		Supply	No	23		
10		Install	No	23		
	32mm bosal conduit					
11		Supply	No	100		
12		Install	No	100		
	1,5 mm² (Live)					
13		Supply	m	800		
14		Install	m	800		
	1,5 mm² (Neutral)					
15		Supply	m	800		
16		Install	m	800		
	2,5 mm² (Earth)					
17		Supply	m	1,200		
18		Install	m	1,200		
	2.5 mm² (Live)					
19		Supply	m	1,200		
20		Install	m	1,200		
	2.5 mm² (Neutral)					
21		Supply	m	1,200		
22		Install	m	1,200		
	Carried to Collection					R

Item No				Quantity	Rate	Amount
	2,5 mm² (Earth)					
23		Supply	m	1,200		
24		Install	m	1,200		
	4 mm² (Live)					
25		Supply	m	100		
26		Install	m	100		
	4 mm² (Neutral)					
27		Supply	m	100		
28		Install	m	100		
	2,5 mm² (Earth)					
29		Supply	m	100		
30		Install	m	100		
	TYPE A 1500mm (5ft) Surface mounted, open channel fluorescent luminaire. Metal Body. 2 x T5 fluorescent lamps complete with electronic control gear and telescopic ends. Minimum 8750 Lumens. 2 x 35W Cool White. Colour white or as per Architect					
31		Supply	No	60		
32		Install	No	60		
	Carried to Collection					R

Item No			Quantity	Rate	Amount
	TYPE B Wall mounted die-cast aluminium body with glass diffuser. IP 65, Corrosion and vandal resistant luminaire, complete with 2 x CFL lamp, electronic control gear and all necessary accessories. All external bolts to be stainless steel. Minimum 2400 lm.2 x 11W Cool White. Colour black or as per Architect				
33	Supply	No	20		
34	Install	No	20		
	TYPE C Ceiling/Wall mounted high pressure die-cast aluminium base with opal high-impact acrylic diffuser. Minimum IP 65, Corrosion and vandal resistant luminaire complete with 2x CFL lamps, electronic control gear and all necessary accessories. All external bolts to be stainless steel. Minimum 2400lm.2 x 11W Cool White. Colour black or as per Architect				
35	Supply	No	2		
36	Install	No	2		
	230V, 11W ES/BC Compact fluorescent lamps colour cool white				
37	Supply	No	4		
38	Install	No	4		
	230V, 1500mm T5 fluorescent tubes colour cool white				
39	Supply	No	4		
40	Install	No	4		
	Administration Block Alarm System including connection cables				
	Carried to Collection				R

Section No. 5
Electrical Installation (Provisional)
Bill No. 1
Electrical Installation (Provisional)
NAIDU CONSULTING

Item No				Quantity	Rate	Amount
41		Supply	No	1		
42		Install	No	1		
	200W Low noise wall mounted electric fan					
43		Supply	No	2		
44		Install	No	2		
	Telephone Distribution Board					
45		Supply	No	1		
46		Install	No	1		
	School Siren and Push Button with Latch in Timer					
47		Supply	No	1		
48		Install	No	1		
	50mm PVC Sleeve					
49		Supply	No	10		
50		Install	No	10		
	2-Compartment galvanised and painted power skirting. (Grey)					
51		Supply	m	10		
52		Install	m	10		
	Power skirting inside and Outside corners					
53		Supply	m	10		
54		Install	m	10		
	Carried to Collection					R

Section No. 5
Electrical Installation (Provisional)
Bill No. 1
Electrical Installation (Provisional)
NAIDU CONSULTING

Item No				Quantity	Rate	Amount
	Power skirting end caps					
55		Supply	m	5		
56		Install	m	5		
	Power skirting Cover plates					
57		Supply	m	5		
58		Install	m	5		
	Power skirting conduit entry boxes .					
59		Supply	m	5		
60		Install	m	5		
	16-24 Way Surface Mounted Disribution Board					
61		Supply	No	2		
62		Install	No	2		
	15 Amp single phase Circuit breaker					
63		Supply	No	7		
64		Install	No	7		
	20Amp single phase Circuit breaker					
65		Supply	No	13		
66		Install	No	13		
	60Amp double pole Earth Leakage Unit					
67		Supply	No	5		
68		Install	No	5		
	Carried to Collection					R

Section No. 5
Electrical Installation (Provisional)
Bill No. 1
Electrical Installation (Provisional)
NAIDU CONSULTING

Item No				Quantity	Rate	Amount
	Class II 10kA single pole SPD unit					
69		Supply	No	4		
70		Install	No	4		
	Single Lever, one way switch					
71		Supply	No	18		
72		Install	No	18		
	IP65 Single lever switch					
73		Supply	No	1		
74		Install	No	1		
	Two Lever one way switch					
75		Supply	No	3		
76		Install	No	3		
	16 Amp 3 pin double SSO ZA Plug (White)					
77		Supply	No	20		
78		Install	No	20		
	16 Amp 3 pin Single (White)					
79		Supply	No	2		
80		Install	No	2		
	30 Amp 2 pole 230V					
81		Supply	No	1		
82		Install	No	1		
	Carried to Collection					R

Item No			Quantity	Rate	Amount
	Replace 10 Amp day light switch per SANS 1777				
83	Supply	No	3		
84	Install	No	3		
	8mm Diameter Aluminium lightning protection conductor. To include all holding down clamps, down conductors and bonding to earth rings				
85	Supply	m	200		
86	Install	m	200		
	Bond the metal roofs at each corner of the building bonded to the earth electrode in the ground. To include lugs, brass screws, nuts and washers				
87	Supply	No	21		
88	Install	No	21		
	Provide test joint points at 500mm AFGL at each down conductor location. The test joint shall comprise of two lugs and a 10mm galvanized steel bolt and nut enclosed in a suitable GRP enclosure				
89	Supply	No	21		
90	Install	No	21		
	50mm stranded BCEW down conductor in surface mounted PVC conduit complete with saddles				
91	Supply	m	200		
92	Install	m	200		
	Carried to Collection			R	

Section No. 5
Electrical Installation (Provisional)
Bill No. 1
Electrical Installation (Provisional)
NAIDU CONSULTING

Item No				Quantity	Rate	Amount
	1200mm x 16mm diameter Copper earth electrodes driven in ground, including 'Cadweld' joining sleeves as required					
93		Supply	No	21		
94		Install	No	21		
	6.0mm x 3 Core ECC					
95		Supply	m	100		
96		Install	m	100		
97		Term	No	40		
	16.0mm 3 Core ECC					
98		Supply	m	5		
99		Install	m	5		
100		Term	No	1		
	6.0mm 2 Core ECC					
101		Supply	m	50		
102		Install	m	50		
103	Term		No	10		
	10.0mm 2 Core ECC					
104		Supply	m	10		
105		Install	m	10		
106		Term	No	5		
	Carried to Collection				R	

Item No			Quantity	Rate	Amount
	Trench Excavations including temporary support of sides, keeping excavation dry, bedding material, backfilling, compacting and testing as specified. All backfill material to be suitable as per SANS codes and engineers approval. Backfill material to be imported if necessary. Trench depth to be 800mm below finished ground level				
107	In soft or pickable soil	m3	14		
108	Soft Rock	m3	14		
109	Hard Rock	m3	14		
110	Warning tape installed 500mm below ground level, above cables in trench	m	100		
	TESTING & COMMISSIONING				
111	Test and commission complete installation as per SANS 10142-1	No	3		
112	Provide Certificate of Compliance (CoC) as per SANS 10142-1. One for each DB	No	3		
113	Provide Earthing certificate for each BLOCK, to include earth resistance test of each down conductor earth electrode, measured by an Earthing specialist by means of an approved instrument	No	3		
114	Remove all redundant equipment, store and dispose at an approved dump site. A disposal certificate to be supplied	No	3		
115	Allow for Municipal/Eskom Meter Connection	Item			50,000.00
	40 Amp Double pole single phase main circuit breaker into existing feeder DB				
116	Supply	No	2		
117	Install	No	2		
	Carried to Collection			R	

Section No. 5
Electrical Installation (Provisional)
Bill No. 1
Electrical Installation (Provisional)
NAIDU CONSULTING

Item No				Quantity	Rate	Amount
	16.0mm 3 Core ECC					
118		Supply	m	50		
119		Install	m	50		
120		Term	No	5		
	Trench Excavations including temporary support of sides, keeping excavation dry, bedding material, backfilling, compacting and testing as specified. All backfill material to be suitable as per SANS codes and engineers approval. Backfill material to be imported if necessary. Trench depth to be 500mm below finished ground level					
121	In soft or pickable soil		m3	7		
122	Soft Rock		m3	7		
123	Hard Rock		m3	7		
124	Warning tape installed 300mm below ground level, above cables in trench		m	50		
	TESTING & COMMISSIONING					
125	Test and commission complete installation as per SANS 10142-1		No	2		
126	Provide Certificate of Compliance (CoC) as per SANS 10142-1. One for each DB and one overall		No	2		
127	Decommission, remove and make safe above cable installation upon removal of temporary accommodation		No	2		
	Carried to Collection					R

Section No. 5
Electrical Installation (Provisional)
Bill No. 1
Electrical Installation (Provisional)
NAIDU CONSULTING

Section No. 5

Electrical Installation (Provisional)

Bill No. 1

Electrical Installation (Provisional)

COLLECTION

	Page No	Amount
Total Brought Forward from Page No.	93	
	94	
	95	
	96	
	97	
	98	
	99	
	100	
	101	
	102	
	103	
Carried to Final Summary		R

Section No. 5
Electrical Installation (Provisional)
Bill No. 1
Electrical Installation (Provisional)
NAIDU CONSULTING

FINAL SUMMARY

Section No		Page No	Amount
1	Preliminaries	34	
2	Alterations (Provisional)	45	
3	New Works to Existing Structures (Provisional)	80	
4	Siteworks (Provisional)	92	
5	Electrical Installation (Provisional)	104	
	Sub-Total:		R
	Add Value Added Tax @ 15%		R
	Carried to Form of Offer and Acceptance		R

NAIDU CONSULTING

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

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:	**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID**		
Tender no:	**ZNTU04194W**	**Project Code:**	**063963**

SECTION 1

1 EXTENT OF THE WORKS

1.1 EMPLOYERS OBJECTIVES

Repairs and renovations to storm damaged schools including the provision of new facilities (where applicable). Refer to Scope Of Works. Annexure 13

1.2 OVERVIEW OF THE WORKS

Repairs and renovations to storm damaged schools including the provision of new facilities (where applicable). Refer to Scope Of Works. Annexure 13

1.3 EXTENT OF THE WORKS

Refer to Bills of Quantities and attached drawings for detailed scope of work.

1.4 LOCATION OF THE WORKS

KZN North Coast Region: GPS CO-ORDINATES:Sizuzulu Primary School: 27°28'40.45"S 31° 5'38.38"E

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

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 DAILY RECORDS

The Contractor shall keep daily records of people and equipment employed as well as a site diary in respect of work performed on the site.
At the end of each week the Contractor shall provide the Principal Agent with a written record, in schedule form, reflecting the number and description of tradesmen and labourers employed by him and all Sub-Contractors on the works each day.
At the end of each week the Contractor shall provide the Principal Agent with a written record, in schedule form, reflecting the number, type and capacity of all plant, excluding hand tools, currently used on the works.

5.7 BONDS AND GUARANTEES

The Contractor shall within 10 calendar days after receiving notice from the Engineer and prior to receiving a completed copy of this agreement, including the schedule of deviations (if any), contact the Employer's agent (whose details are given in the contract data) to arrange the delivery of any bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the conditions of contract identified in the Contract Data.

5.8 PAYMENT CERTIFICATES

Requirements will be in accordance with the Employers prescriptions.

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

SECTION 2

SPECIFICATION DATA ASSOCIATED WITH SANS 1921-2004

Clause Numbers	
4.1.7	**The requirements for drawings, information and calculations for which the Contractor is responsible**
	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:**
	Naidu Consulting (Pty) Ltd
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:**
	The contractor shall provide for the fixing of the different blocks in conjunction with the approval of the headmaster and will have to provide temporary classroom accommodation, allow the school to transfer their furniture, items on the wall, etc. to the temporary classrooms and obtain written permission to proceed with the vacated block before they proceed. The contractor needs to allow in his programme for any possible delay that might be associated with such procedure and approvals. The contractor to liaise with the Project Manager, Principal Agent and Headmaster and draw up a plan to show how the blocks would be transferred to the contractor in order for the work to proceed. This plan then needs to be reflected on the contractor's construction programme and must be updated as the project progresses.
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. - Brick sample. - Light fitting sample. - Screed panel 2m x 2m impact test. - Tested trial mix to be approved by the Engineer. - Roof sheeting sample - Gutter sample - Door sample - Ironmongery sample
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 will invalidate the tender.* 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:	**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID**		
Tender no:	**ZNTU04194W**	**Project Code:**	**063963**

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:	**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID**		
Tender no:	**ZNTU04194W**	**Project Code:**	**063963**

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

Project Code: **063963**
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

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

PART C4. SITE INFORMATION

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

Project title:	**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID**		
Tender No.	**ZNTU04194W**	**Project Code:**	**063963**

C4.1 Site Information

C4.1 GENERAL

(a) The nature of ground is assumed to be loose, sandy material, 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 North Coast Region.

The Project would be done classroom block for classroom block and the contractor must allow for the fact that they would not have all the buildings at the same time to work on. The sequence of blocks would be determined once the contractor is on site and the contractor has submitted their construction programme and the approval of the removal of asbestos has been obtained from the appointed AIA (IF APPLICABLE TO THE SCHOOL). The construction programme will further be discussed and agreed to by the Principal of the school to ensure normal operations of the school at all times. The contractor and the Principle of the school will agree how the contractor would get possession of each block. The contractor will the draw up a sequence list of each block or area that they would be working in and submit it at the first site meeting for approval before any works may commence.

C4.2 GEOTECHNICAL INVESTIGATION REPORT

(a) Not applicable

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

PART C4.2 Builders Lien Agreement

Refer to Annexure 8

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

PART C5 - DRAWINGS / ANNEXURES

C5.1 - LIST OF DRAWINGS/ANNEXURES

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

Tender No.:	ZNTU04198W	Project Code:	063466

(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.

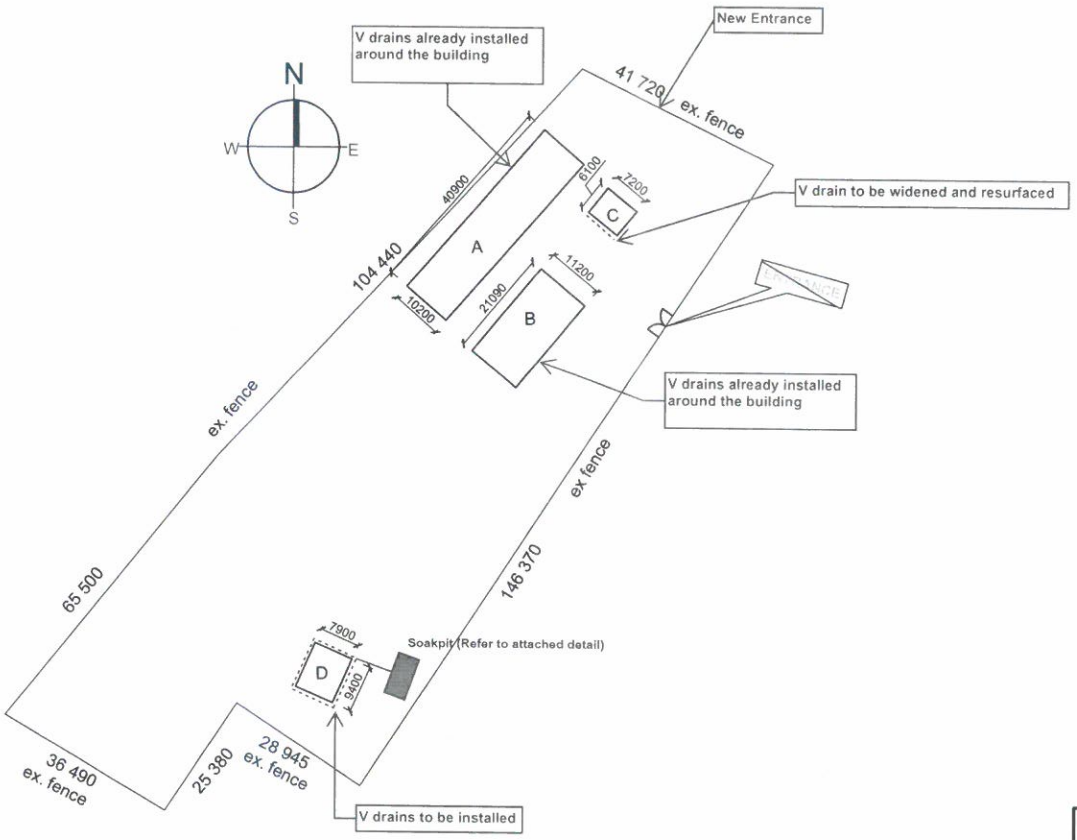
Drawings Number	Description of drawing
1604-99	Site Plan for Sizuzulu Primary School

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
Annexure 14	Structural Engineers Project Specification Drawings
Annexure 15	Electrical Engineers Specifications & Drawings
Annexure 16	Architect Specification & Drawings

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

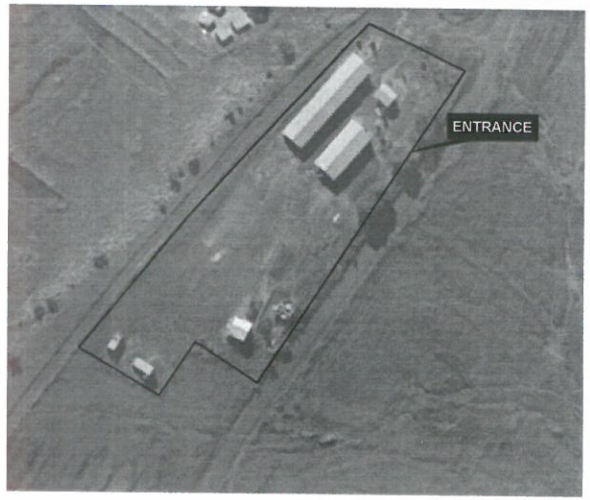
PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

PART C5.2 - PROVISIONAL SITE PLAN



SITE PLAN

SCALE 1:1000



BLOCK	DESCRIPTION	SIZE
A	5 CLASSROOM	40.90m x10.2m
B	3 CLASSROOM	21.09m x 11.2m
C	ADMIN BLOCK / STAFF / STORES	7.2m x 6.10m
D	1 ABLUTION	9.40m x 7.90m

REVISIONS			
Rev.	Date	Description	By
.	.	.	.

EMIS NO: 500271654 SCHOOL: SIZUZULU PRIMARY, 27°28'40.45"S 31° 5'38.38"E
ADDRESS: KWA GWEBU AREA, BHADENI, PAUL PIETERSBURG, 3184

CLIENT
PROVINCE OF KWAZULU-NATAL
DEPARTMENT OF PUBLIC WORKS
HEAD: WORKS

CLIENT DEPARTMENT
education
Department: Education
PROVINCE OF KWAZULU-NATAL

CONSULTANTS
Programme Managers : NAIDU CONSULTING (PTY) LTD
Architect : ARTEK 4 ARCHITECTS
Quantity Surveyors : HENCON & ASSOCIATES
Electrical Engineers : DBA CONSULTING ENGINEERS
Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION
SITE PLAN

Scale	Date	Drawn
1:1000	2016.05.19	MK

Project No.	Drawing No.	Rev.
1604	99	.

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

PART C5.3 - TABULATED SCOPE OF WORKS

REFER TO ANNEXURE 13

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

ANNEXURES

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

ANNEXURE 1
Model Preambles for Trades 2008

The Association of South African Quantity Surveyors
Die Vereniging van Suid-Afrikaanse Bourekenaars

MODEL PREAMBLES FOR TRADES 2008

forming part of
the bills of quantities

Project: _____

_____

_____

Contract Reference Number: _____

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EXPLANATORY NOTES AND INSTRUCTIONS ON THE USE OF THESE MODEL PREAMBLES

1. The document

1.1 This document is published by and is available from the Association of South African Quantity Surveyors, P.O. Box 3527, Halfway House, 1685. Telephone (011) 315 4140. E-mail: administration@asaqs.co.za

1.2 The contents of this document are intended to cover workmanship and materials encountered in a significant majority of projects. If a material is not encountered in a significant majority of projects, its preamble will in all likelihood not be included in this document

1.3 By its very nature, this document is a "Model" document and one that is designed to act as a basis upon which to build. It is anticipated that it will be supplemented by a "Supplementary Preambles" document included in the text of the bills of quantities that will include, *inter alia*, the following:

1.3.1 supplementary clauses of a general nature that practitioners may deem necessary to cover their own individual requirements,

1.3.2 additional clauses pertaining to specific materials incorporated in a project and not covered by the Model Preambles,

1.3.3 amendments to anything contained in the Model Preambles. A clause has been incorporated in the "General" section of the document stipulating that anything contained in the "Supplementary Preambles" which is at variance to that which is contained in the Model Preambles, will take precedence over the Model Preambles and apply to the works in hand

1.4 It is intended that this document will be used by reference only in the text of the bills of quantities and will NOT be bound or reproduced therein

2. The basic philosophy

2.1 Wherever possible, reference has been made throughout the preambles to South African National Standards (SANS) to describe materials and methods respectively. It is therefore incumbent on the users of these preambles to have ready access to the relevant Specifications and Codes. Where such Specifications or Codes do not exist, suitable preambles have been compiled

2.2 These preambles have been designed to assist in abbreviating descriptions in the text of the bills of quantities and practitioners are encouraged to make use of this facility. e.g. The description of a stormwater catchpit would read:

"Brick stormwater catchpit size internally 600 x 400 x 1 200mm deep to invert fitted with and including a 450 x 300mm x 59kg cast iron grating and frame"

2.3 Wherever alternatives exist in respect of materials or workmanship, specific choices have been made in these preambles. Should users require different choices to specific items, these should be referred to in the Supplementary Preambles as outlined in clause 1.3

3. Additional notes in the use of these Model Preambles

3.1 **Concrete, Formwork and Reinforcement**

The Project Specification embodied in these preambles was compiled in collaboration with the Authors of SANS 1200G, which forms the basis for the Concrete, Formwork and Reinforcement model preambles

Users of these preambles are advised to submit a copy of the Model Preambles to the Engineers involved in a project for their scrutiny. Any amplifications, amendments, etc required by individual Engineers would then be incorporated in the Supplementary Preambles referred to in item 1.3

3.2 **Roof Coverings**

The roof coverings included in these Model Preambles are limited in their content and therefore any roofing material not included in these Preambles will need to have its full preamble included in the Supplementary Preambles

3.3 **Structural Steelwork**

The comments made under item 3.1 apply equally to Structural Steelwork

Note that the protective treatment of the structural steel covers only the treatment up to and including the primer (and patching after erection). The finishing coats of paint must be fully described and included either in the "Structural Steelwork" or in the "Paintwork" trade, as the practitioner wishes

MODEL PREAMBLES FOR TRADES

CONTENTS

REFERENCE	TRADE	PAGE
A	General	2
B	Alterations	3
C	Earthworks	4
D	Concrete, Formwork and Reinforcement	6
E	Precast Concrete	10
F	Masonry	11
G	Waterproofing	14
H	Roof Coverings etc	15
I	Carpentry and Joinery	17
J	Ceilings, Partitions and Access Flooring	20
K	Floor Coverings, Wall Linings, etc	22
L	Ironmongery	23
M	Structural Steelwork	24
N	Metalwork	25
O	Plastering	29
P	Tiling	31
Q	Plumbing and Drainage	32
R	Glazing	41
S	Paintwork	42
T	Paperhanging	44
U	External Works	45

A. GENERAL

A.1 APPLICATION OF CLAUSES

These Model Preambles for Trades, and any Supplementary Preambles, shall be read in conjunction with and shall form part of the descriptions of items in the bills of quantities

Where descriptions or Supplementary Preambles in the bills of quantities differ from these Model Preambles for Trades, the descriptions or Supplementary Preambles in the bills of quantities shall take precedence. Where supplementary preambles differ from descriptions in the bills of quantities, the descriptions in the bills of quantities shall take precedence

Except where otherwise stated, all preambles contained in any individual Trade Preamble shall apply equally to any work of a similar nature in all other trades

A.2 ABBREVIATIONS

The following abbreviations shall apply:

AASHTO	–	American Association of State Highway and Transportation Officials
AISI	–	American Institute of Steel Industries
BS	–	British Standard
CKS	–	Coordinating Specifications issued by the Central Coordinating Committee under the auspices of the South African Bureau of Standards
CSIR	–	Council for Scientific and Industrial Research
SANS	–	South African National Standards and the number following shall refer to the relevant specification or code of practice as the case may be

A.3 MATERIALS AND WORKMANSHIP

Materials and workmanship shall be the best of their respective kinds. Only new and undamaged materials shall be used in the Works. Materials to be permanently installed into the works shall not be used for any temporary purposes on site. Work shall be to the approval of the Principal Agent and shall be executed in accordance with the relevant manufacturer's written recommendations and instructions where applicable

A.4 PROPRIETARY PRODUCTS

For the purposes of submission of tenders, rates for items described in the bills of quantities by trade names, catalogue references, etc shall be for the particular type and manufacture specified

The approval of the Principal Agent shall be obtained prior to any substitution and where products or materials etc other than those specified are used, adjustments in the rates will be made if necessary

A.5 ASSEMBLING

Rates for manufactured items shall include assembling complete and handing over in proper working order

A.6 REFERENCES IN DESCRIPTIONS

Any references given in brackets at the end of certain descriptions shall refer to the relevant references on the drawings or schedules

A.7 WATER

Water shall be clean and free from injurious amounts of acids, alkalis, organic matter and other substances and shall be suitable for its intended use

A.8 APPLICATION OF THE NATIONAL BUILDING REGULATIONS

All work shall be executed in accordance with the requirements of SANS 10400

A.9 ACCURACY IN BUILDINGS

The dimensional and positional accuracy of the buildings and their component parts shall comply with Grade II requirements of SANS 10155 unless otherwise stated

A.10 REFERENCES TO OTHER DOCUMENTS

References in these "Model Preambles for Trades" to other documents, including SANS, CKS and BS, shall pertain to the latest edition thereof including all amendments thereto at the date for submission of the tender

B. ALTERATIONS

B.1 ALTERATIONS

In taking down and removing existing work the utmost care shall be observed to prevent any structural or other damage to remaining portions of the building. The Contractor shall ensure the stability of all structures during alteration work

Special care shall be exercised during the progress of the work to ensure that any electrical installations, water supply pipes, telephone and other services which may be encountered are not interfered with and notice shall be given to the Principal Agent if any disconnection or alterations become necessary

The Contractor shall take all precautions necessary to prevent any nuisance from dust whilst carrying out the work

B.2 MATERIALS FROM THE ALTERATIONS, CREDIT, ETC

Materials recovered from the alterations (except where described as to be re-used or to be handed over to the Employer) will become the property of the Contractor, who may allow credit in respect thereof where provided for in the bills of quantities. Such materials shall not be re-used in new work without written permission from the Principal Agent

Materials described as "removed" shall be removed from the site immediately.

Materials described as "handed over to the Employer" shall be carefully dismantled where necessary, neatly stored under cover on the site where directed and protected from damage, until required

Materials described as "set aside for re-use" shall be carefully dismantled where necessary, cleaned, neatly stored under cover and protected from damage until required for re-use. Any damage caused to such materials during removal, storage or refixing shall be made good at the Contractor's expense

B.3 DISPOSAL OF DEBRIS ETC

The Contractor shall be responsible for the removal from the site of all materials, debris and rubbish resulting from the alterations

B.4 MAKING GOOD DAMAGED WORK

The Contractor shall make good in all trades to existing work where damaged or disturbed through the alterations with all necessary new materials to match the existing

B.5 FORMING NEW OPENINGS OR ALTERING OPENINGS IN EXISTING WALLS

Where new openings are formed or openings altered in existing walls, the wall above the opening shall be broken out and a new brick, in situ concrete or prestressed concrete lintel inserted, complete with all necessary reinforcement, formwork, turning piece, etc, the jambs and portions of openings as described shall be built up with new brickwork or blockwork properly toothed and bonded to existing, cavities of hollow walls shall be closed where necessary and finishes shall be made good all round and into reveals

B.6 BUILDING UP OPENINGS

Where existing openings are given in number as built up, the existing surfaces all round shall be prepared as necessary, brickwork or blockwork properly toothed and bonded to existing, wedged up to underside of existing lintel and finishes shall be made good on both sides

C. EARTHWORKS

C.1 DEMOLITIONS

C.1.1 Nature and extent

Descriptions of demolitions give a rough guide only as to the scope of the work. Tenderers are therefore advised to visit the site before submitting a tender and to acquaint themselves with the nature and extent of the work to be done and the value of recoverable materials which are not to be re-used or handed over to the Employer. Unless otherwise stated, loose furniture, kitchen and other equipment, apparatus, machinery, etc shall remain the property of the Employer and the removal thereof does not fall within the scope of this Contract

The Contractor shall completely demolish the buildings etc in a careful, skilful, practical and safe manner down to 150mm below ground level

Demolitions shall include breaking up and removing:

all floors and surface beds;

all external screen walls, steps, ramps, aprons, surface water channels, rainwater sumps, gulleys, etc attached to the building to be demolished;

all services, manholes, etc in ground to a point not less than 1m beyond the perimeter of the building including plugging off ends of all remaining pipes, drains, etc, filling in holes where necessary and ramming and levelling to ground level

Where only a portion of a building is to be demolished, it shall be done without damage to the remaining portion of the building. Any such damage shall be made good by the Contractor at his own expense

C.1.2 Notices etc

The Contractor shall, before commencing work, obtain all necessary authorisation for carrying out the work, by whatever means including the use of pneumatic equipment or blasting, give all necessary notices and pay all charges and fees in connection therewith. He shall also comply with all regulations pertaining to rodent extermination and he shall obtain the requisite Rodent Extermination Clearance Certificate and pay all necessary fees. All receipts and certificates shall be left in the safekeeping of the Principal Agent. All the abovementioned charges and fees shall be paid by the Contractor and included in his prices

The Contractor shall give ample notice to the Principal Agent and Local Authorities regarding any disconnections necessary prior to the removal or interruption of electrical or telephone cables, water and sanitary services etc

C.1.3 Loss

After the handing over of the site to the Contractor, the full risk of any loss or damage to buildings to be demolished shall be the responsibility of the Contractor and he shall take such precautions as he deems necessary against such loss or damage

C.1.4 Materials from the demolitions, credit, etc

Materials recovered from the demolitions will become the property of the Contractor, who may allow credit in respect thereof where provided for in the bills of quantities. Such materials shall not be re-used in any new work without written permission from the Principal Agent

C.1.5 Disposal of debris etc

The Contractor shall be responsible for the removal from the site of all materials, rubble, debris and rubbish resulting from the demolitions

C.2 SOIL INSECTICIDES

The application of soil insecticides shall be carried out in accordance with "The application of soil insecticides for the protection of buildings" - SANS 10124

C.3 FILLING ETC

C.3.1 Filling generally

Filling over site shall be spread, levelled, watered and consolidated in layers not exceeding 300mm

Filling under floors and backfilling to excavations shall be suitable inert material, free from clay, vegetable matter, large stones, etc, having a maximum plasticity index of 10, spread, levelled and compacted to a density of at least 90% Mod. AASHTO

C.3.2 Hardcore

Hardcore shall be broken stone or other approved hard material graded from 25mm to 75mm with the finer material on top and shall be spread, levelled and consolidated

C.4 EXCAVATIONS

C.4.1 Classification of excavated material

"Hard rock" shall mean granite, quartzitic sandstone or other rock of similar hardness, the removal of which requires drilling, wedging and splitting or the use of explosives

"Soft rock" shall mean hard material the removal of which warrants the use of pneumatic tools and includes hard shale, ferricite, compact ouklip and material of similar hardness

"Earth" shall mean all ground other than that classified as "hard rock" or "soft rock" and shall include made-up ground and any loose stones or pieces of concrete not exceeding 0,03m^3 in volume

D. CONCRETE, FORMWORK AND REINFORCEMENT

D.1 SPECIFICATION FOR CONCRETE WORK GENERALLY

All in situ concrete work (plain and reinforced) shall comply with SANS 1200G supplemented by the following Project Specification. Where SANS 1200G and the Project Specification are in conflict, the Project Specification shall take precedence

Wherever the term "Engineer" appears in SANS 1200G or in the following Project Specification this shall be deemed to mean the Principal Agent's representative responsible for this section of the Works

PROJECT SPECIFICATION

The following amplifications, additions and amendments to SANS 1200G shall constitute the Project Specification. Clause numbers refer to either the existing clauses in SANS 1200G or to new clauses, which are related to the existing clauses

1. **SCOPE**
This clause is amended to include:

1.1 This specification does not cover the methods by which the finished structure is to be measured for the purpose of payment and the "Standard System of Measuring Building Work" shall apply

2. **INTERPRETATIONS**

2.1 **SUPPORTING SPECIFICATIONS**
Clause 2.1(b) shall not apply

2.2 **APPLICATION**
This clause shall not apply

4. **PLANT**

4.5 FORMWORK

4.5.2 **Finish**
Unless otherwise stated the quality of all formwork shall be such that the finished surface of the concrete is "Rough" in terms of clause 5.2.1(a)

5. **CONSTRUCTON**

5.2 FORMWORK

5.2.1 **Classification of Finishes**

(a) **Rough**. No treatment of the surface of the concrete will be required after the striking of the formwork. The finish of the concrete need not be more accurate than Degree of Accuracy III

(b) **Smooth**. Imperfections such as small fins, bulges, irregularities, surface honeycombing and surface discolorations shall be made good and repaired by approved methods. The finish of the concrete shall be accurate to Degree of Accuracy II

(c) **Special**

(i) **Smooth and fair**

This class of finish requires the highest standard of concrete work, formwork, accuracy and technique

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

Formwork shall be metal, wrot timber or other approved material in 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 by the Principal Agent. Joints between panels shall be watertight, but the use of sealing tape which will mark the concrete shall not be permitted

Designated joints shall be in the position and of the details 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 Engineer 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 smooth and fair finished side shall be struck true and level with a trowel

Special care shall be taken to ensure that forms are clean and free 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 etc. Any defect shall be made good by either removing and replacing the defective concrete or, in certain instances only, by patching

5.5 CONCRETE

5.5.1.6 **Prescribed mix concrete**

Where prescribed mix concrete is specified the proportions of constituents, the maximum size of coarse aggregate and the estimated minimum compressive strength shall be as specified in the following table:

Class of Concrete	Estimated minimum compressive strength in MPa at 28 days	Maximum nominal size of coarse aggregate in mm	Proportions of Constituents		
			Cement (Parts)	Fine aggregate (Parts)	Coarse aggregate (Parts)
A	7	37,5	1	4	8
B	15	19	1	3	5
C	20	19	1	2,5	3,5

Cement shall comply with SANS 50917-1 of strength 32,5N or higher

Should cement and aggregates be mixed by volume, the contents of a 50kg sack of cement shall be taken to be 0,033m^3

Notwithstanding the requirements contained in SANS 1200G, the Principal Agent may permit certain items of non-structural concrete to be mixed by hand

If the concrete is mixed by hand, it shall first be mixed in a dry state on a clean non-absorbent surface until it is of uniform colour and consistency. Just enough water shall then be added to permit mixing and working, at which stage the concrete shall continue to be mixed until it is of uniform colour and consistency

5.5.1.7 **Strength concrete**

Where strength concrete is specified it shall be designated by its specified strength followed by the size of stone used in its manufacture, eg 30 MPa/19mm

The water/cement ratio shall be as Table 5 of clause 5.5.1.5 for moderate exposure conditions

5.5.1.8 **"No-Fines" concrete**

"No-fines" concrete shall consist of one part cement to eight parts aggregate graded from minimum 6mm to maximum 13mm size

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. Concrete shall be spade worked sufficiently to ensure that it fills the forms but vibrating, tamping or ramming will not be permitted

5.5.3.2 **Ready-mixed concrete**

The use of ready-mixed concrete and the acceptability of test results from a central concrete production facility shall be subject to the written approval of the Engineer

6. **TOLERANCES**

Degree of Accuracy II shall apply for all work unless otherwise stated

7. **TESTS**

7.1 FACILITIES AND FREQUENCY OF SAMPLING

7.1.2 **Frequency of sampling**

7.1.2.5 The frequency of sampling shall be as directed by the Engineer, but not less than one set of cubes from every 50m³ cast

8. **MEASUREMENT AND PAYMENT**

This clause shall not apply

D.2 AGGREGATES OF LOW DENSITY

Aggregates of low density shall comply with SANS 794

D.3 HOLLOW BLOCKS, PREFABRICATED BLOCK BEAMS AND PLANKS, ETC

Blocks, block beams, planks, etc shall be fixed and supported in such a manner that no movement can take place before or during the casting of concrete. No broken components shall be used

D.4 SUPERVISION

A competent and experienced foreman shall superintend personally the whole of the concrete construction and pay special attention to:

(a) The quality, testing and mixing of materials,
(b) The placing and compaction of concrete,
(c) The construction and removal of formwork and
(d) The sizes and position of reinforcement

The Contractor shall obtain the permission of the Principal Agent before commencing concreting of foundations or reinforced structure

No inspection, approval, authorisation to proceed, comment or instructions following from such an inspection, or failure of the Principal Agent to comment on any particular aspect of the work, shall be deemed to relieve the Contractor in any way from his obligation to ensure through his own supervision that the work is constructed in every way in accordance with the Drawings, Specification and Conditions of Contract, nor relieve him from his obligations to make good any fault or defect, nor shall it be deemed that there is any obligation on the Principal Agent to inspect all or any part of the Works or that such inspection is necessarily complete in every respect

D.5 GENERAL

Concrete

Rates for concrete work shall include all "construction joints" other than "designated joints" as defined in SANS 1200G clause 2.4.3 which are measured separately, and for the design of strength concrete mixes and all testing of concrete and materials other than compressive strength testing of concrete samples taken from concrete being placed in the Works. The Contractor shall only be entitled to payment for those samples and compressive strength tests called for by the Engineer and which pass the test requirements

Surface beds cast in panels shall be cast in panels approximately 9m^2

Formwork

Formwork to slabs and beams shall be cambered where required
Rates for formwork to soffits shall include propping not exceeding 3,5m high unless otherwise described. Formwork to walls and columns is not exceeding 3,5m high above bearing level unless otherwise described

Reinforcement

Standard welded steel fabric reinforcement shall be as included in Table 1 of SANS 1024 and shall have 300mm wide laps.

The mass of binding wire is not included in the mass of the reinforcement and the cost thereof shall be included in the rates for the reinforcement

E. PRECAST CONCRETE

E.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Precast concrete paving slabs SANS 541

Cement, water, aggregates and reinforcement shall be as described under D. CONCRETE, FORMWORK AND REINFORCEMENT

E.2 CONCRETE

Concrete shall be as described under D. CONCRETE, FORMWORK AND REINFORCEMENT and unless otherwise stated shall be prescribed mix concrete Class C but with coarse aggregate of an appropriate size

E.3 MOULDS

Before each casting, moulds shall be coated with a suitable release agent which will not in any way discolour the surface of the finished product or impair its strength. Where items are described as "finished smooth from the mould" or as "precast terrazzo", moulds shall be made to a high degree of accuracy and shall be such as to leave even and smooth surfaces

E.4 FINISHES TO BLOCKS

Where described as "precast terrazzo", such surfaces shall have a facing of terrazzo described under O. PLASTERING. The facing shall be poured into the moulds in a wet state (not dry pressed) and thoroughly worked up against finished faces to ensure that it finishes smooth from the mould

Projections shall be rubbed off and faces shall be of even colour and free from blemishes, cracks and other imperfections. Salient angles shall be arris rounded

E.5 CASTING ETC

Items shall be suitably cured, shall not be handled whilst still green and shall not be built in within 21 days of casting

E.6 REINFORCEMENT

Unspecified reinforcement required for manufacturing, handling and erection purposes and for reinforcing projecting and other unwieldy portions of blocks shall be provided by the Contractor at his discretion

E.7 BEDDING, JOINTING AND POINTING

Blocks shall be bedded and jointed solidly in Class I mortar as described under F. MASONRY and shall be pointed with slightly keyed joints

Blocks finished with "precast terrazzo" shall have joints raked out and pointed with slightly keyed joints in tinted waterproofed mortar composed of one part cement and three parts sand to match terrazzo facing

E.8 GENERAL

Precast concrete work shall include reinforcement required for manufacturing, handling and erection purposes, steel rod or wire hooks and/or mortices for lewis bolts required for handling and transporting, any necessary temporary propping and strutting and bedding, jointing and pointing

F. MASONRY

F.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Burnt clay masonry units	SANS 227
Limes for use in building	SANS 523 {Slaked (hydrated) limes}
Aggregates from natural sources – fine aggregates for plaster and mortar	SANS 1090
Concrete masonry units	SANS 1215
Prestressed concrete lintels	SANS 1504
Burnt clay paving units	SANS 1575
Metal ties for cavity walls	SANS 28
Common cement	SANS 50197-1 (Class 32,5N)
Masonry cement	SANS 50413-1 (Class 22,5X)
Concrete masonry construction	SANS 10145
The structural use of masonry	SANS 10164-1
Masonry walling	SANS 10249
Concrete floors	SANS 10109-1&2

F.2 SAND

Sand shall be washed where necessary and screened through a 2,4mm mesh sieve

F.3 BURNT CLAY BRICKS

Burnt clay bricks shall be of nominal size 222 x 106 x 73mm unless otherwise stated

Common bricks shall be General Purpose bricks

Extra hard burnt bricks shall be General Purpose (Special) bricks

Facing bricks shall exhibit a liability to efflorescence not in excess of "Slight" and water absorption when tested in conformity with the requirements of SANS 227 shall not exceed 14%

Particular care shall be taken to preserve arrisses and faces of facing and paving bricks during transit and handling

F.4 CONCRETE BRICKS

Concrete bricks shall have a nominal compressive strength of 8 MPa

F.5 QUARRY TILES ETC

Quarry, cement and similar tiles shall be of approved manufacture, even in shape and size, free from cracks, twists or blemishes and uniform in colour

F.6 WIRE TIES

Wire ties shall be of galvanized steel of the single wire type for solid walls and either the "Butterfly" or Modified PWD type for hollow walls. Ties shall be of sufficient length to allow not less than 75mm of each end to be built into brickwork or embedded in concrete

F.7 BRICKWORK REINFORCEMENT

Brickwork reinforcement shall be manufactured from hard drawn steel wire conforming to BS 785 and shall consist of two 2,8mm diameter main wires with 2,5mm diameter cross wires at 300mm centres welded at intersections

Brickwork reinforcement shall be lapped not less than 300mm at end joints and for a length equal to the width of the widest reinforcement at intersections

F.8 MORTAR

Mortar shall comply with the following table:

1	2	3	4
Mortar Class	Minimum compresive strength MPa	Cement:sand (common cement)	Cement:sand (masonry cement)
I	10	1:4 or 50kg to 130 litres	1:3 or 50kg to 100 litres
II	5	1:6 or 50kg to 200 litres	1:5 or 50kg to 170 litres
III	1,5	1:9 or 50kg to 300 litres	1:6 or 50kg to 200 litres

Mortar shall be Class II unless otherwise specified

Mortar plasticizers may only be used with the approval of the Principal Agent

The materials shall be mixed dry until of uniform colour, water added and the mixture turned over until the ingredients are thoroughly incorporated

Mortar shall be produced in such quantities as can be used before commencement of set and no mortar that has set shall be used

F.9 COMPO MORTAR

Compo mortar shall be Class III mortar in accordance with clause F.8 but with a lime content of 80 litres

The lime and sand shall be mixed dry until of uniform colour, water added and the mixture turned over until the ingredients are thoroughly incorporated. Immediately before use, the cement shall be mixed in and the requisite amount of water added. Compo mortar shall be produced in such quantities as can be used before commencement of set and no compo mortar that has set shall be used

F.10 BRICKWORK

Wherever practicable, brickwork shall be built in stretcher bond. Unless legitimately required to form bond, no false headers shall be used. English bond shall only be used where specifically so indicated or where stretcher bond is not practicable

Brickwork, unless otherwise described, shall be built in Class II mortar

Bricks shall be laid on a solid bed of mortar and all joints shall be grouted up solid

The brickwork shall be carried up in a uniform manner, no part being raised more than 1,2m above adjoining work

Where necessary, bricks shall be wetted before being laid and the course of bricks last laid shall be well wetted before laying a fresh course upon it

Walls in thicknesses of more than one skin shall have at least five wire ties per square metre. Linings to concrete, unless otherwise specified, shall be tied to the concrete with at least five wire ties per square metre

Hollow walls, unless otherwise specified, shall be built of two half brick skins with cavity between, tied together with at least five wire ties per square metre. The cavities shall be kept free of all rubbish, mortar droppings and projecting mortar. Mortar joints to brickwork shall be not less than 8mm or more than 12mm thick

F.11 BLOCKWORK

Unless otherwise described, all blockwork shall be built in stretcher bond. Whole blocks shall be used except where bats or closers are required to form bond. Blockwork, unless otherwise described, shall be built in Class II mortar

Solid blocks shall be laid on a solid bed of mortar and all joints shall be grouted up solid

Hollow blocks shall be laid in shell bedding, ie only the inner and outer shells of the blocks shall be covered with mortar. Vertical joints shall be similarly formed

The blockwork shall be carried up in a uniform manner, no part being raised more than 1,2m above adjoining work

Clay blocks shall be wetted before being laid and the course of blocks last laid shall be well wetted before laying a fresh course upon it

F.12 CENTRES AND TURNING PIECES

Centres and turning pieces to soffits of arches and lintels shall be left in position for not less than 14 days

F.13 FACE BRICKWORK

Face brickwork shall be built in stretcher bond, unless otherwise specified, to a true and fair face. Perpends shall be vertically aligned

Facing bricks shall be mixed to ensure that the proper blending of bricks within the colour range of each facing brick being used is obtained

F.14 PAVINGS, SILLS, COPINGS, ETC

Clay bricks and tiles shall be wetted before fixing and shall be solidly bedded and jointed in Class I mortar and pointed with slightly keyed joints

G. WATERPROOFING

G.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Bituminous damp-proof courses	SANS 248 (Type FV)
Polyolefin film for damp- and waterproofing in buildings (walls, sills, etc)	SANS 952 (Type B)
Polyolefin film for damp- and waterproofing in buildings (floors and basements)	SANS 952 (Type C)
Mastic asphalt for roofing	SANS 297
Mastic asphalt for damp-proof courses and tanking	SANS 298
Bituminous roofing felt	SANS 92 (Type 60)
Polyolefin film for damp- and waterproofing in buildings (flat roofs)	SANS 952 (Type A)
Chloroprene rubber sheet (for waterproofing)	SANS 580
Sealing compounds for the building industry, two-component, polysulphide base	SANS 110 (Type 2 - Gun Grade)
Sealing compounds for the building and construction industry, two- component, polyurethane base	SANS 1077
The waterproofing of buildings (including damp-proofing and vapour barrier installation)	SANS 10021

G.2 WATERPROOFING TO ROOFS, BASEMENTS, ETC

Waterproofing to roofs, basements, etc shall be carried out by workmen who are experienced in this type of work

G.3 DAMP-PROOF COURSE TO WALLS

All joints in damp-proof course to walls shall be lapped a minimum of 150mm except at junctions and corners where the lap shall equal the full thickness of the wall

H. ROOF COVERINGS ETC

H.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Concrete roofing tiles	SANS 542
Clay roofing tiles	SANS 632
Sawn softwood timber battens	SANS 1783-4
Fibre-cement sheets (flat and profiled)	SANS 685
Aluminium alloy corrugated and troughed sheets	SANS 903
Continuous hot-dip zinc-coated carbon steel sheet of commercial, lock-forming and drawing qualities	SANS 3575
Continuous hot-dip zinc-coated carbon steel sheet of structural quality	SANS 4998
Polyolefin film for damp- and waterproofing in buildings	SANS 952
Metal roofing tiles	SANS 1022
Glass-reinforced polyester (GRP) laminated sheets (profiled or flat)	SANS 1150
Fasteners for roof and wall coverings in the form of sheeting	SANS 1273
Materials for thermal insulation of buildings	SANS 1381-1&4
Expanded polystyrene thermal insulation boards	SANS 1508
Fixing of concrete interlocking roofing tiles	SANS 10062
Roof and side cladding	SANS 10237
Sheet zinc	BS 849
Sheet lead	BS 1178
Sheet aluminium	BS 1470
Sheet copper	BS 2870

H.2 GALVANIZED STEEL PROFILED SHEETS ETC

Galvanized steel profiled sheets, ridge and hip coverings, etc shall be coated with a minimum of 275 g zinc per m^2 and shall be free of white rust

H.3 GALVANIZED SHEET IRON

Galvanized sheet iron shall be rolled steel sheet coated on both sides with a minimum of 275 g of zinc per m^2 and shall be free from white rust

H.4 NAILING AND SCREWING

Where nailing and screwing is required:

- galvanized iron nails and screws shall be used for galvanized sheet iron and sheet zinc
- copper or copper alloy nails and screws for sheet copper and sheet lead
- aluminium alloy or stainless steel nails and screws for sheet aluminium

H.5 LAPS

Sheet metal flashings shall have minimum 100mm laps and linings to valleys, secret gutters, etc minimum 225mm laps

H.6 GENERAL

Rates for profiled sheet roofing and rolled edges, ridge and hip coverings, flashing pieces, etc of metal, fibre-cement, plastic, etc shall include fixing accessories

I. CARPENTRY AND JOINERY

I.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Sawn softwood timber : General requirements	SANS 1783-1
Sawn softwood timber : Stress-graded structural timber and timber for frame wall construction	SANS 1783-2
Sawn softwood timber : Brandering and battens	SANS 1783-4
Softwood flooring boards	SANS 629
Hardwood furniture timber	SANS 1099
Hardwood block and strip flooring	SANS 281
Wooden ceiling and panelling boards	SANS 1039
Laminated timber (glulam)	SANS 1460
Gypsum plasterboard	SANS 266
Fibreboard products	SANS 540
Wood-wool panels (cement bonded)	SANS 637
Fibre-cement sheets (flat and profiled)	SANS 685
Fibre-cement boards	SANS 803
Plywood and composite board	SANS 929
Wooden ceiling and panelling boards	SANS 1039
Particle boards	SANS 50312-1to7
Decorative laminates	SANS 4586
Wooden doors	SANS 545
Fire doors	SANS 1253
Materials for thermal insulation of buildings	SANS 1381-1,2,4&6
Expanded polystyrene thermal insulation boards	SANS 1508
Mild steel nails	SANS 820
Metal screws for wood	SANS 1171
Wood-preserving creosote	SANS 539

Softwood shall bear the relevant SABS mark and shall be ordered in the sizes in which it will be used as no scantlings of marked timber will be allowed. Should SABS marked timber be unavailable, the Principal Agent's prior permission shall be obtained before using unmarked timber

I.2 HARDWOODS

All hardwoods shall be specially selected, well seasoned, free from sapwood and well kiln dried. Meranti shall be Red or Medium Brown Meranti, even in grain and colour, selected from "Standard and Better" quality from Malaysia

I.3 INFECTION AND PRE-TREATMENT OF TIMBER

All timber used on the site, whether for permanent or temporary work, shall be free of borer or other beetle and termite infection. If the work under this contract falls within an area designated under Government Notice R2577 of 197812-29, permanent softwood fixed in the building shall be treated against borer etc in accordance with Government Notice R451 of 1969-03-28 using Class B or C preservative

When treated timbers are cut, the cut surfaces shall be effectively brushed with at least two coats of preservative solution

I.4 CONSTRUCTION IN GENERAL

Where applicable, construction methods shall comply with SANS 10082. Wood and laminate flooring shall be installed in accordance with SANS 10043. Roof trusses shall be manufactured, erected and braced in accordance with SANS 10243

I.5 STRUCTURAL TIMBER

Timbers generally shall be in single lengths and jointing of timbers will only be permitted when the required length is unobtainable. Only the absolute minimum of joints to obtain a particular length will be permitted and such joints are to be evenly spaced along the length of the timber

Finger-jointing of structural timber will be permitted, in which case it shall be manufactured in accordance with SANS 10096

I.6 PLATE NAILED TIMBER ROOF TRUSSES

Plate nailed timber roof trusses shall be of approved design and manufacture and constructed with softwood structural timber by a truss Fabricator holding a current Certificate of Competence awarded by the Institute of Timber Construction

Each roof truss shall have all its members accurately cut and closely butted together and rigidly fixed by CSIR approved patented galvanized metal spiked connectors, precision pressed on both sides of each intersection by an approved method, all in accordance with the manufacturer's instructions

The design, manufacture and transportation of the roof trusses, bracing, etc shall be under the control of a registered Structural Engineer in accordance with SANS 1900, SANS 10160 and SANS 10163, who shall, after erection, provide a certificate confirming that the design, manufacture, transportation, erection and bracing has been carried out in accordance with this specification

The design shall include for all live loads, wind loads and for dead loads imposed by roof covering, purlins, ceilings, etc

Fully detailed shop drawings of all trusses etc, indicating sizes, bracing, loading, etc, shall be submitted to the Principal Agent for approval prior to fabrication

Unless specific erection instructions are given, erection shall be carried out in accordance with the procedures and recommendations of the manual "The Erection and Bracing of Timber Roof Trusses" published by the Institute for Timber Construction and the Council for Scientific and Industrial Research or as detailed by the designer

Roof trusses and bracing shall include design and preparation of shop drawings

I.7 TONGUED AND GROOVED BOARDING

Tongued and grooved boards for floors, panelling, etc shall be in long varying lengths with joints tightly cramped up and secret nailed. Flooring boarding shall be flush jointed with staggered heading joints and machine sanded after fixing

I.8 JOINERY

Skirtings, cornices, rails, etc shall be in single lengths wherever practicable and shall have splayed heading joints where
necessary. Skirtings shall be trenched at back

All horns of door frames shall be checked and splayed back where frames are fixed projecting or flush with surface and built in

Heads of screws in exposed faces of hardwood joinery shall be sunk and match pelleted

Joinery shall have arris rounded angles and shall be blocked and planted on

I.9 VENEERS

All face veneers shall be of kiln dried timber, free from knots, cracks, patchwork, sapwood and other defects, selected and glued, dried and machine-sanded to a smooth finish. All veneers shall be applied under hydraulic pressure

I.10 DOORS

Flush doors shall have solid timber edge strips with concealed edges. Where doors are to be finished with a transparent finish, the veneer and the edge strips shall be timber of the same species and as far as possible of matching colour. Unless otherwise described all flush doors shall be of interior quality, but where exterior quality doors are specified the glue used shall be of the WBP type

Framed and ledged batten doors described as filled in with V-jointed boarding shall 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 shall be in narrow widths, closely cramped up, rebated or tongued on outer edges and housed to grooves in stiles and rails and twice countersunk brass screwed at each intersection with ledges and braces and the inner edges of the abutting stiles and rails shall be chamfered to form a V-joint at junction with the board

Unless otherwise described double doors shall have rebated meeting stiles

I.11 FIXING

All nails and screws shall be of the size, length and type appropriate to their respective uses. All screws for hardwood joinery work shall be brass

Items described as "plugged" shall be screwed to fibre, plastic or metal plugs at not exceeding 600mm centres. Where items are described as "bolted", the bolts have been given separately

I.12 ADHESIVES

Adhesives shall comply with BS 1204 and 4071 where applicable. Adhesives used in the manufacture of external joinery exposed to excessive moisture (eg kitchen and laboratory worktops) shall be of the WBP type

J. CEILINGS, PARTITIONS AND ACCESS FLOORING

J.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Gypsum plasterboard	SANS 266
Fibreboard products	SANS 540
Gypsum cove cornice	SANS 622
Wood-wool panels (cement-bonded)	SANS 637
Sawn softwood timber : Brandering and battens	SANS 1783-4
Sawn softwood timber : Timber for frame wall Construction	SANS 1783-2
Fibre-cement boards	SANS 803
Plywood and composite board	SANS 929
Wooden ceiling and panelling boards	SANS 1039
Materials for thermal insulation of buildings	SANS 1381-1&4
Expanded polystyrene thermal insulation boards	SANS 1508
Raised access flooring	SANS 1549

J.2 TONGUED AND GROOVED BOARDING

Tongued and grooved boarding for ceilings shall be in long varying lengths, V-jointed one side and with joints tightly cramped up and secret nailed

J.3 CEILINGS ETC

J.3.1 Brandering

Brandering for ceilings and eaves soffit coverings shall be symmetrically arranged with necessary smaller panels. Main branders shall be at right angles to roof timbers, with cross branders cut in between and branders shall be fixed with galvanized wire nails driven in on skew alternately in opposite directions

J.3.2 Ceiling boards

Ceiling boards shall be in long lengths symmetrically arranged with necessary smaller panels, closely butted and secured at 150mm centres to brandering with galvanized or cadmium-plated clout-headed nails

J.4 GYPSUM SKIM PLASTER

Gypsum skim plaster shall be pure gypsum plaster finished with a steel trowel

J.5 EXPOSED TEE-SYSTEM SUSPENDED CEILINGS

The ceiling panels shall be as described in the items and the panels shall be stiffened at back as recommended by the manufacturer to prevent bowing or sagging

The exposed surfaces of all ceiling panels and supporting members shall be uniform in colour and free from surface blemishes

The suspension grid system shall be an approved patent suspension system comprising 38mm galvanized steel main and cross tee bearers spaced in both directions at centres to suit sizes of ceiling panels used, with the cross bearers fitted between and notched to form flush fit with main bearers. The exposed flange of the tees shall be 25mm wide, covered with a rolled aluminium cap painted a low sheen satin white. Cornices etc shall be as described in the items and shall be finished to match the exposed tees

The main tee bearers shall have holes for cross tees at 300mm centres and holes for hangers at 50mm centres. In addition, main and cross tee bearers shall be holed as necessary for and provided with timber wedges or steel clips where recommended by the manufacturer to prevent ceiling panels from lifting

The web of the exposed cross tee bearers shall extend to form a positive interlock with the main tee bearers and the lower flange shall be cut back to provide a joint free appearance

All hangers shall be galvanized and shall be at centres to meet the requirements of the specification with one end fixed to the suspension grid main bearers and the other end fitted with suitable galvanized fixing cleat securely fixed to the structure. Fixing points shall be agreed to by the Principal Agent before any power shot fixings are made. Hangers shall not be suspended from air-conditioning ducts. Where recommended by the manufacturer, hangers shall be of the rigid type

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

Ceilings shall comprise hangers, suspension grid system and ceiling panels, shall be constructed in a manner suitable for carrying air-conditioning diffusers and light fittings in the positions required, shall be set out to layouts approved by the Principal Agent and shall have the standard suspension systems modified as necessary to work around any pipes or light fittings

J.6 FLUSH PLASTERED SUSPENDED CEILINGS

Gypsum plasterboard panels of the specified thickness generally in 1200mm widths and in long lengths shall be fixed grey side down with self-tapping screws to the suspension system with the joints between boards loosely butt jointed and covered with 50mm wide strips of self-adhesive fibre tape

The plasterboard panels shall be finished with gypsum skim plaster trowelled to a smooth polished surface to the thickness etc recommended by the manufacturer

The suspension system shall be an approved patent concealed suspension system consisting of galvanized mild steel bearers suspended on approved non-rusting metal hangers spaced generally at 1200mm centres or to suit layout of air-conditioning ducts and other services etc above ceiling with one end bolted to the bearer and the other end fitted with a galvanized fixing cleat securely fixed to the structure as required

Fixing points shall be agreed to by the Principal Agent before any power shot fixings are made. Hangers shall not be suspended from air-conditioning ducting

Ceilings shall comprise hangers, suspension system, ceiling panels and plaster finish, shall be constructed in a manner suitable for carrying air-conditioning diffusers and light fittings in the positions required, shall be set out to layouts approved by the Principal Agent and shall have the standard suspension system modified as necessary to work around any pipes or light fittings

K. FLOOR COVERINGS, WALL LININGS, ETC

K.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Semi-flexible vinyl floor tiles	SANS 581
Resin modified vinyl floor tiles	SANS 586
Flexible vinyl flooring	SANS 786
Hardwood block and strip flooring	SANS 281
Wood mosaic flooring	SANS 978
Textile floor coverings (pile construction)	SANS 1375
Textile floor coverings (needle-punched construction)	SANS 141
Carpet underlays	SANS 1419
The installation of wood and laminate flooring	SANS 10043
The installation of resilient thermoplastic and similar flexible floor covering materials	SANS 10070
The installation of textile floor coverings	SANS 10186
Sheet linoleum (calendered types), cork, carpet and linoleum tiles	BS 810
Solid rubber flooring	BS 1711
Felt backed linoleum	BS 1863

K.2 LAYING OF MATERIAL

Floor tiles shall be laid with continuous joints in both directions

Patterned floor coverings shall be matched at joints

K.3 GENERAL

Floor coverings, wall linings, skirtings, nosings, etc shall include all preparatory work to screeded or plastered surfaces etc, priming coats and adhesives

Floor coverings and wall linings shall be dressed around and into corners. Wood block and wood mosaic flooring shall be sanded with a sanding machine and sealed with a coat of approved penetrating sealer

Plastic handrails shall have welded and polished butt joints

L. IRONMONGERY

L.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Locks, latches and associated furniture for doors. (Domestic type)	SANS 4
Kitchen cupboards: Built-in and free-standing	SANS 1385
Single action closers	SANS 1510
Padlocks	SANS 1533
Fasteners	SANS 1700
Chalk writing boards for schools	CKS 36

L.2 KEYS

Locks shall have the minimum possible number of interchangeable keys. Cylinder locks and locks described as "en suite" shall be clearly marked with consecutive numbers and each key shall be punched with the corresponding number of the relative lock

L.3 FIXING

Unless otherwise described, ironmongery is to be fixed to wood

Items described as "plugged" shall be screwed to fibre, plastic or metal plugs

Screws, bolts, etc for fixing of ironmongery shall be of matching metal and finish, except for aluminium ironmongery or ironmongery fixed to aluminium in which cases stainless steel screws may be used

All necessary preparation of pressed steel door frames for the fixing of ironmongery to the frames has been included with the pressed steel door frames

L.4 KITCHEN CUPBOARDS

Steel cupboards shall be finished with baked enamel. Tops of floor cupboards shall have laminated plastic covering

Cupboards shall be fitted with all necessary hinges, handles, catches, etc. Cupboards shall be securely fixed with all necessary screws and fibre, plastic or metal plugs

Where cupboards are described as a "series", tops shall be continuous and cupboards shall be bolted or screwed together, including bolts, screws, holes, etc

M. STRUCTURAL STEELWORK

M.1 SPECIFICATION

All structural steelwork shall comply with SANS 1200H or 1200HA as applicable. Structural fasteners shall comply with
SANS 1700

Whenever the term "Engineer" appears in SANS 1200H or 1200HA or in the following Project Specification this shall be deemed to mean the Principal Agent's representative responsible for this section of the Works

M.2 PROJECT SPECIFICATION INCORPORATING AMPLIFICATIONS, ADDITIONS AND AMENDMENTS TO SANS 1200H AND 1200HA

The following amplifications, additions and amendments to SANS 1200H and SANS 1200HA shall apply and clause numbers refer to either the existing clauses in the relevant SANS or to new clauses which are related to the clauses therein

SANS 1200H

3.1.1 **Weldable structural steel**

Weldable structural steel shall comply with SANS 1431

5.1.2 **Contractor provides shop details**

The Contractor shall be responsible for the preparation of all shop detail drawings

5.1.3 **Engineer provides shop details**

This clause shall not apply

5.3.9 **Protective treatment**

Structural steelwork shall be cleaned and prepared by wire brushing in accordance with SANS 10064 and all surfaces shall be primed as specified to a minimum dry film thickness of 30 micrometres before leaving the workshop. Upon delivery to the site and again after erection all bared surfaces shall be made good with similar primer

8. **Measurement and payment**

This clause shall not apply

SANS 1200HA

5.2.10 **Protective treatment**

Structural steelwork shall be cleaned and prepared by wire brushing in accordance with SANS 10064 and all surfaces shall be primed as specified to a minimum dry film thickness of 30 micrometres before leaving the workshop. Upon delivery to the site and again after erection all bared surfaces shall be made good with similar primer

5.3.7 **Repairs to paint and site painting**
This clause shall not apply

8. **Measurement and payment**

This clause shall not apply

N. METALWORK

N.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Fasteners	SANS 1700
Expanded metal	SANS 190-1&2
Windows and doors made of rolled mild steel sections	SANS 727
Hot-dip galvanized zinc coatings on fabricated iron and steel articles	SANS 121
Strongroom and vault doors	SANS 949
Anodized coatings on aluminium (for architectural applications)	SANS 999
Steel door frames	SANS 1129
Mushroom- and countersunk-head bolts and nuts	SANS 1143
Welding of metalwork	SANS 1044
Adjustable glass-louvred windows	CKS 413
Aluminium sheet and strips	BS 1470
Aluminium extruded tube and hollow sections	BS 1474
Aluminium bars and sections	BS 1476

N.2 STEEL

Steel shall be mild steel of approved commercial quality. Steelwork shall be cleaned and prepared by wire brushing in accordance with SANS 10064 and given one coat of primer as specified before leaving the workshop

N.2.1 Galvanizing of steel

Steelwork described as "galvanized" shall be galvanized by means of the hot-dip process after fabrication. Where welding on site is unavoidable, such welded joints shall be cleaned down and cold galvanized to approval

N.3 STAINLESS STEEL

Stainless steel shall be AISI Type 304 stainless steel and shall be buffed to an even satin finish. Stainless steel screws shall be used for fixing stainless steel

N.4 ALUMINIUM

Aluminium extrusions shall be of 6063-T6 alloy and temper. Aluminium sheet and strips shall be of 1200-H4 alloy and temper.
Joints in all aluminium members shall be formed in an approved manner so that the joints are practically invisible. Screw heads, pins, rivets, etc shall be concealed as far as possible. 300 Series stainless steel screws and bolts shall be used for jointing and fixing aluminium work

The surfaces of all aluminium which are in contact with other materials when fixed shall be suitably insulated with a non-absorbent insulating material to prevent corrosion. All aluminium work shall be suitably protected against damage, deterioration or discolouration caused by mortar droppings, paint, etc by taping with removable tape, covering with temporary casings or by covering with motor oil

N.4.1 Anodizing of aluminium

Aluminium described as "anodized" shall be treated with Grade 25 coating thickness for exterior use or Grade 15 for interior use as specified, to the required finish. All alloys to be anodized shall be suited to anodizing

N.5 BOLTS AND NUTS

Nuts shall be of at least the strength grade appropriate to the grade of bolt or other threaded element with which they are used

N.6 SCREWING OF METALWORK TO STEEL, WOOD, CONCRETE, ETC

Metalwork described as "screwed" to steel, wood, etc or "plugged" to brickwork, concrete, etc shall be fixed at not exceeding 500mm centres, with necessary holes, countersinking, threading, screws, set screws, self-tapping screws and fibre, plastic or metal plugs

N.7 BOLTING OF METALWORK

Where metalwork is described as "bolted" to steel, wood, brickwork, concrete, etc the bolts are measured elsewhere

N.8 WELDING OF METALWORK

All welds shall be cleaned and filed or ground off smooth to approval. All welded joints shall be continuous

N.9 METALWORK GENERALLY

Metalwork shall have all sharp edges ground smooth. Tubular and pipe work shall include running joints. Rails etc described as "continuous" shall be in long lengths with welded joints

N.10 PRESSED STEEL DOORS, FRAMES, ETC

N.10.1 Door frames

Frames shall project not less than 20mm into floor finish. Except where described as galvanized, frames shall be primed as specified before leaving the factory. Frames are to jambs and heads of openings. Frames for single doors shall be provided with two 100mm steel butt hinges and an adjustable striking plate for a mortice lock and frames for double doors shall be provided with four 100mm steel butt hinges. Butt hinges shall be steel butts with loose pins, welded to frames. Where necessary mortar caps shall be welded to frames and back plates shall be welded on behind tappings for screws

N.10.2 Cupboard door frames

Cupboard door frames shall be as described in N.10.1, but with thresholds of unequal channel section, two 100mm steel butt hinges to hanging stiles, two 75mm steel butt hinges to hanging stiles above transoms, necessary striking plates for mortice locks and keeps for barrel bolts

N.10.3 Combination doors and frames

Combination doors and frames shall be manufactured of 1,6mm thick steel plate. Frames shall be as described in N.10.1. Doors shall be standard design and required profile, with a 44mm wide edge all round, vertical reinforcing ribs pressed in and with two reinforcing rails welded on. The door shall be provided with two lever mortice lock with lock box welded to inside. Doors shall be welded to steel butts

N.10.4 Transformer room doors and frames

Transformer room doors and frames shall be manufactured of 1,6mm thick steel plate. Frames shall be as described in N.10.1. Doors shall be of standard design with a 44mm wide edge all round, vertical reinforcing ribs pressed in and with three reinforcing rails welded on. Single doors shall be fitted with a padlock cleat and two 100mm brass pintle hinges and double doors shall be fitted with a padlock cleat, two 150mm bolts and four 100mm brass pintle hinges. Each leaf shall be fitted with a louvered ventilation panel of standard design backed with 6mm mesh galvanized wire vermin proof screen

N.10.5 Sizes

The frame widths given refer to unfinished wall thicknesses

N.10.6 Glazing beads

Where specified, glazing beads shall be 12 x 12mm standard metal glazing beads mitred at angles and countersunk screwed on at not exceeding 300mm centres with self-tapping screws

N.11 STEEL WINDOWS, DOORS, ETC

N.11.1 Windows, doors, etc

All fittings to windows, doors, etc shall be chromium plated. Fixed lights and opening sashes shall be in single squares. Windows etc of single unit construction shall have weather bars at transoms above opening sashes

Composite windows not of single piece construction shall be coupled with standard coupling mullions and transoms that correspond with the window section used

Kicking plates and panels shall be 1,6mm metal plate fixed with standard metal glazing beads mitred at angles and countersunk screwed on at not exceeding 300mm centres with self-tapping screws

Except where described as galvanized, windows, doors, burglar bars, etc shall be primed as specified before leaving the factory

N.11.2 Burglar bars and flyscreens

Where windows are described as fitted with burglar bars or flyscreens, these shall be standard type fitted over opening sashes

N.12 ADJUSTABLE LOUVRE UNITS

Adjustable louvre units shall be suitable for hand or longarm operation

Louvre units shall include glass louvres with polished edges and installation, including holes, screws, rivets, preparation of openings, etc

N.13 ALUMINIUM WINDOWS AND DOORS

The foregoing preambles "N.4 – ALUMINIUM" shall apply to aluminium windows, doors, etc in all respects in so far as they are applicable. Aluminium windows and doors shall be manufactured from extruded aluminium members of 6063T6, 6261-T6 or 6082-T6 alloy and temper

Ancillary members such as sills, flashings, infill panels and the like formed from flat sheet material shall be of an appropriate alloy selected from 1200, 3004 or 5251 complying with BS 1470 of a temper suitable for the method of forming and a composition suitable for anodizing or painting as required

Windows, doors, etc shall be of an approved standard system, manufactured by an approved firm experienced in this type of work, and shall meet with the minimum recommended performance requirements as set out by the Association of Architectural Aluminium Manufacturers of South Africa (AAAMSA) in the latest edition of the Selection Guide

The fittings for all opening sashes shall be substantial and, unless otherwise described, shall be of high quality aluminium alloy finished to match the windows, doors, etc on which they occur. Samples of all fittings shall be supplied to the Principal Agent for approval

Top, side and bottom hung opening sashes shall be hung on two aluminium hinges with 300 Series stainless steel pins, nylon bushes and stainless steel washers. Side hung sashes shall have fasteners and sliding stays, top hung sashes shall have peg stays and bottom hung sashes shall have spring catches and concealed arms

Projected out sashes shall have aluminium fasteners and concealed arms of a non-corrosive material compatible with aluminium

The frames which are to be built into openings in brickwork shall be fitted with the manufacturer's standard type fixing lugs, not less than 20 x 3 x 150mm long, screwed to frame and placed one near each corner and intermediately not more than 450mm apart to sides, top and bottom and where fixed to concrete reveals, wood sub-frames or to preformed openings in brickwork shall have countersunk holes for screws, one near each corner and intermediately not more than 450mm apart to sides, top and bottom

N.13.1 Glazing beads

Where so described, openings and sashes of windows and doors shall be fitted with approved channel section aluminium glazing beads sufficient in size and profile to suit the method of glazing employed, finished to match the windows, doors, etc and neatly mitred. Screws where necessary shall be of aluminium or 300 Series stainless steel and have pan or raised heads finished to match the beads

N.13.2 **Finishes**

Windows, doors, etc described as "anodized" shall be treated with Grade 25 coating thickness. Windows, doors, etc described as "factory painted" shall have an electrostatically applied oven baked polyester paint coating not less than 25 micrometres thick

N.13.3 **General**

Aluminium windows, doors, etc shall include glass as described, fixing in position, sealing and protection against damage, deterioration or discolouration by taping with removable tape or covering with temporary casings or motor oil and removing same on completion

N.14 STRONGROOM AND RECORD ROOM DOORS

Strongroom and record room doors shall not be built in as the work proceeds, but shall be fixed later in the openings provided. The Contractor shall ensure that the lock or other important parts of the door are not tampered with. Should any such tampering occur, the Contractor will be held responsible and at the Principal Agent's discretion shall provide a new door or lock and keys at his own expense. The keys shall not be delivered together with the doors to the building site. The Contractor shall arrange for the manufacturer to send the keys direct to the Principal Agent per registered post. If these instructions are not complied with, a new lock and keys shall be provided by the Contractor at his own expense

N.15 STEEL ROLLER SHUTTERS

Roller shutters shall be of approved manufacture comprising curtain, vertical channel guides and top mechanism. The curtain shall be constructed of 1mm thick machine-rolled galvanized interlocking slats with mild steel end locks spot welded to alternate strips. The bottom shall be provided with a galvanized rail riveted on and vertical edges shall slide in galvanized channel guides formed of steel not less than 2,5mm thick bolted to sides of openings

The mechanism shall be covered in a galvanized sheet iron box. The ungalvanized sections shall be primed as specified before leaving the factory

O. PLASTERING

O.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Common cement	SANS 50197-1(Class 32,5N)
Masonry cement	SANS 50413-1(Class 225X)
Limes for use in building	SANS 523 {Slaked (hydrated) limes}
Aggregates from natural sources – Fine aggregates for plaster and mortar	SANS 1090

O.2 PREPARATORY WORK

Surfaces shall be clean and free of oil and thoroughly wetted directly before any plastering or other in situ finishes are commenced. Concrete surfaces shall be slushed with a mixture of one part cement and one part coarse sand or otherwise treated to form a proper key. Preparatory coats shall be thoroughly scored and roughened to form a proper key

O.3 FINISH

All coats of paving and plastering shall be executed in one operation without any blemishes

O.4 SCREEDS

Screeds shall be composed of one part cement and four parts sand

O.5 CEMENT RENDER

Cement render shall be composed of one part cement and three parts sand finished with a steel trowel to a smooth polished surface and cured for at least seven days after laying

Cement render finish shall be divided into panels not exceeding $6m^2$ with V-joints and deep trowel cuts

O.6 GRANOLITHIC

Granolithic shall be composed of one part cement, one part fine sand, two parts coarse sand and one part granite or other approved stone aggregate that will pass through a 5mm sieve, finished with a steel trowel to a smooth polished surface and cured for at least seven days after laying

Coloured granolithic shall be carried out in two coats in one operation and shall be tinted to the required colour with approved colouring pigment mixed into the finishing coat. Under no circumstances is the pigment to be sprinkled on and trowelled in after the granolithic is laid

Granolithic shall be divided into panels not exceeding $6m^2$ with V-joints and deep trowel cuts

O.7 TERRAZZO

Terrazzo shall be applied in two coats. The undercoat shall be composed of one part cement and three parts sand and shall be finished with a wooden float. The finishing coat shall be composed of one part cement and two parts marble or stone aggregate of a colour and size to obtain the required colour and texture and shall be at least 12mm thick, and applied before the undercoat has dried out. The finishing coat shall be compacted by tamping or rolling until superfluous water has been expelled, finished with a steel trowel and cured for at least seven days after laying. The finished surface shall show at least 80% of the aggregate

Surfaces described as "polished" shall be polished by machine using various grades of abrasive and grouting with tinted cement as necessary between polishings

Surfaces described as "polished" shall be polished by machine using various grades of abrasive and grouting with tinted cement as necessary between polishings

Surfaces described as "brushed" shall be brushed with a steel wire brush on the day the terrazzo has been laid to expose the aggregate as required

Where required, brass or other dividing strips shall be embedded in the undercoat to finish flush with the finished surface

Three sample blocks, each size 300 x 300mm, as separately measured shall be prepared for approval by the Principal Agent and kept in an accessible place on the site until the completion of the contract

O.8 SKIRTINGS

Skirtings shall not exceed 25mm thick and shall have a fair edge with arris or rounded external angle at top edge or V-joint to finish flush with plaster and coved or square junction with floor finish

O.9 THICKNESS OF PLASTER

All plaster, other than skim plaster, shall be not less than 10mm and not more than 20mm thick

O.10 CEMENT PLASTER

Cement plaster shall comply with the following table:

1	2	3
Plaster Class	Cement:sand (common cement)	Cement:sand (masonry cement)
I	1:4 or 50kg to 130 litres	1:3 or 50kg to 100 litres
II	1:6 or 50kg to 200 litres	1:5 or 50kg to 170 litres
III	1:9 or 50kg to 300 litres	1:6 or 50kg to 200 litres

O.11 COMPO PLASTER

Compo plaster shall be composed of one part cement, two parts lime and nine parts sand

O.12 GYPSUM SKIM PLASTER

Gypsum skim plaster shall be pure gypsum plaster finished with a steel trowel

O.13 TWO COAT PLASTER WITH GYPSUM FINISH

Two coat plaster with gypsum finish shall comprise an undercoat of Class II cement plaster finished with a wooden float and a finishing coat of gypsum skim plaster

O.14 ROUGH-CAST PLASTER

Rough-cast plaster shall be applied in two coats. The undercoat shall be composed of one part cement and five parts sand finished with a wooden float. The finishing coat shall be composed of one part cement and three parts stone aggregate that will pass through a 4mm sieve. The finishing coat shall be flicked on with a machine before the undercoat has set to obtain an even texture

O.15 FINE ROUGH-CAST PLASTER

Fine rough-cast plaster shall be as for rough-cast plaster but the finishing coat shall be composed of one part cement and three parts coarse sand

0.16 GENERAL

Rates for plastering described as being on vertical surfaces of brickwork or blockwork shall include concrete columns, beams and lintels flush with the face of the wall

P. TILING

P.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Glazed ceramic wall tiles and fittings	SANS 22
Ceramic wall and floor tiles	SANS 1449
Common cement	SANS 50197-1(Class 32,5N)
Masonry cement	SANS 50413-1(Class 22,5X)
Aggregates from natural sources – Fine aggregates for plaster and mortar	SANS 1090
The design and installation of ceramic tiling	SANS 10107

P.2 TILES, MOSAICS, ETC

Tiles, mosaics, etc shall be even in shape and size, free from cracks, twists or blemishes and uniform in colour

P.3 PREPARATORY WORK

Surfaces shall be clean and free of oil and thoroughly wetted directly before any tiling is commenced. Concrete surfaces shall be slushed with a mixture of one part cement and one part coarse sand or otherwise treated to form a proper key

P.4 CERAMIC WALL AND FLOOR TILING

Where tiles are fixed to plaster or screeds with an adhesive, the adhesive shall be as recommended by the manufacturer of the tiles. Joints shall be straight, continuous and flush pointed with an approved grouting compound

P.5 GENERAL

Tiling described as "on walls" is on brick walls or block walls unless otherwise stated and shall include concrete columns, beams and lintels flush with the face of the wall

Q. PLUMBING AND DRAINAGE

Q.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Sheet metal

Sheet zinc	BS 849
Sheet aluminium	BS 1470
Sheet copper	BS 2870

Rainwater systems

Unplasticized poly(vinyl chloride) (PVC-U) components for external rainwater systems	SANS 11

Pipes and fittings

Steel pipes : Pipes suitable for threading and of nominal size not exceeding 150mm	SANS 62
Plain-ended solid drawn copper tubes for Potable water	SANS 460
Malleable cast iron fittings threaded to ISO 7-1	SANS 4
Polyethylene (PE) pipes for water supply – Specifications	SANS 4427
Cast iron fittings for asbestos cement pressure pipes	SANS 546
Vitrified clay sewer pipes and fittings	SANS 559
Reinforced concrete pressure pipes	SANS 676
Concrete non-pressure pipes	SANS 677
Cast iron pipes and pipe fittings for use above ground in drainage installations	SANS 746
Unplasticized poly(vinyl chloride) (PVC-U) sewer and drain pipes and pipe fittings	SANS 791
Fibre-cement pipes, couplings and fittings for sewerage, drainage and low-pressure irrigation	SANS 819
Pitch-impregnated fibre pipes and fittings and jointing	SANS 921
Unplasticized poly (vinyl chloride) (PVC-U) pressure pipe systems	SANS 966-1
Unplasticized poly(vinyl chloride) (PVC-U) soil, waste and vent pipes and pipe fittings	SANS 967
Rubber joint rings (non-cellular)	SANS 974-1
Copper-based fittings for copper tubes	SANS 1067-1&2
Fibre-cement pressure pipes and couplings	SANS 1223
Polypropylene pressure pipes	SANS 1315
Non-metallic waste traps	SANS 1321-1&2
Vent valves for drainage installations	SANS 1532
Heavy duty cast iron pipe fittings for drainage and gas and water supplies	BS 78

Lead pipes	BS 602
Cast iron pressure pipes for use in drainage and gas and water supplies	BS 1211
Stainless steel pipes for use with compression fittings	BS 4127
Sanitary fittings etc	
Stainless steel sinks with draining boards (for domestic use)	SANS 242
Stainless steel wash-hand basins and wash troughs	SANS 906
Stainless steel sinks for institutional use	SANS 907
Stainless steel stall urinals	SANS 924
Acrylic sanitary ware : Baths	SANS 1402-1
Glazed ceramic sanitary ware	SANS 497
WC flushing cisterns	SANS 821
Flush valves for WC flushing cisterns	SANS 1509
Taps, valves etc	
Water taps (metallic bodies)	SANS 226
Water taps (plastic bodies)	SANS 1021
Single control mixer taps	SANS 1480
Float valves	SANS 752
Plastic floats for ball valves	SANS 1006
Functional control valves and safety valves for Domestic hot and cold water supply systems	SANS 198
Cast iron gate valves for waterworks	SANS 664
Automatic shut-off flush valves for water closets and urinals	SANS 1240
Check valves (flanged and wafer types)	SANS 1551-1&2
Fire extinguishers	
Portable refillable fire extinguishers	SANS 1910
Portable rechargeble fire extinguishers : Halogenated hydrocarbon type extinguishers	SANS 1151
Water heaters and fire hose reels	
Fixed electric storage water heaters	SANS 151
Fire hose reels (with semi-rigid hose)	SANS 543
Drainage covers, gratings, etc	
Cast iron surface boxes and manhole and inspection covers and frames	SANS 558
Cast iron gratings for gullies and stormwater drains	SANS 1115
The installation of polyethylene and poly (vinyl chloride) (PVC-U and PVC-M) pipes	SANS 10112
Water supply and drainage for buildings	SANS 10252-1&2

Cast iron step irons BS 1247

Q.2 GENERAL

Q.2.1 Excavations

Excavations shall be deemed to be in "earth". Backfilling to excavations shall be executed in 300mm thick layers, watered and compacted. Surplus excavated material shall be spread and levelled over site as directed

Q.2.2 Concrete

Unreinforced concrete shall be Class B prescribed mix concrete and reinforced and precast concrete shall be Class C prescribed mix concrete

