

**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 90: MANQONDO
JUNIOR PRIMARY SCHOOL - OPEN BIDS**

Engineer/Principal Agent

Ilifa/Bingelela Consulting Professionals JV
P.O. Box 102278
Meerensee
Richards Bay
3900
035 753 4580 - Tel Number
035 753 5590 - Fax Number
jrichards@bingelela.com

Quantity Surveyor

Bingelela Consulting Professionals
P.O. Box 102278
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3900
035 753 4580 - Tel Number
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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: ZNTD 05381W
CIDB Grading: 4GB or higher
ECDP Number: N/A

Project Code: 063384
Document Date: 06 June 2023

Contracting Party: _____

CIDB Registration number: _____

Central Suppliers Database Registration Number: _____



KWAZULU-NATAL PROVINCE

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**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM
DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST
REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

THE CONTRACT



KWAZULU-NATAL PROVINCE

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C1 - AGREEMENT AND CONTRACT DATA



KWAZULU-NATAL PROVINCE

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FORM OF OFFER AND ACCEPTANCE



KWAZULU-NATAL PROVINCE
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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.



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REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS	
Tender no:	ZNTD 05381W
	The General Conditions of Contract are the clauses contained in the General Conditions of Contract (2010) (Second Edition) published by the South African Institution of Civil Engineering. Copies of these conditions of contract may be obtained through most regional offices of the South African Institution of Civil Engineering, telephone number 011 805 5947 or by visiting their website at www.saice.org.za.
	CONTRACT SPECIFIC DATA The following contract specific data are applicable to this contract:
	CONTRACT VARIABLES This schedule contains all variables specific to this document and is divided into pre-tender and post-tender categories. The pre-tender category must be completed in full and included in the tender documents. Both the pre-tender and post-tender categories form part of this agreement . Spaces requiring information must be filled in, shown as 'not applicable' or deleted <u>but not left blank</u> . Where choices are offered, the non-applicable items are to be deleted. Where insufficient space is provided the information should be annexed hereto and cross referenced to the applicable clause of the schedule. Key cross reference clauses are italicised in [] brackets. The Engineer/Principal Agent, in accordance with Clause 1.1.1.16, shall obtain the specific approval from the Employer before executing any of his functions according to the "Conditions under which Consultants are appointed", or in the event where an employee of the Employer represents the Employer, the relevant General Delegations applicable at the time of executing his/her duties as described in Clause 3.1.2.
Part 1: CONTRACT DATA PROVIDED BY THE EMPLOYER:	
PRE-TENDER INFORMATION	
CONTRACTING AND OTHER PARTIES	
[1.1.1.15]	Employer: Head: Public Works (KZN Department of Public Works: Province of KwaZulu-Natal) Postal address: Private Bag X 9041 PIETERMARITZBURG 3200 Tel: 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 Ilifa Africa Engineers (Pty) Ltd Agent's service: Structural and Civil Engineers Postal address: P.O. Box 10812 Richards Bay 3900 Tel: 035 753 1083 Fax: 035 753 1094
	Employers Agent 2 DNA Consulting Engineers & Project Managers Agent's service: Electrical Engineers Postal address: 5th Floor, MB House, 641 Mokaba, Ridge (North Ridge Road), Morningside Durban 4091 Tel: 031 207 1576 Fax: 086 670 8703
	Employers Agent 3 Striation Architects Agent's service: Architects Postal address: 153 A Helen Joseph Road Durban 4091 Tel: 031 825 1600 Fax: 086 674 0267
	Employers Agent 4 Bingelela Consulting Professionals Agent's service: Quantity Surveyor Postal address: P.O. Box 102278 Richards Bay 3900 Tel: 035 753 4580 Fax: 035 753 5590

Tender no: ZNTD 05381W	
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. (NOTE: NOT APPLICABLE) - Retention will be held at 10% per Payment Certificate.
[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										
[5.8.1]	Non-Working days Non-Working days Sundays Special non- working days All Nationally Recognized Public Holidays and the year end break First Year end break - commences 15-Dec-23 ends on 09-Jan-24 Second Year end break - commences 15-Dec-24 ends on 09-Jan-25 Third Year end break - commences N/A ends on N/A Fourth Year end break - commences N/A ends on N/A										
[3.1.3]	Engineer/Principal Agent to consult with Employer 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.										
[6.2.1]	Security 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. 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 <u>fully signed</u> copy of the Form of Offer and Acceptance from the employer.										
[5.6.1]	The Contractor shall deliver his programme of work within 10 calendar days after notice from the Employer, prior to the Commencement Date.										
	CONTRACT DETAILS										
[1.1.1.33]	Works description: Refer to document C3 – Scope of Work.										
[1.1.1.30]	Site description: Refer to document C4 – Site Information.										
	Specific options that are applicable to a State organ only Where so :										
[6.10.6.2]	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: <table border="1"><tr><td>Yes</td><td>No</td><td>X</td></tr></table> 3) Payment will be made for materials and goods <table border="1"><tr><td>Yes</td><td>X</td><td>No</td></tr></table> 4) Dispute resolution by litigation <table border="1"><tr><td>Yes</td><td>No</td><td>X</td></tr></table> 5) Extended defects liability period applicable to the following elements: <table border="1"><tr><td>Electrical, Mechanical and Civil work</td></tr></table>	Yes	No	X	Yes	X	No	Yes	No	X	Electrical, Mechanical and Civil work
Yes	No	X									
Yes	X	No									
Yes	No	X									
Electrical, Mechanical and Civil work											
[8.6.1.1.2]	The Value of material, supplied by the Employer, and not included in the Contract Price, is: R0.00										
[8.6.1.1.3]	The amount to cover Professional Fees, not included in the Contract Price, for repairing damage and loss to be included in the insurance: 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.										
[5.5.1]	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).										
[5.13.1]	The date for practical completion shall be To be determined 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 <u>construction period exceeds 6 months and the contract exceeds R1,000,000.00</u> , be subject to a Contract Price Adjustment Factor.
[6.8.2]	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]	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 excessive rain, heat, cold, wind and any other climatic condition that would not normally be experienced during the season that the Works are executed in that area. The South African Weather Service's (http://www.weathersa.co.za) 10 year average climatic conditions statistics would be what could be reasonably expected for the specific locality where the Works are executed.
	[6.2.1] CONSTRUCTION GUARANTEE – means an on demand guarantee at call obtained by the contractor from an institution approved by the employer in terms of the employer's construction guarantee form as selected in the Offer and Acceptance Form and the contract data .
	CONSTRUCTION PERIOD – means the period commencing on the commencement date and ending on the date of due completion date . This period will be deemed to commence on actual site hand over date to the contractor and end on the date of practical completion and shall include all annual industrial holiday periods, Sundays and public holidays.
	CORRUPT PRACTICE – means the offer, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.
	FINAL ACCOUNT - The document prepared by the principal agent, which reflects the contract value of the works at final approval or termination.
	FRAUDULENT PRACTICE – means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of any tenderer and includes collusive practise among tenderers (prior to or after the tender submission) designed to establish tender prices at artificial non-competitive levels and to deprive the tenderer of the benefits of free and open competition.

	INTEREST – the interest rates applicable on this contract, whether specifically indicated in the relevant clauses or not, will be in terms of the legislation of the Republic of South Africa, and in particular: (a) in respect of interest owed by the employer, the interest rate as determined by the Minister of Justice and Constitutional Development from time to time, in terms of section 1(2) of the Prescribed Rate of Interest Act, 1975 (Act No. 55 of 1975), will apply; and (b) in respect of interest owed to the employer, the interest rate as determined by the Minister of Finance, from time to time, in terms of section 80(1)(b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999), will apply
[1.1.1.16]	ENGINEER/PRINCIPAL AGENT – means the person or entity appointed by the Employer and named in the Contract Data as the Engineer /Principal Agent to act as agent of the Employer. In the event of an Engineer/Principal Agent not being appointed, then all the duties and obligations of an Engineer/Principal Agent as detailed in the Contract shall be fulfilled by a representative of the Employer as named in the Contract Data. (Hereafter referred to as Engineer)
[1.1.1.21]	GENERAL ITEMS - or preliminaries means items stipulated in the Pricing Data relating to general obligations, site services, facilities and/or items that cover elements of the cost of the work which are not considered as proportional to the quantities of the Permanent Works.
[4.4.1]	Add the following to the clause 4.4.1: "The Contract shall only use subcontractors who are duly registered with the CIDB and who has an ACTIVE status at the time of submitting the tender"
[6.2.1]	Refer to Offer and Acceptance form for the various options that the contractor may choose from in providing a form of Guarantee under "GUARATEE"
[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..."
[5.12.3]	SPECIAL CONDITIONS OF CONTRACT 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 guarantee.
[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 replace with "Employer". (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 Employer.
	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 sub-contractors in his employ and must co-ordinate his planning with any other contractor employed on the project. A fortnightly project control report will be expected from the Contractor in writing, evaluating any gains or delays against the critical path and he should allow for all costs involved in planning reviewing and updating the programme to the satisfaction of the Principal Agent against this item. (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 contract that, the contractor submit to the Engineer/principal agent a detailed CPM Programme which shall be to the approval of the Engineer/principal agent. In this regard tenderers are advised to consult with the Engineer/Principal Agent as to the format and requirements of the programme as no claim whatsoever will be entertained should the programme fail to meet the requirements of the Engineer/Principal Agent. Failure to submit the programme within the stipulated time may result in the contractor being held in breach of contract. 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:
- The criteria to be used for WORK stoppages shall be for safety hazards or poor quality of work.
 - 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.
- 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.
 - No claims for stoppages less than 2(two) hours per day shall be considered.
 - 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.
 - All claims shall be submitted in writing to the Principal Agent within one working day of the actual stoppage.
 - 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.
 - 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.
 - Where the programmed delays for inclement weather exceed the actual delays incurred the Completion Date(s) will not be adjusted.
 - 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	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: ZNTD 05381W

Part 2: CONTRACT DATA PROVIDED BY THE CONTRACTOR:

POST-TENDER INFORMATION

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

1 CONTRACT DETAILS

[1.1.1.9]

Contractor Name:

[1.2.1.2]

Postal address:

Tel no

Fax no

Tax / VAT Registration No:

e-mail

Physical address:

[1.1.1.10]

The accepted contract price inclusive of tax is R :

[Amount in words]

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

The preliminaries amounts shall be paid in terms of:

*Alternative A	Yes
**Alternative B	N/A

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

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

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

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

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

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

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

Alternative A

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

- An amount which shall not be varied.

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

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

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

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

	10% of the amount shall not be varied 15% varied in proportion of the Contract Value to the Contract Sum 75% varied in proportion to the revised Construction period compared with the initial Construction Period Sectional Completion : Subdivision of Preliminaries Costs For the adjustment of preliminaries for sections of the work the value of fixed, value, and time related amounts of the preliminaries for each section is required. The contractor is to provide such information within fifteen (15) working days of taking possession of the site, failing which the categorised preliminaries amounts shall be prorated to the value of each section. The above shall apply equally for projects where sectional completion was not contemplated at tender stage but subsequently occurred on an 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 <input checked="" type="text" value="X"/> No Lump Sum document : Yes No <input checked="" type="text" value="X"/> Guarantee Options: Not applicable 2.2 DESIGN BRIEF Not Applicable YES YES or NO 2.3 DRAWINGS See list of drawings/ Annexures attached to this document. YES YES or NO 2.4 DESIGN PROCEDURES Not applicable. YES YES or NO Contract drawings: <input checked="" type="text" value="X"/> YES 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.....onof.....20....

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

Capacity of signatory _____ as Witness.

Thus done and signed at.....onof.....20....

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

Capacity of signatory _____ as Witness.



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM
DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST
REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

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 ZNTD 05381W

Project Code 063384

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

GUARANTOR DETAILS AND DEFINITIONS

"Guarantor" means: _____

Physical Address: _____

"Employer" means: The Provincial Administration of KwaZulu-Natal, 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
90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

"Site" means: _____

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

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

Amount in Words:

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

Amount in Words: _____

"Expiry Date" means: _____

CONTRACT DETAILS

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

PERFORMANCE GUARANTEE

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

- 10 The Employer shall have the absolute right to arrange his affairs with the Contractor in any manner which the Employer may deem fit and the Guarantor shall not have the right to claim his release from this Performance Guarantee on account of any conduct alleged to be prejudicial to the Guarantor.
- 11 The Guarantor chooses the physical address as stated above for the service of all notices for all purposes in connection herewith.
- 12 This Performance Guarantee is neither negotiable nor transferable and shall expire in terms of 2, where after no claims will be considered by the Guarantor. The original of this Guarantee shall be returned to the Guarantor after it has expired.
- 13 This Performance Guarantee, with the required demand notices in terms of 4 or 5, shall be regarded as a liquid document for the purposes of obtaining a court order.
- 14 Where this Performance Guarantee is issued in the Republic of South Africa the Guarantor hereby consents in terms of Section 45 of the Magistrate's Court Act No 32 of 19-11, as amended, to this jurisdiction of the Magistrate's Court of any district having jurisdiction in terms of Section 28 of the said Act, notwithstanding that the amount of the claim may exceed the jurisdiction of the Magistrate's Court.

Signed at _____

Date _____

Guarantor's signatory (1) _____

Capacity _____

Guarantor's signatory (2) _____

Capacity _____

Witness signatory (1) _____

Witness signatory (2) _____



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED
SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION:
CLUSTER 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS		
Tender no:	ZNTD 05381W	Project Code:	063384

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 verification functionality of key supplier information. 2. Prospective suppliers will be able to self - register on the CSD website: www.csd.gov.za 3. Once the supplier information has been verified with external data sources by National Treasury a unique supplier number and security code will be allocated and communicated to the supplier. Suppliers will be required to keep their data updated regularly and should confirm at least once a year that their data is still current and updated. 4. Suppliers can provide their CSD supplier number and unique security code to organs of state to view their verified CSD information. 5. Tenderers are required to fill in clearly, legibly, in bold print and black ink their CSD supplier number in the space hereunder: <table border="1" data-bbox="204 1328 1412 1467"> <tr> <td data-bbox="204 1328 667 1384">Name of Supplier</td> <td data-bbox="667 1328 1412 1384"></td> </tr> <tr> <td data-bbox="204 1384 667 1467">Central Supplier Database (CSD) Supplier Number:</td> <td data-bbox="667 1384 1412 1467"></td> </tr> </table>	Name of Supplier		Central Supplier Database (CSD) Supplier Number:	
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 Compliance Status (TCS) requirements are also applicable to foreign Tenderers / individuals who wish to submit Tenders. 2 SARS will then furnish the Tenderer with a Tax Compliance Status (TCS) PIN that will be valid for a period of 1 (one) year from the date of approval. 3 In tenders where Consortia / Joint Ventures / Sub-contractors are involved, each party must submit a separate Tax Compliance Status (TCS) PIN. 4 Application for Tax Compliance Status (TCS) PIN can be done via e-filing at any SARS branch office nationally or on the website www.sars.gov.za.				

	5 Tax Clearance Certificates may be printed via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za. 6 Tax Clearance Certificates may be printed via eFiling. In order to use this provision, taxpayers will need to register with SARS as eFilers through the website www.sars.gov.za.		
	<table border="1"> <tr> <td data-bbox="209 412 564 472">Security PIN Number</td> <td data-bbox="564 412 1412 472"></td> </tr> </table>	Security PIN Number	
Security PIN Number			
	<table border="1"> <tr> <td data-bbox="209 472 564 539">Company / Entity Tax Reference Number</td> <td data-bbox="564 472 1412 539"></td> </tr> </table>	Company / Entity Tax Reference 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.		



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**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED
SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION:
CLUSTER 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

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

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

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS

BILL NO. 1

C2.2 PRELIMINARY AND GENERAL

	NOTES	UNIT	QUANTITY	RATE	AMOUNT
i)	The agreement is to be the General Conditions of Contract for Works of Civil Engineering Construction (2010) (Second Edition) , published by the S. A. Institution Of Civil Engineering.				
ii)	The Preliminaries are to be the Construction and management requirements for works contracts - Part 1: General engineering and construction works (SANS 1921-1: 2004 Edition 1) prepared by Standards South Africa and shall be deemed to be incorporated herein.				
iii)	Tenderers are referred to the abovementioned documents for the full intent and meaning of each clause thereof (hereinafter referred to by heading and clause number only) for which such allowance must be made as may be considered necessary.				
iv)	Where standard clauses or alternatives are not entirely applicable to this contract such modifications, corrections or supplements as will apply are given under each relevant clause heading.				
v)	Where any item is not relevant to this specific contract such item is marked N/A (signifying "not applicable").				
vi)	Adjustment of the preliminaries: each item priced, is to be allocated to one or more of the three categories, where "F" denotes a fixed amount (amount not to be varied), "V" denotes an amount variable in proportion to value and "T" denotes an amount in proportion to time.				
vii)	Time (T) related Preliminaries will only be adjusted for omissions or additions, issued by the Employer, or delays caused by the Employer, for which variation and extension of time has been granted. See Contract Data .				
	SECTION A: GENERAL CONDITIONS OF CONTRACT				
A1	General (clause 1) F:..... V:..... T:.....	Item			
A2	Basis of Contract (clause 2) F:..... V:..... T:.....	Item			
A3	Engineer (clause 3) F:..... V:..... T:.....	Item			
A4	Contractor's General Obligation (clause 4) F:..... V:..... T:.....	Item			
A5	Time and Related Matters (clause 5) - As referred to in the Contract Data under Special Condition of Contract. The Contract Period shall be deemed to include all Non – Working Days, Special Non – Working Days and the year-end Builders Annual Industry Holiday Periods. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

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

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

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

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

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

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

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

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

	UNIT	QUANTITY	RATE	AMOUNT
E12.4 EPWP REPORTING as per EPWP DATA FORM At the end of each month as part of site progress report and to be attached to every contractors' progress payment certificate; the contractor shall provide the principal agent & Public Works with a written records, as per EPWP data form; which will be reflecting, beneficiaries full name & surname; ID No and job description of labour employed by main contractor and sub-contractors on site. At the end of each month the contractor must submit the following documents to be attached to the Progress payment certificate: 1. EPWP monthly data collection form 2. Worker monthly payment upload 3. Worker monthly proof of payment i.e 3.1 Acknowledgement of receipt of payment or 3.2 Payslips 3.3 Bank statement highlighted the workers paid 4. Worker monthly training form 5. Monthly attendance register 6. Certified copies of ID's (once off) 7. ID size photos (once off) 8. Proof of UIF 9. Proof of COIDA F:..... V:..... T:..... E12.5 EPWP PROMOTION 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 MEDUIM " letters are to be used . Professional title to be 10 mm above line . Line thickness to be 8 mm thick . Space between bottom of the line and bottom of the lettering below the line has to be 100 mm. Letter sizes are as follows : Helvetica meduim 100 mm black upper case to be for project name and owner . Helvetica meduim 75mm black upper case only to be used for professional titles.Project name and owner shall be black lettering on white background.board sizes are as follows : Board to be minomum 2000mm from ground level and to be constructed from reinforced formed chromadek panels minimum 0,6mm thick chromadek. The contractor is responsible for ensuring that the project board remains neatly and safely erected for the full duration including maintenance period,after which the project board and post are to be dismantled and handed to the client in good order. F:..... V:..... T:..... 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:..... E12.6 COMMUNITY LIAISON OFFICER (CLO) UTILISATION OF A COMMUNITY LIAISON OFFICER In addition to the requirements of Clause E9, contained in this document; The Contractor shall allow for and pay any and all costs necessary for the engagement of the services of a Community Liaison Officer (CLO) for the full duration of this contract	Item			
	Item	N/A		
	Item	N/A		
Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	In the interest of providing a sound service to both the community and the Contractor, a CLO may only manage one project at a given time. A CLO will be identified by the local structures of the ward areas and appointed following fair and transparent interviewing process, to be conducted in the presence of local structures and the contractor representative, in order to assist the Contractor in the procurement of any local labour, etc. required for this project. The Contractor is to liaise with the CLO and afford him any assistance needed in ensuring sound working relations with the local community. Key Responsibilities of the CLO are envisaged to include and not necessary be limited to: 1. Assisting local leadership in conducting skills and resources audit which facilitates sourcing labour from within the ward or targeted areas for employment, as required by contractor. 2. Assisting in sourcing labour-only domestic sub-contractors and the procurement of materials from local resources, as required by the contractor. 3. Assisting the contractor by identifying areas of potential conflict and or threats to the project or to stakeholders in the project and recommend appropriate action to the contractor. 4. Assisting contractor and stakeholders in the project in the resolution of any conflict which may arise. 5. Establishing and ensuring that sufficient and open communication channels between the contractor and the work force are maintained. 6. Establish and ensuring that efficient and open communication channels between the contractor and the community are maintained 7. Identifying and reporting to the Contractor regarding issues where communication between stakeholder is necessary, recommend courses of action and facilitate such communications 8. Assisting the Contractor and the work force in the establishment of grievance procedures and necessary recommenda-tion to the Contractor regarding the grievances and solution thereto. 9. Attending to site meetings and project implementation meetings as required by the Contractor and prepare periodic reports as may be required by the Contractor from time to time. 10. Attending to such other duties which are consistent with the functions of a CLO, as may be required by the Contractor from time to time. Tenderers are to price twice the rate of unskilled local labour rate against this item for any and all costs arising out of compliance with the foregoing and in the event of a Tenderer failing to price against this item or making inadequate financial provision against this item for compliance as aforesaid, then no claim for costs or additional cost incurred will be entertained by the Head: Works F:..... V:..... T:..... E12.7 SKILLS DEVELOPMENT ON SITE Contractor in conforming to the object of EPWP that its beneficiaries need to be capacitated with skills that will render them employable in the future. It is then the responsibility of the Contractor that mandatory life skills are provided to 100% of workforce on site and on the job training to labourers from whom the potential for further development has been identified. The latter is not mandatory to all as it covers technical skills. Contractor should also make provision for the possibility that there might be local youth that will need to be placed on the project with an intention to be provided support towards improving their level of competency and productivity.	Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	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:..... E12.8 LABOUR ONLY Sub Contracting for local emerging enterprises Tenderer's are advised that this contract is subject to the Expanded Public Works Programme (EPWP) and the following criteria will apply: <u>African Equity Ownership</u> a) The Tenderer is to allow for 5% of the total value of works to be undertaken by a Priority Population Group. This percentage excludes the costs of employing local unskilled labour. The allocation of this percentage from the Project, the screening of people, the selection of skills, will be for the Contractor to adjudicate. b) The Priority Population Group consists of women, youth and disabled people. c) The Contractor is to give first option for prospective PPG's from the surrounding areas of the Project. Should there be insufficient suitable people fitting the criteria of PPG's, the Contractor may hire people from further afield. This is to be done only after consultation with the Department of Works EPWP Co-ordinator and the Community Liaison Officer (CLO). d) A Mentor is to be employed by the Contractor, in consultation with the Department of Works for the purposes of quality control and liaison between the Contractor and the selected PPG's on site. The mentor will be responsible for ensuring an acceptable level of quality workmanship and that such work carried out by the PPG's is executed within the time frames stipulated. In so far as possible, the Contractor is encouraged to expand the PPG's skills, knowledge and performance levels. F:..... V:..... T:..... 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.	Item	N/A		
		Item			
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	CO-ORDINATION The Contractor is to co-ordinate the work of all the PPG's, Sub-Contractors and Nominated Sub- Contractors appointed direct by the Employer in such a manner and at all times as will suit the building programme and he is to allow adequate access, for the PPG's, where required, to carry out their work in an efficient manner as no claims for extras in this connection will be entertained. F:..... V:..... T:..... ATTENDANCE The Contractor may allow for attendance upon the PPG's concerned to execute the work. The Contractor is to allow the PPG's the use of any scaffolding belonging to him while it remains so erected on the site. Where scaffolding is necessary for the use by any PPG and the Contractor has not erected any for his own use or has removed same after his own use, the Contractor shall supply sufficient scaffolding to the PPG to be erected and dismantled by the PPG and returned to the Contractor. This attendance upon PPG's to execute the work is to include for the scaffolding provisions as aforesaid and, in addition, is to include for co-operating to the fullest extent with all the parties, attending on off-loading materials, providing suitable storage for tools and materials used by the PPG's, use of general facilities such as latrines, etc., supply and cost of power, lighting, water and the like. F:..... V:..... T:..... E12.9 EPWP CONTRACT FOR LABOUR It is compulsory that shortly after the contractor and or sub contractor has appointed local labour, the employment contract should be signed by both parties, prior to commencement with works on site. The employment contract forms part of the Ministerial Determination or from the regional EPWP officials. Each contract will lapse at the end of each financial year therefore requiring the Contractor to do a renewal of each contract should the need of employment still exist for that particular labourer. F:..... V:..... T:..... E12.10 EPWP SCOPE of WORK Note: Contractors are to price any item on the Bill of Quantities having below, bearing in mind that they are regarded as main sources of job creation, whether sub contracted or undertaken by the main contractor. Elements on the scope of work where application of Labour Intensive Construction methods as will indicated with letters (LI) are regarded feasible are as follows; i) Excavating trenches for foundations and any other civil works with the depth not more than 1.5 m ii) All masonry works which include concrete mixing on site; brickwork; plastering; screed works; jointing; etc. iii) Painting, Plumbing, Ironmongery; roof cladding; glazing; tilling; carpentry; flooring; waterproofing; etc. F:..... V:..... T:.....	Item	N/A		
		Item	N/A		
		Item	N/A		
		Item	N/A		
	Carried forward to collection			R	

		UNIT	QUANTITY	RATE	AMOUNT
	Note: It is a general requirement of this contract that persons normally resident in the ward of the works (local labour) be given preference for employment on the contract. Provided, however, that should adequate and appropriate labour not be available within the ward, others may be employed subject to satisfactory proof being provided that every reasonable endeavour has been made to employ local labour (Local Sub-contractor(s); Skilled; Semi-Skilled and Unskilled). The contractor shall in consultation with the local community leaders with the purpose of negotiating with them regarding the utilization of local resources in the construction process. In this regard, the contractor shall furthermore give preference, wherever possible to the employment of single heads of households, women and youth as well as families declared as most indigent by War on Poverty/ Sukuma Sakhe program profiling process. The contractor should aim, in general, to maximise the involvement of the local community, however workers from other communities should not exceed 20% of all persons working on the project, where local employees possess skills at level of competency that meet contractors requirements. <u>Payment for the labour-intensive component of the works</u> Payment for works identified in the Scope of Work as being labour-intensive shall only be made in accordance with the provisions of the Contract if the works are constructed strictly in accordance with the provisions of the Scope of Work. Any non-payment for such works shall not relieve the Contractor in any way from his obligations either in contract or in delict. <u>Linkage of payment for labour-intensive component of works to submission of project data</u> The Contractor's payment invoices shall be accompanied by labour information for the corresponding period in a format specified by the employer. If the contractor chooses to delay submitting payment invoices, labour returns shall still be submitted as per frequency and timeframe stipulated by the Employer. The contractor's invoices shall not be paid until all pending labour information has been submitted. <u>Applicable labour laws</u> The current Ministerial Determination (also downloadable at 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. F:..... V:..... T:.....				
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)	Item	N/A		
E13.1	Provide and maintain a condom dispenser in terms of Clause 5.1a) F:..... V:..... T:.....	Item			
E13.2	Provide and maintain HIV/AIDS awareness posters terms of Clause 5.1b) F:..... V:..... T:.....	Item			
E13.3	HIV /Aids Awareness Programme on Site for not less than 90% of workers inclusive of all direct and indirect costs; Engage a qualified service provider as described in the scope of works to conduct an HIV Awareness Programme in terms of Clause 5.2.1a) F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

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

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

		UNIT	QUANTITY	RATE	AMOUNT
E25	SECURITY CHECK OF PERSONNEL The principal agent may require the contractor to have his personnel and workmen, or a certain number of them, security classified. In the event of the principal agent requesting the removal of a person or persons from the works for security reasons, the contractor shall do so forthwith and shall thereafter ensure that such person or persons are denied access to the works and the site and/or to any document or information relating to the works. F:..... V:..... T:.....	Item			
E26	PROHIBITION ON TAKING PHOTOGRAPHS In terms of article 119 of the Defence Act, 44 of 1957, it is prohibited to sketch or to take photographs of any military site or installation or any building or civil works thereon or to be in possession of a camera or other apparatus used for taking photographs, except when authorised thereto by or on behalf of the Minister. The same prohibition is also applicable to all Correctional Institutions in terms of article 44.1(e) of the Correctional Services Act 8 of 1959. F:..... V:..... T:.....	Item			
E27	Management of Water Water for Construction purposes must be obtained from alternative water sources (i.e. supply other than water that is produced and distributed by a regulated water service authority from a licenced water treatment works for human consumption), eg dams, rivers, boreholes, springs, rainwater harvesting, recycled sewerage water, etc. The alternative water source shall not be of an inferior quality / standard than that required for construction purposes. The client reserves the right through his agents to test such supplies or request certificates confirming the grade and nature of the water supply. Relevant knowledge of the respective area will be an advantage.				
E28	Electricity Consumption The Contractor will be responsible to remunerate the school with an amount of R1,200.00/month for electricity used on the site during the construction period, from site handover until Works completion is reached and must make allowance in his Preliminaries for such Payment to the School on a monthly basis and if this is not paid, it will be deducted in the final account. The abovementioned electricity payments will only be applicable if the contractor makes use of the schools electricity. However the school is not 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 will be entertained in respect of time or money. F:..... V:..... T:.....	Item			
	Carried forward to collection			R	

SECTION 1

SUMMARY – PRELIMINARY & GENERAL

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



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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

PART C2.3 BILL OF QUANTITIES

Item No	Quantity	Rate	Amount
BILL NO. 1 PRELIMINARIES			
BUILDING AGREEMENT AND PRELIMINARIES			
See C2.2 - Preliminaries for GCC for Construction works - 2nd Edition (2010)			
1	Preliminaries.		
	A : 0.00 B : 0.00 C : 0.00 D : 0.00		
	E : 0.00 F : 0.00 G : 0.00 H : 0.00		
	I : 1.00 J : 0.00 K : 0.00 L : 0.00		
Carried Forward to Project Summary			R
Bill No. 1 Preliminaries			

<u>Item No</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>BILL NO. 2</u>			
<u>ALTERATIONS (PROVISIONAL)</u>			
<u>MODEL PREAMBLES</u>			
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			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>View</u>			
Before submitting his tender the Contractor shall visit the site and satisfy himself as to the nature and extent of the work to be done and the value of the materials contained in the buildings or portions of the buildings to be demolished. No claim for any variations of the contract sum in respect of the nature and extent of the work or of inferior or damaged materials will be entertained			
<u>Existing Furniture, Equipment, etc</u>			
The Contractor shall not remove or damage any furniture, equipment or similar items that belong to the Department except when specifically described. The Contractor must give the Principal Agent sufficient notice if the removal of any items are required before any prescribed alterations can be done			
<u>Damage to existing finishes</u>			
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 existing 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 existing surfaces and structures as may be necessary to effect the above, as the cost of repairing damage to			
Carried Forward to Bill Summary			R
Bill No. 2			
Alterations (Provisional)			

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
existing surfaces and structures will be solely for the Contractors account			
<u>Responsibility for site</u>			
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 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			
<u>Explosives</u>			
No explosives whatsoever maybe used for demolition purposes unless otherwise stated			
<u>General</u>			
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 effectively 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			
Carried Forward to Bill Summary			
Bill No. 2 Alterations (Provisional)			
		R	

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
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<u>Item No</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
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. "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 damp proof courses, lintels, sills, etc. After building in of the new frame, the opening is to be built up 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 is to acknowledge that sequencing of the work will be necessary to accommodate the operational aspects of the school. The Contractor is to accordingly factor the above requirement in the construction programme and pricing			
Carried Forward to Bill Summary			
Bill No. 2 Alterations (Provisional)			
		R	

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
"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 where disturbed 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 "Building up openings" implies that after the removal of any doors, windows or screens that may be described to be taken down, the opening is to be filled up solid (or to the thickness 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 <u>Removal of asbestos material</u> The removal of asbestos shall be carried out by a certified entity, registered in accordance with 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. Asbestos in all forms/building elements that is to be removed, shall be carried out 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 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			
Carried Forward to Bill Summary			
Bill No. 2 Alterations (Provisional)			
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STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>																																							
	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 occurring, the Contractor will be held responsible contractually and may further be prosecuted criminally																																										
	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																																										
	<u>Location Key</u>																																										
	<table><tr><td><u>Key</u></td><td><u>Block</u></td><td><u>Description</u></td></tr><tr><td>A</td><td>1</td><td>1 Classroom</td></tr><tr><td>B</td><td>2</td><td>2 Classrooms</td></tr><tr><td>C</td><td>3</td><td>2 Classrooms</td></tr><tr><td>D</td><td>4</td><td>2 Classrooms</td></tr><tr><td>E</td><td>5</td><td>Building</td></tr><tr><td>F</td><td>6</td><td>Building</td></tr><tr><td>G</td><td>7</td><td>4 Classrooms</td></tr><tr><td>H</td><td>8</td><td>Standard Park Home</td></tr><tr><td>I</td><td></td><td>Preliminaries</td></tr><tr><td>J</td><td></td><td>Provisional Sums</td></tr><tr><td>K</td><td></td><td>External Works</td></tr><tr><td>L</td><td></td><td>Electrical Installation</td></tr></table>	<u>Key</u>	<u>Block</u>	<u>Description</u>	A	1	1 Classroom	B	2	2 Classrooms	C	3	2 Classrooms	D	4	2 Classrooms	E	5	Building	F	6	Building	G	7	4 Classrooms	H	8	Standard Park Home	I		Preliminaries	J		Provisional Sums	K		External Works	L		Electrical Installation			
<u>Key</u>	<u>Block</u>	<u>Description</u>																																									
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K		External Works																																									
L		Electrical Installation																																									
	<u>REMOVAL OF EXISTING WORK</u>																																										
	<u>Breaking up and removing concrete</u>																																										
1	Unreinforced concrete surface beds	m3	6																																								
	<table><tr><td>A : 0</td><td>B : 3</td><td>C : 3</td><td>D : 0</td></tr><tr><td>E : 0</td><td>F : 0</td><td>G : 0</td><td>H : 0</td></tr><tr><td>I : 0</td><td>J : 0</td><td>K : 0</td><td>L : 0</td></tr></table>	A : 0	B : 3	C : 3	D : 0	E : 0	F : 0	G : 0	H : 0	I : 0	J : 0	K : 0	L : 0																														
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STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Carefully breaking down and removing from site</u>				
2	Half brick walls in beamfilling	m2	37		
	A : 4 B : 9 C : 9 D : 9				
	E : 0 F : 0 G : 4 H : 2				
	I : 0 J : 0 K : 0 L : 0				
3	One brick walls in beamfilling	m2	25		
	A : 5 B : 5 C : 5 D : 5				
	E : 0 F : 0 G : 3 H : 1				
	I : 0 J : 0 K : 0 L : 0				
	<u>Carefully take out and remove</u>				
4	Timber single door and steel frame 813 x 2032mm high overall from one brick wall to remain, including temporary propping and preparing opening to receive new frame (elsewhere measured)	No	3		
	A : 0 B : 0 C : 0 D : 0				
	E : 0 F : 0 G : 2 H : 1				
	I : 0 J : 0 K : 0 L : 0				
5	Door lock and furniture and preparing to receive new (elsewhere measured)	No	8		
	A : 2 B : 2 C : 2 D : 0				
	E : 0 F : 0 G : 2 H : 0				
	I : 0 J : 0 K : 0 L : 0				
6	Gypsum plasterboard or fibre cement ceilings including cornices and cover strips from brandering to remain, including preparing branders for new ceiling (elsewhere measured)	m2	590		
	A : 80 B : 170 C : 170 D : 170				
	E : 0 F : 0 G : 0 H : 0				
	I : 0 J : 0 K : 0 L : 0				
Carried Forward to Bill Summary					R
Bill No. 2					
Alterations (Provisional)					

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>Taking off/out/down and removing from site</u>				
7	Chalkboard and frame exceeding 2.5m2 and not exceeding 5m2, including making good to plaster, etc. A : 1 B : 2 C : 1 D : 2 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	No	6	
8	Pinboard and frame exceeding 2.5m2 and not exceeding 5m2, including making good to plaster, etc. A : 1 B : 2 C : 2 D : 2 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	No	7	
9	Asbestos roof sheeting including timber purlins, underlay, etc complete and the provision of a certificate of safe disposal for asbestos. (measured on flat) A : 0 B : 0 C : 170 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	m2	170	
10	Sheet iron roof sheeting including timber purlins, underlay, etc complete. (measured on flat) A : 80 B : 170 C : 0 D : 170 E : 0 F : 0 G : 64 H : 0 I : 0 J : 0 K : 0 L : 0	m2	484	
11	uPVC, fibre-cement or sheet metal rainwater pipes and holder bats A : 2 B : 2 C : 2 D : 2 E : 0 F : 0 G : 2 H : 0 I : 0 J : 0 K : 0 L : 0	m	10	
12	uPVC, fibre-cement or sheet metal rainwater gutters A : 10 B : 17 C : 17 D : 17 E : 0 F : 0 G : 8 H : 0 I : 0 J : 0 K : 0 L : 0	m	69	
Carried Forward to Bill Summary				R
Bill No. 2 Alterations (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
13	Fibre-cement fascia and barge boards	m	102	
	A : 18 B : 22 C : 22 D : 22 E : 0 F : 0 G : 18 H : 0 I : 0 J : 0 K : 0 L : 0			
	<u>Carefully taking out and removing doors and frames from brickwork to remain (new door and frame measured elsewhere)</u>			
14	Timber single door and frame not exceeding 2,5m ²	No	4	
	A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 4 H : 0 I : 0 J : 0 K : 0 L : 0			
15	Steel security gate and frame not exceeding 2,5m ²	No	4	
	A : 0 B : 0 C : 2 D : 0 E : 0 F : 0 G : 2 H : 0 I : 0 J : 0 K : 0 L : 0			
	<u>Carefully taking out and removing</u>			
16	Glass from steel windows including cleaning out rebates and preparing for new glass (elsewhere measured)	m2	17	
	A : 0 B : 2 C : 2 D : 1 E : 8 F : 0 G : 4 H : 0 I : 0 J : 0 K : 0 L : 0			
17	Putty from existing glazed window frames, prepare rebates for and re-putty.	m	145	
	A : 15 B : 30 C : 8 D : 30 E : 15 F : 0 G : 46 H : 0 I : 0 J : 0 K : 0 L : 0			
18	Window sliding stay	No	23	
	A : 2 B : 5 C : 5 D : 5 E : 0 F : 0 G : 6 H : 0 I : 0 J : 0 K : 0 L : 0			
Carried Forward to Bill Summary				R
Bill No. 2 Alterations (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
19	Window latch	No	23		
	A : 2 B : 5 C : 5 D : 5				
	E : 0 F : 0 G : 6 H : 0				
	I : 0 J : 0 K : 0 L : 0				
20	Air vents	No	4		
	A : 0 B : 0 C : 0 D : 0				
	E : 0 F : 0 G : 0 H : 4				
	I : 0 J : 0 K : 0 L : 0				
	<u>Taking out/off and removing sanitary fittings including making good wall finishes, temporarily stopping off services and re-connecting to new fittings (paintwork & new fittings elsewhere measured)</u>				
21	Polyethylene pit WC pedestal and footpiece and preparing opening to receive new (elsewhere measured)	No	6		
	A : 0 B : 0 C : 0 D : 0				
	E : 0 F : 0 G : 6 H : 0				
	I : 0 J : 0 K : 0 L : 0				
	<u>PREPARATORY WORK TO EXISTING SURFACES</u>				
	<u>Hack up/off and remove floor screeds, plaster and prepare surfaces for new</u>				
22	25mm Screed from floors	m2	56		
	A : 0 B : 24 C : 16 D : 16				
	E : 0 F : 0 G : 0 H : 0				
	I : 0 J : 0 K : 0 L : 0				
Carried Forward to Bill Summary					R
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STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>REMEDIAL WORK</u>				
<u>Make good internal cement plaster</u>				
23	Chase out plaster down to brick face $\pm$ 100mm wide either side of crack to form recess, insert galvanised chicken mesh strip and re-plaster with 1:4 cement mortar, including floating up smooth to match existing	m	26	
	A : 0 B : 2 C : 10 D : 14			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
<u>TEMPORARY BARRIERS, SCREENS, ETC</u>				
<u>Temporary barriers, screens, etc including removal and allow for re-use</u>				
24	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 maximum 3m spacing	m	44	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 44			
	I : 0 J : 0 K : 0 L : 0			
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Alterations (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>TEMPORARY ACCOMMODATION</u>				
<u>Provide temporary accommodation units (park homes) for Educational Facilities during construction in phases as herein measured, including levelling of area, positioning on site, two tier steps for access and connected to electrical supply. Park homes to be standard classroom size and need to be minimum 7m x 7m or nearest standard size</u>				
25	Rental of temporary accommodation unit approximate size 7m x 7m wide, including standard windows, burglar bars, curtains and tracks, two tier steps for access, light fittings and electrical certificate of compliance, for a period of Twelve (12) calender months	No	1	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 1 J : 0 K : 0 L : 0			
26	Electrical Compliance Certificate	No	1	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 1 J : 0 K : 0 L : 0			
27	Transportation and establishment on site and de-establishment on completion, temporary accommodation units approximate size 7 x 7m	No	1	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 1 J : 0 K : 0 L : 0			
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Bill No. 2				
Alterations (Provisional)				

Bill No. 2

Alterations (Provisional)

BILL SUMMARY

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Bill No. 2

Alterations (Provisional)

<u>Item No</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>BILL NO. 3</u>			
<u>EARTHWORKS (PROVISIONAL)</u>			
<u>MODEL PREAMBLES</u>			
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			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Nature of ground</u>			
The nature of the ground is assumed to be sandy, therefore "soft excavation", but possibly interspersed with "intermediate material" or "hard rock"			
<u>Carting away</u>			
Descriptions of carting away of excavated material shall be deemed to include loading excavated material onto trucks directly from the excavations or, alternatively, from stock piles situated on the building site			
<u>Filling</u>			
Before any material is used for filling the full test results of such materials must be submitted to the Employer for his approval and prices are to include therefore. All filling material to be supplied by the Contractor , shall be found by him and shall be his sole responsibility.			
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Bill No. 3 Earthworks (Provisional)			

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

Item No					Quantity	Rate	Amount																																																				
Location Key																																																											
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EXCAVATION, FILLING, ETC																																																											
<u>Excavation in soft material not exceeding 2 metres deep below natural or reduced ground level for</u>																																																											
1	Reduce levels under surface bed			m3	18																																																						
	A : 0	B : 9	C : 9	D : 0																																																							
	E : 0	F : 0	G : 0	H : 0																																																							
	I : 0	J : 0	K : 0	L : 0																																																							
<u>Filling, etc</u>																																																											
<u>Approved earth filling supplied by the Contractor, well watered and compacted in layers not exceeding 150mm to a density as specified</u>																																																											
2	G5 Filling under surface beds and compacted to 98% MOD AASHTO			m3	18																																																						
	A : 0	B : 9	C : 9	D : 0																																																							
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Bill No. 3																																																											
Earthworks (Provisional)																																																											

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>River sand filling supplied by the Contractor</u>			
3	25mm Thick under solid floors, etc. A : 0 B : 31 C : 31 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	m2 61		
	<u>Compaction of surfaces</u>			
4	Scarify to a depth of 150mm and level and re-compact earth to 93% MOD AASHTO A : 0 B : 31 C : 31 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	m2 61		
	<u>SOIL POISONING</u>			
	<u>Apply 'Chlorodane' or 'aldrin' soil insecticides in strict accordance with manufacturers instructions and SABS 1164-1165.</u>			
5	Termite poisoning of ground surfaces under solid floors A : 0 B : 31 C : 31 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	m2 61		
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Bill No. 3 Earthworks (Provisional)				

Bill No. 3

Earthworks (Provisional

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Earthworks (Provisional

<u>Item No</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>BILL NO. 4</u>			
<u>CONCRETE, FORMWORK & REINFORCEMENT (PROVISIONAL)</u>			
<u>MODEL PREAMBLES</u>			
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			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Concrete</u>			
<u>In situ concrete</u>			
All concrete work will be done in accordance with the applicable departmental specifications and SABS 1200G and where any discrepancies occur the former shall take preference			
<u>Cement</u>			
Cement must be Portland cement in accordance with SABS 471, unless otherwise described			
<u>Formwork</u>			
The vertical strutting shall be carried down to such construction as is sufficiently strong to afford the required support without damage and shall remain in position until the newly constructed work is able to support itself.			
Formwork to sides of bases, pile caps, ground beams, etc will only be measured where it is prescribed by the engineer for design reasons. Formwork necessitated by irregularity or collapse of excavated faces will not be measured and the cost thereof shall be deemed to be included in the allowance for taking the risk of collapse of the sides of the excavations, provision for which is made in "Earthworks"			
Formwork must be considered to be propped up to heights not exceeding 3,5m high unless otherwise stated.			
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Concrete, Formwork & Reinforcement (Provisional)			