Q.2.3 Brickwork

Brickwork shall be of extra hard burnt bricks built in Class I mortar

Q.2.4 Plaster

Plaster shall be 1:3 cement plaster finished smooth with a steel trowel. All angles shall be rounded

Q.2.5 Diameters of pipes etc

Diameters stated for pipes, traps, valves, etc are internal diameters except PVC, polyethylene, stainless steel and copper pipes and traps for which external diameters are stated

Q.3 SHEET METAL WORK

Q.3.1 Galvanized sheet iron

Galvanized sheet iron shall be rolled steel sheet coated on both sides with Class Z275, unless otherwise specified, zinc coating complying with SANS 3575/4998. Sheets shall be free from white rust

Q.4 EAVES GUTTERS

Q.4.1 Galvanized sheet iron gutters

Galvanized sheet iron gutters shall have beaded edges and all joints shall be riveted and soldered. Angles shall be strengthened with 50 x 0,6mm galvanized sheet iron strips soldered on over the internal faces of mitres

Gutters shall be fixed with falls to outlets on 30 x 3mm galvanized mild steel brackets, bent to the shape of gutters, with front ends taken up to the underside of beaded edge of gutter and each screwed to roof timbers or bolted to fibre-cement fascias with 6mm galvanized gutter bolts. Gutters shall be bolted to brackets at front with 6mm galvanized gutter bolts, one to each bracket

Brackets shall be positioned at joints of gutters and intermediately at not exceeding 1,25m centres

Q.4.2 Fibre-cement gutters

Fibre-cement gutters shall have spigot and socket joints. Gutters shall be fixed with falls to outlets on standard aluminium alloy brackets, screwed or bolted to roof timbers or fascias

Q.4.3 Unplasticized polyvinyl chloride (UPVC) gutters

Gutters shall be fixed with falls to outlets on brackets as supplied by the manufacturer, screwed or bolted to roof timbers or fascias

Q.4.4 Aluminium gutters

Aluminium gutters shall be roll formed on site to required lengths and profiles from 3003H14-3SH4 alloy strip not less than 0,7mm thick factory coated on both sides with baked enamel and two coats of silicone modified polyester to a total minimum thickness of 20 micrometres. Angles, stopped ends, etc shall be prefabricated units pop riveted to gutters with joints sealed with mastic. The guttering shall be in continuous lengths between angles, stopped ends, etc

Q.5 RAINWATER PIPES

Q.5.1 Galvanized sheet iron pipes

Galvanized sheet iron pipes shall have seams at the back and shall be jointed with soldered slip joints. Pipes shall be fixed to walls etc with galvanized mild steel holderbats spaced at not exceeding 2m centres with tails driven in or cut and pinned in 1:3 cement mortar

Q.5.2 Fibre-cement pipes

Fibre-cement pipes shall have spigot and socket joints. Pipes shall be fixed to walls etc with standard aluminium alloy holderbats with tails driven in or cut and pinned in 1:3 cement mortar

Q.5.3 Unplasticized polyvinyl chloride (UPVC) pipes

Pipes shall be fixed to walls etc with patented UPVC or aluminium clips and holderbats as supplied by the manufacturer of the pipe

Q.5.4 Aluminium pipes

Aluminium pipes and fixing straps shall be formed from 3003H14-3SH4 alloy strip not less than 0,7mm thick factory coated on both sides as described for aluminium gutters. Pipes shall be in continuous lengths with formed angles, offsets, shoes, etc. Pipes shall be fixed to walls etc with 20 x 0,6mm straps at not exceeding 1,5m centres screwed to 25 x 75 x 100mm hardwood chamfered and oiled blocks plugged to walls

Q.6 STORMWATER CHANNELS

In-situ concrete stormwater channels shall be constructed of unreinforced concrete with segmental channel formed in top. Channels shall be laid to falls on a well rammed earth bottom and finished smooth on exposed surfaces

Precast concrete channels shall be of 25 MPa concrete, generally in 1m lengths, finished smooth from the mould on exposed surfaces, laid to falls on a well rammed earth bottom, jointed in 1:3 cement mortar and pointed with keyed joints

Q.7 JOINTS

Joints of pipes not covered by SANS shall be as follows:

Pipes	Joints
Fibre-cement, concrete, pitch-impregnated fibre and vitrified clay pipes for use under ground in non-pressure pipe lines	Flexible joints in accordance with the manufacturer's instructions
Cast iron for use above ground	Spigot and socket joints with tarred rope yarn and caulking compound or Plain ended joints with stainless steel couplings with neoprene rubber sleeves
Cast iron for use below ground	Spigot and socket joints with tarred rope yarn and caulking compound
Galvanized mild steel	Joints of screwed galvanized steel sockets or bolted galvanized iron flanges Screwed joints with plastic jointing tape or hemp Flanged joints which shall be bolted and provided with rubber gaskets and with flanges screwed to pipes
Joints between pipes of different materials shall be as follows:	
Between cast iron and mild steel	Spigot and socket joints with tarred rope yarn and caulking compound
Between cast iron and clay	Spigot and socket joint with semi-dry cement caulking and 1:2 cement mortar fillet
Between mild steel or copper and clay	Spigot and socket joint with either bitumen or semi-dry cement caulking and 1:2 cement mortar fillet

Q.8 FIXING OF PIPES

Pipes shall be fixed as follows:

Q.8.1	Galvanized mild steel (except those stated in Q.8.3)	To walls with galvanized mild steel brackets for pipes not exceeding 80mm diameter and with galvanized cast iron hinged holderbats with brass pins or bolts for pipes exceeding 80mm diameter; both types with tails cut and pinned in 1:3 cement mortar To woodwork with screw-on type galvanized mild steel holderbats
Q.8.2	Copper and stainless steel	To walls with brass holderbats or screw-on type two- piece spacing clips for pipes not exceeding 75mm diameter and with purpose made holderbats for pipes exceeding 75mm diameter; both types with tails cut and pinned in 1:3 cement mortar To woodwork with screw-on type brass holderbats
Q.8.3	Cast iron and galvanized mild steel for soil, waste and vent pipes	To walls with hinged cast iron holderbats with brass bolts and with tails cut and pinned in 1:3 cement mortar To woodwork with screw-on type galvanized mild steel holderbats
Q.8.4	Polyethylene, polypropylene and patented UPVC or unplasticized polyvinyl chloride	To walls, woodwork, etc with aluminium clips and holderbats as supplied by the manufacturer of the pipes
Q.8.5	Fibre-cement	To walls with aluminium alloy holderbats with tails cut and pinned in 1:3 cement mortar

Q.8.6	Pipes fixed to ceilings	Fixed with holderbats and standard or purpose made hangers, with extended hangers for pipes to falls

Q.9 PIPES LAID IN GROUND

Q.9.1 **Water pipes etc**

Water pipes, gas pipes, etc laid in ground shall be at least 400mm deep from the crown of the pipe to the finished surface

Q92 **Drain pipes**

Excavations taken out too deep shall be filled in with selected soil and compacted. Backfilling to sides and up to 300mm above plastic pipes shall be free from stone or hard substances which will not pass a 10mm mesh

Q.10 CLEANING EYE LIDS

Cleaning eye lids for drain pipe fittings shall be fixed and sealed as follows:

Pipe fittings	**Method of sealing and fixing**
Fibre-cement	Sealed with synthetic rubber or bituminous mastic packing and fixed with screws
Vitrified clay	Polypropylene lid sealed with synthetic rubber packing and pressed into position
Polypropylene and unplasticized polyvinyl chloride	Sealed with synthetic rubber packing and screwed on or pressed into position
Cast iron	Sealed with tallow or putty and fixed with non-ferrous metal screws
Galvanized malleable cast iron and cast brass	Sealed with synthetic rubber packing and screwed in

Q.11 CLEANING EYES

Cleaning eyes shall consist of cast iron frames and lids with letters "CE" (or "SO") cast in lids. The lids shall be secured with non-ferrous metal screws. Frames shall be jointed to vertical drain pipes. Cleaning eyes shall be encased in unreinforced concrete taken up to ground level and plastered on exposed surfaces

Q.12 INSPECTION EYE MARKER SLABS

Inspection eye marker slabs shall be 350 x 350 x 50mm thick precast concrete finished smooth from the mould, with letters "IE" (or "IO") formed in top and placed flush in ground or paving

Q.13 GULLEYS

Gulleys shall be built up of traps, vertical piping and gulley heads with loose gratings, all encased in unreinforced concrete to finish flush with gulley head top and taken up to at least 50mm above surrounding finished surfaces. The outer top edge of the concrete encasing shall be splayed and the exposed surfaces plastered

Q.14 DISHED GULLEYS

Dished gulleys shall be built up of traps, vertical piping and gulley heads with loose gratings, all encased in unreinforced concrete and with dished unreinforced concrete hopper size 450 x 450mm overall around gulley head with rounded kerb 50mm wide to front and sides and 25mm wide at back, 100mm high above top of dishing and the hopper plastered on exposed surfaces. Top of hopper shall be taken up to at least 50mm above surrounding finished surfaces

Q.15 SUMPS, CATCHPITS, INSPECTION CHAMBERS, ETC

Q.15.1 Rainwater sumps

Rainwater sumps shall be built with half-brick sides on 100mm thick unreinforced concrete bottom, plastered internally on walls and with 80mm high unreinforced concrete kerb at top rebated for grating or cover and plastered on exposed surfaces

Q.15.2 Stormwater catchpits and inspection chambers

Brick catchpits and inspection chambers shall be built with one-brick sides on 150mm thick unreinforced concrete bottom projecting 100mm beyond walls all round, plastered internally on walls and with 100mm thick reinforced concrete cover slab with opening rebated for frame of grating or cover and plastered on exposed surfaces

Precast concrete catchpits and inspection chambers shall be constructed in accordance with the applicable details shown on Drawing LE-1 of SANS 1200LE. Precast concrete manhole sections and slabs shall comply with SANS 1294 and pipes shall be SC type and in accordance with SANS 677

Q.15.3 Sewer inspection chambers

Brick inspection chambers shall be built as for brick stormwater inspection chambers and with the bottom of the chamber well benched around half round channels, bends, junctions, etc up to sides of chamber in unreinforced concrete finished smooth

Precast concrete inspection chambers shall be constructed in accordance with the applicable details shown on Drawing LD-5 of SANS 1200LD. Precast concrete manhole sections and slabs shall comply with SANS 1294 and the pipes shall be SC type in accordance with SANS 677

Q.15.4 Stormwater drain junction boxes

Junction boxes shall be formed of 150mm thick unreinforced concrete bottom and sides to suit the various sizes of the drain pipes and built after the pipes have been laid, with the sides taken up slightly higher than the highest pipe and finished level on top for and covered with a 75mm thick loose precast concrete slab

Q.15.5 Step irons

Where inspection chambers exceed 1,2m deep, cast iron step irons shall be provided, built into the wall at 300mm centres and staggered regularly in vertical rows spaced at 200mm centres horizontally

Q.16 STOPCOCK AND METER BOXES

Stopcock and meter boxes shall be built with half-brick sides with a cast iron box and lid complying with SANS 558 set in 75mm wide unreinforced concrete kerb for the full depth of the cast iron box and plastered on exposed surfaces

Q.17 VALVE CHAMBERS

Valve chambers shall be built with half-brick sides with 100mm thick unreinforced concrete kerb to top with rebate for cover and frame to finish flush with adjacent paving or finished ground level and plastered on exposed surfaces

Q.18 CAST IRON COVERS, GRATINGS, ETC

All cast iron covers, gratings, frames and surface boxes shall be coated with preservative solution. Frames shall be cast into concrete. Covers, except covers to stormwater drainage or electrical cable inspection chambers, shall be set in grease

Q.19 CONCRETE ENCASING

Concrete encasing for pipes, bends, traps, gulleys, grease traps, etc shall be unreinforced concrete not less than 100mm thick all round

Q.20 SANITARY FITTINGS

Q.20.1 General

Glazed ceramic, acrylic and porcelain enamelled sanitary fittings and component parts shall be white. Accessories for sanitary fittings shall be chromium plated brass

Waste outlets for baths, basins, etc shall comprise chromium plated brass waste union with grating, rubber washers and locknut, fitted with rubber or vulcanite plug on a chromium plated brass chain and stay

Q.20.2 Stainless steel sanitary fittings

Stainless steel sinks and draining boards, basins, wash troughs and urinals shall be AISI Type 304 satin finished stainless steel. All stainless steel fittings shall be treated on the back with a vermin proof sound deadening coating. Sinks, basins and wash troughs shall be provided with 40mm diameter screwed waste outlets

Q.20.3 Precast concrete wash troughs

Reinforced precast concrete wash troughs shall have a sloping front with ribbed rubbing surface and shall be finished smooth on exposed faces with top edges and inner angles rounded. Each compartment shall be fitted with a 40mm diameter waste outlet. Wash troughs shall each be supported on two reinforced precast concrete pedestals finished smooth on exposed faces

Q.20.4 Steel baths

Steel baths shall be porcelain enamelled internally and painted externally and fitted with waste outlet and overflow grating with coupling

Q.20.5 Acrylic resinous baths

Acrylic resinous baths shall be fitted with waste outlet and overflow grating with coupling

Q.20.6 Acrylic resinous wash hand basins

Acrylic resinous wash hand basins and vanity units shall have a smooth high gloss finish, with outlet openings, soap recesses, tap-holes and integral overflow and shall be fitted with waste outlet and overflow grating with coupling

Q.20.7 Glazed ceramic sanitary fittings

Sinks shall be provided with integral weir overflows

Washdown closet pans shall have washdown action and be provided with smooth finished injection moulded polypropylene heavy duty double flap seats fixed with non-ferrous bolts. Urinal channels shall be provided with outlet gratings fitted in bitumen

Q.20.8 Flush and sparge pipes

Flush pipes for high level cisterns shall be of plastic or drawn galvanized steel

Flushpipes for low level cisterns shall be of plastic

Flush and sparge pipes for urinals with high level cisterns shall be of chromium plated copper piping and of the sizes recommended by the manufacturer of the urinal

Q.21 INSTALLATION OF SANITARY FITTINGS

Sanitary fittings shall be installed as follows:

Q.21.1 Precast concrete wash troughs

Precast concrete wash troughs shall be bedded on top of pedestals which shall be bedded on floors in 1:3 cement mortar

Q.21.2 Stainless steel wash troughs and wash hand basins

Stainless steel wash troughs and wash hand basins shall be fixed to walls on a pair of galvanized mild steel gallows brackets bolted to wall with 6mm diameter expanding bolts

Q.21.3 **Acrylic resinous wash hand basins**

Acrylic resinous wash hand basins shall be fixed to walls on a pair of standard painted cast iron brackets screwed to underside of basin and bolted to wall with 6mm diameter expanding bolts

Q.21.4 **Ceramic wash hand basins**

Ceramic wash hand basins shall be fixed to walls on a pair of standard painted steel or cast iron brackets bolted to wall with 6mm diameter expanding bolts

Q.21.5 **Acrylic resinous baths**

Acrylic resinous baths shall be bedded in 1:5 cement mortar on three cross rows of bricks or bedded solid on a layer of dry river sand and fixed to wall with galvanized steel brackets under edges (in the middle of the sides against walls) bolted to wall with 6mm diameter expanding bolts and sealed along top against wall finishes with patent mildew resistant silicone rubber

Q.21.6 **Washdown closet pans and cisterns**

Washdown closet pans shall be bedded on floors in 1:3 cement mortar. Cisterns shall be fixed to walls with 6mm diameter expanding bolts

Q.21.7 **Ceramic urinals**

Ceramic stall and slab urinals shall be bedded on floors and against walls in 1:3 cement mortar. Slabs, channels, treads, etc shall be jointed in 1:3 cement mortar and pointed in white cement

Ceramic bowl urinals shall be fixed to walls on standard steel brackets bolted to wall with 6mm diameter expanding bolts. Cisterns shall be fixed to walls on standard brackets bolted to wall with 6mm diameter expanding bolts

Q.21.8 **Stainless steel urinals**

Stainless steel stall and slab urinals shall be bedded on floors in 1:3 cement mortar and with backs and sides against walls filled in with fine unreinforced concrete. Cisterns shall be fixed as cisterns for ceramic urinals

Q.22 FIRE HOSE REELS

Fire hose reels shall each be fitted with a 30m long hose of internal diameter not less than 19mm with a 4,8mm internal diameter chromium plated brass nozzle

Q.23 FIRE EXTINGUISHERS

All fire extinguishers shall be fully charged

Q.24 TESTS

Sewerage pipe lines, sanitary plumbing including fittings and hot and cold water supply and fire service shall be tested to the approval of the Principal Agent and Local Authority

The Contractor shall provide all testing apparatus, material and labour required for the tests and inspections

R. GLAZING

R.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Glass in building	SANS 50572-1 to 5
Glazing putty for wooden and metal window frames	SANS 680
Silvered glass mirrors for general use	SANS 1236
Safety and security glazing materials for buildings	SANS 1263-1 to 3
Sealing compounds for the building industry, one Component, silicone-rubber based	SANS 1305
The installation of glazing materials in buildings	SANS 10137
Work on glass for glazing	SANS 1817

R.2 PUTTY ETC

Glazing putty shall be Type I for wooden sashes and Type II for steel sashes. Putty for glazing to unpainted hardwood shall be tinted to match the colour of the wood

Back putty shall not exceed 3mm thick. Putty shall not be painted until it has formed a surface crust, and if the putty does not form a surface crust it shall be replaced

Butyl putty shall be used where glass is to be fixed in aluminium sashes with glazing beads

Non-setting compounds shall be used where laminated glass is fixed in sashes with glazing beads

S. PAINTWORK

S.1 MATERIALS AND WORKMANSHIP

Materials and workmanship shall comply with the following standards:

Decorative paint for interior use	SANS 515
Decorative high gloss enamel paints	SANS 630
Primers for wood (for external work)	SANS 678
Primers for wood (for internal work)	SANS 678
Zinc phosphate primer for steel	SANS 1319
Undercoats for paints (except emulsion paint)	SANS 681
Aluminium paint	SANS 682
Varnish for interior use	SANS 887
Emulsion paints	SANS 1586

Materials for paintwork shall be delivered to the site in unopened containers and applied in accordance with the manufacturer's instructions. Materials shall be suitable for application to the surfaces concerned. Undercoats shall be as
recommended by the manufacturer of the finishing coats

S.2 PREPARATORY WORK

S.2.1 Plastered surfaces etc

Plastered surfaces shall be thoroughly inspected and, if necessary, washed down and brushed in order to remove any traces of efflorescence and allowed to dry completely before any paint finish is applied. Before any paint is applied, holes, cracks and irregularities in plaster and other surfaces shall be filled with a suitable filler and finished smooth. Unfinished concrete surfaces shall have all projections rubbed off and shall be thoroughly cleaned with a spirits-of-salts solution (1 part concentrated spirits-of-salts to 4 parts water)

S.2.2 Metal surfaces

Metal surfaces shall be sanded, where necessary, washed with a suitable cleaning agent and left smooth

Protective coatings applied by manufacturers to galvanized metal surfaces shall be removed with a suitable agent and the surfaces washed down

Rust, grease and defective factory primers on metal surfaces, as well as pitch on cast iron pipes, shall be removed

S.2.3 Wood surfaces

Knots in woodwork shall be treated with knotting. Minor blemishes shall be filled with a suitable filler. Wood surfaces shall be sanded smooth

S.3 APPLICATION OF PAINT

Primers to wood surfaces shall be applied by brush. Primers to other surfaces may be applied by roller with the approval of the Principal Agent. Undercoats and finishing coats may be applied by brush or roller

Paint shall not be sprayed on except in the case of cellulose and other special paints where spray painting is the accepted method of application

Before subsequent coats of paint are applied the previous coat shall be properly dry and shall be sanded down where necessary

S.4 COLOUR SCHEME

A colour scheme comprising colours and the blending of colours approved by the Principal Agent shall be used for the paintwork. The tints of the undercoats shall closely match the finishing coat but nevertheless differ sufficiently to indicate the number of undercoats. Colour samples of the finishing coats shall be provided in all cases

S.5 GENERAL

Paintwork shall include the preparation of surfaces, filling, stopping, sanding and priming of nail heads and screws. Where windows, sashes, etc are to be painted, the rebates of the openings to be glazed shall be primed

T. PAPERHANGING

T.1 PREPARATORY WORK

Plaster surfaces to be papered shall be dry, thoroughly cleaned down, filled with a suitable filler as necessary to obtain a smooth surface and painted thereafter with a single coat of emulsion paint

Wood surfaces to be papered shall be knotted, stopped and sanded

T.2 PAPERHANGING

Wallpaper shall be hung in vertical long lengths. Vertical joints shall be close-fitted and plumb and the paper shall be tightly fitted to skirtings, ceilings, door frames, windows, etc. Horizontal joints will not be allowed

U. EXTERNAL WORKS

U.1 GENERAL

U.1.1 Excavations

Excavations shall be deemed to be in "earth"

U.2 LANDSCAPING

U.2.1 Topsoil

Topsoil shall vary between sandy loamy soil and sandy clayey soil with an ideal composition of 15% to 25% clay, 10% silt/sludge and 65% to 75% sand, with a minimum ratio of organic material of 2%. All material shall be free of harmful deposits as well as unwanted seeds

U.2.2 Compost

Compost shall be composed of properly decayed organic material, free from harmful deposits, salts, seeds and other waste material and shall have a pH of more than 4 and less than 7

U.2.3 Mulch

Mulch shall be approved organic material free from small particles of bark residue, fungus, disease, etc

U.2.4 Lime

Lime shall be agricultural lime of an approved manufacture

U.2.5 Fertilizer

Fertilizer shall be of the type specified, mixed thoroughly into the soil as prescribed. No fertilizer shall be added more than two weeks prior to planting

U.2.6 Backfilling

Backfilling in plant and tree holes shall be composed of two parts topsoil to one part compost mixed thoroughly together and compacted by foot in 100mm layers. Fertilizer shall only be added if prescribed

U.2.7 Pebbles

Pebbles shall be smooth with a uniform colour and form and ranging in size from 50mm to 75mm diameter. Removal of pebbles from river beds shall be done selectively to avoid any major disruption to the ecology of the river and environment

U.2.8 Plant material

U.2.8.1 General

All plant material (plants, shrubs, trees, etc) shall be obtained from a registered nursery and shall be free from damaged parts, parasites, fungus, other plant diseases or insects. No container-bound plants will be acceptable

U.2.8.2 Trees

The height of trees described in the bills of quantities shall be measured from the top of the root ball to the top of the tree. Where trees are pruned, such prune wounds shall not be more than 25mm in diameter and be sealed with an approved sealing compound

U.2.8.3 Shrubs and small plants

Shrubs and small plants shall meet the requirements for height and spread as specified. Thin or sparsely branched plants shall not be accepted. Branches shall be well spread with ample young branches and the plant as a whole shall be growing well

U.2.8.4 Groundcover

Groundcover shall be dense and healthy and shall comply with the minimum requirements for leaf density as specified

Formal grass shall be planted as runners in 50mm deep drills at 150mm centres unless otherwise described

U.2.9 **Cultivation and preparation of planting areas etc**

All surface rocks and stones larger than 50mm shall be removed before commencing cultivation and preparation. The entire area shall be ripped and rotavated using approved machinery by breaking up the earth to a depth of 300mm at 600mm centres in both directions, unless otherwise described, and then levelled. Where fertilizer or compost is specified, it shall be worked into the topsoil after ripping and rotavation to a depth of 300mm and finished to final levels

All fertilizer to areas to be grassed shall be strewn on the final layer before final finishing is commenced and worked mechanically into the top 150mm soil

U.2.10 **Planting procedure**

Holes for shrubs and groundcover shall be as follows:

Shrubs – 500 x 500 x 500mm deep

Groundcover – 300 x 300 x 300mm deep (if not planted in drills)

Holes for trees shall be square, of adequate size to accommodate the root system and suitable for the height of the tree

All plant material shall be watered thoroughly before careful removal from the container and planted in the prescribed planting medium with the top of the soil in the container finishing level with the surrounding area. Water dams size 800mm diameter x 150mm deep and 500mm diameter x 150mm deep shall be formed around trees and shrubs respectively and all planting material shall be watered immediately after planting. Trees, shrubs, etc shall be properly staked or stayed, depending on their size, on the prevailing windy side with patent tree ties

U.2.11 **Maintenance**

All planted areas shall be maintained for a period of three months after practical completion as defined in the contract with the exception of hydroseeded areas which shall be maintained for 12 months after an acceptable cover has been obtained

This maintenance shall consist of keeping clear of weeds and litter, loosening soil where necessary every two weeks, replacing damaged, diseased or dead plants, pruning, cutting and mowing as necessary and watering so as to keep the plant material in a healthy growing condition

U.3 ROADWORK

U.3.1 **Filling**

Filling under roads etc shall be of inert material having a maximum plasticity index of 10, free from large stones etc spread, levelled, watered and compacted in layers not exceeding 200mm thick to a density of 98% Mod AASHTO

U.3.2 **Preparation of sub-grade**

The sub-grade shall be prepared by scarifying for a depth of 150mm and compacting to a density of 98% Mod. AASHTO, including trimming to the correct levels and grades

U.3.3 **Base course**

The base course shall consist of crusher run stone compacted to a density of 98% Mod. AASHTO and finished to the correct levels and grades

U.3.4 **Weed killer**

The completed sub-grade shall be treated with an approved total weed killer

U.3.5 **Bituminous premix road surfacing**

Before spreading the premix material, the base course shall be swept clean and free from all dust, dirt and loose particles, lightly wetted and sprayed with a prime coat of cutback bitumen complying with SANS 308 at the rate of 1 litre/m^2

The material shall consist of semi-gap graded crushed stone aggregate having the following grading:

Sieve size (mm)	% By mass passing sieve
13,2	100
4,75	45-60
2,36	42-55
1,18	40-52
0,3	25-45
0,075	5-12

The aggregate shall be mixed with bituminous road tar binder complying with SANS 748 at the rate of 1m3 of stone to 120 litre of emulsion at atmospheric temperature

The binder shall be added to the stone and mixed until the stone is uniformly coated. Thereafter 5% of clean, dry quartzitic sand shall be added and mixed until evenly distributed through the mixture

The premix shall be applied only after the primer has dried out completely and shall be spread immediately after mixing and rolled on the same day

Spreading shall be done evenly over the prepared base course to a loose depth sufficient to ensure the consolidated thickness specified

Rolling shall commence as soon as the binder has set sufficiently, followed after three days by a final rolling

U.3.6 **Precast concrete block road surfacing**

Paving blocks shall be precast concrete blocks complying with SANS 1058

Blocks shall be laid to true levels and grades on and including a 25mm thick layer of river sand with joints exceeding 2mm and not exceeding 6mm wide

After laying, the paving shall be compacted by means of a vibrating plate compactor, with joints between the blocks filled in, after compaction, by sweeping in fine sand

Infill areas at edges of paving constituting less than 25% of a full block unit and of 25mm minimum dimension shall be filled with Class C prescribed mix unreinforced concrete with top surface trowelled smooth to match blocks. Smaller areas shall be filled with 1:4 cement mortar

U.3.7 **Precast concrete kerbs and channels**

Precast concrete kerbs and channels shall comply with SANS 927, generally in 1m lengths and finished smooth from the mould on exposed surfaces. Kerbs and channels shall be bedded on and jointed in 1:3 cement mortar and pointed with keyed joints. Bases to kerbs shall be Class B prescribed mix unreinforced concrete

U.3.8 **Process control tests**

The Contractor shall be responsible for carrying out all necessary process control tests on the density and moisture content of the compacted sub-grade, base course, etc to ensure that the required compaction is being attained

U.4 FENCING ETC

U.4.1 **Materials**

Materials and workmanship shall comply with the following specifications and requirements :

Wooden poles, droppers, guardrail posts and spacer blocks	SANS 457-2&3
Zinc-coated fencing wire	SANS 675
Prefabricated concrete components for fencing	SANS 1372
Chain-link fencing and its wire accessories	SANS 1373

Fasteners	SANS 1700
Anti-intruder fences	CKS 451
Metal droppers and standards	CKS 451

U.4.2 **Galvanized wire**

All galvanized wire shall be zinc coated wire with Class B zinc coating. Straining wire shall be 4mm diameter galvanized mild steel wire. Tie wire shall be 1,6mm diameter galvanized mild steel wire

U.4.3 **Plastic coated wire**

Plastic coated straining wire shall be 3,15mm diameter Class C galvanized mild steel wire plastic coated to an overall diameter of 3,95mm

Plastic coated tie wire shall be 1,8mm diameter Class C galvanized mild steel wire plastic coated to an overall diameter of 2,5mm

U.4.4 **Galvanized barbed wire**

Galvanized barbed wire shall be 2,5mm diameter mild steel double strand reverse twist zinc coated barbed wire with Class A zinc coating

U.4.5 **Galvanized wire mesh**

Galvanized wire mesh shall be 50mm mesh chain link netting of 2,5mm diameter Class C galvanized mild steel wire

U.4.6 **Plastic coated wire mesh**

Plastic coated wire mesh shall be 50mm mesh chain link netting of 2,5mm diameter Class C galvanized mild steel wire plastic coated to an overall diameter of 3,25mm

U.4.7 **Galvanized welded wire mesh**

Galvanized welded wire mesh shall be fabricated from pre-galvanized wires to rectangular pattern welded together at each intersection using a welding method which forms a zinc oxide protective coating at each intersection

U.4.8 **Razor wire**

Razor wire shall be fabricated from 2,5mm diameter galvanized high tensile steel wire fitted with razor barbs formed of 0,5mm galvanized steel strip clipped on at 37,5mm centres

U.4.9 **Metal droppers and standards**

Droppers shall be of ridged T-section mild steel with a mass of not less than 0,55kg/m. Standards shall be of I- section mild steel with a mass of not less than 3kg/m or of ridged edge Y-section mild steel with a mass of not less than 2,5kg/m, and shall be driven 600mm deep into the ground

Droppers and standards shall have either galvanized, sprayed metal or painted finish as described in the items and in accordance with CKS 451. In addition, those surfaces of standards embedded in the ground shall be coated with bitumen

U.4.10 **Metal posts and stays**

Posts and stays shall comply with CKS 451 and shall be of black galvanized mild steel tubing as specified

Straining posts shall be of 108mm outside diameter x 3mm wall thickness tubing, each with a 300 x 300 x 5mm thick mild steel sole plate and a steel cap welded on

Intermediate posts shall be of 50mm outside diameter x 2,5mm wall thickness tubing, each with a 230 x 230 x 5mm thick mild steel sole plate and a steel cap welded on
Stays for straining posts shall be of 50mm outside diameter x 2,5mm wall thickness tubing, each with a 230 x 230 x 5mm thick mild steel sole plate welded on and fixed raking with top end flattened, bent, holed and bolted to straining post with and including a 5mm diameter galvanized mild steel bolt with nut and washer

Posts and stays shall have either galvanized or painted finish as described in the items and in accordance with CKS 451. In addition, sole plates and portions of posts and stays embedded in ground shall be coated with bitumen

U.4.11 **Timber posts, stays and droppers**

Timber posts shall be 125mm diameter, timber stays shall be 100mm diameter and timber droppers shall be 30mm diameter

U.4.12 **Prestressed concrete posts and stays**

Prestressed concrete posts and stays shall be finished smooth from the mould and uniformly stressed by means of high tensile longitudinal prestressing wires with concrete cover to wires of not less than 20mm

Corner and straining posts shall be 100 x 100mm and intermediate posts and stays shall be 75 x 75mm. Stays shall be fixed raking with top end splayed and glued to posts with a suitable epoxy compound

U.4.13 **Bolts, nuts and washers**

Straining eye bolts, hinge bolts, bolts, nuts and washers shall be galvanized

U.4.14 **Precast concrete fencing**

Precast concrete fencing over sloping terrain shall be stepped to suit terrain, including the use of increased lengths of posts as necessary, excavation, etc

U.4.15 **Concrete bases**

Bases in ground for posts, stays, etc shall be of Class B prescribed mix concrete with tops 100mm below surface of ground

Sizes of concrete bases for posts, stays, etc shall be as follows:

Straining and gate posts	–	450 x 450 x 700mm deep
Intermediate posts	–	300 x 300 x 600mm deep
Stays	–	600 x 300 x 500mm deep

U.4.16 **Security overhangs**

Where fencing is described as having a security overhang, the posts and standards shall have angular (single arm) extension arms

Extension arms shall be attached to the posts and standards by welding in the case of steel and by spiking in the case of timber

Concrete extension arms shall be cast integrally with the post or standard

Barbed wire to security overhangs shall be tightly strained and wired at each intersection with extension arms and shall have barbed wire braces at 450mm centres between standards, posts, etc wired onto the barbed wire and the top straining wire

U.4.17 **Gates**

Gates shall be formed of 40mm outside diameter x 2,5mm wall thickness mild steel tubular framework with welded joints, strongly braced as necessary and filled in with wire mesh as described above, properly strained and securely bound to framework with tie wire

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

ANNEXURE 2
General Electrical Specifications

GENERAL ELECTRICAL SPECIFICATION

(ALL IN CONTRACTS)

1. CONDUIT AND CONDUIT ACCESSORIES

1.1 Conduit

Conduit shall be of steel galvanised internally and externally, either solid drawn, or welded and not less than 20 mm diameter, with all rough edges removed. All tube ends removed. All tube ends are to be reamed. With screwed conduit one threaded end is to be fitted with a coupling and the other end is to be protected against damage.

UPVC conduit may only be used if permitted by the Head : Works and only in those areas which he may specify. In this case this conduit shall be according to SABS 950.

Conduit accessories, which are secured to the conduit by means of lugs, screws or setscrews, are not acceptable.

General requirements of conduiting to SABS IEC 60614 (1).

Metal conduits shall be fully in accordance with SABS 1065 PART I.

1.2 Conduit Accessories

All conduit accessories shall be galvanised both internally and externally and comply with SABS 1065 – PART II.

All screwed conduit fittings shall be of malleable cast iron.

Where fittings are fitted with covers, the covers shall be of galvanised pressed steel secured with brass screws.

1.3 Flexible Conduit

Flexible conduit shall be of the plastic covered metal type complete with brass connectors to the approval of the Head : Works.

2. INSTALLATION OF CONDUIT

2.1 General

Except where cables are specified for certain circuits, the installation(s) shall be tubed throughout in steel conduit. Split conduit is not permitted. All conduits shall, wherever possible, or unless otherwise specified or agreed, be concealed in the structural work.

Except where agreed or otherwise specified or indicated on the drawings, all conduit to points shall run via the ceiling and floor slabs or roof space. In damp situations and where exposed to the weather, the conduits shall be so installed as to avoid, as far as possible, the condensation of moisture within them. All running joints are to be painted with an approved metal primer.

Mechanical and Electrical continuity must be maintained throughout the installation. Each length of conduit and every conduit fitting must be inspected for defects and all sharp edges or burrs must be removed before it is installed. All joints are to be tightly fitted together.

Running joints with long threads, where used, are to be fitted with a lock nut and the running thread shall not be longer in length than a coupling and lock unit.

In conduits smaller than 32 mm elbows and normal bends are not to be used but conduits are to be set to the required angles.

Flexible connections between conduit and appliance or other equipment shall be by means of flexible tubing (see Par 1.3).

No wiring shall be drawn into conduits until the conduits have been installed.

Where more than one socket outlet is connected on a circuit, the conduit shall be looped from the one outlet box to the following outlet box.

All switch-boxes, socket outlet boxes and any other purpose made metal box including distribution board trays shall be suitable treated against corrosion before installation with "Rustodian" or other approved metal primer.

All conduits shall be securely fixed into chases, and all flush switch and socket outlet boxes must be firmly embedded in cement mortar.

The Contractor shall make himself familiar with the positions of all fittings, such as blackboards, pinning boards, cupboards, shelving, worktops, etc, before commencing the conduit installation. The position of switches and socket outlets as indicated on the drawings are approximate only. The Contractor must verify that the final position of these will not be covered by the installation of the fittings referred to above, or come midway between the junction of any dados and upper wall finishes.

No extras will be entertained for moving switches or socket outlets as a result of the Contractor's failure to verify the final positions of the fittings or type of wall finish.

2.2 **In Roof Spaces**

The conduit in roof spaces shall be installed parallel or at right angles to the roof truss members and shall be secured at centers not exceeding 1,2 m by means of galvanised saddles nailed to the timbers with galvanised clout nails. Crampets will not be allowed.

Crossing of conduits is to be avoided wherever possible. Where unavoidable, one conduit must be neatly set over the other. Where a number of conduits have to run back to the distribution board or switchboard, they shall run parallel to the distribution board or switchboard, and at saddle distance to each other wherever possible.

Conduit runs from distribution boards shall terminate in fabricated sheet steel draw boxes installed in the roof above the distribution boards. Each draw box shall be fabricated from 1,6 mm galvanised sheet steel with welded corners and

suitably treated against corrosion with "Rustodian" or other approved primer and finished in aluminium paint.
Each draw box is to be fitted with slip-on lid with a 13 mm skirt. The box shall be 75 mm deep, shall be rectangular in shape and the size of conduits entering or leaving the box. Conduits shall be fixed to the box by means of couplings and brass male bushes or lock nuts and brass bush-nuts.

Conduit droppers shall be neatly cut into timber wall plates and set to face the right direction. All sets must be uniform. Conduits may be set at angles only where droppers or ceiling points are within 230 mm of roof members.

No conduits are to be run over the top of gangplanks or trapdoors.

Draw-in boxes with metal covers shall be provided where required and shall be installed near the gangplanks, if any. All inspection conduit fittings in open roof spaces shall face upwards to facilitate wiring and to permit easy inspection. Three-way conduit boxes shall be used for tee-off purposed in open roof spaces. Inspection tees are not to be used except where otherwise agreed or specified.

All conduits extended into a roof space with a roof clearance of more than 900 mm shall be set onto the beam and extended into the roof for a distance where there is sufficient clearance. Under flat roofs or where there is less than 900 mm clearance, the conduit shall be installed as specified for tubing in concrete slabs, right angle bends should be kept to a minimum and the shortest route taken.

Where false ceilings occur they shall be tubed as called for in the detailed specification. Conduits in restricted spaces and run as for concrete slabs must however, be installed in a neat and orderly manner.

Conduits to ceiling points for all types of fittings must be firmly supported and shall terminate in a back entry conduit box. The conduit box shall be taken through to the face of the ceiling and finish flush. Where the ceiling brandering interferes with the installation of the ceiling point specified, the Contractor must trim the brandering to allow the conduit box to be taken through to the face of the ceiling as specified. Luminaires must be bonded to the conduit box by means of metal threaded screws.

2.3 **<u>In Concrete Slabs</u>**

In order not to delay building operations, the Contractor must ensure that all conduits and conduit fittings, which are to be cast in concrete, are laid in good time. The Contractor shall have a competent Electrical Artisan standing by during casting of concrete, etc, to ensure that the conduit boxes are not damaged during casting of concrete.

Draw boxes, expansion joints boxes and round conduit boxes are to be provided where necessary.

Deep type conduit boxes shall be used for side entering conduits and normal shallow boxes may be used for back entry conduits. No elbows, bends or sharp sets will be allowed in concrete slabs except in cases of conduits of 40 mm diameter or when larger sweeping bends will be permitted.

Common drawn and/or inspection boxes shall be used where there is more than one circuit involved. They shall be installed in lavatories, storerooms, or other inconspicuous places. Covers shall be of hardboard neatly finished to match the finished ceiling or wall surface, and shall be fitted parallel to the wall or ceiling.
All boxes, etc. are to be securely fixed to the shuttering to prevent displacement when concrete is cast. All conduits must be laid off the deck, supported and secured at regular intervals and installed as close as possible to the neutral axis of concrete beams and slabs.

Expansion joints shall be shown on layout drawings and shall consist of a metal box in which one conduit is fixed and the other capable of movement with the building's expansion and contraction. Earth continuity of these joints shall be maintained by means of stranded copper conductors bonded to the conduits in the box as shown on the drawing.

Earth conductors and clamps buried in concrete are not permitted.

Conduits must be spaced sufficiently apart to allow for proper concreting. All joints shall be painted with an approved metal primer after completion of the tubing installation, prior to the concreting. All exposed parts of the conduit installation shall be suitably, protected against corrosion at the discretion of the Head : Works.

Before any concrete slab is cast, all conduit droppers to switchboards shall be neatly spaced and rigidly fixed.

2.4 **Surface Work**

All conduit must be plumbed and leveled and only straight lengths shall be used.

In cases where doorframes are out of plumb, or fittings, beams etc, are out of level, the conduit shall be run parallel with the doorframes, fittings, beams etc.

No threads shall be visible when the conduit installation is complete, except on running couplings.

Running couplings shall only be used where unavoidable and shall be fitted with a sliced coupling as a lock nut.

No inspection or normal bends are to be used on surface work, except with the approval of the Works Inspector and where conduits of 32 mm diameter or larger are used. Conduits shall be set uniformly and inspection couplings shall be used where necessary.

Fittings, tees, boxes, couplings, etc, are to be cut into the surface to allow the conduit to fit flush against the surface or alternatively spacer bar saddles may be used. Conduit is to be bedded into any irregularities to avoid gaps between the surface and the conduit.

Double sets, where used, shall be parallel with no twists and shall be as short as possible. All conduits, which terminate at metal trays, boxes, industrial switches and plugs shall do so by means of couplings and male bushes. No couplings will be permitted in droppers of lengths less than 3.6 m.

Where crossings of conduits is unavoidable, purpose made metal boxes shall be used. The length of the box is to be 8 times the diameter of the largest conduit, the width one and half times the sum of the diameter of al the conduits, and the depth one and half times the diameter of the largest conduit with a minimum depth of 50 mm. The box shall be fitted with a neatly fitting cover and the finish shall be in keeping with the general layout.
Where a number of conduits are to be installed in parallel they shall be evenly spaced and grouped under one purpose made saddle. Conduit spacing shall not exceed 10 mm. The purpose made saddle shall be made of 25 x 2 mm galvanised steel strip or other approved material, formed to suit the curvature of the various conduits and shall be drilled and fixed by means of screws between. Saddles shall be spaced at intervals not exceeding 1.8 m, except for conduit droppers, which shall be saddled centrally between ceiling and accessory box. All saddles are to be secured to the wall by means of black japan or brass rounded head screws. Distribution boards, draw boxes, industrial switches and plugs, etc, shall be neatly recessed into the surface of plastered walls to avoid double sets or alternatively spacer bar saddles may be used. On face brick walls the conduit shall be tightly set into the switch or plug.

In situations where there are not ceilings, the conduits are to be run along the wall plates and tie beams.

No wiring is to be carried out until the tubing has been inspected and approved.

Where spacer bar saddles are used, these shall be installed at centers of 1 m for horizontal and 1.5 m for vertical runs.

All conduits shall be painted with an approved enamel paint to match the background colour.

2.5 Future Extensions

In roof spaces with a minimum clearance of 900 mm, switch and plug drips for future use are to be set 300 mm in the correct direction and shall be threaded and fitted with plugged couplings. Where the roof over a slab is to be removed for future expansions, conduits for future use are to terminate 40 mm above tie beams and shall be threaded and fitted with plugged couplings.

Where future extensions are to be below slabs, all switch, socket outlet and other conduit droppers are to terminate 130 mm below slabs or beams with conduit ends threaded and fitted with plugged couplings.

Where provision is made for future extensions to a concrete slab, all conduits required for future use are to project 130 mm from the slab. Conduit projections are to be painted with an approved anti-corrosive paint and must be fitted with plugged couplings.

All switch, plug and other outlet boxes required for future use shall be fitted with approved blank cover plates.

Unused lighting outlet boxes are to be fitted with round hardboard or plastic covers with brass cover screws, which shall fit flat on the finished ceiling.

2.6 **Fixing of Conduits**

Conduits shall be fixed to switch and socket outlet boxes by means of couplings and brass male bushes or lock nuts and brass bush nuts. Couplings and male bushes to be used on all surface work.

2.7 **Chases and Building Work**

Except where otherwise specified conduits, switch boxes, plug boxes and distribution boards are to be built into the brick walls by the Contractor. It will, however, remain the responsibility of the Contractor to ensure that the above-mentioned boxes and distribution boards are correctly built in and are firmly bedded and cemented into the walls, plumb and square.

The Contractor shall, unless otherwise specified, do all necessary chasing and cutting of bricks. All electrical materials (e.g. conduits up to 40 mm for UG cables, conduits, conduit boxes, distribution boards etc) must be supplied by the Contractor who must arrange to have these on site, and positioned when required for the building work. A competent Electrical Artisan must be in attendance and ensure that the conduits etc are correctly installed and positioned.

The Contractor is to ensure that tubing installed in chases is securely nailed and covered by a layer of 5:1 mixture of coarse sand and cement, finished flush with brickwork and that switch and plug boxes finish flush with the finished wall surface.

The Contractor is to ensue that below distribution boards connected by means of under-ground cables, a 230 mm wide by 115 mm deep cavity in the wall from the cable pipe to the distribution board is to be provided by the Contractor, or alternatively, cable sleeves as specified.

3. **PLUGGING OF WALLS**

Only approved plastic plugs shall be used to secure conduit or equipment up to 5kg mass. The use of round-headed screws only will be permitted.

Heavier equipment shall be secured by means of approved expansion bolts.

Wood plugs and any plugs in the joints in brick walls are not permitted.

4. **FIXING TO CONCRETE CEILINGS**

Ceilings mounted equipment other than luminaires shall be secured to concrete ceilings by means of expansion bolts, shot bolts or "Robot" tools bolts or as expressly specified for the service.

5. **WIRING**

5.1 **PVC Insulated Single Core Medium Voltage Conductor**

The conductor is to be of high conductivity copper wire insulated with Polyvinyl Chloride. The cable shall be finished in the required colours and shall be in accordance with SABS 1507 and 1574.

Circuit wiring shall be of the Loop-in system and no wiring joints in the conduit or conduit fittings will be permitted. Not more than two conductors of a kind will be allowed at any outlet point. the end strands of cables, whether single or looped which have to be connected to terminals of switched, plugs, lamp-holders, fittings and distribution boards, etc, are to be tightly twisted together. Cutting away of wire strands of any cable will not be allowed. Only one circuit in any one conduit will be permitted unless otherwise specified.

Conductor sizes shall be as follows except where otherwise specified:

Lighting circuits	1,5 mm^2	
Bells circuits	1,5 mm^2	
Clock circuits	1,5 mm^2	
Incinerator circuits	2,5 mm^2	
Ironing circuits	2,5 mm^2	with 2,5 mm^2 insulated earth wire
Plug circuits	4,0 mm^2	with 2,5 mm^2 insulated earth wire
Geyser circuits	4,0 mm^2	with 2,5 mm^2 insulated earth wire
Heater circuits	4,0 mm^2	with 2,5 mm^2 insulated earth wire
Stove	10 mm^2	with 6,0 mm^2 insulated earth wire
Motor circuits		
Up to 4kW single phase	4,0 mm^2	with 2,5 mm^2 insulated earth wire
Up to 11kW three phase	4,0 mm^2	with 2,5 mm^2 insulated earth wire

To avoid deformation of PVC insulated cables at temperatures in excess of 57° C, they shall not be brought directly on to the terminals of appliances such as electric heaters, or any other electrical appliances or apparatus (including luminaires) which have a temperature in excess of 57° C. They shall terminate in a suitable terminal box as near to the appliance or fittings as possible and connect up from thereon, with heat resistant conductor.

6. MOUNTING AND POSITIONING OF LUMINAIRES

Luminaires and installation to comply with SABS 1464 Parts 1 to 22 and IEC 598-1 and IEC 60598 as applicable.

The contractor shall, in the case of board and acoustic tile ceilings (i.e. as opposed to concrete slabs), ensure that the luminaires are symmetrically positioned with regard to the ceiling pattern.

The layout of the luminaires as indicated on the drawings shall be adhered to as far as possible. The exact positions must be confirmed on site with the Head : Works.

Except where otherwise specified, pendant luminaires are to be mounted with the bottom of the fittings 2,5 m above finished floor level, mounted on either metal discs or wood blocks.

Under no circumstances shall cover strips be cut to accommodate wood blocks. Wood blocks must be neatly slotted to fit over cover strips and are to be secured by a minimum of two screws, which shall penetrate at least 25 mm into solid wood. Ceiling cover strips shall be neatly cut to accommodate fluorescent luminaires.

Where ceilings are raked, all incandescent luminaires are to be mounted on shaped leveling wood blocks securely fixed to the ceiling. Batten holders shall be secured to woodblocks by suitable brass screws. Fluorescent luminaires are to be mounted direct on raked ceiling without leveling blocks.

Fluorescent luminaires to be mounted on concrete ceilings shall be screwed to the outlet boxes and additionally supported by means of 50 x 6 mm expansion bolts. The bolts are to be 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.

2.4 **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 mm^2 conductors and a 6 mm^2 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

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

ANNEXURE 3
Lightning Protection Specifications

LIGHTNING PROTECTION INSTALLATION

GENERAL SPECIFICATION

1. SATISFACTORY INSTALLATION

The whole of the installation shall be carried out in accordance with:

(a) The latest S.A.B.S. Code of Practice for the Protection of Structures against Lightning - S.A.B.S. 03 ; SABS IEC 61024 (1) , 61024 (1 -1); SABS IEC 61312 (1) ; SABS IEC 61662 & NRS 042.

(b) The KwaZulu-Natal Department of Works General Electrical Specification.

(c) The Municipal By-Laws and any other special requirements as deemed necessary by the Local Supply Authority;

(d) Local Fire Regulations.

2. S.A.B.S. APPROVED DRAWINGS

SABS Approved drawings are not required for this project.

3. TEST ON COMPLETION

Upon completion of the lightning protection system, the following tests shall be witnessed by an appointed representative of the Employer. The results shall be recorded on suitable test certificates which must be signed by both the Contractor and the Employers representative. A sketch must be included on each test certificate indicating the positions of each earth electrode in relation to some permanent reference point. It must also indicate the positions at which tests were carried out, the type of test and the results of these tests.

3.1 Earth Resistance Test

The Earth Resistance Test shall involve measuring the resistance to earth of each rod-type electrode, or group of rod-type electrodes, or trench earth which would normally be connected to one down-conductor or earth terminal. This test must be made with the electrodes completely disconnected from any part of the structure or lightning protection system.

3.2 Electrical Continuity Tests

(a) **External Down-Conductors**

Electrical continuity between the lower ends of external down-conductors which must all be disconnected from the earthing system during the test shall not exceed 1 (one) ohm.

(b) Metallic Services

Electrical continuity between any metallic structures of services (e.g. rainwater pipes) which form an integral part of the lightning protection system shall not exceed 1 (one) ohm. These tests should be carried out with all other components of the lightning protection system disconnected from the component being tested.

4. DESCRIPTION OF MATERIAL

4.1 Air Terminals and Down-conductors

All conductors must be in accordance with the requirements of BSS 1474 or American Standards Specification 6063. All aluminium conductors shall have a cross-section area of not less than 30 mm^2 (domestic dwelling only) or 50 mm^2 for all other applications. The dimensions of flat section conductors to be 20 mm x 3 mm. Where conductors are mounted in stand-off guides, the cross-section area of the conductor must be not less than 70 mm^2 to give adequate mechanical strength.

4.2 Conductor Guides

The conductor must be mounted in aluminium alloy guides conforming with the material specification given in 4.1 above. The guides must allow for free longitudinal movement of the conductor to cater for expansion and contraction of the system caused by temperature variation. The minimum thickness of any part of the guide shall not be less than 3 mm. The guides must be securely attached to the structure using two stainless steel screws and plugs, the use of plated screws is not permitted.

The conductor system shall be supported in guides so that an air gap exists at all times between the aluminium and the surface of the structure, the guides being seated upon plastic or other similar insulating material. Should conductors be installed directly upon the surface of concrete or cement plaster, an insulating strip is to be installed over its whole length to prevent contact between the two surfaces. Guides shall be installed to support the conductor at intervals not exceeding 1,2 metres horizontally or 1,5 metres vertically.

N.B.: No part of an aluminium conductor system must be allowed to come into direct contact with concrete or cement plaster as this may cause the aluminium to corrode.

4.3 Expansion Loops

Where conductors are installed horizontally without deviation from a straight line over long distances, expansion loops must be provided at distances not exceeding 30 metres. These expansion loops must have a cross-sectional area which is at least equal to that of the conductor.

4.4 Protection of Down-conductors

Where external down-conductors are installed in areas which are readily accessible to the public, the lower ends of the conductors shall be enclosed in a semi-rigid insulating material. In the case of a circular section conductor this shall comprise a 2 metre length of 20 mm diameter P.V.C. conduit. This conduit shall be securely attached to the wall by means of galvanized steel saddles fixed with stainless steel screws and plugs, spaced at intervals not exceeding 1 m. Where a flat section conductor is used this shall be covered by a similar length of 25 mm P.V.C. conduit. The lower end of the conduit shall be positioned as close as practicable to ground level, i.e. immediately above an aluminium to copper joint. The ends of the conduit shall not be sealed.

4.5 Earthing Electrodes

Earthing electrodes must consist of either copper-clad steel rods not less than 12 mm in diameter and having a minimum copper thickness of 0,20 mm driven into the ground, or a 50 mm^2 (35 mm^2 for domestic dwellings) bare copper conductor buried in a trench, or a combination thereof. Where copper clad steel electrodes are used they must have a suitable bond between the steel core and copper exterior to prevent moisture ingress between the two metals. Where it is necessary to extend earth rods, an electrolytically compatible corrosion resistant, coupling device, which prevents ingress or moisture into the joint shall be used. The copper conductor below the down-conductor joint shall be covered by a semi-rigid P.V.C. conduit for a distance of approximately 200 mm above ground and 400 mm below ground.

4.6 Joints Above Ground

Circular section aluminium conductors shall be jointed by aluminium ferrules or lugs which are securely crimped into place. Aluminium lugs must be bolted together using 10 mm diameter aluminium bolts and washers. The material specification for these components must conform with that laid down in paragraph 4.1. Alternatively heavily tinned copper lugs and ferrules may be used. The lugs should be joined together by means of 10 mm diameter copper, brass or bronze bolts and washers. Care should be taken to inhibit corrosion where dissimilar metals are used by thoroughly cleaning the surfaces of the metal before assembly and subsequently sealing the joint with an inert tenacious compound or tape.

Flat section aluminium conductors shall be joined by double riveting, using aluminium rivets which comply with the material specification laid down in 4.1. Alternatively 2 x 6 mm diameter stainless steel bolts, nuts and washers may be used. Fold over type bends will not be permitted.

Down-conductors are to be terminated approximately 200 mm above finished ground level. Circular section aluminium is to be jointed to a 50 mm^2 (35 mm^2 in the case of domestic dwellings) stranded copper conductor by securely crimping in place two heavily tinned lugs and bolting these together using 10 mm diameter copper, brass or bronze nuts, bolts and washers.

N.B. : Under no circumstances shall aluminium conductors be buried in the ground.

4.7 Joints Below Ground

A joint in the stranded copper conductor which forms part of the earthing system must be made by using a crimped copper ferrule clamping (not lugs) using two copper line taps of suitable dimensions, or exothermic welding. The copper earth conductor must be joined to an earth rod by either clamping, using a standard earth rod clamp or copper line tap or by exothermic welding. Joints which are made between dissimilar metals (i.e. copper conductor to galvanized steel water main), must be thoroughly cleaned before assembly. They shall be rendered watertight using waterproof adhesive tape on a suitable compound for a minimum distance of 200 mm in all directions from the joint.

4.8 Bonds

Where it is necessary to bond the aluminium conductor to any other metallic surface, this must be done by bolting or riveting. When attaching aluminium to a dissimilar metal the joints are to be thoroughly cleaned and sealed to prevent corrosion.

5. GENERAL INSTALLATION PROCEDURE

5.1 Air Terminals for Non-metallic Pitched Roofs

Aluminium conductors are to be installed along all ridges of roofs and projections such as dormer windows, etc., terminating at the ends with conductors running downwards over the surface of the roof and the eaves. Non-metallic chimneys must be protected by means of a finial of sufficient length to cover the chimney within a 45° angle struck downwards from its point. Alternatively it should have a conductor installed in the form of a closed loop upon the upper surface. The conductors are to follow the outer contour of the stack and must be bonded at a convenient point to the nearest component of the air terminal system.

N.B. : This bond may run in a horizontal or downward direction, but under no circumstances must any part of it run above horizontal.

Conductors may be dead-ended (i.e. have one end free and unbonded), providing that the length of such a conductor does not exceed 10 metres and that the unbonded end is either at the same level or higher than the bonded end. This technique may be used where ridge conductors are installed over dormer windows, etc.

In all cases where metallic gutters have been installed along the eaves of a pitched roof, these must be bonded to the air terminal system. Where metallic gutters do not exist, however, a conductor must be installed over the surface of the roof at eaves level to which the remainder of the air terminal system is to be bonded, with the following exceptions :

(a) Where the maximum distance from the ground level to the eaves of the building is less than 4 metres and the pitch of the roof is more than 1 in 2 (27° from the horizontal).

(b) Where the maximum distances from ground level to the eaves is less then 7 metres and the pitch of the roof is more than 1 in 1,5 (34° from the horizontal).

(c) Where the distance from the ground level to the eaves is more than 7 metres and the pitch of the roof is more than 1 in 1 (i.e. the included angle at the apex of the roof is less than 90°).

Under these circumstances eaves conductors need not be installed.

Any non-metallic objects which protrude above the general roof lines, such as Cape Dutch gable ends, must be protected as described above with a suitable air terminal system. Any metallic objects which protrude above the general roof line, such as hot water expansion pipes must be bonded as directly as possible to the nearest eaves conductor, gutter or other part of the lightning system.

N.B. : These bonding conductors must run in a horizontal or preferably a downward direction, from the vent pipe, etc., to the lightning protection system.

5.2 Air Terminals for Metallic Pitched Roofs

Buildings with roofs covered with electrically continuous metal sheets do not require separate air terminals but must be earthed via down conductors generally as described in 5.6 and 5.7. Any non-metallic objects projecting above the general roof line must be separately protected as described in 5.1 and bonded to the metal roof covering.

5.3 Air Terminals for Non-metallic flat or Mono-pitched Roofs

For flat or mono pitched roofs of non-metallic construction the air terminal system must consist of aluminium alloy conductors installed around the outer perimeter of each section of the roof structure. These conductors must be installed on top of parapet walls if these exist. Lift motor rooms, tank rooms, penthouses, etc., which protrude above the general roof line must have air terminal conductors installed around the outer perimeter of each roof slab or parapet wall. Any metallic objects which protrude above the roof line, such as expansion pipes, signs, flag poles, handrails, etc., must be bonded directly to the nearest component of the lightning protection system as described in 5.1.

N.B. : It is not permissible for the ends of conductors to be bonded directly to the perimeter air terminal system if the latter is installed upon a parapet wall having a height exceeding 500 mm above roof slab level. In these circumstances the conductors are to be bonded directly to the down conductors.

5.4 Air Terminals for Metallic flat or Mono Pitched Roofs

Metallic flat or mono pitched roofs do not require separate air terminal conductors, providing that there is electrical continuity between the metallic roofing sheets, (see 5.2). A metallic roof surrounded by a non-metallic parapet wall shall have conductors installed at the top of the parapet wall and these must be bonded to the metallic roof at intervals not exceeding 20 metres. If the parapet wall is clad with metal over its upper surface or a handrail is installed which affords good electrical continuity, separate air terminal conductors need not be installed. Under these circumstances the metal handrail or cladding must be bonded to the metal roof covering at intervals not exceeding 20 metres.

All non-metallic covering such as slates, tiles, asbestos cement sheeting, etc., supported by a steel structure being electrically continuous throughout may be treated as being of a complete metal construction. In these circumstances no separate air terminal system need be installed providing the steel roof structure is bonded to earth at intervals given in 5.5.

5.5 Down Conductors for Non-metallic Structures

Down conductors must be installed at regular intervals around structures and to run as directly as possible between the air terminal and earthing system. They must, where practicable, be positioned at the external corners of the structure. The maximum separating distance between down conductors around the perimeter of the structure must not exceed 30 metres. In the case of very tall buildings having a slender base (i.e. chimney stacks, water towers, etc.), a minimum of two down conductors must be installed.

The lower ends of down conductors are to be terminated and bonded to the earthing system approximately 200 mm above finished ground level. Under no circumstances must aluminium conductors be buried underground. Test joints must be provided between the down conductors and earthing system. Down conductors must run vertically between the air terminal and earthing systems. Where this is impracticable, their course may be deviated to run at any angle up to and including horizontal.

Where it is necessary to run conductors horizontally over the upper surface of a structural protrusion, such as an exposed concrete slab, the conductor may run down vertically over the edge of the slab and return to the main structure, so that the distance between the upper and lower conductors exceeds one third of the length of the horizontal run. Looped down conductors are not permitted. Down conductors must not run over the underside of large overhangs which are less than 6 metres above ground level, or other areas where people are likely to be present during a thunderstorm.

External or internal metallic rainwater pipes may be used as down conductors providing these are of substantial section and are jointed by screwing one length into another or welding. Thin gauge galvanized steel pipes whose sections are held together by friction, rivets or screws must not form part of a lightning protection system.

5.6 Down conductors for reinforced concrete framed structures

The steel reinforcement of this type of structure may be used in place of down conductors. Where the reinforcing system is used, the air terminal system must be bonded to it at a maximum of 30 metre intervals using steel clamps. This bond may be achieved by clamping, with a steel clamp, a steel conductor to a selected reinforcing bar, the opposite end of this conductor must terminate at a corrosion resistant metallic terminal such as Grade 316 stainless steel.

The reinforcing system of prefabricated concrete buildings must not be used unless special provision is made for bonding the various prefabricated sections together.

The terminals should be mounted flush with the face of the concrete. An aluminium alloy bond must then be taken from the air terminal system and be connected to the stainless steel terminal by means of a heavily tinned crimp lug for circular section aluminium, or a suitable bi-metallic joint in the case of flat section aluminium. A similar system must be used to bond the reinforcing system at ground level to the earthing system at points directly below the air terminal bonds. Here copper conductors must be used as the external bonding material.

Under no circumstances must copper, or other non-ferrous material be allowed to come into contact with steel reinforcing bars, as this may cause severe corrosion and subsequent structural damage. The lightning protection system must not be bonded to any part of the structure which is electrically isolated from the remainder of the building, i.e. cantilevered sections. In these circumstances, or where it is otherwise impracticable to use the reinforcing system, external down conductors must be installed as described in 5.5.

5.7 Down conductors for steel framed structures

Where the framework of a building is constructed of structural steel columns, these may be used in place of down conductors providing the separating distance between them does not exceed 30 metres. The upper ends of the columns must be bonded to the air terminal systems and the lower ends to the earthing system.

5.8 Earthing by means of vertically installed rod type electrodes

Rod-type electrodes must be driven into the ground at a position directly below each down connector. The maximum earthing resistance of each electrode or number of electrodes bonded to any one down conductor shall not exceed N X 30 ohms, where N equals the total number of down conductors which are bonded to a common air terminal system, or 200 ohms whichever is the lower value.

The minimum horizontal separating distance between rod-type electrodes bonded together must not be less than their installed depth. The upper ends of installed rod-type electrodes are to be terminated approximately 500 mm below finished surface level. A 50 mm^2 copper bonding conductor must be installed to run between each earthing electrode system and the lower ends of the adjacent down conductors. A joint is to be made between each of these bonding conductors and the down conductors at a position approximately 200 mm above finished ground level. These bonding conductors must be installed in P.V.C. conduit securely affixed to the wall (see 3.4). The length of this P.V.C. conduit must be approximately 600 mm and must be installed so that approximately 200 mm protrudes above ground level, the remainder being buried into the soil.

5.9 Earthing by means of metallic water mains

Where two or three down conductors are installed the water mains may serve as an earth terminal for one of these. Where three of more down conductors are installed the water mains may serve as an earth terminal for two of these. Regardless of whether the water mains are used as an earth terminal or not, the incoming metal water pipe must be bonded to the lightning protection earthing system underground.

5.10 Earthing by means of trench type electrodes

Where the soil conditions prevent the satisfactory installation of rod-type electrodes, a trench earth system must be installed. This method is to comprise a 50 mm^2 stranded copper conductor installed horizontally into a trench at a depth of 500 mm below finished ground level. The conductor is to follow the general outline of the structure to be protected and be installed 1 metre away from the outside walls. Where the building stands on rocky ground, the trench earth may be attached to the lower part of the wall in areas where rock protrudes through the soil. The conductor must, however, be buried wherever possible as described above.

Each down conductor must be bonded to the trench earth system as directly as possible by means of a copper conductor.

Trench earth systems must have a maximum earth resistance of 30 ohms. An isolated length of trench earth mat must be bonded to the down conductor system in such a way as to reduce the length of dead-ends to the minimum.

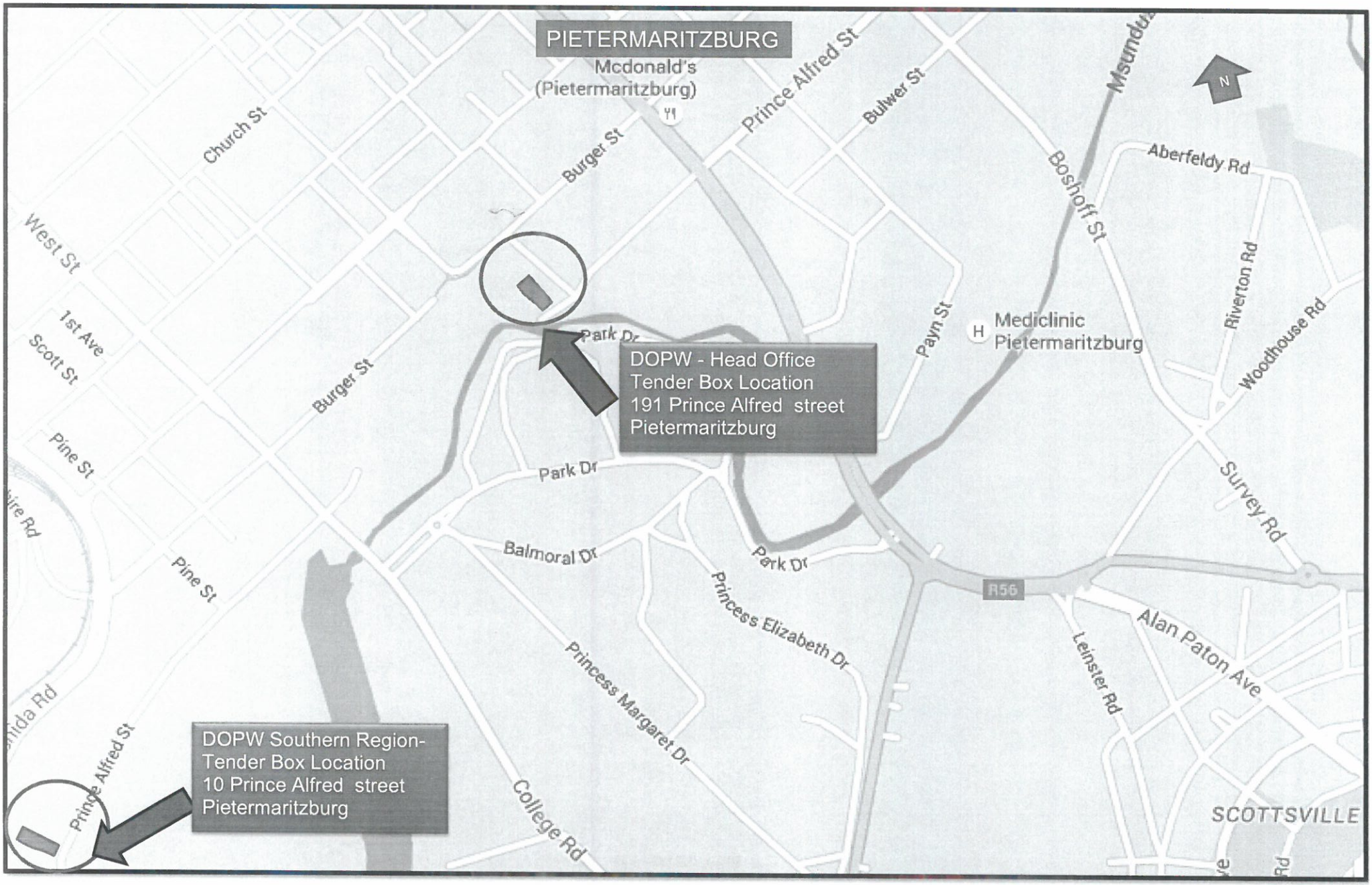
Should trench earths be installed beneath pathways where people are likely to be present during a thunderstorm, a plastic, bitumastic or ceramic pipe must be installed having a length similar to the width of the pathway and the trench earth conductor run inside it.

N.B. : The maximum useful length of a dead-ended trench earth is 80 metres.

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

ANNEXURE 4
Map of Tender Submission Location


PIETERMARITZBURG
Mcdonald's
(Pietermaritzburg)
Church St
Burger St
Prince Alfred St
Bulwer St
Msunduzi
N
Aberfeldy Rd
Boshoff St
West St
1st Ave
Scott St
Burger St
Payn St
Mediclinic
Pietermaritzburg
Riverton Rd
Woodhouse Rd
DOPW - Head Office
Tender Box Location
191 Prince Alfred street
Pietermaritzburg
Pine St
Park Dr
Survey Rd
Balmoral Dr
Park Dr
R56
Princess Elizabeth Dr
Alan Paton Ave
Leinster Rd
Princess Margaret Dr
College Rd
DOPW Southern Region-
Tender Box Location
10 Prince Alfred street
Pietermaritzburg
SCOTTSVILLE

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

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)*

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

Now it is hereby agreed as follows :

2. **DEFINITIONS AND INTERPRETATION**

2.1 Definitions

The following words and expressions shall have the meanings indicated, except where the context otherwise requires. Defined terms and words are, in general, signified in the text of the Agreement by the use of capital initial letters, but the absence of such letters does not necessarily signify that a term, or word, is not defined.

'Agreement' means the agreement between the Members of the Joint Venture and includes this model form of agreement together with the Preamble, Specific Provisions, if any, Schedules 'A', 'B' and 'C' and any relevant Documents prepared prior to the signing of the Agreement and appended thereto.

'Contract' means the contract with the Employer for the supply of the Deliverables, for the purposes of securing and executing which, the Joint Venture has been formed.

'Deliverables' means the works and/or services, equipment, materials, goods, etc. to be furnished by the Joint Venture to the Employer in terms of the Contract.

'Document' means any written, drawn, typed, printed, or photographic material, which relates to the Agreement.

'Employer' means the person, or body, which is to award the Contract and will employ the Joint Venture if it is awarded the Contract.

'Joint Venture' means the joint venture formed by the Members in accordance with the Agreement.

'Management Committee' means the body established in terms of the Agreement to manage all aspects of the work of the Joint Venture in securing and executing the Contract and in meeting the provisions for the Agreement.

'Member' means a person, or body which, being a party to the Agreement, is a member of the Joint Venture.

'Member's Interest' means the proportion expressed as a percentage, which the total monetary value of all resources provided and contributions made by a Member towards the execution by the Joint Venture of the Contract bears to the total of such values by all Members and, unless otherwise indicated in the Agreement, represents the extent to which the Member participates in the fortunes of the Joint Venture.

'Representative' means the person representing a Member on the Management Committee.

'Schedules' means Schedules 'A', 'B' and 'C' which set out general, financial and other information relating to the Members and the obligations, duties, rights, risks and benefits arising from their participation in the Joint Venture.

'Specific Provisions' means the variations, if any, required to this standard form of agreement for the specific purposes of the Agreement.

2.2 Interpretation

Unless inconsistent with the context, an expression in the Agreement which denotes:

- any gender shall include the other genders
- a natural person shall include a juristic person and vice versa
- the singular shall include the plural and vice versa

2.3 Headings

The headings to clauses of the Agreement shall not be considered part thereof, nor shall the words they contain be taken into account in the interpretation of any clause.

2.4 Law

The Agreement shall be construed in accordance with and governed by the laws of the Republic of South Africa and the English language versions shall prevail.

2.5 Language

English shall be exclusively used by the Members in the preparation of Documents unless otherwise indicated.

2.6 Conflict between Agreement and Contract

Should any provision of the Agreement be in conflict with the terms of the Contract, the Agreement shall be amended to the approval of the Management Committee so as to eliminate the conflict.

3. JOINT VENTURE GENERAL

3.1 Establishment and Purpose

The Joint Venture established by the Members in terms of the Agreement is an unincorporated association with the exclusive purposes of securing and executing the Contract for the benefit of the Members.

3.2 Termination

The operation of the Joint Venture and the validity of the Agreement shall terminate if and when it becomes evident that the Joint Venture will not be awarded the Contract, or, if the Joint Venture secures the Contract, when all obligations and rights of the Joint Venture and the Members in connection with the Contract and the Agreement have ceased and/or been satisfactorily discharged.

Unless otherwise decided by the Management Committee, the Agreement shall not terminate if a Member changes its name, or is taken over by, or merged with, another body.

This agreement will terminate when any one of the Members resigns, are liquidated or opts out of this agreement and the Joint Venture will be in breach of contract with the Employer and their contract could be cancelled.

3.3 Exclusivity

Unless otherwise agreed by the Management Committee, or provided for in the Contract no Member shall engage in any activity related to the Contract other than as a Member of the Joint Venture and Members shall ensure that their subsidiaries and other bodies over which they have control comply with this requirement.

3.4 Participation of Members

Except as may otherwise be stipulated in the Agreement, each Member shall be responsible for all costs incurred by it prior to the date of inception of the Agreement.

Subsequent to the date of inception of the Agreement, each Member shall, participate in the operations, risks, responsibilities and fortunes of the Joint Venture including, inter alia, the provision of funding, sureties, guarantees, insurances, human and other resources and participation in profits and losses to the extents indicated in the Schedules. Participation in any aspect not covered in the Schedules shall, if an agreement cannot be reached between the Members, be to the same extents as indicated by the Members Interests.

3.5 Management

The affairs of the Joint Venture shall be directed and controlled by the Management Committee, as set out in Section 4 hereof.

3.6 Confidentiality

All matters relating to the Agreement and the Contract shall be treated by the Members as confidential and no such matter shall be disclosed to any third party without the prior written approval of the Management Committee.

No Member shall be party to the dissemination of publicity relating to the Contract, or the Agreement, without the prior written approval of the Management Committee and the Employer.

3.7 Assignment

No Member shall cede, assign, or in any other way make over any of its rights, or obligations, under the Agreement without the prior written consent of the Management Committee.

3.8 Subcontracting

No Member shall subcontract any obligation, work or duty for which it is, itself, responsible in terms of the Agreement without the prior written consent of the Management Committee.

3.9 Variations to Agreement

No variation, modification, or waiver of any part of the Agreement shall be of any force, or effect, unless unanimously agreed by the Members and reduced to writing.

3.10 Liability

Each Member warrants that it will indemnify the other Members against all legal liabilities arising out of, or in connection with the performance of its obligations under the Agreement.

It is acknowledged by the Members that they may be held jointly and severally liable in respect of claims against the Joint Venture by the Employer or third parties.

4. MANAGEMENT OF JOINT VENTURE

4.1 General

The affairs of the Joint Venture shall be directed, controlled and managed by the Management Committee, which, within the terms of the Agreement and the Contract, shall have full authority to bind the Members in all matters relating to the affairs of the Joint Venture.

Communication between the Joint Venture and the Employer, or third parties, relating to the Contract shall be conducted exclusively by the Management Committee, or by such person as it may delegate to perform this function.

The Management Committee shall have the power to appoint a project manager and/or such other persons as it may see fit to appoint for the purpose of executing the Contract and may delegate such of its powers, responsibilities and duties as it may consider necessary, or desirable, to persons or bodies appointed or seconded for this purpose.

Such administrative functions as are necessary to ensure the effective operation of the Management Committee shall be performed by its chairman.

4.2 Management Committee

4.2.1 *Composition*

The Management Committee shall, unless otherwise agreed by all the Members, consist of one Representative of each Member and each Member shall be obliged, at all times, to maintain a Representative on the Management Committee.

Each member shall, not later than three working days after the signing of the Agreement, appoint its Representative and notify the other Members of the name and contact details of the Representative. Such Representative shall have the power to bind the Member that he represents in all matters relating to the execution of the Contract and the performance of the Agreement.

A Member shall be entitled, after giving the other Members not less than three working days written notice of his intention to do so, appoint, remove and/or replace, an alternate who shall, at any meeting of the Management Committee from which the Representative whom he represents is absent, be vested with all rights and powers and subjected to all the obligations of the absent Representative.

The chairman of the Management Committee shall be the Representative of the Member which has the largest Member's Interest. If two, or more, Members have the same, largest Member's Interest, the chairmanship shall rotate between the Representatives of such Members at three monthly intervals, the order of rotation to be determined by ballot.

Notwithstanding the foregoing, the chairmanship of the Management Committee may be determined, or changed, at any time by unanimous decision of the Management Committee.

No remuneration shall be paid by the Joint Venture to Representatives or their alternates for serving on the Management Committee,

4.2.2 *Meetings*

Meetings of the Management Committee shall take place at such times and places as the Management Committee may determine, provided that the chairman shall convene a meeting of the Management Committee to be held not later than ten working days after he has been requested, in writing, by a Member to do so. Not less than five working days written notice of any meeting of the Management Committee shall be given to all Representatives and their alternates.

The Management Committee may permit, or invite, persons other than Representatives or alternates to attend any of its meetings, but such persons shall not have voting rights.

4.2.3 *Decisions*

Each Representative shall have one vote on the Management Committee and where, in terms of this clause, a casting vote is required, this shall be exercised by the chairman.

All decisions of the Management Committee shall, desirably, be unanimous. Accordingly, if unanimity cannot, initially, be achieved in regard to a decision, the meeting at which that decision is sought shall be adjourned for a period of 48 hours to enable Representatives to consult with their principals. If, on resumption of the adjourned meeting, unanimity can still not be achieved, the decision, provided it is not one requiring unanimity of the Members, shall be taken by majority vote and, in the event of a tie, the chairman shall exercise a casting vote.

A Member not satisfied with a majority decision of the Management Committee may declare a dispute, to be dealt with in terms of Clause 8 hereof, but the majority decision shall, nevertheless, be implemented with immediate effect.

Decisions of the Management Committee, whether taken at a meeting, or otherwise, shall be recorded in written minutes, which shall be distributed by the chairman to reach the Representatives not later than five working days after those decisions were taken. Such minutes shall be deemed to have been affirmed by the Representatives unless written notice of dissent is received by the chairman not later than three working days after receipt of the minutes by the Representative.

4.2.4 Powers and duties

The functions, responsibilities and powers of the Management Committee shall include, inter alia, those listed below:

4.2.4.1 Formulating overall policy in regard to the achievement of the objectives of the Joint Venture.

4.2.4.2 Managing the day to day affairs of the Joint Venture.

4.2.4.3 Monitoring, directing and co-ordinating the activities of the Members to ensure that the objectives of the Joint Venture are achieved and that the obligations and responsibilities of the individual Members are met.

4.2.4.4 Monitoring and controlling the financial affairs of the Joint Venture and ensuring that proper books of account and financial records relating to affairs of the Joint Venture are maintained in an approved form and submitted to the Management Committee for approval at regular intervals, which shall not be longer than one month.

4.2.4.5 Determining the necessity for and the details of any changes in the duties and responsibilities of Members provided that any resulting changes in Members' Interests shall be unanimously approved by the Members.

4.2.4.6 Determining the terms and conditions of employment of personnel and the emoluments applicable to staff seconded to the Joint Venture by the Members.

4.2.4.7 Controlling and approving the appointment of all subcontractors.

4.2.4.8 Procuring, after the completion of the Contract and the release of all bonds, guarantees and sureties given in respect of the performances of the Joint Venture and the Members, the preparation and auditing of a final set of accounts, on the basis of which the final profits, or losses, attributable to the individual Members shall be determined and any necessary adjustments effected.

5 RESOURCES OF JOINT VENTURE

The resources to be utilised by the Joint Venture in securing and executing the Contract shall, insofar as these are to be provided directly by the Members, be as set out in the Schedules and may, from time to time, be amended by decision of the Management Committee, provided that the Member's Interests are not, except with the unanimous approval of the Members, affected thereby.

Similarly, specific areas of responsibility of the Members for the performance of work and the provision of facilities shall be as set out in the Schedules and may, from time to time, be amended by decision of the Management Committee, provided that the Members' Interest are not, except with the unanimous approval of the Members, affected thereby.

5.1 Schedule 'A' (General)

Schedule 'A' shall contain general information relating to the Joint Venture including, inter alia, the following :

1. The Employer's name and address.
2. A brief description of the Contract and the Deliverables.
3. The name, physical address, communications addresses and domicilium citandi et executandi of each Member and of the Joint Venture.
4. The Members' Interests.
5. A statement indicating whether, or not, Specific Provisions apply to the Agreement.
6. A schedule of insurance policies which must be taken out by the Joint Venture and by the individual Members.
7. A Schedule of sureties, indemnities and guarantees that must be furnished by the Joint Venture and by the individual Members.
8. Details of the persons, who, in the event of failure by the Members to reach agreement on the appointments of mediator and arbitrator, will nominate appointees to these positions in terms of Clauses 8.2 and 8.3.

5.2 Schedule 'B' (Financial)

Schedule 'B' shall contain information regarding the financial affairs of the Joint Venture including, inter alia, the following :

1. The working capital required by the Joint Venture and the extent to which and manner whereby this will be provided and/or guaranteed by the individual Members from time to time.
2. The banking accounts that are to be opened in the name of the Joint Venture and the manner in which these are to be operated.
3. The rates of interest that will be applicable to amounts by which Members are in debit, or credit, to the Joint Venture.
4. The names of the auditors and others, if any, who will provide auditing and accounting services to the Joint Venture.
5. The intervals at which interim financial accounts and forecasts will be prepared for approval by the Management Committee.
6. Insofar as not covered in Schedule 'C', the basis on which contributions of various types by the Members towards the work of the Joint Venture in securing, executing, managing and satisfactorily completing the Contract, will be valued.
7. The basis on which profits and/or surplus cash will, if available from time to time, be distributed to Members.
8. The basis upon which losses, if any, are to be apportioned to Members.

5.3 Schedule 'C' (Contributions by Members)

Schedule 'C' shall set out the contributions of various types, other than cash, that will be made by the individual Members towards the work and obligations of the Joint Venture and shall, as far as possible, indicate the monetary values to be placed on such contributions, which may include, inter alia, the following :

1. Staff seconded to the Joint Venture.
2. Work carried out and services provided to, or on behalf of, the Joint Venture.
3. Plant, equipment, facilities etc. made available for use by the Joint Venture.
4. Materials and goods supplied to, or on behalf of, the Joint Venture.
5. Licences, sureties, guarantees and indemnities furnished to, or on behalf of, the Joint Venture.
6. Joint Venture Disclosure form required for the Contract.

6. BREACH OF AGREEMENT

If a Member breaches any material provision of the Agreement, or delays or fails to fulfil its obligations in whole, or in part, and does not remedy the situation within fourteen calendar days of receipt of notice from the Management Committee, or another Member, to do so, the other Members shall have the right, without prejudice to any other rights arising from the default, to summarily terminate the Agreement and re-assign the defaulting Member's rights and obligations in the Joint Venture as they see fit and withhold any moneys due to the defaulting member by the Joint Venture.

Each Member shall indemnify the other Members against all losses, costs and claims which may arise against them in the event of the Agreement being terminated as a result of breach of the Agreement by the said Member.

7. INSOLVENCY OF MEMBER

Should a Member be placed in liquidation, or under judicial management, whether provisionally or finally, or propose any compromise with its creditors, the other Members shall be entitled to proceed in terms of Clause 6, as if the Member had breached the Agreement.

8. DISPUTES

8.1 Settlement

The Members shall negotiate in good faith and make every effort to settle any dispute, or claim, that may arise out of, or relate to, the Agreement.