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>																										
	Where rough formwork has been used after stripping thereof the concrete shall immediately be well wetted and wire brushed whilst the concrete is still green and then slushed over with 2:1 cement grout to form a key for finishes. Where smooth formwork is used, concrete surfaces shall be hacked adequately and a 13mm thick (3:1) sand cement plaster applied in one coat and finished smooth, even and level with a wood trowel at no extra cost to the employer. Decorative features in concrete shall be priced as part of the formwok. <u>Location Key</u> <table><tr><th><u>Key</u></th><th><u>Description</u></th></tr><tr><td>A</td><td>1 Classroom</td></tr><tr><td>B</td><td>2 Classrooms</td></tr><tr><td>C</td><td>2 Classrooms</td></tr><tr><td>D</td><td>2 Classrooms</td></tr><tr><td>E</td><td>Building</td></tr><tr><td>F</td><td>Building</td></tr><tr><td>G</td><td>4 Classrooms</td></tr><tr><td>H</td><td>Standard Park Home</td></tr><tr><td>I</td><td>Preliminaries</td></tr><tr><td>J</td><td>Provisional Sums</td></tr><tr><td>K</td><td>External Works</td></tr><tr><td>L</td><td>Electrical Installation</td></tr></table>	<u>Key</u>	<u>Description</u>	A	1 Classroom	B	2 Classrooms	C	2 Classrooms	D	2 Classrooms	E	Building	F	Building	G	4 Classrooms	H	Standard Park Home	I	Preliminaries	J	Provisional Sums	K	External Works	L	Electrical Installation			
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	<u>REINFORCED CONCRETE</u> <u>Concrete Class 25/19 in</u>																													
1	Surface beds	m3	6																											
	A : 0 B : 3 C : 3 D : 0																													
	E : 0 F : 0 G : 0 H : 0																													
	I : 0 J : 0 K : 0 L : 0																													
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	Concrete, Formwork & Reinforcement (Provisional)																													
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>TEST CUBES</u>				
2	Allow for preparing set of three 152 x 152 x 152mm concrete test cubes cast from batches of concrete required for the contract as specified, made, stored, cured and tested in accordance with SABS methods 861 and 863 including use of approved cube moulds, transporting, paying all charges and submitting reports to Employer (Provisional)	No	1	
	A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 1 L : 0			
<u>MOVEMENT JOINTS, ETC (PROVISIONAL)</u>				
<u>Saw cut joints and reaming</u>				
3	3 x 25mm Saw cut joints in top of concrete	m	31	
	A : 0 B : 15 C : 15 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0			
<u>CONCRETE SUNDRIES</u>				
<u>Finishing top surfaces of concrete</u>				
4	Power float finish to surface beds, slabs, etc	m2	61	
	A : 0 B : 31 C : 31 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0			
<u>STEEL REINFORCEMENT (PROVISIONAL)</u>				
<u>Mesh reinforcement in concrete surface beds, slabs, etc.</u>				
5	Mesh reinforcement ref 245	m2	61	
	A : 0 B : 31 C : 31 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0			
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Concrete, Formwork & Reinforcement (Provisional)

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>BILL NO. 5</u>			
	<u>MASONRY (PROVISIONAL)</u>			
	<u>MODEL PREAMBLES</u>			
	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			
	<u>SUPPLEMENTARY PREAMBLES</u>			
	<u>Sizes in descriptions</u>			
	Where sizes in descriptions are given in brick units, "one brick" shall represent the length and "half brick" the width of a brick			
	<u>Bricks</u>			
	Clay and concrete bricks are to comply with NHBC Part 2, Section 3			
	<u>Bagged and sealed walls</u>			
	Walls in two skins described as "bagged and sealed" shall be deemed to include having the outer face of the inner skin bagged with 1:6 cement and sand mixture and sealed with two coats bitumen emulsion waterproofing coating			
	<u>Face bricks</u>			
	Bricks shall be ordered timeously to obtain uniformity in size and colour			
	<u>Hollow walls etc</u>			
	Descriptions of hollow walls shall be deemed to include leaving every fifth perpend of the bottom course of the external skin open as a weep hole.			
	<u>Pointing</u>			
	All pointing of exposed joints to be concave			
	Carried Forward to Bill Summary			
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	Masonry (Provisional)			
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STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>																																																												
	<u>Samples</u> Samples of all masonry building units, except those of walls described as "load bearing", shall consist of a minimum of 6 units. Samples of building units to be used in walls described as "load bearing" shall consist of 30 units from every 30 000 units delivered to site <u>Location Key</u> <table><tr><th><u>Key</u></th><th><u>Description</u></th></tr><tr><td>A</td><td>1 Classroom</td></tr><tr><td>B</td><td>2 Classrooms</td></tr><tr><td>C</td><td>2 Classrooms</td></tr><tr><td>D</td><td>2 Classrooms</td></tr><tr><td>E</td><td>Building</td></tr><tr><td>F</td><td>Building</td></tr><tr><td>G</td><td>4 Classrooms</td></tr><tr><td>H</td><td>Standard Park Home</td></tr><tr><td>I</td><td>Preliminaries</td></tr><tr><td>J</td><td>Provisional Sums</td></tr><tr><td>K</td><td>External Works</td></tr><tr><td>L</td><td>Electrical Installation</td></tr></table>	<u>Key</u>	<u>Description</u>	A	1 Classroom	B	2 Classrooms	C	2 Classrooms	D	2 Classrooms	E	Building	F	Building	G	4 Classrooms	H	Standard Park Home	I	Preliminaries	J	Provisional Sums	K	External Works	L	Electrical Installation																																					
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	<u>BRICKWORK</u> <u>Brickwork of NFP bricks in class II mortar:</u> <table><tr><td>1</td><td>Half brick wall in beamfilling</td><td>m2</td><td>37</td><td></td></tr><tr><td></td><td>A : 4 B : 9 C : 9 D : 9</td><td></td><td></td><td></td></tr><tr><td></td><td>E : 0 F : 0 G : 4 H : 2</td><td></td><td></td><td></td></tr><tr><td></td><td>I : 0 J : 0 K : 0 L : 0</td><td></td><td></td><td></td></tr><tr><td>2</td><td>Half brick bund wall</td><td>m2</td><td>9</td><td></td></tr><tr><td></td><td>A : 0 B : 4 C : 4 D : 0</td><td></td><td></td><td></td></tr><tr><td></td><td>E : 0 F : 0 G : 0 H : 0</td><td></td><td></td><td></td></tr><tr><td></td><td>I : 0 J : 0 K : 0 L : 0</td><td></td><td></td><td></td></tr><tr><td>3</td><td>One brick wall in beamfilling</td><td>m2</td><td>25</td><td></td></tr><tr><td></td><td>A : 5 B : 5 C : 5 D : 5</td><td></td><td></td><td></td></tr><tr><td></td><td>E : 0 F : 0 G : 3 H : 1</td><td></td><td></td><td></td></tr><tr><td></td><td>I : 0 J : 0 K : 0 L : 0</td><td></td><td></td><td></td></tr></table>	1	Half brick wall in beamfilling	m2	37			A : 4 B : 9 C : 9 D : 9					E : 0 F : 0 G : 4 H : 2					I : 0 J : 0 K : 0 L : 0				2	Half brick bund wall	m2	9			A : 0 B : 4 C : 4 D : 0					E : 0 F : 0 G : 0 H : 0					I : 0 J : 0 K : 0 L : 0				3	One brick wall in beamfilling	m2	25			A : 5 B : 5 C : 5 D : 5					E : 0 F : 0 G : 3 H : 1					I : 0 J : 0 K : 0 L : 0						
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STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
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Item No		Quantity	Rate	Amount
<u>BRICKWORK SUNDRIES</u>				
<u>Galvanised hoop iron cramps, ties, etc</u>				
4	30 x 1,6mm Roof tie 1,5m long with one end built 6 courses into brickwork and other end wrapped around and nailed to timber rafter	No	112	
	A : 16 B : 28 C : 28 D : 28			
	E : 0 F : 0 G : 12 H : 0			
	I : 0 J : 0 K : 0 L : 0			
<u>AIR BRICKS</u>				
5	229x152mm Terra-cotta vermin proof air brick	No	4	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 4			
	I : 0 J : 0 K : 0 L : 0			
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Bill No. 5
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Item No	Quantity	Rate	Amount
BILL NO. 6			
WATERPROOFING			
PREAMBLES			
The Model Preambles for Trades (2008 edition) as published by the Association of South African Quantity Surveyors shall be deemed to be incorporated in these bills of quantities and no claims arising from brevity of description of items fully described in the said Model Preambles will be entertained <u>Descriptions and Preambles</u> Tenderers are referred to Trades to follow hereafter for preambles and full descriptions of materials and items not fully described in this Trade and which shall apply equally to work in this Trade, unless otherwise described. <u>Trade Names and Proprietary Products:</u> All descriptions or clauses where trades names or proprietary products are specified, are deemed to include the phrase "or other approved". Waterproofing of roofs, basements, etc shall be laid under a ten year guarantee. Waterproofing to roofs shall be laid to even falls to outlets etc with necessary ridges, hips and valleys. Descriptions of sheet or membrane waterproofing shall be deemed to include additional labour to turn-ups and turn-downs			
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Bill No. 6 Waterproofing (Provisional)			

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<u>Item No</u>					<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>Location Key</u>							
<u>Key</u>	<u>Description</u>						
A	1	1 Classroom					
B	2	2 Classrooms					
C	3	2 Classrooms					
D	4	2 Classrooms					
E	5	Building					
F	6	Building					
G	7	4 Classrooms					
H	8	Standard Park Home					
I		Preliminaries					
J		Provisional Sums					
K		External Works					
L		Electrical Installation					
<u>DAMPPROOFING OF WALLS AND FLOORS</u>							
<u>375µm Brikgrip DPC embossed black polyethylene sheeting</u>							
1	One layer to walls, under sills, etc.				m2	4	
	A : 0	B : 2	C : 2	D : 0			
	E : 0	F : 0	G : 0	H : 0			
	I : 0	J : 0	K : 0	L : 0			
<u>250µm Gunplas USB Green polyethylene waterproof sheeting, with minimum 200mm overlaps at intersections, sealed at laps with Gunplas pressure sensitive tape</u>							
2	One layer damp proofing under surface beds				m2	61	
	A : 0	B : 31	C : 31	D : 0			
	E : 0	F : 0	G : 0	H : 0			
	I : 0	J : 0	K : 0	L : 0			
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<u>Item No</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>JOINT SEALANTS ETC. (PROVISIONAL)</u>					
<u>"Sikaflex Pro 3 I-Cure" or similar approved joint sealant in</u>					
3	10 x 10mm In expansion joints in floors	m	34		
	A : 0 B : 17 C : 17 D : 0				
	E : 0 F : 0 G : 0 H : 0				
	I : 0 J : 0 K : 0 L : 0				
4	6 x 10mm Sealant in horizontal saw cut floor joint 13mm deep	m	65		
	A : 0 B : 32 C : 32 D : 0				
	E : 0 F : 0 G : 0 H : 0				
	I : 0 J : 0 K : 0 L : 0				
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Bill No. 6
Waterproofing (Provisional)

Item No	Quantity	Rate	Amount
BILL NO. 7			
ROOF COVERINGS (PROVISIONAL)			
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 Profile			
The roof sheeting shall be GRS or similar approved IBR 686 profile from certified ZincAL® 0.55mm steel. A certificate verifying compliance shall be issued by the manufacturer. The profile shall have 5 trapezoidal ribs at 171.5mm centres giving a net cover of 686mm with each pan incorporating a stiffener rib. The rib height shall be 37mm			
Material and Finish for IBR 686 Roof Sheeting			
ZincAL AZ150 coated steel G550 with a ColorPLUS colour coated finish to one side with a Cool Grey backing coat			
Fixing IBR 686 profile ZincAL AZ150			
The sheeting shall be laid with side-laps on the leeward side of the prevailing wind direction. An approved side-lap sealant shall be incorporated on roofing with a pitch of less than 15 degrees. All fixing holes shall be drilled and not punched. Roof sheets shall be fixed by means of No.14 Topspeed Hex Head screws 65mm long for steel purlins or 90mm long for timber purlins and shall incorporate 19mm diameter galvanised washers with rubber gasket . Side-lap stitching shall be effected at no more than 600mm centres with 25mm long Topspeed Hex Head screws and shall incorporate 19mm diameter galvanised washers with rubber gasket .			
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Bill No. 7 Roof Coverings (Provisional)			

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<u>Item No</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
Roof sheets shall additionally be fixed through each rib to the furthestmost eaves purlin as well as apex purlin by means of No.14 Topspeed Hex Head screws 65mm long for steel purlins or 90mm long for timber purlins and shall also incorporate 19mm diameter galvanised washers with rubber gasket. <u>IBR 686 profile ZincAL AZ150 Flashings</u> Stop endings must be formed at apex to form a dam and the pan turned down to form drip. The roof sheeting shall be closed as necessary with purpose made flashings and shall incorporate serrated closers and poly closers where necessary. Flashing shall be fixed to roofing by means of No. 14 Topspeed Hex head screws 25mm long with 19mm diameter galvanised washers with rubber gaskets on roof and for side cladding <u>Safety</u> The contractor shall exercise special care when handling long length sheeting, particularly in windy conditions. Should work be interrupted for any reason, all loose sheeting and incomplete sections must be adequately secured against possible movement by wind and gravity <u>Installation</u> Every precaution shall be taken to prevent damage to roof sheets during all stages of construction. Duck boards should be used when necessary to protect the sheeting from damage. Sheeting which has become deformed or damaged in any way, should be replaced. Care shall be taken to ensure that no sheeting or flashing will be cut with abrasive disc on roof surfaces in order to prevent steel particles from penetrating coated surfaces			
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Bill No. 7 Roof Coverings (Provisional)			

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<u>Item No</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>Handling and Storage</u>			
The contractor shall ensure that all materials used on site for cladding, etc. are transported, handled and stored in accordance with the manufacturer's recommendations. Material damaged shall be rejected and replaced with undamaged material at the contractor's expense. Repair of damaged material will not generally be permitted. Rates are to include for preventing damage and protecting sheets through all stages of construction			
<u>Guarantee</u>			
IBR 686 profile ZincAL AZ150 or equal approved sheeting shall be laid in strict accordance with manufacturer's specifications by an approved contractor. The employer shall be provided with a ten year written guarantee on materials and a five year written guarantee on workmanship and water-tightness after final inspection of the roofs, by the manufacturer			
<u>Inspection Prior to Installation or Erection</u>			
Before commencing with installation, the contractor shall verify that the following items have been checked and accepted:			
a. The entire structure or the portion thereof to be sheeted has been correctly aligned, levelled and grouted			
b. Purlins and sheeting rails are at the correct spacing and are within the specified tolerances			
c. The corners of the roof are square and the wall framework is perpendicular or as specified			
d. No protrusions such as bolt heads, splice plates, cleats, etc. appear on the face of the framework			
e. All members to which roofing and cladding are to be fixed in aesthetically sensitive areas are true and square			
f. Paint and any other materials that may be incompatible with the sheeting, have been painted over or so dealt with that direct contact with the sheeting is avoided			
g. The contact faces between the purlins or girts and the cladding are in the same plane. Should the alignment be inadequate, the contractor shall request instructions from the engineer before proceeding with the fixing of the cladding			
Carried Forward to Bill Summary			R
Bill No. 7			
Roof Coverings (Provisional)			

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>Protrusion through Sheeted Surfaces</u>			
Protrusions such as pipes, ducts and the like, shall be adequately flashed where they pass through the sheeting surface. Where ribs have to be cut away to permit penetration, additional framing is to be installed as required to support the sheeting. Depending on the position of the penetration through the roof, special attention shall be given to back flashing the sheeting to the ridge or point of water entry. In all cases, all cutting and flashings shall be so arranged that adequate provision is made for the drainage of all troughs and corrugations			
<u>Quality Assurance</u>			
The manufacturer shall be assessed and certified as comply with ISO 9001:2008 Quality Management System			
<u>Cleaning of Roofs, etc</u>			
All debris arising from the fixing of the cladding shall be removed from the sheeting as the fixing progresses. In addition, off-cuts of insulation, surplus fasteners and sealants, mandrels from pop rivets, off-cuts of flashings and sheeting, surplus flashing, food packaging, cartoons, bottles, cans, etc. shall not be left on the roof or in the gutters. Care shall be taken to ensure that no such material enters, blocks or partially impedes the flow of water into the outlets, downpipes, etc.			
<u>Location Key</u>			
<u>Key</u>	<u>Description</u>		
A	1	1 Classroom	
B	2	2 Classrooms	
C	3	2 Classrooms	
D	4	2 Classrooms	
E	5	Building	
F	6	Building	
G	7	4 Classrooms	
H	8	Standard Park Home	
I		Preliminaries	
J		Provisional Sums	
K		External Works	
L		Electrical Installation	
Carried Forward to Bill Summary			R
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Roof Coverings (Provisional)			

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

Item No		Quantity	Rate	Amount
	<u>PROFILED METAL SHEETING AND ACCESSORIES</u>			
	<u>Roof sheeting shall be IBR 686 roll-formed from certified ZincAL AZ150 coated steel G550 0.55mm (Heavy Industrial) with an approved colour ColorPLUS finish to one side and standard Cool Grey backing coat to other side, fixed in single lengths to steel/timber purlins/girts using class 3 fasteners in strict accordance with the manufacturer's specification for coastal areas by an approved Contractor (all bending of troughs to form dams and drips to be included in the rate for the sheeting)</u>			
1	Roof covering with pitch not exceeding 25 degrees A : 88 B : 188 C : 188 D : 188 E : 0 F : 0 G : 71 H : 0 I : 0 J : 0 K : 0 L : 0	m2	722	
	<u>Flashings shall be manufactured from ZincAL AZ150 coated steel G550 0.55mm (Heavy Industrial) with an approved colour ColorPLUS finish to one side and standard Cool Grey backing coat to other side and fixed in strict accordance with the manufacturer's specification</u>			
2	Ridge Cap 462mm girth 3 times bent including broad flute serrated closers and Poly-Closers A : 10 B : 17 C : 17 D : 17 E : 0 F : 0 G : 8 H : 0 I : 0 J : 0 K : 0 L : 0	m	69	
3	Sondor polyclosures to match profile of roof sheeting A : 20 B : 34 C : 34 D : 34 E : 0 F : 0 G : 16 H : 0 I : 0 J : 0 K : 0 L : 0	m	138	
4	Barge Flash 462mm girth 1 times bent A : 18 B : 22 C : 22 D : 22 E : 0 F : 0 G : 18 H : 0 I : 0 J : 0 K : 0 L : 0	m	102	
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Bill No. 7 Roof Coverings (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
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MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
5	Broad flute serrated closer to match profile of roof sheeting A : 20 B : 34 C : 34 D : 34 E : 0 F : 0 G : 16 H : 0 I : 0 J : 0 K : 0 L : 0	m	138	
<u>ROOF AND WALL INSULATION</u>				
<u>Approved heavy duty industrial grade double-sided fire retardant foil laminate under-roof insulation</u>				
6	Insulation laid taut over trusses or rafters (at approximately 750mm centres) and fixed under purlins concurrent with roof covering including galvanised steel straining wires at 500mm centres. A : 80 B : 170 C : 170 D : 170 E : 0 F : 0 G : 64 H : 0 I : 0 J : 0 K : 0 L : 0	m2	654	
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Bill No. 7 Roof Coverings (Provisional)				

Bill No. 7
Roof Coverings (Provisional)

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Bill No. 7
Roof Coverings (Provisional)

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>BILL NO. 8</u>			
	<u>CARPENTRY AND JOINERY</u>			
	<u>(PROVISIONAL)</u>			
	<u>MODEL PREAMBLES</u>			
	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			
	<u>Location Key</u>			
	<u>Key</u>	<u>Block</u>	<u>Description</u>	
	A	1	1 Classroom	
	B	2	2 Classrooms	
	C	3	2 Classrooms	
	D	4	2 Classrooms	
	E	5	Building	
	F	6	Building	
	G	7	4 Classrooms	
	H	8	Standard Park Home	
	I		Preliminaries	
	J		Provisional Sums	
	K		External Works	
	L		Electrical Installation	
	<u>ROOF CONSTRUCTION</u>			
	<u>Grade S5 Treated Sawn South African Pine</u>			
1	38 x 114mm Rafters	m	48	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 48 H : 0			
	I : 0 J : 0 K : 0 L : 0			
2	38 x 114mm Bearer between trusses for gutter fixing	m	35	
	A : 5 B : 9 C : 9 D : 9			
	E : 0 F : 0 G : 4 H : 0			
	I : 0 J : 0 K : 0 L : 0			
	Carried Forward to Bill Summary			R
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	Carpentry & Joinery (Provisional)			