If agreement cannot be reached, an aggrieved Member shall, if he intends to proceed further in terms of Clause 8.2 hereof, advise all other Members in writing that negotiations have failed and that he intends to refer the matter to mediation in terms of Clause 8.2.

8.2 Mediation

Not earlier than ten working days after having advised the other Members, in terms of Clause 8.1, that negotiations in regard to a dispute have failed, an aggrieved Member may require that the dispute be referred, without legal representation, to mediation by a single mediator.

The mediator shall be selected by agreement between the Members, or, failing such agreement, by the person named for this purpose in Schedule 'A'. The costs of the mediation shall be borne equally by all Members.

The mediator shall convene a hearing of the Members and may hold separate discussions with any Member and shall assist the Members in reaching a mutually acceptable settlement of their differences through means of reconciliation, interpretation, clarification, suggestion and advice. The Members shall record such agreement in writing and thereafter they shall be bound by such agreement.

The mediator is authorised to end the mediation process whenever in his opinion further efforts at mediation would not contribute to a resolution of the dispute between the Members.

8.3 Arbitration

Where a dispute or claim is not resolved by mediation, it shall be referred to arbitration by a single arbitrator to be selected by agreement between the Members or, failing agreement, to be nominated by the person named for this purpose in Schedule 'A'.

The Member requiring referral to arbitration shall notify the other Members, in writing, thereof, not later than thirty calendar days after the mediator has expressed his opinion, failing which the mediator's opinion shall be deemed to have been accepted by all Members and shall be put into effect.

Arbitration shall be conducted in accordance with the provisions of the Arbitration Act No. 42 of 1965, as amended, and in accordance with such procedure as may be agreed by the Members or, failing such agreement, in accordance with the rules for the Conduct of Arbitrations published by the Association of Arbitrators and current at the date that the arbitrator is appointed.

The decisions of the arbitrator shall be final and binding on the Members, shall be carried into immediate effect and, if necessary, be made an order of any court of competent jurisdiction.

9. DOMICILIUM

The Members choose domicilium citandi et executandi for all purposes of and in connection with the Agreement as stated in Schedule 'A'. A Member shall be entitled to change his domicilium from time to time, but such change shall be effective only on receipt of written notice of the change by all other Members.

Member No. 1

Thus done and signed at _____ this _____ day of _____ 20___

For and on behalf of _____ *[Company]*

by *[name]* _____ who warrants his authority to do so.

_____

As witnesses 1. _____ As witnesses 2. _____

Member No. 2

Thus done and signed at _____ this _____ day of _____ 20___

For and on behalf of _____ *[Company]*

by *[name]* _____ who warrants his authority to do so.

_____

As witnesses 1. _____ As witnesses 2. _____

Member No. 3

Thus done and signed at _____ this _____ day of _____20___

For and on behalf of_____*[Company]*

by *[name]* _____ who warrants his authority to do so.

_____

As witnesses 1. _____ As witnesses 2. _____

[Allow for additional parties as necessary].

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

ANNEXURE 6
Project Specific Health and Safety Specification

October 2022

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

Occupational Health and Safety Specification

(OHSE SPEC)

Project Name : Sizuzulu Primary School : Storm Damage

WIMS No. : 063963

Client OHS Representative : L. Ntuli

Region : North Coast Region

District : Zululand

Ward no. : N/A

TABLE OF CONTENTS

1 Introduction 3

2. Definitions 4-5

3. Scope of application 6

4. Contractual Issues 7

5. Administrative Requirements 8

5.1 *Notification of Construction Work* 8

6. Appointment of Safety Officers 8

7. Annexures

i. Annexure A – Structure of the detailed OHSE Plan 9-10

ii. Annexure B – Client Specific Legal Requirements 11-16

iii. Annexure C – OHS Declaration for Tenders 17

iv. Annexure D - Baseline Risk Assessment 18-24

1. Introduction

The *Kwa Zulu / Natal Department of Public Works* is deemed as the **"Client"** in terms of the definitions of Construction Regulations of 2014 as published in *Government Gazette No. 37305*.The Construction Regulations of 2014 under *CR (5) (1)* stipulates that the client must prepare a suitable, sufficiently documented and coherent site specific Occupational Health and Safety Specification for the intended construction work based on the baseline risk assessment.

The purpose of this Occupational Health and Safety Specification document (*which hereinafter will be referred to as OHSE Spec*) is to provide designers and the successful tenderer with essential OHS information to ensure effective safety management during the design and construction phase of the project.

This OHSE Spec forms an integral part of the contract between the Client and the Principal Contractor, so as to ensure compliance with the Occupational Health and Safety Act, Act 85 of 1993 and its applicable regulations and must serve as the basis for the Principal Contractor to develop his/her Project Safety, Health and Environmental Management Plan. As with any other plan for it to be implemented and managed effectively it requires the allocation of sufficient funds to achieve the objectives set out in the plan. In line with this requirement Construction Regulation 5(1) (g) requires the Client to ensure that the Principal Contractor has made adequate provisions for the cost of Health and Safety Measures in their tenders.

It must be noted that this OHSE Spec as much as it is detailed it is not exhaustive and the onus is on the Principal Contractors to ensure that they comply with Section 8 of the OHS Act, Act 85 of 1993 which states that "*Every Employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees*." this means that Principal Contractors as they are employers in their own right must at all times ensure continuous assessments are done for continued provision and maintenance of a healthy and safe working environment.

2. Definitions

For the purpose of the OHSE Spec, the abbreviations or definitions given hereunder shall apply and the reference to on gender will also apply to the other gender.

"CR" refers to the Construction Regulations 2014

"Agent (*Pr. CHSA***)"** means a competent person who acts as a representative for a Client in terms of regulation (5)5.

"Client" means Department of Public Works

"Competent person" means a person who-

(a) Has in respect of the work or task to be performed the required knowledge, training and experience and, where applicable, qualifications, specific for that work or task: Provided that where appropriate qualifications and training are registered in terms of the provisions of the National Qualifications Framework Act, 2000 (Act No.67 of 2000), those qualifications and that training must be regarded as the required qualifications and training; and

(b) Is familiar with the OHS Act, Act 85 of 1993 and with the applicable regulations made under the Act;

"Construction Manager (*Site Agent***)"** means a competent person responsible for the management of the physical construction processes and the coordination, administration and management of resources on a construction site;

"Construction Site" means a work place where construction work is being performed;

"Construction Supervisor" means a competent person responsible for supervising construction activities on a construction site;

"Construction Vehicle" means a vehicle used as a means of conveyance for transporting persons or material, or persons and material, on and off the construction site for the purposes of performing construction work;

"Construction work" means any work in connection with –

(a) The construction, erection, alteration, renovation, repair, demolition or dismantling of or addition to a building or any similar structure; or

(b) the construction, erection, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system; or the moving

of earth, clearing of land, the making of excavation, piling, or any similar civil engineering structure or type of work;

"Construction Work Permit" means a document issued in terms of regulation 3 of the Construction Regulations 2014;

"Contractor" means an employer who performs construction work;

"Demolition Work" means a method to dismantle, wreck, break, pull down or knock down of a structure or part thereof by way of manual labour, machinery, or the use of explosives;

"Fall Protection Plan" means a documented plan, which includes and provides for-

(a) All risks relating to working from a fall risk position, considering the nature of work undertaken;

(b) The procedures and methods to be applied in order to eliminate the risk of falling; and

(c) A rescue plan and procedures;

"Health and Safety File" means a file, or other record containing the information in writing required by these Regulations;

"Health and Safety Plan" means a site, activity or project specific documented plan in accordance with the client's health and safety specification;

"Health and Safety Specification" means a site, activity or project specific document prepared by the client pertaining to all health and safety requirements related to construction work;

"Medical Certificate of Fitness" means a certificate contemplated in regulation 7(8) of Construction Regulations 2014;

"Principal Contractor" means an employer appointed by the client to perform construction work;

"Safety Officer" – a person deemed competent by SACPCMP under the relevant category of registration.

"Professional Engineer or Professional Certificated Engineer" means a person holding registration as either a Professional Engineer or Professional Certificated Engineer in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000);

3. Scope of Application

3.1 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.

3.2 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;

Sizuzulu Primary School: Storm Damage Project

3.3 This OHSE Specification further seeks to achieve the following;

3.3.1 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***

3.3.2 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***

3.3.3 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***

3.3.4 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 professionals appointed and that the OHSE Specification is incorporated into the tender documents. ***See Annexure D***

4. Contractual Issues

4.1 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.

4.2 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.

4.3 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.

4.4 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.

4.5 The Client will not entertain any claim of any nature whatsoever which arises as a result of costs incurred or delays being experienced due to the Contractor not complying with the requirements of this document and or any other applicable legislative requirements imposed on the Contractor.

5. Administrative Requirements

5.1. Notification of Construction Work

The successful tenderer must at least within 07 working days before commencing with construction work notify the Provincial Director in writing using **Annexure "2"**. A copy of the notification once stamped by a DEL Official must be submitted to the client prior to commencing with construction work.

6. Appointment of a Part time Safety Officer

6.1 The Principal Contractors will have to appoint a competent Part Time Construction H&S Officer as per the following criteria;

- *A part time safety officer shall be appointed and will be onsite at least 2 days a week.*
- *During asbestos removal the Safety Officer will have to be present during that period.*

Annexure A

Structure of the Detailed OHSE Plan

A detailed OHSE Plan is to be submitted by the successful tenderer as per section 3.3.1 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 –

Sizuzulu Primary School: Storm Damage Project

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. Fall Protection Plan
6. Relevant checklists and registers.
7. SHE Audit Format to be used for Self-audits and Sub-contractors
8. Site specific OHSE Organogram
9. Preliminary Induction Program
10. Environmental Management Plan
11. Proof of competency for the following legal appointees;

11.1. Construction Manager –(Detailed CV reflecting qualification, relevant experience and references from previous clients)

11.2. Construction Work Supervisor - Detailed CV reflecting qualification, relevant experience and references from previous clients.

11.3. Construction H&S Officer – ((Proof of registration with SACPCMP + CV)

11.4. Risk Assessor – SAMTRAC or equivalent

11.5. Fall Protection Planner - Fall Protection Certificate or equivalent (Training recognised under SAQA unit standard u/s 229994.

11.6. Incident Investigator - SAMTRAC or equivalent

11.7. Incident Investigator - SAMTRAC or equivalent

11.8. *Incident Investigator - SAMTRAC or equivalent*

Legal appointments to be appointed	
Prior Site Handover	**After Site Handover on commencement with Construction work**
• S 16.2 • Construction Manager • Construction Work Supervisor • Risk Assessor • Fall Protection Planner • Incident / Accident Investigator • Construction H&S Officer	• Scaffold Erectors • Scaffold Inspectors • Excavation inspector • Demolition Work Supervisor • First Aider • Emergency co-ordinator • Fire Marshalls • Fire team members • Portable Electrical tool inspector • Hand tools inspector • Housekeeping inspector • Stacking and storage inspector • Construction Vehicle Operator • Flammable liquids Storage Inspector • Hazardous substance storage inspector • SHE Representative • Ladder 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.
Medical Certificates	• In compliance with the requirements of the Construction Regulations 2014 section 7(8) the Contractor must ensure that all of his employee's onsite have a valid medical certificate of fitness specific to the construction work to be performed and issued by an occupational health practitioner in the form of Annexure 3.
Appointment of a Part -time safety officer	• The Principal Contractors will have to appoint a competent Part Time Construction H&S Officer for this project and the part time safety officer will have to visit the site at least once in every 30 days for the duration of this project.
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	• The Principal Contractor must incorporate any aspects of the Local Municipal bylaws which affect the, Safety and Environmental wellbeing of the employees and the public into his/her OHSE Plan and ensure compliance to such bylaws.
Risk assessment for construction work	• To comply with CR (9) and to also address environmental issues *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)
Asbestos	1) To comply with Asbestos Regulations as published in Government Notice No. R. 155 dated 10 February 2002. 2) Removal to be done by an accredited asbestos contractor

	3) Proof of accreditation to be kept on site. 4) Proof of safe systems of work 5) Disposal certificate. 6) Under no circumstances may asbestos be handed over to the community irrespective of shape or condition.
Construction vehicles	• 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 Hard hats. The Principal Contractor and all Sub Contractors shall make provision and keep adequate quantities of SABS approved PPE on site at all times. All employees issued with PPE to be trained in correct use, records of training and issue to be kept in the Site SHE File. Procedure to be in place to deal with: 1. Lost or stolen PPE; 2. Worn out or damaged PPE replacement; and 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.
Speed Restrictions and Protections	Unless otherwise stipulated, the maximum speed limit on sites must be limited to 10 km/h. 1) Vehicle movement routes on site must be clearly indicated where applicable. 2) Signage to ensure the safe movement of vehicles on site, as well as to ensure the health and safety of all employees and visitors on site, must be displayed in strategic locations.
Hazardous Chemical Substances (HCS)	1) To comply with Hazardous Chemical Substances Regulations as published in Government Notice No. R. 1179 dated 25 August 1995. 2) In addition to the abovementioned, Material Safety Data Sheets must be kept on site for all materials, which may contain hazardous chemical substances.
Fire Extinguishers and Fire Fighting Equipment	1) The Principal Contractor and Sub-Contractors must allow for and provide adequate provision of regularly serviced temporary firefighting 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. o That only authorized trained persons use the tools. o That safe working procedures apply. o That PPE is provided and used.
Adequate Lighting	All Contractors must allow for and ensure that adequate lighting is provided to allow for work to be carried out safely.
Transportation of Workers	1) In addition to CR 23 the following will apply The Principal Contractor and Sub-Contractors shall not: • Transport persons together with goods or tools unless there is an appropriate area or section of the vehicle in which to store such goods. • Transport persons on the back of trucks except if a proper canopy (properly covering the sides and top) has been provided with suitable seating areas. • Permit workers to stand or sit on the edge of the transporting vehicle. • Transport workers in LDVs unless they are closed / covered and have the correct number of seats for the passengers • No driver may transport more than six people on the back of a 1 Ton LDV and more than four passengers on the back of a ½ Ton LDV. 2) The driver of any LDV may not permit more than two passengers to occupy the cab of any LDV. 3) Drivers of such vehicles must have a valid driver's license for the code of vehicle being driven by them. 4) No servicing of vehicles will be permitted on a Construction Site. No Vehicles or machinery leaking oil will be permitted on site due to the risk posed to the environment. 5) Any oil or diesel spilled on site must be cleaned up as per accepted environmental practice. In the event that Earth Moving Machinery is present on site the following must be adhered to:

	• Drivers of vehicles must be instructed to avoid parking behind earth moving machinery in order to ensure that their vehicles are visible to the operators of earth moving machinery. • Right of way must be afforded to earth moving machinery at all times. • Vehicles must only be permitted to park, where possible, in designated areas.
Occupational Hygiene	1) Occupational exposure is a major problem and all Contractors must ensure that proper health and hygiene measures are put in place to prevent exposure to these hazards. 2) All Contractors must prevent inhalation, ingestion and absorption of any harmful chemical or biological agents. 3) Water to be utilized for drinking purposes may only be drawn from taps designated for drinking water purposes. Fire hydrants and fire hose reels may not be utilized for drinking water purposes.
Environmental Management	• The Principal Contractor and Sub-Contractors must comply with the requirements of NEMA Act No. 107 (***National Environmental Management Act No 107, 1998***). • The Principal Contractor must develop a waste management plan, implement and maintained it onsite. • Cement mixing to be done at a predetermined location on site which must include a solid, slab, and bunded edges to prevent runoff. • Contaminated run off water from the site must be treated such as to ensure that it does not pose a risk to the environment. • Any material which may have a harmful effect when disposed of by normal means must be disposed of in an appropriate manner to eliminate its harmful effect on the environment after disposal. • The Principal Contractor must allow for and ensure that adequate procedures are implemented and maintained to ensure that waste generated is placed in suitable receptacles and removed from the site promptly. • Plans to deal with spillages must be in place and maintained. • No waste materials (liquid or solid) may be disposed of in drains. • No burning of waste material may take place on site as such material being burned may result in pollution of the air or give off toxic vapours which could be harmful to the health of employees or any other person present on site.
Alcohol and other Drugs	• No alcohol and other drugs will be allowed on site without the express permission of the Principal Contractor • No person may be under the influence of alcohol or any other drugs while on the construction site. • Any person on the construction site who is on prescription drugs must inform his / her Employer accordingly and the Employer shall in turn report this to the Principal Contractor immediately. • Any person on the construction site who is suffering from any illness / condition that may have a negative effect on his/her safety performance must report this to his / her Employer, who in turn must report this to the Principal Contractor forthwith.

	• Any person on the construction site who is suspected of being under the influence of alcohol or other drugs must be removed from site immediately and be instructed to report back the next day for a preliminary inquiry. A full disciplinary procedure must be followed by the Contractor concerned and a copy of the disciplinary action must be forwarded to the Principal Contractor for his records.

Annexure C

T2.16 CONTRACTOR'S SAFETY, HEALTH AND ENVIRONMENTAL DECLARATION

Project title:	**Sizuzulu Primary School: Storm Damage Project**		
Bid no:		**WIMS no:**	**063963**

INTRODUCTION

In terms of *Construction Regulation 7(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 have been made in my tender to cover the cost of all Safety, Health and Environmental duties and responsibilities imposed on me by the Occupational Health and Safety Act, Act 85 of 1993, the Construction Regulations of February 2014 and the Construction Safety, Health and Environmental Specification.

4. I confirm that I may not commence with any part of construction work under the contract until my Construction Safety, Health and Environmental Plan has been approved in writing by the Client.

5. I hereby confirm that copies of the following documentation will be kept on site for viewing and inspection purposes for the duration of the construction work:

   a) Client's Construction Safety, Health and Environmental Specification
   b) Approved Construction Safety, Health and Environmental Plan
   c) Occupational Health and Safety Act, Act 85 of 1993, and
   d) Construction Regulations of February 2014.

6. I agree that my failure to complete and execute this declaration to the satisfaction of the Client will mean that I am unable to comply with the requirements of the Occupational Health and Safety Act, Act 85 of 1993 and Construction Regulations 2014, and accept that my tender will be rejected.

Duly Signed at..... on this the..... day of.....201.....

_____ _____

Full Name of Signatory | Name of Enterprise

_____ _____

Capacity of Signatory | Signature of authorised representative of Bidder

Annexure D

Baseline Risk Assessment

Sizuzulu Primary School: Storm Damage Project

Main Activity	Sub Activity	Safety Risk	Health Risk	Environmental Risk	Public Safety Risk	Control Measures	Responsible Person
Site Establishment	Identification of existing services *(i.e. water pipes, live electricity cables, sewer, etc.).*	Electrocution, multi body burns, struck by tools, bite by poisonous insects & other dangerous animals, etc.	Dust exposure, body fatigue, back strains, exposure to extreme temperature, etc.	Land Pollution from poor housekeeping	None	Safe systems of work, training , PPE, Good Housekeeping Practises, Supervision; etc.	**Contractor**
	Water & Electricity services provision *(i.e. electricity connections, etc.)*	Electrocution, multi body burns, struck by tools; etc.	Dust exposure, body fatigue, back strains, exposure to extreme temperature, etc.	Land Pollution from poor housekeeping	Electrocution, exposure to dust, etc.	Safe systems of work, training, PPE, Good Housekeeping Practises, Supervision; etc.	**Contractor**
	Temporal fencing of active construction areas.	Physical injuries *(I.e. cuts, abrasion, etc.)* from being struck by tools; falls from trips, etc.	Back strain; exposed to intermittent noise levels; respiratory conditions from dust inhalation; etc.	Littering from poor housekeeping	Physical injuries from tripping hazard; etc.	Safe systems of work, training , PPE, Good Housekeeping Practises, Supervision; etc.	**Contractor**
	Placement of site office & Construction Facilities *(i.e. toilets, changing areas, etc.)* on site.	Physical injuries *(I.e. cuts, abrasion, etc.); cuts & abrasion; trips & falls; eye injuries;* etc.	Back strain; exposed to intermittent noise levels; respiratory conditions from dust inhalation; etc.	Littering from poor housekeeping	Physical injuries from tripping hazard; etc.	Safe systems of work, training , PPE, Good Housekeeping Practises, Supervision; etc.	**Contractor**
	Vehicles entering & exiting a construction site	Death or physical injuries; employees nocked / run-over by construction vehicles; etc.	Dust inhalation; death; etc.	Land pollution from petrol and oil leaks & spillages from construction vehicles.	Exposed to noise levels & dust inhalation on site; etc.	Safe systems of work, training , PPE, Good Housekeeping Practises, Supervision; etc.	**Contractor**

	Moving and stacking of materials	Physical injuries from tripping; struck or bumped by or against any construction materials; etc.	Back strain from lifting heavy material; bruising & hand injuries from handling sharp equipment; etc.	Land pollution (from poor housekeeping)	none	Safe systems of work, training , PPE, Good Housekeeping Practises, Supervision; etc.	**Contractor**
Main Activity	**Sub Activity**	**Safety Risk**	**Health Risk**	**Environmental Risk**	**Public Safety Risk**	**Control Measures**	**Responsible Person**
Installation of gutters and down pipes	Lifting into position	Falls, hazardous dust, bumps, sharp edges, struck by falling objects	Muscular strains, cuts and abrasions	None	None	Training, PPE, safe systems of work and supervision	Contractor
	Drilling and securing	Falls, hazardous dust, bumps, sharp edges, struck by falling objects	Muscular strains, cuts and abrasions, noise	None	None	Training, PPE, safe systems of work and supervision	Contractor
Fitting Doors/windows	Fitting doors/windows into frames /openings	Struck by items, hands caught between areas, falling items,sharp edges, noise,dust	Cuts, abrasions, fractures, death	none	None	Training, PPE, safe systems of work and supervision	Contractor
	Fitting glass panes	Struck by items, hands caught between areas,, falling items, sharp edges	Cuts, abrasions, fractures, severe injuries, death	None	None	Training, PPE, safe systems of work and supervision	Contractor
	Glazing	Contact with sharp edges , Hazardous substances, falling	Cuts and lacerations ,, fractures , death	None	None	Training, PPE, safe systems of work and supervision	Contractor
Stitching	Grinding	Falls, hazardous dust, bumps, sharp edges, struck by falling objects	Muscular strains, cuts and abrasions	None	None	Training, PPE, safe systems of work and supervision	Contractor

Redesigning of surface Drainage	Setting out for excavations	Tripping, struck by, bumping against,	Back strain, dust inhalation, cuts and abrasions	none	none	Training, PPE, Barricading, safe systems of work and supervision.	Contractor
	Digging of Excavations manually	Struck by tools , tripping, Falling into excavations, Hidden services	Back strain, heat exhaustion, bruising,, cuts, abrasions, death	Spilling of oil, diesel, petrol	Noise, dust, collisions, death	Training, PPE, Barricading, safe systems of work and supervision.	Contractor
	Digging of Excavations by machines	Machinery colliding with people and vehicles, machine coming into contact with hidden services. Heated surfaces	Fractures, death ,	Contamination of environmental resources due to leaking of fuel, diesel and oil	Dust, noise, death, severe cuts and abrasions	Flag man, traffic control, reverse hooters reflective vest, proper barricading, signage and safe systems of work and supervision.	Contractor
	Aprons and v chanels	Tripping over protruding pegs ,Dust and noise from cutting timber, Electricity ,Struck by, contact with hazardous substances	Dust inhalation, dermatitis, cuts and abrasions , fractures	None	None	Safe systems of work , supervision , PPE , Barricading	Contractor
	Soil Compaction	Struck by machinery, explosion and fire, struck by flying objects	Circulatory problems, crushing, noise induced hearing loss, dust inhalation	Contamination of environmental resources due to leaking of fuel, diesel and oil	none	Training, PPE, Barricading, safe systems of work and supervision.	Contractor
	Mixing and pouring concrete	Striking against area, sharp edge, hazardous substance	Cuts &abrasions, inhalation of duct, contact dermatitis	Cement spillage	Striking against area, sharp edge, hazardous substance	Training, PPE, Barricading, safe systems of work and supervision.	Contractor

	Brick work	Rough surfaces, hazardous substances, flying particles, falling objects	Cuts, abrasions, burns, fractures, death	None	None	Training, PPE, safe systems of work and supervision	**Contractor**
Desludging Existing Ablutions	Vacuum Truck entering & exiting site	Injuries from vehicles collision; knocked / run-over by Vacuum truck or other construction vehicles; etc.	Dust inhalation; noise; etc.	petrol and oil leaks & spillages; etc.	Exposed to intermittent noise levels & dust inhalation; etc.	Safe systems of work, training, PPE, Good Housekeeping Practises, Supervision; etc.	**Contractor**
	Desludging Toilets	Cuts from sharp edges; struck by vacuum truck pipe; injuries from slips trips & falls; etc.	Back pains from lifting heavy Vacuum Truck pipes; death due to direct / indirect exposure to multiple feacal pathogens; etc.	sewer spillage; Fatigue; offensive smells; etc.	offensive smells; etc.	Safe systems of work, training on Desludging, PPE, Good Housekeeping Practises, Supervision; etc.	**Contractor**
	Transporting sludge away from site	Death or serious injuries from being knocked / run over by a Vacuum Truck; bumping onto objects; etc.	Dust; noise; smells; etc.	Oil & petrol spillages; etc.	Exposed to intermittent noise levels & dust inhalation; etc.	Training, PPE, safe systems of work and supervision	**Contractor**
Installation of a Jo-jo tank	Excavation	Poor posture, Bumps, sharp edges etc	Muscular strains, dust inhalation, cuts and abrasions	None	None	Training, PPE, safe systems of work and supervision	**Contractor**
	Concrete pouring for base	Poor posture, Bumps, sharp edges etc	Muscular strains, dust inhalation, cuts and abrasions	None	None	Training, PPE, safe systems of work and supervision	**Contractor**

Sizuzulu Primary School: Onsite General Construction Activities					
Activity	**Risk to safety**	**Risk to Health**	**Risk to Environment**	**Risk to Public Safety**	**Control Measures**
Drilling	Entanglement, struck by flying objects, electricity, hazardous substance dust , noise, etc.	Electrocution, dust inhalation, noise induced hearing loss, muscle strain, foreign objects in eyes, etc.	Contamination of natural resources (spillages), etc.	dust , noise	Safe systems of work ,Training, PPE, barricading, Supervision, etc.
External Wall Painting	Bumping against, wrist strain, etc.	Inhalation of vapours, paint in eyes , minor abrasions, etc.	Contamination of natural resources (spillages), etc.	None	Safe systems of work ,PPE, ventilation of area, good housekeeping, etc.
Grinding	Electrocution, entanglement,, tripping hazards, struck by flying materials, etc.	Noise induced hearing loss, cuts, loss of limbs, electrocution, etc.	none	Noise, dust etc.	Safe systems of work ,Wet cutting, barricading, temporary guarding, signage Supervision, etc.
Breaking of concrete	Struck by flying particles, impact hazards, vibration, electrocution, etc.	Noise induced hearing loss ,dust inhalation , particles in eye, electrocution, etc.	None	Noise, dust etc.	Safe Systems of work , barricading, temporary guarding, signage Supervision, etc.
Plastering	Grazing abrasions, bumping against, struck by flying/falling objects, slipping hazards, hazardous substances, etc.	Minor bruising, particles in eyes, dust inhalation, hazardous substances exposure effects, etc.	Contamination of natural resources, etc.	None	Safe systems of work, training , PPE Supervision ,etc.
Loading and unloading by hand	Bumping against edges , Hands caught between , Sharp edges, muscle strain, etc.	Back strain, exhaustion, bruising, hand injuries, etc.	None	None	Safe systems of work, PPE, Training in correct lifting procedures , Supervision etc.
Ladder use	Incorrect positioning, overreach , Overhead hazards , dropping of tools from ladder , Falls, etc.	Broken bones , death, electrocution, etc.	None	None	Safe systems of work , PPE usage, Supervision, etc.
Extension cords	Electricity , tripping hazards, etc.	Electrocution , fractures etc.	none	None	Safe systems of work, PPE, Supervision etc.
Hand tools	Tripping, struck by, bumping against, abrasions, sharp edges,	Cuts ,Bruising ,Foreign material in eyes, etc.	none	None	Safe systems of work, PPE, Supervision, etc.

	caught between surfaces, flying metal particles etc.				
Scaffolding erection, dismantling	Falls from height, dropping of items, sharp edges, scaffolding collapse, etc.	Back strain, bruising, cuts, abrasions, broken bones, death, etc.	none	None	Safe system of work, use of fall arrest equip, erection of safe scaffolding, Supervision, etc.

Note:

CR 7 (8) A contractor must ensure that ***all his or her employees*** *have a* ***valid medical certificate of fitness*** *specific to the construction work to be performed, and* ***issued by an Occupational Health Practitioner in the form of Annexure 3.***

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

ANNEXURE 7
Health and Safety Bill of Quantities

HEALTH AND SAFETY IMPLEMENTATION COSTING

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

ITEM	DESCRIPTION	UNIT	QUAN-TITY	MONTHS (Indicative)	RATE	AMOUNT
			(a)		(b)	(a) x (b)
1	**MEDICALS**					
1.1	Pre-employment medical	Nr.	-			
1.2	Re-medicals - yearly	Nr.	-			
	TOTAL					
2	**PERSONAL PROTECTIVE EQUIPMENT**					
2.1	Overalls	Nr.				
2.2	Hard Hats	Nr.				
2.3	Safety boots/shoes	Nr.				
2.4	Gloves	Nr.				
2.5	Gumboots steel toe cap	Nr.				
2.6	Safety glasses	Nr.				
2.7	Reflector Bibs	Nr.				
2.8	Barricading Material	M				
2.9	Dust masks	Box 20				
	TOTAL					
3	**FIRE FIGHTING**					
3.1	Fire extinguishers - 4.5Kg	Nr.				
3.2	Surveys - Annual Service	Nr.				
	TOTAL					
4	**HEALTH AND SAFETY PERSONNEL**					
4.1	Safety Manager	Nr.				
4.2	Safety Officer	Nr.				
4.3	Construction Phase Safety, Health, Environmental and Waste Management Plan	Nr.				
	TOTAL					
5	**FACILITIES**					
5.1	Provision of ablution facilities	Nr.				
5.2	Service and maintenance of ablution facilities	Nr.				
5.3	Provision of eating areas	Nr.				
5.4	Cleaning of Lay down and other storage areas	Nr.				
5.5	Wash hand basin	Nr.				
5.6	Hot and Cold running water	Nr.				
5.7	Degreasing & Toilet soap	Nr.				
	TOTAL					

6	**FALL PREVENTION / PROTECTION**					
6.1	Safety harnesses with double lanyards	Nr.				
6.2	Safety harnesses with Scaffold hooks	Nr.				
6.3	Lifelines and vertical fall arrest systems	Nr.				
6.4	Scaffolding – material, erection and inspection (Estimate for project)	Nr.				
6.5	Temporary hand railing material and kick flats	Nr.				
6.6	Chin Straps	Nr.				
	TOTAL					
7	**FIRST AID**					
7.1	Replenishment of boxes and other supplies	Nr				
	TOTAL					
8	**TRAINING**					
8.1	SHE Representative	Nr.				
8.2	First Aid Level 1	Nr.				
8.3	Fire Fighting	Nr.				
	TOTAL					
9	**SIGNAGE**					
9.1	All Signage as required by Law, regulatory, warning and information	Nr.				
9.2	Posters for awareness	Nr.				
	TOTAL					
10	**ELECTRICAL**					
10.1	Replacement of Locks required for lockouts	Nr.				
10.2	Replacement of tags	Nr.				
10.3	Replacement for Permit books	Nr.				
10.4	Replacement of Callipers	Nr.				
	TOTAL					
11	**OTHERS (Project Specific)**					
11.1		Nr.				
	TOTAL					
GRAND TOTAL TO BE CARRIED TO THE PRELIMINARIES AND GENERAL IN BILL OF QUANTITIES						

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

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): **PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID**

Site: GPS CO-ORDINATES: 27°28'40.45"S 31°5'38.38"E

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

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

ANNEXURE 9
Geotechnical Investigation Report (If applicable)

NOT APPLICABLE

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 24: IWANGU PRIMARY SCHOOL. OPEN BID

ANNEXURE 10
EPWP Employment Contract

SCOPE OF WORKS IN RESPECT OF WORK RELATING TO THE EXTENDEND PUBLIC WORKS PROGRAMME (EPWP)			
Project title:	**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID**		
Project Code:	**063963**	**EPWP NO:**	**N/A**

Introductory notes:

1. The works, or parts of the works will be constructed using labour-intensive methods only in terms of this specification. The use of plant to provide such works, other than plant specifically provided for in the scope of work, is a variation to the contract. The items marked with the letters **LI** are not necessarily an exhaustive list of all the activities which must be done by hand, and this clause does not over-ride any of the requirements in the generic labour intensive specification in the Scope of Works.

2. Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment.

DESCRIPTION OF THE WORKS

Employer's objectives

The employer's objectives are to deliver public infrastructure using labour-intensive methods in accordance with EPWP Guidelines.

Labour-intensive works

Labour-intensive works comprise the activities described in the Labour-Intensive Specification. Labour-intensive works shall be constructed/maintained using local workers who are temporarily employed in terms of the scope of work.

LABOUR-INTENSIVE COMPETENCIES OF SUPERVISORY AND MANAGEMENT STAFF

Contractors shall only engage supervisory and management staff in labour-intensive works that have completed the skills programme including Foremen/ Supervisors at NQF level 4 "National Certificate: Supervision of Civil Engineering Construction Processes" and Site Agent/ Manager at NQF level 5 "Manage Labour-Intensive Construction Processes" or equivalent QCTO qualifications (See Appendix C). at NQF outlined in Table 1. (See GUIDELINES FOR THE IMPLEMENTATION OF LABOUR-INTENSIVE INFRASTRUCTURE PROJECTS UNDER THE EXPANDED PUBLIC WORKS PROGRAMME (EPWP) -THIRD EDITION 2015)

Emerging contractors shall have personally completed, or be registered on a skills programme for the NQF level 2 unit standard. All other site supervisory staff in the employ of emerging contractors must have completed, or be registered on a skills programme for the NQF level 2 unit standards or NQF level 4 unit standards. Table 1: Skills programme for supervisory and management staff.

Table 1: Skills programme for supervisory and management staff

Personnel	NQF level	Unit standard titles	Skills programme description
Team leader / supervisor	2	Apply Labour-Intensive Construction Systems and Techniques to Work Activities	This unit standard must be completed, and
		Use Labour-Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	any one of these 3 unit standards
		Use Labour-Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour-Intensive Construction Methods to Construct, Repair and Maintain structures	

Personnel	NQF level	Unit standard titles	Skills programme description
Foreman/supervisor	4	Implement Labour-Intensive Construction Systems and Techniques	This unit standard must be completed, and
		Use Labour-Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	any one of these 3 unit standards
		Use Labour-Intensive Construction Methods to Construct and Maintain Water an Sanitation Services	
		Use Labour-Intensive Construction Methods to Construct, Repair and Maintain structures	
Site Agent /Manager (i.e. the contractor's most senior representative that is resident on the site)	5	Manage Labour-Intensive Construction Processes	Skills Programme against this single unit standard
Details of these skills programmes may be obtained from the CETA ETQA manager (e-mail :gerard@ceta.co.za , tel: 011-265 5900)			

EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR-INTENSIVE WORKS

1.1 Requirements for the sourcing and engagement of labour.

1.1.1 Unskilled and semi-skilled labour required for the execution of all labour-intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour.

1.1.2 The rate of pay set for the SPWP per task or per day will be an acceptable rate determined by the Department of Labour.

1.1.3 Tasks established by the contractor must be such that:

a) the average worker completes 5 tasks per week in 40 hours or less; and
b) the weakest worker completes 5 tasks per week in 55 hours or less.

1.1.4 The contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of 1.1.3.

1.1.5 The Contractor shall, through all available community structures, inform the local community of the labour-intensive works and the employment opportunities presented thereby. Preference must be given to people with previous practical experience in construction and / or who come from households:

a) where the head of the household has less than a primary school education;
b) that have less than one full time person earning an income;
c) where subsistence-agriculture is the source of income.
d) that who are not in receipt of any social security pension income

1.1.6 The Contractor shall endeavour to ensure that the expenditure on the employment of unskilled and semi-skilled workers is in the following proportions:

a) 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 excavateable material

Hand excavateable material is material:

a) Granular materials:

i) whose consistency when profiled may in terms of table 1 be classified as very loose, loose, medium dense, or dense; or

ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 15 blows of a dynamic cone penetrometer is required to penetrate 100mm;

b) Cohesive materials:

i) whose consistency when profiled may in terms of table 1 be classified as very soft, soft, firm, stiff and stiff / very stiff; or

ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 8 blows of a dynamic cone penetrometer is required to penetrate 100mm;

Note: 1) A boulder, a cobble and gravel is material with a particle size greater than 200mm, between 60 and 200mm.

2) A dynamic cone penetrometer is an instrument used to measure the in-situ shear resistance of a soil comprising a drop weight of approximately 10 kg which falls through a height of 400mm and drives a cone having a maximum diameter of 20mm (cone angle of. 60 degrees with respect to the horizontal) into the material being used.

Table 2: Consistency of materials when profiled

GRANULAR MATERIALS		COHESIVE MATERIALS	
CONSISTENCY	**DESCRIPTION**	**CONSISTENCY**	**DESCRIPTION**
Very loose	Crumbles very easily when scraped with a geological pick.	Very soft	Geological pick head can easily be pushed in as far as the shaft of the handle.
Loose	Small resistance to penetration by sharp end of a geological pick.	Soft	Easily dented by thumb; sharp end of a geological pick can be pushed in 30-40 mm; can be moulded by fingers with some pressure.
Medium dense	Considerable resistance to penetration by sharp end of a geological pick.	Firm	Indented by thumb with effort; sharp end of geological pick can be pushed in upto 10 mm; very difficult to mould with fingers; can just be penetrated with an ordinary hand spade.
Dense	Very high resistance to penetration by the sharp end of a geological pick; requires many blows for excavation.	stiff	Can be indented by thumb-nail; slight indentation produced by pushing geological pick point into soil; cannot be moulded by fingers.
Very dense	High resistance to repeated blows of a geological pick.	Very stiff	Indented by thumb-nail' with difficulty; slight indentation produced by blow of a geological pick point.

4 Trench excavation

All hand excavateable material in trenches having a depth of less than 1,5 metres shall be excavated by hand.

5 Compaction of backfilling to trenches (areas not subject to traffic)

Backfilling to trenches shall be placed in layers of thickness (before compaction) not exceeding 100mm. Each layer shall be compacted using hand stampers

a) to 90% Proctor density;

b) such that in excess of 5 blows of a dynamic cone penetrometer (DCP) is required to penetrate 100 mm of the backfill, provided that backfill does not comprise more than 10% gravel of size less than 10mm and contains no isolated boulders, or

c) such that the density of the compacted trench backfill is not less than that of the surrounding undisturbed soil when tested comparatively with a DCP.

6 Excavation

All hand excavateable material including topsoil classified as hand excavateable shall be excavated by hand. Harder material may be loosened by mechanical means prior to excavation by hand.

The excavation of any material which presents the possibility of danger or injury to workers shall not be excavated by hand.

7 Clearing and grubbing

Grass and small bushes shall be cleared by hand.

8 Shaping

All shaping shall be undertaken by hand.

9 Loading

All loading shall be done by hand, regardless of the method of haulage.

10 Haul

Excavation material shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150 m.

11 Offloading

All material, however transported, is to be off-loaded by hand, unless tipper-trucks are utilised for haulage.

12 Spreading

All material shall be spread by hand.

13 Compaction

Small areas may be compacted by hand provided that the specified compaction is achieved.

14 Grassing

All grassing shall be undertaking by sprigging, sodding, or seeding by hand.

15 Stone pitching and rubble concrete masonry

All stone required for stone pitching and rubble concrete masonry, whether grouted or dry, must be collected, loaded, off loaded and placed by hand.

Sand and stone shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150m.

Grout shall be mixed and placed by hand.

16 Manufactured Elements

Elements manufactured or designed by the Contractor, such as manhole rings and cover slabs, precast concrete planks and pipes, masonry units and edge beams shall not individually, have a mass of more than 320kg. In addition, the items shall be large enough so that four workers can conveniently and simultaneously acquire a proper handhold on them.

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: 50 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 26 days (ref. SL 11.02.01)				
1	3	Travelling (based on 50km/EPWP beneficiary)	km	2500		
1	4	Profit and attendance on Items 1, 2 & 3	%			
1		**EMPLOYMENT OF EPWP BENEFICIARY**				
1	5	Employment of EPWP beneficiary (30 youth) [New Office Block]	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 6 months appointment for EPWP beneficiary				
1	6	Employment of EPWP beneficiary(40 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 110/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 (30 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 120/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 100 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 100 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				

ADDITIONAL SPECIFICATION - EPWP

SL **EMPLOYMENT AND TRAINING OF EPWP BENEFICIARY ON THE EXPANDED PUBLIC WORKS PROGRAMME (EPWP) Infrastructure Projects:**

CONTENTS

SL 01 SCOPE
SL 02 TERMINOLOGY AND DEFINITIONS
SL 03 APPLICABLE LABOUR LAWS
SL 04 EXTRACTS FROM MINISTERIAL DETERMINATION REGARDING EPWP
SL 05 EMPLOYER'S RESPONSIBILITIES
SL 06 PLACEMENT OF RECRUITED EPWP BENEFICIARY
SL 07 TRAINING OF YOUTH WORKERS
SL 08 BENEFICIARY (EPWP BENEFICIARY) SELECTION CRITERIA
SL 09 CONTRACTUAL OBLIGATIONS IN RELATION TO EPWP BENEFICIARY
SL 10 PROVINCIAL RATES OF PAY
SL 11 MEASUREMENTS AND PAYMENT
EXAMPLE EPWP EMPLOYMENT AGREEMENT

SL 01 SCOPE

This project is part of the Expanded Public Works Programme aims to train young people and provide them with practical work experience as part of this programme. Youth aged between 18 and 35 will be recruited and trained in skills relevant to the work to be done on this project. These youth will have to be employed by the contractor as part of this project so that they can gain their work experience on these projects. The training of the youth will be coordinated and implemented by a separate service provider. This service provider will provide the contractor with a list of all the youth and the training each of these youth have received. The Contractor will be required to employ all of these youth for a minimum period of 6 months. Furthermore the Contractor will be required to supervise these youth to ensure that the work they perform is of the required standard. If necessary the contractor's staff will be required to assist and mentor the youth to ensure that they are able to perform the type of work they need to do to the satisfactory standards required. The contractor will not be required to employ all youth in the programme at the same time, but may rotate the youth on the project, as long as all youth are employed for the minimum duration stated earlier.

This specification contains the standard terms and conditions for workers employed in elementary occupations and trained on a Expanded Public Works Programme (EPWP) for the Infrastructure Programme.

SL 02 TERMINOLOGY AND DEFINITIONS

SL 02.01 TERMINOLOGY

(a) EPWP The Code of Good Practice for Expanded Public Works Programmes, which has been gazetted by the Department of Labour, and which provides for special conditions of employment for these EPWP projects. In terms of the Code of Good Practice, the workers on these projects are entitled to formal training, which will be provided by training providers appointed (and funded) by the Department of Labour. For projects of up to six months in duration, this training will cover life-skills and information about other education, training and employment opportunities.

(b) EPWP Expanded Public Works Programme, a National Programme of the government of South Africa, approved by Cabinet.

(c) UYF Umsobumvu Youth Fund.

(d) DOL Department of Labour.

SL 02.02 DEFINITIONS

(a)	"employer"	means the contractor or any party employing the worker / beneficiary under the EPWP Programme.
(b)	"client"	means the Department of Public Works.
(c)	" worker / trainee"	means any person working or training in an elementary occupation on a EPWP.

SL 03 APPLICABLE LABOUR LAWS

In line with the Expanded Public Works Programme (EPWP) policies, the Ministerial Determination, Special Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of labour in government Notice No. R63 of 25 January 2002, of which extracts have been reproduced below in clauses SL 04 shall apply to works described in the scope of work and which are undertaken by unskilled or semi-skilled workers. The Code of Good Practise for Employment and Conditions of Work for Expanded Public Works Programmes, issued in terms of the Basic Conditions of Employment Act of 1997 by the Minister of Labour in Government Notice No. R64 of 25 January 2002 shall apply to works described in the scope of work and which unskilled or semi-skilled workers undertake.

SI 04 EXTRACTS FROM MINISTERIAL DETERMINATION REGARDING EPWP

SL 04.01 DEFINITIONS

(a) "department" means any department of the State, implementing agent or contractor;

(b) "employer" means any department that hires workers to work in elementary occupations on a EPWP;

(c) "worker" means any person working in an elementary occupation on a EPWP;

(d) "elementary occupation" means any occupation involving unskilled or semi-skilled work;

(e) "management" means any person employed by a department or implementing agency to administer or execute a EPWP;

(f) "task" means a fixed quantity of work;

(g) "task-based work" means work in which a worker is paid a fixed rate for performing a task;

(h) "task-rated worker" means a worker paid on the basis of the number of tasks completed;

(i) "time-rated worker" means a worker paid on the basis of the length of time worked

(j) "Service Provider" means the consultant appointed by Department to coordinate and arrange the employment and training of labour on EPWP infrastructure projects.

SL 04.02 TERMS OF WORK

(a) Workers on a EPWP are employed on a temporary basis.

(b) A worker may NOT be employed for longer than 24 months in any five-year cycle on a EPWP.

(c) Employment on a EPWP does not qualify as employment and a worker so employed does not have to register as a contributor for the purposes of the Unemployment

SL 04.03 NORMAL HOURS OF WORK

(a) An employer may not set tasks or hours of work that require a worker to work–

(i) more than forty hours in any week
(ii) on more than five days in any week; and
(iii) for more than eight hours on any day.

(b) An employer and a worker may agree that the worker will work four days per week. The worker may then work up to ten hours per day.

(c) A task-rated worker may not work more than a total of 55 hours in any week to complete the tasks (based on a 40-hour week) allocated to him.

Every work is entitled to a daily rest period of at least eight consecutive hours. The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next dav.

SL 04.04 MEAL BREAKS

(a) A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.

(b) An employer and worker may agree on longer meal breaks.

(c) A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.

SL 04.05 SPECIAL CONDITIONS FOR SECURITY GUARDS

(a) A security guard may work up to 55 hours per week and up to eleven hours per day.

(b) A security guard who works more than ten hours per day must have a meal break of at least one hour duration or two breaks of at least 30 minutes duration each.

SL 04.06 DAILY REST PERIOD

Every worker is entitled to a daily rest period of at least eight consecutive hours. The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next day.

SL 04.07 WEEKLY REST PERIOD

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

SL 04.08 WORK ON SUNDAYS AND PUBLIC HOLIDAYS

(a) A worker may only work on a Sunday or public holiday to perform emergency or security work.

(b) Work on Sundays is paid at the ordinary rate of pay.

(c) A task-rated worker who works on a public holiday must be paid –
  (i) the worker's daily task rate, if the worker works for less than four hours;
  (ii) double the worker's daily task rate, if the worker works for more than four hours.

(d) A time-rated worker who works on a public holiday must be paid –
  (i) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday;
  (ii) double the worker's daily rate of pay, if the worker works for more than four hours on the public holiday.

SL 04.09 SICK LEAVE

(a) Only workers who work four or more days per week have the right to claim sick-pay in terms of this clause.

(b) A worker who is unable to work on account of illness or injury is entitled to claim one day's paid sick leave for every full month that the worker has worked in terms of a

(c) A worker may accumulate a maximum of twelve days' sick leave in a year.

(d) Accumulated sick-leave may not be transferred from one contract to another contract.

(e) An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.

(f) An employer must pay a time-rated worker the worker's daily rate of pay for a day's sick leave.

(g) An employer must pay a worker sick pay on the worker's usual payday.

(h) Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is –

(i) absent from work for more than two consecutive days; or

(ii) absent from work on more than two occasions in any eight-week period.

(i) A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity.

(j) A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Diseases Act.

SL 04.10 MATERNITY LEAVE

(a) A worker may take up to four consecutive months' unpaid maternity leave.

(b) A worker is not entitled to any payment or employment-related benefits during maternity leave.

(c) A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.

(d) A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.

(e) A worker may begin maternity leave –

(i) four weeks before the expected date of birth; or

(ii) on an earlier date –

(1) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or

(2) if agreed to between employer and worker; or

(iii) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.

(f) A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth.

(g) A worker who returns to work after maternity leave, has the right to start a new cycle of twenty-four months employment, unless the EPWP on which she was employed has ended.

SL 04.11 FAMILY RESPONSIBILITY LEAVE

(a) Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances -

(i) when the employee's child is born;

(ii) when the employee's child is sick;

(iii) in the event of the death of –

(1) the employee's spouse or life partner

(2) the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling

SL 04.12 STATEMENT OF CONDITIONS

(a) An employer must give a worker a statement containing the following details at the start of employment –

(i) the employer's name and address and the name of the EPWP;

(ii) the tasks or job that the worker is to perform;

(iii) the period for which the worker is hired or, if this is not certain, the expected duration of the contract;

(iv) the worker's rate of pay and how this is to be calculated;

(v) the training that the worker may be entitled to receive during the EPWP.

(b) An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement.

(c) An employer must supply each worker with a copy of the relevant conditions of employment contained in this specification.

(d) An employer must enter into a formal contract of employment with each employee. A copy of a pro-forma is attached at the end of this specification.

SL 04.13 KEEPING RECORDS

(a) Every employer must keep a written record of at least the following –

(i) the worker's name and position;

(ii) in the case of a task-rated worker, the number of tasks completed by the worker;

(iii) in the case of a time-rated worker, the time worked by the worker;

(iv) payments made to each worker.

(b) The employer must keep this record for a period of at least three years after the completion of the EPWP.

SL 04.14 PAYMENT

(a) A task-rated worker will only be paid for tasks that have been completed.

(b) An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer. Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.

(c) A time-rated worker will be paid at the end of each month and payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.

(d) Payment in cash or by cheque must take place –

(i) at the workplace or at a place agreed to by at least 75% of the workers; and

(ii) during the worker's working hours or within fifteen minutes of the start or finish of work;

(e) All payments must be enclosed in a sealed envelope which becomes the property of the worker.

(f) An employer must give a worker the following information in writing –

(i) the period for which payment is made;

(ii) the number of tasks completed or hours worked;

(iii) the worker's earnings;

(iv) any money deducted from the payment;

(v) the actual amount paid to the worker.

(g) If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it.

(h) If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

SL 04.15 DEDUCTIONS

(a) An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.

(b) An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.

(c) An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned.

(d) An employer may not require or allow a worker to –

(i) repay any payment except an overpayment previously made by the employer by mistake;

(ii) state that the worker received a greater amount of money than the employer actually paid to the worker; or

(iii) pay the employer or any other person for having been employed.

SL 04.16 HEALTH AND SAFETY

(a) Employers must take all reasonable steps to ensure that the working environment is healthy and safe and that all legal requirements regarding health and safety are strictly adhered to.

(b) A worker must:

(i) work in a way that does not endanger his/her health and safety or that of any other person;

(ii) obey any health and safety instruction;

(iii) obey all health and safety rules;

(iv) use any personal protective equipment or clothing issued by the employer;

(v) report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

SL 04.17 COMPENSATION FOR INJURIES AND DISEASES

(a) It is the responsibility of employers to arrange for all persons employed on a EPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.

(b) A worker must report any work-related injury or occupational disease to their employer or manager.

(c) The employer must report the accident or disease to the Compensation Commissioner.

(d) An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

SL 04.18 TERMINATION

(a) The employer may terminate the employment of a worker provided he has a valid reason and after following existing termination procedures.

(b) A worker will not receive severance pay on termination.

(c) A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement.

(d) A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

(e) A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

SL 04.19 CERTIFICATE OF SERVICE

(a) On termination of employment, a worker is entitled to a certificate stating –

(i) the worker's full name;
(ii) the name and address of the employer;
(iii) the SPWP on which the worker worked;
(iv) the work performed by the worker;
(v) any training received by the worker as part of the EPWP;
(vi) the period for which the worker worked on the EPWP;
(vii) any other information agreed on by the employer and worker.

SL 05 EMPLOYER'S RESPONSIBILITIES

The employer shall adhere to the conditions of employment as stipulated in the *Code of Good Practice for Employment and Conditions of Work for Expanded Public Works Programmes*. Over and above the conditions stipulated above, he shall be responsible to:

(a) formulate and design a contract between himself/ herself and each of the recruited EPWP beneficiary, ensuring that the contract does not contravene any of the Acts stipulated in South African Law, e.g. Basic Conditions of Employment Act, etc. (A copy of a pro-forma contract is attached at the end of this specification);

(b) screen and select suitable candidates for employment from the priority list of EPWP beneficiary provided by the Umsobumvu Youth Fund (UYF);

(c) ensure that the recruited EPWP beneficiary are made available to receive basic life skills training which will be conducted and paid for by the Umsobumvu Youth Fund;

(d) ensure that all EPWP beneficiary receive instruction on safety on site prior to them commencing with work on site;

(e) ensure that all EPWP beneficiary are covered under workmen's compensation for as long as they are contracted to the contractor. Payment to the Compensation Commissioner shall be the responsibility of the contractor;

(f) assist in the identification and assessment of potential EPWP beneficiary to undergo advanced technical training in respective trades;

(g) test and implement strict quality control and to ensure that the health and safety regulations are adhered to;

(h) provide all EPWP beneficiary with the necessary protective clothing as required by law for the specific trades that they are involved in.

(i) provide overall supervision and day-to-day management of EPWP beneficiary and/or sub-contractors; and

(j) ensure that all EPWP beneficiary are paid their wages on time through a pre-agreed payment method as stipulated in the contract with the EPWP beneficiary.

SL 06 PLACEMENT OF RECRUITED EPWP BENEFICIARY

Employers will be contractually obliged to:

(a) employ EPWP beneficiary from targeted social groups from the priority list provided by the Service Provider/ Umsobumvu Youth Fund.

(b) facilitate on-the-job training and skills development programmes for the EPWP beneficiary;

(c) achieve the following minimum employment targets:

(i) 55% people between the ages of 18 and 35

(ii) 55% women;

(iii) 2% people with disabilities.

(d) brief EPWP beneficiary on the conditions of employment as specified in sub clause SL 04.09 above;

(e) enter into a contract with each EPWP beneficiary, which contract will form part of the Employment Agreement;

(f) allow EPWP beneficiary the opportunity to attend life skills training through DOL. This shall be arranged at the beginning of the contract;

(g) ensure that payments to EPWP beneficiary are made as set out in sub clauses SL 04.14 and SL 04.15 above.

(h) set up of personal profile files as prescribed by EPWP beneficiary and as set out in sub clause SL 04.13 above.

(i) in addition to (h)
- a copy of the I.D;
- qualifications;
- career progress;
- EPWP Employment Agreement, and
- list of small trade tools;

must be included in the EPWP beneficiary's personal profile file.

SL 07 TRAINING OF EPWP BENEFICIARY

Three types of training are applicable, namely

- Life skills;
- On the job training and
- Technical Skills training.

Training will be implemented by training instructors accredited by DOL and/or CETA :

- EPWP beneficiary shall be employed on the projects for an average of 6 months.
- EPWP beneficiary shall be deployed on projects in the vicinity of their homes. The same arrangements as for other workers regarding accommodation, subsistence and travel shall be applicable to EPWP beneficiary.

(a) Life skills training

All EPWP beneficiary are entitled to undergo life skills training. Training of this module will be flexible enough to meet the needs of the employer. Training should take place immediately after site hand-over and during the period of site establishment and pre-planning before actual construction starts, alternatively this will be spread over the duration of the contract period. The contractor will be required to work closely with the person to schedule the training sessions so that the timing of the training is aligned with the contractors work schedule and his demand for workers.

(b) On-the job training

The Employer shall provide EPWP beneficiary with on-the-job training to enable them to fulfil their employment requirements. The employer shall also be expected to closely monitor the job performance of EPWP beneficiary and shall identify potential EPWP beneficiary for skills development programmes.

(c) Technical skills training
The Employer shall assist in identifying EPWP beneficiary for further training. These EPWP beneficiary will undergo further technical training to prepare them for opportunities as semi-skilled labourers.

Such training will comprise of an off-site theoretical component and practical training on-site. The contractor will be responsible for on-site practical work under his supervision. EPWP beneficiary who graduate from the first phase of the training programme will be identified and given opportunities to register for skills development programmes. These can ultimately result in a accredited qualification. The programme will consist of theoretical instruction away from the construction site as well as on-site practical work under the supervision of the employer. Candidates will be entitled to employment to complete all training modules.

SL 08 BENEFICIARY (EPWP BENEFICIARY) SELECTION CRITERIA

SL 08.01 PREAMBLE

The *Code of Good Practise for Employment and Conditions of Work for Expanded Public Works Programmes* encourages:

- optimal use of locally-based labour in a Expanded Public Works Programme (EPWP);
- a focus on targeted groups which consist of namely youth, consisting of women, female-headed households, disabled and households coping with HIV/AIDS; and
- the empowerment of individuals and communities engaged in a SPWP through the provision of training.

SL 08.02 BENEFICIARY (EPWP BENEFICIARY) SELECTION CRITERIA

(a) The EPWP beneficiary of the programmes should preferably be non-working individuals from the most vulnerable sections of disadvantaged communities who do not receive any social security pension income. The local community must, through all structures available, be informed of and consulted about the establishment of any EPWP

(b) In order to spread the benefit as broadly as possible in the community, a maximum of one person per household should be employed, taking local circumstances into account.

(c) Skilled artisans from other areas may be employed if they have skills that are required for a project and there are not enough persons in the local communities who have those skills or who could undergo appropriate skills training. However, this should not result in more than 20% of persons working on a programme not being from local communities.

(d) Programmes should set participation targets for employment with respect to youth, single male- and female-headed households, women, people with disabilities, households coping with HIV/AIDS, people who have never worked, and those in long-term unemployment.

(e) The proposed targets as set out in sub clause SL 06 (c)

- 55% youth from 18 to 35 years of age;
- 55% women;
- 2% disabled.

SL 09 CONTRACTUAL OBLIGATIONS IN RELATION TO YOUTH LABOUR

The EPWP beneficiary to be employed in the programme (EPWP) shall be directly contracted to the employer. Over and above the construction and project management responsibilities, the employer will be expected to perform the tasks and responsibilities as set out in clause SL 05 above.

SL 10 PROVINCIAL RATES OF PAY

It is stipulated that youth workers on the EPWP receive a minimum of R 1 000 per month whilst working and R 600 per month whilst on training in ALL provinces. Should EPWP beneficiary be attending training whilst employed by the contractor, the contractor will still be responsible for payment to the EPWP beneficiary whilst at training.

SL 11 MEASUREMENTS AND PAYMENT

The number of EPWP beneficiary specified for this contract that will receive life skills training is 50 and technical training is 50

SL 11.01 PAYMENT FOR TRAINING OF EPWP BENEFICIARY (TARGET:- 50 EPWP BENEFICIARY)

SL 11.01.01 Skills development and Technical training for EPWP beneficiary for an average of 10 days ……(Prov.Sum)……..Unit: R/EPWP beneficiary

The above item is only applicable if DoL does not fund the Technical Training PRIOR to site handover.

SL 11.01.02 Penalty due to not meeting the target as in SL 11.01.01……..Unit: EPWP beneficiary

LESS R 2000 per EPWP beneficiary

SL 11.02 PAYMENT FOR TRAVELLING AND ACCOMMODATION DURING OFF-SITE TRAINING

SL 11.02.01 Life skills training for 26 days:

01 Travelling (based on 50 km/EPWP beneficiary) ……Unit: km

02 Accommodation……(Prov.Sum)…..Unit: R/EPWP beneficiary

03 Profit and attendance…… Unit: %

SL 11.02.02 Skilled development and Technical training:

01 Travelling (based on 50 km/EPWP beneficiary)……..Unit: km

02 Accommodation……(Prov.Sum)….Unit: R/EPWP beneficiary

03 Profit and attendance …… Unit: %

The units of measurement for sub items SL 11.02.01 (01) and SL 11.02.02 (01) above shall be the distance travelled in km by the EPWP beneficiary trained off site. The tendered rate shall include full compensation to safely transport the youth workers to and from the training venue/s.

The unit of measurement for sub items SL 11.02.01 (02) and SL 11.02.02 (02) above shall be the amounts in Rand expended for accommodation and daily meal allowances for the EPWP beneficiary trained off site that must be arranged by the contractor. Amounts quoted shall be corrected according to re-measurement based on actual invoices.

The tendered percentages under sub items SL 11.02.01 (03) and SL 11.02.02 (03) will be paid to the contractor on the value of each payment pertaining to the accommodation and advance meal allowances to cover his expenses in this regard.

SL 11.03 ALTERNATIVE WORKERS FOR THE PERIOD OF OFF-SITE TRAINING

SL 11.03.01 Life skills training for 26 days ..... Unit: worker-days

SL 11.03.02 Skilled development and Technical training for EPWP beneficiary for (.....) days..... Unit: worker-days

The unit of measurement shall be the number of EPWP beneficiary replaced while in training multiplied by the number of days absent from the site.

The rates tendered shall include full compensation for additional replacement labour during periods of off-site training.

SL 11.04 EMPLOYMENT OF EPWP BENEFICIARY

SL 11.04.01 Employment of EPWP beneficiary.....(Prov.Sum)¼.Unit: R/ worker-month

SL 11.04.02 Employment of EPWP beneficiary.....(Prov.Sum)¼.Unit: R/ worker-month

The unit of measurement shall be the number of EPWP beneficiary at the statutory labour rates of R ..... multiplied by the period employed in months and the rate tendered shall include full compensation for all costs associated with the employment of EPWP beneficiary and for complying with the conditions of contract. The cost for the training shall be excluded from this item. This item is based on 6 months appointment for EPWP beneficiary.

SL 11.05 PROVISION OF EPWP DESIGNED OVERALLS TO EPWP BENEFICIARY

SL 11.05.01 Supply EPWP designed overalls to EPWP beneficiary ..... (Prov.Sum).....Unit: R

EPWP beneficiary overalls should be orange (top and bottom) as per EPWP specification with the exception of Correctional Services contracts where the EPWP beneficiary top would be blue and the bottom orange.

SL 11.05.02 Profit and attendance..... Unit: %

An amount has been provided in the Schedule of Quantities under sub item SL 10.05.01 for the supply of EPWP designed overalls, as per the specification provided by the EPWP unit, arranged by the Service Provider. The Engineer will have sole authority to spend the amounts or part thereof. The tendered percentage under sub items SL 10.05.02 will be paid to the contractor on the value of each payment pertaining to the supply of overalls to cover his expenses in this regard.

SL 11.06 PROVISION OF SMALL TOOLS FOR EPWP BENEFICIARY

SL 11.06.01 Provide all EPWP beneficiary with prescribed tools for their respective trades. Specification for the mentioned tools to be provided by the EPWP Service Provider. These tools will become the property of the EPWP beneficiary after the completion of the programme.....(Prov.Sum)....Unit: **R 500-00** /youth worker

SL 11.06.02 Profit and attendance..... Unit: %

SL 11.07 APPOINTMENT OF EPWP BENEFICIARY TEAM LEADER/S

SL 11.07.01 Appointment of (_____) EPWP beneficiary team leader/s for the duration of the contract.....(Prov.Sum)..... Unit: R / EPWP beneficiary team leader

The EPWP beneficiary Team Leader will act as CLO/PLO to facilitate the project work between the EPWP beneficiary and the contractor. Umsobumvu Youth Fund can assist with the sourcing of EPWP beneficiary Team Leader for employment by the contractor.

SL 11.08 LIAISON WITH SERVICE PROVIDER .....Unit: hours

The tendered rate shall include full compensation for the cost of liaising with the Service Provider and Social Facilitators on all issues regarding the works.

(Insert Your Company Logo)

(This shall serve as the cover page on employment contracts for local labour)

EMPLOYMENT AGREEMENT

BETWEEN

[CONTRACTOR NAME].....

AND

[WORKER NAME].....

1. PARTIES

The Parties to this Agreement are -

1.1. Contractor: _____

herein represented by: _____

duly authorised thereto

And

1.2. Mr / Me: _____
[worker's name]

2. DEFINITIONS AND INTERPRETATION

2.1. In this Agreement and any Annexure thereto, unless inconsistent with or otherwise indicated by the context-

"Agreement"	means the contents of this Agreement.
"Company"	means the company that employs the worker
"Department"	means the Department of Public Works
"Worker"	is a person that performs a specific or necessary task or who completes tasks in a certain way
"EPWP"	The Expanded Public Works Programme is a government programme aimed at the alleviation of poverty and unemployment. The programme ensures the full engagement on Labour Intensive Methods of Construction (LIC) to contractors for skills development. The EPWP focuses at reducing unemployment by increasing economic growth by means of improving skills levels through education and training and improving the enabling environment for the industry to flourish.

3. PURPOSE

The purpose of this agreement is to:-

Ensure that the agreement is binding to both the Worker and the Employer.

4. TERMS AND CONDITIONS

- The worker will have no entitlement to the benefits of a full time employee, namely;

  _____

  _____

- The worker should not have the expectation that this contract will be renewed or extended.
- The worker will be subject to all laws, rules, policies, codes and procedures applicable to the;

  _____

- The worker must meet the standards and requirements of the contractor
- The worker must render his/her services during normal working hours of minimum of forty to fifty five hours in any week; which comprise of an eight-hour working day in a five-day week.

5. REMUNERATION

The worker will receive compensation to the amount of R_____00 which must be paid by the 25th or on the last day of each month.

6. ROLES AND RESPONSIBILITIES

6.1 Employer / Worker

- Work for _____ in terms of the period as specified in the employment agreement contract.
- Be available for and participate in all learning and work experience required by the company.
- Comply with workplace policies and procedures.
- Complete any attendance or any written assessment tools supplied by the contractor to record relevant workplace experience.
- Demonstrate willingness to grow and learn through work experience.

  Provide the following documentation to the employer,

  - Certified identity document not longer than 3 months
  - ID size photos
  - Sign employment contract

6.2 Employer

- Employ the worker for a period specified in the agreement.
- Provide the worker with appropriate work based experience in the work environment.
- Facilitate payments of wages / stipends.
- Keep accurate records of workers.
- Where a worker/ learner is disabled, the employer will have to provide in the additional needs e.g. special materials, learning aids and in some cases physical or professional support (such aids remain the property of the employer).
- Keep up to date records of learning and discuss progress with the intern on a regular basis.
- Apply fair disciplinary, grievance and dispute resolution procedures to the worker.
- Prepare an orientation/ induction course to introduce worker/ learner to the workplace and specific workplace requirements.
- Ensure the daily attendance register is signed by the worker.

7. DURATION.

This agreement commences on: _____

and

expires on: _____

8. BREACH.

If either party commits any breach of the terms of this contract (and fails to rectify it within 30 days of receipt of a written notice calling it to do so, then) the other party shall be entitled to terminate the contract or to claim specific performance without prejudice to any of its other legal rights, including its rights to claim damages.

9. CONDITIONS OF EMPLOYMENT

9.1. Meal Breaks

9.1.1 A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.

9.1.2 An employer and worker may agree on longer meal breaks.

9.1.3 A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.

9.1.4 A worker is not entitled to payment for the period of a meal break. However, a worker who is paid on the basis of time worked must be paid if the worker is required to work or to be available for work during the meal break.

9.2. Special Conditions for Security Guards (Only applicable to security Guards)

9.2.1 A security guard may work up to 55 hours per week and up to eleven hours per day.

9.2.2 A security guard who works more than ten hours per day must have a meal break of at least one hour or two breaks of at least 30 minutes each.

9.3. Weekly Rest Period

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

9.4. Work on Sundays and Public Holidays

9.4.1 A worker may only work on a Sunday or public holiday to perform emergency or security work.

9.4.2 Work on Sundays is paid at the ordinary rate of pay.

9.4.3 A task-rated worker who works on a public holiday must be paid;

(a) the worker's daily task rate, if the worker works for less than four hours;

(b) double the worker's daily task rate, if the worker works for more than four hours.

9.4.4 A time-rated worker who works on a public holiday must be paid

(a) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday;

(b) double the worker's daily rate of pay, if the worker works for more than four hours on the public holiday.

9.5 Sick leave

9.5.1 Only workers who work more than 24 hours per month have the right to claim sick-pay in terms of this clause.

9.5.2 A worker who is unable to work on account of illness or injury is entitled to claim one day's paid sick leave for every full month that the worker has worked in terms of a contract.

9.5.3 A worker may accumulate a maximum of twelve days' sick leave in a year.

9.5.4 Accumulated sick-leave may not be transferred from one contract to another contract.

9.5.5 An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.

9.5.6 An employer must pay a time-rated worker the worker's daily rate of pay for a day's sick leave.

9.5.7 An employer must pay a worker sick pay on the worker's usual payday.

9.5.8 Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is

(a) absent from work for more than two consecutive days; or

(b) absent from work on more than two occasions in any eight-week period.

9.5.9 A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity.

9.5.10 A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Diseases Act.

9.6. Maternity Leave

9.6.1 A worker may take up to four consecutive months' unpaid maternity leave.

9.6.2 A worker is not entitled to any payment or employment-related benefits during maternity leave.

9.6.3 A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.

9.6.4 A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.

9.6.5 A worker may begin maternity leave as follows;

(a) four weeks before the expected date of birth; or

(b) on an earlier date

(i) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or

(ii) if agreed to between employer and worker; or

(c) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.

10.6 A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth.

9.7. Family responsibility leave

9.7.1 Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances;

(a) when the employee's child is born;

(b) when the employee's child is sick;

(c) in the event of a death of

(i) the employee's spouse or life partner;

(ii) the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling.

9.8. Keeping Records

9.8.1 Every employer must keep a written record on site for the duration of the project and three (3) year after completion records should consists of at least the following;

(a) the worker's name and position;

(b) copy of an acceptable worker identification

(c) in the case of a task-rated worker the number of tasks completed by the worker;

(d) in the case of a time-rated worker, the time worked by the worker;

(e) payments made to each worker in a form of Proof of Payment, Payroll registers and the acknowledgement of payment receipt signed by the worker.

9.8.2 The employer must keep this record for a period of at least three years after the completion of the EPWP.

9.9. Payment

9.9.1 An employer must pay all wages at least monthly in cash or by cheque or into a bank account.

9.9.2 A worker may not be paid less than the Ministerial Determination wage rate.

9.9.3 A task-rated worker will only be paid for tasks that have been completed.

9.9.4 An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer.

9.9.5 A time-rated worker will be paid at the end of each month.

9.9.6 Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.

9.9.7 Payment in cash or by cheque must take place

(a) at the workplace or at a place agreed to by the worker;

(b) during the worker's working hours or within fifteen minutes of the start or finish of work;

(c) in a sealed envelope which becomes the property of the worker.

9.9.8 An employer must give a worker the following information in writing

(a) the period for which payment is made;

(b) the numbers of tasks completed or hours worked;

(c) the worker's earnings;

(d) any money deducted from the payment;

(e) the actual amount paid to the worker.

9.9.9 If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it.

9.9.10 If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

9.10. Inclement weather

If no work has begun on site, and if an employee has reported for work, the employee will be paid for four hours. Should work be stopped after the first four hours, the employee will be paid for the hours worked. Where the employer has given employees notice on the previous working day that no work will be available due to inclement weather, then no payment will be made.

9.11. Deductions

9.11.1 An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.

9.11.2 An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.

9.11.3 An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement of Law; court order or arbitration

9.11.4 It is the responsibility of the employers to arrange for all persons employed on a Project to be covered in terms of the Unemployment Insurance Fund Contributions Act, 2002 (Act No. 4 of 2002)

9.11.5 An employer may not require or allow a worker to

(a) repay any payment except an overpayment previously made by the employer by mistake;

(b) state that the worker received a greater amount of money than the employer actually paid to the worker; or

(c) pay the employer or any other person for having been employed.

9.12. Health and Safety

9.12.1 Employers must take all reasonable steps to ensure that the working environment is healthy and safe.

9.12.2 A worker must;

(a) work in a way that does not endanger his/her health and safety or that of any other person;

(b) obey any health and safety instruction;

(c) use any personal protective equipment or clothing issued by the employer;

(d) report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

9.13. Compensation for Injuries and Diseases

9.13.1 It is the responsibility of the employers to arrange for all persons employed on a Project to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993 as amended by COIDA Act 61, 1997.

9.13.2 A worker must report any work-related injury or occupational disease to their employer or manager.

9.13.3 The employer must report the accident or disease to the Compensation Commissioner.

9.13.4 An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

9.14. Termination

9.14.1 The employer may terminate the employment of a worker for good cause after following a fair procedure.

9.14.2 A worker will not receive severance pay on termination.

9.14.3 A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement.

9.14.4 A worker **who is absent for more than three consecutive days** without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available.

9.14.5 A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available.

Notice procedure is as follows;

- One week if employed for four weeks or less
- Two weeks if employed for more than four weeks but not more than a year
- Four weeks 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

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

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: **PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID**

Project Code: **063963** Tender No **ZNTU04194W**

IDENTITY NUMBER:

Day	Date	Time In	Signature	Time Out	Signature	Report On Any Formal Training Provided In The Reporting Month
WEEK 1						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
WEEK 2						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
WEEK 3						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
WEEK 4						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
WEEK 5						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
Total Days worked						

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

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: **063963** Project location name (area):_____

Name of Project: **PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID**

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:_____ **DPW Official/Consultant sign:**_____ **EPWP Official sign:**_____

Designation:_____ Designation:_____ Designation:_____

Date:_____ Date:_____ Date:_____

Contact no:_____ Contact no:_____ 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	
Email	
Tel (Office)	
Fax Number	
Cell Number	
Physical Address 1	
Physical Address 2	
Physical Address 3	
Physical Address 4	
Postal Address 1	
Postal Address 2	
Postal Address 3	
Postal Address 4	

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: 063963

Name of Project: PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

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: PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

Project Code: 063963

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

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

ANNEXURE 13
Scope Of Works Matrix

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

NAIDU CONSULTING

DPW : STORM DAMAGED SCHOOLS: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU NATAL

SCHOOL NAME: SIZUZULU PRIMARY SCHOOL

SCOPE OF WORK SCHEDULE

EXISTING BUILDINGS

SCHOOL NAME : SIZUZULU PRIMARY SCHOOL

		EXISTING BUILDINGS					
	SCOPE OF WORKS DESCRIPTION	BLOCK A	BLOCK B	BLOCK C	BLOCK D		EXTERNAL WORKS
1	**Remedial Works to Existing Structures**						
1.1	Replace old asbestos roof with new corrugated iron including new trusses						
1.2	Replace old damaged corrugated roof sheeting with new corrugated iron including new trusses						
1.3	Install hurricane clips		X				
1.4	Construction of v-drains around building				X		
1.5	Construction of new concrete aprons						
1.6	New gutters, downpipes, barge and facia boards	X	X	X	X		
1.7	Provision of new ceiling boards and cornices		X				
1.8	Provision of new ceiling boards and cornices for walkways only			X			
1.9	Beam filling plaster and paint						
1.10	Window burglar bars	X		X			
1.11	Replace glazing	X			X		
1.12	New door and frame	X					
1.13	Steel gate and lock	X		X			

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

NAIDU CONSULTING

DPW : STORM DAMAGED SCHOOLS: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU NATAL

SCHOOL NAME: SIZUZULU PRIMARY SCHOOL

SCOPE OF WORK SCHEDULE
EXISTING BUILDINGS

SCHOOL NAME : SIZUZULU PRIMARY SCHOOL

1.14	Scabble existing and lay new granolithic screed	X	X	X	X		
1.15	Rescreed floors			X			
1.16	Floor tilling repairs		X				
1.17	Plaster and paint work to internal walls	X	X	X			
1.18	Repaint door						
1.19	Install new jojo tanks	X		X	X		
1	**ELECTRICAL WORKS**	X		X	X		
2	**External Works**						
2.1	Provision of temporary accomodation	X					
2.2	Stormwater Management Berms & Earthworks						X
2.3	Provision of gas tank housing to outside of building	X					

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

NAIDU CONSULTING

DPW : STORM DAMAGED SCHOOLS: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU NATAL

SCHOOL NAME: SIZUZULU PRIMARY SCHOOL

SCOPE OF WORK SCHEDULE
EXISTING BUILDINGS

SCHOOL NAME : SIZUZULU PRIMARY SCHOOL

APPROVAL

DOE PLANNER	NAME	
	SURNAME	
	DATE	
DPW REPRESENTATIVE	NAME	
	SURNAME	
	DATE	
UMBAMBISANE CONSTRUCTION	NAME	
	SURNAME	
	DATE	
SCHOOL PRINCIPAL / SGB MEMBER	NAME	
	SURNAME	
	DATE	
PROJECT MANAGEMENT / PRINCIPAL AGENT	NAME	
	SURNAME	
	DATE	

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

ANNEXURE 14
Structural Engineers Project Specification Drawings

NAIDU CONSULTING (PTY) LTD

CIVIL & STRUCTURAL
ENGINEERING CONSULTANTS
ENGINEERING DEVELOPMENT

DRAWING REGISTER

Discipline : Sructural
Page : 1

D576 STORM DAMAGED SCHOOLS

Doc No :	Original Size :	REV	DRAWING TITLE	SCHOOL
D576-001	A3	0	REMEDY FOR MINOR CRACKS IN BRICKWORK	ALL
D576-002	A3	0	REMEDY FOR MAJOR CRACKS IN BRICKWORK	ALL
D576-003	A3	0	REMEDY FOR MINOR CRACKS IN BLOCKWORK	ALL
D576-004	A3	0	REMEDY FOR MAJOR CRACKS IN BLOCKWORK	ALL
D576-005	A3	0	REMEDY FOR CRACKS IN FACE BRICKWORK	ALL
D576-006	A3	0	UNDERPINNING DETAILS	ALL
D576-007	A3	0	SCREED REPAIRS	ALL
D576-008	A3	0	RESCREED DETAILS	ALL
D576-009	A3	0	ISOLATION JOINT DETAILS	ALL
D576-010	A3	2	TERRAFORCE RETAINING WALLS SECTION AND DETAILS UPTO A MAXIMUM HEIGHT OF 1.5M	ALL
D576-011	A3	2	TERRAFORCE RETAINING WALLS SECTION AND DETAILS UPTO A MAXIMUM HEIGHT OF 2.5M	ALL
D576-012	A3	3	TYPICAL SECTION THROUGH CONCRETE APRON AND SOAK AWAY DETAIL	ALL
D576-013	A3	1	TYPICAL ROOF SECTION	ALL
D576-014	A3	1	TY[PICAL V-DRAIN SECTION AND DETAILS	ALL
D576-015	A3	0	VERANDA SUPPORT POST DETAILS	ALL
-	-	-	DRAWING REMOVED	-
D576-017	A3	0	HEADWALL DETAILS	ALL
D576-018	A3	0	TEMPORARY BRACING DETAILS FOR PRECAST CONCRETE FENCE CLASSROOM	ALL
D576-019	A3	0	ROOF BRACKET FIXING DETAILS FOR PRECAST CONCRETE FENCE CLASSROOM	ALL
D576-020a	A3	1	7M RETAINING WALL SECTION AND DETAILS	ALL
D576-020b	A3	1	7M RETAINING WALL REINFORCEMENT DETAILS	ALL
D576-021	A3	0	REPAIR TO INTERSECTING STRUCTURAL WALLS THAT ARE CRACKED/LEANING	ALL
D576-022	A3	2	600mm V-DRAIN SECTION AND DETAILS, GUTTER BRACKET DETAILS.	ALL
D576-023	A3	0	NEW SURFACE BED SECTION	ALL
D576-024	A3	0	RETAINING WALL LAYOUT PLAN, SECTION AND DETAILS	ALL

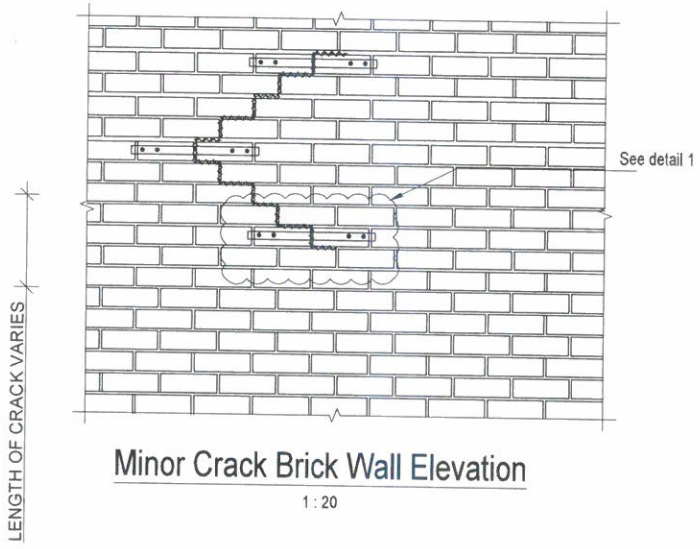
Description:
Minor Cracks are classified as cracks having a maximum width of 2mm.

Notes:
32mm wide Strap
1.6mm Thick
500mm Long Shot fixed into Brickwork.

SHOT FIXING: -- Where items are described as "shot fixed" these are to be fixed with an approved cartridge-assisted tool, and rates are to include for all nails, spikes,blanks, washers, cartridges, accessories, etc that is required to shot fix the item concerned

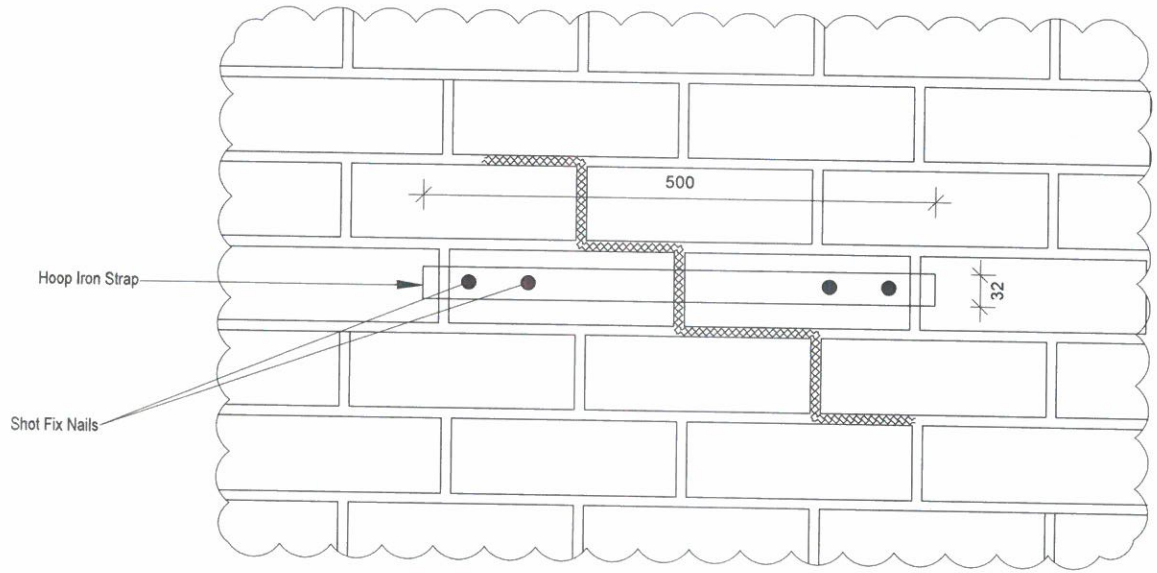
Method Statement : Break out plaster in vicinity of crack. Remove all dust and dirt thoroughly from cracks using mechanical means. Fill cracks with mortar. Install straps every 4th course. Straps to follow line of crack. Prior to the application of plaster finishes, the surfaces of the new or existing, brickwork, etc., are to be thoroughly cleaned, chipped, hacked,sloshed, etc., as necessary to ensure a satisfactory bond.

Repairs to be done on the interior and exterior if both sides have minor cracks.