STORM DAMAGE TO SCHOOLS: PHASE 14
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
3	50 x 76mm Cross bracing to trusses A : 40 B : 85 C : 85 D : 85 E : 0 F : 0 G : 32 H : 0 I : 0 J : 0 K : 0 L : 0	m	327	
4	50 x 76mm Barge board trimmer battens A : 18 B : 22 C : 22 D : 22 E : 0 F : 0 G : 18 H : 0 I : 0 J : 0 K : 0 L : 0	m	102	
5	50 x 76mm Gable trims A : 18 B : 22 C : 22 D : 22 E : 0 F : 0 G : 18 H : 0 I : 0 J : 0 K : 0 L : 0	m	102	
6	50 x 76mm Purlins A : 100 B : 170 C : 170 D : 170 E : 0 F : 0 G : 80 H : 0 I : 0 J : 0 K : 0 L : 0	m	690	
7	50 x 76mm Splayed eaves purlins A : 20 B : 34 C : 34 D : 34 E : 0 F : 0 G : 16 H : 0 I : 0 J : 0 K : 0 L : 0	m	138	
8	50 x 50mm Fascia stiffening purlins A : 20 B : 34 C : 34 D : 34 E : 0 F : 0 G : 16 H : 0 I : 0 J : 0 K : 0 L : 0	m	138	
9	50 x 50mm Fascia hangers in short lengths A : 3 B : 6 C : 6 D : 6 E : 0 F : 0 G : 2 H : 0 I : 0 J : 0 K : 0 L : 0	m	22	
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Bill No. 8 Carpentry & Joinery (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>ROOF SUNDRIES</u>				
10	Two coats Carbolinium on sawn roof timbers A : 32 B : 51 C : 51 D : 51 E : 0 F : 0 G : 41 H : 0 I : 0 J : 0 K : 0 L : 0	m2	227	
11	Approved galvanised steel two way hurricane clips A : 160 B : 280 C : 280 D : 280 E : 0 F : 0 G : 120 H : 0 I : 0 J : 0 K : 0 L : 0	No	1,120	
<u>EAVES, VERGES, ETC</u>				
<u>Approved Fibre-cement Fascias & Barge Boards</u>				
<u>Fibre cement fascia boards, medium density plain, fittings and fixing accessories fixed to timber supporting structure with Ø4mm x 50mm long galvanised mild steel counter sunk screws or to steel supporting structure with Ø6mm x 30mm long galvanised mild steel bolts, nuts and washers (Supporting structure measured elsewhere), inclusive of plastic H-profile fascia joiners</u>				
12	10 x 225mm Fascia boards fixed to timber supporting structure with 4mm diameter x 50mm long galvanised mild steel counter sunk screws A : 20 B : 34 C : 34 D : 34 E : 0 F : 0 G : 16 H : 0 I : 0 J : 0 K : 0 L : 0	m	138	
Carried Forward to Bill Summary				R
Bill No. 8 Carpentry & Joinery (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

Item No		Quantity	Rate	Amount
	<u>Fibre cement fascia boards, medium density plain (used as barge boards), fittings and fixing accessories fixed to timber supporting structure with Ø4mm x 50mm long galvanised mild steel counter sunk screws, or to steel supporting structure with Ø6mm x 30mm long galvanised mild steel bolts, nuts and washers (Supporting structure measured elsewhere), inclusive of plastic H-profile fascia joiners and cutting and waste at apex/</u>			
13	12 x 300mm Fascia boards fixed to timber supporting structure with Ø4mm x 50mm long galvanised mild steel counter sunk screws	m	102	
	A : 18 B : 22 C : 22 D : 22 E : 0 F : 0 G : 18 H : 0 I : 0 J : 0 K : 0 L : 0			
	<u>FLUSH DOORS</u>			
	<u>Semi-solid core flush panel door with hardwood edge strips and commercial ply finish suitable for painting both sides hung to steel frames:</u>			
14	40mm Thick door, size 762 x 1982mm	No	4	
	A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 4 H : 0 I : 0 J : 0 K : 0 L : 0			
	<u>FRAMED DOORS, ETC.</u>			
	<u>Wrot Meranti framed, ledged and braced batten doors hung to steel frames:</u>			
15	40mm Framed, ledged and braced batten door size 813 x 2032mm high of 40 x 110mm wide top rail and stiles, 20 x 150mm middle ledge, 20 x 225mm bottom ledge and 20 x 110mm braces	No	3	
	A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 2 H : 1 I : 0 J : 0 K : 0 L : 0			
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Carpentry & Joinery (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
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 MANQONDO JUNIOR PRIMARY SCHOOL
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>BUMPER RAILS</u>			
16	Purpose made 200mm wide bumper rails ex 19mm shutterboard with slightly rounded exposed edges fixed to walls with countersunk and pelleted plugs and screws	m	178	
	A : 26 B : 54 C : 44 D : 54			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
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Carpentry & Joinery (Provisional)

STORM DAMAGE TO SCHOOLS: PHASE 14
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MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>BILL NO. 5</u>			
<u>CEILINGS</u>			
<u>CEILINGS, PARTITIONS & ACCESS FLOORING (PROVISIONAL)</u>			
<u>MODEL PREAMBLES</u>			
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			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Descriptions</u>			
Items described as "nailed" shall be deemed to be fixed with hardened steel nails or pins or shot pinned to brickwork or concrete			
<u>Trade Names</u>			
Where trade names are specified equal materials approved by the Principal Agent may be used			
<u>Location Key</u>			
<u>Key</u>	<u>Block</u>	<u>Description</u>	
A	1	1 Classroom	
B	2	2 Classrooms	
C	3	2 Classrooms	
D	4	2 Classrooms	
E	5	Building	
F	6	Building	
G	7	4 Classrooms	
H	8	Standard Park Home	
I		Preliminaries	
J		Provisional Sums	
K		External Works	
L		Electrical Installation	
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Bill No. 9 Ceilings, Partitions & Access Flooring (Provisional)			

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>BRANDERED CEILINGS</u>				
<u>Approved 9.5mm Gypsum plasterboard ceilings including 38 x 50mm sawn softwood brander at 450mm centres in one direction to trusses</u>				
1	Ceilings including 38 x50mm sawn softwood brander at 450mm centres in one direction to trusses	m2	590	
	A : 80 B : 170 C : 170 D : 170			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
<u>Cornices</u>				
2	Approved 75mm paper-covered polystyrene core cornice glued to ceiling board and to wall with an approved acrylic filler and adhesive	m	258	
	A : 36 B : 74 C : 74 D : 74			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
<u>Trapdoors</u>				
3	Extra over ceiling for 600 x 600mm trap door of 32 x 44mm wrought hardwood rebated framing and 38 x 114mm sawn softwood kerb spiked to rafters, etc., and filled in with matching ceiling board in opening.	No	7	
	A : 1 B : 2 C : 2 D : 2			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
Carried Forward to Bill Summary				R
Bill No. 9				
Ceilings, Partitions & Access Flooring (Provisional)				

Bill No. 9
Ceilings, Partitions & Access Flooring (Provisional)

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Bill No. 9
Ceilings, Partitions & Access Flooring (Provisional)

<u>Item No</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>BILL NO. 9</u>			
<u>IRONMONGERY (PROVISIONAL)</u>			
<u>MODEL PREAMBLES</u>			
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			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Keys/locks</u>			
Each lock is to be distinctly numbered with consecutive numbers and each key is to be stamped with corresponding number to the lock that it controls. All locks are to have two keys			
<u>Trade Names</u>			
Where trade names are specified equal materials approved by the Principal Agent may be used			
<u>Fixing</u>			
Fixing of ironmongery is deemed to be fixed to timber unless otherwise described			
<u>Location Key</u>			
<u>Key</u>	<u>Block</u>	<u>Description</u>	
A	1	1 Classroom	
B	2	2 Classrooms	
C	3	2 Classrooms	
D	4	2 Classrooms	
E	5	Building	
F	6	Building	
G	7	4 Classrooms	
H	8	Standard Park Home	
I		Preliminaries	
J		Provisional Sums	
K		External Works	
L		Electrical Installation	
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Bill No. 10 Ironmongery (Provisional)			

STORM DAMAGE TO SCHOOLS: PHASE 14
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MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>LOCKS AND HANDLES</u>				
1	Approved door lock and handle set comprising satin chromed cast zinc handles and galvanised 4-lever mortice lock case	No	11	
	A : 2 B : 2 C : 2 D : 0			
	E : 0 F : 0 G : 4 H : 1			
	I : 0 J : 0 K : 0 L : 0			
2	Approved silver anodised aluminium Indicator Bolt as per ASSA ABLOY Code: AL8294AS or similar	No	4	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 4 H : 0			
	I : 0 J : 0 K : 0 L : 0			
<u>HINGES, BOLTS, ETC.</u>				
3	Approved 38mm diameter rubber door stop, plugged and screwed to wall with 50mm long brass screw	No	4	
	A : 0 B : 0 C : 2 D : 0			
	E : 0 F : 0 G : 2 H : 0			
	I : 0 J : 0 K : 0 L : 0			
4	Approved 150mm satin chrome plated brass cabin hook and eye fixed on and including 200 x 114 x 38mm Meranti block with chamfered edges and bolted to brickwork with two M13 x 100mm expansion bolts	No	4	
	A : 0 B : 0 C : 2 D : 0			
	E : 0 F : 0 G : 2 H : 0			
	I : 0 J : 0 K : 0 L : 0			
5	Approved 175mm brass plated window sliding stay to match existing	No	23	
	A : 2 B : 5 C : 5 D : 5			
	E : 0 F : 0 G : 6 H : 0			
	I : 0 J : 0 K : 0 L : 0			
6	Approved brass window latch to match existing	No	23	
	A : 2 B : 5 C : 5 D : 5			
	E : 0 F : 0 G : 6 H : 0			
	I : 0 J : 0 K : 0 L : 0			
Carried Forward to Bill Summary				R
Bill No. 10 Ironmongery (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>PINNING BOARDS, WRITING BOARDS, PROJECTION SCREENS, ETC</u>			
	<u>Vitrex or similar approved boards including all fixing to brickwork in accordance with the manufacturer's instructions</u>			
7	Model 2100 chalkboard overall size 4800 x 1200mm high comprising <u>two</u> Code 2109 boards fixed side-by- side, complete with continuous anodised aluminium chalk rail A : 1 B : 2 C : 1 D : 2 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	No 6		
8	Model 2300, Code 2309 pinboard overall size 2400 x 1200mm high A : 1 B : 2 C : 2 D : 2 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	No 7		
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Bill No. 10

Ironmongery (Provisional)

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Ironmongery (Provisional)

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>BILL NO. 10</u>			
	<u>METALWORK (PROVISIONAL)</u>			
	<u>MODEL PREAMBLES</u>			
	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			
	<u>Descriptions and Preambles</u>			
	Tenderers are referred to Trades to follow hereafter for preambles and full descriptions of materials and items not fully described in this Trade and which shall apply equally to work in this Trade, unless otherwise described.			
	<u>Trade Names and Proprietary Products:</u>			
	All descriptions or clauses where trades names or proprietary products are specified, are deemed to include the phrase "or other approved".			
	<u>Location Key</u>			
	<u>Key</u>	<u>Block</u>	<u>Description</u>	
	A	1	1 Classroom	
	B	2	2 Classrooms	
	C	3	2 Classrooms	
	D	4	2 Classrooms	
	E	5	Building	
	F	6	Building	
	G	7	4 Classrooms	
	H	8	Standard Park Home	
	I		Preliminaries	
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STORM DAMAGE TO SCHOOLS: PHASE 14
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>HOT DIPPED GALVANIZED STEEL DOOR FRAMES</u>			
	<u>1,2mm Double rebated frames with mitred, welded and reinforced corners and fitted with one-and-a-half pairs of 100mm five-knuckle loose pin steel hinges for each door or each leaf of double doors, and with one pair of 75mm five-knuckle loose pin steel hinges for each fanlight, suitable for half brick walls:</u>			
1	Frame for door 762 x 2032mm high A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 4 H : 0 I : 0 J : 0 K : 0 L : 0	No	4	
	<u>1,2mm Double rebated frames with mitred, welded and reinforced corners and fitted with one pair of 100mm five-knuckle loose pin steel hinges for each door or each leaf of double doors, suitable for one brick walls:</u>			
2	Frame for door 813 x 2032mm high A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 2 H : 1 I : 0 J : 0 K : 0 L : 0	No	3	
Carried Forward to Bill Summary				R
Bill No. 11 Metalwork (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>HOT DIP GALVANISED WELDED SECURITY GATES</u>			
	<u>Security gate comprising 40 x 40 x 3mm square tubing frame with two 40 x 6mm horizontal flat bar rails and 19mm diameter vertical bars equally spaced at 110mm centres, hung to and including 45 x 45 x 3mm square section frame with three 25mm diameter x 80mm bullet hinges, bolted to wall with eight M13 x 100mm expansion bolts with heads tack welded to prevent removal, including padlock sliding pin and holding lug, complete with suitable approved padlock</u>			
3	Gate size 843mm x 2250mm high	No	4	
	A : 0 B : 0 C : 2 D : 0 E : 0 F : 0 G : 2 H : 0 I : 0 J : 0 K : 0 L : 0			
	<u>STEEL MESH REINFORCEMENT BURGLAR PROOFING</u>			
	<u>Mesh reinforcement in confined roof space above ceilings fixed to timber truss tie-beams</u>			
4	Mesh reinforcement Ref. 617	m2	136	
	A : 0 B : 0 C : 136 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0			
	<u>PROVISIONAL AMOUNTS</u>			
	<u>Smart Interactive Board</u>			
5	Allow the Provisional Amount of R120 000.00 for the supply and installation of one (1) smart interactive board (screen) to be installed in the team teaching or general multi-purpose classroom or standard classroom as directed	Item		120,000.00
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	Bill No. 11			
	Metalwork (Provisional)			

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MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
6	Allow for Profit and Attendance on the abovementioned Amount A : 0.00 B : 0.00 C : 0.10 D : 0.00 E : 0.00 F : 0.00 G : 0.00 H : 0.00 I : 0.00 J : 0.00 K : 0.00 L : 0.00	%		
7	Allow the Provisional Amount for training to be given on the functioning of the smart interactive screen	Item		10,000.00
8	Allow for Profit and Attendance on the abovementioned Amount A : 0.00 B : 0.00 C : 0.10 D : 0.00 E : 0.00 F : 0.00 G : 0.00 H : 0.00 I : 0.00 J : 0.00 K : 0.00 L : 0.00	%		
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Bill No. 11 Metalwork (Provisional)				

Bill No. 11

Metalwork (Provisional)

BILL SUMMARY

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Bill No. 11

Metalwork (Provisional)

Item
No

Quantity

Rate

Amount

BILL NO. 11

PLUMBING & DRAINAGE (PROVISIONAL)

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

Location Key

<u>Key</u>	<u>Block</u>	<u>Description</u>
A	1	1 Classroom
B	2	2 Classrooms
C	3	2 Classrooms
D	4	2 Classrooms
E	5	Building
F	6	Building
G	7	4 Classrooms
H	8	Standard Park Home
I		Preliminaries
J		Provisional Sums
K		External Works
L		Electrical Installation

RAINWATER DISPOSAL

0.6mm Extruded seamless aluminium gutters pre-painted with double coat Polymer Silicon baked enamel

- 1 150 x 150mm Square gutter fixed to falls with aluminium brackets screwed to eaves purlin/false timber through fibre cement fascia with galvanised screws OR bolted to fibre cement fascia or steel supporting structure with galvanised bolts, nuts and washers at 500mm centres

m

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A : 20	B : 34	C : 34	D : 34
E : 0	F : 0	G : 16	H : 0
I : 0	J : 0	K : 0	L : 0

Carried Forward to Bill Summary

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Bill No. 12
Plumbing & Drainage (Provisional)

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
2	Extra over gutter for 100 x 75mm outlet with nozzle	No	10	
	A : 2 B : 2 C : 2 D : 2			
	E : 0 F : 0 G : 2 H : 0			
	I : 0 J : 0 K : 0 L : 0			
3	Extra over gutter for drop-box	No	10	
	A : 2 B : 2 C : 2 D : 2			
	E : 0 F : 0 G : 2 H : 0			
	I : 0 J : 0 K : 0 L : 0			
4	Extra over gutter for stop end	No	20	
	A : 4 B : 4 C : 4 D : 4			
	E : 0 F : 0 G : 4 H : 0			
	I : 0 J : 0 K : 0 L : 0			
	<u>0.6mm Aluminium down pipes pre-painted internally and externally with double coat Polymer Silicon baked enamel</u>			
5	100 x 75mm Down pipe secured to wall at 1000mm centres with and including pre-painted aluminium straps fixed to walls with nail plugs and/or fixed to steel supports with galvanised self-tapping screws	m	35	
	A : 7 B : 7 C : 7 D : 7			
	E : 0 F : 0 G : 7 H : 0			
	I : 0 J : 0 K : 0 L : 0			
6	Extra over down pipe for bend	No	20	
	A : 4 B : 4 C : 4 D : 4			
	E : 0 F : 0 G : 4 H : 0			
	I : 0 J : 0 K : 0 L : 0			
7	Extra over down pipe for shoe	No	10	
	A : 2 B : 2 C : 2 D : 2			
	E : 0 F : 0 G : 2 H : 0			
	I : 0 J : 0 K : 0 L : 0			
	Carried Forward to Bill Summary			R
	Bill No. 12			
	Plumbing & Drainage (Provisional)			

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>SANITARY FITTINGS</u>				
<u>The following in waterless sanitary fittings fixed in position complete:</u>				
8	"Atlas Plastics" Model V.I.P. 200 pit pedestal and footpiece complete with seat and lid and setting in position over opening in concrete slab	No	6	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 6 H : 0			
	I : 0 J : 0 K : 0 L : 0			
<u>SANITARY PIPE WORK</u>				
<u>uPVC (S&V) pipes to comply with SABS 967</u>				
9	110mm Pipe in ventilation stack 3.5m high fixed vertically to wall at 1000mm centres with and including aluminium brackets	No	4	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 4 H : 0			
	I : 0 J : 0 K : 0 L : 0			
<u>Extra over uPVC (S&V) pipes for fittings:</u>				
10	110mm Air vent cowl	No	4	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 4 H : 0			
	I : 0 J : 0 K : 0 L : 0			
<u>PROVISIONAL AMOUNT</u>				
<u>Desludge Septic Tank</u>				
11	Allow the Provisional Amount of R10 000.00 for the desludging of existing Ablution Block Septic Tank			
		Item		10,000.00
12	Allow for Profit and Attendance on the abovementioned Amount		%	
	A : 0.00 B : 0.00 C : 0.00 D : 0.00			
	E : 0.00 F : 0.00 G : 0.10 H : 0.00			
	I : 0.00 J : 0.00 K : 0.00 L : 0.00			
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Bill No. 12 Plumbing & Drainage (Provisional)				

Bill No. 12

Plumbing & Drainage (Provisional)

BILL SUMMARY

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Bill No. 12

Plumbing & Drainage (Provisional)

Item
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BILL NO. 12

ELECTRICAL WORK (PROVISIONAL)

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

REPAIRS AND RENOVATIONS TO EXISTING BUILDINGS

Repair / Replace the electrical installation in Classrooms, Admin Blocks, Toilets, etc. that is to be refurbished or non-compliant in terms of SANS 10142-1. Note that all asbestos roofs on building are to be removed and replaced. Necessary safety gear to be used when working in this environment

The contractor is to Remove and replace existing Lighting fixtures, DB's and other outlets that are affected or non-compliant in terms of SANS codes. Rates are to include for removing and re-fixing existing fixtures to new positions where applicable. All installations to be made safe in terms of SANS 10142-1

Location Key

<u>Key</u>	<u>Block</u>	<u>Description</u>
A	1	1 Classroom
B	2	2 Classrooms
C	3	2 Classrooms
D	4	2 Classrooms
E	5	Building
F	6	Building
G	7	4 Classrooms
H	8	Standard Park Home
I		Preliminaries
J		Provisional Sums
K		External Works
L		Electrical Installation

Carried Forward to Bill Summary

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Bill No. 13
Electrical Work (Provisional)

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>CONDUIT AND CONDUIT BOXES</u>				
<u>Remove & replace PVC conduit in walls, floors or ceiling spaces as specified for lighting, small power and other auxiliary outlets, including couplings, bushes, bending, drawboxes and fixing, etc in accordance with non-metallic conduit and accessories as per SANS 950</u>				
1	P8000 Galvanised Trunking complete with Cover A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 200	m	200	
2	20mm PVC conduit A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 320	m	320	
3	20mm Bozal conduit A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 40	m	40	
4	20mm PVC round boxes complete with lids & mounting screws A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 40	No	40	
5	100 x 100 x 50 mm deep mounted on surface for isolators / SSO units A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 20	No	20	
Carried Forward to Bill Summary				R
Bill No. 13 Electrical Work (Provisional)				

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>DUCTING AND POWER SKIRTING</u>				
<u>Supply and installation of surface mounted power skirting as specified in detail specification, complete with cover plates - plug assemblies not included.</u>				
6	3 Compartment galvanised and painted power skirting (Grey)	m	70	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 70			
7	Power skirting Inside and Outside corners	No	10	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 10			
8	Power skirting End Caps	No	10	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 10			
9	Power skirting Cover Plates	No	10	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 10			
10	Power skirting Conduit Entry Boxes	No	10	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 10			
Carried Forward to Bill Summary				R
Bill No. 13 Electrical Work (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>CIRCUIT WIRING</u>				
	<u>Supply and install copper PVC insulated conductors in conduit or trunking system in walls, floors or in roof space for lights, plugs and power points, including connection to switches and equipment.</u>				
11	1,5 mm²		m	3,600	
	A : 0	B : 0	C : 0	D : 0	
	E : 0	F : 0	G : 0	H : 0	
	I : 0	J : 0	K : 0	L : 3600	
12	2,5mm²		m	3,600	
	A : 0	B : 0	C : 0	D : 0	
	E : 0	F : 0	G : 0	H : 0	
	I : 0	J : 0	K : 0	L : 3600	
13	4,0mm²		m	3,600	
	A : 0	B : 0	C : 0	D : 0	
	E : 0	F : 0	G : 0	H : 0	
	I : 0	J : 0	K : 0	L : 3600	
	<u>LIGHTING EQUIPMENT</u>				
	<u>Remove existing light fitting & replace with existing or with new lighting fixtures. Located in ceilings and/or walls</u>				
	<u>Re-install Existing Fittings</u>				
14	Remove and re-install existing light fitting due to replacement of ceilings or due to loose fixing in ceiling or wall.		No	52	
	A : 0	B : 0	C : 0	D : 0	
	E : 0	F : 0	G : 0	H : 0	
	I : 0	J : 0	K : 0	L : 52	
	Carried Forward to Bill Summary				R
Bill No. 13 Electrical Work (Provisional)					

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>Supply & Install New Light Fittings</u>			
15	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. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 48	No	48	
16	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 18W Cool White. Colour black or as per architect. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 18	No	18	
17	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 18W Cool White. Colour black or as per architect. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 6	No	6	
Carried Forward to Bill Summary				R
Bill No. 13 Electrical Work (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
18	Type D. Post Top mounted luminaire, Including pole, 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 18W 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. Price to include pole complete with fitting. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 1	No	1	
19	Type E. Pole mounted flood-light luminaire, including pole, 2 x High-pressure die-cast aluminium light fitting. Heat & impact resistant diffuser. Minimum IP 65 compartments for lamp and control gear, with stainless steel screws including finger grips for aiming luminaire. All external bolts to be stainless steel. Minimum 20 000lm. Cool White. Colour Black or as per architect. Mounted on 4.6m Pole at 4m mounting height. Price to include pole, complete with 2x 250W Metal Halide fittings, lamp, electronic control gear and all necessary accessories. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 1 <u>Re-lamp existing lights with lamps as noted below:</u>	No	1	
20	230V, 11W ES/BC Compact Fluorescent lamps. Colour Cool White. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 48	No	48	
21	230V, 1500mm T5 Fluorescent Tubes. Colour Cool White A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 48	No	48	
Carried Forward to Bill Summary				R
Bill No. 13 Electrical Work (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>MISCELLANEOUS</u>				
22	Administration Block Alarm System including connection cables A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 1	No	1	
23	Telephone Distribution Board A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 1	No	1	
24	School Siren and Push Button with Latch in Timer A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 1	No	1	
25	50mm PVC Sleeve A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 10	m	10	
<u>DISTRIBUTION BOARDS</u>				
<u>Remove and replace distribution boards, complete with doors where applicable, frames, subframes, chassis, fixtures, fittings, spare space, busbar etc. as per specification and drawings. All shop drawings to be approved prior to manufacture . Refer to Schematic for full details and cicuit breaker count.</u>				
26	Wall mounted Fan A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 5	No	5	
27	16 Way Surface Mounted A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 4	No	4	
Carried Forward to Bill Summary				R
Bill No. 13 Electrical Work (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
28	12 Way Surface Mounted A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 3	No	3	
29	Allow for Municipal Eskom Meter A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 1 <u>Upgrade DB to bring up to SANS standard and Supply & Install circuit breakers as required. All circuit breakers to match DB kA rating with minimum 6kA Schneider/ CBI breakers. To include all wiring, labels, blanks and safety labels for DB.</u>			SUM
30	15Amp single phase Circuit breaker A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 16	No	16	
31	20Amp single phase Circuit breaker A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 16	No	16	
32	60Amp double pole Earth Leakage Unit A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 4	No	4	
33	Class II 10kA single pole SPD unit A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 4	No	4	
34	60Amp three phase 4-pole main Circuit Breaker A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 4	No	4	
Carried Forward to Bill Summary				R
Bill No. 13 Electrical Work (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>			<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
35	40Amp Double pole Single Phase Main Circuit breaker	No	4		
	A : 0 B : 0 C : 0 D : 0				
	E : 0 F : 0 G : 0 H : 0				
	I : 0 J : 0 K : 0 L : 4				
	<u>LIGHT SWITCHES</u>				
	<u>Remove and replace, 16 Amp light switches in existing flush 50 x 100 x 50mm boxes, including white coloured cover plates.</u>				
36	Single Lever, one way switch	No	24		
	A : 0 B : 0 C : 0 D : 0				
	E : 0 F : 0 G : 0 H : 0				
	I : 0 J : 0 K : 0 L : 24				
37	Two Lever one way switch	No	24		
	A : 0 B : 0 C : 0 D : 0				
	E : 0 F : 0 G : 0 H : 0				
	I : 0 J : 0 K : 0 L : 24				
38	IP65 Single Lever switch	No	4		
	A : 0 B : 0 C : 0 D : 0				
	E : 0 F : 0 G : 0 H : 0				
	I : 0 J : 0 K : 0 L : 4				
39	One Lever two way switch	No	8		
	A : 0 B : 0 C : 0 D : 0				
	E : 0 F : 0 G : 0 H : 0				
	I : 0 J : 0 K : 0 L : 8				
	<u>SWITCHED SOCKET OUTLETS</u>				
	<u>Remove and replace 16Amp switched socket outlets in existing 100 x 100 x 50mm boxes with white coloured cover plates</u>				
40	16 Amp 3 pin double SSO (White)	No	16		
	A : 0 B : 0 C : 0 D : 0				
	E : 0 F : 0 G : 0 H : 0				
	I : 0 J : 0 K : 0 L : 16				
Carried Forward to Bill Summary					R
Bill No. 13 Electrical Work (Provisional)					

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
41	16 Amp 3 pin Single (White) A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 16 <u>Supply, installation and connection of 16Amp switched socket outlets in single, two or three compartment power skirting</u> <u>Provisional - for changes in Computer Room</u>	No	16	
42	16 Amp 3-pin single (White) A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 1	No	1	
43	16Amp 3 pin dedicated complete with plug top (Red) A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 24	No	24	
44	Cradles and Blank covers for telephone/data outlet points. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 4	No	4	
45	RJ45 Data Outlet complete with cover A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 24	No	24	
46	RJ11 Telephone Outlet complete with Cover A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 24	No	24	
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Bill No. 13 Electrical Work (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>ISOLATORS</u>				
<u>Remove and replace isolator in GRP extension box. To be supplied complete with 100 x 100 x 50mm box</u>				
47	30 Amp 2 pole 230V A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 8	No	8	
48	30 Amp 2 pole 230V, weather proof A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 8	No	8	
<u>PHOTO CELLS</u>				
49	Replace 10 Amp day light switch per SANS 1777 A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 8	No	8	
<u>EARTHING, BONDING AND LIGHTNING PROTECTION</u>				
<u>Install Earthing & Lightning Protection per SANS 10313, 62305 and 10142. To be undertaken by specialist earthing and lightning contractor. Refer to specification Part A. Item 14.</u>				
50	Ø8mm Aluminium lightning protection conductor. To include all holding down clamps, down conductors and bonding to earth ring A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 120	m	120	
51	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. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 32	No	32	
Carried Forward to Bill Summary				R
Bill No. 13 Electrical Work (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
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MANQONDO JUNIOR PRIMARY SCHOOL
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
52	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. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 32	No	32	
53	50mm ² stranded BCEW down conductor in surface mounted PVC conduit complete with saddles. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 120	m	120	
54	1200mm x 16mm diameter Copper earth electrodes driven in ground, including 'Cadweld' joining sleeves as required. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 32	No	32	
<u>LOW VOLTAGE CABLES</u>				
<u>Supply and installation and termination of copper PVC/SWA/ECC cables laid in ducts, trenches, horizontal racks or vertical ducts. Rates shall include the supply and fixing of supports with regard to installation of cables. Rates shall include the PVC cable ties as required. All cables are Copper PVC/SWA/ECC cables per SANS 1507.</u>				
55	6.0mm x 3 Core ECC. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 100	m	100	
56	6.0mm x 3 Core ECC - (Termination) A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 2	No	2	
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Bill No. 13 Electrical Work (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
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MANQONDO JUNIOR PRIMARY SCHOOL
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
57	16mm x 3 Core ECC. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 100	m	100	
58	16mm x 3 Core ECC - (Termination) A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 2	No	2	
<u>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.</u>				
59	In soft or pickable soil A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 45	m3	45	
60	Soft Rock A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 15	m3	15	
61	Hard Rock A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 15	m3	15	
62	Warning tape installed 300mm below ground level, above cables in trench A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 150	m	150	
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Bill No. 13 Electrical Work (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>TESTING & COMMISSIONING</u>				
63	Test and commission complete installation as per SANS 10142-1.		SUM	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 1			
64	Provide Certificate of Compliance (CoC) as per SANS 10142-1. One for each DB and the associated circuits connected to the DB and one for the overall installation		SUM	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 1			
65	Provide Earthing certificate for entire site, to include earth resistance test of each down conductor earth electrode, measured by an Earthing specialist by means of an approved instrument.		SUM	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 1			
66	Remove all redundant equipment, store and dispose at an approved dump site. A disposal certificate to be supplied.		SUM	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 1			
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Electrical Work (Provisional)				

Bill No. 13

Electrical Work (Provisional)

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Bill No. 13
Electrical Work (Provisional)

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>BILL NO. 13</u>			
	<u>PLASTERING (PROVISIONAL)</u>			
	<u>MODEL PREAMBLES</u>			
	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			
	<u>Location Key</u>			
	<u>Key</u>	<u>Block</u>	<u>Description</u>	
	A	1	1 Classroom	
	B	2	2 Classrooms	
	C	3	2 Classrooms	
	D	4	2 Classrooms	
	E	5	Building	
	F	6	Building	
	G	7	4 Classrooms	
	H	8	Standard Park Home	
	I		Preliminaries	
	J		Provisional Sums	
	K		External Works	
	L		Electrical Installation	
	<u>SCREEDS</u>			
	<u>(1:4) Cement mortar screeds finished with a steel trowel on concrete:</u>			
1	25mm Thick on floors	m2	56	
	A : 0	B : 24	C : 16	D : 16
	E : 0	F : 0	G : 0	H : 0
	I : 0	J : 0	K : 0	L : 0
	Carried Forward to Bill Summary			R
	Bill No. 14 Plastering (Provisional)			

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>INTERNAL PLASTER</u>				
<u>One coat (1:4) cement plaster finished with a steel trowel</u>				
2	On walls	m2	80	
	A : 10 B : 10 C : 10 D : 10			
	E : 0 F : 0 G : 20 H : 20			
	I : 0 J : 0 K : 0 L : 0			
<u>EXTERNAL PLASTER</u>				
<u>One coat (1:4) cement plaster finished with a wood trowel</u>				
3	On walls	m2	80	
	A : 10 B : 10 C : 10 D : 10			
	E : 0 F : 0 G : 20 H : 20			
	I : 0 J : 0 K : 0 L : 0			
4	On narrow widths	m2	71	
	A : 9 B : 18 C : 18 D : 14			
	E : 0 F : 0 G : 7 H : 3			
	I : 0 J : 0 K : 0 L : 0			
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Plastering (Provisional)				

Bill No. 14

Plastering (Provisional)

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Bill No. 14
Plastering (Provisional)

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BILL NO. 11

GLAZING (PROVISIONAL)

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

Glazing Certificate of Compliance

The Tenderer shall provide a Certificate of Compliance signed by a registered member of SAGGA, confirming that the glazing complies with SANS 10400-N:2012

Location Key

<u>Key</u>	<u>Block</u>	<u>Description</u>
A	1	1 Classroom
B	2	2 Classrooms
C	3	2 Classrooms
D	4	2 Classrooms
E	5	Building
F	6	Building
G	7	4 Classrooms
H	8	Standard Park Home
I		Preliminaries
J		Provisional Sums
K		External Works
L		Electrical Installation

GLAZING TO STEEL WITH PUTTY

6.38mm Clear Safety Glass

1	Panes exceeding 0,1m ² and not exceeding 0,5m ²	m2	17
	A : 0 B : 2 C : 2 D : 1		
	E : 8 F : 0 G : 4 H : 0		
	I : 0 J : 0 K : 0 L : 0		

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Bill No. 15
Glazing (Provisional)

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>BILL NO. 12</u>			
	<u>PAINTWORK (PROVISIONAL)</u>			
	<u>MODEL PREAMBLES</u>			
	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			
	<u>SUPPLEMENTARY PREAMBLES</u>			
	<u>Trade Names</u>			
	Where trade names are specified, equal materials approved by the Principal Agent may be used			
	<u>Colours, etc.</u>			
	Unless otherwise described all paintwork shall be deemed to have colour value in excess of 7 on Munsell system in accordance with SANS 1091			
	<u>PREPARATORY WORK TO EXISTING WORK</u>			
	<u>Previously painted metal surfaces</u>			
	Surfaces shall be thoroughly rubbed and cleaned down. Blistered or peeling paint shall be completely removed down to bare metal			
	<u>Previously painted wood surfaces</u>			
	Surfaces shall be thoroughly cleaned down. Blistered or peeling paint shall be completely removed and cracks and crevices shall be primed, filled with suitable filler and finished smooth			
	Carried Forward to Bill Summary		R	
	Bill No. 16			
	Paintwork (Provisional)			

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>					<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>Location Key</u>							
<u>Key</u>	<u>Block</u>	<u>Description</u>					
A	1	1 Classroom					
B	2	2 Classrooms					
C	3	2 Classrooms					
D	4	2 Classrooms					
E	5	Building					
F	6	Building					
G	7	4 Classrooms					
H	8	Standard Park Home					
I		Preliminaries					
J		Provisional Sums					
K		External Works					
L		Electrical Installation					
<u>PAINTWORK TO PREVIOUSLY PAINTED WORK</u>							
<u>ON PLASTER, ETC.</u>							
<u>Prepare and brush surface to remove all loose contaminants, clean down, make good cracks and minor defects with an approved interior/exterior filler paste, apply one coat approved all-purpose plaster primer, one coat approved universal undercoat and two coats approved durable and washable pure acrylic emulsion sheen paint on:</u>							
1	Plastered walls internally				m2	935	
	A : 95	B : 196	C : 196	D : 196			
	E : 0	F : 0	G : 217	H : 34			
	I : 0	J : 0	K : 0	L : 0			
2	Plastered walls externally				m2	750	
	A : 113	B : 170	C : 170	D : 170			
	E : 0	F : 0	G : 85	H : 41			
	I : 0	J : 0	K : 0	L : 0			
Carried Forward to Bill Summary							R
Bill No. 16							
Paintwork (Provisional)							

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>ON METAL</u>				
<u>Prepare and brush surface to remove all loose contaminants, clean and apply one coat approved galvanised iron primer and two coats approved water-based enamel paint on:</u>				
3	Window frames (both sides measured)	m2	171	
	A : 21 B : 42 C : 42 D : 42			
	E : 0 F : 0 G : 18 H : 6			
	I : 0 J : 0 K : 0 L : 0			
4	Security gates (both sides measured)	m2	4	
	A : 0 B : 0 C : 4 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
5	Door frames	m2	15	
	A : 4 B : 4 C : 4 D : 4			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
<u>ON WOOD</u>				
<u>Prepare, sand and apply three coats approved exterior clear low-gloss finish polywax sealer with UV-protection and water repellence, sanding lightly between coats on :</u>				
6	Doors	m2	26	
	A : 7 B : 7 C : 7 D : 7			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
Carried Forward to Bill Summary				R
Bill No. 16				
Paintwork (Provisional)				

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>PAINTWORK TO NEW WORK</u>			
	<u>ON PLASTER, ETC.</u>			
	<u>Prepare and apply one coat approved all-purpose plaster primer, one coat approved universal undercoat and two coats approved durable and washable pure acrylic emulsion sheen paint on:</u>			
7	Plastered walls externally A : 9 B : 14 C : 14 D : 14 E : 0 F : 0 G : 7 H : 3 I : 0 J : 0 K : 0 L : 0	m2	62	
8	Gypsum plasterboard ceilings, coverstrips, cornices, etc., internally including priming and stopping up nail heads. A : 80 B : 170 C : 170 D : 170 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	m2	590	
9	Fibre-cement fascias & bargeboards A : 20 B : 30 C : 30 D : 30 E : 0 F : 0 G : 18 H : 0 I : 0 J : 0 K : 0 L : 0	m2	128	
	<u>ON METAL</u>			
	<u>Prepare and brush surface to remove all loose contaminants, clean and apply one coat approved galvanised iron primer and two coats approved water-based enamel paint on:</u>			
10	Door frames A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 4 H : 2 I : 0 J : 0 K : 0 L : 0	m2	6	
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Bill No. 16 Paintwork (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>ON WOOD</u>			
	<u>Prepare, sand and apply three coats approved exterior clear low-gloss finish polywax sealer with UV-protection and water repellence, sanding lightly between coats on :</u>			
11	Doors A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 19 H : 3 I : 0 J : 0 K : 0 L : 0	m2	22	
12	On bumper rails, skirtings, etc. not exceeding 300mm wide A : 26 B : 54 C : 44 D : 54 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	m	178	
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Bill No. 16 Paintwork (Provisional)				

Bill No. 16

Paintwork (Provisional)

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Bill No. 16

Paintwork (Provisional)

STORM DAMAGE TO SCHOOLS: PHASE 14
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MANQONDO JUNIOR PRIMARY SCHOOL
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<u>Item No</u>	<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>BILL NO. 13</u>			
<u>EXTERNAL WORKS (PROVISIONAL)</u>			
<u>MODEL PREAMBLES</u>			
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			
<u>SUPPLEMENTARY PREAMBLES</u>			
<u>Trade Names</u>			
Where trade names are specified equal materials approved by the Principal Agent may be used			
<u>Soil Poisoning Certificate</u>			
The Tenderer shall provide a Guarantee Certificate signed by an Applicator registered with the Department of Agriculture confirming that the service was carried out in accordance with Act HG36/1947- Department of Agriculture and SANS 10124:2006			
<u>Location Key</u>			
<u>Key</u>	<u>Block</u>	<u>Description</u>	
A	1	1 Classroom	
B	2	2 Classrooms	
C	3	2 Classrooms	
D	4	2 Classrooms	
E	5	Building	
F	6	Building	
G	7	4 Classrooms	
H	8	Standard Park Home	
I		Preliminaries	
J		Provisional Sums	
K		External Works	
L		Electrical Installation	
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External Works (Provisional)			

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
<u>RAINWATER TANKS & STANDS</u>				
1	Approved 5000 litre Polyethylene Low-Profile water tank with Ø40mm inlet, Ø40mm overflow and Ø40mm outlet, Ø480mm lid with 100 x 75mm opening for rainwater pipe and fitted with Ø20mm an approved threaded one piece uv stabilised ABS ball valve complete with 40/20mm uv stabilised ABS reducing bush, Ø20mm uv stabilised ABS long screw parallel thread and Ø20mm uv stabilised pp/nylon insert male elbow on outlet side of valve, embedded in pedestal to a minimum 400mm above ground level and tied down with 2 No. Ø4mm galvanised double strap stay wires tied to galvanised M12 eye bolts drilled and fixed to corners of concrete supporting base	No	8	
	A : 2 B : 2 C : 2 D : 2 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0			
<u>The following in Tank Stands</u>				
2	Excavations in earth not exceeding 2m deep for trenches	m3	39	
	A : 10 B : 10 C : 10 D : 10 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0			
3	Risk of collapse to sides of trench and hole excavations not exceeding 1,5m deep.	m2	111	
	A : 28 B : 28 C : 28 D : 28 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0			
4	Keeping excavations free of all water other than subterranean water	Item		
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Bill No. 17 External Works (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
5	Backfilling from excavated material to trenches, holes, etc. and compact to 95% Mod AASHTO density	m3	22	
	A : 5 B : 5 C : 5 D : 5			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
6	Filling from excavated material under water tank slab including levelling and compacting to 95% Mod AASHTO density	m3	5	
	A : 1 B : 1 C : 1 D : 1			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
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 AASHHTO density	m2	36	
	A : 9 B : 9 C : 9 D : 9			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
8	Apply Chlordane or Aldrin type soil insecticides in strict accordance with manufacturers instructions and complying with SANS Specifications 1165 and 1165 respectively, to ground surfaces under surface beds, etc.	m2	83	
	A : 21 B : 21 C : 21 D : 21			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
9	25MPa/19mm unreinforced concrete in strip footings	m3	12	
	A : 3 B : 3 C : 3 D : 3			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 0 L : 0			
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External Works (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
10	25MPa/19mm reinforced concrete in surface beds A : 1 B : 1 C : 1 D : 1 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	m3 4		
11	Finishing top surfaces of concrete smooth with a wood float to surface beds A : 9 B : 9 C : 9 D : 9 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	m2 36		
12	Smooth formwork to edges, risers, ends, etc. not exceeding 300mm high or wide A : 17 B : 17 C : 17 D : 17 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	m 68		
13	Ref 193 mesh reinforcement in concrete surface beds, slabs, etc. A : 9 B : 9 C : 9 D : 9 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	m2 36		
14	One brick wall in NFX clay bricks with 4:1 cement mortar A : 22 B : 22 C : 22 D : 22 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	m2 86		
15	Galvanised wire mesh reinforcement 150mm wide built into walls A : 63 B : 63 C : 63 D : 63 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0	m 253		
Carried Forward to Bill Summary				R
Bill No. 17 External Works (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
16	Extra over ordinary brickwork for approved Travertine FBA face brickwork	m2	59	
	A : 15 B : 15 C : 15 D : 15 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 0 L : 0			
<u>STORMWATER MANAGEMENT</u>				
<u>The following in cutting and shaping platforms to slope away from buildings</u>				
17	Cut, shape and compact in-situ material to 95% MOD AASHTO maximum density	m3	100	
	A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 100 L : 0			
18	Fill in-situ material from platform shaping in layers not exceeding 150mm and compact to 95% MOD AASHTO maximum density	m3	100	
	A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 100 L : 0			
19	Fill imported G7 quality material in layers not exceeding 150mm and compact to 95% MOD AASHTO maximum density	m3	25	
	A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 25 L : 0			
<u>STORMWATER DISPOSAL</u>				
<u>The following in V-drains</u>				
20	Excavate in earth not exceeding 2m deep to reduce levels under V-drains	m3	39	
	A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 39 L : 0			
Carried Forward to Bill Summary				R
Bill No. 17 External Works (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
21	Scarify to a depth of 150mm and level and re-compact earth to 93% MOD AASHTO	m2	525	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 525 L : 0			
22	G5 earthfilling under V-drains compacted to 95% Mod AASHTO density	m3	39	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 39 L : 0			
23	Reinforced concrete Class 25/19 in V-drains cast in panels to falls	m3	39	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 39 L : 0			
24	6 x 25mm Saw cut joints in top of concrete	m	131	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 131 L : 0			
25	Wood float finish to top of V-drains	m2	263	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 263 L : 0			
26	Mesh Ref. 193 in concrete V-drains	m2	263	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 263 L : 0			
27	Rough formwork to sides not exceeding 300mm high or wide	m	355	
	A : 0 B : 0 C : 0 D : 0			
	E : 0 F : 0 G : 0 H : 0			
	I : 0 J : 0 K : 355 L : 0			
Carried Forward to Bill Summary				R
Bill No. 17				
External Works (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
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MANQONDO JUNIOR PRIMARY SCHOOL
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<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
28	10mm Closed Cell expanded polyethylene foam in expansion/isolation joints not exceeding 300mm high A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 382 L : 0	m	382	
29	Sikaflex Pro 3 I-Cure polyurethane sealing compound in 10 x 10mm expansion joints including raking out polyethylene as necessary A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 382 L : 0	m	382	
<u>Stormwater Spreader</u>				
30	Class A galvanised Reno Mattress size 4m x 1m x 300mm deep with Kaytech U14 Bidim and filled with 100-250mm suitable un-weathered rock, erected in position complete, including all necessary excavation, levelling, scarifying, compacting, etc. A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 2 L : 0	No	2	
<u>Stormwater Disperser</u>				
31	Disperser 1500mm long tapering from 900mm to 1500mm wide x 150mm thick, complete with sixteen cement bricks embedded on-end into concrete and protruding 100mm minimum size 2m x 1m composed of two layers of rocks at end of stormwater channel A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 3 L : 0	No	3	
<u>V-Drain Crossings</u>				
32	2000x1500x6mm Hot dipped galvanised Vastrap plate complete with 70x70x3mm hot dipped galvanised steel angle section support frame A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 2 L : 0	No	2	
Carried Forward to Bill Summary				R
Bill No. 17 External Works (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>The following in Apron</u>			
33	Excavate in earth not exceeding 2m deep to reduce levels under aprons A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 18 L : 0	m3	18	
34	Scarify to a depth of 150mm and level and re-compact earth to 93% MOD AASHTO A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 235 L : 0	m2	235	
35	G5 earthfilling under V-drains compacted to 95% Mod AASHTO density A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 18 L : 0	m3	18	
36	Reinforced concrete Class 25/19 in aprons cast in panels to falls A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 18 L : 0	m3	18	
37	6 x 25mm Saw cut joints in top of concrete A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 59 L : 0	m	59	
38	Wood float finish to top of aprons A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 117 L : 0	m2	117	
39	Mesh Ref. 193 in concrete aprons A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 117 L : 0	m2	117	
Carried Forward to Bill Summary				R
Bill No. 17 External Works (Provisional)				

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
40	Rough formwork to sides not exceeding 300mm high or wide A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 72 L : 0	m	72	
41	10mm Closed Cell expanded polyethylene foam in expansion/isolation joints not exceeding 300mm high A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 113 L : 0	m	113	
42	Sikaflex Pro 3 I-Cure polyurethane sealing compound in 10 x 10mm expansion joints including raking out polyethylene as necessary A : 0 B : 0 C : 0 D : 0 E : 0 F : 0 G : 0 H : 0 I : 0 J : 0 K : 124 L : 0	m	124	
Carried Forward to Bill Summary				R
Bill No. 17 External Works (Provisional)				

Bill No. 17

External Works (Provisional)

BILL SUMMARY

Total Brought Forward from Page No.