Minor Crack Brick Wall Elevation

1 : 20



Detail 1 : Minor Crack

Scale 1 : 5

REVISIONS			
Rev.	Date	Description	By
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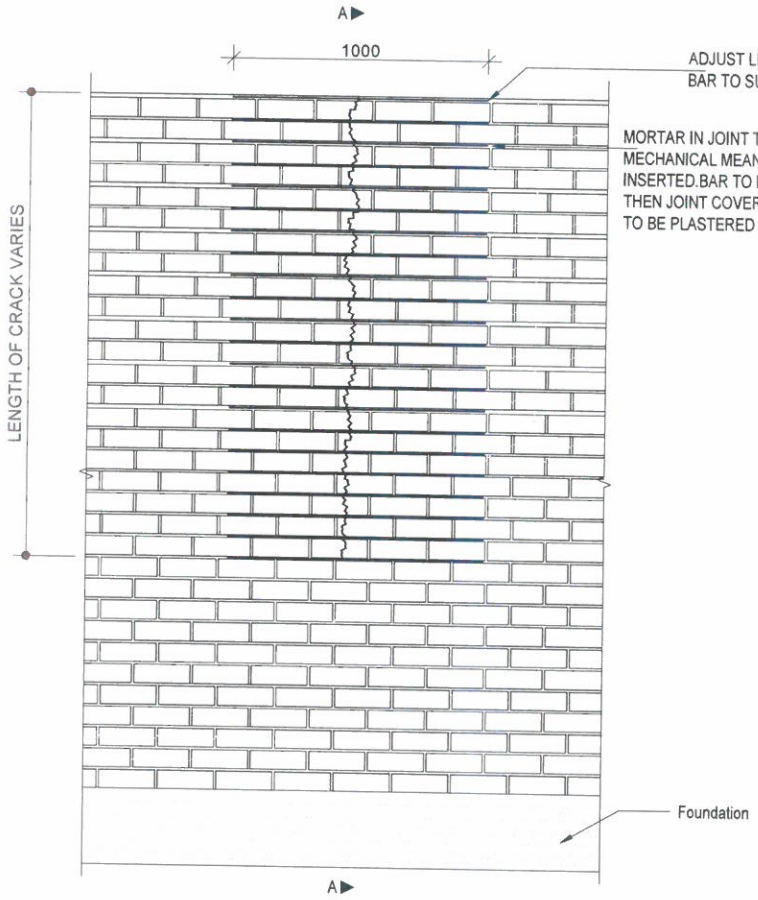
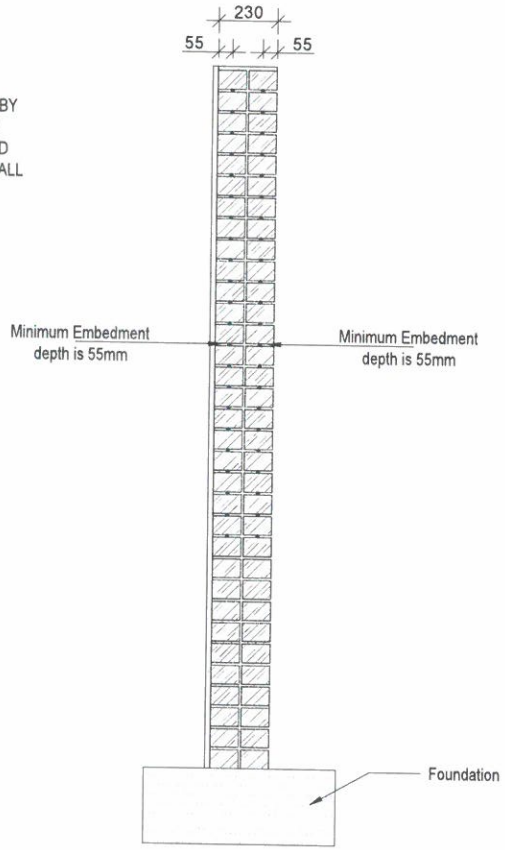
CLIENT public works Department: Public Works **PROVINCE OF KWAZULU-NATAL**	CLIENT DEPARTMENT education Department: Education PROVINCE OF KWAZULU-NATAL	CONSULTANTS Programme Managers : NAIDU CONSULTING (PTY) LTD Architect : ARTEK 4 ARCHITECTS Quantity Surveyors : HENCON & ASSOCIATES Electrical Engineers : DBA CONSULTING ENGINEERS Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD	PROJECT STORM DAMAGED SCHOOLS PROGRAMME DRAWING DESCRIPTION Remedy for Minor cracks in Brickwork	Scale As shown Project No. D576	Date 24/06/2016 Drawing No. 001	Drawn NM Rev. 00



Major Crack Brick Wall Elevation

1 : 20



Major Crack Brick Wall Section
Section A - A

1 : 20

Description:
Major Cracks are classified as cracks having a width of 2mm - 5mm.

Method Statement : Break out plaster in vicinity of crack. Remove all dust and dirt thoroughly from cracks . Fill cracks with epoxy resin injected from a cartridge System, insert non-corrodible R8 Steel Reinforcing bar and Cover the steel bar with Epoxy. Wall to be plastered after 7 days. Prior to the application of plaster finishes, the surfaces of the new or existing, brickwork, etc., are to be thoroughly cleaned, chipped, hacked, sloshed, etc., as necessary to ensure a satisfactory bond.

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PROVINCE OF KWAZULU-NATAL

CLIENT DEPARTMENT
education
Department:
Education
PROVINCE OF KWAZULU-NATAL

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

Scale: As shown
Date: 24/06/2016
Drawn: NM

DRAWING DESCRIPTION
Remedy for Major cracks in Brickwork

Project No.: D576
Drawing No.: 002
Rev.: 00

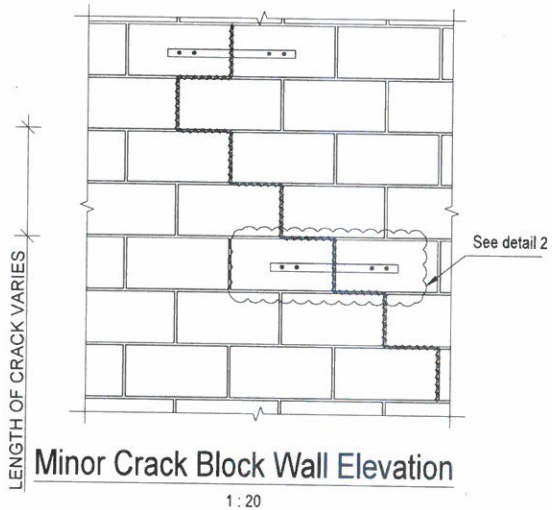
Description:
Minor Cracks are classified as cracks having a maximum width of 2mm.

Notes:
32mm wide Strap
1.6mm Thick
500mm Long Shot fixed into Brickwork.

SHOT FIXING: -- Where items are described as "shot fixed" these are to be fixed with an approved cartridge-assisted tool, and rates are to include for all nails, spikes,blanks, washers, cartridges, accessories, etc that is required to shot fix the item concerned

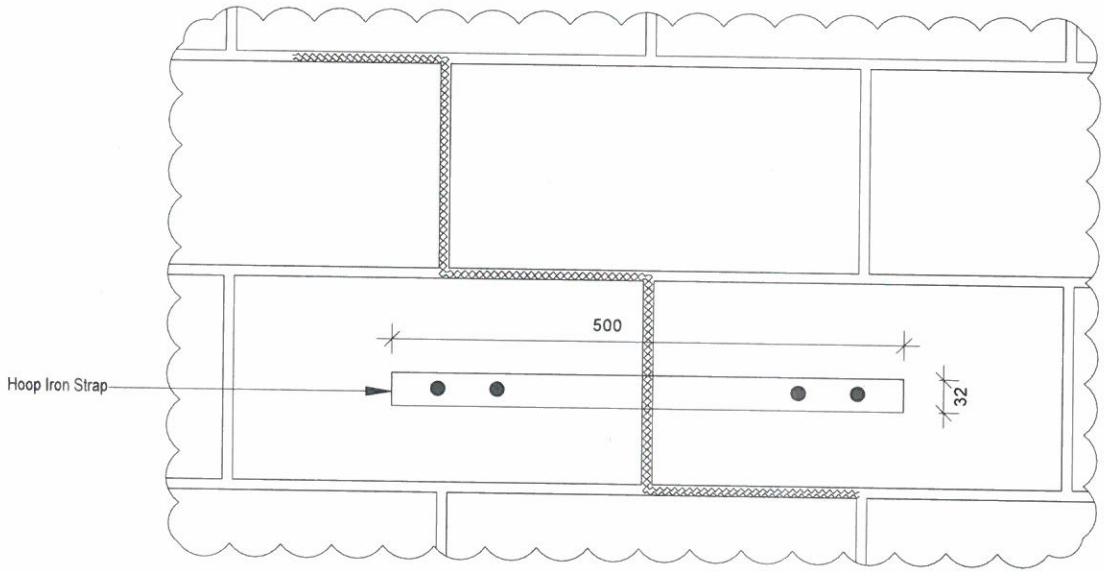
Method Statement : Break out plaster in vicinity of crack. Remove all dust and dirt thoroughly from cracks . Fill cracks with mortar. Install straps every 4th course. Straps to follow line of crack. Prior to the application of plaster finishes, the surfaces of the new or existing, brickwork, etc., are to be thoroughly cleaned, chipped, hacked, sloshed, etc., as necessary to ensure a satisfactory bond.

Repairs to be done on the interior and exterior if both sides have minor cracks.



Minor Crack Block Wall Elevation

1 : 20



Detail 2 : Minor Crack

Scale 1 : 5

REVISIONS			
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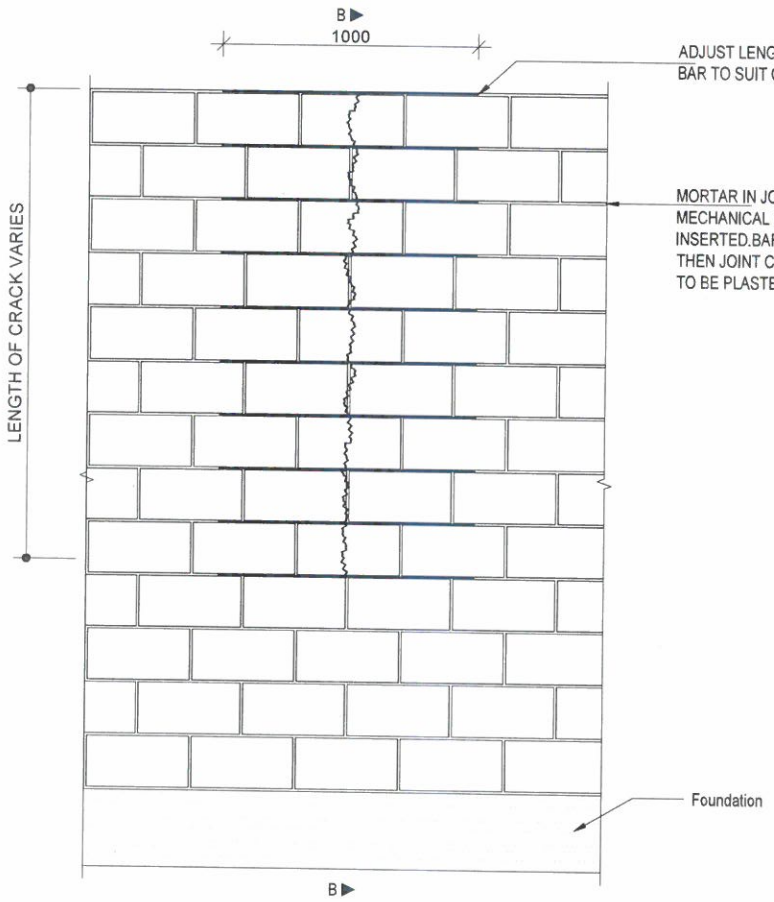
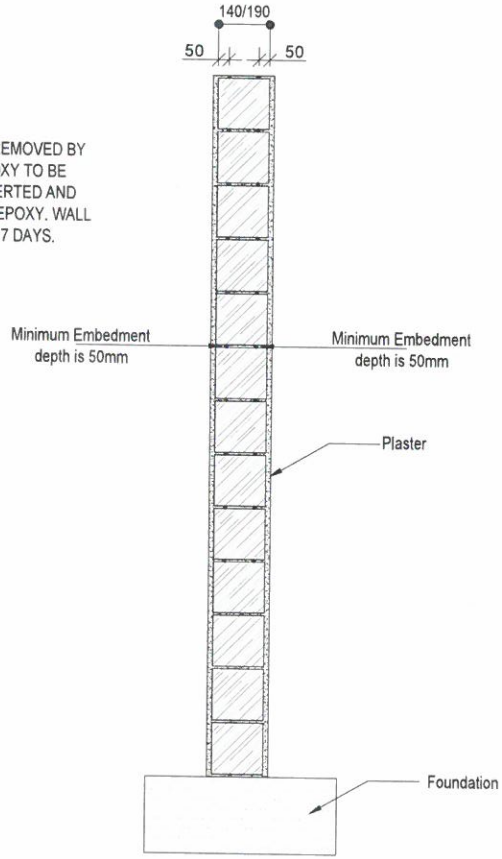
CLIENT public works Department: Public Works **PROVINCE OF KWAZULU-NATAL**	CLIENT DEPARTMENT education Department: Education PROVINCE OF KWAZULU-NATAL	CONSULTANTS Programme Managers : NAIDU CONSULTING (PTY) LTD Architect : ARTEK 4 ARCHITECTS Quantity Surveyors : HENCON & ASSOCIATES Electrical Engineers : DBA CONSULTING ENGINEERS Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD	PROJECT STORM DAMAGED SCHOOLS PROGRAMME DRAWING DESCRIPTION Remedy for Minor cracks in Blockwork	Scale As shown Project No. D576	Date 24/06/2016 Drawing No. 003	Drawn NM Rev. 00



Major Crack Block Wall Elevation

1 : 20



Major Crack Block Wall Section
Section B - B

1 : 20

Description:
Major Cracks are classified as cracks having a width of 2mm - 5mm.

Method Statement : Break out plaster in vicinity of crack. Remove all dust and dirt thoroughly from cracks . Fill cracks with epoxy resin injected from a cartridge System, insert non-corrodible R8 Steel Reinforcing bar and Cover the steel bar with Epoxy. Wall to be plastered after 7 days. Prior to the application of plaster finishes, the surfaces of the new or existing, brickwork, etc., are to be thoroughly cleaned, chipped, hacked, sloshed, etc., as necessary to ensure a satisfactory bond.

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Rev.	Date	Description	By
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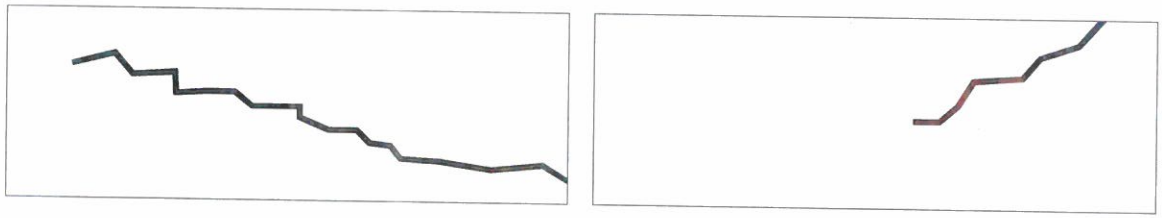
CLIENT public works Department: Public Works **PROVINCE OF KWAZULU-NATAL**	CLIENT DEPARTMENT education Department: Education PROVINCE OF KWAZULU-NATAL	CONSULTANTS Programme Managers : NAIDU CONSULTING (PTY) LTD Architect : ARTEK 4 ARCHITECTS Quantity Surveyors : HENCON & ASSOCIATES Electrical Engineers : DBA CONSULTING ENGINEERS Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD	PROJECT STORM DAMAGED SCHOOLS PROGRAMME	Scale As shown	Date 24/06/2016	Drawn NM
			DRAWING DESCRIPTION Remedy for Major cracks in Blockwork	Project No. D576	Drawing No. 004	Rev. 00



Cracks in Face Brickwork

Scale 1 : 2

Description:
Minor Cracks are classified as cracks having a maximum width of 2mm.

Method Statement : Remove all dust and dirt thoroughly from cracks. Water seal cracks with UV resistant and moisture resistant silicone sealant.

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public works
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Public Works
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Department:
Education
PROVINCE OF KWAZULU-NATAL

CONSULTANTS

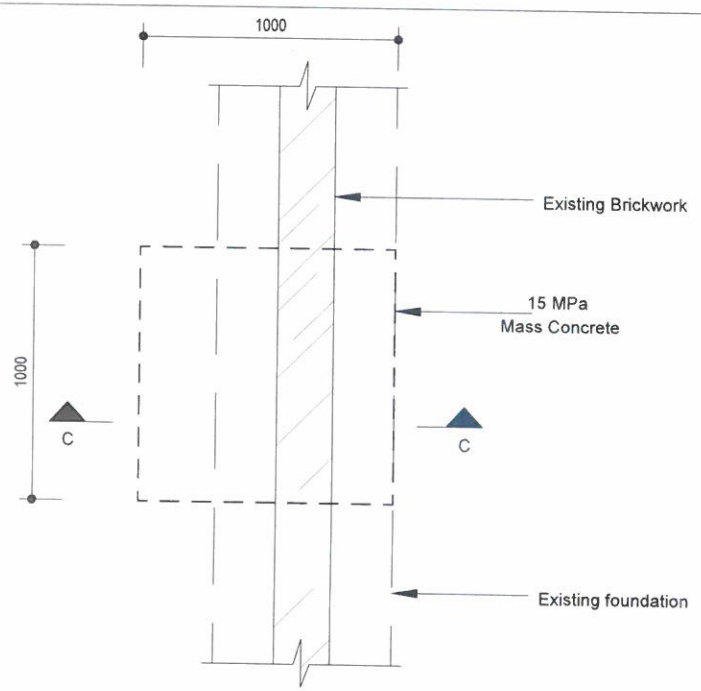
Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION
Remedy for cracks in Face Brickwork

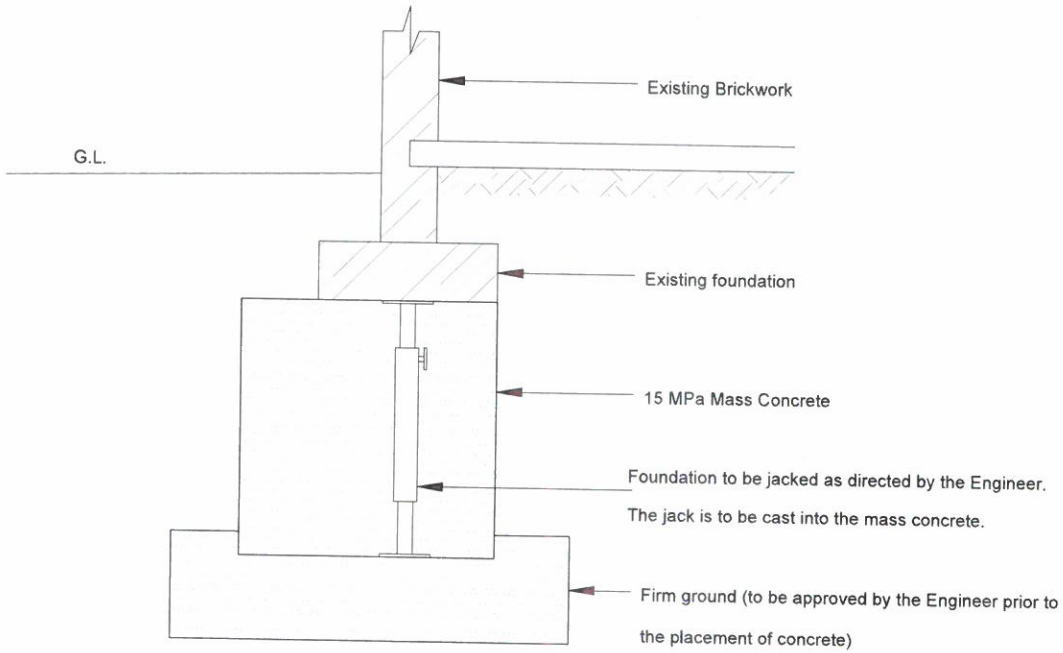
Scale	Date	Drawn
As shown	24/06/2016	NM

Project No.	Drawing No.	Rev.
D576	005	00



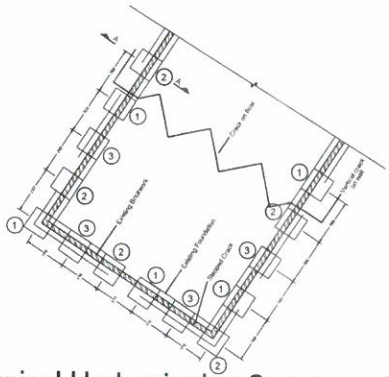
Typical Plan of Underpinning

Scale: N.T.S



Section C - C

Scale: N.T.S



Typical Underpinning Sequence layout Plan

Scale : N.T.S

Important Notes:

1. All dimensions shown on plan must be verified on site prior to construction.

2. Before undertaking any excavations the contractor shall locate any existing services in the vicinity and inform the Engineer if it has an impact on underpinning activities.

3. The excavations are to be protected from both weather and collapse, are to be kept clean and dry.

4. The Engineer must inspect the founding levels of the excavations at each underpinning point prior to the placement of concrete. Time between excavation and placing concrete to be done no longer than 24 hours.

5. Foundations to be jacked as directed by the Engineer.

6. Underpinning shall be carried out in accordance with the number sequence as noted on the drawing.

7. A minimum of 48 hours curing time shall be allowed before the commencement of any excavations for the next set of underpinning.

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Education
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CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
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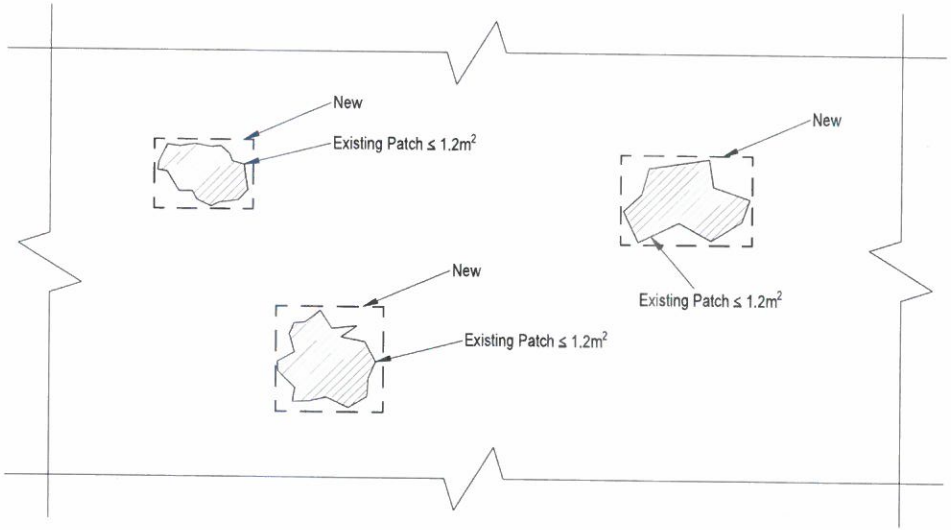
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

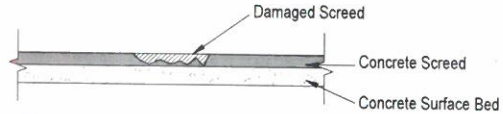
DRAWING DESCRIPTION
Underpinning details

Scale	Date	Drawn
As shown	24/06/2016	NM
Project No.	**Drawing No.**	**Rev.**
D576	006	00



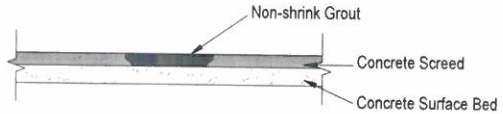
Rescreeding Floor in Patches / Holes in Screed Layout Plan

Scale 1 : 30



Typical Section Through Hole in Screed

Scale 1 : 20



Typical Section Through Repaired Screed

Scale 1 : 20

Note: Patched ≤ 1.2m²
Chip loose material away until a dense uniform surface of concrete is obtained.
Feathered edges shall be saw cut to form surfaces perpendicular to the concrete (minimum 20mm).
All Loose material and dust to be removed by water.
The cavity shall then be filled with a non-shrink cementitious grout.

REVISIONS			
Rev.	Date	Description	By
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Department:
Education
PROVINCE OF KWAZULU-NATAL

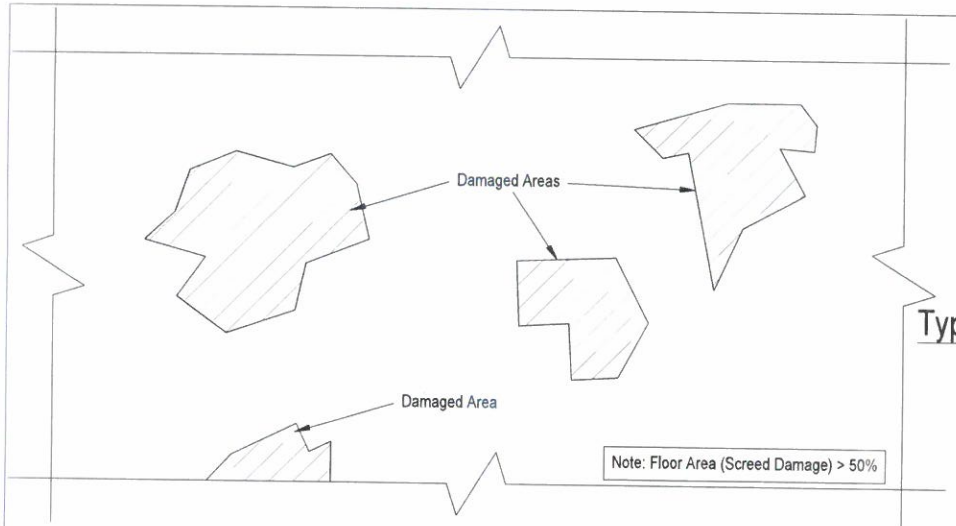
CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

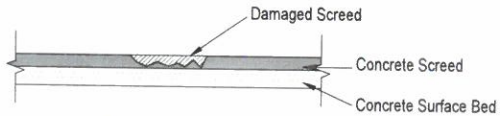
DRAWING DESCRIPTION
Screed Repairs

Scale	Date	Drawn
As shown	24/06/2016	NM
Project No.	Drawing No.	Rev.
D576	007	00



Detail for Rescreeding Entire Floor

Scale 1 : 30

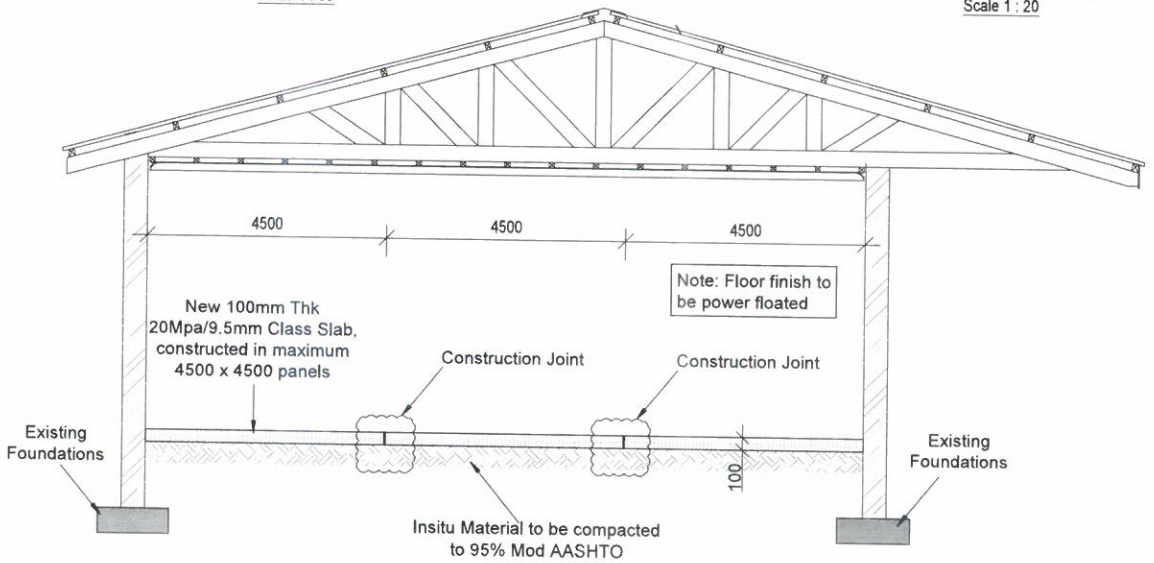


Typical Section Through Damaged Screed

Scale 1 : 20

Typical Section Through Repaired Screed

Scale 1 : 20



SURFACE BED RESCREED SECTION

SCALE N.T.S

Notes

125mm Thick Surface bed rescreed to be 25Mpa/19mm class concrete, Constructed in maximum 4500mm by 4500mm sections with construction joints between them.

EXPANSION JOINT SEALANTS: - approved polysulphide sealants complying with SABS Specification 110. Type 2, well compacted into joint and neatly pointed.

Floor Preparation - New and Existing (old) Screeds

Use of screed smoothing compounds should be avoided except for making minor repairs, however should a full skim be required, then the most common method in both instances is the use of a smoothing compound e.g. **Pavelite** in combination with **Pavelite**

Bonding Liquid, mixed to the correct ratio and consistency. Only recommended products,

mixed strictly in accordance with manufacturers instruction should be used. Do not use smoothing compound on power floated finishes. It is recommended that in new structures the screeding should be as specified by "Tal" using "Screedmaster", the pumped method. A badly undulating floor may require grinding by mechanical means to improve the overall levelness. Although smoothing compounds such as **Pavelite** will improve the sub-floor it will not achieve perfection.

In cases where old vinyl floor coverings have been uplifted, leaving a bitumen adhesive residue, it is recommended that a strict procedure relating to the "Preparation of Sub Floors with Bitumen Residue", be complied with. (This method may not constitute good flooring practice, but has proved to be successful on many occasions. No guarantee is however given or implied).

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 m2 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.

REVISIONS			
Rev.	Date	Description	By
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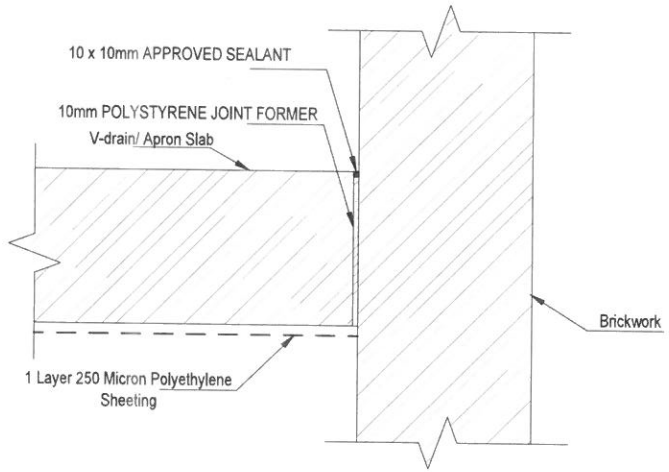
CLIENT public works Department: Public Works **PROVINCE OF KWAZULU-NATAL**	CLIENT DEPARTMENT education Department: Education PROVINCE OF KWAZULU-NATAL	CONSULTANTS Programme Managers : NAIDU CONSULTING (PTY) LTD Architect : ARTEK 4 ARCHITECTS Quantity Surveyors : HENCON & ASSOCIATES Electrical Engineers : DBA CONSULTING ENGINEERS Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD	PROJECT STORM DAMAGED SCHOOLS PROGRAMME DRAWING DESCRIPTION Rescreed details	Scale As shown Project No. D576	Date 24/06/2016 Drawing No. 008	Drawn NM Rev. 00



ISOLATION JOINT

1 : 10

REVISIONS			
Rev.	Date	Description	By
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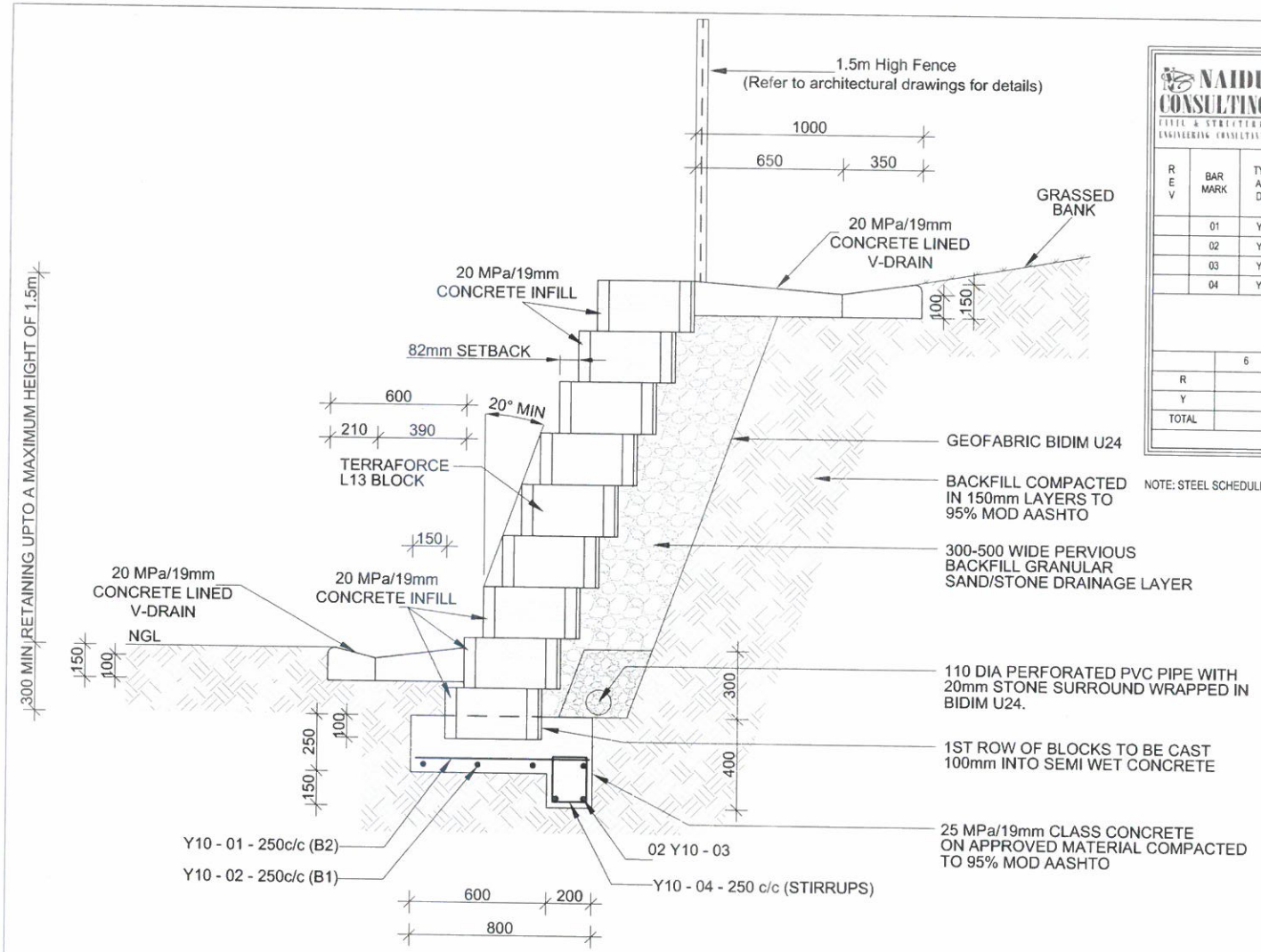
CLIENT public works Department: Public Works **PROVINCE OF KWAZULU-NATAL**	CLIENT DEPARTMENT education Department: Education PROVINCE OF KWAZULU-NATAL	CONSULTANTS Programme Managers : NAIDU CONSULTING (PTY) LTD Architect : ARTEK 4 ARCHITECTS Quantity Surveyors : HENCON & ASSOCIATES Electrical Engineers : DBA CONSULTING ENGINEERS Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD	PROJECT STORM DAMAGED SCHOOLS PROGRAMME DRAWING DESCRIPTION Isolation Joint details	Scale As shown Project No. D576	Date 24/06/2016 Drawing No. 009	Drawn NM Rev. 00



NAIDU CONSULTING
CIVIL & STRUCTURAL ENGINEERING CONSULTANTS

REFERENCE DRAWING Nos. - REF.DRAWING REV: REV DATE: DATE

REV	BAR MARK	TYPE AND DIA.	NO. PER UNIT	NO. OF UNITS	TOTAL NO.	CUTTING LENGTH (mm)	SHAPE CODE	DIMENSIONS A (mm)	B (mm)	C (mm)	D (mm)	E/R (mm)
	01	Y10	10	1	10	700	20	700				
	02	Y10	04	1	04	2200	20	2200				
	03	Y10	02	1	02	2200	20	2200				
	04	Y10	02	1	09	700	60	100	200			

	6	8	10	12	16	20	25	32	40	TOTAL
R										
Y			16							16
TOTAL			16							16

NOTE: STEEL SCHEDULE IS FOR THE FOUNDATIONS FOR A 2M LENGTH OF RETAINING WALL

TYPICAL SECTION OF TERRAFORCE BLOCK RETAINING WALL RETAINING UPTO A MAXIMUM HEIGHT OF 1.5m

SCALE 1:20

NOTES :

1) CONCRETE GRADE 20/19 Mpa.
2) COVER TO STEEL 40mm MIN.

REVISIONS			
Rev.	Date	Description	By
02	04/08/2016	Change Concrete grade	NM

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education
Department:
Education
PROVINCE OF KWAZULU-NATAL

CONSULTANTS

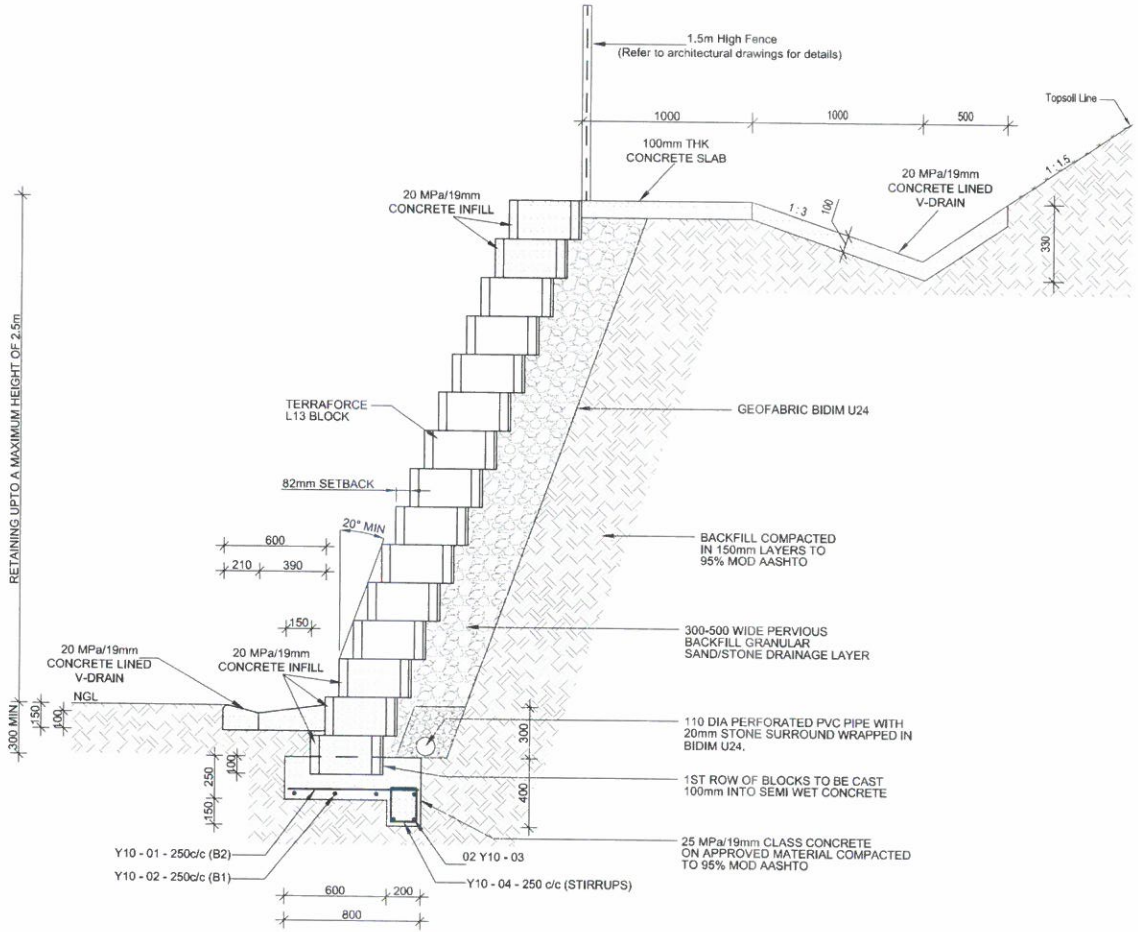
Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION
TERRAFORCE RETAINING WALL SECTION AND DETAILS

Scale	Date	Drawn
As shown	04/08/2016	NM

Project No.	Drawing No.	Rev.
D576	010	02



TYPICAL SECTION OF TERRAFORCE BLOCK RETAINING WALL RETAINING UPTO A MAXIMUM HEIGHT OF 2.5m

SCALE N.T.S

NOTES :

1) CONCRETE GRADE 20/26 MPa.
2) COVER TO STEEL 40mm MIN.

NAIDU CONSULTING
CIVIL & STRUCTURAL ENGINEERING CONSULTANTS

REFERENCE DRAWING Nos. - REF.DRAWING REV: REV DATE: DATE

REV	BAR MARK	TYPE AND DIA.	NO. PER UNIT	NO. OF UNITS	TOTAL NO.	CUTTING LENGTH (mm)	SHAPE CODE	DIMENSIONS A (mm)	B (mm)	C (mm)	D (mm)	E/R (mm)
	01	Y10	10	1	10	700	20	700				
	02	Y10	04	1	04	2200	20	2200				
	03	Y10	02	1	02	2200	20	2200				
	04	Y10	02	1	09	700	60	100	200			

	6	8	10	12	16	20	25	32	40	TOTAL
R										
Y			16							16
TOTAL			16							16

NOTE: STEEL SCHEDULE IS FOR THE FOUNDATIONS FOR A 2M LENGTH OF RETAINING WALL

REVISIONS			
Rev.	Date	Description	By
02	04/08/2016	Change Concrete grade	NM

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CLIENT DEPARTMENT
education
Department:
Education
PROVINCE OF KWAZULU-NATAL

CONSULTANTS
Programme Managers : NAIDU CONSULTING (PTY) LTD
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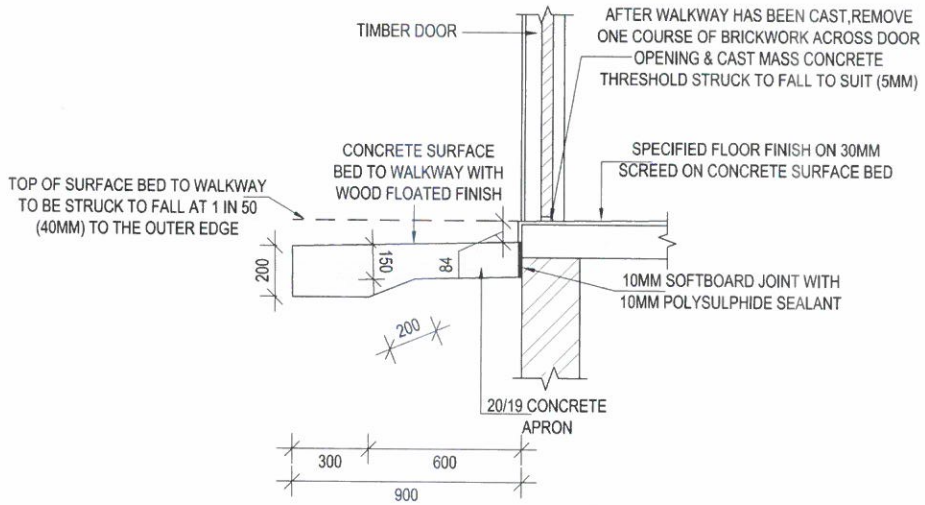
Quantity Surveyors : HENCON & ASSOCIATES
Electrical Engineers : DBA CONSULTING ENGINEERS
Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

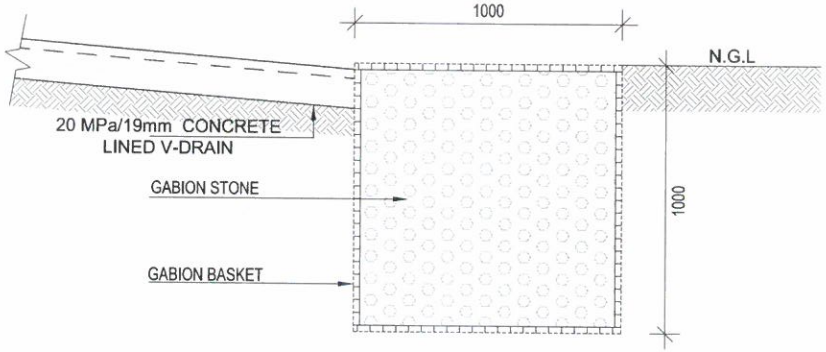
DRAWING DESCRIPTION
TERRAFORCE RETAINING WALL SECTION AND DETAILS

Scale	Date	Drawn
As shown	04/08/2016	NM
Project No.	Drawing No.	Rev.
D576	011	02



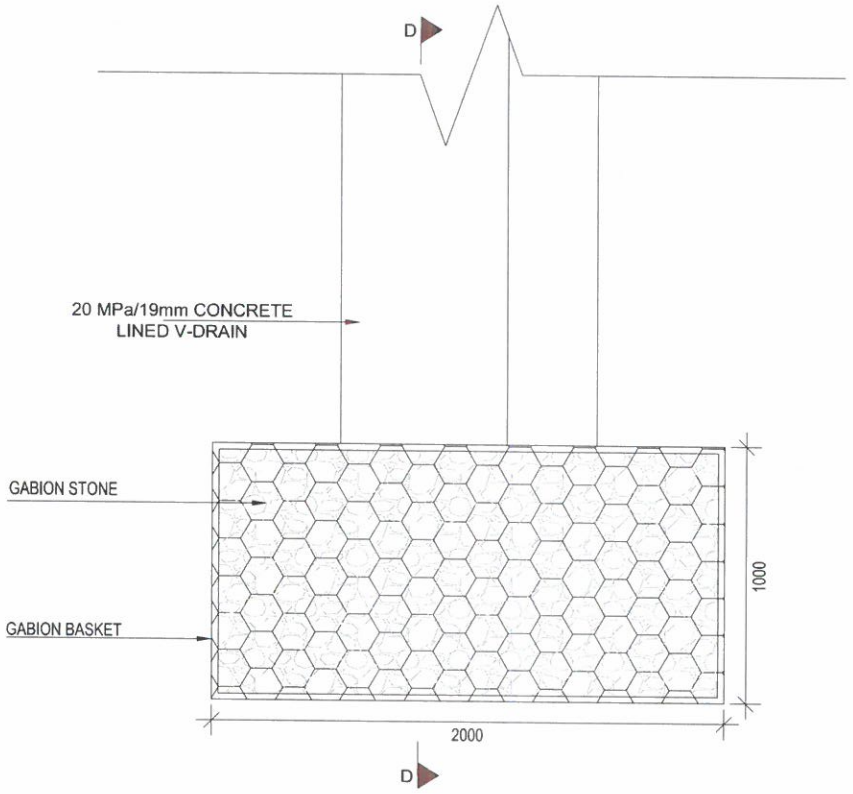
TYPICAL SECTION THROUGH CONCRETE APRON

SCALE 1 : 20



SOAK AWAY DETAIL SECTION D -D

1 : 20



SOAK AWAY DETAIL Plan view

1 : 20

REVISIONS			
Rev.	Date	Description	By
03	04/08/2016	Change of Concrete grade	NM

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Department:
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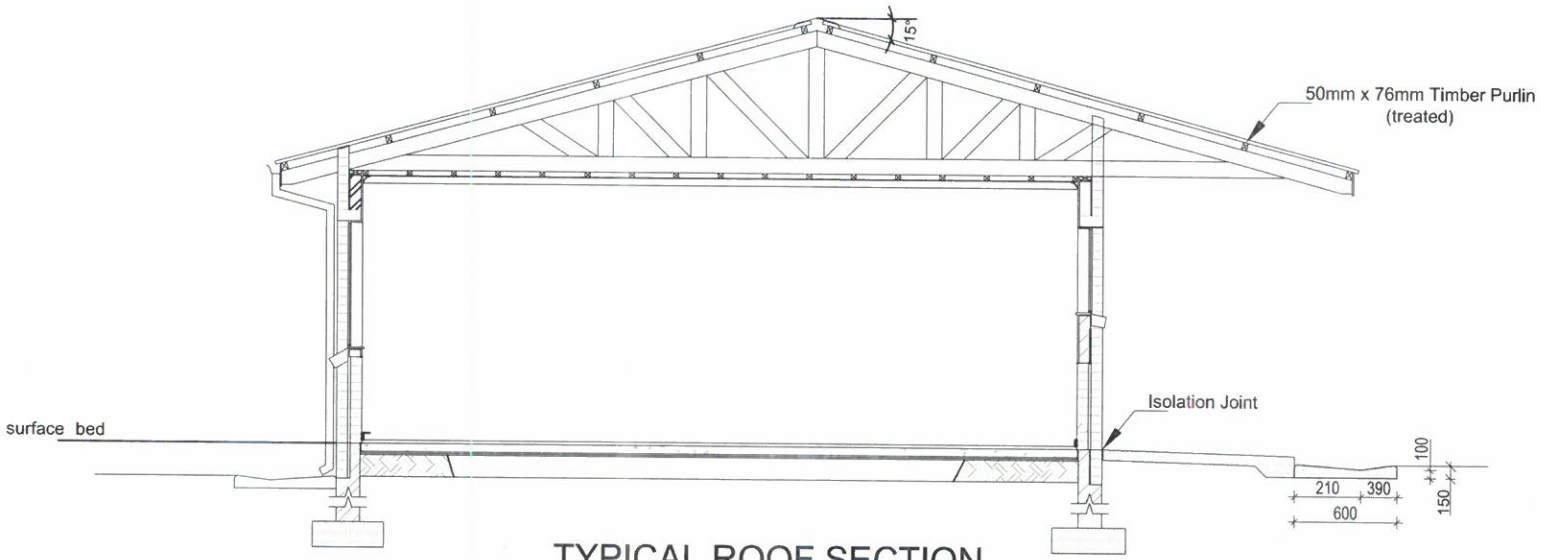
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION
Typical Section Through Apron and Soak away detail

Scale	Date	Drawn
As shown	04/08/2016	NM
Project No.	Drawing No.	Rev.
D576	012	03

Note: Timber roof truss designed in accordance with SANS 10160 and SANS 10400-L roofs.



TYPICAL ROOF SECTION

SCALE 1 : 50

REVISIONS			
Rev.	Date	Description	By
01	04/08/2016	Change of Concrete grade	NM

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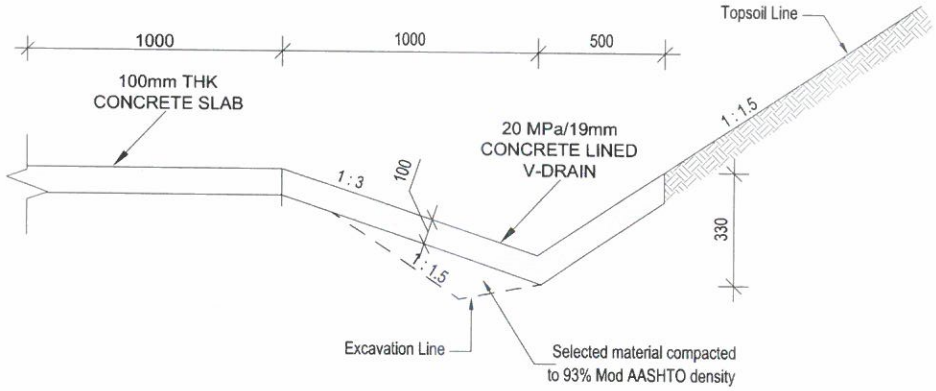
PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION
TYPICAL ROOF SECTION

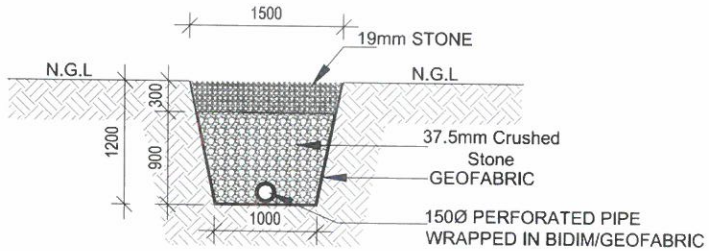
Scale	Date	Drawn
As shown	04/08/2016	NM
Project No.	**Drawing No.**	**Rev.**
D576	013	01



Typical Section:
1500mm V-Drain

Scale : 1 : 20

Note: Use for Thutukani Special School



TYPICAL SECTION: FRENCH DRAIN

1 : 50

REVISIONS			
Rev.	Date	Description	By
01	04/08/2016	Change of Concrete grade	NM

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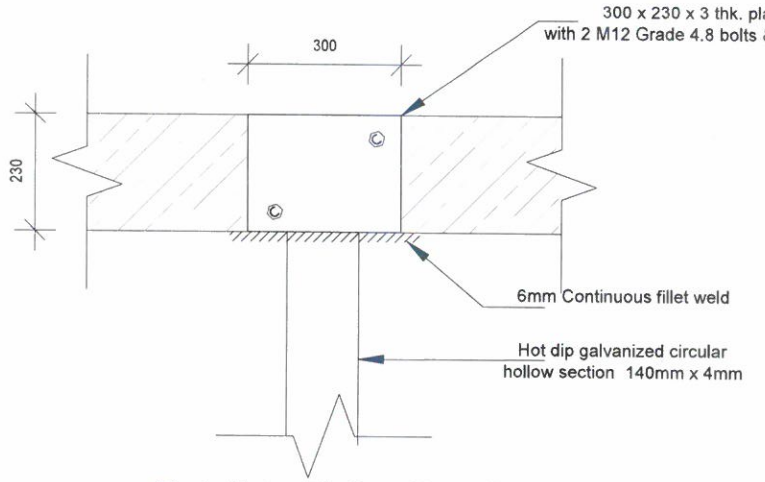
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

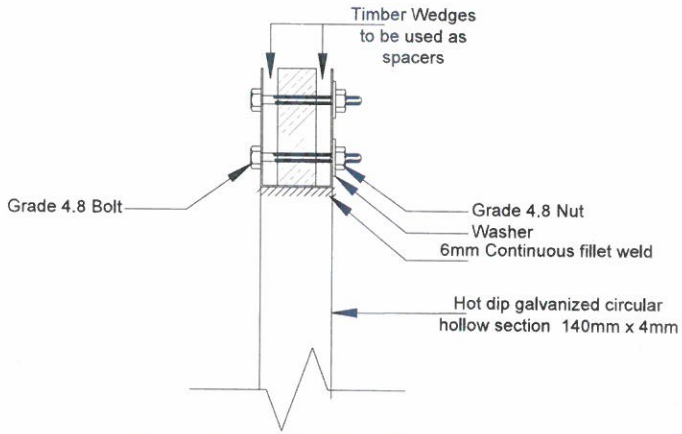
PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
TYPICAL V-DRAIN SECTION

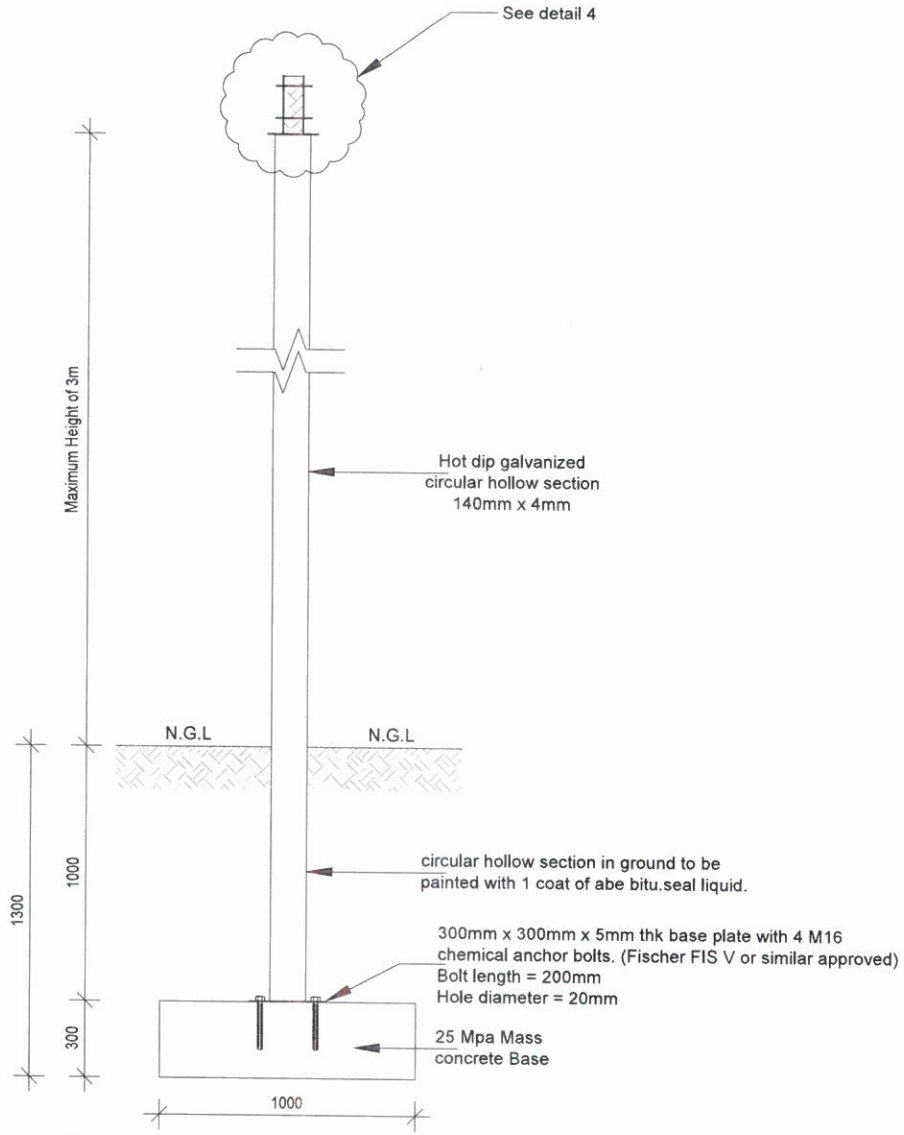
Scale	Date	Drawn
As shown	04/08/2016	NM
Project No.	Drawing No.	Rev.
D576	014	01



Detail 4 : Fixing Details
Side View
Scale 1 : 10



Detail 4 : Fixing Details
Section & Details
Scale 1 : 10



Veranda Support Post and Fixing details
Scale 1 : 20

REVISIONS			
Rev.	Date	Description	By
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Department:
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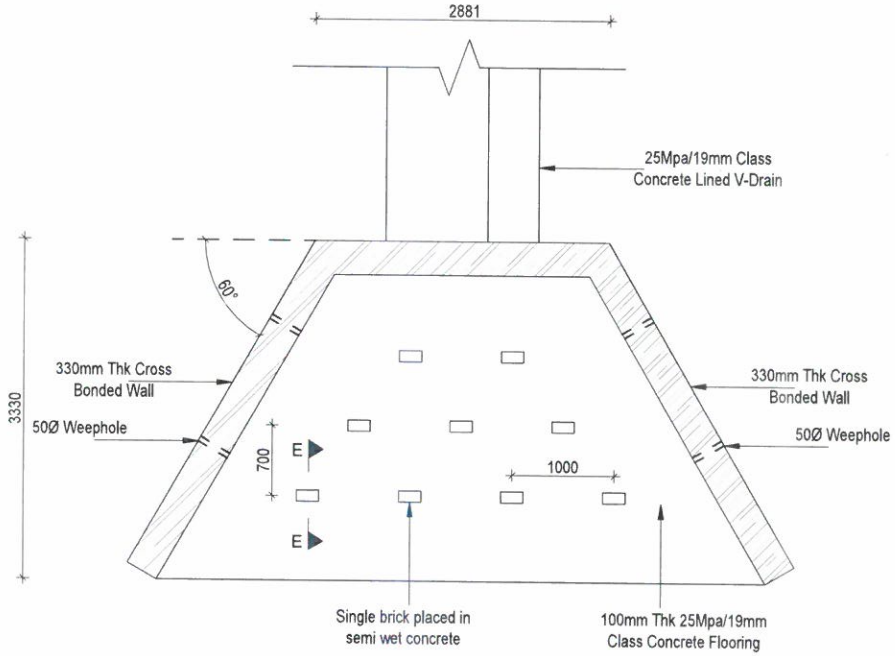
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
VERANDA SUPPORT POST
DETAILS

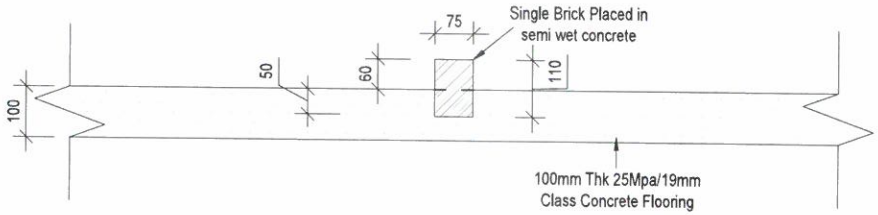
Scale	Date	Drawn
As shown	24/06/2016	NM

Project No.	Drawing No.	Rev.
D576	015	00



Detail 3: V-Drain Headwall

Scale 1 : 50



Section E - E

Scale 1 : 10

REVISIONS			
Rev.	Date	Description	By
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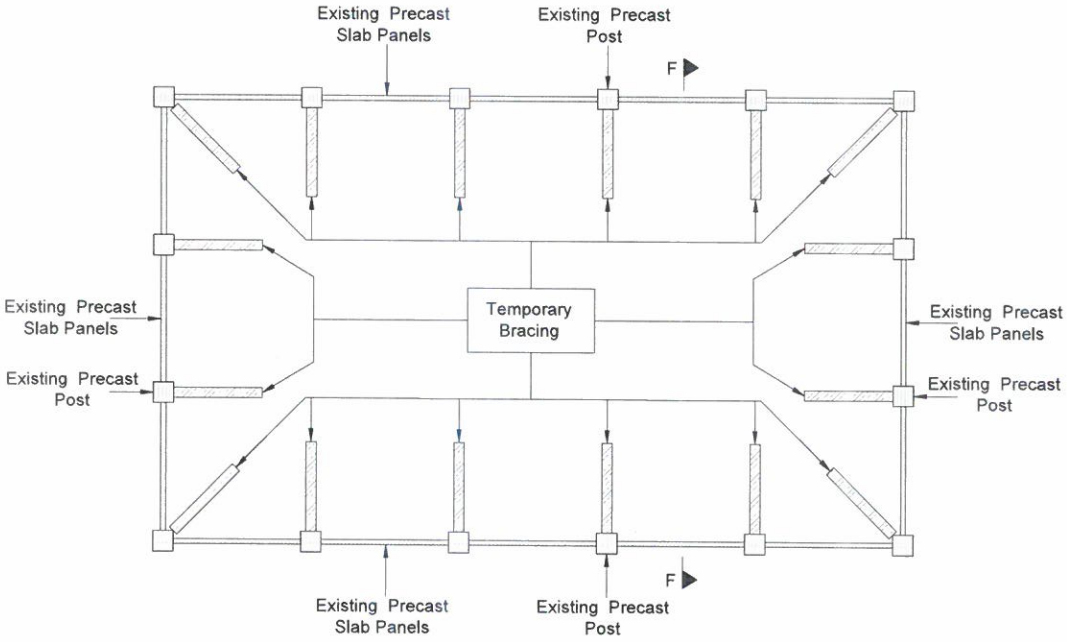
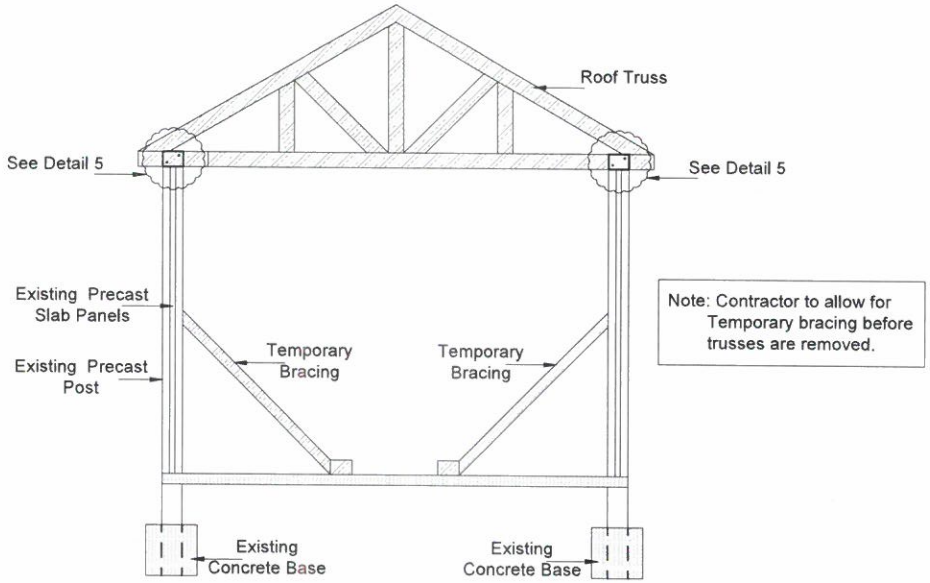
CLIENT public works Department: Public Works **PROVINCE OF KWAZULU-NATAL**	CLIENT DEPARTMENT education Department: Education PROVINCE OF KWAZULU-NATAL	CONSULTANTS Programme Managers : NAIDU CONSULTING (PTY) LTD Architect : ARTEK 4 ARCHITECTS Quantity Surveyors : HENCON & ASSOCIATES Electrical Engineers : DBA CONSULTING ENGINEERS Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD	PROJECT STORM DAMAGED SCHOOLS PROGRAMME DRAWING DESCRIPTION HEADWALL DETAILS	Scale As shown Project No. D576	Date 24/06/2016 Drawing No. 017	Drawn NM Rev. 00



Typical Temporary Bracing Layout Plan

Scale : N.T.S



Section F - F

Scale : N.T.S

REVISIONS			
Rev.	Date	Description	By
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education

Department:
Education
PROVINCE OF KWAZULU-NATAL

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
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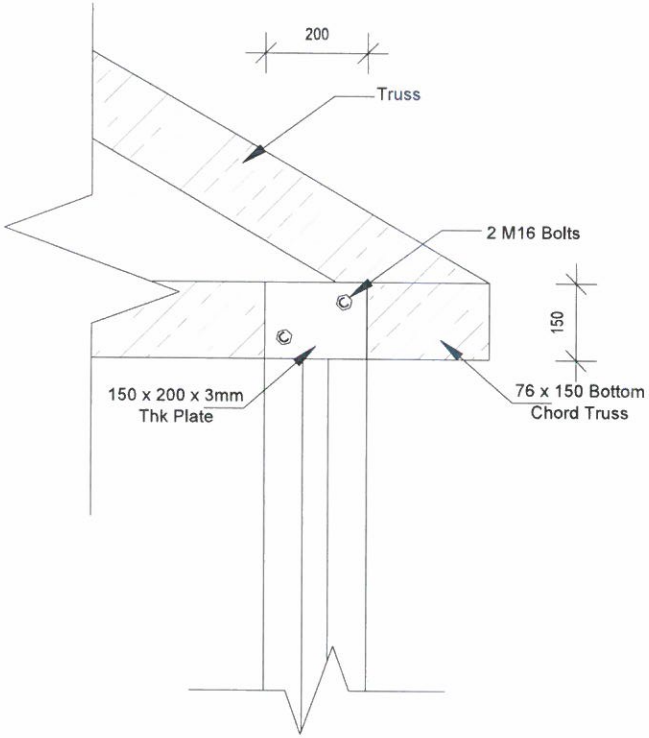
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION
Temporary Bracing Details Precast Concrete "Fence" Classroom

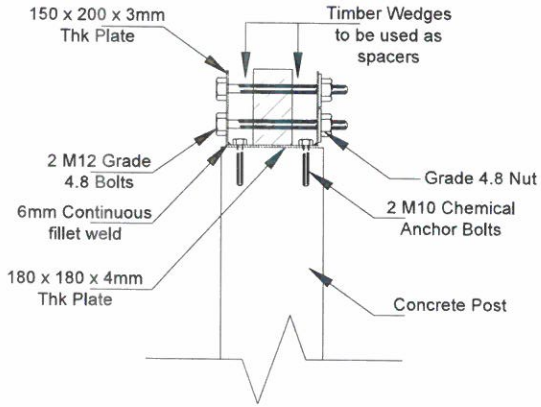
Scale	Date	Drawn
As shown	24/06/2016	NM

Project No.	Drawing No.	Rev.
D576	018	00



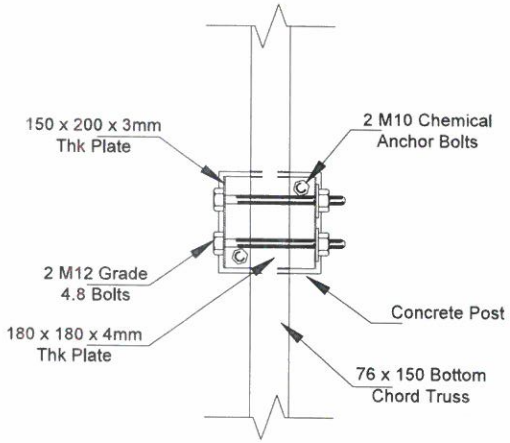
Detail 5 : Fixing Details Elevation

Scale 1 : 10



Detail 5 : Fixing Details Section & Details

Scale 1 : 10



Detail 5 : Fixing Details Plan View

Scale 1 : 10

REVISIONS			
Rev.	Date	Description	By
.	.	.	.

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Department:
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Department:
Education
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CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
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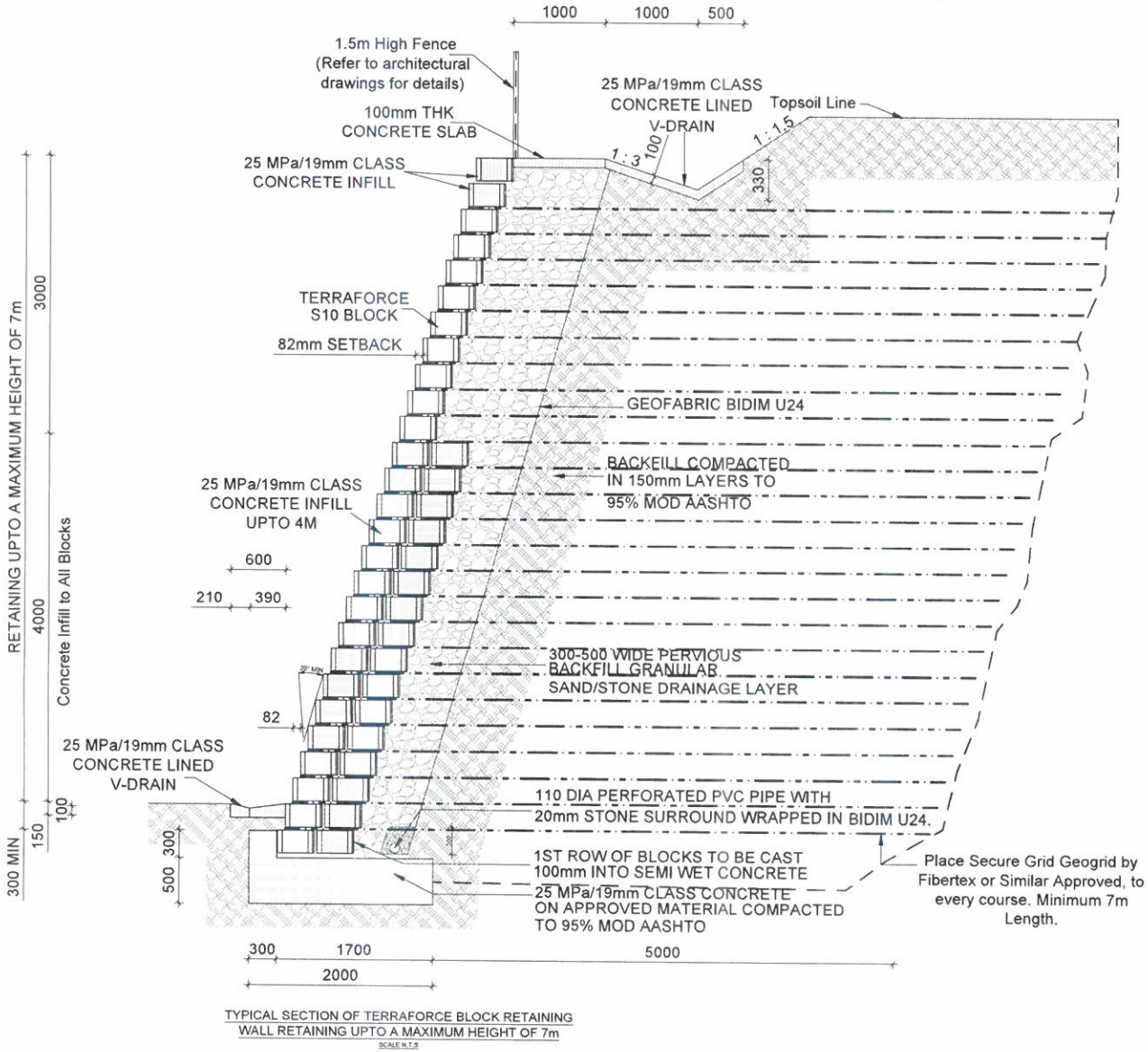
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION
Roof Bracket Fixing Details. Precast Concrete "Fence" Classroom

Scale	Date	Drawn
As shown	24/06/2016	NM
Project No.	**Drawing No.**	**Rev.**
D576	019	00



TYPICAL SECTION OF TERRAFORCE BLOCK RETAINING WALL RETAINING UPTO A MAXIMUM HEIGHT OF 7m

SCALE N.T.S

NOTES :

1) CONCRETE GRADE 20/26 MPa.
2) COVER TO STEEL 40mm MIN.

Note: Drawing 20a & 20b to be read in Conjunction

REVISIONS			
Rev.	Date	Description	By
01	18/07/2016	Change in V-drain design	NM

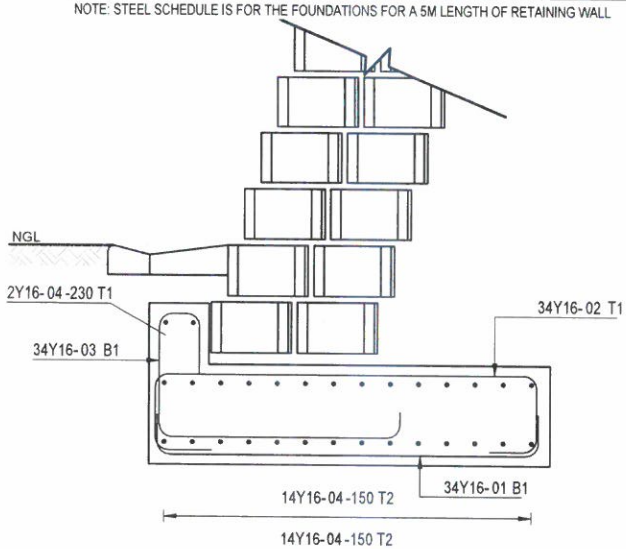
CLIENT public works Department: Public Works **PROVINCE OF KWAZULU-NATAL**	CLIENT DEPARTMENT education Department: Education PROVINCE OF KWAZULU-NATAL	CONSULTANTS Programme Managers : NAIDU CONSULTING (PTY) LTD Architect : ARTEK 4 ARCHITECTS Quantity Surveyors : HENCON & ASSOCIATES Electrical Engineers : DBA CONSULTING ENGINEERS Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD	PROJECT STORM DAMAGED SCHOOLS PROGRAMME DRAWING DESCRIPTION 7m Retaining Wall Details	Scale As shown Project No. D576	Date 18/07/2016 Drawing No. 020a	Drawn NM Rev. 01

NAIDU CONSULTING
CIVIL & STRUCTURAL ENGINEERING CONSULTANTS

REV	BAR MARK	TYPE AND DIA.	NO. PER UNIT	NO. OF UNITS	TOTAL NO.	CUTTING LENGTH (mm)	SHAPE CODE	DIMENSIONS A (mm)	B (mm)	C (mm)	D (mm)	E/R (mm)
	01	Y16	34	1	34	2250	38	200	1900			
	02	Y16	34	1	34	2950	55	200	400	1900	400	
	03	Y16	34	1	34	2300	55	290	200	610	1200	
	04	Y16	30	1	30	5250	38	200	4900			
	05	Y16	28	1	28	1000	20	1000				

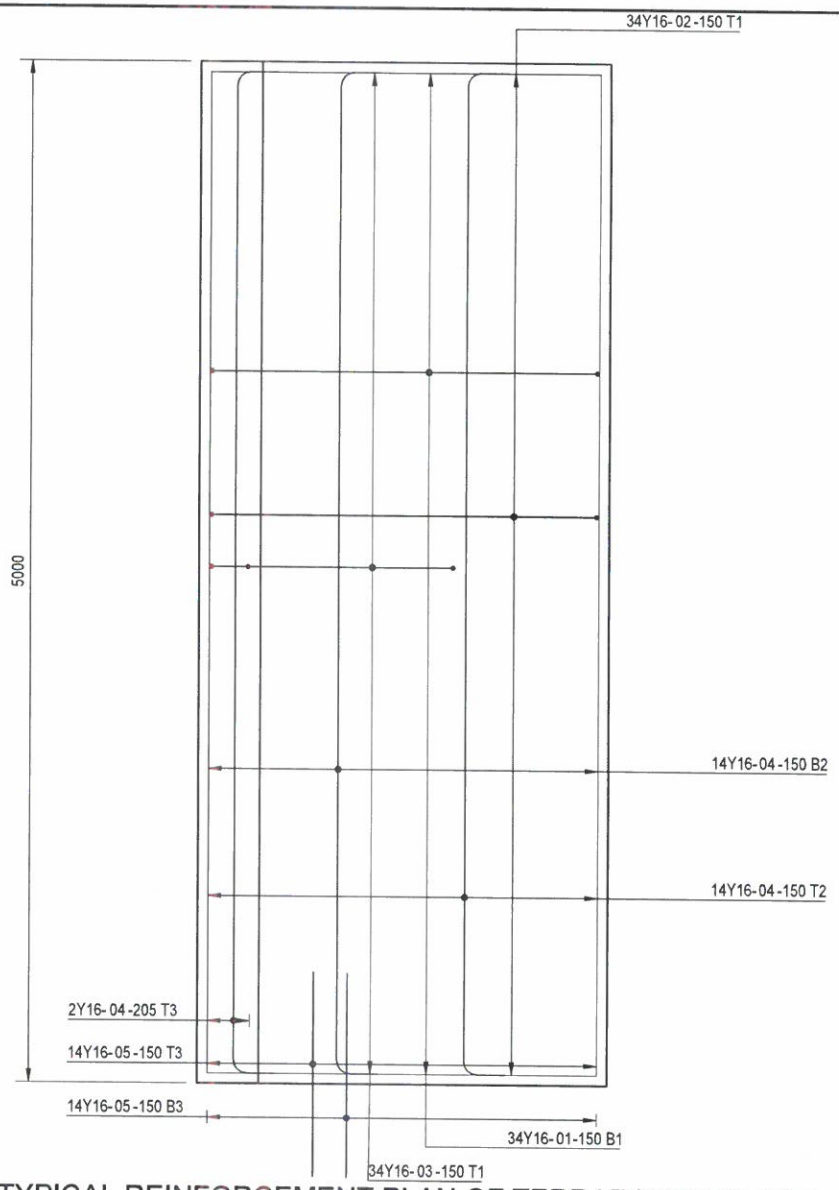
	6	8	10	12	16	20	25	32	40	TOTAL
R										
Y					695					695
TOTAL					695					695

NOTE: STEEL SCHEDULE IS FOR THE FOUNDATIONS FOR A 5M LENGTH OF RETAINING WALL



TYPICAL REINFORCEMENT SECTION OF TERRAFORCE BLOCK RETAINING WALL RETAINING UPTO A MAXIMUM HEIGHT OF 7m

SCALE N.T.S



TYPICAL REINFORCEMENT PLAN OF TERRAFORCE BLOCK RETAINING WALL RETAINING UPTO A MAXIMUM HEIGHT OF 7m

SCALE N.T.S

REVISIONS			
Rev.	Date	Description	By
01	18/07/2016	Change in V-drain design	NM

Note: Drawing 20a & 20b to be read in Conjunction

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education
Department:
Education
PROVINCE OF KWAZULU-NATAL

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
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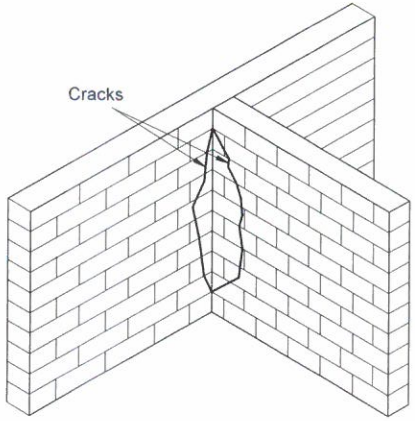
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION
7m Retaining Wall Reinforcement Details

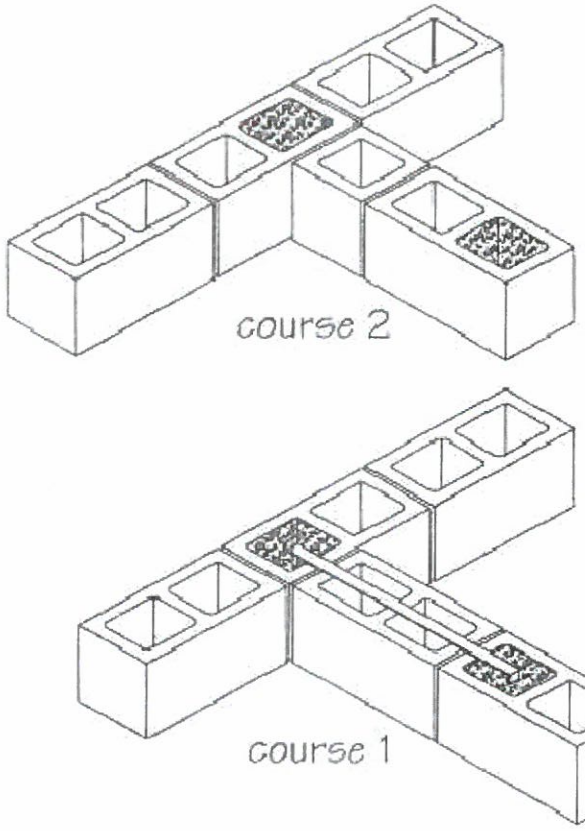
Scale	Date	Drawn
As shown	18/07/2016	NM
Project No.	Drawing No.	Rev.
D576	020b	01



Elevation

Scale: N.T.S

Note: Intersecting walls shall be either bonded by means of a full masonry bond or shall be tied to the intersecting walls by means of galvanised hoop iron straps located at vertical centres not exceeding 450mm built into the bed joint. Such straps shall have thickness, width and length dimensions of not less than 1.6, 30 and 700mm respectively and in the case of walls constructed of hollow masonry units, shall be bent perpendicularly for a nominal distance of 50 to 100mm at both ends. The cores of hollow masonry units shall be solidly filled with mortar or infill concrete where hoop iron straps are provided so that the ends of the straps are embedded in mortar or concrete. This also applies to bricks.