**Page
No**

Amount

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Bill No. 17

External Works (Provisional)

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Item No</u>		<u>Quantity</u>	<u>Rate</u>	<u>Amount</u>
	<u>BILL NO. 14</u>			
	NOTE: The following allowances are for specialist activities to be performed <u>PROVISIONAL SUMS</u> <u>Asbestos Removal</u> 1 Allow the Sum of R100 000.00 for the Asbestos Inspection Authority (AIA) to be appointed by the Department of Public Works via the awarded contractor. The Awarded contractor will be expected to provide three (3) quotes for AIA services for approval and acceptance by the Department of Public Works and will then be appointed by the Contractor and paid by the Contractor . The appointed AIA and the appointed Asbestos contractor for removal and disposal will not be the same entity / company. Refer to duties for AIA and Asbestos contractor attached" The duties and responsibilities of the appointed AIA Inspection Authority are briefly the following in terms of the Asbestos Abatement Regulations of 2020: 1. If there is no Asbestos Inventory available, the AIA will develop the Inventory for the Client. 2. If there is an Asbestos Inventory, the AIA will review the Inventory and Risk Assessment and amend if needed. 3. Based on the Inventory, recommend an anticipated Scope of Work and advise the Client of what category of Asbestos Contractor needs to be appointed. 4. When the asbestos Contractor is appointed, in consultation with the Asbestos Contractor develop and approve the Plan of Work. 5. Upon approval of the Asbestos Plan, at least 7 days before work is scheduled to take place, submit the plan to Department of Employment and Labour. 6. Ensure that acknowledgement of the Work Plan Submission to the Department of Employment Carried Forward to Bill Summary Bill No. 18 Provisional Sums			
			R	

Bill No. 18

Provisional Sums

BILL SUMMARY

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No**

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Amount

Carried Forward to Project Summary

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Bill No. 18

Provisional Sums

STORM DAMAGE TO SCHOOLS: PHASE 14
ETHEKWINI REGION: CLUSTER 90
MANQONDO JUNIOR PRIMARY SCHOOL
WIMS NO. 063384

<u>Bill No</u>	<u>PROJECT SUMMARY</u>	<u>Page No</u>	<u>Amount</u>
1	Preliminaries	1	
2	Alterations (Provisional)	13	
3	Earthworks (Provisional)	17	
4	Concrete, Formwork & Reinforcement (Provisional)	21	
5	Masonry (Provisional)	25	
6	Waterproofing (Provisional)	29	
7	Roof Coverings (Provisional)	36	
8	Carpentry & Joinery (Provisional)	42	
9	Ceilings, Partitions & Access Flooring (Provisional)	45	
10	Ironmongery (Provisional)	49	
11	Metalwork (Provisional)	54	
12	Plumbing & Drainage (Provisional)	58	
13	Electrical Work (Provisional)	73	
14	Plastering (Provisional)	76	
15	Glazing (Provisional)	77	
16	Paintwork (Provisional)	83	
17	External Works (Provisional)	93	
18	Provisional Sums	96	
	VALUE OF BUILDERS WORK		R
	Value Added Tax (15%)		R
	TOTAL PROJECT COST		R
	 Carried Forward to Final Summary of Cluster 90		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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS		
Tender no:	ZNTD 05381W	Project Code:	063384
1	<u>SECTION 1</u> <u>EXTENT OF THE WORKS</u> 1.1 EMPLOYERS OBJECTIVES Repairs and renovations to storm damaged schools including the provision of new facilities (where applicable). Refer to Scope Of Works. 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. 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 The site for Manqondo Primary School is situated at Location grid – AI30 of the Kwazulu-Natal School's Field Guide in Ilembe District in the Ndwedwe Circuit. Access to the school is via the R614 teeing off on 60km of gravel road, then through district roads which are mainly blacktoppe except for the last 200m. The GPS Coordinates S 29 28' 59.9" E 30 39' 43.4" 1.5 TEMPORARY WORKS All temporary work to comply with the Occupational Health and safety Act (Act 85 of 1993)		
2	<u>ENGINEERING</u> 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	<u>PROCUREMENT</u>
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	<u>CONSTRUCTION</u>
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: <table border="0"> <thead> <tr> <th><u>SPECIFICATION</u></th><th><u>PAGES</u></th></tr> </thead> <tbody> <tr> <td>Specification for HIV/AIDS Awareness (CIDB)</td><td>HIV1 TO HIV3</td></tr> <tr> <td>Specific Construction, Safety, Health and Environmental Plan</td><td></td></tr> <tr> <td>Model Preambles for Trades 2008</td><td>1 to 49</td></tr> <tr> <td>General Electrical Specification</td><td>E/1 to E/20</td></tr> <tr> <td>Lightning Protection Installation</td><td>LP/1 to LP/6</td></tr> <tr> <td>Project Specifications for electrical work</td><td></td></tr> </tbody> </table>	<u>SPECIFICATION</u>	<u>PAGES</u>	Specification for HIV/AIDS Awareness (CIDB)	HIV1 TO HIV3	Specific Construction, Safety, Health and Environmental Plan		Model Preambles for Trades 2008	1 to 49	General Electrical Specification	E/1 to E/20	Lightning Protection Installation	LP/1 to LP/6	Project Specifications for electrical work	
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General Electrical Specification	E/1 to E/20														
Lightning Protection Installation	LP/1 to LP/6														
Project Specifications for electrical work															
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	<u>MANAGEMENT</u>														
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 <u>SECTION 2</u> <u>SPECIFICATION DATA ASSOCIATED WITH SANS 1921-2004</u>
Clause Numbers	4.1.7 The requirements for drawings, information and calculations for which the Contractor is responsible
	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:
	Ilifa Africa Engineers (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: <table border="0"> <tr> <td>- Tile sample.</td><td>- Roof sheeting sample</td></tr> <tr> <td>- Brick sample.</td><td>- Gutter sample</td></tr> <tr> <td>- Light fitting sample.</td><td>- Door sample</td></tr> <tr> <td>- Screed panel 2m x 2m impact test.</td><td>- Ironmongery sample</td></tr> <tr> <td>- Tested trial mix to be approved by the Engineer.</td><td></td></tr> </table> 4.12.2 Fabrication drawings that the contractor is to provide to the employer are: None	- Tile sample.	- Roof sheeting sample	- Brick sample.	- Gutter sample	- Light fitting sample.	- Door sample	- Screed panel 2m x 2m impact test.	- Ironmongery sample	- Tested trial mix to be approved by the Engineer.	
- Tile sample.	- Roof sheeting sample										
- Brick sample.	- Gutter sample										
- Light fitting sample.	- Door sample										
- Screed panel 2m x 2m impact test.	- Ironmongery sample										
- Tested trial mix to be approved by the Engineer.											
4.12.3	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 alternative but prior permission of the Employer will be necessary before construction of such an office is commenced and his requirements shall be stated and fulfilled by the Contractor. 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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS		
Tender no:	ZNTD 05381W	Project Code:	063384

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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS		
Tender no:	ZNTD 05381W	Project Code:	063384

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

Project Code:	063384
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).

[illegible]

For Contractor:

Date: _____

Employer's representative:

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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS		
Tender No.	ZNTD 05381W	Project Code:	063384
C4.1 Site Information			
C4.1 (a) (b) (c)	GENERAL Manqondo Primary school is set on a flat slope on a sandy, non-erodible soil type. There are no waterways running through or close to the property that could cause flooding. 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 of material on site would not be problematic and the contractor must provide to create a workable space which will not disrupt the operation of the school or endanger the learners on the premises. The working area must also be clearly demarcated and entrance to the Works must be controlled. The school is situated towards the North West of Tongaat in a rural area. The school is situated in a rural setting approximately 21 km away from Tongaat Industrial Area and has 119 learners. 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 the blocks would be determined once the contractor is on site and the contractor and the Principal of the school have coordinated how the contractor would get possession of each block. The contractor will then 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 work may commence.		
C4.2 (a)	GEOTECHNICAL INVESTIGATION REPORT 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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS

Tender No.:	ZNTD 05381W	Project Code:	063384
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(Where drawings/annexure's are issued, document compilers must insert the following paragraph and list the applicable drawings/annexure's below.)

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

<u>DRAWING NO</u>	<u>DESCRIPTION</u>
-------------------	--------------------

[illegible]

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



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
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**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM
DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST
REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

PART C5.2 - PROVISIONAL SITE PLAN

C5.2 - PROVISIONAL SITE PLAN GCC FOR CONSTRUCTION WORKS (2 Edition of 2010)

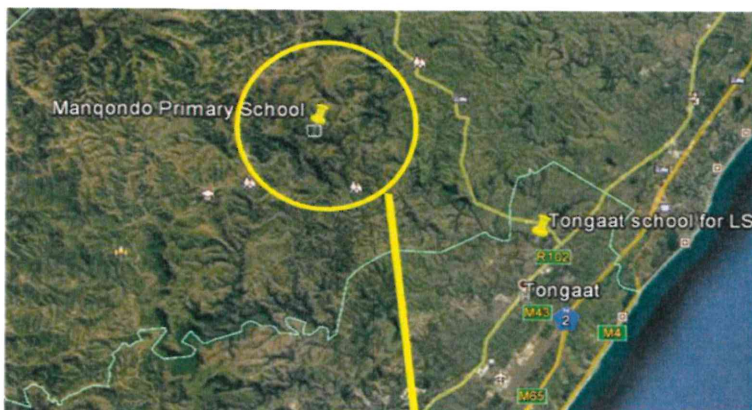
**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION:
CLUSTER 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

Tender No.:

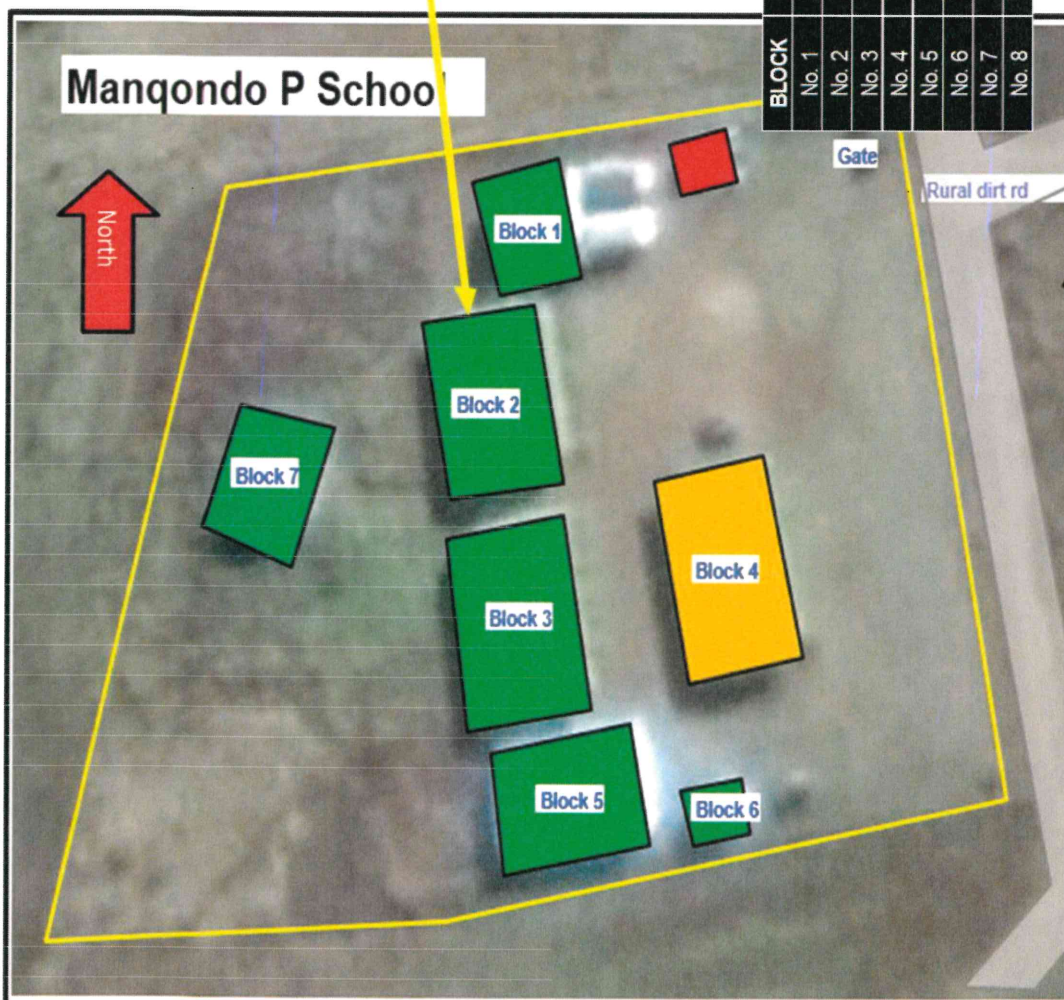
ZNTD 05381W

Project Code:

063384



DESCRIPTION
1 x Classrooms
2 x Classrooms
2 x Classrooms
2 x Classrooms
Building
Building
4 x Classrooms
Standard Park Home - Principal's Office



Site Layout Schedule

Manqondo Primary School - Coordinates: S 29 28' 59.9" E 30 39' 43.4"



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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

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 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS**

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: _____

Effective date November 2008

ISBN 978-0-620-1663-4

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

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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 outcrop 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 0,03m³ 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. CONSTRUCTION

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 0,033m³

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 9m²

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 compressive 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. Perpend 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 m² 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 m² 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 1978/12-29, 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 6m² 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 6m² 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

O.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
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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 rechargeable 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

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

Fibre-cement, concrete, pitch-impregnated fibre and vitrified clay pipes for use under ground in non-pressure pipe lines

Cast iron for use above ground

Cast iron for use below ground

Galvanized mild steel

Joints between pipes of different materials shall be as follows:

Between cast iron and mild steel

Between cast iron and clay

Between mild steel or copper and clay

Joints

Flexible joints in accordance with the manufacturer's instructions

Spigot and socket joints with tarred rope yarn and caulking compound

or

Plain ended joints with stainless steel couplings with neoprene rubber sleeves

Spigot and socket joints with tarred rope yarn and caulking compound

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

Spigot and socket joints with tarred rope yarn and caulking compound

Spigot and socket joint with semi-dry cement caulking and 1:2 cement mortar fillet

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

Q.9.2 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 gully heads with loose gratings, all encased in unreinforced concrete and with dished unreinforced concrete hopper size 450 x 450mm overall around gully 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 galleys 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/m²

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

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|------------------------------|-----------|
| 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 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS**

ANNEXURE 2
General Electrical Specifications

GENERAL ELECTRICAL SPECIFICATION

(ALL IN CONTRACTS)

1. CONDUIT AND CONDUIT ACCESSORIES

1.1 Conduit

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

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

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

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

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

1.2 Conduit Accessories

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

All screwed conduit fittings shall be of malleable cast iron.

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

1.3 Flexible Conduit

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

2. INSTALLATION OF CONDUIT

2.1 General

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

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

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

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

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

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

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

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

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

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

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

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

2.2

In Roof Spaces

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

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

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

treated against corrosion with "Rustodian" or other approved primer and finished in aluminium paint.

Each draw box is to be fitted with slip-on lid with a 13 mm skirt. The box shall be 75 mm deep, shall be rectangular in shape and the size of conduits entering or leaving the box. Conduits shall be fixed to the box by means of couplings and brass male bushes or lock nuts and brass bush-nuts.

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

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

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

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

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

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

2.3 In Concrete Slabs

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

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

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

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

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

Earth conductors and clamps buried in concrete are not permitted.

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

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

2.4

Surface Work

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

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

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

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

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

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

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

Where crossings of conduits is unavoidable, purpose made metal boxes shall be used. The length of the box is to be 8 times the diameter of the largest conduit,

the width one and half times the sum of the diameter of all the conduits, and the depth one and half times the diameter of the largest conduit with a minimum depth of 50 mm. The box shall be fitted with a neatly fitting cover and the finish shall be in keeping with the general layout.

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

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

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

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

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

2.5

Future Extensions

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

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

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

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

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

2.6 Fixing of Conduits

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

2.7 Chases and Building Work

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

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

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

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

3. PLUGGING OF WALLS

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

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

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

4. FIXING TO CONCRETE CEILINGS

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

5. WIRING

5.1 PVC Insulated Single Core Medium Voltage Conductor

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

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

Conductor sizes shall be as follows except where otherwise specified:

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

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

6. MOUNTING AND POSITIONING OF LUMINAIRES

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

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

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

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

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

Where ceilings are raked, all incandescent luminaires are to be mounted on shaped leveling wood blocks securely fixed to the ceiling. Batten holders shall be secured

to woodblocks by suitable brass screws. Fluorescent luminaires are to be mounted direct on raked ceiling without leveling blocks.

Fluorescent luminaires to be mounted on concrete ceilings shall be screwed to the outlet boxes and additionally supported by means of 50 x 6 mm expansion bolts. The bolts are to be $\frac{3}{4}$ of the length of luminaires apart.

Where a number of luminaires are installed end to end, outlet points must be provided after every second luminaire unless otherwise indicated on the drawing. The luminaires are to be joined together by means of 20 mm conduit nipples, lock nuts and male brass bushes, and the wiring led through the channels of the luminaires. The Contractor shall ensure that all such rows are correctly lined up and that the rows are parallel with the relevant building line.

The luminaires are to be jointed together by means of 20 mm conduit nipples, lock nuts and male brass bushes, and the wiring led through the channels of the luminaires. The Contractor shall ensure that all such rows are correctly lined up and that the rows are parallel with the relevant building line.

Incandescent luminaires are to be screwed directly to outlet boxes in concrete slabs and in board ceilings. In board ceilings the conduit box and the conduit shall be secured to the timberwork of the ceiling in such a manner that it shall support any incandescent luminaire, which is designed to be fixed to a normal conduit box.

Fluorescent luminaires shall be secured to board ceilings by means of the conduit box and 6 mm bolts passing through the boards and banding.

7. BATTEN HOLDERS

B.C. batten holders shall be of brass or moulded plastic reinforced type complete with shade ring. The batten holders shall comply with SABS IEC 60238 and SABS IEC 61184. All lamp holders are to have brass terminals with screw type connection.

8. LAMP HOLDERS

Edison screw lamp holders : SABS IEC 60238

Bayonet lamp holders : SABS IEC 61184

Lamp holders for tubular fluorescent lamps : SABS IEC 60400

B.C. screwed lamp holders shall be of brass 20 mm E.T. complete with shade ring and shall comply with SABS IEC 60238 and SABS IEC 61184 with screw type connection terminals.

9. SWITCHES AND SOCKET OUTLETS

Switches SABS IEC 60669 as applicable and socket outlets SABS IEC 60884 as applicable shall be of the most modern manufacture and bear the SABS mark.

Flush switch and plug cover plates shall, unless otherwise specified, be of anodized aluminium of thickness not less than 0.9 mm, satin or other approved finish as directed and otherwise to be fully in accordance with SABS IEC 1084 for cover plates and SABS 1085 for wall boxes.

10. POSITIONS OF SWITCHES AND SOCKET OUTLETS

Except where otherwise specified, lighting switches and socket outlets are to be installed 1,4 m above finished floor level.

All mounting heights specified are to be measured from finished floor level to the bottom of the outlet box.

Where the lower portion of the wall consists of face brickwork and the upper portion of plastered finish, switches and socket outlets are to be mounted in the plastered surface, provided that the lower edge of the plasterwork does not exceed a height of 1,5 m above finished floor level in which case the switches or socket outlets are to be installed in the face brick dado.

Where socket outlet and switch boxes have been installed with fixing lugs below finished wall surface, only approved distance pieces required to compensate for the recess shall be used. The lengths of distance pieces are not to exceed 15 mm.

Unless otherwise approved, light switches adjacent to doors are to be installed at the lock side of the door. Where the lock position is not indicated on the drawings, its position shall be ascertained before the switch box is installed. Switches are to be installed 150 mm from the reveal, or centrally if there is a fitting near the door.

All switch and socket outlet boxes shall be installed plumb, and built into the wall with a 1:1 mixture of cement and sand.

Industrial type switches and socket outlets shall be neatly recessed into the surface of plastered walls to avoid sets or alternatively spacer bar saddles may be used.

Deep type boxes may be used where switches or socket outlets are back to back, but where one side only is to be utilized at the time and the other is for future use, the side for future use shall be suitably covered with a metal cover plate.

11. LOW TENSION SWITCHBOARDS

Low Voltage switch gear and control gear to comply with SABS 1473 and SABS IEC 60947 and SABS 60349.

Where switchboards are to be installed in switch rooms or switch cupboards, the Contractor must ensure that the boards are manufactured to suit the dimensions of the rooms or cupboards.

Low tension switchboards shall be specified in detail for each service, but shall generally conform to the following:

They are to be of strong and rigid construction, with suitable angle, channel or folded steel framework. They are to be flush fronted and totally enclosed with sheet steel panels suitably formed at the edges and reinforced to prevent distortion. Unless otherwise directed, all front panels must be at least 2 mm thick and all other panels at least 1,6 mm thick. Panels are to be secured to the framework with studs and chromium plated dome nuts (self-tapping and similar screws are not permitted).

Switches, etc, are to be mounted on metal frames within the boards to give flush front panels. Equipment of normally surface mounted types such as energy meters,

time switches and contractors, are to be mounted on inner metal trays behind hinged front panels. In the case of supply authority meters the hinged front panels must have transparent inserts.

All metal work of the boards must be thoroughly degreased, primed with PA 10 self etching primer and finished with one coat of undercoat and two coats of electrical orange high gloss enamel, unless otherwise specified.

All accessible current carrying parts, bus-bars, connecting strips, collector bars, etc, are to be adequately insulated in phase colours and suitably braced to withstand projected fault currents.

Connecting strips and collector bars must be of sufficient cross sectional area to carry full rated current of the switches served, irrespective of the fuse or trip rating.

The complete distribution board including bus-bars must be suitably constructed to withstand fault currents specified.

Connections to bus-bars are to be made by means of lugs suitably bolted and locked with high tensile bolts and connections to lugs must be effected by means of a crimping tools.

Incoming and outgoing bus-bar studs, where required, must be suitably insulated where they pass through panels of the board, and firmly supported within the board.

Where applicable, incoming and outgoing collector bars for cables in parallel must so arrange that the multiple cable ends can be connected to the bars with reasonably short tails which do not have to cross.
Cable supports must be placed at suitable heights having regard to the bending radius of the cables concerned and convenience in making off.

Wall-mounting and floor-standing back to wall type boards must be provided with full easy access to all equipment and wiring without any necessity of disconnecting or removing of any of the equipment mounted in the board.

Clear visible indication of all switch positions must be provided and the switches must be clearly labeled as directed by the Head : Works.

The details of construction proposed, and the Head : Works must approve all equipment of switchboards: Works before manufacture is commenced.

12. DISTRIBUTION BOARDS

12.1 Approval

The Head : Works must approve the details of construction proposed and all equipment within distribution boards: Works before manufacture is commenced.

12.2 Flush Mounting Distribution Boards

These shall be generally manufactured in accordance with SABS 1765. The board shall consist of two panels fitted side by side with common bonding tray and attached to a common architrave. One panel shall accommodate all single phase MCB's and the second panel shall accommodate the main isolator, main bus-bars

and the triple pole MCB's. Chassis shall be of rigid channel section rust proofed steel with clip-on trays for the single pole MCB's. The main isolator is to be mounted at the bottom of the second panel with the triple pole circuit breakers above.

12.3 Surface Mounting Distribution Boards

These shall be generally manufactured in accordance with SABS 1765, with two panels as for flush boards.

12.4 Single Phase Distribution Boards

Single Phased boards shall be generally constructed as three phase boards except they shall have a single panel. Single phase boards shall be mounted with the bottom of the architrave 1,5 m above finished floor level unless specifically directed otherwise.

12.5 Distribution Board – In Roof Spaces

Where distribution boards are installed below a roof space, a minimum of 2 x 20 mm and 1 x 25 mm spare conduits are to be run from the distribution board into the roof space.

13. METER BOXES

The meter box shall be mounted with the top 1,7 m above finished ground level. Surface mounted meter boxes shall be secured by at least 4 x 10 mm expansion bolts.

Service cables entering the meter box shall be protected by means of a suitably sized galvanised pipe extended 450 mm below the ground surface and securely saddled to the wall and bonded to the meter box.

14. CONNECTIONS TO OUTLETS

14.1 General

Where connectors are used to connect to the wiring of luminaires and other appliances, the connectors shall comply with SABS Specification 1239.

14.2 Connection to Stoves

14.2.1 General

The connection to an electric stove, unless otherwise specified shall consist of 2 x 10 mm² conductors and a 6 mm² insulated earth wire in 25 mm conduit. The stove shall be controlled by a 60 Amp micro gap switch of approved make and the connection shall be by means of a 45 Amp 3 pin stove plug of the "Cape Town" type. Cable ends, which are to be connected to the stove, shall be equipped with suitable soldered or crimped lugs. The connection between the stove plug and stove shall be by means of flexible conduit.

Except for high school domestic science unit kitchens (see Clause 14.2.2), the conduit shall be chased into the wall and fitted with a switchbox for housing the micro gap switch and a 25 mm circular conduit box over which the stove plug will

be mounted. The stove plug shall be fitted with an adaptor plate and shall be screwed directly to the conduit box by means of round head metal screws. The plug outlet shall face downward.

The stove plug and switch shall be mounted 430 mm and 1,4 m respectively above finished floor level unless otherwise specified or indicated on the drawings.

14.2.2 Stove Connections in High School Domestic Science Unit Kitchens

Connections to stoves in High School Domestic Science Unit Kitchens, where the stoves are situated in front of a fitting, shall be generally as specified in Clause 14.2.1 except that the 25 mm diameter conduit shall be run in the floor slab, from the distribution board to a position to the right of the stove. A pedestal, which is complete with a 45 Amp 3 pin "Cape Town" type cooker plug, mounted on the back, shall be fitted over the conduit and securely bolted to the floor by means of expansion bolts. The plug circuit, which passes through the pedestal, is to be on a separate circuit.

14.3 Connections to Hot-water Cylinders

The connections to hot-water cylinders not exceeding 3kW loading shall consist of 2 x 4 mm² PVC conductors and 1 x 2,5 mm² earth wire in a 20 mm diameter conduit from the distribution board. The conduits shall be chased in the wall and shall terminate at the side of the cylinder in a box over which is to be mounted a double pole isolator with pilot light.

The final connection between the isolator and cylinder shall be by means of silicone heat resistant conductors in 20 mm diameter flexible conduit.

Connections to roof mounted hot-water cylinders shall generally be as specified above with an isolator with pilot light mounted adjacent.

14.4 Connections to Power Points

Connections to electric motors and fixed apparatus to vibration shall, unless otherwise specified or indicated on the drawings, have final connections consisting of conduit and flexible tubing or reinforced hose in accordance with Clause 1.3 of this specification and PVC cables and earth wire of the required size.

An isolator shall protect all fixed apparatus and where necessary a starter fitted with a no-volt coil and overload protection adjacent to such apparatus.

Power points for connection of fixed apparatus to be installed by others, shall terminate in an approved type wall mounted switch unless otherwise specified.

The minimum conductor size for all power points shall be 4 mm² unless otherwise specified.

14.5 Underground Service Connection

This clause refers to underground service connections not provided by the Supply Authority.

The service cable and earth wire to be connected at the supply point in accordance with Clause 15.8 of this specification, and unless otherwise specified, shall be as

600 mm below ground level throughout and otherwise fully in accordance with Clause 15 and all applicable sub-clauses thereof. Cable entries to meter boxes shall be in accordance with Clause 13 and other entries shall be by pipe or duct as directed.

14.6 Connections to Outbuildings

Connections to outbuildings shall be made by means of underground cable only, laid in accordance with Clause 15 and all applicable sub-clauses.

Where the cable is run from the roof space of the main building, it shall be enclosed in suitably sized galvanised pipe built into the wall or run surface as directed. Surface run pipes shall be securely saddled at 1,8 m centers. Where the cable connects to the conduit in the roof space, a suitable joint box shall be provided or alternatively the cable may be taken through the roof space, a suitable joint box shall be provided or alternatively the cable may be taken through the roof space with fixings at regular intervals, and down to the main board. At the outbuildings, the cable shall be enclosed in a suitably sized galvanised sleeve pipe built into the wall or run surface and terminated in the distribution board tray.

14.7 Connection and Mounting of Cable Fed Street/Site Lighting

Street/site lights shall in all cases, except where otherwise specified, be fed by underground cable. Unless otherwise directed, a suitable terminal board shall be provided in the base of the lighting pole for the connection of the incoming and outgoing cables, the feeds from the terminal board to the fitting shall be as specified.

"Surfix" cable and compression glands shall be installed between terminal board and cross arm/bracket mounted luminaires. The terminal board shall also accommodate a miniature circuit-breaker in the phase connection to the fitting. Poles intended for mounting directly in ground are to be provided with a 300 x 300 mm base plate.

15. UNDERGROUND CABLES

1000 volt PVC SWA and 110 Volt PILCA cable and accessories shall be in accordance with the relevant SABS specifications to SABS 1507.

The storage, transportation, handling and laying of underground cables shall be according to the manufacturer's requirements and the Contractor shall have adequate and suitable equipment and labour to ensure that no damage is done to cables during such operation. All cable pipes and ducts entering buildings are to be sealed against the ingress of vermin, water, etc.

15.1 Trenching

Cables, unless otherwise specifically directed, shall be laid at a depth of 600 mm below ground level. Trenches shall not be less than 300 mm wide for one to three cables, and the width shall be increased where more than three cables are to be laid together so that the cables may be placed at least 75 mm throughout the run.

The Contractor shall take all necessary precautions to prevent trenching work being in any way a hazard to the public and to safeguard all structures, roads, sewer works, or other property from risk of subsidence and damage.

15.2 Cable Joints

Joints in underground cable runs will not be permitted unless unavoidable and at the discretion of the Head : Works. Where cable joints are unavoidable, the cable jointer is to work efficiently and cleanly and so that each end of the cables to be joined may have a minimum of 0,9 m of slack disposed in a loop without stress. Back-filling under joints must be firmly tamped to prevent any subsequent settling.

15.3 Bedding

In trenches made in intermediate, hard rock, or boulder material, the cables shall be laid on a 75 mm thick bed of earth and be covered with a 150 mm layer of earth before the trench is filled in. The Contractor to supply all earth required for trench filling.

15.4 Laying

Cables shall be removed from the cable drum in such a way that no twisting, tension or mechanical damage is caused, and must be adequately supported at short intervals during the whole operation. Particular care must be exercised where it is necessary to draw cables through pipes and ducts, to avoid abrasion, elongation or distortion of any kind. The ends of such pipes and ducts shall be sealed to approval after the drawing in of the cables.

15.5 Back Filling

Back filling after bedding (see Clause 15.3) is to be carried out with a proper grading of the material to ensure settling without voids, and the material is to be tamped down after the addition of every 150 mm. The surface is to be made good as required.

Back filling of cable trenches must not be commenced until after the cable trenches and laid cable(s) have been inspected by the Head : Works. Where a Contractor fails to observe this requirement he may, at the discretion of the Head : Works, be required to re-open such cable trenches for inspection at his own expense.

15.6 Protection of Cables

Where so directed by the Head : Works, concrete or other warning covers shall be placed over cables above the top bedding layer. Cable pipes when directed are to be installed at road and other crossings.

15.7 Marking of Cables

Cable marking tape is to be supplied by the Contractor and is to be laid 150 mm below ground over a cable run and as may be directed by the Head : Works to give early indication of underground cable runs.

15.8 Joints and Termination of Cables

Joints in underground cables and terminations shall be made by means of "Scotch Cast" or other approved epoxy-resin pressure type jointing kits. Low tension PVC cables are to be made off with sealing glands and materials designed for this purpose, which must be of approved make.

15.9 Sealing of Paper Insulated Cable Ends

Where cables are cut and not immediately made off, the ends must be sealed without delay. If cables are cut and the ends not immediately made off or sealed, the cable may be rejected and the Contractor will be required to replace it at his own expense.

15.10 Earth Wires

Except where specifically directed otherwise, earth continuity conductors are to be run with all underground cables constituting part of a low tension distribution system. Such earth continuity conductors shall be bare copper wire of a cross sectional area in accordance with the Code of Practice 0142 but shall not be less than 4 mm² nor more than 70 mm². The earth continuity conductor is to be bonded to the cable armouring, and to the lead sheath if any, at each termination, as well as to the local earth bard. The earth wire must be secured to the cable at 1,8 m centers.

15.11 Opening Up of Existing Cables

Where it is necessary to expose existing buried cables for any purpose, or to excavate in the vicinity of existing buried cables, pipes, etc, every care is to be exercised and only labourers experienced in such work, and duly warned by the Contractor, shall be employed thereon.

15.12 Definitions for Classifying of Excavation

- (a) Soft Excavation – shall be excavation in material that can be efficiently removed by a back-acting excavator of flywheel power approximately 0,10kW per millimeter of tinned-bucket width, without the assistance of pneumatic tools such as paving breakers, or that can be efficiently loaded without prior ripping or stockpiling by a rubber tyred front-end loader approximately 15T mass and a flywheel power of approximately 100kW.
- (b) Intermediate Excavation – shall be excavation in material that requires a back-acting excavator of flywheel power exceeding 0,10kW per millimeter of tinned-bucket width and the assistance of pneumatic tools prior to removal by equipment equivalent to that specified in (a) above.
- (c) Hard Rock Excavation – shall be excavation in material that cannot be efficiently removed without blasting or without wedging and splitting prior to removal.
- (d) Class A Boulder Excavation – shall be excavation in materials containing more than 40% by volume of boulders of sizes between 0,03 cubic meter and 20 cubic meter in a matrix of softer material or smaller boulders.

Note: (1) Excavation of solid boulders or lumps of size exceeding 20 cubic meter will be classified as hard rock excavation.

(2) Excavation of fissured or fractured rock will not be classed as boulder excavation but as hard rock intermediate excavation according to the nature of the material.

- (e) Class B Boulder Excavation - shall be excavation of boulders only in a material containing 40% or less by volume of boulders of size between 0,03 cubic meter and 20 cubic meter in a matrix of softer material or smaller boulders.

Note: Those boulders that required individual drilling and blasting in order to be loaded by a back-acting excavator as specified in (a) above, or by a track type front-end loader, will each be separately classed as Class B Boulder Excavation.

16. EARTHING

16.1 Main Earthing

The type of main earthing shall be as required by the Supply Authority, if other than the Head : Works and in any case as directed by the Head : Works who may require additional earthing to meet test standards.

Where required, an earth mat is to be provided, the minimum size, unless otherwise specified, being constructed from copper straps 950 x 25 x 3 mm at 230 mm centers and braced at all intersections. Alternatively or additionally earth rods or trench earths may be required, as the Head : Works may direct, and installed according to his instructions.

All earth electrodes and connections thereto must be approved "in-situ" by the Head : Works before back-filling.

The electrical installation shall not be earthed by means of the lightning arrester earth electrode, if such is included in the installation, but may be bonded thereto.

16.2 Earthing in Installations

The installation shall be effectively earthed in accordance with the relevant sections of the Code of Practice 0142 and the requirements of the Supply Authority.

All hot and cold water and waste pipes are to be effectively bonded by means of 12 x 1,5 mm solid copper tape (perforated tape or wire will not be permitted), clamped by means of brass bolts and nuts. Bonding tapes exceeding 75 mm in length must be fixed to the wall by means of No. 6 x 20 mm brass screws and plastic plugs not exceeding 150 mm centers. Main earth copper tapes where installed less than 2,5 m from ground level, must be run in 20 mm diameter conduit securely saddled to the wall.

Gutters and down pipes are to be bonded by means of 6 mm round headed brass bolts, with nuts and washers. Self-tapping screws are not permitted.

Connections from the earth bar or terminal on the main board must be made to a visible cold water main, the incoming service conductor, if any, and the earth mat or plate (where such is required) by means of either 12 x 1,5 mm solid copper tape or bare 25 mm² copper wire, or such larger conductor as the Head : Works may direct. From each distribution board separate earth conductors are to be taken to the main earth bar or terminal on the main board. Each conductor shall consist of 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.

**STORM DAMAGE PROGRAMME
REPAIRS AND RENOVATIONS TO SCHOOLS**

ELECTRICAL SPECIFICATIONS

SECTION A: DETAIL TECHNICAL SPECIFICATIONS

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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 Technical Specification
Drawings
Bill of Quantities
Standard Specification

2. SITE LOCATIONS AND CONDITIONS

The sites are situated various locations within the KwaZulu-Natal Province.

The sites are subjected to the following prevailing conditions:

Maximum ambient temperature	-	35° C
Minimum ambient temperature	-	0° C
Relative humidity	-	85 % at maximum temperature
Altitude	-	± 430m - 600m above MSL

3. SUBMISSION OF FORMS AND FEES

The Contractor shall issue all notices and make the necessary arrangements with Supply Authorities, 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 and /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 Repairs and Renovations of the electrical installation and lightning protection for the various **Storm Damage Schools within KwaZulu-Natal**.

The School comprises of 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 the Department of the complete installation in working order of the following:-

- 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 the lightning protection and Earthing of building roofs;
- The Earthing of the complete installation as required by the Regulations and Standards;
- Making safe, removing and reinstalling electrical infrastructure on existing buildings;
- 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 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 Electrical Engineer;
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-resin 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 m³ 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 polyethylene 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 Part B 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 of Part B 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 shall be 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, where 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 be accessible from below the ceiling for re-wiring purposes.

The wiring of all light and socket outlet circuits will consist of 2 x 2,5mm² PVC insulated copper conductors and 1 x 2,5mm² PVC insulated copper earth wire

The wiring of all aircon circuits shall consist of 2 x 4,0mm² PVC insulated copper conductors and 1 x 2,5mm² PVC insulated 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 in front 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 chrome-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 chrome-plated fixing screws.

Outdoor light switches shall be 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 of Part B 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 as shown on the drawings. 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 clauses of Part B 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.

19. SCHEDULES

The following schedules have been included at the end of this section:

SCHEDULE		PAGE:
(1)	Luminaire Schedule	C-1
(2)	Distribution Board & Cable Schedule	C-2
(3)	Drawing Register	C-3

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.

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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 - 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", 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".
- 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".

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 2,5mm² 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.

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". 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 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 by 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", 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 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", and "INSTALLATION OF WIRING CHANNELS".

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", 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: 2,5mm² and 2,5mm² copper earth conductor

Socket-outlet circuits: 2,5mm² and 2,5mm² copper earth conductor.

Bell circuits: 1,5mm²

Stove circuits: 6mm² and 4mm² 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 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 joiner 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 $1,5^{\circ}\text{C m/W}$) 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 : 800mm
- 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 sea 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".

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 may 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" or "CABLE TERMINATIONS AND JOINTS".

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 $130\text{ C} \pm 5\text{ C}$.
- (b) Cut a small length ($\pm 300\text{mm}$) 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", 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".

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 that 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".
- 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", 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.

B.7 SWITCHBOARDS (UP TO 1 KV)**1. GENERAL****1.1 SCOPE**

This section covers the manufacturing and testing of flush mounted, surface mounted and floor standing switchboards for general installations in normal environmental conditions and for system voltages up to 1 kV.

1.2 SIZE

All switchboards shall be of ample size to accommodate the specified switchgear and provide space for future switchgear. For every 4 (or part of 4) 5kA circuit-breakers on a switchboard, space for an additional 5kA circuit breaker shall be allowed unless future space requirements are clearly specified. For circuit breakers above 5kA, this factor shall be 15%. The clearance between adjoining switchgear openings shall be as specified in par. 6.2.

1.3 EXTERNAL DIMENSIONS

The maximum allowable height of free standing switchboards is 2,2m. Cubicle type boards may be up to 2,4m high if they can be fully dismantled into individual cubicles. Where, due to space restrictions, a board exceeds 2,4m in height, equipment not normally requiring access, shall be installed in the top section, enabling equipment normally requiring access to be installed lower down in the board. All other specified external dimensions for switchboards shall be strictly adhered to. If the clearances specified in par. 6.2 cannot be adhered to as a result of restricting external dimensions, the Contractor shall obtain the approval of the Department before manufacturing the switchboards.

1.4 MOISTURE AND VERMIN

All switchboards shall be rendered moisture proof and vermin proof and shall be adequately ventilated. Refer to par. 4.10 and 4.11.

1.5 LOAD BALANCE

The load shall be balanced as equally as possible across multiphase supplies.

2. CONSTRUCTION OF FLUSH MOUNTED SWITCHBOARDS**2.1 STANDARD**

Flush mounted switchboards shall comply fully with SANS 1765. Unless the depths of the switchboards are specified, the depths shall be determined in accordance with par. 6.

2.2 EXPANDED METAL

Where switchboards are to be built into 115mm thick walls, expanded metal shall be spot-welded to the rear of the bonding trays. The expanded metal shall protrude at least 75mm on each tray side to prevent plaster from cracking.

2.3 KNOCK-OUTS

Knock-outs shall be provided in the top and bottom ends of each switchboard tray to allow for the installation of conduits for the specified and future circuits. Knock-outs shall be provided for an equal number of 20mm and 25mm dia. conduits.

2.4 PANEL

Front panels shall have machine punched slots for housing the specified and future flush mounted switchgear. The distance between the inside of the closed doors and the panel shall not be less than 20mm. No equipment may be mounted on the panel unless the panel is permanently hinged to the switchboard frame.

2.5 FIXING OF FRONT PANELS

The front panel shall be secured to the architrave frame by means of 6mm studs and chromium-plated hexagonal domed nuts, hank nuts or captive fasteners. Alternatively the panel may be secured to the architrave frame by means of two pins at the bottom and a latch or lock at the top of the panel. Self-tapping screws will not be allowed. All front panels shall be provided with a minimum of one chrome plated handle.

2.6 DOOR HANDLES AND CATCHES

Switchboard doors shall be equipped with handles and catches. Locks shall only be provided when specified. In all cases where lockable doors are required and in all cases where the switchboard doors are higher or wider than 450mm, handles consisting of a push-button-and-handle combination with spring loaded catch or rotary handle-and-catch combination shall be installed. Switchboard doors smaller than 450mm in height and width may be equipped with spring loaded flush mounted ring type latches. Square key operated catches are not acceptable unless specified.

3. CONSTRUCTION OF SURFACE MOUNTED SWITCHBOARDS

3.1 STANDARD

Surface mounted switchboards shall comply with SANS 1765.

3.2 SWITCHBOARD TRAY

Surface mounted switchboards shall be equipped with a 1,6mm minimum sheet steel reinforced tray suitably braced and stiffened to carry the chassis, door and equipment. Lugs to secure the switchboard to a vertical surface shall be provided.

3.3 CONSTRUCTION

All joints shall be welded or securely bolted. The tray shall be square and neatly finished without protrusions. The front tray sides shall be rounded with an edge of at least 20mm to accommodate flush doors.

3.4 CHASSIS

A sheet steel chassis for the mounting of equipment shall be bolted to the tray and shall comply with the requirements of par. 6.1 and 6.3.

3.5 FRONT PANEL AND DOOR

The front panel and door shall comply with par. 2.4 to 2.6 above. Doors shall fit flush in the tray when closed.