Repair to Intersecting Structural walls that are cracked/ Leaning

Scale : N.T.S

REVISIONS			
Rev.	Date	Description	By
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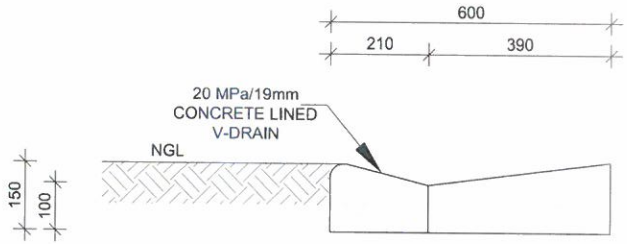
CLIENT public works Department: Public Works **PROVINCE OF KWAZULU-NATAL**	CLIENT DEPARTMENT education Department: Education PROVINCE OF KWAZULU-NATAL	CONSULTANTS Programme Managers : NAIDU CONSULTING (PTY) LTD Architect : ARTEK 4 ARCHITECTS Quantity Surveyors : HENCON & ASSOCIATES Electrical Engineers : DBA CONSULTING ENGINEERS Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD	PROJECT STORM DAMAGED SCHOOLS PROGRAMME DRAWING DESCRIPTION Repair To Intersecting Structural Walls That Are Cracked/Leaning	Scale As shown Project No. D576	Date 24/06/2016 Drawing No. 021	Drawn NM Rev. 00

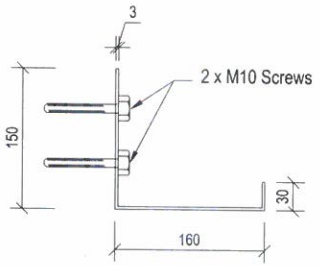


Typical Section: 600mm V-Drain

Scale : 1 : 10

Note: Gutter Bracket Type 1

- 3mm Thk and 20mm Wide Steel Flat Bar to be used for the Gutter Brackets.
- Gutter brackets to be positioned at every truss center to center.

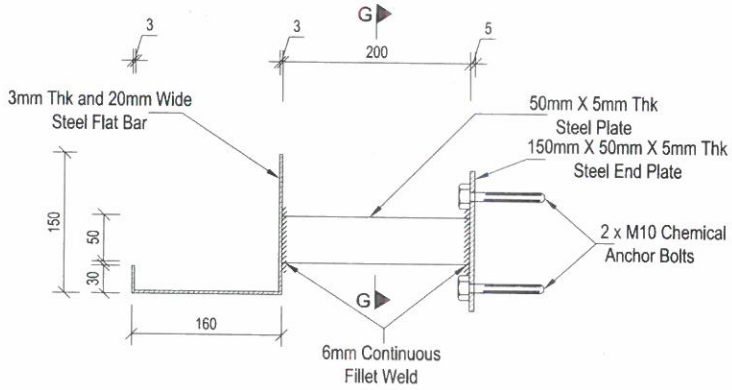


Gutter Bracket Type 1

Scale 1 : 5

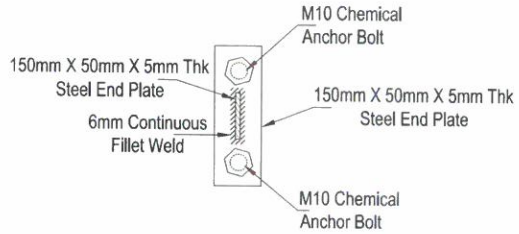
NOTES: Gutter Bracket Type 2

- To be used at Thuthukani Special School, Block J,
- Gutter brackets to be positioned at every 1200 center to center.



Gutter Bracket Type 2

Scale 1 : 5

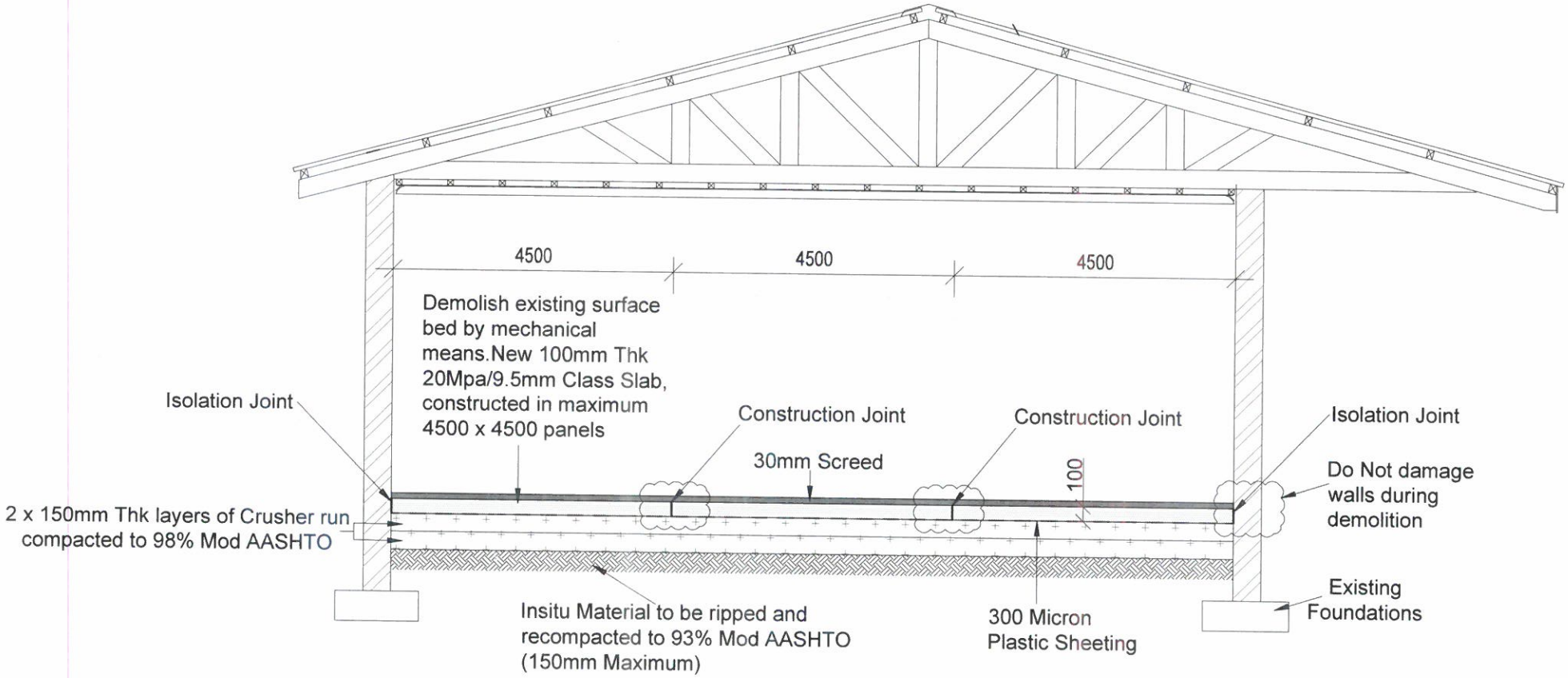


Section G - G

Scale 1 : 5

REVISIONS			
Rev.	Date	Description	By
02	08/08/2016	Gutter Bracket Details	NM

CLIENT: public works, Department: Public Works, PROVINCE OF KWAZULU-NATAL	CLIENT DEPARTMENT: education, Department: Education, PROVINCE OF KWAZULU-NATAL	CONSULTANTS Programme Managers : NAIDU CONSULTING (PTY) LTD Architect : ARTEK 4 ARCHITECTS Quantity Surveyors : HENCON & ASSOCIATES Electrical Engineers : DBA CONSULTING ENGINEERS Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD	PROJECT: STORM DAMAGED SCHOOLS PROGRAMME DRAWING DESCRIPTION: 600MM V-DRAIN SECTION AND DETAILS, GUTTER BRACKET DETAILS	Scale: As shown Project No.: D576	Date: 08/08/2016 Drawing No.: 022	Drawn: NM Rev.: 02



NEW SURFACE BED SECTION

SCALE N.T.S

REVISIONS			
Rev.	Date	Description	By

CLIENT

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

CLIENT DEPARTMENT

education

Department:
Education
PROVINCE OF KWAZULU-NATAL

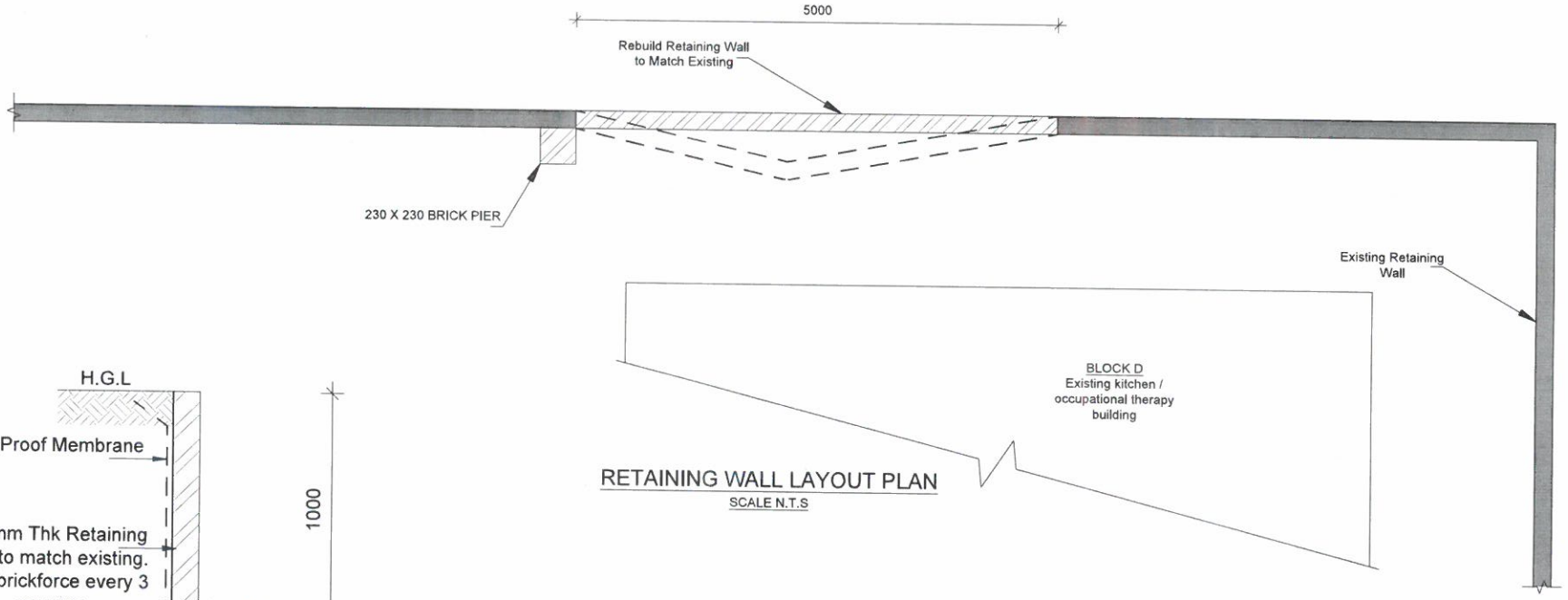
CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

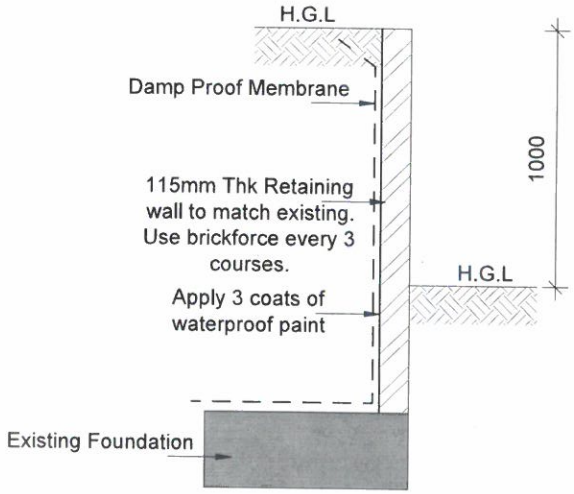
DRAWING DESCRIPTION
NEW SURFACE BED SECTION

Scale	Date	Drawn
As shown	11/08/2016	NM
Project No.	**Drawing No.**	**Rev.**
D576	023	00



RETAINING WALL LAYOUT PLAN

SCALE N.T.S



RETAINING WALL SECTION AND DETAILS

SCALE N.T.S

REVISIONS			
Rev.	Date	Description	By
.	.	.	.

CLIENT

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

CLIENT DEPARTMENT

education

Department:
Education
PROVINCE OF KWAZULU-NATAL

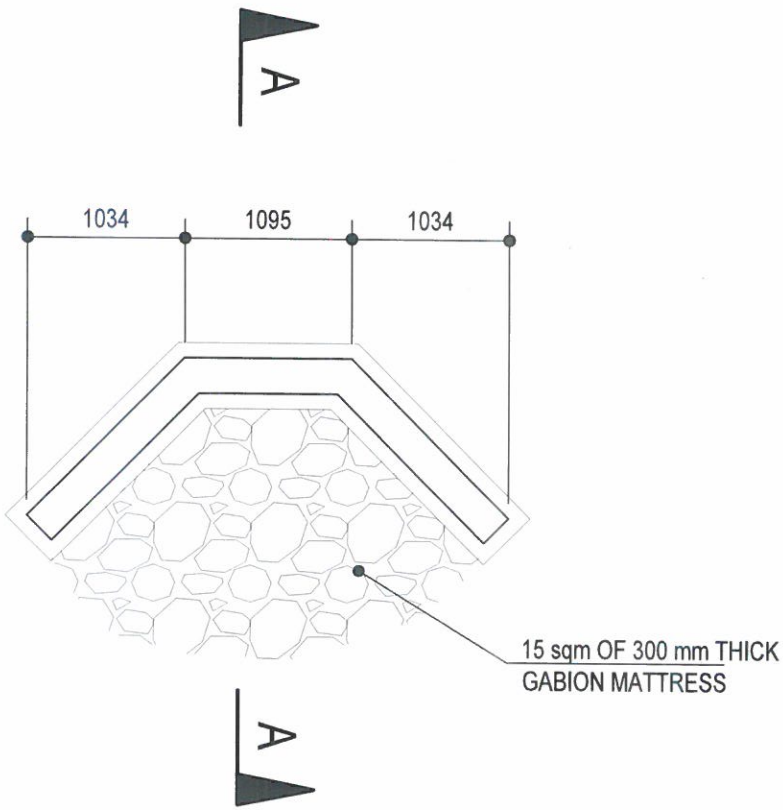
CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

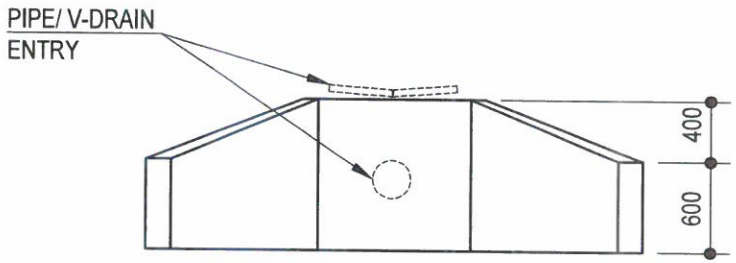
DRAWING DESCRIPTION
RETAINING WALL LAYOUT PLAN, SECTION AND DETAILS

Scale	Date	Drawn
As shown	11/08/2016	NM
Project No.	**Drawing No.**	**Rev.**
D576	024	00



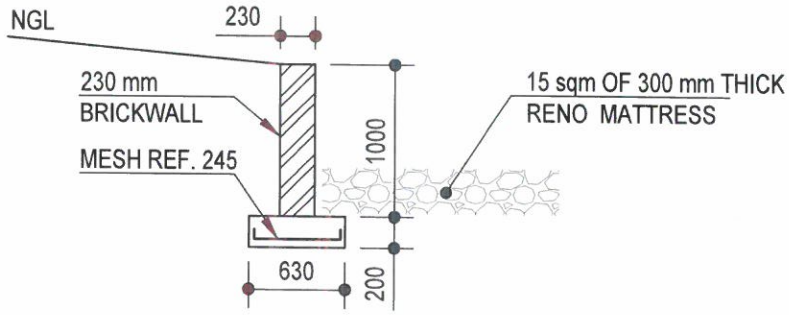
PLAN - SOAKAWAY

1 : 50



ELEVATION

1 : 50



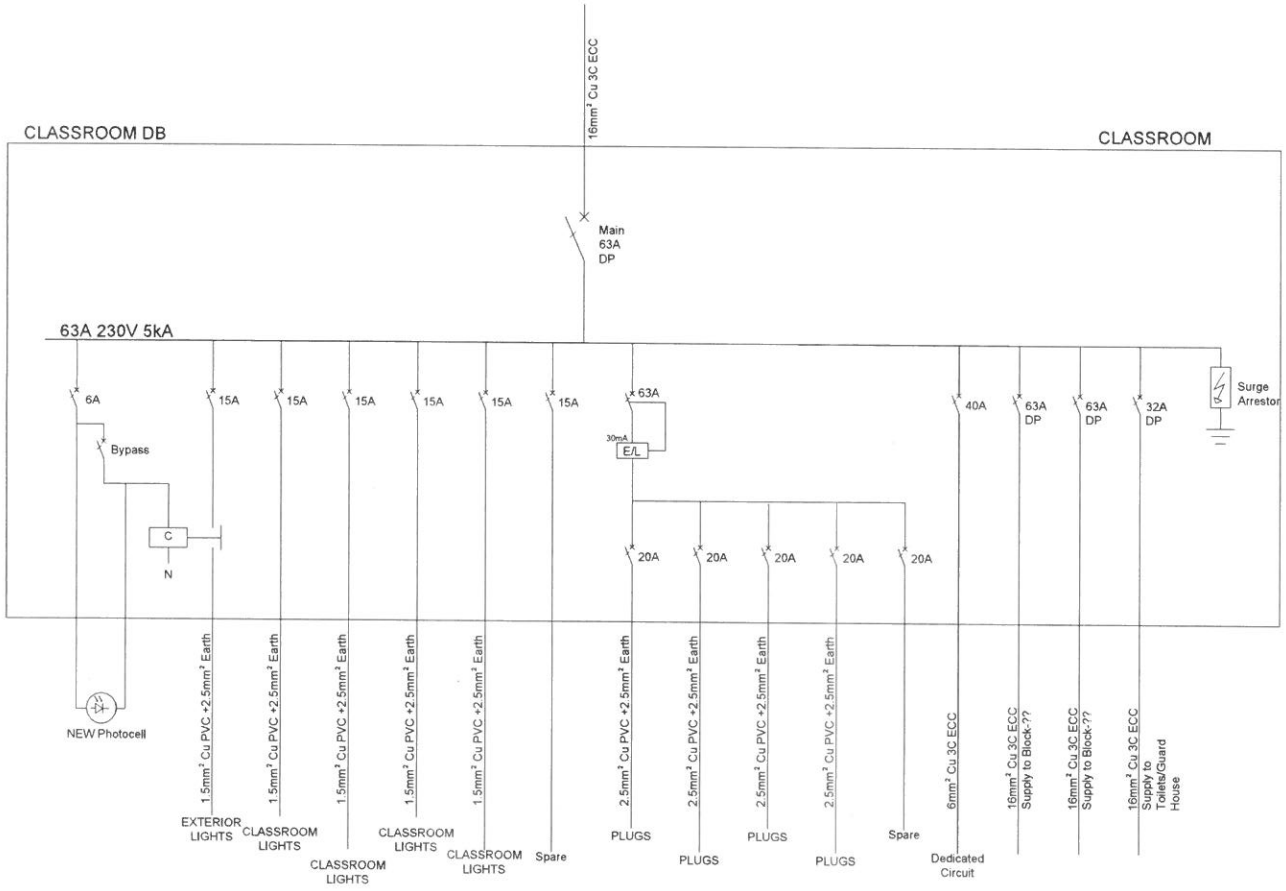
SECTION A-A

1 : 50

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

ANNEXURE 15
Electrical Engineers Specifications & Drawings



DISTRIBUTION BOARD INFORMATION

BOARD NO. : TYPICAL FOR DB'S

(TYPE) CONSTRUCTION		MAX. DIMENSIONS	
RECESSED		HEIGHT (mm)	
SEMI-RECESSED		WIDTH(mm)	
SURFACE	X	DEPTH (mm)	
FREE STANDING		PLINTH	
FLOOR STANDING		IP RATING	
DOORS			
LOCKABLE DOORS	X	MATERIAL	
CUPBOARD		GALVINIZED STEEL	X
SPARE SPACE	30%	FIBRE GLASS	
PLINTH		3CR12 STAINLESS STEEL	

SERVICE ACCESS		COLOUR	
FRONT	X	OUTER COVER	WHITE
REAR		INNER FRAME	WHITE
		INNER COVER	WHITE

INCOMER		OUTGOING	
TOP ENTRY	X	TOP ENTRY	X
BOTTOM ENTRY	X	BOTTOM ENTRY	X
SIDE ENTRY		SIDE ENTRY	

LEGEND:

NOTES:

1. COMPLETE ELECTRICAL INSTALLATION TO COMPLY WITH THE RELEVANT CLAUSES OF SANS CODE OF PRACTICE, SANS 10142.
2. ALL DB SHOP DRAWINGS ARE SUBJECT TO APPROVAL PRIOR TO PURCHASE BY ELECTRICAL ENGINEER
3. FINAL DISTRIBUTION BOARD POSITIONS SHALL BE DETERMINED AND CONFIRMED ON SITE WITH ENGINEER.
4. MAX No. OF SOCKETS ON A CIRCUITS
   Based on load- after diversity at 80% of 20A
   Based on load-after diversity at 80% of 15A.

REVISIONS

NO.	DATE	REVISION	DRAWN
A	07/03/2019	ISSUED FOR TENDER	LM

ARCHITECT

ELECTRICAL ENGINEER **ECSA NUMBER: 200870035**

DNA Consulting Engineers & Project Managers

PROJECT MANAGER | **IMPLEMENTING AGENT**

	NAME	SIGNATURE	DATE	SIZE
	D.NAIDOO		07-03-2019	A1
	L.MBASO			NTS

PROVINCE

KwaZulu - Natal

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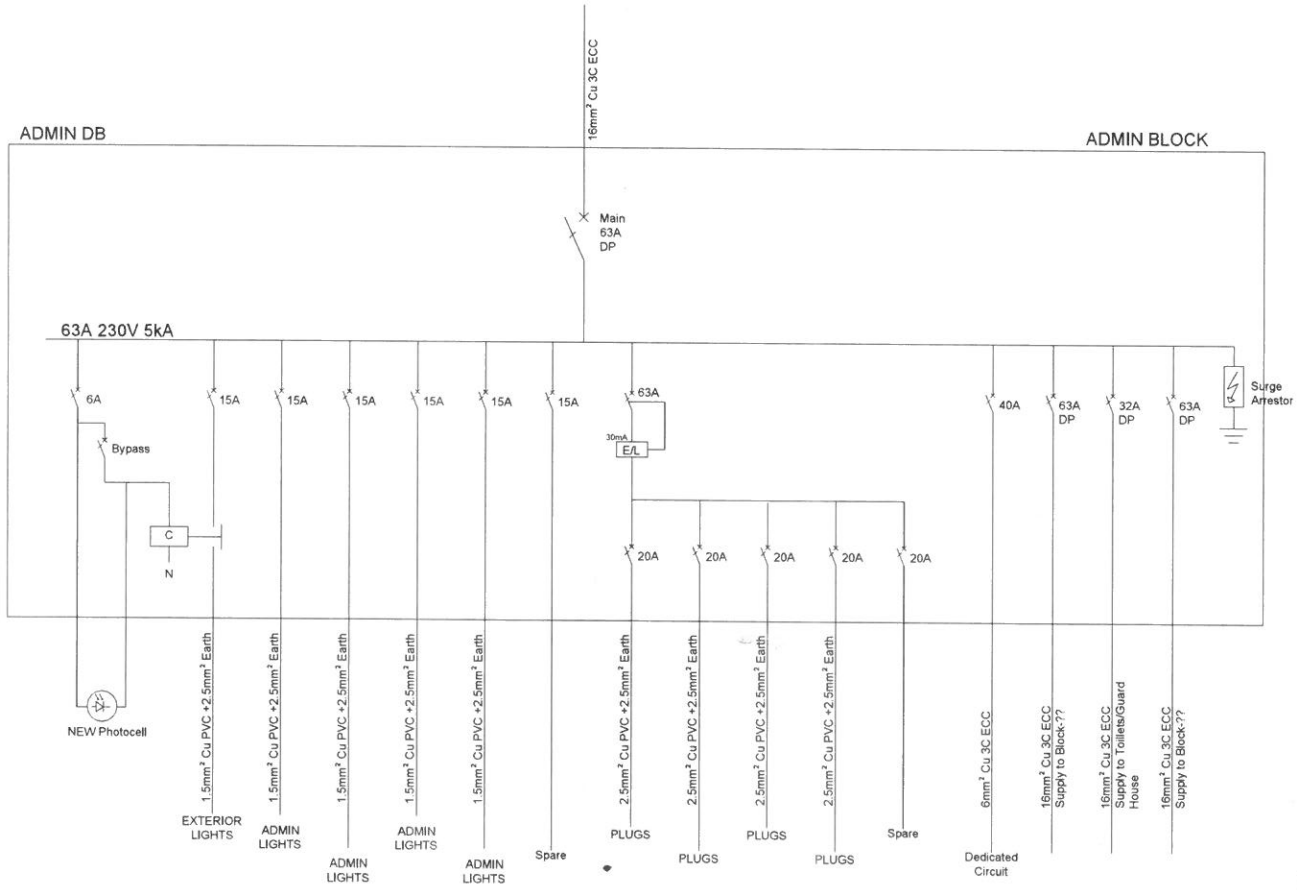
public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

PROJECT
PHASE 14: STORM DAMAGED SCHOOLS

DRAWING TITLE
TYPICAL CLASSROOM SCHEMATIC

	ELECTRICAL	DNA-ELE-SK-001	T	A



DISTRIBUTION BOARD INFORMATION

BOARD NO. : TYPICAL FOR DB'S

(TYPE) CONSTRUCTION		MAX. DIMENSIONS	
RECESSED		HEIGHT (mm)	
SEMI-RECESSED		WIDTH(mm)	
SURFACE	X	DEPTH (mm)	
FREE STANDING		PLINTH	
FLOOR STANDING		IP RATING	
DOORS			
LOCKABLE DOORS	X	MATERIAL	
CUPBOARD		GALVINIZED STEEL	X
SPARE SPACE	30%	FIBRE GLASS	
PLINTH		3CR12 STAINLESS STEEL	

SERVICE ACCESS		COLOUR	
FRONT	X	OUTER COVER	WHITE
REAR		INNER FRAME	WHITE
		INNER COVER	WHITE

INCOMER		OUTGOING	
TOP ENTRY	X	TOP ENTRY	X
BOTTOM ENTRY	X	BOTTOM ENTRY	X
SIDE ENTRY		SIDE ENTRY	

LEGEND:

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   Based on load-after diversity at 80% of 15A.

REVISIONS

NO.	DATE	REVISION	DRAWN
A	07/MAR/2019	ISSUED FOR TENDER	LM

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ELECTRICAL ENGINEER **ECSA NUMBER: 20070035**

DNA Consulting Engineers & Project Managers

PROJECT MANAGEMENT	IMPLEMENTING AGENT

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APPROVED				

PROVINCE

KwaZulu - Natal

CLIENT

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Department
Public Works
PROVINCE OF KWAZULU-NATAL

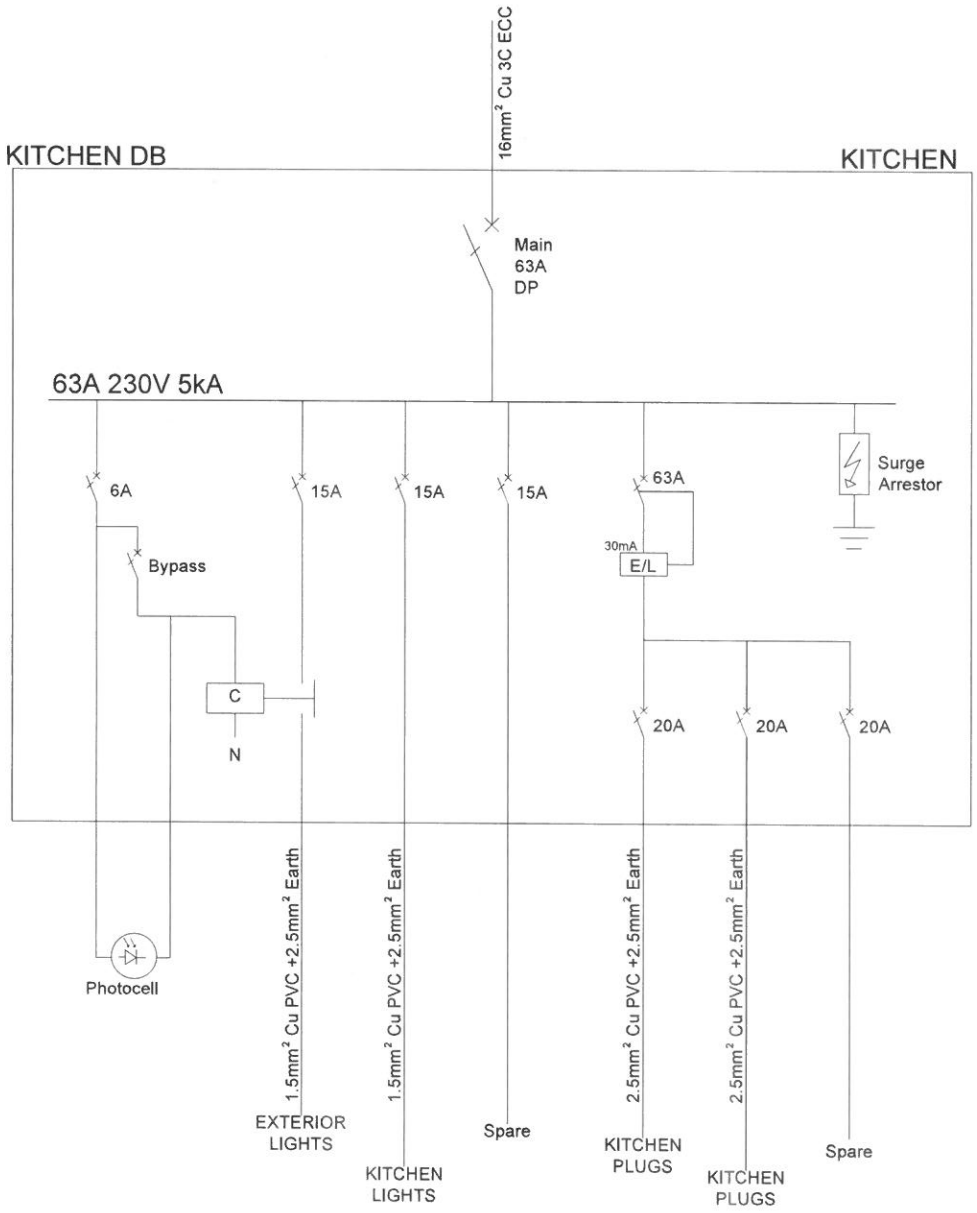
PROJECT

PHASE 14: STORM DAMAGED SCHOOLS

DRAWING TITLE

TYPICAL ADMIN BLOCK SCHEMATIC

DISCIPLINE	DRAWING NUMBER	STATUS	REVISION
ELECTRICAL	DNA-ELE-SK-002	T	A



DISTRIBUTION BOARD INFORMATION

BOARD NO. : TYPICAL FOR DB'S

(TYPE) CONSTRUCTION		MAX. DIMENSIONS	
RECESSED		HEIGHT (mm)	
SEMI-RECESSED		WIDTH(mm)	
SURFACE	X	DEPTH (mm)	
FREE STANDING		PLINTH	
FLOOR STANDING		IP RATING	
DOORS			
LOCKABLE DOORS	X	MATERIAL	
CUPBOARD		GALVINIZED STEEL	X
SPARE SPACE	30%	FIBRE GLASS	
PLINTH		3CR12 STAINLESS STEEL	

SERVICE ACCESS		COLOUR	
FRONT	X	OUTER COVER	WHITE
REAR		INNER FRAME	WHITE
		INNER COVER	WHITE

INCOMER		OUTGOING	
TOP ENTRY	X	TOP ENTRY	X
BOTTOM ENTRY	X	BOTTOM ENTRY	X
SIDE ENTRY		SIDE ENTRY	

LEGEND:

NOTES:

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REVISIONS

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ARCHITECT

ELECTRICAL ENGINEER ECSA NUMBER: 200870035

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APPROVED				NTS
VALIDATED				

PROVINCE

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public works
Department:
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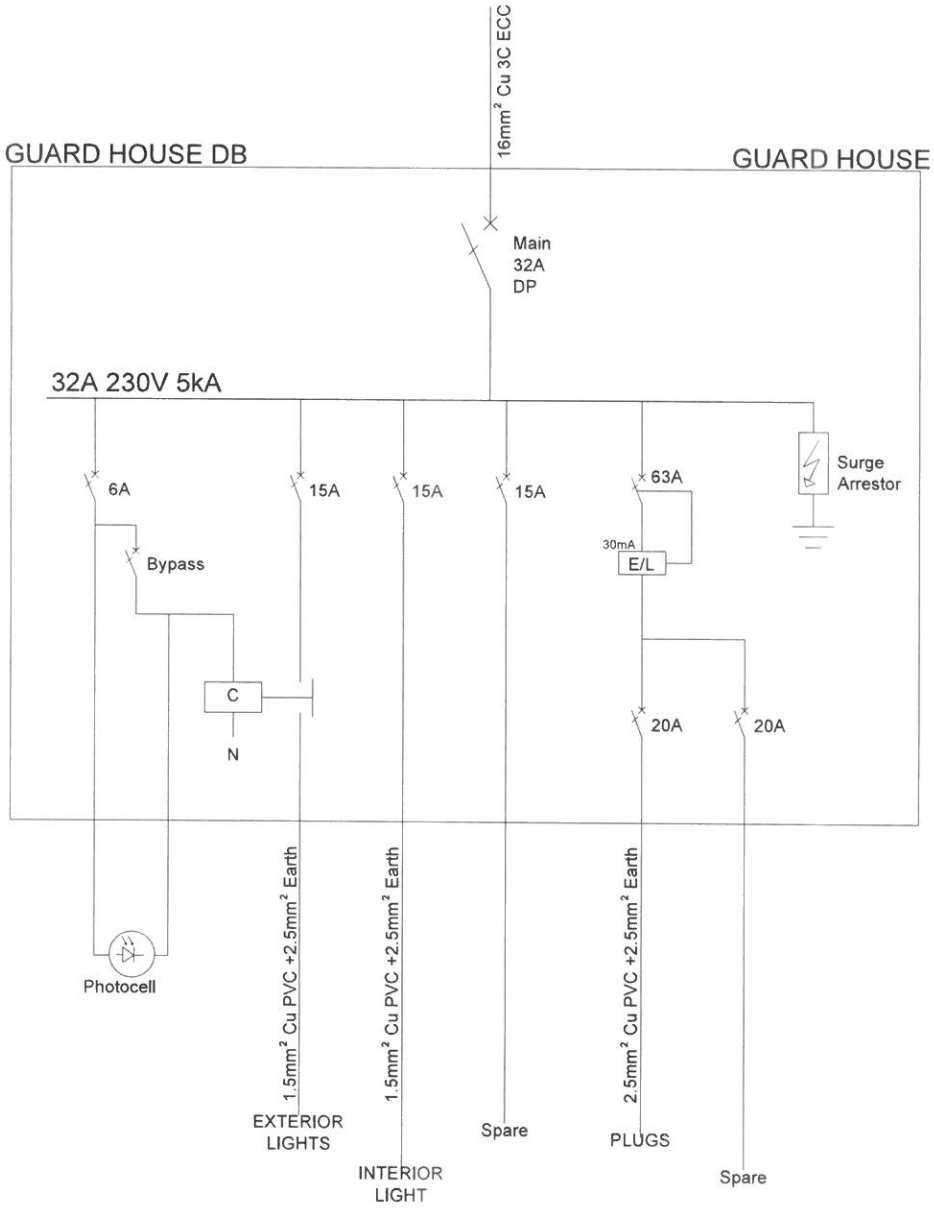
PROVINCE OF KWAZULU-NATAL

PROJECT
PHASE 14: STORM DAMAGED SCHOOLS

DRAWING TITLE
TYPICAL KITCHEN SCHEMATIC

DISCIPLINE	DRAWING NO.	REVISION	SHEET
ELECTRICAL	DNA-ELE-SK-003	T	A



DISTRIBUTION BOARD INFORMATION

BOARD NO. : TYPICAL FOR DB'S

(TYPE) CONSTRUCTION		MAX. DIMENSIONS	
RECESSED		HEIGHT (mm)	
SEMI-RECESSED		WIDTH(mm)	
SURFACE	X	DEPTH (mm)	
FREE STANDING		PLINTH	
FLOOR STANDING		IP RATING	
DOORS			
LOCKABLE DOORS	X	MATERIAL	
CUPBOARD		GALVINIZED STEEL	X
SPARE SPACE	30%	FIBRE GLASS	
PLINTH		3CR12 STAINLESS STEEL	

SERVICE ACCESS		COLOUR	
FRONT	X	OUTER COVER	WHITE
REAR		INNER FRAME	WHITE
		INNER COVER	WHITE

INCOMER		OUTGOING	
TOP ENTRY	X	TOP ENTRY	X
BOTTOM ENTRY	X	BOTTOM ENTRY	X
SIDE ENTRY		SIDE ENTRY	

LEGEND:

NOTES:

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   Based on load- after diversity at 80% of 20A
   Based on load-after diversity at 80% of 15A.

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ELECTRICAL ENGINEER ECSA NUMBER: 200870035

DNA CONSULTING ELECTRICAL ENGINEERS & PROJECT MANAGERS

DNA Consulting Engineers & Project Managers

PROJECT MANANGER | IMPLEMENTING AGENT

	NAME	SIGNATURE	DATE	SHEET SIZE
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CHECKED	L.NABASO			SCALE
APPROVED				NTS

PROVINCE

KwaZulu - Natal

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Department:
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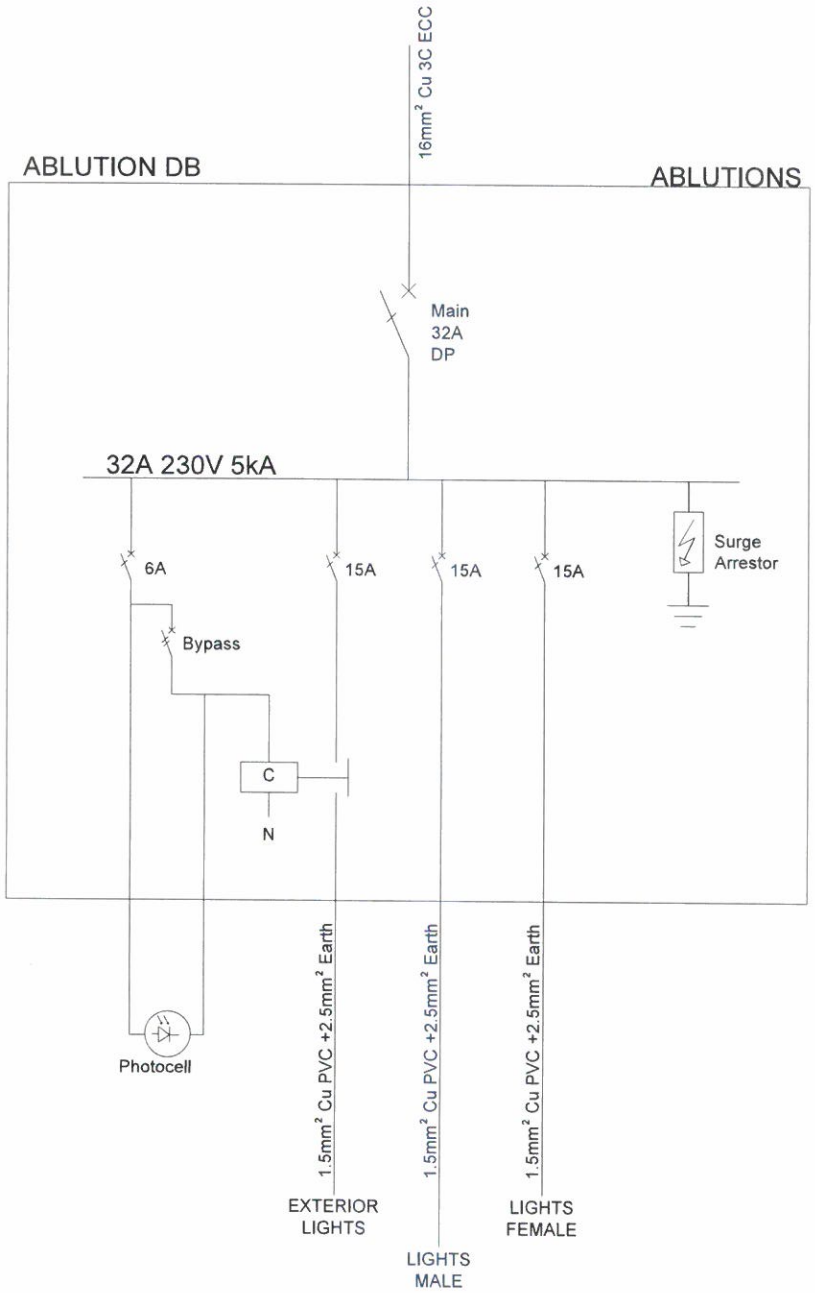
PROVINCE OF KWAZULU-NATAL

PROJECT
PHASE 14:STORM DAMAGED SCHOOLS

DRAWING TITLE
TYPICAL GUARD HOUSE SCHEMATIC

	DISCIPLINE	DRAWING NUMBER	TYPE	REVISION
	ELECTRICAL	DNA-ELE-SK-004	T	A



DISTRIBUTION BOARD INFORMATION

BOARD NO. : TYPICAL FOR DB'S

(TYPE) CONSTRUCTION		MAX. DIMENSIONS	
RECESSED		HEIGHT (mm)	
SEMI-RECESSED		WIDTH(mm)	
SURFACE	X	DEPTH (mm)	
FREE STANDING		PLINTH	
FLOOR STANDING		IP RATING	
DOORS			
LOCKABLE DOORS	X	MATERIAL	
CUPBOARD		GALVINIZED STEEL	X
SPARE SPACE	30%	FIBRE GLASS	
PLINTH		3CR12 STAINLESS STEEL	

SERVICE ACCESS		COLOUR	
FRONT	X	OUTER COVER	WHITE
REAR		INNER FRAME	WHITE
		INNER COVER	WHITE

INCOMER		OUTGOING	
TOP ENTRY	X	TOP ENTRY	X
BOTTOM ENTRY	X	BOTTOM ENTRY	X
SIDE ENTRY		SIDE ENTRY	

LEGEND:

NOTES:

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   Based on load-after diversity at 80% of 15A.

REVISIONS

NO.	DATE	REVISION	DRAWN
A	07/05/2019	ISSUED FOR TENDER	LM

ARCHITECT

ELECTRICAL ENGINEER **ECSA NUMBER: 20070035**

DNA
CONSULTING ELECTRICAL ENGINEERS & PROJECT MANAGERS
DNA Consulting Engineers & Project Managers

PROJECT MANAGER	IMPLEMENTING AGENT

	NAME	SIGNATURE	DATE	SIZE
DRAWN	D.NKEDO		07-05-2019	A1
CHECKED	L.MABASO			SCALE
APPROVED				NTS
AS BUILT				

PROVINCE

KwaZulu - Natal

CLIENT

public works
Department
Public Works
PROVINCE OF KWAZULU-NATAL

PROJECT

PHASE 14: STORM DAMAGED SCHOOL

DRAWING TITLE

TYPICAL ABLUTIONS SCHEMATIC

	ELECTRICAL	DNA-ELE-SK-005	T	A

STORM DAMAGED PROGRAMME
REPAIRES AND RENOVATIONS TO SCHOOL

ELECTRICAL SPECIFICATIONS

SECTION A: DETAIL TECHNICAL SPECIFICATIONS

SECTION B: STANDARD SPECIFICATIONS

TABLE OF CONTENTS

DESCRIPTION **PAGE NO.**

SECTION A: DETAIL TECHNICAL SPECIFICATIONS 1
A.1 SCOPE OF WORKS 1
1. GENERAL 1
2. SITE LOCATIONS AND CONDITIONS 1
3. SUBMISSION OF FORMS AND FEES 1
4. DRAWINGS AND VERIFICATION OF POSITIONS 1
5. ELECTRICAL EQUIPMENT 2
6. SCOPE OF WORK 2
7. WORK UNDERTAKEN BY OTHERS 2
8. PARTICULAR REQUIREMENTS OF MATERIALS, EQUIPMENT AND INSTALLATION: 3
A.2 PRE-AMBLE TO STANDARD SPECIFICATION FOR ELECTRICAL INSTALLATIONS 18
1. INTRODUCTION 18
2. INSTALLATION WORK 18
3. REGULATIONS 18
4. SITE CONDITIONS 19
5. ARRANGEMENTS WITH THE SUPPLY AUTHORITY 19
6. MATERIAL AND EQUIPMENT 19
7. CODES OF PRACTICE OR STANDARD SPECIFICATION 20
SECTION B: STANDARD SPECIFICATIONS 21
B.1 INSTALLATION AND TERMINATION OF CONDUITS AND CONDUIT ACCESSORIES 21
1. GENERAL 21
2. SCREWED METALLIC CONDUIT 22
3. PLAIN-END METALLIC CONDUIT 24
4. NON-METALLIC CONDUIT 25
5. FLEXIBLE CONDUIT 27
6. INSTALLATION REQUIREMENTS 28
7. INSTALLATION IN CONCRETE 30
8. SURFACE INSTALLATIONS AND INSTALLATIONS IN ROOF SPACES 31
9. FUTURE EXTENSIONS 34
10. EXPANSION JOINTS 34
11. CHASES AND BUILDER'S WORK 35
B2. INSTALLATION OF WIRING CHANNELS, UNDERFLOOR DUCTING AND POWER SKIRTING 37
1. RESPONSIBILITY OF THE CONTRACTOR 37
2. WIRING CHANNELS 37
3. UNDERFLOOR DUCTING 39
4. POWER SKIRTING 41
B.3 INSTALLATION OF CABLE TRAYS AND LADDERS 43
1. GENERAL 43
2. RESPONSIBILITY OF THE CONTRACTOR 43
3. SUPPORTS 43
4. SPACING OF HORIZONTAL SUPPORTS 43
5. JOINTS 44
6. FIXING TO SUPPORTS 44
7. FIXING TO THE STRUCTURE 44
8. INSTALLATION OF CABLES 45
9. EARTHING 45
10. CORROSION 45
B.4 FIXING MATERIALS 46
1. RESPONSIBILITY 46
2. FINISHING 46
3. STRUCTURAL STEEL 46
4. SCREWS AND BOLTS 46
5. WALL PLUGS 46
6. ANCHOR BOLTS 46
7. GALVANISED EQUIPMENT 47
8. SHOT-FIRED FIXING 47

9. CLAMPS AND BRACKETS 47
B.5 WIRING 48
1. TYPE OF CONDUCTORS 48
2. WIRE-WAYS 48
3. ORDER OF WORK 48
4. CIRCUITS 48
5. LOOPING AND JOINTS 49
6. GROUPING OF CONDUCTORS 49
7. CABLE TRAYS 49
8. DRAWING-IN OF CONDUCTORS 49
9. THREE-PHASE OUTLETS 49
10. VERTICAL CONDUIT INSTALLATION 50
11. CONNECTIONS 50
12. EARTHING CONDUCTORS 50
13. COLOURS 50
14. SINGLE-POLE SWITCHES 50
15. SIZE OF CONDUCTORS 50
16. PARTITIONS 51
B.6 INSTALLATION OF CABLES 52
1. GENERAL 52
2. IDENTIFICATION OF CABLES 52
3. TRENCHING 52
4. INSTALLATION OF UNDERGROUND CABLES 59
5. INSTALLATION OF CABLES IN CONCRETE TRENCHES 60
6. FIXING OF CABLES TO TRAYS OR STRUCTURES 62
7. GROUPING AND SPACING OF CABLES IN BUILDINGS AND STRUCTURES 63
8. TERMINATION AND JOINTING OF CABLES 64
9. TESTING 68
10. MEASUREMENTS 69
11. COMPLETION 69
B.7 INSTALLATION OF LIGHT SWITCHES AND SOCKET-OUTLETS 71
1. GENERAL 71
2. INSTALLATION OF SOCKET-OUTLETS 72
3. INSTALLATION OF LIGHT SWITCHES 72
B.8 PHOTO-ELECTRIC DAYLIGHT SENSITIVE SWITCH FOR OUTSIDE LIGHTING 74
1. INSTALLATION 74
B.9 INSTALLATION OF LUMINAIRES 75
1. POSITIONS 75
2. COVER PLATES 75
3. FIXING TO DRAW-BOXES 75
4. HANGERS AND SUPPORTS 75
5. SUSPENDED LUMINAIRES 75
6. SUSPENDED WIRING CHANNELS 75
7. CEILING BATTENS 76
8. GLASS-BOWL LUMINAIRES 76
9. FLUORESCENT LUMINAIRES FIXED TO CONCRETE SLABS 76
10. FLUORESCENT LUMINAIRES FIXED TO CEILINGS 76
11. CONTINUOUS ROWS OF LUMINAIRES 77
12. RECESSED LUMINAIRES 77
13. SPECIAL CEILINGS 78
14. BULKHEAD LUMINAIRES 78
15. TYPE OF CONDUCTOR 78
16. WIRING OF LAMPHOLDERS 78
17. HIGH BAY LUMINAIRES 78
B.10 CONNECTIONS TO EQUIPMENT 80
1. GENERAL 80
2. CONNECTIONS TO SWITCHBOARDS 80
3. CONNECTIONS TO WATER HEATERS 81
4. CONNECTIONS TO HEATERS, FANS AND AIRCONDITIONING UNITS 82
5. CONNECTIONS TO COOKING APPLIANCES 84
B.11 EARTHING 85

1. RECOMMENDATIONS: PRACTICAL INSTALLATION OF EARTH ELECTRODES 85
2. EARTHING OF A GENERAL ELECTRICAL INSTALLATION 86
B.12 PROVISION FOR TELEPHONE INSTALLATION 89
1. CONTRACTOR'S RESPONSIBILITY 89
2. REGULATIONS 89
3. SEPARATION OF SERVICES 89
4. MAIN TELEPHONE DISTRIBUTION BOARD 89
5. VERTICAL BUILDING (SERVICE) DUCTS 90
6. TELEPHONE OUTLETS 90
7. CONNECTION OF TELEPHONE OUTLETS 91
B.13 INSPECTIONS, TESTING, COMMISSIONING AND HANDING OVER 93
1. PHYSICAL INSPECTION PROCEDURE 93
2. TESTING AND OPERATIONAL INSPECTION PROCEDURE 93
3. "AS BUILT" DRAWINGS 93

SECTION A: DETAIL TECHNICAL SPECIFICATIONS

A.1 SCOPE OF WORKS

1. GENERAL

This Detail Technical Specification **Section A** of this document shall be read in conjunction with the Standard Specification in **Section B** of this document, and shall apply unless otherwise indicated in this section.

Should there be any conflict between any parts of this document then sections shall be considered in the following order of priority:

Detail Specification
Drawings
Bill of Quantities
Standard Specification

2. SITE LOCATIONS AND CONDITIONS

The site are situated in various locations within the Kwazulu-Natal province.
The site is subjected to the following prevailing conditions:

Maximum ambient temperature	-	35° C
Minimum ambient temperature	-	0° C
Relative humidity	-	85 % at maximum temperature
Altitude	-	±430 - 6000m above MSL

3. SUBMISSION OF FORMS AND FEES

The Contractor shall issue all notices and make the necessary arrangements with Supply Authorities, the Postmaster-General, SA. Transport Services, Provincial or National Road Authorities and other authorities as may be required with respect to the installation.

The Contractor shall submit all the necessary application, commencement and completion forms to the Supply Authority and arrange to pay the fees for the electrical connection.

4. DRAWINGS AND VERIFICATION OF POSITIONS

The drawings generally show the scope and extent of the proposed work and shall not be held as showing every minute detail of the work to be executed. The position of all items of electrical equipment indicated on the drawings shall therefore be taken as approximate.

The position of power points, switches and light points that may be influenced by built-in furniture must be established on site, prior to these items being built in.

The Contractor shall ensure that the positions of items of electrical equipment do not conflict with other equipment and/or fixtures and, if in doubt, decisions shall be obtained from the Department's representative.

5. ELECTRICAL EQUIPMENT

All equipment and fittings supplied must be suitable for the relevant supply voltage, and frequency and must be approved by the Department's representative OR Electrical Engineer.

6. SCOPE OF WORK

The contract comprises the supply, delivery, off-loading, storage, installation, commissioning, testing, handing over and maintenance for the period stated in the tender document and applicable drawings for the electrical installation and lightning protection for the various **Storm Damage Schools within KwaZulu-Natal**

The schools comprises of the existing building blocks that is to be revamped and possible new blocks constructed. The work covered by this specification and drawings comprises the complete electrical installation, which will include the supply, installation, connection, testing and commissioning and handing over to department of the complete installation in working order of the following:

- Repairs and renovations to damaged electrical installations/equipment
- Supply and installation of new LV distribution boards;
- Supply and installation of new LV cable reticulation;
- Supply and installation of complete Lighting Layout;
- Supply and installation of complete Power Layout;
- Supply and installation of conduits for Telephone, data and intercom Systems.
- Supply and installation of the lightning protection and Earthing of the steel roofs;
- The Earthing of the complete installation as required by the Regulations and Standards;
- Testing and commissioning of the complete installation;
- All other materials and labour necessary for the proper completion of the electrical installation.

7. WORK UNDERTAKEN BY OTHERS

The following particulars do NOT form part of the Electrical Installation:

- Telephone and data installation
- Intercom installation; and
- Making good of chases in walls and floors after the installation of conduit, boxes and other accessories.

8. PARTICULAR REQUIREMENTS OF MATERIALS, EQUIPMENT AND INSTALLATION:

1. ELECTRICAL SUPPLY

No new electrical supplies are anticipated. The Existing installation is to be repaired and renovated only.

2. WORKS ON EXISTING BUILDINGS

Existing buildings within the site will be refurbished and brought up to the required standard. All condemned buildings are to be demolished. All asbestos roofs on existing buildings will be removed and replaced with steel roofs. The electrical installation in the buildings that have been vandalised, needs to be made good or replaced under this contract. The contractor must make resources available to disconnect, remove and make safe all existing installations where the buildings are being refurbished or demolished. all electrical upgrades / repairs to be comply with sans 10142-1 and form part of the final overall electrical CoC for the site.

3. CABLES

The Contractor shall supply and install all cables as shown on the drawings, the overall schematic diagrams, or in the Bills of quantities. All armoured cables shall be 600/1000V PVCA + ECC type with stranded annealed copper conductors.

All routes, lengths and size shall be as indicated on the drawings and as specified. The final cable routes must be determined on site in conjunction with the Engineer.
The actual cable lengths must be measured on site before ordering the cables. The cable lengths must be measured from conductor termination to conductor termination as no payment will be made for superfluous cable. The tender price will be adjusted if the actual cable length installed differs from that specified. The adjustment will be made according to the rate tendered for the particular cable size concerned.

The storage, transportation, handling and laying of the underground cables shall be in accordance with first class practice and the Contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to the cables during such operations.

The handling and laying of cables shall be carried out in accordance with the following:-

1. Cable laying shall not commence until the trenches have been inspected and approved and the soil qualification type is agreed upon by the Contractor and the Department's representative;
2. Cables shall not be subjected to any undue tension, twists, kinks of any type or improper handling;
3. The inside radius shall be greater than 12 times the overall diameter of the cable;

4. Care shall be taken where cables are drawn through sleeves and ducts to avoid abrasion, elongation or distortion of any kind. The ends of such sleeves shall be sealed off to the approval of the Engineer after drawing-in of cables;
5. Adequate slack shall be allowed for the termination of cables;
6. No outdoor cable work shall be carried out during inclement weather. Where cables are cut and not immediately made-off, the ends are to be sealed without delay to protect the cable against ingress of moisture;
7. Cables installed in trenches shall be laid at least 150mm apart over a 75mm bedding of sifted ground or soft sand. The trench shall then be backfilled with a 75mm layer of sifted ground or soft soil and then compacted. The trench shall then be filled and compacted in 150mm layers to the top; and
8. PVC cable warning tape shall be installed at 300mm below ground level directly above the cables along the entire cable routes.

The jointing and the making-off of the cables must only be carried out by qualified experienced cable jointers.

Cables shall be terminated by means of suitable cable glands and neoprene shrouds of an approved make using the manufacturers recommended method.

All joints in underground cables and terminations shall be made either by means of compound filled boxes according to the best established practice by competent cable jointers using first class materials or by means of approved epoxy-resin pressure type jointing kits such as "Scotchcast". Epoxy-resign joints must be made entirely in accordance with the manufacturer's instructions and with materials stipulated in such instructions. Low voltage PVCA cables are to be made off with sealing glands and materials designed for this purpose which must be of an approved make.

All terminations must be such that the armouring is bonded to the metal gland plate. Where cables are not glanded-off onto a gland plate, the armouring shall be bonded to the earth bar or terminal using a suitable earthing ring.

During the course of the work the actual lengths will be measured on site and adjustments will be made according to the price per meter length as installed by the Contractor for the particular cable size concerned.

On each completed section of the laid and jointed cable, the insulation resistance shall be tested to approval with an approved "Megger" type instrument of not less than 500 V for low voltage cables.

4. EXCAVATIONS AND CABLE SLEEVES

The Contractor shall acquaint himself with the position of existing services such as stormwater pipes, water mains, power cables, telephone cables, etc. and take the necessary precautions before commencing excavations to prevent disruption of these services. Any damage caused by the Contractor to these services shall be repaired at his cost.

The Contractor shall take the necessary precautions and provide the necessary warning signs and/or lights to ensure that the public and/or employees on site are not endangered.

The Contractor shall take the necessary precautions to safeguard existing structures, sewerage works, water reticulation works, roads or other property on the site from any damage or risk of subsidence.

Cable trenches for underground LV cables installed in general areas shall be excavated to a depth of not less than 750mm below ground level and the width shall not be more than 400mm for one or two cables. The minimum cover from the top of the cables to finished ground level shall not be less than 600mm.

Cable trenches for underground LV cables installed under roads and load bearing areas shall be excavated to a depth of not less than 950mm below ground level and the width shall not be more than 450mm for one or two cables. The minimum cover from the top of the cables to finished ground level shall not be less than 800mm.

The width shall be increased where more than two cables are laid together so that the cables may be spaced at least 150mm apart throughout the run. The bottom of the trench shall be level and clear and the bottom sides free from rocks or stones liable to cause damage to the cables.

Cable trenches may not be backfilled before the cables laid on the bedding have been inspected and the cables have been tested. Cable trench shall be backfilled and properly compacted in layers with suitable hand tampers or mechanical stampers to ensure that there is no subsidence. During compaction the soil may have to be moistened to a optimum moisture content to attain an adequate compaction density. If suitable backfill material is not available at the trenches, the Contractor shall obtain it elsewhere at no additional cost. All surplus ground and rocks shall be removed from the site of works and this cost be included in the Contractor's tender price.

Tenderers must base their cost of trenching in soft or hard material on the total quantities as indicated in the Bill of Quantities. The actual quantities, based on the applicable number of cables to be laid, will be measured on site during the course of the service and adjustments made according to the price per cubic metre as inserted in the Bill of Quantities by the Tenderer. Payment for the trenching having a greater volume than that specified for the purpose will not be considered

except where extra excavations are necessary to by-pass obstacles such as water pipes, drains, large boulder etc. In all such instances the amount of the extra excavations must be agreed upon on site between the Engineer and the contractor.

The tendered rate shall include full compensation for clearing and grubbing the trench areas and the temporary removal of improvements from the line of the trench, for excavating the trench, preparing the bottom of the trench, separating material unsuitable for backfill, keeping the excavations safe, dealing with any surface or subsurface water, measuring, classification and keeping of all records and for separating topsoil and selected backfill material where necessary.

The rate shall furthermore cover the costs of installing the sand bed and sand cover, backfilling, compacting and disposing of the surplus material.

The materials excavated shall be classified as follows for payment purposes:

Hard material:
Material which cannot be excavated efficiently except with the use of pneumatic tools, blasting or wedging and splitting, and shall include boulders exceeding 0.15 m^3 in volume.

Soft material:
All material not classified as hard material. Notwithstanding the above classification, all material excavated from previously constructed fills, embankments, pavement layers and from above existing services shall be classified as soft material.

The decision of the Engineer as to the classification of the material shall be final and binding and any objection as to the classification shall be made before the excavation has been backfilled.

The measured items shall include any or all of the following:

(1) Excavate in all materials for trenches, backfill, compact and dispose of surplus material. This rate shall apply to all excavations.

(2) Extra over on item (1) for excavating in hard material.

(3) Extra over on item (1) for excavating by hand in all materials.

(4) Extra over on item (1) for using backfill material obtained from sources provided by the Contractor.

Where cables cross under roadways, other services and where cables enter buildings, the cables shall be installed in asbestos-cement pipes, earthenware or high density polyethylene pipes.

The Contractor shall supply and install all the cable access sleeves as indicated on the drawings and as specified. All underground sleeves shall, unless where otherwise specified, comprise uPVC pipes. It shall be the responsibility of the Contractor to ensure that all the sleeves are correctly installed.

Suitable large radius or easy bends shall be allowed where sleeves are to terminate in distribution boards or draw boxes. Sleeves terminating in manholes are to be positioned to provide maximum cable bending radius.

The top of all underground sleeves, which are installed in general areas other than roadways and load bearing areas, shall be not less than 600mm below finished ground level. PVC warning tape shall be installed 300 below finished ground level directly above the sleeves.

Where cables cross under roadways or other load bearing areas the cables shall be installed in asbestos-cement pipes, earthenware or high density polyethelene sleeves. In all such cases the top of the sleeves shall be not less than 800 mm below the finished level of the road surface.

Before backfilling, the ends of all used and unused sleeves shall be sealed with paper and weak cement mix or a suitable non-hardening watertight compound. Suitable nylon draw cords shall be installed in all unused sleeves.

5. DISTRIBUTION BOARDS

In addition to clause 14 and clause 15 of Part 1 of this specification the following shall also be applicable to distribution boards (DB) required for this service.

The Electrical Contractor shall supply and install the new distribution boards as indicated on the drawings and indicated in the distribution board schedules. All distribution boards shall be approved by the Department's inspectorate or Electrical Engineer.

All indoor boards shall be manufactured from pre-galvanised sheet steel and outdoor kiosks from 3CR12 stainless steel. The door hinges and turn catch shall be stainless steel. Cover plates shall be retained with twist-lock captive square-keyed fixing device.

All distribution boards shall be delivered complete with switchgear, busbars, internal wiring, dummy circuit breakers, labels etc. in the positions indicated on the drawings.

All distribution boards shall be supplied with reference labels that are securely fixed with brass screws. A main designation label shall be fixed on the outside frame or door and a main label fixed to the inner cover plate. A legend card and holder shall be provided on the inside of the door. Details of circuits and locations of outlet typed thereon shall be as shown on the single line diagram and board arrangement drawing.

The main label shall include the following information:

DB Name:
Fed from:
Size of cable:
Fault Level:

All spare space for future equipment shall be blanked-off with dummy covers or purpose-made cover plates to match the distribution board.

The fault level of the circuit breakers shall be similar to or higher than that indicated on the distribution board drawings.

Surge arresters for use in distribution boards shall comply with SANS IEC 61643-1. Class I (Lightning) 25/60 kA (I imp)/ 50 kA (If) with suitable back-up fuses shall be used on the main switchboard. The surge arresters shall be modular and shall have an easily identifiable failure indication feature so that each module can be replaced separately.

All internal wiring shall be neatly done and tied down with "Hellerman" cable ties.

Two (2) copies of working drawings of each distribution board showing the general layout, arrangements, construction detail, etc. shall be submitted to the Engineer for reviewing prior to manufacture. The boards are to be inspected at the manufacturer's premises by the Engineer and then Contractor before they can be delivered to site.

The distribution boards shall be as specified in the DB Schedules attached at the end of this section.

All distribution boards shall be installed with additional 20 mm diameter conduits to the ceiling void where applicable.

6. WIREWAYS

The Electrical Contractor shall supply and install all the wireways as required and as indicated on the drawings.

All conduits, regardless of the system employed, shall comply with clauses 7 to 10 of Part 1 of this specification.

Conduit and conduit accessories used shall be plain end galvanized steel in accordance with SANS 163, 763 and 1007 respectively and shall be concealed in the buildings work where possible.

NOTE:
Where plain end conduit is offered all switches and light fittings must be supplied with a permanent earth terminal for the connections of the earth wire.

The Contractor shall be responsible for the supply and installation of all power skirting complete with corner pieces, end pieces, junction pieces, supply conduits, cover plates, drawboxes and power outlets as specified.

The power skirting must comply with SANS 1197. The Contractor must ensure that the power skirting is installed to satisfaction of the Department's representative before commencing with the wiring of the power skirting.

The power skirting shall be similar and approved to "CABSTRUT" Classic GC/2 (165 x 57mm) 2-compartment power skirting with duct divider. The power skirting shallbe manufactured from 0.8mm thick epoxy coated mild steel with standard grey colour finish.

The cable tray shall be medium duty type made from 1mm thick pre-galvanized sheet steel with 27mm turn-ups and shall include all accessories. The cable tray shall be installed in the roof space for the main feeder cables to distribution boards.

The trunking shall be 'P9000' 127mm x 76mm made from 1mm thick pre-galvanised steel with snap-in steel covers. The trunking shall be painted, were required, in accordance with the Department's standard specification.

7. WIRING

Wiring of the installation shall comply with clause of Part B of this specification.

All wiring installed in conduit concealed within board ceilings shall accessible from below the ceiling for re-wiring purposes.

The wiring of all light circuits will consist of 2 x 2,5mm² PVC insulated copper conductors and 1 x 2,5mm²PVC insulated copper earth wire

The wiring of all plug circuits shall consist out of 2 x 4,0mm² PVC insulated copper conductors and 1 x 2,5mm² PVC copper earth wire.

8. POWER OUTLETS

The Electrical Contractor shall allow for the supply of power outlets. The location and final positions of the power outlets to be advised by an Engineer.

Isolators shall be 2-pole or 3-pole of the no-load type as required, and be suitably rated for the load to be connected.

Externally mounted isolators shall be enclosed in suitable weatherproof glass-reinforced polyester (GRP) enclosures with sliding lids.

All isolators shall, wherever possible, be of one make and shall be as manufactured by 'Crabtree' or 'Clipsal'.

Details of the power outlets for the various type of equipment to be connected shall be as follows:

(1) Air Conditioning Units

Isolators for indoor air conditioning units, wall mounted at low level, shall be rated at not less than 20 A with cord grip outlet and flush mounted in power skirting adjacent to the connection point of the unit. The final connection to the unit shall be with suitably rated white PVC flexible cable.

Isolators for indoor air conditioning units, wall mounted at high level, shall be rated at not less than 20 A with cord grip outlet installed in suitable flush mounted box adjacent to the connection point of the unit. The final connection to the unit shall be with suitably rated white PVC flexible cable.

Isolators for air conditioning units mounted externally or in ceiling voids, shall be rated at not less than 20 A and installed in suitable GRP box with sliding lid mounted adjacent to the connection point of the unit. The final connection to all external units shall be with suitably rated black uv-resistant neoprene flexible cable.

(2) Geysers

Isolators for geysers mounted in ceiling voids, shall be rated at not less than 20 A and installed in suitable GRP box with sliding lid mounted adjacent to the connection point of the unit. The final connection to the unit shall be with suitably rated white PVC flexible cable or with 'Kopex' type flexible conduit and PVC insulated conductors.

Isolators for geysers, wall mounted below the ceiling, shall be rated at not less than 20 A with cord grip outlet installed in a 100x100 extension box mounted over a flush mounted box adjacent to the connection point of the unit. The final connection to the unit shall be with suitably rated white PVC flexible cable or with 'Kopex' type flexible conduit and PVC insulated conductors.

(3) Stoves

Isolators for free standing single-phase stoves shall be 60 A, 2-pole with neon indication light installed in suitable flush mounted box at 1400 AFFL. The flush box shall be linked to a flush mounted round conduit box, directly below at 300 AFFL, with 25mm conduit. A 100x100 metal extension box with cover shall be mounted on the wall infront of the flush round box. 'Kopex' type flexible conduit shall be used to form the connection between the extension box and the stove. The flexible conduit shall be long enough to move the stove by at least 1m from its normal position for cleaning purposes.

9. SOCKET OUTLETS

All switched socket outlets shall be of one make and shall be as manufactured by 'Crabtree' or 'Clipsal'.

Indoor socket outlets shall be installed in flush wall mounted boxes or in powerskirting as indicated on the drawings. The switch cover plates shall be white epoxy-coated metal with crome-plated fixing screws.

10. LIGHT SWITCHES

All light switches shall be of one make and shall be as manufactured by 'Crabtree' or 'Clipsal' and shall be of the same manufacture as the socket outlets.

Indoor light switches shall be installed in flush wall mounted boxes. The switch cover plates shall be white epoxy-coated metal with crome-plated fixing screws.

Outdoor light switches shall be of of the water tight surface mounted type with metal body and rotary switch rated at 16 A, as per 'WACO' type NS3500 or similar and approved.

Light sensitive (daylight) switches shall be equal and approved to "NATIONAL" or "ROYCE Thompson" and shall be installed in an approved bulkhead fitting for the control of outside lights. The daylight switch shall be of the fail-safe type and shall comprise a photo-electric cell, thermal actuator and a change-over switch rated at 10A, 230v. The unit shall be housed in an empty bulkhead fitting having a rectangular aluminium base and a high impact acrylic diffuser. The bulkhead fitting shall be installed vertically on a wall or surface at a suitable location which, unless otherwise shown, has a north-westerly aspect. The Contractor shall ensure that the operation of the daylight switch is not affected by nearby light fittings.

11. LIGHTING INSTALLATION

The installation and mounting of light fittings shall comply with clause 19 of Part 1 of this specification.

All light fittings shall be supplied by the Contractor and shall be approved by the Department's representative. The light fittings shall be of the type specified in the Luminaire Schedule attached at the end of this section.

12. BELLS/SIREN

The bells must be suitable to operate on a 230V, 50Hz supply and the entire bell system must be controlled by a switchable bell switch installed in the Administration building. The bells must be of the 203mm Gents type.

A 20A, double pole isolator must be mounted next to each bell. A label with the wording "Danger Supply is from Admin DB" must be mounted on the isolator or on the wall next to the isolator at each bell, i.e. a suitable York box or similar approved box.

Bell outlets must consist of outlet boxes flush in the wall behind the isolator and bell.

A lockable 300 x 300 x 100mm deep surface mounted purpose made terminal box must be provided in the Administration building. The box must be labelled "Bell" and must be mounted and installed in the same manner applicable to distribution boards. The manufacture of this box must in general comply to distribution boards requirements and must be linked with the internal intercom terminal box by a 25mm diameter conduit. A 32mm conduit must be installed between this bell distribution board and DB in administration block. The bell push shall be of the push button type suitable for operation at 230V 50Hz. The push button shall be mounted in a 100 x 50 x 50mm wall box in position indicated on the drawing. The push button shall be equal and similar to "Crabtree" Type 2441.

13. IDENTIFICATION

Labels indicating the circuit number shown on the 'As-built' record drawings shall be provided on the inside of all cover plates. The label shall be permanently fixed and shall indicate the DB from which it is fed and the circuit number i.e. DB -1/L2.

All cables shall be labelled using approved durable labels. Labels shall be provided at the distribution boards as well as on both sides of underground sleeves crossing roadways and hardened areas.

14. LIGHTNING PROTECTION

The Contractor shall earth the metal roofs around the perimeter of the buildings by providing a series of down conductors . The down conductors shall comprise 16 mm² stranded PVC copper earth wire enclosed in concealed or surface conduit with one end bonded to the roof sheeting and the other to a 1.2 m earth electrode located at least 1m from the building. Certain sections of the roof shall also be bonded to the main roof using 16 mm² stranded bare copper earth wire tails. The termination of the 16 mm² down conductors and bonding tails to the roof sheeting shall be done by means of lugs and brass screws, nuts and washers. All terminations on the roof sheeting shall be sealed with a suitable uv-resistant water-proof compound to the approval of the Engineer.

A test joint shall be provided at 500mm AFGL at each downconductor location. The test joint shall comprise of two lugs and a 10mm galvanized steel bolt enclosed in a suitable GRP enclosure.

All earth electrodes shall comprise "Cadweld" solid 16 mm diameter copper welded type with a minimum copper coating of 200 microns to SANS 0163. Inferior grade earth rods will not be acceptable. The earth electrodes must be driven into the ground to at least 500 mm below finished ground level and only after the final bonding and tests have been carried out must proper back-filling and compacting of same take place. The use of charcoal is not permitted.

The earth resistance of each down conductor earth electrode shall be measured by an Earthing specialist by means of an approved instrument.
Earth resistance tests shall be carried out as soon as possible after the rods have been connected and shall not exceed 10 ohm. Tests shall be carried out under normal dry ground conditions. Test certificates shall be provided for each down conductor/earth rod location.

15. EARTHING

The Contractor will be responsible for all earthing and bonding of the complete electrical installation. The earthing and bonding shall comply with clause 18 of Part 1 of this specification, and shall be to the satisfaction of the Department's Representative.

A trench earth shall be provided in the vicinity of the main switchboard in the generator room, and shall have a resistance of not more than 1 ohm.

16. TESTING AND COMMISSIONING

The Contractor shall test the complete electrical installation in accordance with SANS 10142 as amended and with the requirements of the Supply Authority, before final commissioning and handing over of the complete installation.

The Contractor shall insure that the installation is completed and commissioned in every respect and tested and that there are no major defects prior to notifying the Engineer for the final inspection.

Upon successful completion of all testing the Contractor shall submit a fully completed test report (attached to this document) together with a Certificate of Compliance for each DB when notifying the Engineer for a final inspection.

The Engineer reserves the right to witness all tests and the Contractor shall therefore notify the Engineer when he intends to commence testing.

The Contractor may be required to carry out random tests on the electrical installation, as directed by the Engineer, during the final inspection and shall therefore provide all the necessary test equipment for this purpose. If there is reason to doubt the accuracy of such instruments, the Contractor shall take the necessary action to prove their accuracy.

The Contractor shall issue the relevant Compliance Certificates for areas covered by each new DB before these areas are occupied.

All single phase socket outlets shall be tested for polarity and sensitivity of the earth leakage protection equipment and shall be tested by means of an approved instrument.

Each length of cable shall be tested for insulation and polarity by means of a 1000 volt megger. In the case of underground cables this shall be done before backfilling. In addition, the earth-loop impedance of each main and sub-main feed shall be measured. "DANGER" notices shall be displayed at remote ends of cables under test.

The Contractor shall balance the loads across all three-phase switchboards as evenly as possible during commissioning of the installation. Where conductors are altered to achieve satisfactory results they shall be re-taped by the Contractor.

The Contractor shall submit one complete set of marked-up "as-Built" record drawings of the whole electrical installation to the approval of the Engineer. These drawings shall show details and positions of all services actually installed in the works. All cables joints, markers, cable sleeves, etc., must be accurately dimensioned on the drawings.

An "As-built" drawing transparency of the main electrical reticulation network of the overall installation shall be suitably framed to the approval of the Engineer and shall be mounted in the main electrical switch room.

Retention moneys normally due at the start of the maintenance period will not be released until "As-built" drawings have been prepared to the satisfaction of the Engineer.

17. OPERATING AND MAINTENANCE MANUALS

The Contractor must provide three (3) copies of a maintenance manual to the approval of the Engineer.

The final completion certificate will not be issued until the copies of the approved maintenance manual have been issued to the Engineer.

The Contractor must ensure that he provides marked-up 'as-built' record drawings timeously to the Engineer so that final 'as-built' record drawings for inserting in the manuals can be prepared.

The maintenance manuals shall comprise of a suitably labelled plastic covered 'Bantex' lever arch files with pre-labelled plastic dividers.

The manual shall be made up of the following sections and sub-sections:

1. **Introduction:**

   Scope of Manual;
   General Arrangement of Manual;
   Description of Installation;
   List of design & construction firms.

2. **List of Drawings:**

3. **Specifications:**

   Detailed Electrical Specification;
   General Electrical Specification; and
   Any other specification such as for painting etc.

4. **Operating Procedures:**

   Switching methodology of lighting installation; and
   Other equipment such as ventilation / extract fans, pool pumps etc.

5. **Maintenance:**

   Purpose of maintenance;
   Preventative maintenance schedule with monthly and yearly activities;
   & Break down maintenance.

6. **Parts and Components:**

   Switchgear and control equipment;
   Cables;
   Lighting equipment;
   Ventilation equipment;
   Any other relevant equipment; and
   Supplier details.

7. **Appendices:**

   Compliance Certificates for each DB;

Electrical installation test certificate.
Earthing test certificates;
Equipment guarantees;
Completion Certificate; and
Final 'As-Built' record drawings.

Notes:

(a) The completion certificate and the final 'As-built' record drawings for inserting in the maintenance manual will be provided by the Engineer.
(b) Copies of equipment brochures shall be inserted after the relevant sub-sections.

18. COMPLETION AND MAINTENANCE DURING THE MAINTENANCE PERIOD

Practical completion shall occur when the installation has been completed with the exception of a few outstanding minor items, which must be attended to within a reasonable period of time. Practical completion may also only occur after the installation has been fully tested and is fully compliant with the relevant Codes and Regulations. Occupation of the works after practical completion may only occur after the relevant Certificates of Compliance have been issued to and reviewed by the Engineer.

Completion shall occur when all defects indicated on the Practical Completion Certificate have been successfully attended to, to the satisfaction of the Engineer.

The maintenance period shall commence from the date when the completion certificate has been issued by the Engineer. During the guarantee period the Contractor shall be fully responsible for the complete maintenance of the installation, which shall include materials equipment and labour. Maintenance of the installation shall mean the regular servicing, repairing cleaning and adjustments of the installation as well as free of charge replacement of any defective components during the guarantee period.

A fully qualified and trained person shall examine and test the installation when a fault occurs and shall also perform all the necessary maintenance tasks to ensure smooth and faultless operation. All emergency calls shall immediately be attended to by the Contractor.

A notebook shall be kept on site and all details of each visit and of the servicing and repairs carried out shall be recorded. Each entry shall be dated and signed by the Contractor as well as the delegated representative of the Client or owner or occupier of the premises. The book shall at all times be kept in a safe place on site and shall be made available to the Engineer for inspection as and when requested. Failure to record all details of servicing and repairs carried out, in this book, may result in the guarantee period being extended.

A Final Completion Certificate shall be issued at the end of the maintenance period provided all the outstanding items have been attended to, to the satisfaction of the Department's representative.

A.2 PRE-AMBLE TO STANDARD SPECIFICATION FOR ELECTRICAL INSTALLATIONS

GENERAL

1. INTRODUCTION

(a) These Standard Specifications cover the general technical requirements for the equipment, materials, installation, testing, commissioning and maintenance of electrical installations for the Department. These requirements shall be read in conjunction with the Documents as specified below.

(b) "Document" shall mean the complete set of contract documents, including the Department's Tender Conditions, Tender Qualifications, the Standard Specification and the Detail Technical Specification including all drawings and variation orders issued in terms of the contract.

(c) "Contractor" shall mean the person, partnership, company or firm appointed for the supply, installation, testing, commissioning and maintenance of the Electrical Installation. In the case of the Electrical Installation being a sub-contract, nominated in terms of the Main Contract or otherwise, the word "Contractor" shall also mean "Sub-Contractor" in terms of the Sub-Contract Conditions for the specific installation. Where applicable the Builder or Principal Contractor shall be referred to as "Main Contractor".

2. INSTALLATION WORK

(a) The complete installation shall comply with the requirements of this Specification. Should any discrepancies or contradictions exist between this specification and the Detail Technical Specification for the specific installation, then the latter shall take precedence.

In the event of discrepancies between the drawings, specifications and bill of quantities the Department shall decide whether the work as executed shall be remeasured on site or whether remeasurement shall be effected from the working drawings only.

(b) The Department's authorised representative will inspect the installation from time to time during the progress of the work. Discrepancies will be pointed out to the Contractor and these shall be remedied at the Contractor's expense. Under no circumstances shall these inspections relieve the Contractor of his obligations in terms of the Documents.

(c) The Contractor shall notify the Department timeously when the installation reaches important stages of completion (e.g. before closing cable trenches, before casting concrete, etc.) so that the Department's authorised representative may schedule his inspections in the best interest of all parties concerned.

3. REGULATIONS

(a) The installation shall be erected and tested in accordance with SANS 10142-1: The Wiring of Premises.

(b) The Contractor shall issue all notices and pay all of the required fees in respect of the installation to the authorities, and shall exempt the Department from all losses, claims, costs or expenditures which may arise as a result of the Contractor's negligence in complying with the requirements of the regulations.

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

4. SITE CONDITIONS

Tenderers are advised to visit the site and acquaint themselves with all local conditions pertaining to the execution of the installation before tender closing date. No claims from the Contractor which may arise from insufficient knowledge of site access, type of site, labour conditions, establishment space, transport and loading/unloading facilities, power and water supply, etc. will be considered after submission of tenders.

For services where prior permission is required before contractors can visit the site, a visit will be arranged for all interested parties.

5. ARRANGEMENTS WITH THE SUPPLY AUTHORITY

(a) The contractor shall give all notices required by and pay all necessary fees, including any inspection fees, which may be due to the local Supply Authority unless specified to the contrary.

(b) It shall be the responsibility of the Contractor to make the necessary arrangements with the local Supply Authority at his own cost and to supply the labour, equipment and means to inspect, test and commission the installation to the satisfaction of the Local and Supply Authorities.

(c) The Contractor shall supply and install all notices and warning signs that are required by the relevant laws, regulations and/or the Documents.

6. MATERIAL AND EQUIPMENT

(a) All material and equipment shall conform in respect of quality, manufacture, tests and performance, with the requirements of the South African Bureau of Standards or where no such standards exist, with the relevant current Specification of the British Standards Institution.

(b) All material and equipment shall be of high quality and suitable for the conditions on site. These conditions shall include weather conditions as well as conditions under which materials are installed, stored and used. Should the materials not be suitable for use under temporary site conditions then the Contractor shall at his own cost provide suitable protection until these unfavourable site conditions cease to exist.

(c) The Contractor shall, where requested to do so, submit samples of equipment and material to the Department for approval prior to installation. Samples may be retained in the Department's possession until the contract is completed after which they will be returned.

7. CODES OF PRACTICE OR STANDARD SPECIFICATION

Where reference is made to any Code of Practice or Standard Specification in this document the latest edition or amendment shall be applicable, except where specified to the contrary.

SECTION B: STANDARD SPECIFICATIONS

B.1 INSTALLATION AND TERMINATION OF CONDUITS AND CONDUIT ACCESSORIES

1. GENERAL

1.1 SCOPE

1.1.1 This section covers the installation of conduits and conduit accessories in buildings and other structures under normal environmental conditions and for system voltages up to 600 V.

1.1.2 The following types of conduit installations are included:

(a) Screwed metallic conduit - black enamelled and galvanised.

(b) Plain-end metallic conduit - black enamelled and galvanised.

(c) Non-metallic conduit.

(d) Flexible conduit.

1.1.3 Conduits may be installed as follows:

(a) In open roof spaces.

(b) Cast in concrete.

(c) Surface mounted against walls, concrete slabs, etc.

(d) In wall chases.

1.1.4 Where conduits are to be installed in concrete, this shall be undertaken while the building work is still in progress. Conduits may only be surface mounted where specified or where the Department has given its written consent.

1.1.5 Under no circumstances will conduit having a wall thickness of less than 1,6mm be allowed in screeding laid on top of concrete slabs.

1.1.6 Bending and setting of conduit must be done with special bending apparatus manufactured for the purpose and which are obtainable from the manufacturers of the conduit systems. Damage to conduit resulting from the use of incorrect bending apparatus or methods applied must on indication by the Department's inspectorate staff, be completely removed and rectified and any wiring already drawn into such damaged conduits must be completely renewed at the contractor's expense.

1.1.7 Tenderers must ensure that general approval of the proposed conduit system to be used is obtained from the local electricity supply authority prior to the submission of their tender. Under no circumstances will consideration be given by the Department to any claim submitted by the contractor, which may result from a lack of knowledge in regard to the supply authority's requirements.

1.1.8 For light and socket outlet circuits, the conduit used shall have an external diameter of 20mm. In all other instances the sizes of conduit shall be in accordance with the "Wiring Code" for the specified number and size of conductors, unless otherwise directed in part 2 of this specification or indicated on the drawings.

1.2 OTHER SERVICES

Conduits may not be installed closer than 150 mm to pipes containing gas, steam, hot water or other materials, which may damage the conduits or conductors. Conduits may not touch pipes of other service installations in order to prevent electrolytic corrosion. Where this is unavoidable, cathodic protection shall be provided.

Conduit and conduit accessories used for flame-proof or explosion proof installations and for the suspension of luminaries as well as all load bearing conduit shall in all instances be of the metallic screwed type.

2. SCREWED METALLIC CONDUIT

2.1 GENERAL

2.1.1 In general, screwed steel conduit shall be used in the wiring of buildings.

2.1.2 The installation shall comply with SANS 10142.

2.2 GALVANISED CONDUIT

Galvanised conduit and accessories shall be used in the following:

(a) In damp areas.
(b) In areas exposed to the weather.
(c) For all installations within 50 km of the coast.
(d) In plenum chambers containing humidifying equipment.
(e) For surface mounted conduit installations in kitchens and boiler rooms.
(f) In screeds resting directly on soil.
(g) For connection points to future installations.
(h) For underground conduit containing earthing conductors.
(I) In buildings where animals are housed such as cattle, sheep, dogs, etc.

2.3 TERMINATIONS

2.3.1 Spouted Connections.

Conduits shall be connected directly to draw-boxes with spouted connections. Conduits shall be screwed tightly home and no threads shall be visible.

2.3.2 Switchboards, Power skirting, etc.

Conduits shall be terminated by means of a brass female bush and two locknuts in pressed steel switchboards and distribution boxes, cable ducts, power skirting, etc. The conduit end shall only project far

enough through the entry hole to accommodate the bush and locknut. Alternatively the method detailed in 2.3.3 may be used.

2.3.3 Draw-boxes.

A female bush and two locknuts shall be used to terminate conduits at draw-boxes and outlet boxes without spouts, should there be sufficient room in the box. Where there is insufficient room, a coupling, brass male bush and locknut may be used with sufficient allowance for the reduction of the internal diameter by the male bush.

2.3.4 Holes.

Holes to accommodate brass bushes shall be large enough to accommodate the bush with a minimum of clearance.

2.3.5 Bush-nuts.

Bush-nuts for the connection of earth conductors to conduits are not acceptable.

2.4 SCREWS, BOLTS AND NUTS

Steel locknuts of thick gauge steel with milled sides shall be used in all cases. Cadmium-plated bolts and nuts shall be used except where the installation is exposed to the weather in which case brass bolts and nuts shall be used. Screws shall be installed in all tapped holes in fittings and accessories to prevent damage to the screw thread by concrete or plaster. The screws shall be screwed completely down to prevent damage to the thread on the screw.

2.5 CONDUIT ENDS

Conduit ends shall be cut at right angles to ensure that ends butt squarely at joints. Threads shall not be visible at joints and connections except at running joints. The total length of the thread on the two conduit ends shall not exceed the length of the coupling.

2.6 JOINTS

All conduit ends shall be reamed and all joints tightly screwed. Only approved couplings shall be used. Running joints with long threads shall be kept to a minimum and locknuts shall be provided to ensure a strong mechanical and a continuous electrical joint. Running joints in screwed conduit are to be avoided as far as possible and all conduit systems shall be set or bent to the required angles. The use of normal bends

must be kept to a minimum with exception of larger diameter conduits where the use of such bends is essential.

2.7 FINISH

All joints shall be painted with red lead to prevent them from rusting in damp areas, areas within 50 km of the coast and in cases where the installation is exposed to the weather for any length of time. Where the galvanising or black paint has been damaged, the area shall first be cleaned and a coat of zinc base paint applied subsequently. Additional coats of paint shall only be applied after the undercoat has completely dried. All surface mounted non-galvanised metallic conduit must be painted. (Refer to par. 8.8 of Section B1).

2.8 CONTINUITY

Mechanical and electrical continuity shall be maintained throughout the conduit installation.

3. PLAIN-END METALLIC CONDUIT

As an alternative to the screwed conduit, plain-end conduit complying with the Department's standard specification for "CONDUITS AND CONDUIT ACCESSORIES", par. 7 of Section CI, may be installed subject to the following additional conditions:

3.1 Bending and setting of plain-end conduit must be done with special benders and apparatus manufactured for this purpose and which are obtainable from the suppliers of the system. Damaged conduit resulting from the use of incorrect bending apparatus shall be completely removed and any wiring already drawn into such damaged conduits shall be completely renewed at the Contractor's expense.

3.2 Screwed conduit must be used in the following instances:

(a) In flameproof installations.
(b) Load bearing conduit.
(c) For the suspension of luminaries.
(d) Surface mounted conduit.

3.3 Plain-end conduit and associated accessories shall be manufactured of mild steel having a minimum thickness of 1,2 mm and shall comply with SANS 1065. Conduit manufactured of lighter gauge material, i.e. 0,97 mm, will not be permitted.

3.4 All conduit and accessories used in areas within 50 km of the coast shall be hot-dip galvanised to SANS 32 & 121. In inland areas Electro-galvanised or cadmium-plated accessories will be accepted.

4. NON-METALLIC CONDUIT

4.1 INSTALLATION CONDITIONS

Where specified for a particular service, non-metallic conduit may be installed under the following conditions:

4.1.1 All non-metallic conduit shall comply fully with SANS 950 and shall be installed in accordance with Appendix C of the same specification as well as SANS 10142.

4.1.2 Insulated heat-resistant boxes shall be used for outlets of totally enclosed luminaries and other fittings where excessive temperatures are likely to occur.

4.1.3 Luminaries and other fittings shall not be supported by non-metallic conduit or conduit boxes. These fittings shall be secured to the surrounding structure in a way that is acceptable to the Department. Refer to the Department's standard specification for "INSTALLATION OF LUMINAIRES", Section B9.

4.1.4 The conduit shall be supported and fixed with saddles with a maximum spacing of 1 m, even in roof spaces. (Refer to SANS 10142.) The Contractor shall supply and install all additional supporting timbers required.

4.1.5 It shall be possible to rewire the completed installation in the future without undue difficulty.

4.1.6 Non-metallic conduit and fittings shall not be used under the following conditions:

(a) Outside a building (unless protected, or sheltered under eaves).

(b) For mechanical load bearing.

(c) Where they may be subjected to temperatures below -10°C or above 70°C for prolonged periods.

(d) As primary electrical insulation.

(e) In areas where they may be subject to mechanical damage.

(f) For applications other than those for which they are designed.

(g) In concrete slab unless specified to the contrary.

4.2 PAINTING OF CONDUITS

Exposed conduit may be painted with normal oil or PVA paints, but care must be taken to ensure that the paint used does not contain any component that will soften or have any other detrimental effect on the materials from which the conduit and fittings are manufactured.

4.3 CONNECTING OF CONDUIT TO METAL EQUIPMENT/COMPONENTS

When any part of a non-metallic conduit system has to be connected to metal equipment or components (e.g. switchboard, surface socket-outlet or switch box, existing metallic conduit system, etc.) fittings and joints manufactured specifically for this purpose must be used. Non-metallic conduit must not be threaded to fit metallic connectors.

4.4 BENDS

In conduit of nominal size not exceeding 25 mm, bends may be made in accordance with par. 4.5. In all other cases bends must be achieved by the use of accessories that are introduced into the conduit run. Bends shall comply with SANS 10142.

4.5 BENDING

Conduit of nominal size up to and including 25mm may be cold bent by hand provided that the radius of the bend is greater than six times the nominal size of the conduit, and that the external angle of the bend does not exceed 90°. The procedure (which involves the use of a bending spring) should be as follows:

(a) Determine the angle through which the conduit is to be bent.

(b) Warm the cold conduit over the length to be bent by rubbing with hands.

(c) Select a bending spring which matches the conduit size and insert in to the conduit at the point where the bend is required.

(d) Bend the conduit slowly with one motion (either with the hands alone approximately 1 m apart, or across the knee) to double the required angle, release the conduit and, when its position is stable, withdraw the bending spring (turning it in an anti-clockwise direction to reduce its diameter) and gently correct the angle.

(e) Install and secure the conduit immediately following bending.

4.6 ADHESIVE JOINTS

All adhesive joints must be made in a clean dry area. The surfaces of all components to be bonded must be dry and clean.

The insertion depth should be marked on the conduit end and the adhesive applied (by means of a soft clean brush) as quickly as possible to the surfaces to be bonded by brushing lengthwise along the conduit, ensuring that a thin coating of uniform thickness is formed. The joint must be made immediately after the application of the adhesive by pushing the prepared parts squarely together with a twisting motion to the full insertion depth. Care must be taken to avoid squeezing adhesive into the cableway and all excess adhesive must be wiped off.

NOTE: Solvent adhesives contain highly volatile liquids and their containers should not be left open.

4.7 Cutting

A fine-tooth hacksaw should be used to cut conduit to the required length. Each cut end should be square and free from swarf, burrs and loose material. When determining the length of conduit to be cut, allowance must be made for the length of couplings or accessories attached to the conduit. Incorrect determination will cause bulging of the conduit or insufficient joint length.

5. FLEXIBLE CONDUIT

5.1 In installations where the equipment has to be moved frequently to enable adjustment during normal operation, for the connection of motors or any other vibrating equipment, for the connection of thermostats and sensors on equipment, for stove connections and where otherwise required by the Department, flexible conduit shall be used for the final connection to the equipment.

5.2 The installation shall comply with SANS 10142.

5.3 Flexible conduit shall preferably be connected to the remainder of the installation by means of a draw-box. The flexible conduit may be connected directly to the end of a conduit if an existing draw-box is available within 2 m of the junction and if the flexible conduit can easily be rewired.

5.4 Flexible conduit shall consist of metal-reinforced plastic conduit or PVC-covered metal conduit with an internal diameter of at least 15mm, unless approved to the contrary. In false ceiling voids, flexible conduit of galvanised steel construction may be used. connectors for coupling to the flexible conduit shall be of the gland or screw-in type, manufactured of either brass or mild steel plated with either zinc or cadmium.

6. INSTALLATION REQUIREMENTS

6.1 POSITIONS OF OUTLETS

All accessories such as boxes for socket-outlets, switches, lights, etc. shall be accurately positioned. It is the responsibility of the Contractor to ensure that all outlets are installed level and square, at the correct height from the floor, ceiling or roof level and in the correct position relative to building lines and equipment positions as specified. It shall be the responsibility of the Contractor to determine the correct final floor, ceiling and roof levels in conjunction with the Main Contractor. Draw-boxes shall not be installed in positions where they will be inaccessible after completion of the installation. Draw-boxes shall be installed in inconspicuous positions to the approval of the Department's representative and shall be indicated on the "as built" drawings.

6.2 COVER PLATES

All draw-boxes and outlets shall be fitted with cover plates, either as part of the switch or socket assembly or with blank cover plates if unused. Blank cover plates shall match other cover plates in the same area. Flush mounted cover plates in both ceilings and walls shall overlap the draw-box and edges of the recess. If the fixing lugs are substantially deeper than the finished wall surfaces, suitable coiled steel wire or tubes shall be used as spacers.

6.3 DRAW-WIRES

Galvanised steel draw-wires shall be installed in all unwired conduits e.g. conduits for future extensions, telephone installations and other services.

6.4 BENDS

A maximum of two 90 bends or the equivalent displacement will be allowed between outlets and/or boxes.

Draw-boxes shall be installed at maximum intervals of 15 m in straight runs. All bends shall be made without heating the conduit or without reducing the diameter of the conduit. The inside radius of a bend shall not be less than five times the outside diameter of the conduit. (Refer to SANS 10142,

6.5 WALL SOCKET-OUTLETS

Where more than one socket-outlet is connected to the same circuit, the conduit shall be looped from one outlet box to the following on the same circuit. Where a metal channel is used, the conduit may be installed from the channel directly to the outlet box on condition that the conductors can be looped from one outlet to the next without making any joints in the wires.

6.6 LUMINAIRES

Where the conduit end is used to support luminaries, a ball-and socket type lid shall be fitted to the pendant box in all cases where the conduit is longer than 500 mm. In all other cases a dome lid may be used. Where luminaries are specified which are fixed directly to the pendant box, the pendant box shall be fixed independently of the conduit installation except where the pendant box is cast into concrete.

6.7 FLUSH MOUNTED OUTLET BOXES

The edges of flush mounted outlet boxes shall not be deeper than 10 mm from the final surface. Spacer springs shall be used under screws where necessary.

6.8 EXCESS HOLES

All excess holes in draw-boxes or other conduit accessories shall be securely blanked off by means of brass plugs to render the installation vermin proof.

6.9 DEBRIS

Care shall be taken to prevent debris or moisture from entering conduits during and after installation. Conduit ends shall be sealed by means of a solid plug which shall be screwed to the conduit end. Conduits shall be cleaned and swabbed to remove oil, moisture or other debris that may be present before conductors are installed. Swabs shall not be attached to the conductors.

6.10 DEFECTS

Each length of conduit shall be inspected for defects and all burrs shall be removed. All conduits that are split, dented or otherwise damaged or any conduits with sharp internal edges shall be removed from site. The Contractor shall ensure that conduits are not blocked.

6.11 WITHDRAWAL OF CONDUCTORS

To ensure that all electrical conductors are easily withdrawable from conduits and to ensure that there are no joints in the conductors, the Department's representative will have the right to have the conductors of any circuit removed at his discretion. If the conductors are found to be in a satisfactory condition after having been withdrawn, the Department shall bear the cost of withdrawing and re-installing such conductors. If the conductors are found to have been damaged during installation or removal or if joints are found, they shall be replaced and the cost shall be borne by the Contractor.

7. INSTALLATION IN CONCRETE

7.1 TIMEOUS INSTALLATION

In order not to delay building operations, the Contractor shall ensure that all conduits and accessories which are to be cast in concrete are placed in position in good time. The Contractor or his representative shall be in attendance when the concrete is cast.

7.2 DRAW-BOXES

Draw-boxes, expansion joints and round ceiling boxes shall be installed where required and shall be neatly finished to match the finished slab and wall surfaces. Ceiling draw-boxes shall be of the deep type. In hollow block slabs, rear-entry draw-boxes shall be used. In columns where flush mounted draw-boxes are installed, the conduits shall be offset from the surface of the column immediately after leaving the draw-box.

7.3 ELBOWS

Elbows for conduits of 32mm dia. and smaller and sharp bends will not be allowed in concrete slabs.

7.4 COVER PLATES

Draw-boxes and/or inspection boxes shall, where possible, be grouped together under a common approved cover plate, and must preferably installed in passages or male toilets. The cover plate shall be secured by means of screws.

7.5 NEUTRAL AXIS

All conduits shall be installed as close as possible to the neutral axis of concrete beams, slabs and columns. The conduits shall be rigidly secured to the reinforcing to prevent movement towards the surface of the concrete.

7.6 FIXING TO THE SHUTTERING

All conduits, draw-boxes etc. shall be securely fixed to the shuttering to prevent displacement when concrete is cast. Draw-boxes and outlet boxes shall preferably be secured by means of a bolt and nut installed from the back of the box through the shuttering. Fixing lugs may also be used to screw the boxes to the shuttering. Wire will not be accepted for securing boxes to the shuttering where off-shutter finishes are required. Where fibreglass shuttering is used by the Builder, the equipment shall be fixed to the steel only and no holes shall be drilled or made in shuttering. All draw-boxes and outlet boxes shall be plugged with wet paper before they are secured to the shuttering.

Before any concrete slabs are cast, all conduit droppers to switchboards shall be neatly spaced and rigidly fixed.

7.7 CONCRETE FLOOR SLABS

Conduits will not be allowed in concrete floor slabs of boiler rooms (or boiler houses), laundries or other damp areas. All socket outlets and three phase outlets in damp areas shall be supplied from above with galvanised conduit and accessories.

7.8 EXPANSION JOINTS

As far as possible, conduits shall not be installed across expansion joints. Where this is unavoidable a conduit expansion joint shall be provided. (Refer to par. 10)

7.9 SCREEDS

The installation of conduits in floor screeds shall be kept to a minimum. Where conduits are installed in screeds, the top of the conduit shall be at least 20 mm below the surface of the screed. Where the screed is laid directly on the ground, galvanised conduits shall be used. This ruling will always be applicable to the lowest floor of a building. A minimum distance of twice the outside diameter of the conduit shall be left free between adjoining conduits. Conduits shall be secured to the concrete slab at intervals not exceeding 2 m. The Contractor shall ensure that conduits are not visible above the screed where the conduits leave the screed.

7.10 INSPECTION

All draw-boxes, conduits, etc. which are installed in concrete shall be cleaned with compressed air and provided with draw-wires two days after removal of the shuttering. Errors that occurred during the installation of the conduits, or any lost draw-boxes, or blocked conduits shall be immediately reported to the Department by telephone and confirmed in writing in order that an alternative route can be planned and approved by the Department before the additional concrete is cast. Any additional cost shall be for the Contractor's account.

8. SURFACE INSTALLATIONS AND INSTALLATIONS IN ROOF SPACES

Wherever possible, the conduit installation is to be concealed in the building work; however, where unavoidable or otherwise specified, conduit installed on the surface must be plumbed or levelled and only straight lengths shall be used.

8.1 APPEARANCE

(a) All conduits shall be installed horizontally or vertically as determined by the route and the Contractor shall take all measures to ensure a neat installation.

(b) Where conduits are to be installed directly alongside door frames, beams, etc. that are not true, conduits shall be installed parallel to the frames, beams, etc.

(c) All labels shall be removed from surface mounted conduit.

8.2 SADDLES

Conduits shall be firmly secured by means of saddles and screws and in accordance with SANS 10142. Where saddles are used to secure vertical lengths of conduit connected to surface mounted switch boxes or socket outlet boxes, the saddles shall be spaced so that the intervals between the box and the first saddle, between any two successive saddles and between the last saddle and the ceiling or roof are equidistant. Conduits shall be secured within 150 mm before and after each 90° bend and within 100mm of each outlet box.

8.3 JOINTS

Joints will only be allowed in surface conduit lengths exceeding 3,5 m. Threads shall not be visible at joints of completed installations, except where running joints are used. Running joints will be allowed only when absolutely necessary. All running joints shall be provided with locknuts and shall be painted with red lead immediately after installation.

8.4 ACCESSORIES

Inspection bends or tee pieces shall not be used. Non-inspection type bends may be used in the case of 32mm or 50 mm diameter conduits. All draw-boxes supporting luminaries or other equipment shall be fixed independently of the conduit installation.

8.5 OFFSETS

Where an offset is required at conduit terminations or crossovers, the conduit shall be saddled at the offset.

8.6 CROSS-OVER

Conduit routes shall be carefully planned to avoid crossovers. Where a crossover is inevitable, one conduit only shall be offset to cross the other. Crossovers shall be as short as possible and shall be uniform. Alternatively, crossovers shall be installed in purpose-made boxes. This method shall be employed on face brick walls and in other circumstances where required by the Department.

8.7 PARALLEL CONDUIT

Parallel conduit runs shall be equidistant and saddles shall be installed in line. Alternatively, a special clamp may be used to secure all conduits in unison. In the case of conduits of different diameters, the latter method shall only be used if a purpose-made clamp designed to accommodate the various conduit sizes, is provided.

8.8 PAINTING OF CONDUIT

All surface mounted conduits and accessories shall be painted with two coats of a high quality enamel paint or as otherwise specified. The colour shall comply with the colour code specified for the installation or where no code has been specified, shall match the colour of the surrounding finishes.

8.9 CONDUIT IN ROOF SPACES

8.9.1 In open roof spaces (no ceiling) conduits shall run along the wall plates and the rafters. The installation of conduits suspended between the rafters is not acceptable.

8.9.2 Conduit in roof spaces shall be installed parallel or at right angles to the roof members and shall be secured at intervals not exceeding 1,5 m by means of saddles screwed to the roof timbers for metallic conduit and 1m for non-metallic conduit.

8.9.3 Nails or crampets will not be allowed.

8.9.4 Under flat roofs in false ceilings or where there is less than 900 mm clearance, or in instances where the ceilings are insulated with glass-wool or other insulating material impeding access, the conduit shall be installed in a manner which allows for wiring from below the ceilings.

8.9.5 Conduit runs from switchboards shall terminate in fabricated sheet steel draw-boxes installed directly above or in close proximity to the boards. Refer to the Department's standard specification for "CONNECTIONS TO SWITCHBOARDS", par. 2 of Section B10.

8.9.6 Spare conduits covering the total number of spare ways on switchboards, shall be provided between the boards and the roof draw-box.

8.9.7 Where non metallic conduit has been specified for a particular service, the conduit shall be supported and fixed with saddles with a maximum spacing of 450mm throughout the installation. The contractor shall supply and install all additional supporting timbers in the roof space as required.

8.10 FIXING TO WALLS

Only approved plugging materials such as aluminium inserts, fibre plugs or plastic plugs, etc., and round-head screws shall be used when fixing saddles, switches, plugs etc. to walls. Wood plugs are not acceptable nor should plugs be installed in joints in brick walls.

9. FUTURE EXTENSIONS

9.1 OPEN ROOF SPACES

Conduits intended for future switches and socket outlets, shall terminate 40 mm above the tie beams in roof spaces with more than 900 mm free space. The conduit ends shall be threaded and fitted with a coupling and brass plug.

9.2 CONCRETE SLABS

Conduit ends shall protrude 150 mm from the concrete to facilitate the installation of future extensions above, below or to the side of the concrete slabs. All these conduits shall be connected to a draw-box, which is cast into the concrete within 2 m of the end of the concrete. Conduit ends shall be threaded and fitted with a coupling and brass plug. In cases where holes cannot be drilled through the shuttering to accommodate the conduit end, a deep draw-box with rear entry may be placed over the conduit end.

9.3 COVER PLATES

Unused boxes for switches and socket-outlets shall be covered with metal cover plates. Unused boxes for luminaries shall be covered with round galvanised metal cover plates, which fit tightly against the finished surface. The cover plate shall overlap the outlet box and recess.

9.4 GALVANISED CONDUIT

Galvanised conduit shall be installed at all free ends intended for future extensions. The conduit shall be treated with a paint, which will prevent corrosion and white rust.

10. EXPANSION JOINTS

10.1 Where conduits cross expansion joints in the structure, approved draw-boxes which provide a flexible connection in the conduit installation shall be installed. Refer to the Department's standard drawing No EE3/136/139.

10.2 The draw-box shall be installed adjacent to the expansion joint of the structure and a conduit sleeve, one size larger than that specified for the circuit, shall be provided on the side of the draw-box nearest the joint. The one end of the sleeve shall terminate at the edge of the joint and the other shall be secured to the draw-box by means of locknuts.

10.3 The circuit conduit passing through the sleeve shall be terminated 40 mm inside the draw-box and in the case of metallic conduit, the conduit end shall be fitted with a brass bush. The gap between the sleeve and the conduit at the joint shall be sealed with 'Pratley Tic-Tac' or equal sealing compound, to prevent the ingress of wet cement. In the case of metallic conduit, an earth clip shall be fitted to the conduit projection inside the draw-box and the conduit bonded to the box by means of 2,5mm2 bare copper earth wire and a brass bolt and nut.

10.4 The end of the other circuit conduit shall be secured to the draw-box by means of locknuts and a brass bush in the case of screwed metallic conduit or a standard bushed adaptor for other conduit types.

10.5 In the case of metallic conduit, a 2,5mm^2 bare copper wire shall be installed between the first conduit boxes on either side of the joint, in addition to an earth wire, which may be specified for the circuit. The conduit boxes shall be drilled and tapped and the earth wire shall be bonded to the boxes by means of lugs and brass screws.

10.6 Suitable steel cover plates shall be screwed to draw-boxes installed along the expansion joint. The cover plates shall be installed before the ceilings are painted.

10.7 Where a number of conduits are installed in parallel they shall cross the expansion joint of the structure via a single draw-box. A number of draw-boxes adjacent to each other will not be allowed.

11. CHASES AND BUILDER'S WORK

11.1 Except where otherwise specified the Builder or Main Contractor shall be responsible for the builder's work related to the installation of conduits, outlet boxes, switchboard trays, bonding trays and other wall outlet boxes and will undertake the necessary chasing and cutting of walls and the provision of openings in ceilings and floors for luminaries and other electrical outlets. The Contractor shall notify the Builder or Main Contractor of his requirements and the responsibility lies with the Contractor to ensure that all builder's work is clearly indicated or marked in accordance with his requirements.

11.2 Electrical materials to be built in must be supplied, placed and fixed in position by the Contractor when required to do so by the Builder or Main Contractor. The Contractor shall also ensure that these materials are installed in the correct positions.

11.3 Where no Builder or Main Contractor is available, the Contractor must provide all chases and is required to cover conduits installed in chases by a layer of 4:1 mixture of coarse sand and cement, finished 6 mm below the face of the plaster and roughened. Chases shall be deep enough to ensure that the top of conduits are at least 12 mm below the finished surface of the plaster.

11.4 Where the Contractor is responsible for the cutting of chases or the building in of conduits and other equipment, he will be held responsible for all damage as a result of this work and will be required to make good to the satisfaction of the Department.

This ruling is particularly applicable but not exclusively to the rewiring and renewal of existing installations. Chases shall be made by means of a cutting machine.

11.5 Under no circumstances shall face brick walls or finished surfaces be chased or cut without the written permission of the Department. Where it is necessary to cut or drill holes in the concrete structure, the prior permission of the Department shall be obtained.

SECTION B2

B2. INSTALLATION OF WIRING CHANNELS, UNDERFLOOR DUCTING AND POWER SKIRTING

1. RESPONSIBILITY OF THE CONTRACTOR

The Contractor shall supply and install all wiring channels, underfloor ducting and power skirting as specified or as required for the cable, socket outlet and wiring installation including the necessary supports, hangers, fixing materials, bends, angles, junctions, T-pieces, etc. He shall further liaise with the Main contractor to verify the position of holes and access routes through the structure and finishes.

(Refer to the Department's quality specification for "WIRING CHANNELS, UNDERFLOOR DUCTING AND POWER SKIRTING", Section C2 to determine which types are acceptable).

2. WIRING CHANNELS

2.1 FIXING

The Contractor shall supply and install all hangers, supports or fixings for the channels. Channels up to and including 76 x 76 mm shall be supported at maximum intervals of 600 mm and larger channels at maximum intervals of 1 m. Channel runs shall be carefully planned to avoid clashes with other services and to ensure that all covers can be removed after completion of the entire installation. Purpose made clamps, hangers, etc. shall be used as required. Where it is not possible to support the channels at the specified intervals, they shall be supported in a sound manner to the satisfaction of the Department.

2.2 INSTALLATION IN CONCRETE

Where channels are cast into concrete, the insert type shall be used. Additional spacer blocks shall be used where necessary to prevent ducts from being deformed while the concrete is cast. Channels shall be filled with polystyrene or other suitable fillers to prevent the ingress of concrete and shall be securely fixed in position to the shuttering.

2.3 COVER PLATES

All channels up to and including 127mm width shall have snap-in cover plates of metal or PVC. Cover plates for wider channels shall be of metal and shall be fixed by means of screws at suitable intervals to prevent warping. Cover plates shall be installed over the full length of the channels. Flush mounted wiring channels shall be fitted with overlapping metal cover plates with plastic edge trim to cover irregularities in the wall recess.

2.4 JOINTS

Adjoining lengths shall be aligned and securely joined by means of fishplates fixed by mushroom bolts, washers and nuts or connection pieces that are pop-riveted to both adjoining sections. All adjoining sections shall be rectangular and shall butt tightly. Covers shall fit tightly across the joints.

Where channels cross expansion joints in the structure, suitable expansion joints shall be provided in the channels by means of fishplates pop-riveted or screwed to the channel on one side of the expansion joint and floating freely in the channel on the other side of the expansion joint.

2.5 SUPPORT FOR CONDUCTORS

All conductors in inverted cable channels shall be retained by means of metal clips or metal spacer bars at not more than 1m centres. Where vertical duct lengths exceed 5m, conductors installed in the channels shall be secured at intervals not exceeding 5m to support the weight of the conductors. Clamps shall be provided in suitable draw-boxes for this purpose.

2.6 CONDUIT CONNECTIONS

Conduit connections shall be terminated by means of two locknuts and a brass female bush. Where the channel is wide enough, conduit connections may be made by means of a conduit box and hole through the back or side of the channel. All holes through which conductors pass shall be fitted with bushes or grommets or shall be sleeved.

2.7 INTERNAL FINISHES

Bends and T-joints shall be constructed to ensure compliance with the allowable bending radii specified in SANS 10142, Appendix D in the case of PVC-insulated cables and conductors and shall comply with the relevant specification in the case of other cables. Burrs and sharp edges shall be removed and the inside edges of the joints shall be lined with rubber cement or other suitable rubberised or plastic compound to prevent laceration of the conductor insulation.

2.8 VERMIN PROOFING

All cable channels shall be vermin proofed after installation. Holes shall be covered by means of screwed metal plugs or by means of metal strips, which are bolted, or pop-riveted to the channel. Wooden or other plugs which are driven into holes or other temporary plugs or covers are not acceptable.

2.9 SERVICES

Multiple duct runs or internal metal partitions shall be used where conductors for power, control, communication and other services are present.

3. UNDERFLOOR DUCTING

3.1 GENERAL

3.1.1 Two or three compartment underfloor ducting as specified shall be supplied and installed in the positions and according to the layouts indicated on the drawings.

3.1.2 Three compartment ducting shall have a cross-section of approximately 200 x 32mm, subdivided into three approximately equal compartments, of which the centre compartment shall be used for electrical power distribution with the two outer compartments for telephone and other light current services respectively.

3.1.3 Unless specified to the contrary in the Detail Technical Specification or on the drawings, each compartment shall be provided with openings (occurring in line) at 1,5 m centres to permit installation of pedestals or recessed outlets in accordance with the design of the system. The openings shall have removable, flush, cover plates and shall have prepared fixing holes for future installation of pedestals or recessed outlets. The centre of the openings shall be offset a distance of 200 mm from the building nodule lines.

3.2 JUNCTIONS

The underfloor ducting installation shall be provided with flush cross-over, T-junction and right angle bend draw-boxes installed in the runs of ducting, generally as indicated on the drawings. The junction boxes shall be complete with cross-over of services. The junction boxes shall have nominal 300 x 300mm removable cover plates secured by means of four countersunk screws.

3.3 PEDESTAL UNITS

Where the system accommodates floor pedestal units, these shall consist of pressed steel or die cast aluminium units, suitable for either two or three services, as specified in the Detail Technical Specification. Where the pedestals are installed on vinyl tiled or similar floors which will be subject to washing, a matching waterproofing gasket shall be supplied below each pedestal to render the junction waterproof.

3.4 INSTALLATION

The underfloor ducting, junction boxes, pedestals, outlets and other accessories shall be installed strictly in accordance with the manufacturer's instructions and according to the following procedure:

a) The underfloor ducting shall be installed on a mortar bed, provided by the Plasterer for purposes of levelling the channel to the final floor screed level. The Contractor shall assist the Plasterer in marking out the layout of the ducting to enable the mortar bed to be laid. Final height of the underfloor ducting shall be determined in close liaison with the Builder.

b) After installation of the mortar bed, the components of the underfloor ducting shall be assembled and installed by the Contractor, following which the screeding will be completed.

3.5 TERMINATIONS

Up bends manufactured by the supplier of the underfloor ducting shall be supplied and installed wherever the ducting is terminated at a switchboard, telephone duct or telephone distribution box or where the ducting terminates behind power skirting.

3.6 WIRING

3.6.1 Power circuit wiring shall be installed in the centre compartment of the underfloor ducting. Sufficient slack shall be provided to allow for the installation of a floor pedestal outlet at each opening in the ducting, whether an outlet is specified at that position or not. This provision shall take the form of loops in the wiring, including the earth wire, wherever the openings occur. The loops shall be pushed back into the channel and the cover plates replaced. In the instances where pedestals/outlets are not installed, these provisions shall of necessity only be made for the area covered by the circuit and not for the run from the switchboard.

3.6.2 The entire underfloor ducting installation shall be effectively earthed and bonded together.

3.6.3 Galvanised draw-wires shall be supplied and installed along the entire length of the telephone and light current service compartments of the underfloor ducting. The draw-wires shall be interrupted at the junction boxes, with enough slack left coiled up to facilitate the drawing in of cables by others.

3.7 EXPANSION JOINTS

Where expansion joints in the buildings are crossed by underfloor ducting, expansion joints shall be provided as detailed in par. 2.4 of this section.

4. POWER SKIRTING

4.1 GENERAL

4.1.1 Two or three compartment power skirting as specified shall be supplied and installed in the positions and according to the layouts indicated on the drawings.

4.1.2 The top compartment shall be used for power wiring and switched socket outlets, whilst the bottom compartments shall be for telephone and other light current services.

4.2 MODULE

4.2.1 The power skirting shall be manufactured from 1mm (minimum) thick sheet steel or aluminium (as specified) in approximately 2,5m lengths.

4.2.2 The covers shall be manufactured in modular lengths, as specified in the Detail Technical Specification or otherwise in 1 m lengths and shall be secured to the wall channel by means of toggle or swivel nuts. Snap-in covers are also acceptable.

4.2.3 At the building module lines, covers of specified length or otherwise in 250 mm lengths shall be installed, against which partition walls may be installed, thereby trapping these covers. The removable modular covers shall be installed between these "fixed" covers.

4.2.4 Each modular cover associated with the power compartment shall be punched and prepared for the installation of either a 13A or a 16A, 3-pin standard flush switched socket outlet, whether any is specified or indicated for that module or not. Where socket outlets are not installed, the punched holes shall be blanked off with a metal blanking plate, painted the same colour as the power skirting and installed at the back of the covers. These blanking plates shall be easily removable to permit future installation of socket outlets.

4.2.5 Unless otherwise specified, no provision shall be made on the covers of the telephone or light current services compartments for the installation of sockets.

4.2.6 Factory-made end covers shall be installed at the ends of all runs of power skirting. All internal and external bends or offsets shall be factory-made and shall be installed to provide a neat and workmanlike appearance.

4.3 PAINTING

The power skirting shall be painted in a colour as specified in the Detail Technical Specification. The painting of steel power skirting shall comply with the Department's "STANDARD PAINT SPECIFICATION", Section C39. Aluminium power skirting shall be anodised. The power skirting channels and covers shall be individually wrapped or packed to protect them against damage in transit and before installation.

4.4 SOCKET-OUTLETS

4.4.1 Standard 13 A or 16 A, 3-pin flush switched socket outlets (100 x 50 mm nominal size) shall be supplied and installed in the positions indicated on the drawings and as specified in the Detail Technical Specification.

4.4.2 The switched socket outlets shall be secured to the channel by means of suitable brackets.

4.4.3 After installation of the modular front covers, they shall be screwed to the socket outlets to ensure proper alignment between the two components. Separate standard covers need not be provided for the socket outlets.

4.5 CONDUIT FEEDERS

4.5.1 Conduits for the circuit wiring to the power skirting shall be installed in the floor slab and shall terminate in flush conduit or boxes, behind the power skirting and installed to match the height of the power, telephone and light current services compartments of the skirting.

4.5.2 The wiring/cables shall pass through large diameter holes cut in the rear of the power skirting. The holes shall be suitably bushed or trimmed to prevent damage to the wiring or cables.

4.5.3 Alternatively conduits feeding to the telephone compartment may be terminated in boxes facing upwards in the floor slab immediately below the power skirting, with suitable bushed or trimmed openings being provided through the bottom of the power skirting duct for the cables to pass through. (Applicable only where the power skirting occurs at floor level).

4.6 POWER SKIRTING AT DOORWAYS

Where a section of power skirting is interrupted by a doorway, bridging conduits shall be installed to interconnect the power skirting sections. Where conduits are not specifically indicated, a minimum of 1 x 32mm bridging conduit shall be installed for each of the power, light current and telephone compartments.

4.7 CLEANING

Prior to fitting front covers, the power skirting shall be thoroughly cleaned to remove all dust and rubble and damage to paintwork where this has occurred, shall be repaired.

SECTION B3

B.3 INSTALLATION OF CABLE TRAYS AND LADDERS

1. GENERAL

Cable trays and cable ladders complying with the Department's standard specification for "CABLE TRAYS AND LADDERS", Section C3 shall be supplied and installed where specified and/or where generally suitable for cable distribution.

2. RESPONSIBILITY OF THE CONTRACTOR

The Contractor shall supply and install all cable trays and/or ladders as specified or as required by the cable routes including the necessary supports, clamps, hangers, fixing materials, bends, angles, junctions, reducers, T-pieces etc. He shall further liaise with the Main Contractor for the provision of holes and access through the structure and finishes.

3. SUPPORTS

Cable tray supports shall consist of two steel hangar rods, at least 8mm in diameter, on both sides of the tray with a substantial steel cross-member on the underside of the tray and bolted to the rods. Alternatively, cable trays may be cantilevered from walls on suitable brackets.

4. SPACING OF HORIZONTAL SUPPORTS

4.1 Horizontal trays shall be supported at the following maximum intervals:

(a) 1,2 mm to 1,6 mm thick metal with 12mm to 19 mm return trays. 1m maximum spacing

(b) 2,5 mm thick metal trays with 76 mm return 1,5m spacing.

(c) Cable ladders with 76mm side rail of 2mm thickness and with crossrungs. 1,5m spacing

(d) Metal cable ladders other than c) above, including site manufactured angle iron types 1m spacing

(e) 3 mm thick PVC trays with 40mm return. 1m maximum spacing

(f) 4 mm thick PVC trays with 60mm return 1,5m maximum spacing

4.2 In addition to the above spacing on the longitudinal run, trays and ladders shall be supported at each bend, offset and T-junction.

5. JOINTS

5.1 Joints shall be smooth and without projections or rough edges that may damage the cables. The Contractor will be required to cover joints with rubber cement or other non-hardening rubberised or plastic compounds if in the opinion of the Department joints may damage cables.

5.2 Joints shall as far as possible be arranged to fall on supports. Where joints do not coincide with supports, joints shall be made by means of wrap-around splices of the same material as the tray and at least 450mm long. The two cable tray ends shall butt tightly at the centre of the splice and the splice shall be bolted to each cable tray be means of at least 8 round head bolts, nuts and washers. Splices shall have the same finish as the rest of the tray.

5.3 Splices as described above shall be provided at joints, which do coincide with supports if the loaded tray sags adjacent to the joint due to the interruption of the bending moment in the tray.

6. FIXING TO SUPPORTS

Trays shall be bolted to supports by at least two round head bolts per support. Bolts shall be securely tightened against the tray surface to avoid projections which might damage cables during installation.

7. FIXING TO THE STRUCTURE

7.1 Where installed on concrete or brick, the supports for cable trays and ladders shall be securely fixed by means of at least 2 heavy duty, expansion type anchor bolts. Cantilevered trays shall be supported by a minimum of two 6mm diameter expansion bolts per support.

7.2 It is the responsibility of the Contractor to ensure that adequate fixing is provided since cable trays and ladders that work loose shall be rectified at his expense. The fixing shall take into account site conditions that prevail during installation.

7.3 Where installed on vertical steelwork, cable trays and ladders shall be fixed by means of 6mm diameter bolts and nuts.

7.4 On horizontal steelwork, use may alternatively be made of "CADDY" type fasteners.

7.5 Horizontal trays and ladders shall in general be installed 450 mm below slabs, ceilings, etc. to facilitate access during installation of cables.

7.6 Multiple runs shall be spaced at least 300 mm apart unless a different spacing is specified in the Detail Technical Specification.

8. INSTALLATION OF CABLES

Cables shall be installed adjacent and parallel to each other on the trays with spacings as specified in the Department's standard specification for "INSTALLATION OF CABLES", Section B6, and snaked slightly to allow for expansion. Cables shall present a neat appearance and shall under no circumstances be bunched. Cables shall be clamped at maximum intervals of 3 m when installed on horizontal trays and at maximum intervals of 600 mm when installed on vertical trays.

9. EARTHING

Metal trays and ladders shall be bonded to the earth bar of the switchboard to which the cables are connected. Additional bare copper stranded conductors or copper tape shall be bolted to the tray or ladder where the electrical continuity cannot be guaranteed. These additional conductors or tapes shall always be installed in outdoor applications and in coastal regions.

10. CORROSION

PVC trays shall be used in corrosive atmospheres. All supports shall be adequately protected against corrosion, preferably with a powder coated paint finish in accordance with the Department's "STANDARD PAINT SPECIFICATION", Section C39.

SECTION B4

B.4 FIXING MATERIALS

1. RESPONSIBILITY

It is the responsibility of the Contractor to position and securely fix conduits, ducts, cables and cable channels, switchboards, fittings and all other equipment or accessories as required for the Installation. The Contractor shall provide and fix all supports, clamps, brackets, hangers and other fixing materials.

2. FINISHING

All unpainted supporting steelwork installed by the Contractor shall be wire brushed and given one coat of rust-resisting primer, followed by one coat of high quality enamel paint before any other equipment is fixed.

3. STRUCTURAL STEEL

Supports, brackets, hangers, etc. may only be welded to structural steel members where prior permission of the Department has been obtained. "CADDY" or similar fasteners may be used to fix equipment to structural steel members.

4. SCREWS AND BOLTS

Where holes exist in equipment to be fixed, bolts and fixing screws as specified shall be used. Where sizes are not specified, the largest bolt or screw that will fit into the hole shall be used.

5. WALL PLUGS

Where the fixing holes in brick or concrete walls are smaller than 10mm dia. and where the mass of the equipment is less than 10kg, wall plugs may be used to fix conduits, cables and other equipment. Fibre or plastic plugs shall be used. Wooden Plugs are not acceptable. Aluminium plugs may be used in face bricks. Plugs installed in joints between bricks are not acceptable. A masonry drill of the correct size shall be used to drill holes for plugs. Round-headed screws of the correct diameter to match the specific plug shall be used throughout.

6. ANCHOR BOLTS

Where the fixing holes are 10mm and larger or where the mass of the equipment is 10kg, equipment shall be fixed by means of expanding anchor bolts or by means of bolts cast into the concrete or built into walls.

7. GALVANISED EQUIPMENT

Brass screws bolts and nuts shall be used to fix galvanised equipment.

8. SHOT-FIRED FIXING

8.1 Materials such as metal cable ducts or channels may be fixed against walls and concrete slabs by means of the shot-fired fixings.

8.2 The Contractor shall ascertain whether this method of fixing will carry the weight of the material including conductors, cables and other items of equipment to be installed later. Should it be found that the method of fixing is inadequate and supports tend to loosen, the Contractor will be required to fix the material by an alternative method to the satisfaction of the Department.

8.3 Where the shot-fired method is used, warning signs shall be placed at all entrances leading to the area where this work is in progress. The Contractor shall take all reasonable precautions to prevent accidents. Refer also to The Occupational Health and Safety Act.

8.4 Nails and explosive charges recommended by the manufacturer shall be used throughout.

9. CLAMPS AND BRACKETS

Clamps and brackets used to fix or support equipment such as cable trays, ducts, etc. shall be of a purpose-made type suitable for the specific application. Refer also to the Department's standard specification for "CABLE TRAYS AND LADDERS", Section B3 and "INSTALLATION OF WIRING CHANNELS", Section B2.

SECTION B5

B.5 WIRING

This section covers wiring in approved wire-ways for electrical installations in buildings or other structures under normal environmental conditions for 50 Hz systems not exceeding 600 V.

1. TYPE OF CONDUCTORS

PVC-insulated or equivalent, stranded copper conductors and bare stranded or green PVC-insulated copper earth conductors complying with the Department's quality specification for "PVC-INSULATED CABLES", Section C4, shall be used exclusively. Only where cables are specified or in instances where the exceptions stipulated in SANS 10142 are applicable, may the Contractor deviate from this requirement.

2. WIRE-WAYS

2.1 All unarmoured conductors shall be installed in conduits, cable channels (trunking) or power skirting and shall under no circumstances be exposed. Cable channels and power skirting shall be of metal construction unless specifically approved to the contrary.

2.2 Tenderers must note that common wire-ways will only be permitted for relatively light current-carrying conductors such as lighting and socket-outlet circuits. Refer also to par. 4 below. Heavy current-carrying conductors such as feeders to distribution boards and large power points, must be installed in separate conduits or wire-ways.

3. ORDER OF WORK

Wiring shall only be carried out after the wire-way installation has been completed, but before painting has commenced. Debris and moisture shall be removed from the wireways prior to the installation of the conductors.

4. CIRCUITS

Conductors that are connected to different switchboards, shall not be installed in the same wireway. The wiring of one circuit only will be allowed in a 20 mm dia. conduit with the exception of the wiring from switchboards to fabricated sheet metal boxes close to switchboards in which case more than one circuit will be allowed. For larger conduit sizes the requirements of SANS 10142, shall be met.

5. LOOPING AND JOINTS

A loop-in wiring system where conductors are looped from outlet to outlet, shall be employed. Joints in conductors shall be avoided as far as possible but where it becomes unavoidable, joints will be accepted in cable channels only and not in conduits. Joints shall be soldered or shall alternatively consist of approved ferruling, properly covered with heat-shrink sleeves. The use of PVC insulation tape is not acceptable.

6. GROUPING OF CONDUCTORS

In cases where the conductors of more than one circuit are installed in the same wireway, the conductors of each separate circuit (including earth conductor) shall be taped at intervals of 1m with PVC insulation tape. The conductors of different circuits shall however remain separate in order that any given circuit can be withdrawn. Conductors entering switchboards or control boards shall be grouped and bound by means of plastic or metal bands (not tape).

7. CABLE TRAYS

Conductors may only be installed directly on cable trays if specifically approved by the Department. In these cases cable trays shall be at least 2m above walkways or working areas. Conductors of the same circuit shall be grouped in the same manner as described in the previous paragraph. All the conductors on the cable tray shall then be tied down securely to the cable tray at intervals of 2m or less by means of plastic or metal bands (not tape).

8. DRAWING-IN OF CONDUCTORS

When conductors are drawn through conduit, care shall be taken that they are not kinked or twisted. Care shall also be taken that the conductors do not come into contact with materials or surfaces that may damage or otherwise adversely affect the durability of the conductor.

9. THREE-PHASE OUTLETS

9.1 With the exception of three-phase outlets, circuits connected to different phases shall not normally be present at lighting, switch or socket outlet boxes. Where this is unavoidable, barriers shall be provided between terminals or connections of the various phases and the box shall be suitably labelled internally to indicate the presence of three phase voltages.

9.2 A neutral conductor shall be installed to all three phase outlets intended for equipment connection, whether sockets or isolators, irrespective of whether the particular equipment normally requires a neutral or not.

10. VERTICAL CONDUIT INSTALLATION

Conductors installed in vertical wire-ways shall be secured at intervals not exceeding 5m to support the weight of the conductors. Clamps shall be provided in suitable drawboxes for this purpose.

11. CONNECTIONS

The insulation of conductors shall only be removed over the portion of the conductors that enter the terminals of switches, socket outlets or other equipment. When more than one conductor enters a terminal, the strands shall be securely twisted together. Under no circumstances shall strands be cut off.

12. EARTHING CONDUCTORS

12.1 When earth continuity conductors are looped between terminals of equipment, the looped conductor ends shall be twisted together and then soldered or ferruled to ensure that earth continuity is maintained when the conductors are removed from a terminal.

12.2 The installation shall be earthed to comply with SANS 10142.

12.3 The installation shall be bonded to comply with SANS 10142.

13. COLOURS

The colours of conductor insulation shall comply with SANS 10142. The colours of conductors for sub-circuits shall as far as possible correspond with the colour of the supply phase. The colours of conductors for wiring to two-way and intermediate switches shall preferably differ from the colour of phase conductors.

14. SINGLE-POLE SWITCHES

Single-pole switches shall be connected to the phase conductor and not to the neutral conductor.

15. SIZE OF CONDUCTORS

Where conductor sizes are not specified, the following minimum conductor sizes shall be used:

Lighting circuits: 1,5mm² and 2.5mm² copper earth conductor

Socket-outlet circuits: 2,5mm² and 2,5mm² copper earth conductor.

Bell circuits: 2,5mm² and 2,5mm² copper earth conductor.

Stove circuits: 10mm² and 6mm² copper earth conductor

Clock circuits: 1,5mm²

16. PARTITIONS

16.1 When wiring is installed in removable partitions, the vertical and/or horizontal metal supports of the walls may be utilised for wiring on condition that:

(a) the conductors are not exposed,

(b) the metal supports are properly earthed,

(c) a separate bare earth continuity conductor is drawn in together with the current carrying conductors and is earthed to the metal parts of the switches and/or the socket-outlets, and

(d) conductors are installed in the metal and non-inflammable sections of the partitions.

16.2 Conductors enclosed in a copper braiding (harness wiring) may be installed in removable partitions. The braiding can be used as earth continuity conductor. The wiring shall be joined to the conduit (or cable) installation by interconnecting the conductor and the earth conductors in a draw-box using suitable ferrules and heat-shrink sleeves or screwed terminals.

SECTION B6

B.6 INSTALLATION OF CABLES

This section covers the installation of cables for the distribution of power in buildings, other structures and in ground for system voltages up to 11 kV, 50 Hz.

1. GENERAL

1.1 CABLE TYPES

(a) All cables and jointing and termination accessories used for power distribution shall comply with the Department's Quality Specifications, Section C.

(b) Cables with copper conductors shall be used throughout unless otherwise specified or approved.

(c) All unarmoured cables shall be installed in metal trunking, sleeves or conduit unless clearly specified to the contrary.

(d) XLPE Cables shall only be used in exceptional circumstances with the written permission of the Department.

1.2. COMPETENCE OF PERSONNEL

It is a definite requirement that the Contractor shall only employ personnel fully conversant with cable manufacturer's recommendations for joining and terminating cables.

2. IDENTIFICATION OF CABLES

2.1 Cables shall be identified at all terminations by means of punched metallic bands or marked with labels or tags. (Refer also to SANS 10142).

2.2 The use of PVC tape with punched characters is not acceptable.

2.3 The identification numbers of cables shall be shown on "as built" drawings of the Installation.

3. TRENCHING

3.1 GENERAL

3.1.1 The Contractor shall be responsible for all trenching excavations unless specified to the contrary.

3.1.2 The Contractor shall, before trenching commences, familiarise himself with the routes and site conditions and the procedure and order of doing the work shall be planned in conjunction with the general construction programme for other services and building requirements.

3.1.3 The Contractor shall acquaint himself with the position of all the existing services such as stormwater pipes, water mains, sewer mains, gas pipes, telephone cables, etc. before any excavations are commenced. For this purpose he shall approach this Department's representative, the local municipal authority and any other authority which may be involved, in writing.

3.1.4 The Contractor will be held responsible for damage to any existing services brought to his attention by the relevant authorities and shall be responsible for the cost of repairs.

3.1.5 The Contractor shall take all the necessary precautions and provide the necessary warning signs and/or lights to ensure that the public and/or employees on site are not endangered.

3.1.6 The Contractor shall ensure that the excavations will not endanger existing structures, roads, railways, other site constructions or other property.

3.2 MECHANICAL EXCAVATORS

3.2.1 Power driven mechanical excavators may be used for trenching operations provided that they are not used in close proximity to other plant, services or other installations likely to be damaged by the use of such machinery.

3.2.2

3.2.2 The use of power driven mechanical excavators shall be subject to the approval of the Department. Should the excavator produce trenches that exceed the required dimensions, payment based on volumetric excavation rates will be calculated on the required dimensions only.

3.3 BLASTING

3.3.1 No guarantee is given or implied that blasting will not be required.

3.3.2 Should blasting be necessary and approved by the Department, the Contractor shall obtain the necessary authority from the relevant Government Departments and Local Authorities. The Contractor shall take full responsibility and observe all conditions and regulations set forth by the above authorities.

3.4 ROUTES

3.4.1 Trenches shall connect the points shown on the drawings in a straight line. Any deviations due to obstructions or existing services shall be approved by the Department beforehand. Refer also to par. 10.4.

3.4.2 The Department reserves the right to alter any cable route or portion thereof in advance of cable laying. Payment in respect of any additional or wasted work involved shall be at the documented rates.

3.4.3 The removal of obstructions along the cable routes shall be subject to the approval of the Department.

3.5 SHORING AND WATERLOGGING

3.5.1 The Contractor shall provide shoring for use in locations where there is a danger of the sides of the trench collapsing due to waterlogging or other ground conditions. Refer to the The Occupational Health and Safety Act.

3.5.2 The strength of shoring must be adequate for site conditions prevailing and the shoring must be braced across the trench.

3.5.3 The Contractor shall provide all pumps and equipment required to remove accumulated water from trenches. Water or any other liquid removed shall be disposed of without any nuisance or hazard.

3.6 TRENCHING

3.6.1 Trenching shall be programmed in advance and the approved programme shall not be departed from except with the consent of the Department.

3.6.2 Trenches shall be as straight as possible and shall be excavated to the dimensions indicated in this specification.

3.6.3 The bottom of the trench shall be of smooth contour, and shall have no sharp dips or rises which may cause tensile forces in the cable during backfilling.

3.6.4 The excavated material shall be placed adjacent to each trench in such a manner as to prevent nuisance, interference or damage to adjacent drains, gateways, trenches, water furrows, other works, properties or traffic. Where this is not possible the excavated materials shall be removed from site and returned for backfilling on completion of cable laying.

3.6.5 Surplus material shall be removed from site and disposed of at the cost of the Contractor.

3.6.6 Trenches across roads, access ways or footpaths shall not be left open. If cables cannot be laid immediately the Contractor shall install temporary "bridges" or cover plates of sufficient strength to accommodate the traffic concerned.

3.6.7 In the event of damage to other services or structures during trenching operations the Contractor shall immediately notify the Department and institute repairs. (Refer to par. 3.1.3 and 3.1.4)

3.6.8 Prior to cable laying the trench shall be inspected thoroughly and all objects likely to cause damage to the cables either during or after laying shall be removed.

3.6.9 Where ground conditions are likely to reduce maximum current carrying capacities of cables or where the cables are likely to be subjected to chemical or other damage or electrolytic action, the Department shall be notified before installing the cables. The Department will advise on the course of action to be taken.

3.6.10 Extreme care shall be taken not to disturb surveyor's pegs. These pegs shall not be covered with excavated material. If the surveyor's pegs are disturbed, they shall be replaced by a person qualified to do so.

3.7 DIMENSIONS OF TRENCHES

3.7.1 Cable trenches for one or two cables shall not be less than 300 mm wide and need not be more than 450 mm wide. This dimension shall be valid for the total trench depth.

3.7.2 The width shall be increased where more cables are installed to allow for the spacings stipulated in par. 4.2.

3.7.3 Where trenches change direction or where cable slack is to be accommodated, the Contractor shall ensure that the requirements of the relevant SANS Specification regarding the bending radii of cables are met when determining trench widths.

3.7.4 Trench depths shall be determined in accordance with cable laying depths and bedding thickness.

3.7.5 Payment will be made on a volumetric excavation rate calculated on the basis of the given maximum dimensions or the actual dimensions, whichever is the lesser. Refer also to par. 3.2.2 and 3.7.1 above.

3.8 JOINT HOLES

Where cable joints are required to be made in the course of a cable run, a joint hole shall be excavated of sufficient size to enable the cable jointer to work efficiently and unimpeded.

3.9 BEDDING

3.9.1 The bottom of the trench shall be filled across the full width with a 75mm layer of suitable soil sifted through a 6mm mesh and levelled off.

3.9.2 Only sandy clay or loam soil with a satisfactory thermal resistivity (not exceeding 1,5°C m/W) may be used for this purpose. Sea or river sand, ash, chalk, peat, clinker or clayey soil shall not be used. The use of crusher sand is acceptable.

3.9.3 Where no suitable soil is available on site, the Contractor shall import fill from elsewhere and make all the necessary arrangements to do so. The cost of importing soil for bedding purposes shall be included in the unit rates for excavations.

3.9.4 After cable laying a further layer of bedding shall be provided to extend to 75 mm above the cables.

3.9.5 The bedding under joints shall be fully consolidated to prevent subsequent settling.

3.10 CABLE SLEEVES

3.10.1 Where cables cross under roads, railway tracks, other service areas, etc. and where cables enter buildings, the cables shall be installed in Polyethylene (6mm thickness), asbestos cement pipes or earthenware pipes. Pitch fibre and PVC pipes are not acceptable because of the adhesion that occurs after a period of time between the pipe and the sheathing or outer serving of the cables.

3.10.2 Pipes shall be joined in accordance with the manufacturer's instructions.

3.10.3 Sleeves shall cross roads and railway tracks at right angles.

3.10.4 Sleeves shall have a minimum diameter of 100mm. They shall extend at least 2m beyond the tracks of a railway line or of the outermost tracks where there is more than one line. In the case of roads, the sleeves shall extend at least 1m beyond the road edge or kerb on both sides of the road.

3.10.5 All sleeves shall be graded 1:400 for water drainage.

3.10.6 Cable sleeves shall be installed to the spacings and depths stated in paragraph 4 below.

3.10.7 Galvanised metallic sleeves up to and including 76mm dia. shall be supplied and installed by the contractor.

3.10.8 The ends of all sleeves shall be sealed with a non-hardening watertight compound after the installation of cables. All sleeves intended for future use shall likewise be sealed.

3.11 BACKFILLING

3.11.1 The Contractor shall not commence with the backfilling of trenches without prior notification to the Department so that the cable installation may be inspected. Should the Contractor fail to give a timeous notification, the trenches shall be re-opened at the Contractor's cost. Such an inspection will not be unreasonably delayed.

3.11.2 For high voltage cables (1 kV to 11 kV) a coloured plastic marking tape shall be installed 400 mm above the cable. The tape shall be yellow, marked with the words "ELECTRIC CABLE/ELEKTRIESE KABEL" in red. These markings shall not be more than 1m apart from centre to centre.

3.11.3 Backfilling shall be undertaken with soil suitable to ensure settling without voids. The maximum allowable diameter of stones present in the backfill material, is 75mm.

3.11.4 The Contractor shall have allowed in his tender for the importation of suitable backfill material if required.

3.11.5 The backfill shall be compacted in layers of 150mm and sufficient allowance shall be made for final settlement. The Contractor shall maintain the refilled trench at his expense for the duration of the contract. Surplus material shall be removed from site and suitably disposed of.

3.11.6 On completion, the surface shall be made good to match the surrounding area.

3.11.7 In the case of roadways or paved areas the excavations shall be consolidated to the original density of the surrounding material and the surface finish reinstated.

3.12 CABLE MARKERS (FOR HV CABLES ONLY, EXCEPT WHERE OTHERWISE SPECIFIED)

3.12.1 Cable markers shall be provided along all HV cable routes but need only be provided along LV cable routes where specified.

3.12.2 Cable markers shall consist of concrete blocks in the shape of truncated pyramids, approx. 300mm high, 150 x 150mm at the top and 250 x 250mm at the bottom.

3.12.3 Brass plates shall be cast into the tops of the blocks in such a manner that they cannot be prised loose. The wording "ELECTRIC CABLE/ELEKTRIESE KABEL" shall be stamped on the brass plates as well as direction arrows and the cable voltage rating.

3.12.4 Cable markers shall be installed on the surface along all the underground routes and shall project 35 mm above normal ground level unless the projected markers could be a hazard to pedestrian or other traffic in which case they shall be installed flush with the surface.

3.12.5 Cable markers shall be installed at the beginning and end of a cable run (e.g. where a cable enters a substation or building), at all changes of direction, above all joints, above cable pipe entries and exits and at intervals not exceeding 50 m along the cable route.

3.12.6 The position of cable markers shall be indicated on the "as built" drawings.

3.13 TRANSNET, PROVINCIAL ADMINISTRATION OR NATIONAL ROAD CROSSINGS

3.13.1 The Contractor shall not trench beneath any railway tracks without the TRANSNET Administration's supervision. The Contractor shall request the Department timeously to arrange for the necessary supervision. The cost of such supervision will be paid for by the Department.

3.13.2 The Department will arrange for the necessary wayleave and permission to cross TRANSNET property and railway tracks, or Provincial or National road reserves and TELKOM Authority approval of proposed cable routes.

3.13.3 The Contractor shall carry out the crossing installation in strict accordance with the TRANSNET and Provincial Administration's requirements and stipulations. Where these requirements are in contradiction with this specification, the Department's ruling shall be sought.

3.13.4 The Contractor shall ensure that he will comply with the various Administration's requirements regarding crossing of Provincial and National roads, especially with regard to the safeguarding of the public. The Contractor shall also provide proof of adequate insurance cover against any claim from any accident as a result of work done by the Contractor during the crossing operation. The Department shall also be indemnified from all liability in this regard.

3.13.5 The Contractor shall liaise with the various Administrations well in advance regarding the intended dates, times and expected duration of the crossing operations and obtain their approval of the programme and method of operation before commencing with the work.

4. INSTALLATION OF UNDERGROUND CABLES

4.1 INSTALLATION DEPTHS

4.1.1 Cables shall be installed at the following minimum depths below final ground level :

Up to 11kV : 8OOmm

4.1.2 All cable depth measurements shall be made to the top of the cable when laid directly in ground or to the top of the duct or sleeve where these are provided.

4.1.3 The above depths shall apply to the top layer where cables are installed in layers.

4.1.4 The Contractor may only deviate from the above depths provided prior authority in writing has been obtained from the Department. In this event the cables shall be protected with a suitable concrete covering.

4.1.5 The depth of cable pipes or ducts beneath railway lines or roads shall be not less than 1,1 m below the formation level.

4.2 CABLE SPACINGS

4.2.1 Cables installed in the same trench shall be laid parallel to each other with the following spacings between cables (LV: up to 1 kV; HV: 1 kV to 11 kV):

LV/LV	:	2 cable diameters
LV/HV	:	150mm minimum
HV/HV	:	150mm minimum
LV/HV/PILOT	:	1 cable diameter

4.2.2 Where HV and LV cables have to be installed in the same trench, both shall be laid at a depth of 800 mm and then covered with 200mm of soil. The soil shall then be compacted, and then backfilled layer by layer and compacted until the trench is completely backfilled.

4.2.3 Cables for telephones, communication systems and other low voltage systems (less than 50 V) shall be separated from power cables by at least 1m. All control or pilot cables without a lead sheath and steel armouring shall be laid at least 300mm from power cables.

4.2.4 Cables shall not be buried on top of each other unless layers are specified. The minimum spacing between layers shall be 200mm.

4.3 CABLE LAYING

4.3.1 Except where ducts, tunnels or pipes are provided, cables shall be laid directly in the ground.

4.3.2 The cable shall be removed from the drum in such a manner that the cable is not subjected to twisting or tension exceeding that stipulated by the cable manufacturer.

4.3.3 Cable rollers shall be used as far as possible to run out cables. Rollers shall be spaced so that the length of cable in the trench will be totally suspended during the laying operation and sufficiently close to prevent undue sagging and the cable from touching the ground. Rollers shall also be placed in the trench in such a manner that they will not readily capsize.

4.3.4 Cable rollers shall have no sharp projecting parts liable to damage the cables.

4.3.5 Where cables have to be drawn around corners, well-lubricated skid plates shall be used. The skid plates shall be securely fixed between rollers and shall constantly be examined during cable laying operations.

4.3.6 Where cables have to be drawn through pipes or ducts, a suitable cable sock shall be used and particular care shall be exercised to avoid abrasion, elongation or distortion of any kind. In the case of oil filled cables, a cable sock may never be used. Special eyes giving access to the interior of the cable, must be utilised.

4.3.7 The maximum allowable tension when pulling a cable, is 70 N/mm2 of conductor area.

4.3.8 It will be assumed that the price or rates contained in the tender includes for the installation of cables in pipes and ducts or below existing or newly installed services.

4.3.9 The Department shall be informed timeously of the intention to carry out all cable laying operations to allow an inspection of the works by the Department if so required.

5. INSTALLATION OF CABLES IN CONCRETE TRENCHES

5.1 GENERAL

This paragraph covers the installation of cables in building trenches, service ducts, etc. The trenches, ducts, etc. inside buildings will be constructed and installed by others.

5.2 INSTALLATION

Cables shall be installed in one of the following ways:

(a) On horizontal cable trays.

(b) On horizontal metal supports with suitable clamps.

(c) On vertical cable trays or metal. supports fixed to the side of the trench. The cables shall be clamped in position.

Cables shall not be bunched and laid on the floor of the building trenches.

5.3 COVERS

5.3.1 The covering of concrete trenches shall as a rule fall outside the scope of the electrical installation. The Contractor shall however be responsible for the cutting or drilling and smoothing of holes for cables through chequer plates, concrete or other coverings as required.

5.3.2 Cables shall enter and exit the trench through sleeves protruding 300mm beyond the covering. The sleeves shall be permanently secured in position and the open space between the cable and sleeves shall be sealed with a non-hardening, watertight compound.

5.4 FILLED TRENCHES

5.4.1 Where specified, floor trenches shall be filled with fine crusher sand (no river or see sand).

5.4.2 If a sand filling is specified, the cables shall be fixed to non-corroding supports.

5.4.3 Sand-filled trenches other than in substations shall be covered in one of the following ways:

(a) Reinforced concrete covers.

(b) Sand and cement screed.

(c) Removable chequer plates.

5.4.4 Method (a) above shall be used where vehicular traffic may be encountered over trenches. Unless otherwise specified allowance for a mass of 2 tons shall be made.

5.4.5 Cable trenches in substations, switch rooms and generator rooms shall be covered in accordance with the Department's standard specification for "COVERING AND SEALING OF CABLE TRENCHES", Par. 9 of Section B13.

6. FIXING OF CABLES TO TRAYS OR STRUCTURES

6.1 INSTALLATION

Cables may be installed in one of the following ways:

(a) On horizontal cable trays.
(b) Against vertical cable trays with suitable clamps.
(c) Against horizontal or vertical metal supports or brackets with suitable clamps.
(d) On clamps which are fixed to the structure.

6.2 CLAMPS

Suitable clamps (cleats) which will secure cables without damage shall be used. Metal clamps or drilled hard wood blocks shall be used. Clamps shall consist of adjustable metal wings which clamp to a metal support, or consist of two halves that are bolted together. The correct clamp size to fit the cable shall be used. Cables of different sizes nay only be fixed by a common clamp when the clamp is specially made to accommodate the various cables.

6.3 SPACING OF SUPPORTS

Two methods of supporting cables are found in practice. The most generally known method is the restrained installation where the distance between supports is small enough to prevent any noticeable sag in the cable. The alternative method is the unrestrained installation where the distance between supports should be great enough to ensure that there will be obvious sag in each span between supports.

6.4 SPACING OF SUPPORTS OF UNRESTRAINED CABLES

Large single core cables shall always be installed according to this method. Generally, single core cables with conductors exceeding a cross sectional area of 185mm² should be supported at spacings in excess of 2m since the sag between supports will safely accommodate any thermal expansion.

Reducing the spacing between the supports to 1,5m or less shall be avoided at all costs, as expansion cannot be taken up by a change of sag and chances of sheath failure become considerable.

6.5 SPACING OF SUPPORTS OF RESTRAINED CABLES

Additional cleats shall be installed at each bend or offset in the cable run. The maximum distance between supports or cleats for multi-core control cables shall be 20 times the outside diameter of the cable with a maximum spacing of 550mm for unarmoured cables and 30 times the outside diameter of the cable with a maximum spacing of 900mm for armoured cables. Spacing of supports for cables for high voltage lighting shall be in accordance with Table 8 of SANS 10142. A minimum of 20mm ventilation clearance shall be maintained between cables and the wall to which they are cleated.

7. GROUPING AND SPACING OF CABLES IN BUILDINGS AND STRUCTURES

7.1 SPACING CORRECTION FACTORS

Cables shall as a rule be spaced two cable diameters apart, for which no grouping correction factor need be applied.

7.2 CABLES ON DIFFERENT LEVELS

Where parallel cable runs are installed at different levels (e.g. on parallel cable trays) and where the spacing of the layers is not specified, a minimum spacing of 300mm shall be maintained.

SINGLE CORE CABLES

Where single core cables are installed along a three-phase circuit, the cables shall be installed in trefoil formation and bound together at 300mm intervals.

7.4 HIGH VOLTAGE CABLES

High voltage cables shall be separated from other cables and services throughout the installation and shall as far as possible be installed in separate floor trenches, pipes or metal channels. Where this is not feasible a minimum spacing of 500 mm shall be maintained.

7.5 CABLES FOR OTHER SERVICES

Cables for telephones, communication systems and other low voltage systems (less than 50 V) shall be separated from power cables. In building ducts a physical barrier shall be provided between power cables and cables for other services. Where armoured cables are used for such other services, they shall be installed on separate cable trays or shall otherwise be at least 1m away from power cables. Where unarmoured cables are used for these other services, they shall be installed in separate conduits or metal channels.

TABLE B6.1

Cross-Sectional Area of Cable Conductors (mm^2)	MAXIMUM SPACING OF SUPPORTS (CLEATS) (mm) FOR RESTRAINED CABLES			
	Wire Armoured Cables		Other than Wire Armoured Cables and Unarmoured Cables	
	Horizontal Cable Routes	Vertical Cable Routes	Horizontal Cable Routes	Vertical Cable Routes
1,5	450	750	300	400
2,5	450	750	300	400
4,0	600	750	300	400
6,0	600	750	300	400
10,0	750	900	400	450
16,0	750	1000	400	550
25,0	900	1000	450	550
35,0	900	1000	450	550
Bigger than 35,0	900	1000	450	550

For larger cables the spacing shall be 10 x outside diameter of the cable.

8. TERMINATION AND JOINTING OF CABLES

8.1 GENERAL

8.1.1 Cable ends shall be terminated with glands or in cable boxes with the associated accessories such as clamps, shrouds, etc. complying in all respects with the Department's quality specifications, Section C.

8.1.2 Connection of cables to switchgear shall always be effected in such a way that the various phases, seen from the front of the switchgear will be in the following positions:

No. 1 conductor : left (red) (A)
No. 2 conductor : centre (white) (B)
No. 3 conductor : right (blue) (C)

8.1.3 Exposed armouring shall be covered with bitumen-base paint.

8.1.4 All cable ends shall be supplied with the necessary earth connection.

8.1.5 A channel or other approved means of support shall be provided to remove mechanical stress from the glands.

8.1.6 Cable cores shall be marked with heat-shrunk sleeves where necessary to identify the phases. Refer to SANS 10142.

8.1.7 The current-carrying capacity and breakdown voltage of the cable end shall be the same as for the complete cable.

8.1.8 Cables shall be terminated in accordance with the recommendations laid down by the manufacturers of the cables and glands employed.

8.2 TERMINATION OF PAPER-INSULATED CABLES

8.2.1 The ends shall be terminated in cable end boxes filled with bituminous, cold filling or resin oil semi-fluid compound or heat-shrinkable terminations in accordance with the Department's standard specification for "CABLE END BOXES AND COMPOUND", Section C8 or "CABLE TERMINATIONS AND JOINTS", Section C6.

8.2.2 Heat-shrinkable materials shall only be used in exceptional circumstances with the written permission of the Department.

8.2.3 Before terminating or jointing paper-insulated cables, a test to establish the presence of moisture must be carried out.

The following procedure may be followed:

(a) Place an adequate quantity of cable impregnating oil in a suitable container and heat up to 130 C ± 5 C.

(b) Cut a small length (± 300mm) of the cable concerned and remove the armouring and sheath, taking care not to handle the dielectric in any way.

(c) Dip a section of the outer insulating impregnated paper (belt paper) in the heated oil, taking care not to contaminate the tapes with moisture from the hands. If frothing appears on the surface of the oil, this is a clear indication of the presence of moisture in the paper.

(d) The same procedure should then be repeated on the insulating impregnated paper around the conductors (especially those layers closest to the conductors). Frothing will also indicate the presence of moisture.

(e) Should only a small number of bubbles appear on the surface of the oil, this is an indication of air bubbles on the paper and not moisture since the presence of moisture will result in a series of bubbles rising to the surface of the oil for a number of seconds, until all moisture has been removed.

8.2.4 The armouring shall be bonded to the main earth bar of the switchgear or transformer, but the bond shall be easily removable for testing purposes.

8.2.5 The lead sheath shall be wiped against the conical wiping gland.

8.2.6 All cut cable ends which will be exposed to the atmosphere for more than two hours shall be sealed and wiped to prevent penetration of moisture.

8.3 TERMINATION OF XLPE CABLES

8.3.1 These cables shall only be used in exceptional circumstances and only with the written permission of the Department.

8.3.2 Cross-linked polyethylene cables (XLPE) shall be terminated in accordance with the Department's standard specification for "CABLE TERMINATIONS AND JOINTS", Section C6 unless a pre-fabricated system based on pre-moulded slip-on EPR stress cones is used.

8.3.3 The copper tapes of the earth screen on the cable shall be bonded to the main earth bar of the switchgear or transformer, but the bond shall be easily removable for testing purposes.

8.3.4 The cable shall be firmly secured on the switchgear by means of a clamp to prevent mechanical stress on the cable and terminations.

8.4 TERMINATION OF PVC-INSULATED CABLES

8.4.1 Cable ends shall be terminated by means of adjustable glands in accordance with the Department's standard specification for "GLANDS FOR PVC-INSULATED CABLES", Section C5.

8.4.2 The glands shall be fitted in accordance with the cable and gland manufacturer's instructions.

8.4.3 The correct size and type of gland shall be used for the particular cable and application.

8.5 CONNECTION OF CABLE CONDUCTORS

8.5.1 Suitable lugs shall be used, preferably solidly sweated to the cable conductor ends. Lugs may be crimped, using mechanical or pneumatic tools designed for this purpose, on condition that evidence is submitted that the method used complies with the performance requirements of BS 4579, Part 1 : "COMPRESSION JOINTS IN COPPER".

8.5.2 Contact surfaces shall be thoroughly cleaned and smoothed and fixing bolts shall match the hole size of the lug.

8.5.3 Cables that are connected to clamp type terminals where the clamping screws are not in direct contact with the conductor, need not be lugged but the correct terminal size shall be used.

8.5.4 Ferrules shall be used as far as possible where cable conductors are connected directly to equipment with screws against the conductor strands.

8.5.5 When cutting away insulation from cable conductors to fit into lugs, care shall be taken that no strands are left exposed. Under no circumstances may any of the conductor strands be cut away to fit into lugs.

8.6 JOINTS

8.6.1 Joints in cable runs will not be allowed unless specified in the Detail Technical Specification or authorised by the Department.

8.6.2 Jointing shall be carried out strictly in accordance with the manufacturer's instructions and by personnel competent in jointing the types of cables used.

8.6.3 During outdoor jointing operations, the joint bays shall be adequately covered by tents of waterproof material suitably supported. Where necessary a trench shall be excavated around the bay to prevent the ingress of moisture. The sides of the hole shall be draped with small tarpaulin or plastic sheeting to prevent loose earth from falling in during jointing operations.

8.6.4 The joint shall not impair the anti-electrolysis characteristics of the cable.

8.6.5 The Contractor shall notify the Department timeously of the day on which jointing is to be carried out in order than an inspection may be arranged if so required. Any cable joint not inspected by the Department because of insufficient notice being given, shall be opened for inspection and redone at the discretion of the Department at the cost of the contractor.

8.6.6 HV cable joints on paper insulated cables shall be of the compound cast type and the compound used shall comply with the Department's standard specification for "CABLE END BOX FILLING COMPOUND", par. 2 of Section C8.

8.6.7 HV cable joints on XLPE-insulated cables shall be of the heat shrinkable type and shall comply with the Department's standard specification for "CABLE TERMINATIONS AND JOINTS" Section C6, or shall be based on a prefabricated system utilising pre-moulded slip-on stress cones.

8.6.8 LV cable joints shall be of the epoxy-resin type.

8.6.9 Joints shall be fully water and air tight and shall be free of voids and air pockets.

8.6.10 The crossing of cores in joints will not be permitted under any circumstances.

9. TESTING

9.1 Each cable shall be tested after installation in accordance SANS 1507 (up to 1 kV) and SANS 97 (up to 11 kV) as well as the requirements of the Local and Supply Authorities.

9.2 LV Cables shall be tested by means of a suitable megger at 1 kV and the insulation resistance shall be tabulated and certified.

TABLE B6.2

Cable Rating (kV)	TEST VOLTAGE (Applied for 15 minutes) (kV)				
	Paper-insulated cables				XLPE-insulated cables
6,6 11	Between conductors		Conductors to sheath		Conductors to screen
	AC (r.m.s)	DC	AC (r.m.s)	DC	DC
	12 20	18 30	12 20	18 30	11 18

* High Voltage test with DC to 2kV for 1 minute only. Discharge cable slowly via discharge stick (1 minute). Clamp all conductors to earth for 24 hours.

9.3 HV Cables shall be high voltage tested in accordance with Table B6.2 and the exact leakage current shall be tabulated and certified.

9.4 The Contractor shall make all arrangements, pay all fees and provide all equipment for these tests. The cost of testing shall have been included in the tender price.

9.5 The Contractor shall notify the Department timeously so that a representative of the Department may witness the tests.

9.6 On completion of the tests on any cable, the Contractor shall without delay, submit three copies of the certified Test Reports to the Department.

10. MEASUREMENTS

10.1 All measurements for payments shall be made jointly by the representatives of the Department and the Contractor and the Contractor shall obtain the signature of the Department's representative including approval of such measurements.

10.2 No allowance shall be made for the breaking away of the trench sides, other earth movements or for trenches excavated in excess of the stipulated dimensions. Refer also to par. 3.7.5 above.

10.3 The classification shall be as follows:

Very hard rock shall mean rock that can only be excavated by means of explosives.

Hard rock shall mean granite, quartzitic sandstone, slate and rock of similar or greater hardness, solid shale and boulders in general requiring the use of jack hammers and other mechanical means of excavations.

Soft rock and earth shall mean rock and earth that can be loosened and removed by hand-pick and shovel.

10.4 Where very hard rock and hard rock are encountered, the prior approval of the Department shall be obtained before proceeding with the excavation. This requirement is stipulated in order to afford the Department the opportunity to determine whether an alternative cable route is justified.

10.5 All cable lengths indicated in the Detail Technical Specification and/or shown in the cable route drawings shall be regarded as estimates and are given for tendering purposes only. The successful tenderer shall measure actual cable lengths on site before ordering.

10.6 The final price for the supply and installation of all cables will be adjusted, on the basis of the actual lengths of installed cables, in accordance with the unit rates quoted at the time of tendering. Cable lengths shall be measured on site to the nearest 500mm for this purpose and surplus cable will not be paid for.

11. COMPLETION

11.1 The Department reserves the right to inspect the installation at any stage during the course of construction. Such inspections will however not deem the portions inspected as being complete or accepted and the Contractor shall remain responsible for completing the installation fully in accordance with the Contract Documents.

11.2 The Contractor shall carry out a final "as built" survey of the cable routes and present to the Department "as built" route plans of the complete installation. The following information shall be reflected on the plans or submitted as separate schedules with the plans :

(a) Overall length of each cable.

(b) Locations of all joints (if any) in relation to permanent reference points. Dimensions shall be shown and the method of triangulation i.e. two dimensions to each joint, shall be used.

(c) Identification of each cable.

11.3 The works will be deemed to be incomplete until all tests have been conducted successfully and all "as built" drawings and schedules have been handed to the Department.

SECTION B7

B.7 INSTALLATION OF LIGHT SWITCHES AND SOCKET-OUTLETS

1. GENERAL

1.1 STANDARDS

Light switches and socket-outlets shall comply with the Department's quality specification for "LIGHT SWITCHES", Section C10 and UNSWITCHED AND SWITCHED SOCKET-OUTLETS", Section C11. Surface or flush mounted boxes and cover plates, complying with the Department's quality specification for "CONDUIT AND CONDUIT ACCESSORIES", Section C1, shall be provided.

1.2 POSITION OF OUTLETS

Switches and socket-outlets shall be accurately positioned in accordance with the drawings. It is the Contractor's responsibility to ensure that all outlets are installed level and square, at the correct height from the floor and at the correct position relative to building lines and equipment positions as specified. It is the Contractor's responsibility to determine the correct final floor level and ceiling level in conjunction with the Main Contractor.

1.3 COVER PLATES

All switches and socket-outlets shall be fitted with standard metal cover plates. The colour of cover plates shall be as specified or shall otherwise match the surrounding finishes as closely as possible. Unless specified to the contrary, ivory cover plates shall be installed on painted walls. Cover plates in the same area shall have the same colour. Flush mounted cover plates shall overlap the draw-box and edges of the recess. Cover plates shall under no circumstances be cut unless authorised by the Department.

1.4 ESCUTCHEON PLATES

Where flush mounted switches or socket-outlets are installed in special wall finishes e.g. wood or board panels, acoustic tiles or other cladding, etc. and where the wall finishes must be cut to accommodate the switch, it may be necessary to fix an escutcheon plate to the wall to cover the cut-outs. The escutcheon plate shall fit closely around the outlet boxes and shall be fixed independently of the boxes and cover plates. Bevelled cover plates shall be fixed to the outlet boxes and shall fit firmly against the escutcheon plate.

1.5 APPEARANCE

The sides of adjacent switches, plugs, push-buttons etc. shall be parallel or perpendicular to each other and uniformly spaced. A common escutcheon plate shall be placed around flush mounted outlets and accessories where the standard cover plates do not cover the cut-outs in the finishes.

1.6 DEEP BOXES

Where switch or socket-outlet boxes have been set deep, spiral type steel wire spacers shall be used to fix the yoke of the switch or socket.

2. INSTALLATION OF SOCKET-OUTLETS

2.1 MOUNTING HEIGHT

Unless specified to the contrary, socket-outlets shall be installed at the following heights above finished floor level, measured to the centre of the outlet:

Flush mounted in general:	300mm
Showrooms, shops, servants quarters:	1,4m
Domestic kitchens, tea kitchens:	1,05m
Commercial kitchens:	1,4m
Factories, workshops, garages:	1,4m

2.2 WALLS

In cases where socket-outlets must be mounted at a nominal height of 300mm and where the lower portion of the wall consists of face bricks and the upper portion is plastered, the outlets shall be installed in the plastered portion of the wall. If however the plastered portion of the wall commences 500mm or more above floor level the outlets shall be installed in the face bricks. Where a wall has different surface finishes the outlets shall be installed within the same finish and not in the dividing lines between the different wall finishes. All outlets shall be installed at least 150mm away from door frames.

3. INSTALLATION OF LIGHT SWITCHES

3.1 MOUNTING

Light switches shall be installed 1,4m above finished floor level unless specified to the contrary. Mounting heights given shall be measured from the finished floor level to the centre of the switch. All single switches shall be installed with the long side of the toggle vertical.

3.2 DOORS

Unless specified to the contrary, switches adjacent to doors shall be installed on the side containing the lock. If the position of the lock is not shown on the drawings, the position shall be verified before the switch-box is installed. Switch boxes in brick or concrete walls shall be installed 150mm from the door frame. Light switches installed in partitions or door frames shall be of the type designed for that purpose.

3.3 WALLS

Where the lower portion of a wall is face brick and the upper portion plastered, light switches shall be installed wholly in the plaster provided that the lower edge of the plaster is not higher than 1,6m above the finished floor level. In general where different wall finishes are used in the same area. Switches shall be installed within the same finish and not on the dividing lines between finishes.

3.4 PARTITIONS

Light switches installed in partitions shall preferably be of the type designed to be accommodated in the partition construction. Switches installed in the metal supports do not require switch boxes. Switches may not be flush mounted in partition walls without switch boxes.

3.5 WATERTIGHT SWITCHES

Switches that are exposed to the weather or are installed in damp areas, shall be of the watertight type complying with the Department's quality specification for "WATERTIGHT SWITCHES", par. 3 of Section C1O.

3.6 MULTIPLE SWITCHES

Where several switches are required in one position, multi-lever switches in a common switch box shall be provided wherever possible. All circuits wired into this box shall be on the same phase in order that voltages in excess of 250 V are not present in the box. Where it is not possible or practical to do this, barriers shall be installed and a label shall be prominently displayed within the box stating that voltages in excess of 250 V are present.

SECTION B8

B.8 PHOTO-ELECTRIC DAYLIGHT SENSITIVE SWITCH FOR OUTSIDE LIGHTING

1. INSTALLATION

1.1 The outside lighting of each individual building i.e. light circuits marked "T" on the drawings, shall be controlled by photo-electric daylight sensitive switches.

1.2 The positions of the switches as indicated on the drawings are provisional and the exact positions shall be confirmed with the representative of the Department on site.

1.3 Individual outside lighting circuits on a building may be connected directly to the daylight sensitive switch.

1.4 Where two or more lighting circuits are to be controlled by a single daylight sensitive switch, a contactor actuated by the unit shall be provided in the switchboard.

1.5 A by-pass switch enabling the lights to be turned on at any time, shall be provided.

2. CONSTRUCTION

2.1 The unit shall comprise a photo cell, thermal actuator and change-over switch. The cover of the unit shall be manufactured from a tough, durable material providing protection against tampering. The cover shall have good weathering properties. It shall be ultraviolet-resistant and shall not deteriorate when exposed to sunlight for prolonged periods.

2.2 The unit shall be of the wall mounting type and shall be supplied complete with a suitable bracket.

2.3 The operational level shall be factory preset for "ON" at a light level of approximately 54 lux and "OFF" at approximately 108 lux. Voltage variations shall not materially affect the operational levels.

2.4 A time delay of not less than 15 seconds shall be provided to prevent the unit from functioning due to short period changes in illumination.

2.5 The unit shall be effectively safeguarded against voltage surges by means of a suitable surge protector which shall preferably form an integral part of the unit.

SECTION B9

B.9 INSTALLATION OF LUMINAIRES

1. POSITIONS

The mounting positions of luminaries shall be verified on site. All luminaries shall be placed symmetrically with respect to ceiling panels, battens, beams, columns or other architectural features of the space unless otherwise indicated. The layout as shown in the Documents shall generally be adhered to but any discrepancies or clashes with structural or other features must be referred to the Department, before commencing erection of the installation.

2. COVER PLATES

Cover plates shall be fitted over all draw-boxes and outlets intended for luminaries that are not covered by the luminaries canopy, lamp-holder, ceiling rose or similar accessories.

3. FIXING TO DRAW-BOXES

Where an outlet box or draw-box provides the necessary support for a luminaries, all luminaries with the exception of fluorescent luminaries mounted against ceilings, shall be fixed directly to the box. Fluorescent luminaries and luminaries with a mass in excess of 10kg shall however be suspended independently of the outlet box.

4. HANGERS AND SUPPORTS

Where provision has not been made for the fixing of luminaries, the Contractor shall supply the necessary supports, hangers, conduit extensions, angle brackets or any other fixing method approved by the Department.

5. SUSPENDED LUMINAIRES

The necessary hangers shall be provided where luminaries which are of the non-suspension type have to be fixed below false ceilings or roof slabs. The use of 20mm conduits fixed to the roof slab or ceiling is preferred. Provision shall be made for adjustments to enable the levelling of luminaries. Suspended conduits shall be fixed to the ceiling by means of screwed dome lids, bolts and nuts. Ball-and-spigot type domelids shall be used where conduit lengths exceed 600mm. Wiring shall be installed in the conduit hangers.

6. SUSPENDED WIRING CHANNELS

Luminaries (especially fluorescent luminaries) may also be suspended from ceilings by means of suspended metal channels. The metal channel may be supported by conduits or threaded rods. Should metal rods be utilised, these shall be screwed to anchor bolts fixed in the roof slab. Wiring shall either be installed in

conduits fixed to the metal channel or in the metal channels and covered with a suitable cover plate. Purpose-made clamps shall be used to fix the luminaries to the cable channel.

7. CEILING BATTENS

Where wooden blocks are used to suspend luminaries, ceiling battens shall not be cut. The wooden blocks shall be cut to fit around battens and shall be screwed to the ceiling. Battens may however be cut where fluorescent or incandescent luminaries with metal canopies have to be installed against a false ceiling.

8. GLASS-BOWL LUMINAIRES

Unless specified to the contrary, suspended glass-bowl luminaries shall be installed with the underside at least 2,1 m above finished floor level.

9. FLUORESCENT LUMINAIRES FIXED TO CONCRETE SLABS

Fluorescent luminaries to be installed directly against concrete slabs or walls shall be securely fixed to the outlet box and at two additional points. Shot-fired fixings are not acceptable. Where approved, fluorescent luminaries may be installed against metal wiring channels in which the wiring is housed. The channel fixing may in this case be shot-fired. Purpose-made fluorescent fixing adaptors shall be used to fix luminaries to cable channels.

10. FLUORESCENT LUMINAIRES FIXED TO CEILINGS

10.1 In all cases where luminaries are fixed to false ceilings, the Contractor shall ensure that the ceiling is capable of carrying the weight of the luminaries before commencing installation. Should any doubt exist in this regard, the matter shall be referred to the Department.

10.2 In cases where the weight of the luminaire is not carried by the ceiling but by a support or other suspension method, provision shall be made to prevent relative movement between the ceiling and luminaire, ceiling rose or connection point.

10.3 Surface mounted fluorescent luminaries shall fit firmly against the ceiling brandering without leaving gaps between luminaire and ceiling. The luminaire shall be fixed directly to the ceiling by means of brass plated round-head wood screws and washers.

10.4 In the case of tiled ceilings with exposed or concealed T-section supports, surface mounted luminaries shall be fixed only to the tiles by means of butterfly screws or bolts with nuts and washers. The tiles shall be suitably reinforced.

10.5 Luminaries may alternatively be fixed to metal cross-pieces resting in the ceiling tees.

10.6 Drilling of holes in ceiling tees to support luminaries will not be allowed.

10.7 Luminaries shall be fixed in neat relation to the ceiling lay-out.

11. CONTINUOUS ROWS OF LUMINAIRES

In cases where fluorescent luminaries are installed in tandem, only one connection outlet need be supplied per circuit. All luminaries shall be coupled to one another by means of nipples or brass bushes and locknuts to ensure that wiring is not exposed and that earth continuity is maintained. Luminaries on the same circuit may be wired through the channel formed by the luminaire bodies. In this case silicon-rubber insulated conductors shall be used and internal connections shall be made at porcelain terminal blocks. "SCREW-IT" or similar connectors may only be used if prior permission is obtained from the Department. The wiring for any other circuits or outlets, even though these may be in the same row, may not be installed through the luminaire bodies. The Contractor shall ensure that continuous rows are straight and parallel to the relevant building lines.

12. RECESSED LUMINAIRES

12.1 Where recessed luminaries are specified, the Contractor shall maintain close liaison with the ceiling Contractor. In the case of tiled ceilings, the luminaries shall preferably be installed while the metal supports are being installed and before the tiles are placed in position. The Electrical Contractor shall be responsible for the co-ordination of the cutting of ceiling tiles with the other contractors concerned.

12.2 All mounting rings and other accessories shall fit closely into cut-outs to ensure a proper finish.

12.3 In all false ceilings where wiring channels are used, recessed luminaries shall be connected to the wiring channels by means of unswitched 5 A socket-outlets.

12.4 The following requirements shall be adhered to:

(a) Socket-outlets used shall comply with the Department's quality specification for "UNSWITCHED AND SWITCHED SOCKET-OUTLETS", par. 4 of Section 11 and shall be of 5 A minimum rating.

(b) The connector cord attached to the luminaire may not exceed 3m in length and shall consist of 1,5mm² minimum, 3-core, PVC-insulated flexible cord.

(c) The 5A socket-outlets shall be positioned such that they are not more than 600mm above the false ceiling.

13. SPECIAL CEILINGS

In cases where special ceilings e.g. aluminium strips, decorative glass, metal leaves, etc. are to be installed, the Contractor and the Manufacturer of the ceiling shall agree upon the method of fixing of luminaries in the ceiling.

14. BULKHEAD LUMINAIRES

Surface mounted bulkhead luminaries shall not be screwed directly to conduit ends. The conduit shall terminate in a round draw-box at the top or rear of the luminaire. The PVC-insulated conductors shall terminate in a porcelain terminal strip in the draw-box. Silicon-rubber-insulated conductors shall be installed from the terminal strip to the luminaire lamp-holder. "SCREW-IT" or similar connectors may only be used if prior permission is obtained from the Department.

15. TYPE OF CONDUCTOR

PVC-insulated conductors, unless protected by an approved heat-resistant sheathing, shall not be used where the temperature of the insulation is likely to exceed 70°C. In unventilated luminaries or luminaries capable of housing incandescent lamps over 60W, the interconnecting wiring from the lamp-holder to the circuit wiring shall consist of silicon-rubber insulated conductors. Silicon-rubber insulated conductors shall be used exclusively in the case of high bay fittings. Refer also to the provisions of SANS 10142.

16. WIRING OF LAMPHOLDERS

The central terminal of Edison Screw (E.S.-type) LAMP-HOLDERS shall be connected to the phase conductor and the screwed housing to the neutral conductor.

17. HIGH BAY LUMINAIRES

17.1 High bay luminaries shall be securely suspended from the roof structure.

17.2 The luminaries nay be fixed to suspended wiring channels containing the wiring on condition that:

(a) rigid channels with a maximum width of 42 mm be used,

(b) the channels are supported at intervals that will prevent sag or warp and

(c) the channels are large enough to accommodate the wiring.

17.3 Luminaries may be suspended from metal roof trusses with the aid of "CADDY" or similar fasteners.

17.4 Luminaries shall preferably be connected to unswitched 5A socket outlets. Silicon-rubber insulated flexible cord shall be used exclusively to connect the luminaire to the outlet.

17.5 A safety chain to keep the luminaire from falling when loosened shall be provided.

SECTION B10

B.10 CONNECTIONS TO EQUIPMENT

1. GENERAL

This section covers the final electrical connections to switchboards and various equipment in general electrical installations under normal environmental conditions for system voltages up to 600 V. Refer also to the Department's standard specifications for "WIRING", Section B5 and "INSTALLATION OF CABLES", Section B6.

2. CONNECTIONS TO SWITCHBOARDS

2.1 CONDUIT ENTRIES

2.1.1 Where sufficient space for conduit entries as well as adequate space for future conduit entries is available, conduits may be terminated directly on the switchboard.

2.1.2 Alternatively, conduits connected to switchboards shall terminate in a common fabricated sheet steel draw-box installed in the vicinity of the switchboard. In open roof spaces this draw-box shall be placed in a roof space of not less than 900mm clearance.

2.1.3 Lighting and socket-outlet circuits may be separately grouped in common conduits or metal ducts (trunking) from the distribution board to the draw-box. The drawbox shall be of sheet steel with a minimum thickness of 1,6mm and shall be fitted with a removable cover plate.

2.2 FLUSH MOUNTED SWITCHBOARDS

Where flush mounted switchboards are required, the recessed switchboard tray shall be built into the brick or concrete wall. All conduits from the floor or roof shall be fully recessed and shall be bonded directly to the tray by means of locknuts on both sides and the ends of the conduits fitted with a brass bush.

2.3 SURFACE MOUNTED SWITCHBOARDS

Where surface mounted switchboards are specified but where the conduits can be fully recessed, the conduit shall be connected to a recessed connection box installed behind the switchboard. An opening with the same dimensions as the connection box shall be cut in the back of the switchboard and fitted with a suitable grommet.

2.4 SPARE CONDUITS

Where conduits from a switchboard run into a false ceiling space above the board, a minimum of two 25mm and two 20mm spare conduits shall be installed into the ceiling space immediately above the board.

2.5 CABLE CONNECTIONS

2.5.1 Where underground cables are to be connected to switchboards, it shall be the responsibility of the Contractor to ensure that metal, earthenware, asbestos-cement or other approved sleeves are built in correctly to enable installation and connection of the cable to the switchboard.

2.5.2 PVC or pitch fibre sleeves are not acceptable - refer to par. 3.10 of the Department's standard specification for "INSTALLATION OF CABLES", Section B6.

2.5.3 Sleeves shall tie installed with a fall from inside to outside of the building to facilitate drainage. The sleeves shall be sealed with a non-hardening compound after installation of the cables to render the installation vermin proof and waterproof.

2.5.4 A metal cable channel with removable metal cover plate shall be installed by the Contractor and shall extend from the switchboard to the floor or into the ceiling void as required. The channel shall coincide with the position of sleeves. The channel shall be flush mounted except in the case of surface mounted switchboards and then only with the permission of the Department's representative.

2.5.5 The cable channel shall be large enough to permit the installation of cable glands and future cables, particularly where spare sleeves have been provided.

2.5.6 The colour of the channel cover shall match that of the associated switchboard.

2.6 CABLE TRENCHES

Where cables in floor trenches have to be connected to wall mounted switchboards, approved sleeves or conduits shall be installed from the side of the trench to the bottom of the switchboard. These sleeves shall be positioned and fixed before the concrete is cast.

3. CONNECTIONS TO WATER HEATERS

3.1 Each water heater shall be connected to a separate circuit with a separate earth conductor.

3.2 The conduit from the switchboard to the water heater shall terminate in a draw-box within 1 m of the water heater terminals. The connection from the draw-box shall be conductors in conduit or PVC-

insulated cable. Only in instances where heaters are mounted out of normal reach may flexible conduit and round boxes with dome lids be used for the final connection.

3.3 Three-phase supplies to fixed storage water heaters shall be in accordance with the wiring diagram, Fig. B10.1.

3.4 The mounting of the water heater and the provision of the water connections will be undertaken by others. The Contractor shall ensure that the elements and thermostats can easily be replaced.

3.5 Before testing a water heater, the Contractor shall confirm with the Plumbing Contractor that the unit is filled with water.

3.6 Unless otherwise specified in the Detail Technical Specification, the wiring of hot water heater circuits not exceeding 4 kW shall consist of 4mm² conductors and 2,5mm² earth conductor.

3.7 Unless it is specified that isolators for water heaters shall be provided in the switchboard, a local isolator shall be provided for each water heater. In the case of water heaters not exceeding 4 kW, a 30 A double-pole metal-clad isolator shall be surface mounted over the flush conduit outlet box.

4. CONNECTIONS TO HEATERS, FANS AND AIRCONDITIONING UNITS

4.1 ISOLATORS

A flush mounted suitably rated double-pole isolator shall be provided within 1m of the unit. Where the equipment is mounted out of reach, the isolator shall be installed at 1,5m above floor level. Only where units are mounted in easily accessible positions and where an isolating switch is incorporated in the unit, may this isolator be omitted. Where flush isolators are used, flush conduit shall be installed to link with the equipment outlet point. Flexible cords of sufficient rating may be used for the final connection to the equipment.

4.2 WIRING

The minimum conductor size to be used shall be 4 mm^2. Each fan, heater or air-conditioning unit shall be on a separate circuit.

4.3 FLUSH MOUNTED CONVECTION HEATERS

The heater frame or tray shall be built or cast into the wall at a height such that the underside of the heater is at 250mm above floor level. Conduits shall terminate on the frame near the terminals.

4.4 SURFACE MOUNTED EQUIPMENT

4.4.1 Connections to surface mounted equipment shall consist of a draw-box located in the vicinity of the terminals of the unit. In workshops and industrial areas the connections shall be made by means of flexible conduit connected to dome lids on the draw-box. Conductors shall be connected directly to the unit.

4.4.2 In non-industrial applications PVC-insulated 3-core flexible cables may be used for the connection.

4.4.3 Where flexible cables are used, a bush shall be provided at the rear of the unit for cable entry and a bush and clamp (or gripper gland) at the draw-box. The clamp shall tightly grip the outer insulation of the cable to prevent tension on the connections between cable and conductors in the draw-box.

4.4.4 Where heaters or air-conditioning units are situated above power skirting, the isolator shall be installed in the power skirting and the flexible cable or cord to the unit shall be installed in the power skirting through a gripper or compression gland. The cable shall be made as short as practical and shall be neatly saddled to the surface of the wall.

4.5 RADIANT HEATERS

The installation of radiant heaters and asbestos heaters, where specified, shall comply with the requirements of paragraph 5.4, with the exception that they shall be mounted on spacers, 25mm away from the mounting surface.

4.6 FAN HEATERS

4.6.1 The contractor shall allow for the supply, installation and electrical connection of the fan heaters as indicated on the drawings. The fan heaters shall be rated at 3 kW and shall be complete with control units.

4.6.2 The heaters shall be secured by means of approved expansion bolts at 2,4m above floor level in positions as shown, with the control units at 1,5m above floor level, directly below the unit.

4.6.3 The fan heater shall be installed on a box directly behind the unit.

4.6.4 Each connection shall be protected by means of a single-pole circuit-breaker on the associated switchboard.

4.6.5 Brass bushes shall be provided to protect the wiring at the rear cable entries to the control unit and fan connection box.

5. CONNECTIONS TO COOKING APPLIANCES

5.1 Unless specified to the contrary, the circuit connection to each cooking appliance shall consist of:

(a) 2 x 10mm² PVC-insulated conductors and 6mm² bare copper earth conductor for single phase connections, or

(b) 4 x 4mm² PVC-insulated conductors and 2,5mm² bare copper earth conductor for three phase connections.

5.2 A 60A double pole or 30A triple pole micro-gap isolator flush mounted in a wall outlet box, shall be installed 1,5m above floor level to the left or right of the appliance in accordance with SANS 10142. A white baked enamel cover plate shall be provided, situated wholly on the tiled or plastered surface as applicable.

5.3 The conduit shall terminate 450mm above floor level behind the appliance position. The conduit end shall be approximately 75mm long and shall face downwards. Connections from the conduit end to the appliance shall be installed in accordance with SANS 10142. Sufficient slack shall be provided in the flexible connection to move the appliance 600mm away from its normal position for cleaning or maintenance.

5.4 Alternatively a 45A, 3-pin socket-outlet may be mounted on a round draw-box 450mm above floor level. The connection to the appliance shall consist of a plug and 10mm², rubber-insulated and sheathed cable in accordance with SANS 1520. The cable shall be long enough to enable the appliance to be moved 600mm from its normal position for cleaning or maintenance.

5.5 Crimped or soldered lugs shall be provided on all conductors intended for connection to cooking appliances.

5.6 Each appliance shall be connected to a separate circuit. A separate earth wire shall be provided for each appliance.

SECTION B11

B.11 EARTHING

This section covers the earthing of electrical installations in buildings or other structures. The total earthing system of any electrical installation shall be in complete accordance with SANS 10142.

1. RECOMMENDATIONS: PRACTICAL INSTALLATION OF EARTH ELECTRODES

1.1 REQUIREMENTS OF AN EFFECTIVE EARTH

1.1.1 An effective earth must prevent dangerous over voltages arising between metallic structures, frames, supports or enclosures of electrical equipment and the ground during fault conditions.

1.1.2 An effective earth must be able to permit fault currents of sufficient magnitude to flow so as to operate protective devices to isolate the fault before damage can occur.

1.1.3 The ohmic resistance of an effective earth must be low enough to ensure that the step potential on the ground in the vicinity of the earthing point is within safe limits under fault conditions i.e. a voltage gradient not exceeding 40 V/m for fault durations exceeding 1s.

1.2 TYPES OF EARTH ELECTRODES

Three types of earth electrodes are suitable:

1.2.1 Trench Earths

Trench earths comprise a bare copper or galvanised iron conductor laid at a minimum of 800mm below ground level, usually when underground cables are installed. This type of earth electrode provides a relatively large contact area between electrode and surrounding ground, makes contact with a variety of types of soil and soils of varying moisture content en route and is economical to install.

1.2.2 Spike Earths

Spike earths comprise rods of bare copper, copper-coated steel, stainless steel or galvanised steel designed for the purpose of penetrating ground to depths of up to several metres. A low resistance earth may sometimes be obtained by driving multiple spikes at some distance from each other in order to provide parallel paths.

In hard or rocky ground, it is usually necessary to drill holes into which earth spikes are inserted and then packed with soft soil.

1.2.3 Foundation Earths

Foundation earths comprise bare copper or galvanised iron conductors laid under the foundations of buildings, miniature substations, distribution pillars, bases of wooden, concrete or steel poles and structures. Because soil under foundations usually retains moisture, foundation earths are located to take advantage of this favourable condition. Furthermore, they are economical to install.

1.3 MATERIALS FOR EARTH ELECTRODES

1.3.1 Bare copper, either in stranded, strip or rod form, is considered the most suitable general purpose material for earth electrodes. Its main disadvantage is its cost and susceptibility to theft.

1.3.2 Bare galvanised iron and steel, either in stranded, strip or rod form, has a satisfactory record of survival in non-aggressive soils and is more economical than copper.

1.3.3 Bare aluminium is unsuitable as electrode material.

1.4 CORROSION

Because galvanised ferrous metals corrode sacrificially to copper, galvanised iron and steel electrodes should not be buried in close proximity to bare copper.

2. EARTHING OF A GENERAL ELECTRICAL INSTALLATION

2.1 GENERAL

All earth conductors shall be stranded copper with or without green PVC insulation. The conductors shall comply with the Department's quality specification for "PVC-INSULATED CABLES", Section C4. All earth conductor sizes shall be determined in accordance with SANS 10142, par. 4.6 where the earth does not form an integral part of the cable.

2.2 SWITCHBOARDS

A separate earth connection shall be supplied between the earth busbar of the main switchboard and the earth busbar of every sub-switchboard. These connections shall consist of bare or insulated stranded copper

conductors installed along the same routes as the supply cables or in the same conduit as the supply conductors. Alternatively armoured cables with earth continuity conductors included in the armouring may be utilised.

2.3 SUB-CIRCUITS

The earth conductors of all sub-circuits shall be connected to the earth busbar in the supply switchboard in accordance with SANS 10142.

2.4 RING MAINS

Common earth conductors may be used where various circuits are installed in the same wiring channel in accordance with SANS 10142. In such instances the sizes of earth conductors shall be specifically approved by the Department. Earth conductors for individual circuits branching from the ring main shall be connected to the common earth conductor with T-ferrules or soldered. The common earth shall not be broken.

2.5 CONNECTIONS

Under no circumstances shall connection points, bolts, screws, etc. used for earthing be utilised for any other purpose. It will be the responsibility of the Contractor to supply and fit earth terminals or clamps on equipment and materials that must be earthed where these are not provided. Unless earth conductors are connected to proper terminals, the ends shall be tinned and lugged. Lugs may be crimped, using mechanical or pneumatic tools designed for this purpose, on condition that evidence is submitted that the method used complies with the performance requirements of BS 4579, Part 1: "COMPRESSION JOINTS IN COPPER."

2.6 NON-METALLIC CONDUIT

Where non-metallic conduit is specified or allowed, stranded copper earth conductors shall be installed in the conduits and fixed securely to all metal appliances and equipment, including switch boxes, socket-outlet boxes, draw-boxes, switchboards, luminaries, etc. The securing of earth conductors by means of self-threading screws will not be permitted.

2.7 FLEXIBLE CONDUIT

An earth conductor shall be installed in all non-metallic flexible conduit. This earth conductor shall not be installed external to the flexible conduit but within the conduit with the other conductors. The earth conductor shall be connected to the earth terminals at both ends of the circuit.

2.8 WATER PIPES

Metal cold water mains shall be bonded to the earth busbar in the Main Switchboard by solid 15 x 2mm copper strapping. All other hot and cold water pipes shall be connected by 12 x 0,8mm perforated or solid copper strapping (not conductors) to the nearest switchboard. The strapping shall be fixed to the pipe work by brass nuts and bolts and against walls be brass screws at 150mm centres. In all cases where metal water pipes, down pipes, flues, etc. are positioned within 1,6 m of switchboards, an earth connection consisting of copper strapping shall be installed between the pipe work and the board. In vertical building ducts accommodating both metal water pipes and electrical cables, all the pipes shall be earthed at each switchboard.

2.9 ROOFS

Where service connections consist of overhead conductors, all metal parts of roofs, gutters and down pipes shall be earthed. One bare 10mm² copper conductor shall be installed over the full length of the ceiling void, fixed to the top purlin and connected to the main earth conductor of each switchboard. The roof and gutters shall be connected at 15m intervals to this conductor by means of 12 x 0,8mm copper strapping (not conductors) and galvanised bolts and nuts. Self-tapping screws are not acceptable. Where service connections consist of underground supplies, the above requirements are not applicable.

SECTION B12

B.12 PROVISION FOR TELEPHONE INSTALLATION

1. CONTRACTOR'S RESPONSIBILITY

The Contractor shall only supply and install outlet points, wiring channels and/or conduits for telephones. The telephone installation will be carried out by others.

2. REGULATIONS

All provisions for telephones in buildings shall comply with the latest issue of "FACILITIES FOR TELECOMMUNICATION SERVICES IN BUILDINGS" as issued by the Department of Posts and Telecommunications.

3. SEPARATION OF SERVICES

3.1 Cables or conductors for telephone services shall be separated from all other services by:

(a) providing separate metal channels or conduits, or

(b) installing power cables, conductors and accessories at a minimum distance of 300mm from routes reserved for telephone cables, or

(c) an earthed metal barrier installed in such a manner to ensure that the minimum distance through free air space between the telephone cables and other services is at least 300mm.

3.2 In cases where high voltage cable runs are parallel to telephone cable runs for more than 50m, the correct spacing shall be determined by conferring with the Department of Posts and Telecommunications.

3.3 Conduits or wiring channels provided for telephone services may not be used for any other purpose. Where non-metallic channels are used, the separation stated in par. 3.1 (b) shall he maintained throughout the installation.

4. MAIN TELEPHONE DISTRIBUTION BOARD

4.1 The size and position of the Main Telephone Distribution Board, where required, shall be in accordance with the requirements of the Detail Technical Specification.

4.2 The board shall consist of a metal tray, architrave frame and hinged doors and shall be flush mounted in the position shown on the drawing(s).

4.3 A 20mm thick soft wooden panel (fine grade pine to SANS 1359, without knots) shall be installed in the main telephone distribution board and shall cover the entire back of the board. Chipboard or similar materials are not acceptable.

4.4 All conduits and sleeves to telephone outlets or sub-distribution boards in the buildings or on the site as well as the main incoming sleeves, shall terminate at the main telephone distribution board as indicated on the drawing(s).

4.5 Where 100 x 100 x 50mm draw-boxes are specified as main or sub-distribution boards, the boxes shall be flush mounted and provided with a cover plate. A wooden panel need not be provided in these cases.

5. VERTICAL BUILDING (SERVICE) DUCTS

5.1 If the telephone cables are to be installed in the same duct as power cables the separation of services described in par. 3 shall be maintained.

5.2 Conduits and metal channels to and from building duct(s) shall be installed from the section containing the telephone cables to obviate telephone cables crossing power cables or other services in the duct.

5.3 Where more than one vertical building duct is provided in the structure, the ducts shall be interconnected by at least 2 x 32mm dia. conduits at each floor level unless otherwise specified or indicated on the drawings.

6. TELEPHONE OUTLETS

6.1 Blank cover plates shall be fitted to all telephone outlets.

6.2 Telephone outlets in walls shall consist of flush mounted 100 x 100 x 50mm draw-boxes.

6.3 Telephone outlets in floors shall be of the same type as floor outlets for power socket-outlets. These provisions also apply to underfloor ducting. If the type of floor outlet is not specified, 100 x 100 x 50mm flush mounted draw-boxes shall be provided in the floor at the positions indicated on the drawings. The cover plates for these draw-boxes shall be of the diecast type.

6.4 Where twin underfloor ducts are provided and where the one duct is intended for telephone cables, the separation between the ducts shall be maintained throughout the underfloor ducting installation.

6.5 Where power skirting is specified for telephone installations, the Contractor need only install the skirting with covers since the telephone socket will be fixed directly to the cover. Where multiple power skirting is provided containing other services, no other cables may be installed in the section intended for telephone cables and the separation between the sections shall be maintained throughout the installation.

6.6 Refer also to the Department's standard specification for the "INSTALLATION OF WIRING CHANNELS, UNDERFLOOR DUCTING AND POWER SKIRTING", Section B2.

7. CONNECTION OF TELEPHONE OUTLETS

7.1 Telephone outlets shall be inter-connected and connected to the telephone distribution boards as shown on the drawings.

7.2 If the inter-connecting conduits are not specified, conduit sizes shall be determined as follows:

Inter-connection of 10 outlets maximum - 25mm dia. conduit.

Inter-connection of 20 outlets maximum - 32mm dia. conduit.

7.3 Metal channels or power skirting installed on the same floor level on opposite walls of the same area as well as parallel runs of underfloor ducting intended for the installation of telephone cables, shall be interconnected at intervals of 6m. Conduit may be used for these inter-connections.

7.4 All conduits and all ducts or channels which do not have removable covers, shall be provided with galvanised steel draw-wires.

7.5 Conduit connections to power skirting or surface mounted metal channels, shall consist of a 100 x 100 x 50mm draw-box which is flush mounted immediately behind the duct or channel in which the telephone cables are to be installed. A hole shall be cut in the back of the duct or channel, immediately opposite the draw-box. The edges of the hole shall be grommeted. The draw-box shall be accessible from the front when the cover is removed.

7.6 Purpose-made accessories for the connection of conduits to underfloor ducts shall be used. Where these are not available, a 100 x 100 x 50mm draw-box shall be installed below the underfloor duct opposite a floor telephone outlet. Inter-connecting conduits shall terminate at the draw-box. The edges of the hole shall be grommeted. The draw-box shall be accessible from the top via the floor outlet.

7.7 Exposed conduit ends intended for future extensions shall be terminated by means of a coupling and screwed brass plug. Only galvanised conduit shall be used in these instances.

SECTION B13

B.13 INSPECTIONS, TESTING, COMMISSIONING AND HANDING OVER

1. PHYSICAL INSPECTION PROCEDURE

1.1 Once the Contractor has completed the installation, written notice shall be given to the Department in order that a mutually acceptable date can be arranged for a joint inspection.

1.2 During the course of the inspection, the representative of the Department will compile a list of items (if any) requiring further attention. A copy of this list will be provided to the Contractor who will have a period of 7 days in which to rectify the offending items of the installation.

1.3 The Contractor shall then provide written notice that he is ready for an inspection of the remedial work to the offending items.

1.4 This procedure will continue until the entire installation has been correctly completed to the satisfaction of the Department.

2. TESTING AND OPERATIONAL INSPECTION PROCEDURE

2.1 In addition to the above the Contractor shall have the complete installation tested and approved by the local authorities where applicable.

2.2 Subsequent to the above testing and approval, the Contractor shall in the presence of the representative of the Department test all circuits with respect to:

(a) Phase balance.

(b) Insulation level.

(c) Polarity.

2.3 Upon completion of the installation and within 3 months of the handover date, the Contractor shall provide and make available a recording voltmeter to record the voltage at three locations in the complex over a period of 48 hours each. These locations will be nominated by the Department.

3. "AS BUILT" DRAWINGS

3.1 As each portion of the work is completed, the Contractor shall provide the Department with as-built drawings showing the exact location measured from fixed points of all cables, transmission lines, each outlet point, etc.

3.2 In addition a complete reticulation diagram showing all supply cables and switchboards shall be provided behind a plastic cover in the substation or adjacent to the Main Switchboard if not located in a substation.

3.3 The installation will not be regarded as complete until all of the above requirements listed in 1, 2 and 3 above have been met.

Project : Storm Damaged Schools
Project number : P090

LUMINAIRE SCHEDULE

TYPE	EQUIVALENT WATTAGE	LOCATION	DESCRIPTION	IMAGES
A	2x35	Admin, Kitchen, Guard House, All existing Buildings.	1500mm (5ft) Surface mounted, open channel fluorescent luminaire. Metal Body. 2 x T5 fluorescent lamps complete with electronic control gear and telescopic ends. Minimum 8750 Lumens. Cool White. Colour white or as per architect.	
B	2x11	All buildings outside lights.	Wall mounted die-cast aluminium body with glass diffuser. IP 65, Corrosion and vandal resistant luminaire, complete with 2 xCFL lamp, electronic control gear and all necessary accessories. All external bolts to be stainless steel. Minimum 2400 lm.Cool White. Colour black or as per architect.	
C	2x11	Ablution, Kitchen	Ceiling/Wall mounted high pressure die-cast aluminium base with opal high-impact acrylic diffuser. Minimum IP 65, Corrosion and vandal resistant luminaire complete with 2x CFL lamps, electronic control gear and all necessary accessories. All external bolts to be stainless steel. Minimum 2400lm.Cool White. Colour black or as per architect.	
D	1x18	Parking Lot & Driveway	Post Top mounted luminaire, with glass-filled nylon dome with non-discolouring high-impact acrylic diffuser. High-pressure die-cast aluminium spigot base.Minimum IP 65, Corrosion and vandal resistant luminaire complete with 1x CFL lamp, electronic control gear and all necessary accessories. All external bolts to be stainless steel. Minimum 1200lm. Cool White. Colour Dark Grey or as per architect. Mounted on 3.6m Pole at 3m mounting height.	
E	1x35	Area Lighting	Pole mounted flood-light luminaire, including pole. Minimum IP 65 biult-in driver LED floodlight. All external bolts to be stainless steel. Cool White. Colour Black or as per architect. Mounted on 4.6m Pole at 4m mounting height. Price to include pole, complete with 35W LED fittings and all necessary accessories.	

Note: 1. All luminaires are subject to the approval of the Engineer prior to ordering and purchase.
2. All images are an impression of the luminaire's look & feel. The supplier to provide similar or equivalent fitting subject to approval by the Engineer.
3. Light output verification is subject to simulation of submitted IES/LDT files. Non-submission of photometric data files could lead to rejection of the proposed luminaire.
4. All light fittings supplied must comply with SANS requirements for manufacture and SANS 10114-1.The Engineer reserves the right to request such compliance certificates. Failure to submit such compliance certificates will result in the fittings being rejected.

KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 3: SIZUZULU PRIMARY SCHOOL. OPEN BID

ANNEXURE 16
Architects Specifications & Drawings

ARTEK 4
PROJECT No. 1604

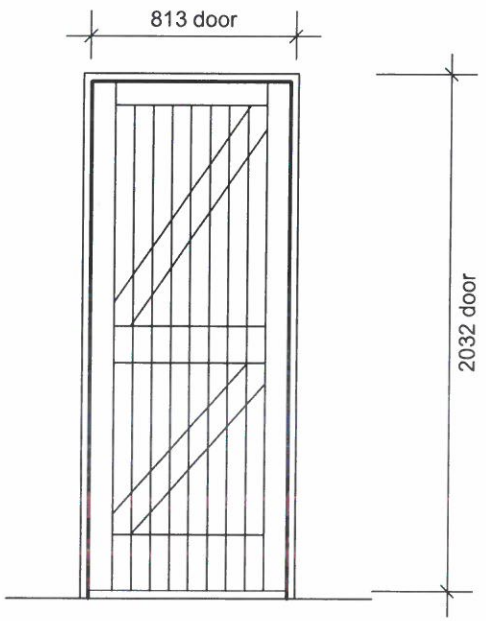
DRAWING REGISTER
STORM DAMAGED – SCHOOLS PROGRAMME

DWG No.	Rev.	Description		Work Stage	Scale	Page	Progress	Time Days	Compl. Date	
Schedules										
400	-	Door Schedule (D1,D2,D3,D6,D8,D14)		1:25	6x A4					
401	-	Window Schedule (W1,W2,W3,W7,W8,W9,W10,w11,w12)		1:25	9 x A4					
402	01	Finishing Schedule (5 Pages)			5 x A4					
403	-	Paint Specification (9 Pages)			9 x A4					
404	-	Sanware Schedule (3 Pages)			3 x A4					
406	-	Gate Schedule (G1,G3,G5)		1:25	3 x A4					
Details										
500	B	Truss Eaves & Barge Detail to Brick Wall		1:50 1:10	A1					
501	B	Truss & Eaves Details to Block Wall		1:25 1:5	A1					
502	A	Threshold Details		1:10	A3					
503	-	Eaves Detail - Tiles		1:5	A3					
504	-	New Sheeting to Steel Truss		1:10	A1					
505	-	5000 l Water Tank & base details		1:50	A3					
505.3	-	Tank Base Details Double Tank		1:50	A3					
506	-	Fence Details 1900 h		1:20 1:2 1:5	A1					
507	-	Precast Handrail Detail		1:25 1:5 1:2	A2					

ARTEK 4
PROJECT No. 1604

DRAWING REGISTER
STORM DAMAGED – SCHOOLS PROGRAMME

DWG No.	Rev.	Description		Work Stage	Scale	Page	Progress	Time Days	Compl. Date	
508	-	Fence Details 1500 h		1:20	A1					
509	-	Typical Strip Section - Blockwork		1:10	A1					
Joinery/Fittings										
600	-	Chalkboard fitting F01		1:25	A3					
601	-	Pinboard type F09		1:25 1:1	A3					



DOOR No.	D1
No. REQUIRED	SEE PLAN
DOOR	813mm wide x 2032mm high x 40mm thick Blaco framed, ledged, braced and battened selected Meranti door. 44mm x 146mm top rail and stiles. 22mm x 108mm braces. 22mm x 146mm lock rail. 22mm x 222mm bottom rail. 22mm x 70mm t. g. and vee-jointed boarding.
FRAME (OMIT FRAME IF EXIST)	Standard 1,2mm thick galvanised pressed steel jamb lining with double rebate, base ties, 1,5 pairs 102mm steel butt hinges, adjustable CP striking plate, rubber buffers and fixing lugs. Lining is to be suitable for a 230mm brick wall.
FINISH	Prepare, knot, clean down and apply one coat of Plascon Woodcare Pretreatment (WWP 1) to the door. Prime with one coat of Woodcare Wood Preservative (FPR 1) and finish with two coats of Woodcare Wood Preservative (FPR 1), all in strict accordance with the Manufacturer's instructions. Galvanised pressed steel jamb lining is not to be painted. Clean down jamb lining upon completion.
LOCK	Union Gower CZ682-24CH/2252-76SS three lever mortice lockset
HANDLE	1 Pair 111mm AL5515-111 BBAS Dove pill handle with back to back fixing.
SUNDRY	38mm dia black rubber stop, plugged & screwed to concrete floor.

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A	2016.8.17	Saligna door changed to Maranti	VM

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PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION
DOOR SCHEDULE
DOOR TYPE - D1

CONSULTANTS
Programme Managers : NAIDU CONSULTING (PTY) LTD
Architect : ARTEK 4 ARCHITECTS
Quantity Surveyors : HENCON & ASSOCIATES
Electrical Engineers : DBA CONSULTING ENGINEERS
Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
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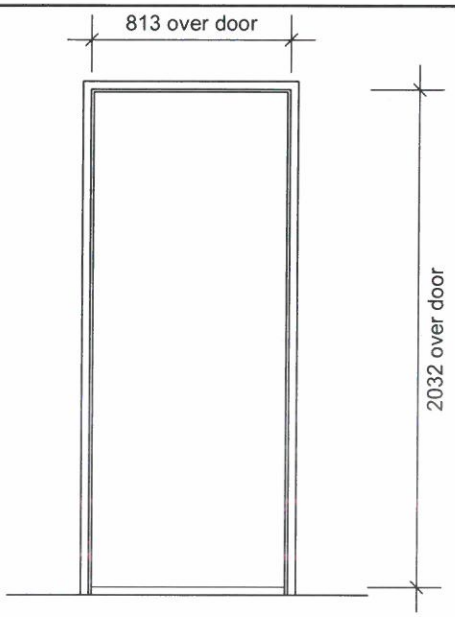

DOOR No.	D2
No. REQUIRED	SEE PLAN
DOOR	44mm thick semi-solid core flush panel door with two concealed edges, faced both sides with an approved commercial veneer, suitable for varnishing.
FRAME	Standard 1,2mm thick galvanised pressed steel jamb lining with double rebate, base ties, 1 pair 102mm steel butt hinges, adjustable CP striking plate, rubber buffers and fixing lugs. Lining is to be suitable for a 230mm brick wall.
FINISH	Prepare, knot and apply one coat of Plascon Woodcare Pretreatment (WWP 1) and two coats of Woodcare Interior Water Based Wood Varnish (IWV 21), all in strict accordance with the Manufacturer's instructions. Galvanised pressed steel jamb lining is not to be painted. Clean down jamb lining upon completion.
LOCK	Union Gower CZ682-24SC/2295-76SS two lever mortice lockset
HANDLE	1 Pair 111mm AL5515-111 BBAS Dove pill handle with back to back fixing.
SUNDRY	38mm dia black rubber stop, plugged & screwed to concrete floor.

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PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
DOOR SCHEDULE
DOOR TYPE - D2

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

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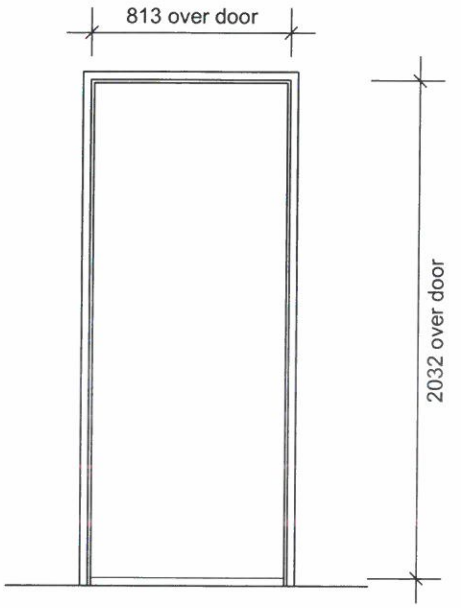

DOOR No.	D3
No. REQUIRED	SEE PLAN
DOOR	44mm thick semi-solid core flush panel door with two concealed edges, faced both sides with an approved commercial veneer, suitable for varnishing.
FRAME	Standard 1,2mm thick galvanised pressed steel jamb lining with double rebate, base ties, 1 pair 102mm steel butt hinges, adjustable CP striking plate, rubber buffers and fixing lugs. Lining is to be suitable for a 230mm brick wall.
FINISH	Prepare, knot and apply one coat of Plascon Woodcare Pretreatment (WWP 1) and two coats of Woodcare Interior Water Based Wood Varnish (IWV 21), all in strict accordance with the Manufacturer's instructions. Galvanised pressed steel jamb lining is not to be painted. Clean down jamb lining upon completion.
LOCK	Union Gower CZ682-24SC/2295-76SS two lever mortice lockset
HANDLE	1 Pair 111mm AL5515-111 BBAS Dove pill handle with back to back fixing.
SUNDRY	38mm dia black rubber stop, plugged & screwed to concrete floor.

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PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
DOOR SCHEDULE
DOOR TYPE - D3

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
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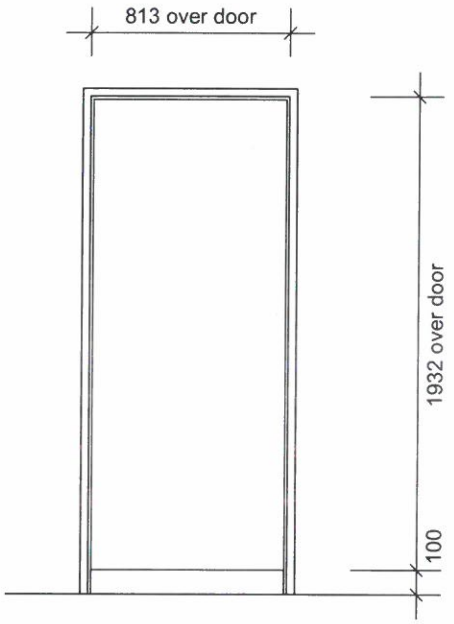

DOOR No.	D6
No. REQUIRED	SEE PLAN
DOOR	44mm thick semi-solid core flush panel door with two concealed edges, faced both sides with tempered hardboard, suitable for painting.
FRAME	Standard 1,2mm thick galvanised pressed steel jamb lining with double rebate, base ties, 1 pair 102mm steel rising butt hinges, adjustable CP striking plate, rubber buffers and fixing lugs. Lining to be suitable for a 115mm brick wall.
FINISH	Prepare, stop and apply one coat Plascon Oil Wood Primer and two coats Plascon Velvaglo Polyurethane Velvet Enamel of selected colour to door. Galvanised pressed steel jamb lining is not to be painted. Clean down galvanised pressed steel jamb lining upon completion.
LOCK	-
HANDLE	AL 8294 AS anod alum mortice wc indicator bolt
SUNDRY	38mm dia black rubber stop, plugged & screwed to concrete floor.

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PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
DOOR SCHEDULE
DOOR TYPE - D6

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

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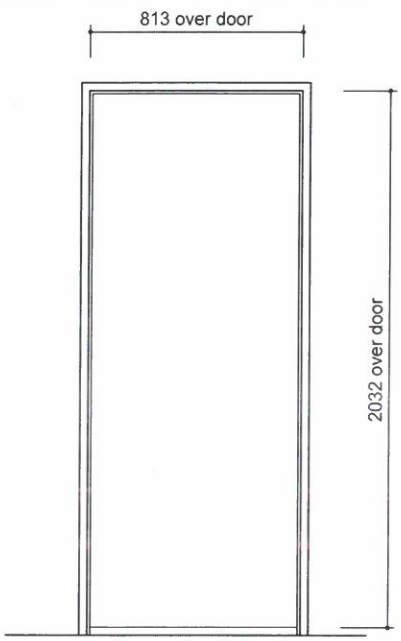

external elevation

DOOR No.	D8
No. REQUIRED	SEE PLAN
DOOR	44mm thick semi-solid core flush panel door with two concealed edges, faced both sides with an approved commercial veneer, suitable for varnishing.
FRAME	Standard 1,2mm thick galvanised pressed steel jamb lining with double rebate, base ties, 1 pair 102mm steel butt hinges, adjustable CP striking plate, rubber buffers and fixing lugs. Lining is to be suitable for a 230mm brick wall.
FINISH	Prepare, knot and apply one coat of Plascon Woodcare Pretreatment (WWP 1) and two coats of Woodcare Interior Water Based Wood Varnish (IWV 21), all in strict accordance with the Manufacturer's instructions. Galvanised pressed steel jamb lining is not to be painted. Clean down jamb lining upon completion.
LOCK	.
HANDLE	AL 37651 as anod alum Helping hand Indicator bolt.
SUNDRY	38mm dia black rubber stop, plugged & screwed to concrete floor.

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PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
DOOR SCHEDULE
DOOR TYPE - D8

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
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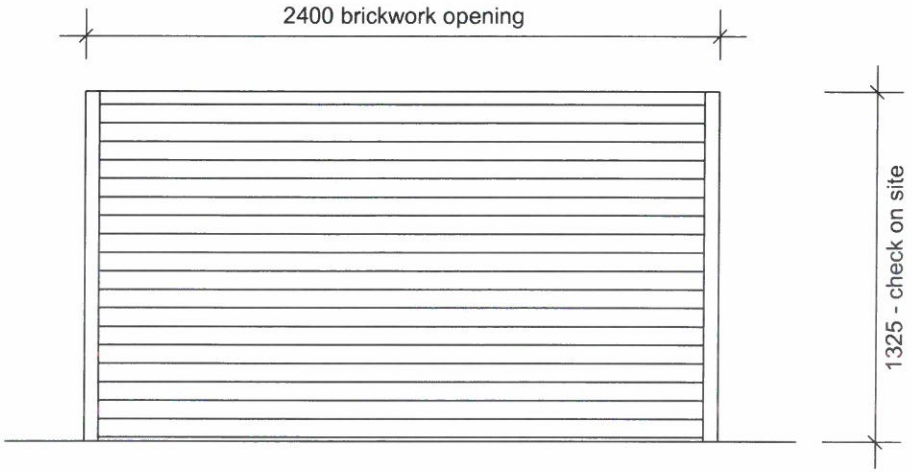

DOOR No.	D14
No. REQUIRED	SEE PLAN
DOOR	Chain operated roller shutter door. Xpanda or equal approved standard security roller shutter door, comprising 75mm x 0,8mm thick interlocking slats cold-rolled from first grade Iscor Z275 galvanised sheet to curtain, with aluminium T-bar bottom rail fitted with a flexible moulded rubber weather astragel The roller shaft is to be ball bearing mounted, with helically wound torsion springs of sufficient capacity to correctly balance the door with a safety factor of 25%, enclosed in a 1,2mm thick continuous galvanised steel mild canopy. The curtain is to run in 3mm thick mild steel channel with fixing lugs at one metre centres. The door is to be supplied with no. 2 galvanised shoot bolts, suitable for padlocking. The door is to suit a clear opening size of 2400mm wide x 1325mm high.
FINISH	The door and all fittings are to be supplied with a galvanised finish.

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PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
DOOR SCHEDULE
DOOR TYPE - D14

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
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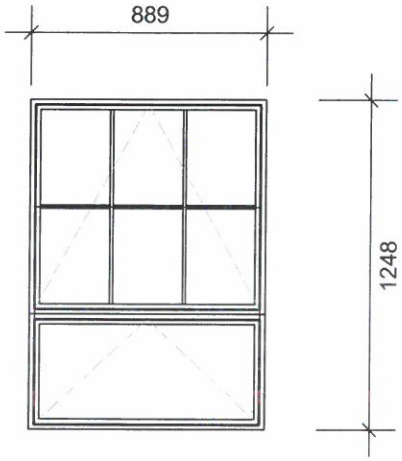
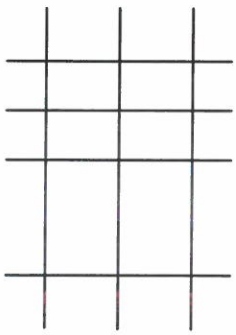


external elevation

4.7 x 19 flat bar burglar bars welded externally at 275 centres vertically & midway on the height of each pane



4.7 x 19 flat bar burglar bars welded externally

burglar bars

WINDOW No.	**w1**
No. REQUIRED	See plan
MATERIAL	Standard School Type steel sashes constructed of rolled steel sections, in accordance with SANS 727:2003, supplied hot-dipped galvanised.
FINISH	No paint finish. Windows and glazing to be cleaned down upon completion.
IRONMONGERY	Steel pull, eye and spring catch with brass bolt. Steel hinges with brass pins and washers. Steel concealed side arms.
GLAZING	Glazing throughout to be 6,38mm thick normal strength PVB laminated clear safety glass secured into galvanised window with a compatible UV resistant sealant.
BURGLAR BARS	Standard factory fitted, 4,7mm x 19mm galvanised mild steel burglar bars welded at intersections and to window frame over both opening and fixed sections of window.

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PROJECT

STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION

WINDOW SCHEDULE
WINDOW TYPE - W1

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
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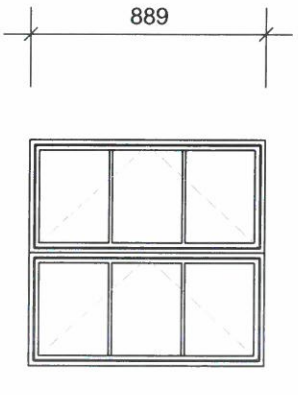
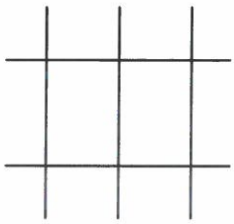


external elevation

4.7 x 19 flat bar burglar bars
welded externally at 275 centres
vertically & 425 centres horizontally



burglar bars

WINDOW No.	w2
No. REQUIRED	See plan
MATERIAL	Standard School Type steel sashes constructed of rolled steel sections, in accordance with SANS 727:2003, supplied hot-dipped galvanised.
FINISH	No paint finish. Windows and glazing to be cleaned down upon completion.
IRONMONGERY	Steel pull, eye and spring catch with brass bolt. Steel hinges with brass pins and washers. Steel concealed side arms.
GLAZING	Glazing throughout to be 6.38mm thick normal strength PVB laminated clear safety glass secured into galvanised window with a compatible UV resistant sealant.
BURGLAR BARS	Standard factory fitted, 4,7mm x 19mm galvanised mild steel burglar bars welded at intersections and to window frame over both opening and fixed sections of window.

REVISIONS			
Rev.	Date	Description	By
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PROVINCE OF KWAZULU-NATAL

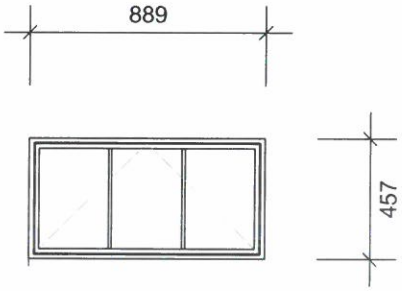
PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
WINDOW SCHEDULE
WINDOW TYPE - W2

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
1:25	2016.05.17	MK	1604	401-02	.



external elevation

4.7 x 19 flat bar burglar bars
welded externally at 228 centres
vertically

burglar bars

WINDOW No.	w3
No. REQUIRED	See plan
MATERIAL	Standard School Type steel sashes constructed of rolled steel sections, in accordance with SANS 727:2003, supplied hot-dipped galvanised.
FINISH	No paint finish. Windows and glazing to be cleaned down upon completion.
IRONMONGERY	Steel pull, eye and spring catch with brass bolt. Steel hinges with brass pins and washers. Steel concealed side arms.
GLAZING	Glazing throughout to be 6.38mm thick normal strength PVB laminated clear safety glass secured into galvanised window with a compatable UV resistant sealant
BURGLAR BARS	Standard factory fitted, 4,7mm x 19mm galvanised mild steel burglar bars welded at intersections and to window frame over both opening and fixed sections of window.

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Rev.	Date	Description	By
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PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
WINDOW SCHEDULE
WINDOW TYPE - W3

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
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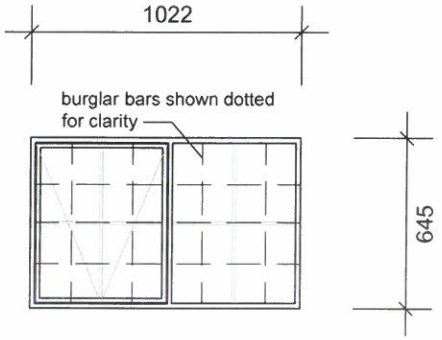
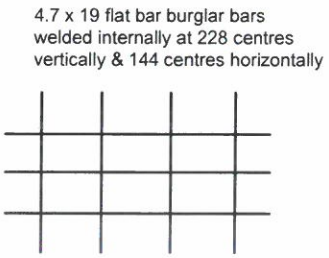


external elevation



burglar bars

WINDOW No.	w7
No. REQUIRED	See plan
MATERIAL	Standard mild steel residential sections, in accordance with SANS 727:2003, supplied hot-dipped galvanised.
FINISH	No paint finish. Windows and glazing to be cleaned down upon completion.
IRONMONGERY	Standard steel close hinges with brass pin. Top hung opening out section to have brass peg stay, steel peg and steel locking lug.
GLAZING	Glazing throughout to be 6.38mm Pacific obscure laminated glass, secured into window with compatable UV sealant.

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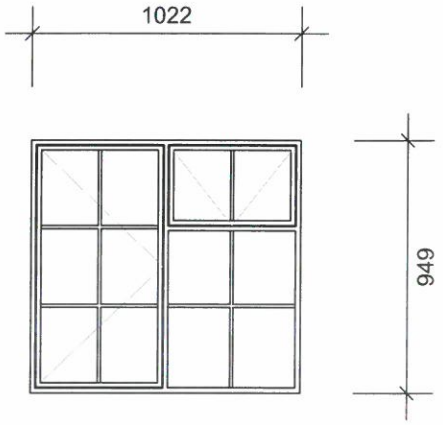
PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION
WINDOW SCHEDULE
WINDOW TYPE - W7

CONSULTANTS

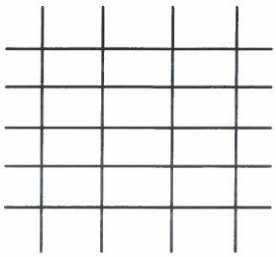
Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
1:25	2016.05.17	MK	1604	401-04	.



external elevation

4.7 x 19 flat bar burglar bars
welded internally at 228 centres
vertically & 144 centres horizontally



burglar bars

WINDOW No.	w8
No. REQUIRED	See plan
MATERIAL	Standard mild steel residential sections, in accordance with SANS 727:2003, supplied hot-dipped galvanised.
FINISH	No paint finish. Windows and glazing to be cleaned down upon completion.
IRONMONGERY	Standard steel close hinges with brass pin. Top hung opening out section to have brass peg stay, steel peg and steel locking lug. Side hung opening section to have brass handle, brass sliding stay and steel locking lug.
GLAZING	Glazing throughout to be 6,38mm thick normal strength PVB laminated clear safety glass secured into galvanised window with a compatible UV resistant sealant.

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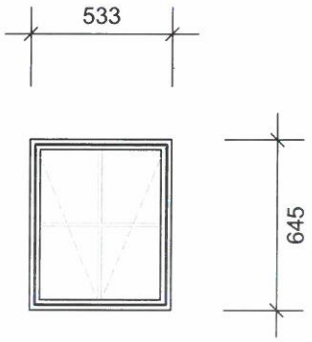
PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
WINDOW SCHEDULE
WINDOW TYPE - W8

CONSULTANTS

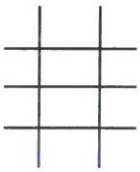
Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
1:25	2016.05.17	MK	1604	401-07	.



external elevation

4.7 x 19 flat bar burglar bars
welded internally at 228 centres
vertically & 144 centres horizontally



burglar bars

WINDOW No.	w9
No. REQUIRED	See plan
MATERIAL	Standard mild steel residential sections, in accordance with SANS 727:2003, supplied hot-dipped galvanised.
FINISH	No paint finish. Windows and glazing to be cleaned down upon completion.
IRONMONGERY	Standard steel close hinges with brass pin. Top hung opening out section to have brass peg stay, steel peg and steel locking lug.
GLAZING	Glazing throughout to be 6,38mm thick normal strength PVB laminated clear safety glass secured into galvanised window with a compatible UV resistant sealant.
EXTERNAL CILL	30° splayed face brick on edge cill to match surrounding facebrick.

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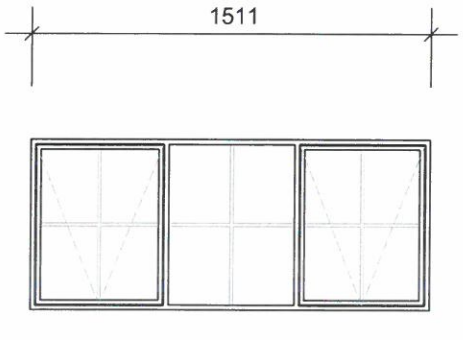
PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
WINDOW SCHEDULE
WINDOW TYPE - W9

CONSULTANTS

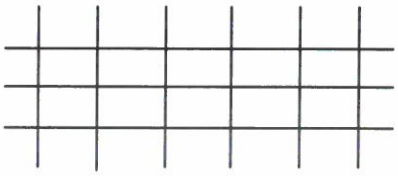
Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
1:25	2016.05.17	MK	1604	401-05	.



external elevation

4.7 x 19 flat bar burglar bars
welded internally at 228 centres
vertically & 144 centres horizontally



burglar bars

WINDOW No.	w10
No. REQUIRED	See plan
MATERIAL	Standard mild steel residential sections, in accordance with SANS 727:2003, supplied hot-dipped galvanised.
FINISH	No paint finish. Windows and glazing to be cleaned down upon completion.
IRONMONGERY	Standard steel close hinges with brass pin. Top hung opening out section to have brass peg stay, steel peg and steel locking lug.
GLAZING	Glazing throughout to be 6,38mm thick normal strength PVB laminated clear safety glass secured into galvanised window with a compatible UV resistant sealant.
BURGLAR BARS	Standard factory fitted, 4,7mm x 19mm galvanised mild steel burglar bars welded at intersections and to window frame over both opening and fixed sections of window.

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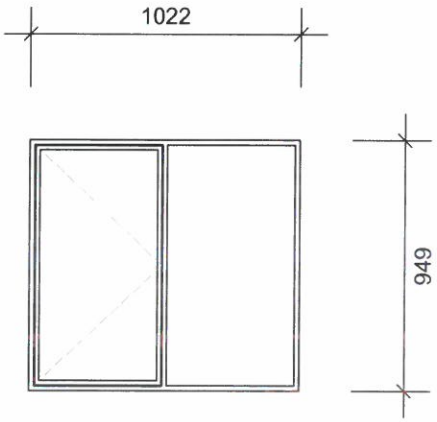
PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
WINDOW SCHEDULE
WINDOW TYPE - 10

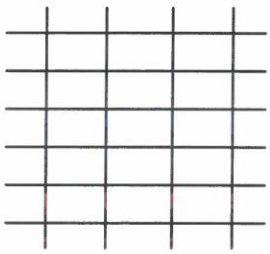
CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
1:25	2016.05.17	MK	1604	401-06	.



4.7 x 19 flat bar burglar bars
welded internally at 228 centres
vertically & 144 centres horizontally



external elevation

WINDOW No.	**w11**
No. REQUIRED	See plan
MATERIAL	Standard mild steel residential sections, in accordance with SANS 727:2003, supplied hot-dipped galvanised.
FINISH	No paint finish. Windows and glazing to be cleaned down upon completion.
IRONMONGERY	Standard steel close hinges with brass pin. Side hung opening section to have brass handle, brass sliding stay and steel locking lug.
GLAZING	Glazing throughout to be 6,38mm thick normal strength PVB laminated clear safety glass secured into galvanised window with a compatible UV resistant sealant.
BURGLAR BARS	Standard factory fitted, 4,7mm x 19mm galvanised mild steel burglar bars welded at intersections and to window frame over both opening and fixed sections of window.

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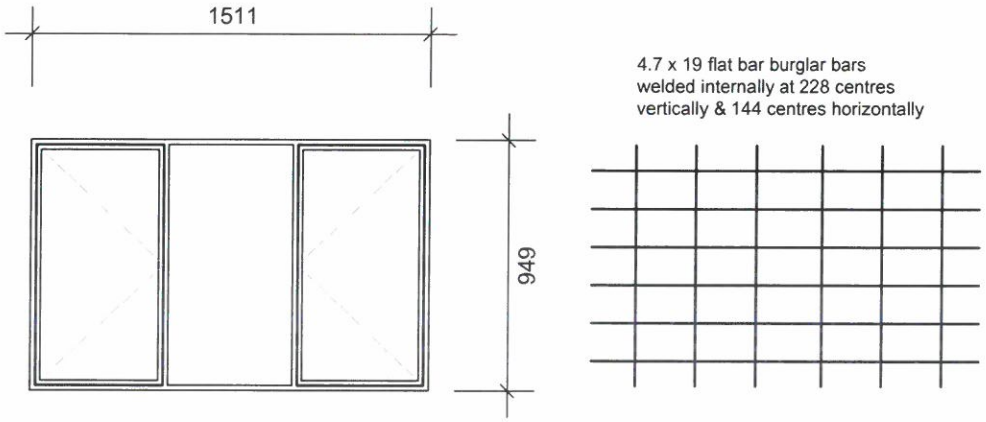
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
WINDOW SCHEDULE
WINDOW TYPE - W11

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
1:25	2016.07.07	MK	1604	401-08	.



external elevation

WINDOW No.	w12
No. REQUIRED	See plan
MATERIAL	Standard mild steel residential sections, in accordance with SANS 727:2003, supplied hot-dipped galvanised.
FINISH	No paint finish. Windows and glazing to be cleaned down upon completion.
IRONMONGERY	Standard steel close hinges with brass pin. Side hung opening sections to have brass handles, brass sliding stays and steel locking lugs.
GLAZING	Glazing throughout to be 6,38mm thick normal strength PVB laminated clear safety glass secured into galvanised window with a compatible UV resistant sealant.
BURGLAR BARS	Standard factory fitted, 4,7mm x 19mm galvanised mild steel burglar bars welded at intersections and to window frame over both opening and fixed sections of window.

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PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
WINDOW SCHEDULE
WINDOW TYPE - W12

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
1:25	2016.07.07	MK	1604	401-09	.

DEPARTMENT OF PUBLIC WORKS

DEPARTMENT OF EDUCATION

SCHOOLS STORM DAMAGED PROGRAM MAY 2015

FINISHING SCHEDULE

(TO BE READ IN CONJUNCTION WITH PAINT SPECIFICATION DWG 1602-403)

GENERAL NOTES

1. This schedule contains pages numbered consecutively. The Contractor is required to check that none of the pages are missing or duplicated. If any part of this Schedule is indistinct or contains any obvious errors, kindly contact the Architect.

2. Paintwork to be done in strict accordance to Manufacturers Specifications. Plascon Paints is used as SABS reference specification. ***(See Addendum A)***

3. The Contractor may use equal or similar SABS approved.

4. All paint reference codes refer to the Plascon Paints colour chart. Colours and tints are to be selected by the Client and/or Architect and the Contractor is to apply these to areas as directed, as samples, so that the appearance in situ can be assessed and the colour selection confirmed.

Rev no	Date	Description

ARTEK 4 ARCHITECTS KZN cc
46 LENA AHRENS ROAD
GLENWOOD, DURBAN 4001
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email admindbn@artek4.co.za

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Department:
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STORM DAMAGED SCHOOLS PROGRAMME FINISHING SCHEDULE	**1604-402**	**01**

KEY		DESCRIPTION
FLOOR	F1	300mm x 300mm x 2,5mm thick fully **flexible vinyl floor tiles** of two different selected colours in a pattern to detail, laid true and level with continuous joints in an adhesive approved by the Manufacturer, on 1:3 cement screed. Overall floor finish to be 30mm.
	F2	Lay 1:1:1 (cement :10mm stone : sand) untinted **granolithic**, 30mm thick on 1:1 cement:sand slurry applied over bedding surface. Granolithic to be laid true, even and level, in panels not exceeding 10 sqm, with full depth cut and v-joint between panels. Seal with one coat non-slip wax polish. *GRANO* to consist of 3 parts granite or other hard stone chips, Half part clean sand and 1 part cement. Trowel smoothe. DO NOT apply cement powder or slurry over surface. Grano to be laid before concrete matures to allow for proper binding. On existing surface bed, chip & clean surface & apply a coat of cement grout before laying grano.
SKIRTING	S1	19mm x 69mm selected wrot Meranti skirting, slightly rounded on top leading edge and ploughed on rear face, steel nailed to walls at 600mm centres. The skirting is to have splayed header joints and mitred angles. Prepare, knot and apply one coat of Plascon Woodcare Pretreatment (WWP 1) and two coats of Interior Water Based **Woodcare** Varnish (IWV 21) (or similar).
	S2	10mm thick x 75mm high untinted granolithic skirting with 25mm radius cove at base of skirting.
WALL	W1	**Face brick** of selected colour, built up to a gauge of four courses in 340mm, with square recessed joints and perps. Bricks to be cleaned down upon completion. Externally to be built to full height. Internally to a height of 850mm above surface bed level. To wall above facebrick dado, one coat 1:5 cement plaster 15mm thick, steel trowelled to a smooth, true and even finish. Prepare and apply one coat Plaster Primer and two coats Plascon **Polvin** Super Acrylic PVA (or similar) of selected colour.
	W2	**Interior**. One coat 1:5 cement plaster 15mm thick, steel trowelled to a smooth, true and even finish. Prepare and apply one coat Plaster Primer and two coats Plascon **Polvin** Super Acrylic PVA (or similar) of selected colour.
	W3	**Wet Areas**:One coat 1:5 cement plaster 15mm thick, steel trowelled to a smooth, true and even finish. Prepare and apply one coat Plaster Primer and two coats Plascon Professional **Eggshell Enamel** (or similar) of selected colour.

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PROVINCE OF KWAZULU-NATAL

STORM DAMAGED SCHOOLS PROGRAMME FINISHING SCHEDULE	**1604-402**	**01**

	W4	**Exterior**. One coat 1:5 cement plaster 15mm thick, wood-trowelled to a smooth, even finish. Prepare and apply one coat Plaster Primer and two coats "Plascon Wall & All" (or similar) of selected colour.
CRACK TREATMENT		Up to 4mm cracks :Rake out cracks with a scraper. Remove dust fill with crack filler Placon Mendall 90 .Prime & paints as described above.

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Department:
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STORM DAMAGED SCHOOLS PROGRAMME FINISHING SCHEDULE	**1604-402**	**01**

KEY		DESCRIPTION
CILL	CL1	One coat 1:5 cement plaster 15mm thick, steel trowelled to a smooth, even and level finish, with a neatly arrised edge, prepared and painted with paint and colour as for adjacent wall.
CORNICE	CC1	RhinoArt Standard 75mm cove cornice (or similar), nailed to the wall only with galvanised nails @ 300mm ccs. Prepare and apply one coat Plaster Primer and two coats Plascon **Polvin** Super Acrylic PVA (or similar), colour white.
	CC2	Form a true and level 10mm radius arris round at junction of plaster to rc slab and wall.
CEILING	C1	9,5mm Gypsum ceiling sheets fixed level - screwed with 25mm streaker screws @ 150mm centres on 38mm x 38mm rough sawn SA Pine brandering at 500mm centres in one direction only. 12 x 44 SA Pine cover strips. Fill screw heads, prepare and apply one coat Plaster Primer and two coats Plascon **Polvin** Super Acrylic PVA, colour white.
	C2	6mm Fibre cement ceiling sheets fixed level - screwed with 25mm streaker screws @ 150mm centres on 38mm x 38mm rough sawn treated SA Pine brandering at 550mm ccs, nailed to the underside of roof trusses. 12 x 44 SA Pine cover strips. Fill screw heads, prepare and apply one coat Timesaver Primer and two coats Plascon **Polvin** Super Acrylic PVA, colour white.
	C3	One coat 1:5 cement plaster 10mm thick, steel trowelled to a smooth, even finish to soffit of the rc slab. Prepare and apply one coat Plaster Primer and two coats Plascon **Polvin** Super Acrylic PVA (or similar), colour white.
EXISTING STEEL WINDOWS		Degrease. Wash to remove all degreaser. Dry, Apply one coat Plascon Zinc Phosphate primer And allow to dry for 16 hours. Apply 2 coats Plascon **Valvaglo** Satin, allowing 4 hours drying time between coats.
NEW STEEL WINDOWS		Leave as natural Galvanised Steel Finish
TIMBER DOORS		Sand with 140 grid paper & round of sharp edges. Fill holes with Plascon Polyfilla Mendall 90 & smooth off Seal with Plascon Woodcare Knot seal. Apply one coat woodprimer & two coats **Valvaglo** Satin, allowing 4 hours drying time between coats.
TRUSSES		Sand surface & apply undiluted **Carbolinium** Wood preserver until saturated.

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STORM DAMAGED SCHOOLS PROGRAMME FINISHING SCHEDULE	**1604-402**	**01**

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STORM DAMAGED SCHOOLS PROGRAMME FINISHING SCHEDULE	**1604-402**	**01**

SCHOOLS PROGRAM
PAINT SPECIFICATION
DRAWING NO. 1604-403

artek 4! ARCHITECTS

SPECIFICATION 1

SUBSTRATE: **EXTERIOR**
Concrete. Cement Plaster
Plastered Walls

PAINT FINISH: Plascon Wall & All
Smooth Finish, Water Based, Premium Pure Acrylic Sheen

SURFACE PREPARATION:

- Ensure that surfaces are dry, sound and clean.
- Concrete must cure for minimum 28 days and cement plaster 14 days before painting.
- Remove any hollow and soft/under bound plaster and replaster.
- Remove dirt and loose particles.
- Remove any oil, grease and other contaminants with Plascon Metalcare Aquasolv Degreaser (GR 1) working it well into affected areas with bristle broom or brush. Leave for 20 minutes to react, then rinse thoroughly with fresh water to remove all traces of Plascon Metalcare Aquasolv Degreaser (GR 1), using high pressure water jet or scrubbing with brush or broom. Allow to dry completely.
- Remove fungi and algae by scrubbing with a solution of household bleach (3, 5% sodium hypochlorite) - 1 part bleach to 2 parts water by volume. Leave for 1 hour, then brush off with a bristle brush. Rinse thoroughly with tap water to remove all traces of bleach and allow to dry.
- Fill cracks and other surface defects with the appropriate Polycell filler - refer Surface Preparation, SP4 Crack Repair.
- Moisture content measured with a Doser Hygrometer (or equivalent) must not exceed the following limits before painting:
  - Concrete, off-shutter, pre-cast: BD 4 scale - 5%
  - Cement plaster, brickwork, fibre-cement: BD 2 scale - 8%

APPLICATION:

- Apply one coat of Professional Gypsum and Plaster Primer (PP700) to achieve a continuous film. Allow 16 hours to dry.
- Apply two full coats of Plascon Wall & All (WAA) to achieve complete obliteration, allowing 2 hours drying between coats

Artek 4 Architects (KZN) cc
Durban Office | 46 Lena Ahrens Road (Manning Road), Glenwood, Durban, 4001 | Tel: 031 201 0445 | Fax: 031 201 6609 | Email: admindbn@artek4.co.za
Port Shepstone Office | 19 Tradewinds, Marine Drive, Shelly Beach | Tel: 039 682 2447 | Fax: 039 682 2446 | Email: adminps@artek4.co.za
Postal: PO Box 52561, Moore Road, 4083

SPECIFICATION 2

SUBSTRATE: **Fibre Cement**
Fascia Boards
Barge Boards

PAINT FINISH: Plascon Wall & All
Smooth Finish, Water Based, Premium Pure Acrylic Sheen

SURFACE PREPARATION:

- Ensure that surfaces are dry, sound and clean.
- Concrete must cure for minimum 28 days and cement plaster 14 days before painting.
- Remove any hollow and soft/under bound plaster and replaster.
- Remove dirt and loose particles.
- Remove any oil, grease and other contaminants with Plascon Metalcare Aquasolv Degreaser (GR 1) working it well into affected areas with bristle broom or brush. Leave for 20 minutes to react, then rinse thoroughly with fresh water to remove all traces of Plascon Metalcare Aquasolv Degreaser (GR 1), using high pressure water jet or scrubbing with brush or broom. Allow to dry completely.
- Remove fungi and algae by scrubbing with a solution of household bleach (3, 5% sodium hypochlorite) - 1-part bleach to 2 parts water by volume. Leave for 1 hour, then brush off with a bristle brush. Rinse thoroughly with tap water to remove all traces of bleach and allow to dry.
- Fill cracks and other surface defects with the appropriate Polycell filler - refer Surface Preparation, SP4 Crack Repair.
- Moisture content measured with a Doser Hygrometer (or equivalent) must not exceed the following limits before painting:
  - Concrete, off-shutter, pre-cast: BD 4 scale - 5%
  - Cement plaster, brickwork, fibre-cement: BD 2 scale - 8%

APPLICATION:

- Apply one coat of Professional Gypsum and Plaster Primer (PP700) to achieve a continuous film. Allow 16 hours to dry.
- Apply two full coats of Plascon Wall & All (WAA) to achieve complete obliteration, allowing 2 hours drying between coats

SPECIFICATION 3

SUBSTRATE: Wood
Doors

PAINT FINISH: Plascon Water based Velvaglo
Smooth Finish, Water Based, Premium Non-Drip Satin Enamel

SURFACE PREPARATION:

- Ensure that surfaces are dry, sound and clean.
- Moisture content measured with a Doser Hygrometer BD2 scale A1-A5 (or equivalent), depending on the wood type, must be <14% before painting.
- Sand wood to a smooth finish with 150 grit paper in the direction of the grain. Sharp edges must be rounded off. Dust off.
- Fill holes and other surface defects with Plascon Polyfilla Mendall 90 (80 16 01) working off smoothly while wet. Allow 8 hours to dry, then sand to a smooth finish. Dust off.
- Wash knots and resinous areas with Plascon Lacquer Thinner (ILS 1). Apply Plascon Woodcare Knot Seal (PK 2) to all knots and resinous areas. Allow 1 hour to dry.

APPLICATION:

- Apply one coat of Plascon Wood Primer (PP800) to achieve a continuous film. Allow 16 hours to dry.
- Apply two full coats of Plascon Water based Velvaglo Satin (VLW) to achieve complete obliteration, allowing 4 hours drying between coats.

SPECIFICATION 4

SUBSTRATE: Mild Steel
Window Frames

PAINT FINISH: Plascon Water based Velvaglo
Smooth Finish, Water Based, Premium Non-Drip Satin Enamel

SURFACE PREPARATION:

- **Rust Free**
  Surfaces must be clean, dry and rust free. Remove surface contaminants using Plascon Metalcare Aquasolv Degreaser (GR1), scrubbing with bristle brush or broom, or using Scotch Brite pads. Rinse thoroughly with tap water while brushing or hydroblast to remove all traces of Plascon Metalcare Aquasolv Degreaser (GR1) to achieve a water break-free surface. Dry surface rapidly to prevent flash rust formation. Cleaned surface must be painted within 4 hours.
- **Rusted**
  After degreasing sand off rust with coarse emery paper or wire brush to ISO 8501 - 01: 1988 – St 3 to attain a bright metal finish. Remove dust.
- **Millscale & Rust**
  Alternatively, remove millscale and rust by abrasive blast cleaning to ISO 8501 - 01: 1988 – Sa 2½. Remove dust by vacuum cleaning. Prime within 4 hours.

APPLICATION:

- Apply one coat of Plascon Plascoprime 170 Zinc Phosphate Primer (UC170) to achieve a continuous film. Allow 16 hours to dry.
- Apply two full coats of Plascon Water based Velvaglo Satin (VLW) to achieve complete obliteration, allowing 4 hours drying between coats.

SPECIFICATION 5

SUBSTRATE: **INTERIOR**
Cement Plaster, Concrete
Walls

PAINT FINISH: Plascon Polvin Super Acrylic
Smooth Finish, Water Based, ,Superior Matt Acrylic, Durable

SURFACE PREPARATION:

- Ensure that surfaces are dry, sound and clean.
- Concrete must cure for minimum 28 days and cement plaster 14 days before painting.
- Remove any hollow and soft/under bound plaster and replaster.
- Remove dirt and loose particles.
- Remove any oil, grease and other contaminants with Plascon Metalcare Aquasolv Degreaser (GR 1) working it well into affected areas with bristle broom or brush. Leave for 20 minutes to react, then rinse thoroughly with fresh water to remove all traces of Plascon Metalcare Aquasolv Degreaser (GR 1), using high pressure water jet or scrubbing with brush or broom. Allow to dry completely.
- Remove fungi and algae by scrubbing with a solution of household bleach (3, 5% sodium hypochlorite) - 1-part bleach to 2 parts water by volume. Leave for 1 hour, then brush off with a bristle brush. Rinse thoroughly with tap water to remove all traces of bleach and allow to dry.
- Fill cracks and other surface defects with the appropriate Polycell filler - refer Surface Preparation, SP4 Crack Repair.
- Moisture content measured with a Doser Hygrometer (or equivalent) must not exceed the following limits before painting:
  - Concrete, off-shutter, pre-cast: BD 4 scale - 5%
  - Cement plaster, brickwork, fibre-cement: BD 2 scale - 8%

APPLICATION:

- Apply one coat of Professional Gypsum and Plaster Primer (PP700) to achieve a continuous film. Allow 16 hours to dry.
- Apply two full coats of Plascon Polvin Super Acrylic (EPL/TAP) to achieve complete obliteration, allowing 1 hours drying between coats.

CRACK TREATMENT

_____ HAIRLINE CRACK REPAIRS (<0,3mm) – using PWC 520:

Cracks exhibiting algae should be scrubbed with hypochlorite solution. Rinse well with clean water and allow drying. Before filling the crack, apply one coat of Professional Gypsum & Plaster Primer (PP700) and allow 16 hours drying at 23°C before over coating. Brush Professional Waterproofing and Crack Bridging Compound (PWC520) or Plascon Multi-seal (WSS2) thinned 5-10% with water over the entire hair-line cracked area.

A second coat may be required after a drying time of two hours in order to fill and bridge these cracks.

PLASTER CRACKS (<4mm) – using Mendall 90

Rake out cracks using an angle grinder to a minimum of 3mm wide and deep. Remove dust and prime repair areas with Professional Gypsum & Plaster Primer (PP700). Allow 16 hours to dry. Fill with Polycell Polyfilla Mendall 90 (801601) and smooth off to match existing plaster. After 8 hours prime repaired areas with Professional Gypsum & Plaster Primer (PP700). After 16 hours make the repaired areas invisible by rolling a coat of Professional Waterproofing and Crack Bridging Compound (PWC 520), applied at a wet film thickness of 650µm, whilst wet draw a water wet brush over the surface to smooth off and feather the edges.

LARGE PLASTER CRACKS (>4mm) – using Masonry Patching Plaster:

Open large plaster cracks using an angle grinder in an inverted V-shape to >5mm wide and deep. Remove dust and debris.

Fill with Polycell Polyfilla Masonry Patching Plaster (102003), imitating the existing plaster finish as closely as possible. Allow to dry for 24 hours.

Patch prime with Professional Gypsum & Plaster Primer (PP700) and allow 16 hours to dry.

Bridge repaired areas with two coats of Professional Waterproofing and Crack Bridging Compound (PWC520) applied at a WFT thickness of 650µm per coat. Whilst wet draw a water wet brush over the surface to smooth off and feather the edges.

SPECIFICATION

SUBSTRATE: **STRUCTURAL STEEL**
Painting and Treatment of steel

PAINT FINISH:

Only paint supplied by the following suppliers is acceptable: -

1. Ameron
2. International
3. Jotun Paints
4. Sigma Coatings
5. StonCor Africa

(a) Primers

The primer shall be a two-component polyamide cured epoxy primer.

(b) Undercoats

The undercoat shall be a two-component micaceous iron oxide polyamide cured epoxy coating.

(c) Finishing coats

The finishing coat shall be a two-component aliphatic polyurethane.

SURFACE PREPARATION:

- The surface preparation of existing steel structures shall be carried out on site in accordance with SANS 1200 HC Corrosion Protection of Structural Steel

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APPLICATION:

- "Manufacturer's test certificates are to be supplied with each batch of paint delivered to the site in accordance with Appendix B of SANS 1200 HC."

- "The Contractor in conjunction with the paint supplier(s) shall provide a suitable 'Product Performance Guarantee' underwritten by an insurance company for a period of 3 (three) years from the completion of the works."

- "Scaffolding or staging will be required to access all areas of the structure requiring treatment. All areas being abrasive-blasted and/or painted must be totally enclosed to prevent dust, debris or paint spray contaminating the surrounding areas. At least 90% of the by-products of the abrasive-blasting operation must be collected by brushing and vacuuming and disposed of at a suitable hazardous material dumping site. Particular care is to be taken that no debris affects the public.

(c) Primer

"The prepared surface will be given one coat of two-component polyamide cured epoxy primer in accordance with the manufacturer's instructions. The dry-film thickness shall not be less than 75 microns"

(d) Undercoat

"The primed surface will be given one coat of two-component micaceous iron oxide polyamide cured epoxy coating in accordance with the manufacturer's instructions. A stripe coat will also be applied first where necessary in accordance with (g) below. The dry-film thickness shall not be less than 125 microns"

(e) Finishing coat

"Over the intermediate coat the surface will be given one coat of two-component micaceous iron oxide polyamide cured epoxy coating in accordance with the manufacturer's instructions. The dry-film thickness shall not be less than 40 microns. The dry thickness of the total paint system shall not be less than 240 microns"

(g) Back-to-back members and areas not easily accessible

"All gaps between back-to-back members are to be abrasive-blasted and primed. A backing cord is then to be caulked into the gap, leaving 10mm to be filled with a general purpose epoxy paste prior to the intermediate coat.

It may be necessary to seal other crevices along the sidewalks and elsewhere.

Other crevices rivet and bolt heads, edges of angles, channels and plates are to receive a stripe coat of the intermediate coat prior to the intermediate coat"

(h) Quality Assurance and control

Quality assurance/control systems to carry out the works are to be set up to the satisfaction of the Engineer.

MEASUREMENT AND PAYMENT

ITEM		UNIT
	Painting:	
	(a) Repairs to structure at Engineer's discretion	Prov Sum
	(b) Water jetting of structure to remove all loose debris, prior to abrasive blasting	m^2
	(c) Abrasive blasting with "Blasrite", prime coat, intermediate coat and finishing coat to all steel members	m^2
	(d) Handling costs and profit in respect of subitem B84.01(a) above	%

Add the following payment items:

ITEM		UNIT
	Disposal of contaminated blast grit:	
	(a) Collect 90% of contaminated blast grit and place in tuff bags	t
	(b) Transport of contaminated blast grit to hazardous waste site at nearest city centre	t.km
	(c) Treating of hazardous waste by an approved industrial waste management company	t

ITEM		UNIT
	Testing carried out by the Engineer:	
	(a) Costs of inspection visits carried out from time to time by a Corrosion Engineer	Prov Sum
	(b) Handling costs and profit in respect of subitem above	%

ITEM		UNIT
	Performance Guarantee:	
	(a) Costs of providing a 3-year performance guarantee	Lump Sum

DEPARTMENT OF PUBLIC WORKS

DEPARTMENT OF EDUCATION

SCHOOLS STORM DAMAGED PROGRAM
MAY 2015

SCHEDULE OF SANITARY WARE

GENERAL NOTES

1. This schedule contains pages numbered consecutively. The Contractor is required to check that none of the pages are missing or duplicated. If any part of this Schedule is indistinct or contains any obvious errors, kindly contact the Architect.

Rev no	Date	Description

ARTEK 4 ARCHITECTS KZN cc
46 LENA AHRENS ROAD
GLENWOOD, DURBAN 4001
PHONE 031 201 0445 FAX 031 201 6589
email admindbn@artek4.co.za

public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

STORM DAMAGED SCHOOLS PROGRAMME SANWARE SCHEDULE	**1604-404**	**0**

KEY		DESCRIPTION
SANITARY FITTINGS	A	Atlas VIP 200 plastic pit toilet pedestal, with granite finish, complete with lid.
	B	Vaal Sanitaryware vitreous china "Hibuscus Elite Vandalproof" low level cistern (code 7116LV) complete with front push button, lid, fitments and low level flush pipe
	C	Franke Grade 304 18/10 stainless steel WB001 wall mounted single wash hand basin, size 520 x 432mm wide with a one piece pressed bowl, 32 x 10mm high apron, standard 40mm waste outlet, fixed to wall with one pair of galvanised mild steel Eagle brackets bolted with 6mm stainless steel anchor bolts. . No. 1 GES Aero Stefani pillartap Code 193012.
	D	Vaal Sanitaryware vitreous china 510 x 405mm rounded "Hibiscus" basin with three semi-punched tapholes (i.e. available in zero, one, two or three taphole configurations), integrated overflow, and chainstay hole through the centre semi-punched taphole. Available in standard colour range.
	E	Franke Model TE (Top Entry Inlet) Barron Bowl Urinal, size 3.16mm x 425mm x 241mm. Unit to be manufactured from Grade 304 (18/10) 1.2mm gauge stainless steel, complete with 40mm dia waste outlet with a pressed perforated stainless steel grid and chrome plated button spreader with a 15mm coupling to connect to water supply. Bowl to be fitted to a 2mm thick mounting plate with two key hole slots for mounting the unit to the wall.
	F	Atlas 469AP waterless urinal fitting and waste. 507AP bowl urinal complete with brackets.
	G	Franke Kitchen Systems (Pty) Ltd grade 304 (18/10) stainless steel Citiline DT100E inset sink and drainer size 1000mm x 457mm with single end bowl, complete with 50mm PVC waste and plug with handle (302021) and Spazio 1 Plumbing Kit (301152). Sink is to be supplied without tapholes. No. 1 GES Aero Stefani pillartap Code 193012. Sink is to be supplied and fitted into counter top by Joinery Contractor.

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public works
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

STORM DAMAGED SCHOOLS PROGRAMME SANWARE SCHEDULE	**1604-404**	**0**

KEY		DESCRIPTION
	H	Franke Grade 304 18/10 stainless steel Luxtub LDL washtrough, size 600 x 500mm x 257mm deep with one pressed 43 litre bowl, PVC waste and plug with handle, fitted on pair of Franke Falcon pressed galvanised mild steel brackets (product code: 300322) fixed to the wall with 6mm stainless steel anchor bolts. No. 1 GES Aero 15mm Slant tap complete with hose union Code 193001.
	I	No. 3 Franke Grade 304 18/10 stainless steel Luxtub LDL washtroughs, size 600mm x 500mm x 257mm deep with one pressed 43 litre bowl, galvanised mild steel brackets (product code: 300322). No.3 GES Aero 15mm Slant taps complete with hose unions Code 193001. Washtroughs PVC waste and plug with handle, fitted on pair of Franke Falcon pressed to be fixed to the wall in Plate Wash Area outside the Kitchen, with 6mm stainless steel anchor bolts.
	J	Franke Cascade CDX 621-120 Stainless Steel product code 101 0039 824 1200mmX500mm sink with two bowls complete with 50mm PVC waste and plug with handle (302021) and Spazio 1 Plumbing Kit (301152). Sink is to be supplied without tapholes. No. 1 GES Aero Stefani pillartap Code 193012. Sink is to be supplied and fitted into counter top by Joinery Contractor.

SUNDRIES	W	19mm diameter x 600mm long CP towel rail, complete with end brackets, plugged and screwed to wall.
	X	450mm wide x 600mm high x 6mm thick GG quality float glass silver backed vertical mirror with polished and bevelled edges, four times drilled for and including CP dome-capped screws, plugged and screwed to wall above wash hand basin.
	Y	Bildware Code B3710 theft proof CP toilet roll holder.
	Z	32mm outside diameter approved stainless steel side grab rail and back grab rail for paraplegic toilet.

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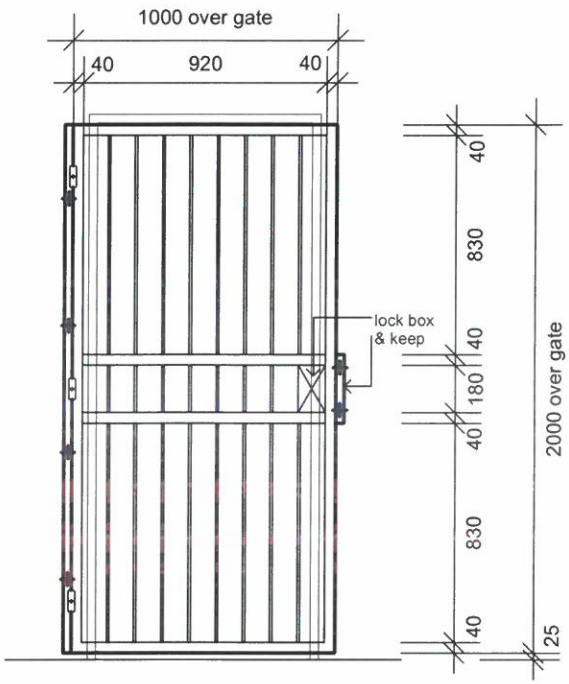
Department:
Public Works
PROVINCE OF KWAZULU-NATAL

STORM DAMAGED SCHOOLS PROGRAMME SANWARE SCHEDULE	**1604-404**	**0**



GATE No.	g1
GATE	Gate constructed from hot-dipped galvanised mild steel, consisting of 40mm x 30mm x 2,0mm thick rectangular hollow section to outer frame and horizontal rails. Infill to be no. 8 continuous 12mm dia galvanised mild steel rods passing through and welded to horizontal rails and welded to outer frame. Lock housing to be formed of no.2 100mm x 180mm x 3mm galvanised mild steel plates welded to finish flush with each face of the gate and is to have the necessary cut-outs for the lock deadbolt and Euro Profile cylinder.
FRAME	Frame stile to hinge side to be 30mm x 30mm x 2,00mm thick galvanised mild steel hollow square section 2000mm long, bolted to wall with no. 4 expansion bolts. 30mm x 30mm x 2,00mm thick galvanised mild steel hollow square section 260mm long, twice bolted to wall as lock keep. End caps to be provided to both the frame stile and the lock keep.
IRONMONGERY	1,5 pairs galvanised mild steel pintle hinges welded to gate and frame stile. Pin of top hinge to be inverted. No. 1 N302 Union Euro Profile Cylinder Gate Lock with LH5240-N302 housing and 2 x 18SC Union double cylinder. No. 1 Halstead 166SC cabin hook and eye with cabin hook screwed to 100mm x 70mm x 32mm Meranti block plugged and screwed to wall, and eye welded to leading edge of gate outer frame.
FINISH	Gate is to be cleaned down upon completion and left unpainted.

REVISIONS			
Rev.	Date	Description	By
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CLIENT

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

CLIENT DEPARTMENT

education

Department:
Education
PROVINCE OF KWAZULU-NATAL

PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
GATE SCHEDULE
GATE TYPE - G1

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
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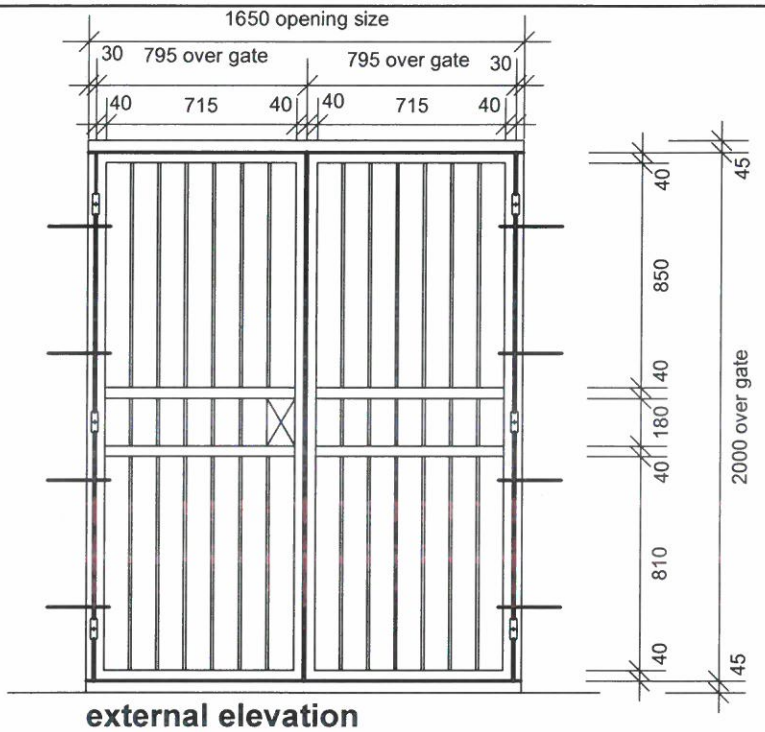

external elevation

GATE No.	g3
GATE	Gates constructed from hot-dipped galvanised mild steel, consisting of 40mm x 30mm x 2,0mm thick rectangular hollow section to outer frame and horizontal rails. Infill to be no. 6 continuous 12mm dia galvanised mild steel rods per leaf, passing through and welded to horizontal rails and welded to outer frame. Lock housing to gate to be formed of no.2 100mm x 180mm x 3mm galvanised mild steel plates welded to finish flush with each face of the gate and is to have the necessary cut-outs for the lock deadbolt and Euro Profile cylinder. Outer frame of the adjacent gate is to be cut out to form a keep, and fitted with suitable SC striking plate.
FRAME	Frame stiles to be 30mm x 30mm x 2,00mm thick galvanised mild steel hollow square section 2000mm long. Each stile to be bolted to wall with no. 4 expansion bolts. End caps to be provided to the frame stiles.
IRONMONGERY	3 pairs galvanised mild steel pintle hinges welded to gate and frame stile. Pin of top hinge to be inverted. No. 1 N302 Union Euro Profile Cylinder Gate Lock with LH5240-N302 housing and 2 x 18SC Union double cylinder. 1 pair Howick Metal Products H102 200mm HD barrel bolts with satin chrome plate finish. No. 2 Halstead 166SC cabin hooks and eyes with cabin hooks screwed to 100mm x 70mm x 32mm Meranti blocks plugged and screwed to wall, and eyes welded to external face of gate outer frame.
FINISH	Gate is to be cleaned down upon completion and left unpainted..

REVISIONS

Rev.	Date	Description	By
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Department:
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PROVINCE OF KWAZULU-NATAL

PROJECT
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION
GATE SCHEDULE
GATE TYPE - G3

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

Scale	Date	Drawn	Project No.	Drawing No.	Rev.
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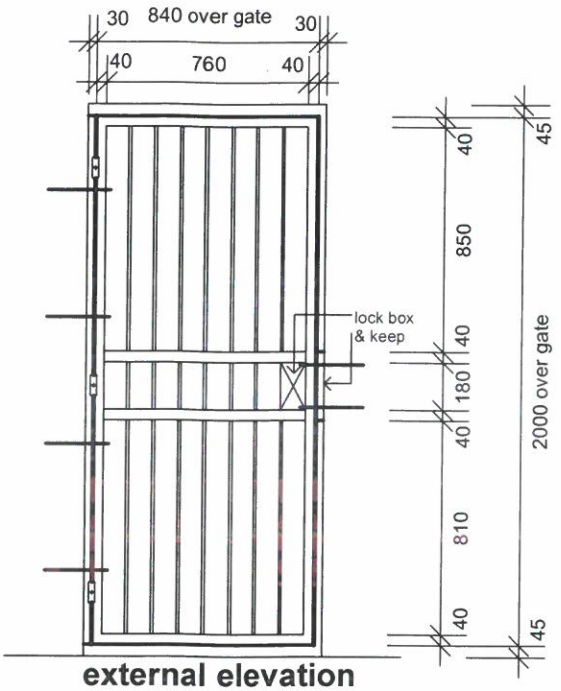

external elevation

GATE No.	g5
GATE	Gate constructed from hot-dipped galvanised mild steel, consisting of 40mm x 30mm x 2,0mm thick rectangular hollow section to outer frame and horizontal rails. Infill to be no. 7 continuous 12mm dia galvanised mild steel rods passing through and welded to horizontal rails and welded to outer frame. Lock housing to be formed of no.2 100mm x 180mm x 3mm galvanised mild steel plates welded to finish flush with each face of the gate and is to have the necessary cut-outs for the lock deadbolt and Euro Profile cylinder. Adjacent frame stile is to be cut out to form a keep, and fitted with suitable SC striking plate.
FRAME	Frame stile to hinge side to be 30mm x 30mm x 2,00mm thick galvanised mild steel hollow square section 2000mm long, bolted to wall with no. 4 expansion bolts. 30mm x 30mm x 2,00mm thick galvanised mild steel hollow square section 260mm long, twice bolted to wall as lock keep. End caps to be provided to both the frame stile and the lock keep.
IRONMONGERY	1,5 pairs galvanised mild steel pintle hinges welded to gate and frame stile. Pin of top hinge to be inverted. No. 1 N302 Union Euro Profile Cylinder Gate Lock with LH5240-N302 housing and 2 x 18SC Union double cylinder. No. 1 Halstead 166SC cabin hook and eye with cabin hook screwed to 100mm x 70mm x 32mm Meranti block plugged and screwed to wall, and eye welded to leading edge of gate outer frame.
FINISH	Gate is to be cleaned down upon completion and left unpainted.

REVISIONS

Rev.	Date	Description	By
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PROVINCE OF KWAZULU-NATAL

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education

Department:
Education
PROVINCE OF KWAZULU-NATAL

PROJECT

STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION

GATE SCHEDULE
GATE TYPE - G5

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD
Architect	: ARTEK 4 ARCHITECTS
Quantity Surveyors	: HENCON & ASSOCIATES
Electrical Engineers	: DBA CONSULTING ENGINEERS
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

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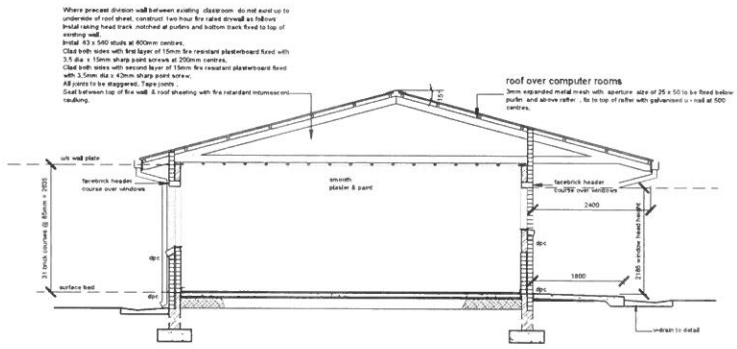

TYPICAL SECTION
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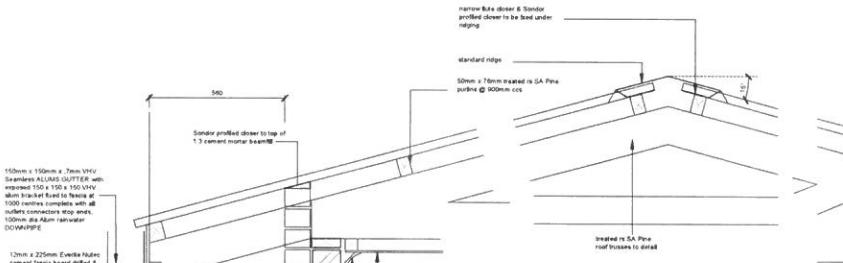
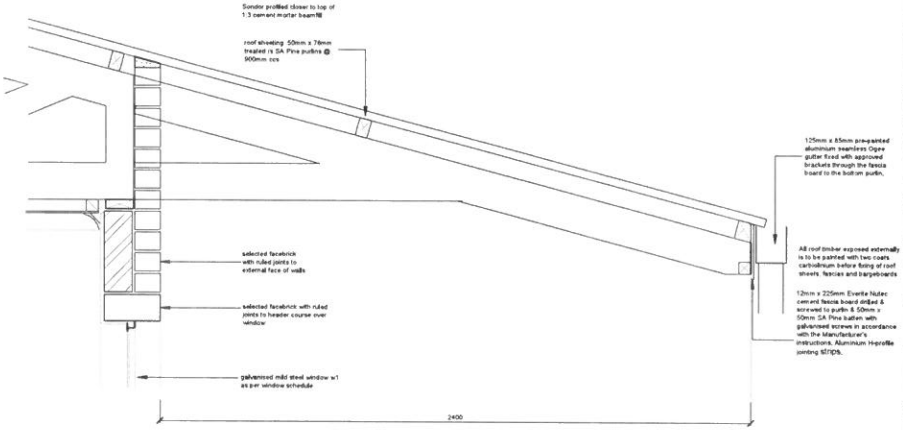


DETAIL 2
scale 1:10



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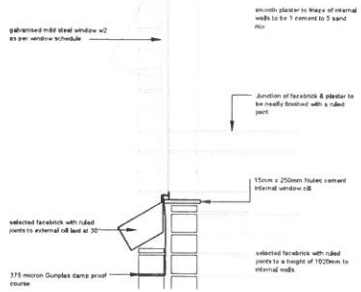
scale 1:10



DETAIL 1
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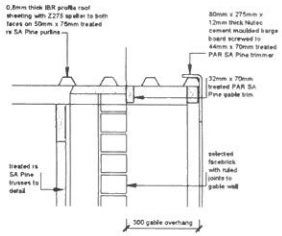

BARGE BOARD DETAIL
scale 1:10

SPECIFICATION NOTES

GENERAL
This drawing and the specification notes are to be read in conjunction with the Standard Preambles to Trades.

FOUNDATIONS
All concrete strip footings are to be as per Engineer's details.

FLOOR
Plascon water based floor paint on 30mm unbrited granolithic on concrete surface bed, on 300 micron Gunplas USB Green damp proof membrane laid on 50mm thick bed of river sand, on filling watered and compacted, all in accordance with the Engineer's details. The soil under the area of the building is to be poisoned in accordance with SABS 1155 and a certificate of poisoning is to be provided.

CONCRETE APRONS
Concrete aprons laid to a fall of 1:200 in panels with movement joints at 4000mm centres, on filling compacted to MOD AASHTO 95%.
Movement joints are to be 10mm wide, formed of bitumin impregnated softboard and sealed with 10mm polysulphide sealant complete with backing cord.

ROOF
Pitch 15°
Global Roofings 0.55mm thick IBR 686 Zincalum AZ150 G550 colourplus with a standard colour and a cool grey backing coat to the other face, on 50mm x 76mm treated rs SA Pine PURLINS @ max. 900mm ccs on super insalation heavy industrial grade 420 insulation roof trusses at 1100 c/c to be designed and certified by the Manufacturer. All exposed roof timbers are to be painted with two coats of abe Provonite or equal approved.

ROOF FIXING
galvanised steel wire or 30mm x 1.6m x 1.6mm thick hoop iron strap wrapped around 6mm reinforcing bar cast at least 1000mm into wall/u-beam and fixed to truss.

RAINWATER GOODS
150mm x 150mm x .7mm VHV Seamless ALUMS GUTTER with exposed 150 x 150 x 150 VHV alum bracket fixed to fascia at 1000 centres complete with all outlets,connectors stop ends.
100mm x 75mm Alum rainwater DOWNPIPE

EAVES
12mm x 225mm Nutec cement FASCIA BOARD with H-profile connecting strips.
275mm x 80mm Everite nutec cement sockelless BARGE boards, joined with aluminium H-profile fascia joiner and secured to a trimmer purlin in strict accordance with the Manufacturer's instructions.

CEILING INTERNALLY
9.5mm Rhinoboard ceiling on 38mm x 50mm timber brandering at 400 centres.
12mm x 44mm PAR SA Pine coverstrips.
75mm Everite Nuceramex.
100mm thick Aerolite to be laid over the ceiling to provide a 2.7 R value.

WALLS
All facebrick to be of a quality and colour approved by the Architect.
Facebrick walls are to be built as indicated in stretcher bond to a gauge of four courses in 340mm and are to have rounded ruled joints and perps.
Plastered walls are to be built up of good hard NFP clay stock bricks and plastered one coat 1:5 cement plaster 15mm thick.
The exterior face of the internal skin of all walls is to be bagged with a 1:6 cement to sand mix and painted two coats abe Bmseal.
350micron Gunplas Brickgrip dpcs shall generally be laid in the walls at floor level, under window cills and as indicated on the details.
Galvanised Brickforce reinforcing is to be built in all round in the first course above the dpc and the first two courses above the window head. The remainder of the sub-structure and structure shall have Brickforce built into every fourth course.

WINDOWS
All windows as per window schedule - drawing no. 401

DOORS
All doors and frames as per door schedule drawing no. 400

REVISIONS			
Rev. No.	Date	Description	By
A	2016.06.27	Drawing Updated	MK
B	2016.08.17	Drawing Updated	WP

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Department:
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Electrical Engineers	: DBA CONSULTING ENGINEERS Tel. 031 536 8207
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD Tel 031 265 6007.

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION
TRUSS EAVES & BARGE DETAILS TO BRICK WALL

Scale	Date	Drawn
1:50/1:10	2016.05.26	MK
Project No.	Drawing No.	Rev.
1604	500	B

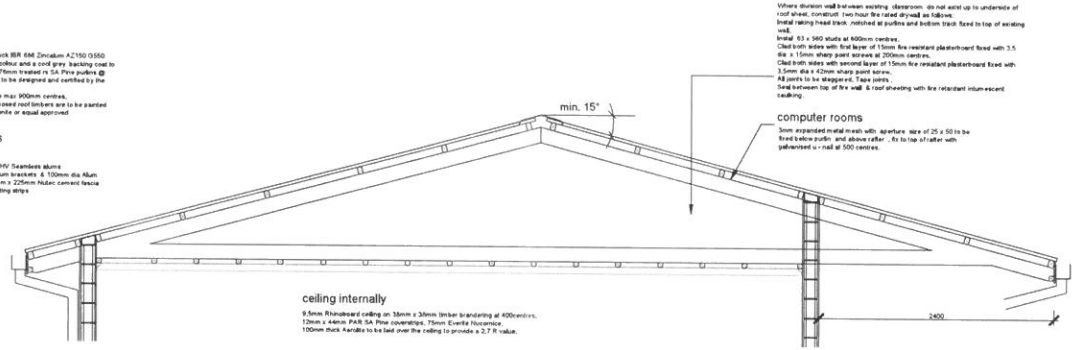
PLOT DATE : Thursday, 18 August 2016
FILE NAME : U:\ARTEK4 - PROJECTS\1604 Schools Programme\00 General\1.00 Drawings\00-500 Truss brick wall DETAILS
SHEET SIZE : A1

roof

Global Roofings 0,56mm thick IBR 686 Zincalum AZ150 G550 colourplus with a standard colour and a cool grey backing coat to the other face, on 50mm x 76mm treated rs SA Pine purlins @ 900mm ccs on roof trusses to be designed and certified by the Manufacturer.
Purlins over Verandah to be max 900mm centres.
Roof pitch to be 15°. All exposed roof timbers are to be painted with two coats of abe Provonite or equal approved.

rainwater goods & eaves

150mm x 150mm x .7mm VHV Seamless aluma gutter with exposed aluminium brackets & 100mm dia Aluminium rainwater downpipe on 12mm x 225mm Nutec cement fascia board with Hi-profile connecting strips



Where division wall between existing classroom do not exist up to underside of roof sheet, construct two hour fire rated drywall as follows;
Install ceiling head track, notched at purlins and bottom track fixed to top of existing wall.
Install 63 x 560 studs at 600mm centres.
Clad both sides with first layer of 15mm fire resistant plasterboard fixed with 3.5 dia. x 15mm sharp point screws at 200mm centres.
Clad both sides with second layer of 15mm fire resistant plasterboard fixed with 3.5mm dia x 42mm sharp point screw.
All joints to be staggered. Tape joints.
Seal between top of fire wall & roof sheeting with fire retardant intumescent caulking.

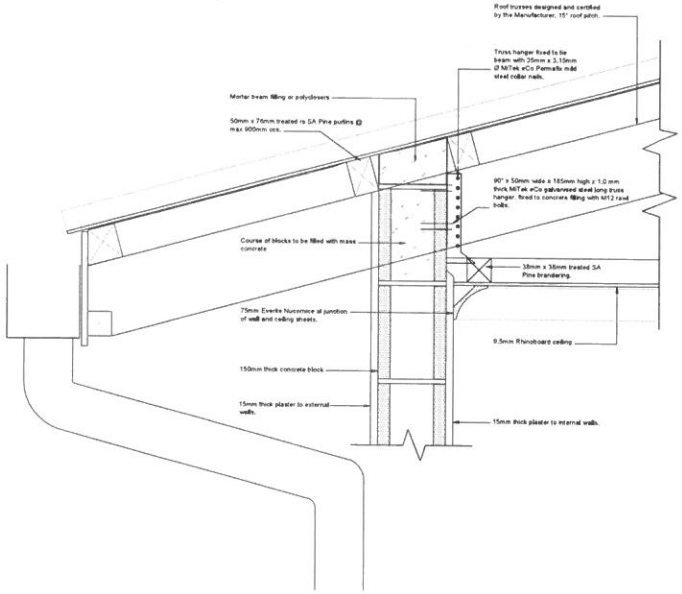
computer rooms

3mm expanded metal mesh with aperture size of 25 x 50 to be fixed below purlin and above rafter , fix to top of rafter with galvanised u - nail at 500 centres.

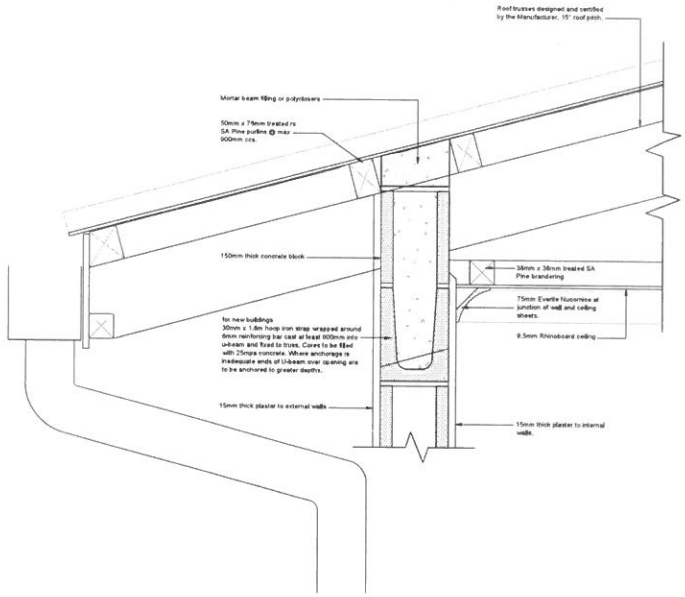
ceiling internally

9.5mm Rhinoboard ceiling on 38mm x 38mm timber brandering at 400centres.
12mm x 44mm PAR SA Pine coverstrips, 75mm Everite Nucornice.
100mm thick Aerolite to be laid over the ceiling to provide a 2.7 R value.

TYPICAL SECTION
scale 1:25



TRUSS / HANGER DETAIL
scale 1:5



TRUSS / U-BLOCK DETAIL
scale 1:5

REVISIONS

Rev. No.	Date	Description	By
A	2016.06.27	Drawing Updated	MK
B	2016.08.18	Drawing Updated	WP

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PROJECT

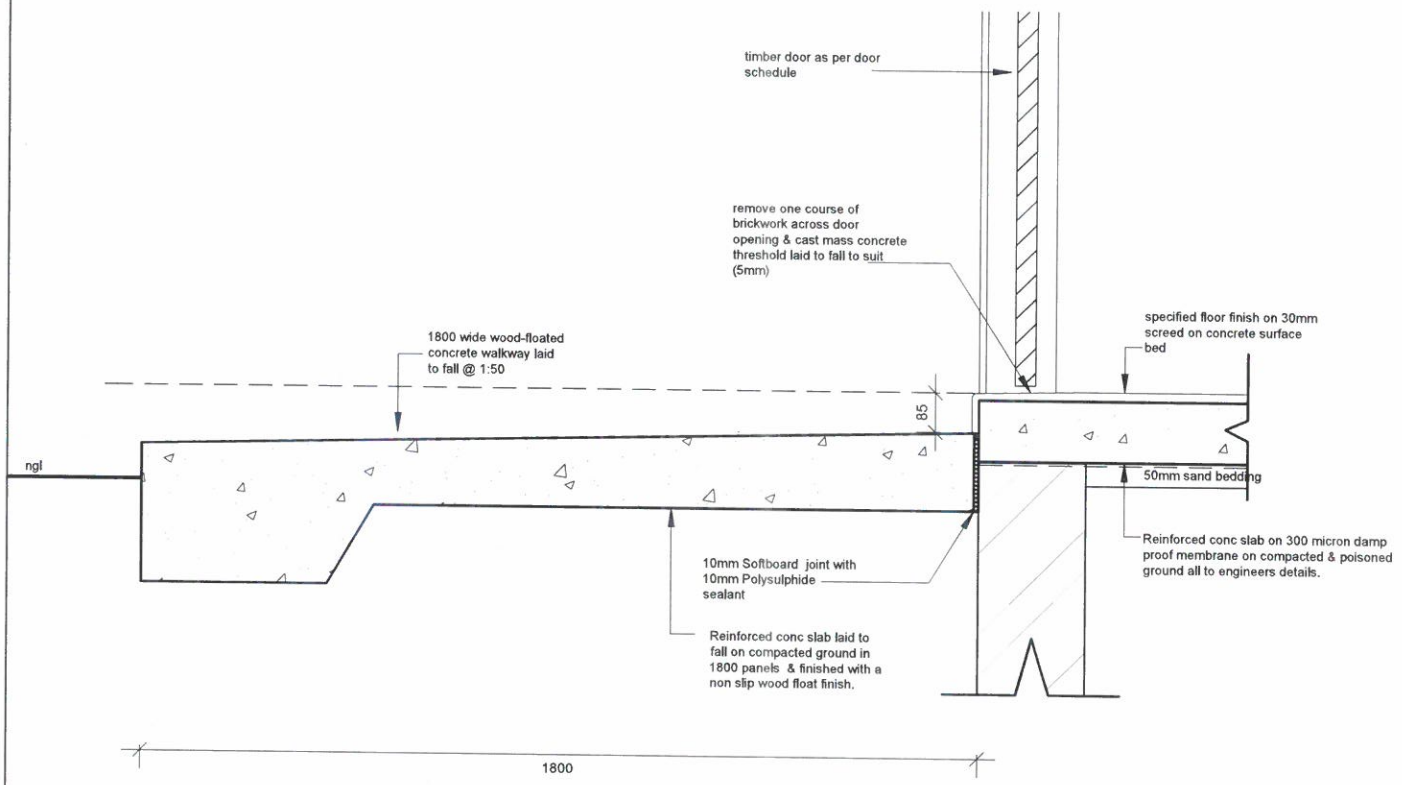
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION

TRUSS & EAVES DETAIL IN BLOCK WALL

Scale	Date	Drawn
1:25 1:5	2016.05.26	MV
Project No. 1604	Drawing No. 501	Rev. B

PLOT DATE : Thursday, 18 August 2016
FILE PATH : M:\1-ARTEK4 - PROJECTS\1-HO4 - Schools Program\00 General\1.00 Drawings\500 - 599 Detail Drawings\DWG\1604-501 Truss Block wall DETAILS
SHEET SIZE : A1



threshold detail
scale 1:10

REVISIONS			
Rev.	Date	Description	By
A	12.8.2016	Notes added.	VM

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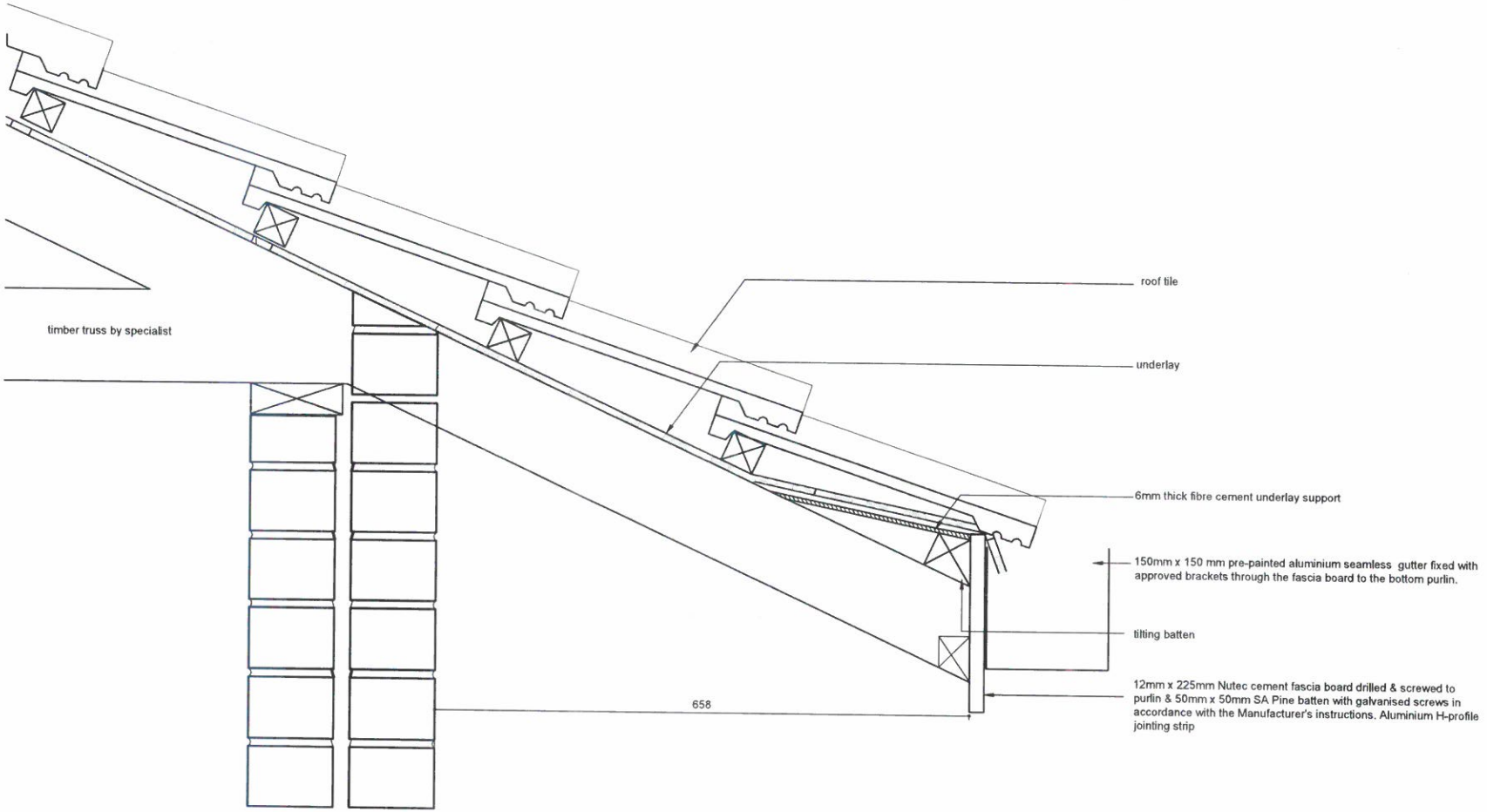

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Rev.	Date	Description	By
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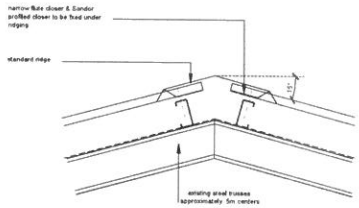
PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION
TILED ROOF EAVES DETAIL

Scale	Date	Drawn
1:5	30.05.2016	VM

Project No.	Drawing No.	Rev.
1604	503	.

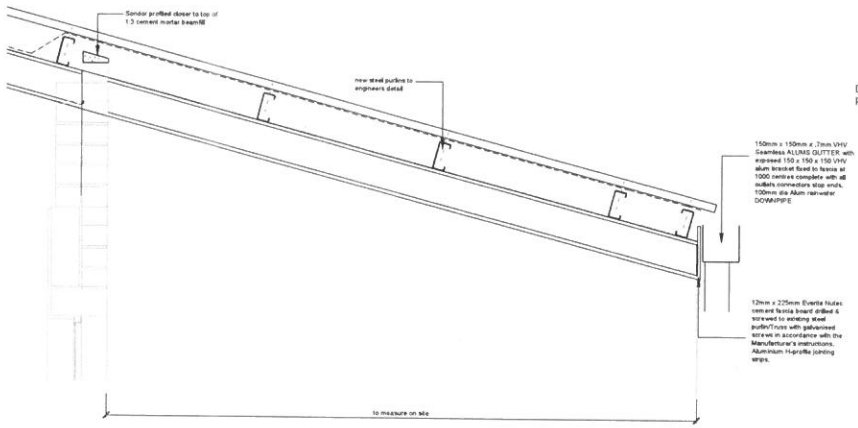


Detail 2
scale 1:10

notes

New sheeting IBR 686 fixed at every alternate flute with 65mm LG Topspeed screws and 26mm bonded washes. Side laps to be fixed with 25mm Topspeed screws and 19mm bonded washers.

Damaged Steel trusses to be repaired apon inspection and specification by engineer.



Detail 3
scale 1:10

SPECIFICATION NOTES

GENERAL

This drawing and the specification notes are to be read in conjunction with the Standard Preambles to Trades.

RAINWATER GOODS

150mm x 150mm x .7mm VHV Seamless ALUMS GUTTER with exposed 150 x 150 x 150 VHV alum bracket fixed to fascia at 1000 centres complete with all outlets,connectors stop ends, 100mm dia Alum rainwater DOWNPIPE

EAVES

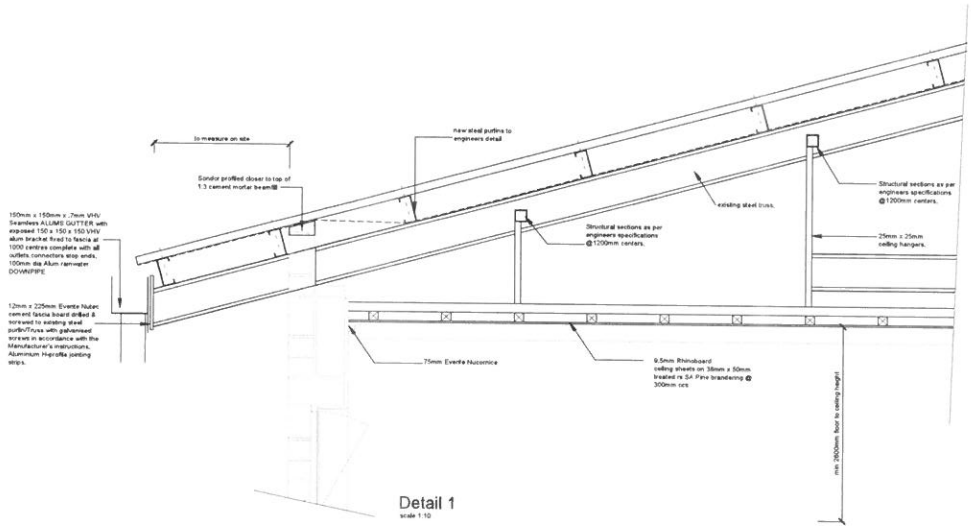
12mm x 225mm Nutec cement FASCIA BOARD with H-profile connecting strips.

275mm x 80mm Everite nutec cement sockedless BARGE boards joined with aluminium H-profile fascia joiner and secured to a trimmer purlin in strict accordance with the Manufacturer's instructions.

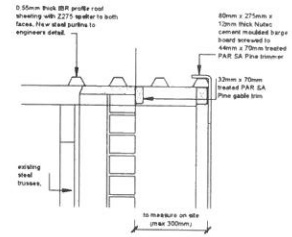
ROOF

Global Roofings 0.55mm thick IBR 686 Zincalum AZ150 G550 colourplus with a standard colour and a roof grey backing coat to the other face,
on new steel PURLINS (to engineers specification) on super sisalation heavy industrial grade 420 insulation.
Existing steel roof trusses.

DRAWING TO BE READ IN CONJUNCTION WITH PAINT SCHEDULE : 1604 - 403



Detail 1
scale 1:10



Barge board detail
scale 1:10

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Rev. No.	Date	Description	By
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Civil & Structural Engs	NAIDU CONSULTING (PTY)LTD Tel 031 265 6007.

PROJECT

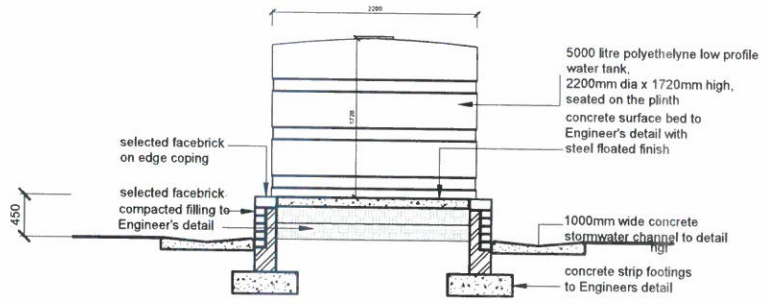
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION

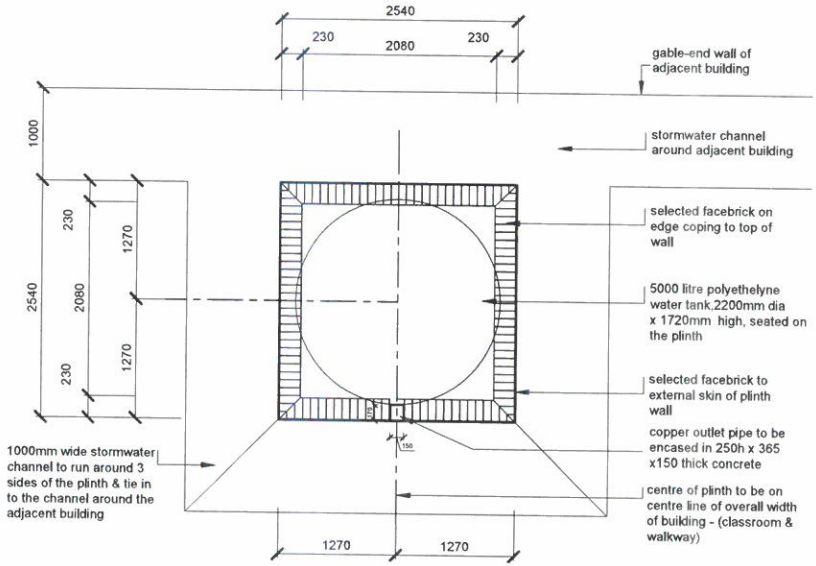
NEW ROOF SHEETING TO STEEL TRUSS & SUSPENDED CEILING

Scale	Date	Drawn
1:50 1:10	2016.08.12	KP
Project No. 1604	Drawing No. 504	Rev. -

PLOT DATE : Thursday, 18 August 2016
FILE PATH : M:\1-ARTEK4 - PROJECTS\1604 - Schools Programme\00 General\1.00 Drawings\500 - 599 Detail Drawings\Dwg\1604-504 - ROOFING TO STEEL TRUSS_r4.dwg
SHEET SIZE : A1



section



plan

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Rev.	Date	Description	By
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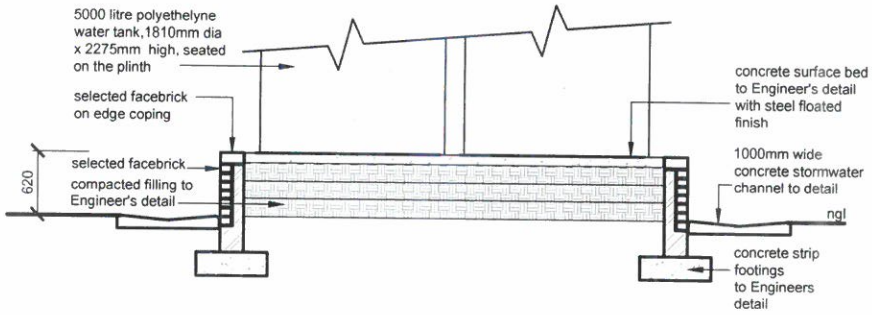
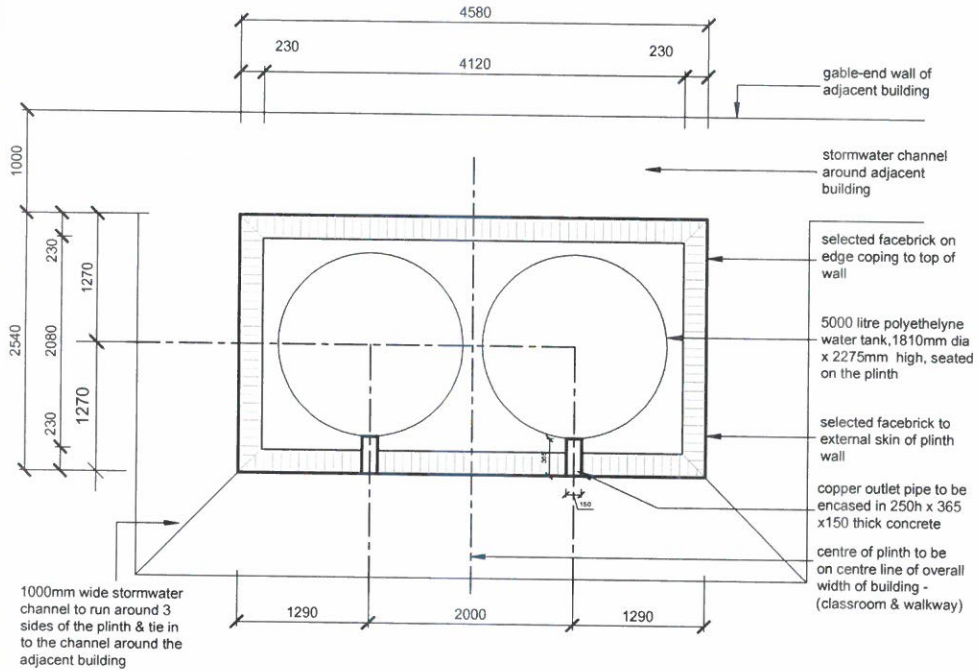


section



plan

REVISIONS			
Rev.	Date	Description	By
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HEAD: WORKS

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education
Department: Education
PROVINCE OF KWAZULU-NATAL

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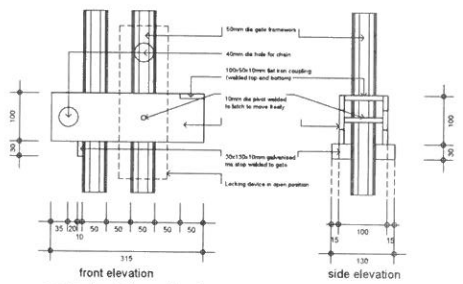
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD

PROJECT
STORM DAMAGED SCHOOLS PROGRAMME

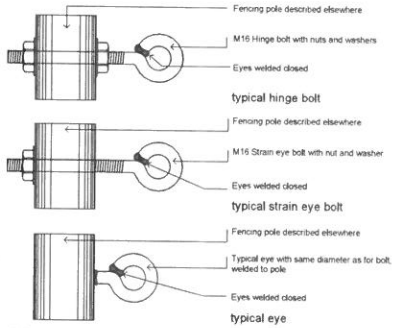
DRAWING DESCRIPTION
TANK BASE DETAILS DOUBLE TANK

Scale	Date	Drawn
1 : 50	25.05.2016	VM
Project No.	**Drawing No.**	**Rev.**
1604	505.3	.



gate locking device

scale 1:5



hinge straining bolt and eye

scale 1:2

SPECIFICATION NOTES

SECURITY FENCING:

2 250mmm high security fencing consisting of :-

1). Corner posts,
2). Straining posts,
3). Stays to corner and straining posts.
4). Intermediate posts,
5). Welded mesh fencing (1.8m high).
6). Razor wire.
7). Tubular steel gate posts (when specified).

1). Corner posts are to be 100mm diameter galvanised mild steel tubing with a wall thickness of 3.00mm, holed and fitted with eye bolts for the straining wires. An end cap is to be welded to the top of the post and a 300mm x 300mm x 6mm base plate welded to the bottom of the post. Corner posts are to have stays fixed to two sides.

2). Straining posts are to be 150mm diameter galvanised mild steel tubing with a wall thickness of 3.00mm, holed and fitted with eye bolts for the straining wires. An end cap is to be welded to the top of the post and a 300mm x 300mm x 6mm base plate welded to the bottom of the post. Straining posts shall be spaced at not more than 50 metres apart. Straining posts are have stays fixed to either side.

3). Stays are to be 50mm diameter galvanised mild steel tubing with a wall thickness of 2.80mm, A 200mm x 200mm x 6mm base plate is to be welded to the bottom of the stay.

4). Intermediate posts are to be 50mm diameter galvanised mild steel tubing with a wall thickness of 2.8mm. An end cap is to be welded to the top of the post and a 200mm x 200mm x 6mm base plate is to be welded to the bottom of the post. Intermediate posts shall be spaced at not more than 3 metres apart.

5). The fence shall comprise of galvanized rectangular welded mesh fencing 1800mm high x 2.50mm dia x 50mm x 50mm rectangles fixed to no. 4.6 gauge hardened galvanized steel straining wires, spaced at 450mm ocs. Welded mesh shall be secured to straining wires with 2mm dia galvanized binding wire spaced at a maximum of 250mm between ties.

6). Coils of 500mm dia galvanized flat wrap razor wire shall be fixed vertically above the welded mesh to a height of 350mm above the top of the welded mesh. Razor wire shall be supported on and fixed to three strands of galvanized double strand barbed wire. Barbed wire shall be fixed to the posts in the same manner as the straining wires. Razor wire shall be fixed to the barbed wire at every intersection with Dovetail Clamps and laced to the steel posts with galvanized binding wire.

7). Where required, gateposts shall be supplied in steel tubing complying with OKS #3. 100mm dia x 3.0mm wall thickness in lengths asindicated, with upper end capped with a 1.6mm thick pressed mild steel domed cap welded on and 3mm thick x 300mm x 300mm footplate welded to base. Gateposts are to be drilled and fitted with mild steel ferrules welded into position to receive 25 mm dia mild steel hinges. Threaded 12 mm dia studs or approved stay collars are to be fixed on to the posts to locate and secure the top ends of stays. The whole shall be hot dipped galvanized. Holes for the threading and fixing of tying wires shall be drilled on site and holes cold galvanized on completion. Stays shall have the top end flattened, bent as required, holed 12 mm dia for bolting to post and the whole hot dip galvanized.

MATERIAL SPECIFICATIONS

Concrete bases for posts shall be Class S (1:3:5-19 mm stone) of indicated size, with tops of bases 50 mm above ground level.

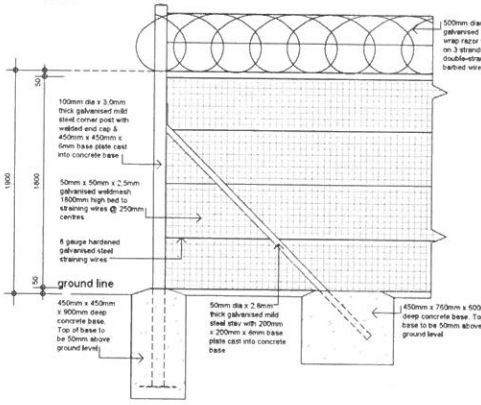
Straining wire :- shall be as specified, or either Type 1 galvanised wire of 3.15 mm dia or Type 2 PVC coated galvanised wire with 3.15 mm dia core wire PVC coated to an overall diameter of 3.95 mm. Stainless steel straining wire where specified shall be 2.50 mm dia A,I.S.I. Type 304 stainless steel, 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 Tying wire :- shall be as specified either Type 1 galvanised wire of 2 mm dia or Type 2 PVC coated galvanised wire with 2 mm dia core wire PVC coated to an overall dia of 2.80 mm.

Galvanised barbed fencing wire :- shall consist of two strands of 1.60 mm dia 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.

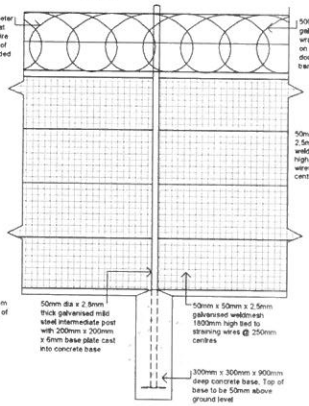
Galvanising :- shall comply with SABS Specification 763 and all items of posts, stays, gate framing, etc., described as galvanised shall be hot dipped galvanised after fabrication with Class A galvanising with all internal and external surfaces fully coated.

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



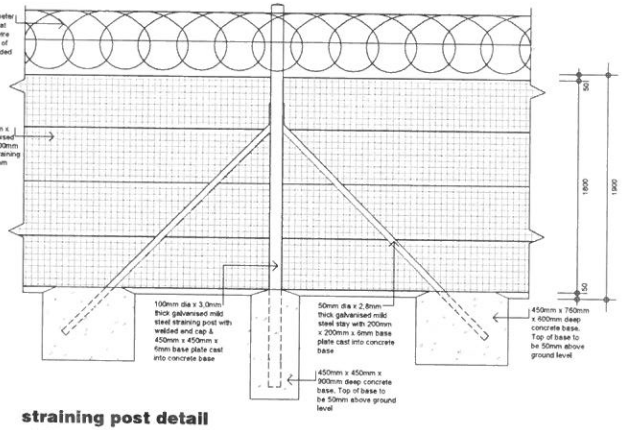
corner post detail

scale 1:20



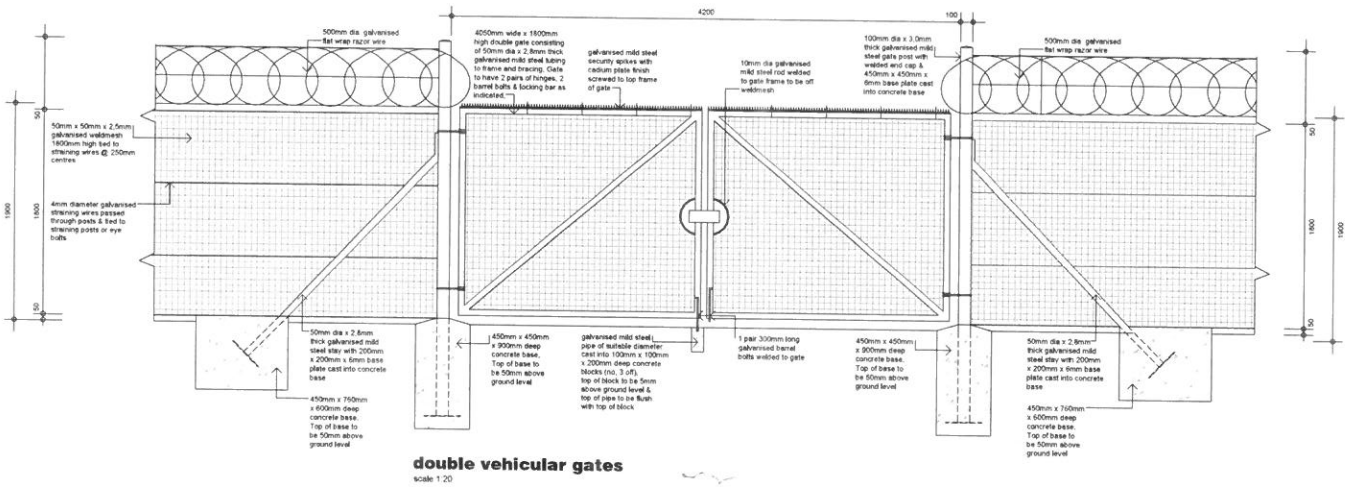
intermediate post detail

scale 1:20



straining post detail

scale 1:20



double vehicular gates

scale 1:20

REVISIONS			
Rev. No.	Date	Description	By
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Department:
Education
PROVINCE OF KWAZULU-NATAL

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PROJECT

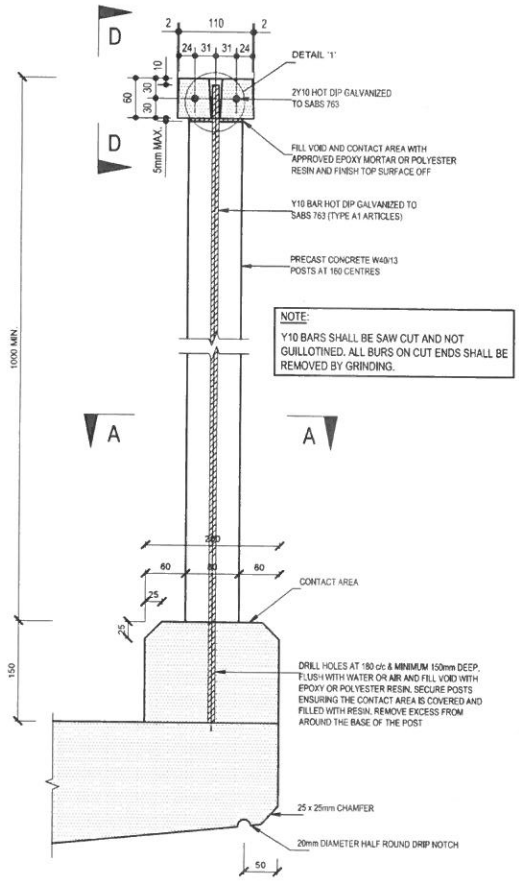
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION

FENCE DETAILS. - 1900h

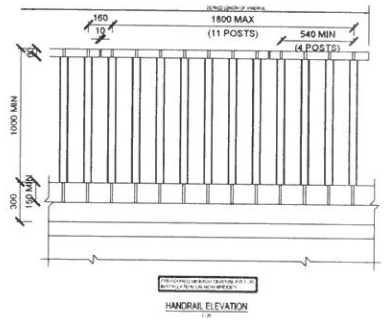
Scale	Date	Drawn
1:20 1:5 1:2	25.01.2016	VM
Project No. 1604	Drawing No. 506	Rev.

PLOT DATE: Thursday, 04 August 2016
PLOT BY: M:\ARTEK - PROJECTS\1604 - Schools Program\14 General\14 Drawings\DWG\1604 - SPR Detail Drawings\1604 - SPR - FENCE
PAPER SIZE: A3



FIXING OF POSTS

1 : 5



NOTES

1. GENERAL

1.1 CONCRETE FOR PRECAST CONCRETE HANDRAIL MEMBERS SHALL BE CLASS 40/13 AND SHALL BE DESIGNED FOR LOW SHRINKAGE VALUES.

1.2 ALL BONDED CONNECTIONS SHALL BE MADE WITH RESIN WITH A SHEAR AND BOND STRENGTH GREATER THAN THAT OF THE CONCRETE.

1.3 FINISH TO PRECAST MEMBERS SHALL BE CLASS F3 AND U3 (STEEL TROWEL). ALL CORNERS TO BE ROUNDED 3mm.

1.4 NO SAG WILL BE ALLOWED BETWEEN THE ENDS OF ANY SINGLE TOP RAIL UNIT. MAXIMUM PERMISSIBLE BOWING WILL BE 2 mm PER METER OF TOP RAIL.

1.5 POSTS AND TOP RAILS SHALL BE PROPERLY BRACED UNTIL THE RESIN USED FOR FIXING HAS SET. CURING TIME SHALL BE VERIFIED BY THE ENGINEER.

1.6 DIAMETERS OF HOLES FOR THE BONDED CONNECTIONS WILL DEPEND ON THE RESIN USED BY THE CONTRACTOR. THE ENGINEER SHALL VERIFY THE REQUIRED HOLE SIZES AND ACCEPTABILITY OF THE PROPOSED RESIN.

1.7 BEFORE THE APPLICATION OF RESIN, CONTACT AREAS SHALL BE SOUND, CLEAN, DRY AND FREE FROM SURFACE DEFECTS OR LAITANCE.

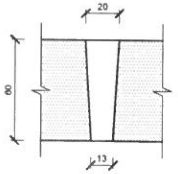
1.8 IF TOP RAILS ARE TRIMMED ON SITE, THE EXPOSED ENDS OF REBAR SHALL BE PAINTED WITH A 2mm THICK COAT OF APPROVED EPOXY RESIN.

2. APPROVAL OF INSTALLERS AND MATERIALS:

2.1 THE CONTRACTOR SHALL SUBMIT SAMPLES OF THE HANDRAIL MEMBERS HE INTENDS USING TO THE ENGINEER FOR APPROVAL. SUCH SAMPLES WILL BE KEPT AND USED BY THE ENGINEER AS A COMPARATIVE STANDARD FOR THE MEMBERS ACTUALLY INSTALLED ON THE BRIDGE.

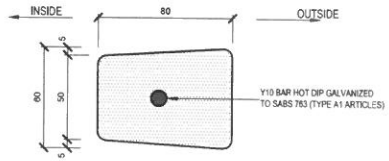
2.2 THE ENGINEER MAY ALSO REQUIRE DESTRUCTIVE TESTING OF INDIVIDUAL MEMBERS TO CONFIRM THEIR COMPLIANCE WITH THE SPECIFIED MANUFACTURING PROCEDURES.

2.3 THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE THE ENGINEER WITH PROOF OF COMPETENCE OF THE PROPOSED INSTALLERS OF THE HANDRAILS.



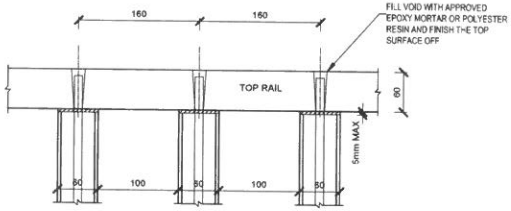
DETAIL '1'

1 : 2



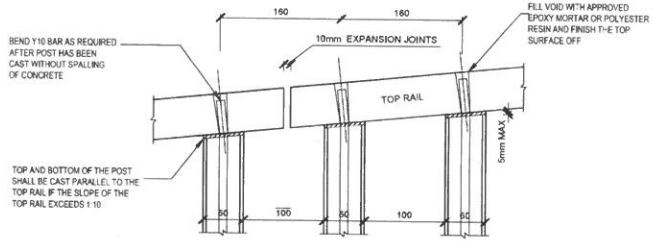
SECTION A - A

1 : 2



INSIDE ELEVATION D-D OF HANDRAIL - HORIZONTAL

1 : 5



INSIDE ELEVATION D-D OF HANDRAIL ON SLOPE

1 : 5

IF TOP RAILS ARE TRIMMED ON SITE, THE EXPOSED ENDS OF REBAR SHALL BE PAINTED WITH A 2mm THICK COAT OF APPROVED EPOXY RESIN.

REVISIONS			
Rev. No.	Date	Description	By
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CLIENT

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

CLIENT DEPARTMENT

education

Department:
Education
PROVINCE OF KWAZULU-NATAL

CONSULTANTS

Programme Managers	: NAIDU CONSULTING (PTY) LTD Tel: 031 265 6007
Architect	: ARTEK 4 ARCHITECTS Tel: 031 201 0445
Quantity Surveyors	: HENCON & ASSOCIATES Tel: 031 825 7562
Electrical Engineers	: DBA CONSULTING ENGINEERS Tel: 031 536 8207
Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD Tel 031 265 6007.

PROJECT

STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION

PRECAST HANDRAIL DETAIL

Scale	Date	Drawn
1:2 1:5 1:25	13 June 2016	VM
Project No. 1604	Drawing No. 507	Rev.

PLOT DATE : Thursday, 16 August 2016
FILE PATH : M:\1 ARTEK4 - PROJECTS\1604 - Schools Programm\00 General\1.00 Drawings\500 - 599 Detail Drawings\DWG\1604-507 Precast Handrail Detail
SHEET SIZE : A2

SPECIFICATION NOTES

SECURITY FENCING

1 500mmm high fencing consisting of :-

1). Corner posts,
2). Straining posts,
3). Stays to corner and straining posts,
4). Intermediate posts,
5). Welded mesh fencing (1.5m high).

1). Corner posts are to be 100mm diameter galvanised mild steel tubing with a wall thickness of 3.00mm, holed and fitted with eye bolts for the straining wires. An end cap is to be welded to the top of the post and a 300mm x 300mm x 6mm base plate welded to the bottom of the post. Corner posts are to have stays fixed to two sides.

2). Straining posts are to be 100mm diameter galvanised mild steel tubing with a wall thickness of 3.00mm, holed and fitted with eye bolts for the straining wires. An end cap is to be welded to the top of the post and a 300mm x 300mm x 6mm base plate welded to the bottom of the post. Straining posts shall be spaced at not more than 50 metres apart. Straining posts are have stays fixed to either side.

3). Stays are to be 50mm diameter galvanised mild steel tubing with a wall thickness of 2.80mm. A 200mm x 200mm x 6mm base plate is to be welded to the bottom of the stay.

4). Intermediate posts are to be 50mm diameter galvanised mild steel tubing with a wall thickness of 2.8mm. An end cap is to be welded to the top of the post and a 200mm x 200mm x 6mm base plate is to be welded to the bottom of the post. Intermediate posts shall be spaced at not more than 3 metres apart.

5). The fence shall comprise of galvanized rectangular welded mesh fencing 1500mm high x 2.50mm dia x 50mm x 50mm rectangles fixed to no. 4.5 gauge hardened galvanized steel straining wires, spaced at 450mm ccs. Welded mesh shall be secured to straining wires
with 2mm dia galvanized binding wire spaced at a maximum of 250mm between ties.

6). Coils of 500mm dia galvanized flat wrap razor wire shall be fixed vertically above the welded mesh to a height of 350mm above the top of the welded mesh. Razor wire shall be supported on and fixed to three strands of galvanized double strand barbed wire. Barbed wire shall be fixed to the posts in the same manner as the straining wires. Razor wire shall be fixed to the barbed wire at every intersection with 'Dovetail Clamps' and laced to the steel posts with galvanized binding wire.

7). Where required, gateposts shall be supplied in steel tubing complying with OKS 82. 100mm dia x 3.0mm wall thickness, in lengths preindicated, with upper end capped with a 1.6mm thick pressed mild steel domed cap welded on and 3mm thick x 300mm x 300mm footplate welded to base. Gateposts are to be drilled and fitted with mild steel ferrules welded into position to receive 25 mm dia mild steel hinges. Threaded 12 mm dia studs or approved stay collars are to be fixed on to the posts to locate and secure the top ends of stays. The whole shall be hot dipped galvanized. Holes for the threading and fixing of tying wires shall be drilled on site and holes cold galvanized on completion. Stays shall have the top end flattened, bent as required, holed 12 mm dia for bolting to post and the whole hot dip galvanized.

MATERIAL SPECIFICATIONS

Concrete bases for posts shall be Class B (1:3.5-19 mm stone) of indicated size. with tops of bases 50 mm above ground level.

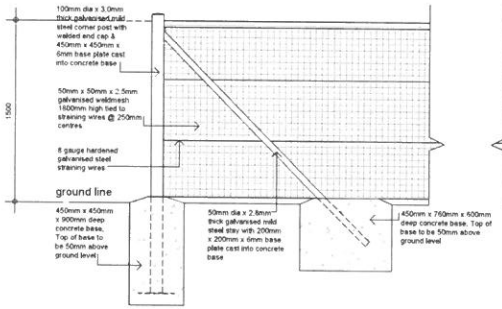
Straining wire - shall be as specified, or either Type 1 galvanised wire of 3.15 mm dia or Type 2 PVC coated galvanised wire with 3.15 mm dia core wire PVC coated to an overall diameter of 3.95 mm. Stainless steel straining wire where specified shall be 2.50 mm dia A.I.S.I. Type 304 stainless steel. 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 Tying wire - shall be as specified. either Type 1 galvanised wire of 2 mm dia or Type 2 PVC coated galvanised wire with 2 mm dia core wire PVC coated to an overall dia of 2.80 mm.

Galvanised barbed fencing wire - shall consist of two strands of 1.60 mm dia 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.

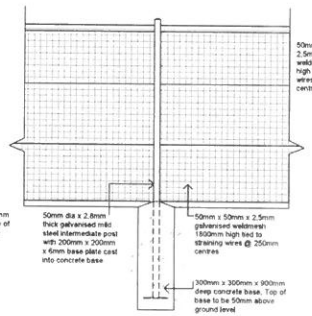
Galvanising: - shall comply with SABS Specification 763 and all items of posts, stays, gate framing, etc., described as galvanised shall be hot dipped galvanised after fabrication with Class A galvanising with all internal and external surfaces fully coated.

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



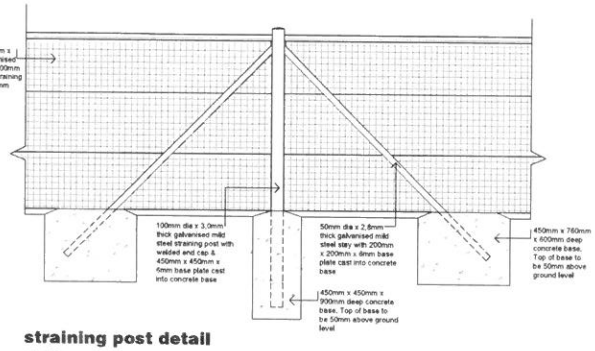
corner post detail

scale 1:20



intermediate post detail

scale 1:20



straining post detail

scale 1:20

REVISIONS			
Rev. No.	Date	Description	By
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CLIENT

public works

Department:
Public Works
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CLIENT DEPARTMENT

education

Department:
Education
PROVINCE OF KWAZULU-NATAL

CONSULTANTS:

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Civil & Structural Engs	: NAIDU CONSULTING (PTY)LTD Tel 031 265 6007.

PROJECT

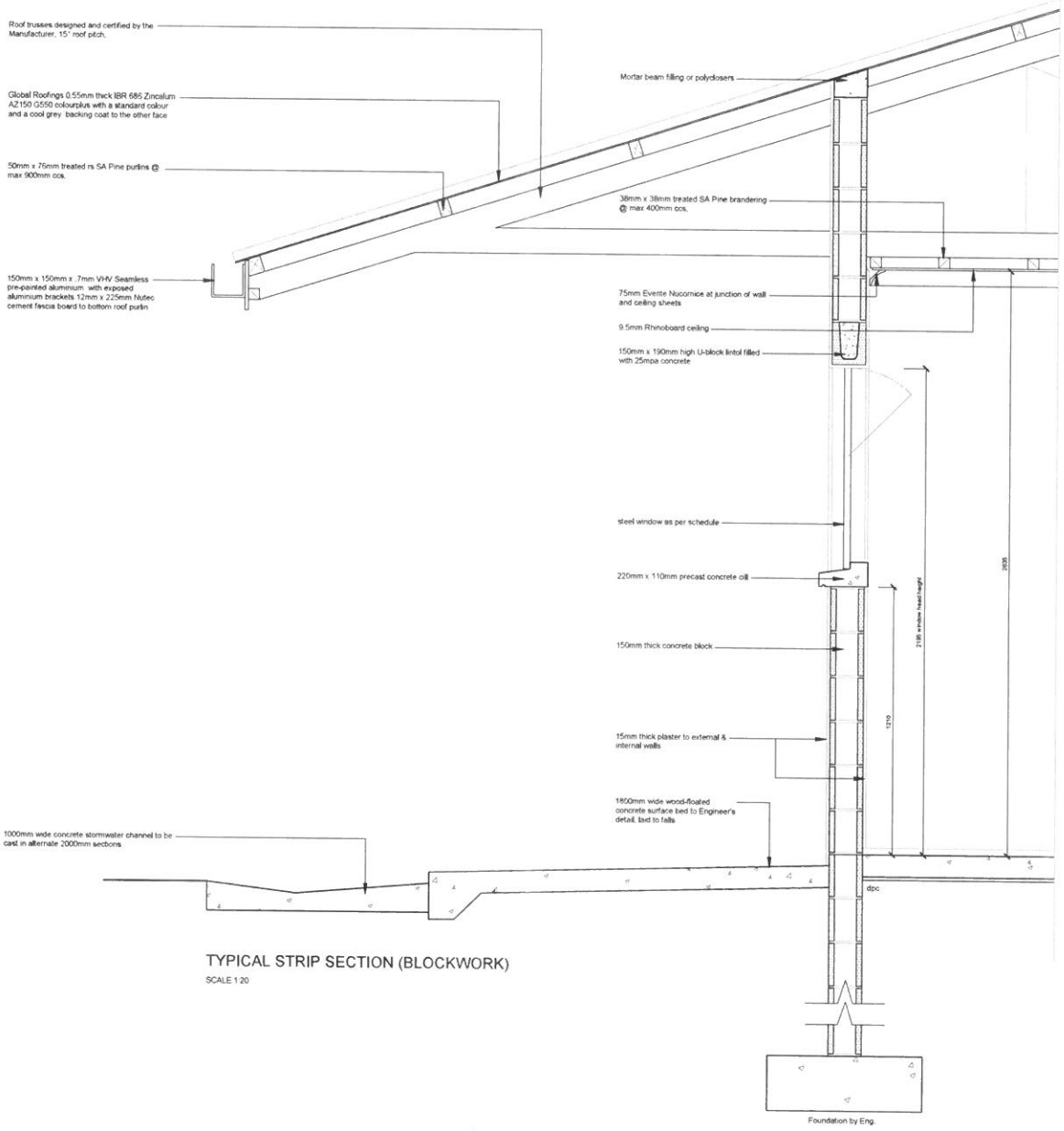
STORM DAMAGED SCHOOLS PROGRAMME

DRAWING DESCRIPTION

FENCE DETAIL - 1500 high

Scale	Date	Drawn
1:20	25.01.2016	VM
Project No. 1604	Drawing No. 508	Rev.

PLOT DATE : Thursday, 18 August 2016
FILE PATH : M:\ARTEK\ - PROJECTS\Naidu - Schools Programme\00 General\1.0 Drawings\1500 - 508 Detail Drawings\DWG\1604-1500 FENCE - 508.pln
SHEET SIZE : A1



TYPICAL STRIP SECTION (BLOCKWORK)

SCALE 1:20

REVISIONS

Rev. No.	Date	Description	By
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CLIENT

public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

CLIENT DEPARTMENT

education

Department:
Education
PROVINCE OF KWAZULU-NATAL

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Civil & Structural Engs.	NAIDU CONSULTING (PTY)LTD Tel 031 265 6007.

PROJECT

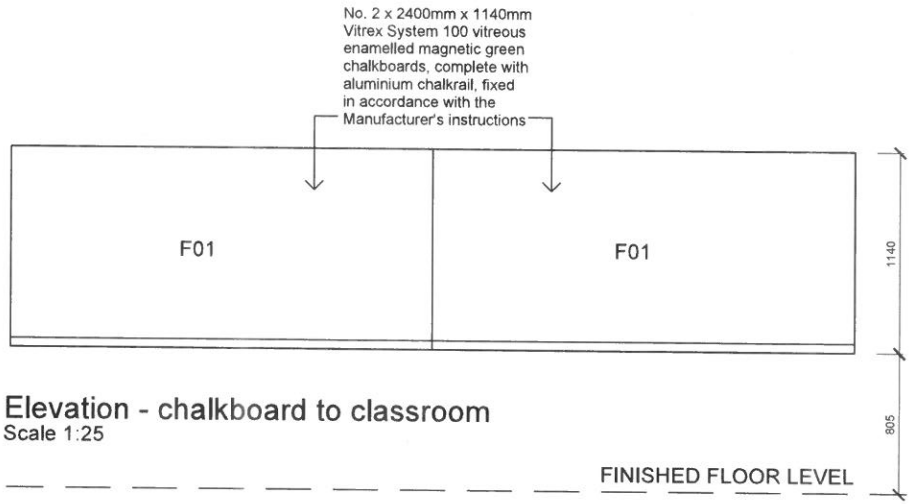
STORM DAMAGED
SCHOOLS PROGRAMME

DRAWING DESCRIPTION

TYPICAL STRIP SECTION - BLOCKWORK

Scale	Date	Drawn
1:10	16.08.2016	WP
Project No.	Drawing No.	Rev.
1604	509	-

PLOT DATE Thursday, 18 August 2016
FILE PATH M:\1 ARTEK4 - PROJECTS\1604 - Schools Programme\00 Damage\1 00 Drawings\000 - 599 Detail Drawings\DWG\1604-509 Typical Strip Section (Blockwork).
SHEET SIZE A1



Elevation - chalkboard to classroom
Scale 1:25

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Rev.	Date	Description	By
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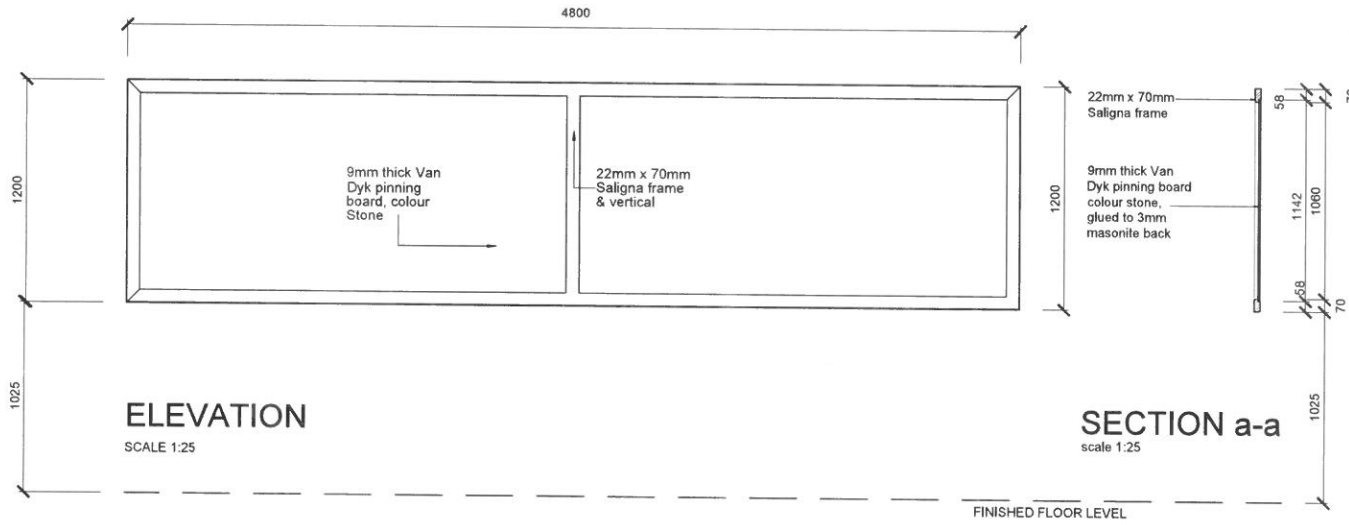
CLIENT: public works Department: Public Works **PROVINCE OF KWAZULU-NATAL**	CLIENT DEPARTMENT: education Department: Education PROVINCE OF KWAZULU-NATAL	CONSULTANTS Programme Managers : NAIDU CONSULTING (PTY) LTD Architect : ARTEK 4 ARCHITECTS Quantity Surveyors : HENCON & ASSOCIATES Electrical Engineers : DBA CONSULTING ENGINEERS Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD	PROJECT STORM DAMAGED SCHOOLS PROGRAMME DRAWING DESCRIPTION CHALKBOARD TO CLASSROOM F01	Scale 1:25 Project No. 1604	Date 2016.05.16 Drawing No. 600	Drawn MK Rev. .

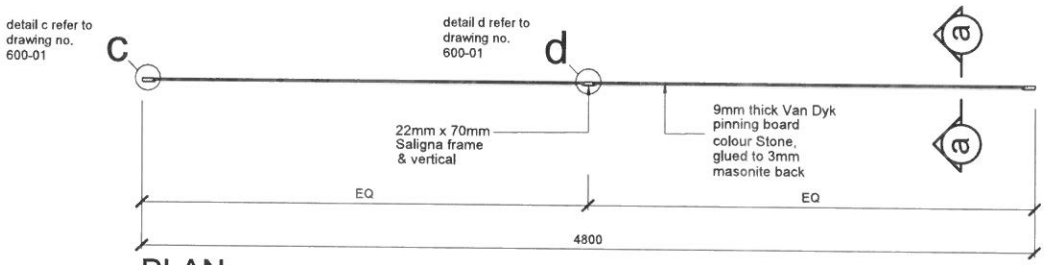


ELEVATION

SCALE 1:25

SECTION a-a

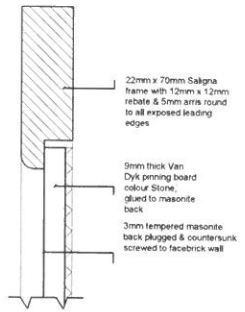
scale 1:25



PLAN

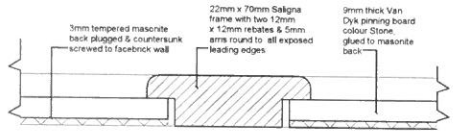
SCALE 1:25

F09



Detail c

Scale 1:1



Detail d

Scale 1:1

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Rev.	Date	Description	By
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CLIENT public works Department: Public Works **PROVINCE OF KWAZULU-NATAL**	CLIENT DEPARTMENT education Department: Education PROVINCE OF KWAZULU-NATAL	CONSULTANTS Programme Managers : NAIDU CONSULTING (PTY) LTD Architect : ARTEK 4 ARCHITECTS Quantity Surveyors : HENCON & ASSOCIATES Electrical Engineers : DBA CONSULTING ENGINEERS Civil & Structural Engs : NAIDU CONSULTING (PTY)LTD	PROJECT STORM DAMAGED SCHOOLS PROGRAMME DRAWING DESCRIPTION PINNING BOARD F09	Scale 1:25 1:1 Project No. 1604	Date 27.05.2016 Drawing No. 601	Drawn VM Rev. .