3.6 DIMENSIONS

Unless the depth of the switchboards is specified, the dimensions shall be determined in accordance with the requirements of par. 6.2 and 6.3.

4. CONSTRUCTION OF FREE STANDING SWITCH BOARDS

4.1 FRAMEWORK

A metal framework for free standing switchboards shall be manufactured from angle iron, channel iron or 2mm minimum folded metal. A solid U-channel base frame, sufficiently braced to support all equipment and span floor trenches and access holes shall be provided. Switchboards shall be of cubicle design with 2mm side panels forming divisions between cubicles. The maximum allowable cubicle width is 1,5m. (Refer also to par. 4.7). Joints shall be non-continuously butt-welded. Welds shall be ground smooth and the joint wiped with plumber's metal in order to provide a smooth finish. Switchboards wider than 2m shall be fitted with screwed eye-bolts attached to the framework to facilitate loading and transportation of the board.

4.2 REAR AND SIDE PANELS

The rear panels shall be removable and shall be manufactured from 2mm minimum sheet steel. The panels shall have returned edges which are recessed in the frame or which fit over lips on the switchboard frame. The panels shall be secured to the frame by means of studs and chromium-plated hexagonal domed brass nuts or hank nuts or captive fasteners equal or similar to "DZUS" or "CAMLOC". Where switchboards are intended for installation in vertical building ducts or against walls, the rear and side panels may consist of a single folded sheet which is either bolted or welded to the frame or which forms part of the folded metal frame.

4.3 FRONT PANELS

- 4.3.1 The front panels of floor standing switchboards shall preferably be hinged except where flush mounted equipment prevents this. Alternatively, panels shall be secured by means of the methods described in par. 2.5. The panels shall be arranged in multi-tiered fashion to allow for the logical grouping of equipment in accordance with par. 6.
- 4.3.2 The hinged front panels shall have a dished appearance with 20mm upturns which fit over a lip on the switchboard frame. Alternatively the hinged panels shall have folded edges and shall be fitted flush or slightly recessed in the switchboard frame. The latter method shall be used where doors are required. (Also refer to par. 4.6). Corners shall be welded and smoothed.
- 4.3.3 The panels shall be of 2mm minimum sheet steel with machine punched slots to allow for the flush mounting of instrumentation, switchgear toggles and operating handles. A minimum clearance of 50mm shall be maintained between the rear of equipment mounted on the panels (taking into account terminals or other projections) and the frame and chassis of the switchboard. Separate panels shall preferably be provided for the mounting of instrumentation and for covering flush mounted switchgear. Enclosed switchgear with front panels e.g. combination fuse-switch units, may be flush mounted in the board in lieu of separate hinged panels.
- 4.3.4 Hinged panels shall be suitably braced and stiffened to carry the weight of flush mounted equipment and to prevent warping.
- 4.3.5 Hinged panels with flush mounted equipment and panels higher than 600mm shall be supported by hinges of adequate strength to ensure smooth and reliable operation. 16mm pedestal or similar heavy duty hinges with single fixing bolts may be used on panels smaller than 600mm. On the larger panels long pedestal type hinges with two fixing bolts per hinge are preferred. Piano hinges are not acceptable for this application.
- 4.3.6 A tubular chromium-plated handle shall be fitted on each panel. The handle may be omitted if "DZUS" or "CAMLOC" fasteners are used.
- 4.3.7 Blanking plates shall be fitted over slots intended for future equipment. These plates shall be fixed in a manner which does not require the drilling of holes through the front panel. Dummy circuit-breakers may be fitted where applicable.
- 4.3.8 Front panels containing live equipment such as instrumentation or control switches, shall be bonded to the switchboard frame with a braided copper earth trap with an equivalent cross-sectional area of at least 4mm².

4.4 SECURING OF FRONT PANELS

Hinged panels shall be secured in position by means of square key operated non-ferrous fasteners designed to draw the panels closed or similar quick-release fasteners. Self-tapping screws are not acceptable. Where non-hinged removable panels are specified, they shall be secured in position by means of 6mm studs and hexagonal chromed brass dome nuts and washers or hank nuts. Non-hinged removable panels may alternatively be secured in position by means of two pins at the bottom and a latch or lock at the top.

4.5 CHASSIS

A suitably braced chassis for the mounting of switchgear and equipment shall be firmly secured to the frame of the switchboard. The chassis shall be designed so that the switchgear can be installed in accordance with par. 6. Circuit-breakers and isolating switches which are not of the moulded-case air-break type and the insulators of busbars for ratings of 200 A and more may be secured directly to the framework. (Refer to par. 6.1).

4.6 DOORS

- (a) Doors need only be provided when specified. Doors shall be arranged in multi-tiered fashion to allow for the logical grouping of equipment in accordance with par. 6.
- (b) Doors shall have a dished appearance with a minimum of 20mm upturns which fit over a lip on the switchboard frame or shall fit flush in the switchboard frame. Corners shall be welded and smoothed.
- (c) Doors shall be of aluminium sheet steel with machine punched slots to allow for the flush mounting of instrumentation, control and protection equipment. Switchgear shall be flush mounted in the front panels behind the doors unless specified to the contrary. A minimum clearance of 50mm shall be allowed between the rear of equipment mounted on doors (including terminals and projections) and the frame, front panel and chassis.
- (d) Doors shall be suitably braced and stiffened to carry the weight of the equipment and to prevent warping.
- (e) Hinges for doors shall be provided as described in par. 4.3.5. At least three hinges shall be provided on doors higher than 1,2m.
- (f) Doors shall be fitted with handles consisting of a pushbutton-and-handle combination with springloaded catch or a rotary handle-and-catch combination. Flush mounted ring type handles or square key operated latches are not acceptable. The same key shall fit all locks on the switchboard in cases where locks are required.
- (g) Doors shall be fitted with hypalon or neoprene seals.
- (h) Doors containing any electrical equipment shall be bonded to the switchboard frame with a braided copper earth wire with an equivalent cross-sectional area of at least 4mm².

4.7 SECTIONS

For ease of transportation and to facilitate access to the allocated accommodation, switchboards may be dismantled into cubicles or sections. Each section shall be rigidly manufactured to ensure that damage to the switchgear will not occur during transportation and handling. Where required, switchboards shall have temporary wood or steel bracing to protect switchgear and facilitate handling.

4.8 GROUPING OF SWITCHGEAR

The switchgear shall be logically arranged and grouped as described in par. 6. Depending upon the number and size of components, a common front panel may be installed over one or more groups of equipment. All equipment shall be installed in accordance with the requirements of par. 6.

4.9 CABLE GLAND PLATE

A cable gland plate shall be installed across the full width of each power cubicle at a minimum height of 300mm above the bottom of the switchboard to house the cable glands. A Steel cable channel or other approved support shall be provided to carry the weight of the cable and remove mechanical stress from the cable glands. A minimum distance as required by the bending radius of outgoing cables shall be provided between the lowest terminals of major equipment and the gland plate.

4.10 VENTILATION

Switchboards shall be properly ventilated, especially cubicles containing contactors, transformers, motor starters, lighting dimmers and other heat producing equipment. Louvres shall be fitted to provide adequate upward or cross ventilation. All louvres shall be vermin proofed with 1,5mm brass mesh or perforated steel plate internally spot welded over the louvres. The internal ambient temperature shall not exceed 40°C.

4.11 VERMIN PROOFING

Free standing boards shall be protected against vermin, especially from below, where cables have to pass through the gland plate, rubber grommets shall be provided and enough non-hardening compound shall be delivered with the board so that these holes can be sealed properly after installation of the cables.

5. CONSTRUCTION OF MAIN LOW TENSION SWITCHBOARDS

Main low tension switchboards and sub-main low tension switchboards heavily equipped shall comply with par. 4.1 to 4.11 as well as the following exceptions or additions:

- (a) These boards shall be fully extensible with removable busbar cover plates in the side panels.
- (b) Doors shall not be supplied unless specifically called for.
- (c) Switchgear and equipment shall be installed in accordance with the requirements of par. 6.
- (d) Provision for metering equipment shall be made in accordance with requirements of local authorities where applicable.

6. MOUNTING OF EQUIPMENT

- 6.1 The mounting of equipment shall comply with SANS 1765 where applicable. Equipment to be mounted on the chassis shall be mounted by bolts, washers and nuts or by bolts screwed into tapped holes in the chassis plate. In the latter case the minimum thickness of the chassis plate shall be 2,5mm. The latter method shall not be used where boards will be subject to vibration or mechanical shocks. Self-tapping screws will not be accepted.

6.2 SPACE REQUIREMENTS

In designing the switchboards the following requirements shall be strictly adhered to:-

- (a) A minimum of 50mm between any piece of equipment and the frame or internal partitioning. This minimum space is required on all sides of the equipment. In the case of a single row of single-pole circuit-breakers the spacing on one side row may be reduced to 25mm if the incoming side of the circuit-breakers is busbar connected.
- (a) A minimum of 75mm between horizontal rows of equipment. The maximum outside dimensions of equipment shall be considered.
- (c) Circuit-breakers up to a fault rating of 10 kA may be installed adjacent to each other. For higher ratings a minimum of 40mm shall be allowed between circuit-breakers or isolators.
- (d) Sufficient space shall be provided for wiring allowing for the appropriate bending radius.
- (e) Space for future equipment shall be allowed as described in par. 1.2.

6.3 MOUNTING OF CHASSIS

The chassis of flush mounted and smaller surface mounted boards shall be mounted in accordance with SANS 1765. For all free standing switchboards and surface mounted switchboards where the main switch rating exceeds 100 A (triple-pole), space for wiring shall be provided between the chassis and tray. This space shall be adequate to install the supply cable behind the chassis and terminate on the main switch without sharp bends in the cable cores.

6.4 GROUPING OF EQUIPMENT

- 6.4.1 Equipment shall be arranged and grouped in logical fashion as follows:

- (a) Main switch - to be installed either at the top or bottom of the board.
- (b) Short circuit protection equipment - fuse gear or fuse-switches.
- (c) Change-over contactors or other contactors controlling the supply.
- (d) Motor supplies.
- (e) Fuse-switches for outgoing circuits.
- (f) Other circuits and equipment.

- 6.4.2 Where a portion of the equipment on the switchboard is supplied from a standby power source, the change-over contactor and the associated equipment shall be grouped in a separate compartment.

- 6.4.3 Where earth leakage units are required, the associated circuit-breakers shall be installed adjacent to the unit.

6.5 MOUNTING OF CIRCUIT-BREAKERS

All moulded-case circuit-breakers shall be flush mounted with only the toggles protruding. Miniature circuit-breakers may be installed in clip-in trays mounted on the frame. All other circuit-breakers shall be bolted to the chassis. Special provision shall be made for large main switches when designing the framework. Care shall be exercised that the rear studs of circuit-breakers are properly insulated from the steel chassis. Where necessary, insulating material shall be installed between the rear studs and the chassis. Circuit-breakers shall be installed so that the toggles are in the up position when "ON" and down when "OFF".

6.6 INSTRUMENTATION

All metering instruments shall be flush mounted in the front panel or door. The rear terminals of instruments mounted on doors shall be covered with an insulating material to prevent accidental contact. Current transformers for metering shall be mounted so that the rating plate is clearly visible. Fuses for instrumentation shall be mounted in an easily accessible position and clearly marked.

6.7 MOUNTING OF FUSES

- 6.7.1 Fuse holders shall be mounted semi-recessed in the front panel so that fuses can readily be changed without removing the front panel. Busbar mounted fuses for instrumentation shall be used as far as possible.
- 6.7.2 Where equipment requiring fuses is specified on a board (fuse switches etc), a ruling shall be obtained from the Department on the quantity of spare fuses to be provided.

6.8 EQUIPMENT IN MAIN BOARDS

Equipment in main low tension switchboards and sub-main boards shall be grouped in individual compartments. Equipment shall be installed as follows:

- 6.8.1 Rack-out type air circuit-breakers shall be mounted in the bottom section, flush behind the panel with the handle only protruding. If this is not possible, the panel shall be omitted and the air circuit-breakers installed behind a door.
- 6.8.2 If the main switch is a moulded-case circuit-breaker or isolator it shall be flush mounted.
- 6.8.3 Contactors controlling the supply shall be installed behind separate front panels.
- 6.8.4 All metering, protection and indicating equipment shall be clearly visible from the front of the board. Current transformer ratios and multiplication factors shall be clearly marked. Where doors are specified the equipment shall be installed flush in the doors and covered as described in par. 6.6.
- 6.8.5 All circuit-breakers and fuses (with the exception of fuse-switches) may be grouped together behind one or more panels as described in par. 4.8.
- 6.8.6 Fuses or fuse-switches providing back-up protection for circuit breakers, shall be grouped with the associated circuit-breakers. Exposed surfaces effuse-switches shall be of the same finish and colour as the rest of the board where practical.

6.9 STANDBY SUPPLIES

- 6.9.1 Where standby power from a diesel-generator set or other sources is available and has to be connected to some of the equipment on a switchboard, the switchboard shall be divided into separate sections with sheet metal divisions to isolate standby power and mains power sections.
- 6.9.2 Standby and normal supply shall each have its own incoming isolator or circuit-breaker.
- 6.9.3 The two sections of the switchboard shall be labelled "ESSENTIAL" and "NON-ESSENTIAL" respectively.
- 6.9.4 The front panels of standby and no-break supply sections shall be painted in distinctive colours as follows:
- | | | | |
|-----|-----------------|-----------------|-------------------------|
| (a) | Normal supply | "LIGHT ORANGE", | colour B26 of SANS 1091 |
| (b) | Standby power | "SIGNAL RED", | colour A11 of SANS 1091 |
| (c) | No-break supply | "DARK VIOLET", | colour F06 or |

"OLIVE GREEN".

colour H05 of SANS 1091

SECTION B8**B.8 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", and UNSWITCHED AND SWITCHED SOCKET-OUTLETS". Surface or flush mounted boxes and cover plates, complying with the Department's quality specification for "CONDUIT AND CONDUIT ACCESSORIES", 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".

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 B9

B.9 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.
- 1.6 Standard control circuits are indicated in fig. B8.1 and B8.2.

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 B10**B.10 INSTALLATION OF LUMINAIRES****1. POSITIONS**

The mounting positions of luminaires shall be verified on site. All luminaires 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 luminaires that are not covered by the luminaires 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 luminaires, all luminaires with the exception of fluorescent luminaires mounted against ceilings, shall be fixed directly to the box. Fluorescent luminaires and luminaires 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 luminaires, 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 luminaires 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 luminaires. 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

Luminaires (especially fluorescent luminaires) 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 luminaires to the cable channel.

7. CEILING BATTENS

Where wooden blocks are used to suspend luminaires, 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 luminaires with metal canopies have to be installed against a false ceiling.

8. GLASS-BOWL LUMINAIRES

Unless specified to the contrary, suspended glass-bowl luminaires shall be installed with the underside at least 2,1 m above finished floor level.

9. FLUORESCENT LUMINAIRES FIXED TO CONCRETE SLABS

Fluorescent luminaires 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 luminaires 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 luminaires to cable channels.

10. FLUORESCENT LUMINAIRES FIXED TO CEILINGS

- 10.1 In all cases where luminaires are fixed to false ceilings, the Contractor shall ensure that the ceiling is capable of carrying the weight of the luminaires 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 luminaires shall fit firmly against the ceiling branding 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 luminaires 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 Luminaires may alternatively be fixed to metal cross-pieces resting in the ceiling tees.
- 10.6 Drilling of holes in ceiling tees to support luminaires will not be allowed.
- 10.7 Luminaires shall be fixed in neat relation to the ceiling lay-out.

11. CONTINUOUS ROWS OF LUMINAIRES

In cases where fluorescent luminaires are installed in tandem, only one connection outlet need be supplied per circuit. All luminaires 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. Luminaires 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 luminaires are specified, the Contractor shall maintain close liaison with the ceiling Contractor. In the case of tiled ceilings, the luminaires 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 luminaires 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" 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 luminaires in the ceiling.

14. BULKHEAD LUMINAIRES

Surface mounted bulkhead luminaires 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 luminaires or luminaires 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 luminaires shall be securely suspended from the roof structure.
- 17.2 The luminaires may 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 Luminaires may be suspended from metal roof trusses with the aid of "CADDY" or similar fasteners.
- 17.4 Luminaires 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 B11**B.11 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" and "INSTALLATION OF CABLES".

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".
- 2.5.3 Sleeves shall be 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 mm². 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 B12**B.12 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". 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 B13**B.13 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 be 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".

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 grommited. 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 grommited. The draw-box shall be accessible from the top via the floor outlet.

SECTION B14**B.14 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, and 2 above have been met.



KWAZULU-NATAL PROVINCE

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NATAL: NORTH COAST REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS**

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 $20 \text{ mm} \times 3 \text{ mm}$. 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 joined 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 joined to a 50 mm² (35 mm² in the case of domestic dwellings) stranded copper conductor by securely crimping in place two heavily tinned lugs and bolting these together using 10 mm diameter copper, brass or bronze nuts, bolts and washers.

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

4.7 Joints Below Ground

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

4.8 Bonds

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

5. GENERAL INSTALLATION PROCEDURE

5.1 Air Terminals for Non-metallic Pitched Roofs

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

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

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

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

- (a) Where the maximum distance from the ground level to the eaves of the building is less than 4 metres and the pitch of the roof is more than 1 in 2 (27° from the horizontal).
- (b) Where the maximum distances from ground level to the eaves is less than 7 metres and the pitch of the roof is more than 1 in 1.5 (34° from the horizontal).
- (c) Where the distance from the ground level to the eaves is more than 7 metres and the pitch of the roof is more than 1 in 1 (i.e. the included angle at the apex of the roof is less than 90°).

Under these circumstances eaves conductors need not be installed.

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

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

5.2 Air Terminals for Metallic Pitched Roofs

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

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

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

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

5.4 Air Terminals for Metallic flat or Mono Pitched Roofs

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

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

5.5 Down Conductors for Non-metallic Structures

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

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

Where it is necessary to run conductors horizontally over the upper surface of a structural protrusion, such as an exposed concrete slab, the conductor may run down vertically over the edge of the slab and return to the main structure, so that the distance between the upper and lower conductors exceeds one third of the length of the horizontal run. Looped down conductors are not permitted. Down conductors must not run over the underside of large overhangs which are less than 6 metres above ground level, or other areas where people are likely to be present during a thunderstorm.

External or internal metallic rainwater pipes may be used as down conductors providing these are of substantial section and are jointed by screwing one length into another or welding. Thin gauge galvanized steel pipes whose sections are held together by friction, rivets or screws must not form part of a lightning protection system.

5.6 Down conductors for reinforced concrete framed structures

The steel reinforcement of this type of structure may be used in place of down conductors. Where the reinforcing system is used, the air terminal system must be bonded to it at a maximum of 30 metre intervals using steel clamps. This bond may be achieved by clamping, with a steel clamp, a steel conductor to a selected reinforcing bar, the opposite end of this conductor must terminate at a corrosion resistant metallic terminal such as Grade 316 stainless steel.

The reinforcing system of prefabricated concrete buildings must not be used unless special provision is made for bonding the various prefabricated sections together.

The terminals should be mounted flush with the face of the concrete. An aluminium alloy bond must then be taken from the air terminal system and be connected to the stainless steel terminal by means of a heavily tinned crimp lug for circular section aluminium, or a suitable bi-metallic joint in the case of flat section aluminium. A similar system must be used to bond the reinforcing system at ground level to the earthing system at points directly below the air terminal bonds. Here copper conductors must be used as the external bonding material.

Under no circumstances must copper, or other non-ferrous material be allowed to come into contact with steel reinforcing bars, as this may cause severe corrosion and subsequent structural damage. The lightning protection system must not be bonded to any part of the structure which is electrically isolated from the remainder of the building, i.e. cantilevered sections. In these circumstances, or where it is otherwise impracticable to use the reinforcing system, external down conductors must be installed as described in 5.5.

5.7 Down conductors for steel framed structures

Where the framework of a building is constructed of structural steel columns, these may be used in place of down conductors providing the separating distance between them does not exceed 30 metres. The upper ends of the columns must be bonded to the air terminal systems and the lower ends to the earthing system.

5.8 Earthing by means of vertically installed rod type electrodes

Rod-type electrodes must be driven into the ground at a position directly below each down conductor. The maximum earthing resistance of each electrode or number of electrodes bonded to any one down conductor shall not exceed $N \times 30$ ohms, where N equals the total number of down conductors which are bonded to a common air terminal system, or 200 ohms whichever is the lower value.

The minimum horizontal separating distance between rod-type electrodes bonded together must not be less than their installed depth. The upper ends of installed rod-type electrodes are to be terminated approximately 500 mm below finished surface level. A 50 mm² copper bonding conductor must be installed to run between each earthing electrode system and the lower ends of the adjacent down conductors. A joint is to be made between each of these bonding conductors and the down conductors at a position approximately 200 mm above finished ground level. These bonding conductors must be installed in P.V.C. conduit securely affixed to the wall (see 3.4). The length of this P.V.C. conduit must be approximately 600 mm and must be installed so that approximately 200 mm protrudes above ground level, the remainder being buried into the soil.

5.9 Earthing by means of metallic water mains

Where two or three down conductors are installed the water mains may serve as an earth terminal for one of these. Where three or more down conductors are installed the water mains may serve as an earth terminal for two of these. Regardless of whether the water mains are used as an earth terminal or not, the incoming metal water pipe must be bonded to the lightning protection earthing system underground.

5.10 Earthing by means of trench type electrodes

Where the soil conditions prevent the satisfactory installation of rod-type electrodes, a trench earth system must be installed. This method is to comprise a 50 mm² stranded copper conductor installed horizontally into a trench at a depth of 500 mm below finished ground level. The conductor is to follow the general outline of the structure to be protected and be installed 1 metre away from the outside walls. Where the building stands on rocky ground, the trench earth may be attached to the lower part of the wall in areas where rock protrudes through the soil. The conductor must, however, be buried wherever possible as described above.

Each down conductor must be bonded to the trench earth system as directly as possible by means of a copper conductor.

Trench earth systems must have a maximum earth resistance of 30 ohms. An isolated length of trench earth mat must be bonded to the down conductor system in such a way as to reduce the length of dead-ends to the minimum.

Should trench earths be installed beneath pathways where people are likely to be present during a thunderstorm, a plastic, bitumastic or ceramic pipe must be installed having a length similar to the width of the pathway and the trench earth conductor run inside it.

N.B.: The maximum useful length of a dead-ended trench earth is 80 metres.

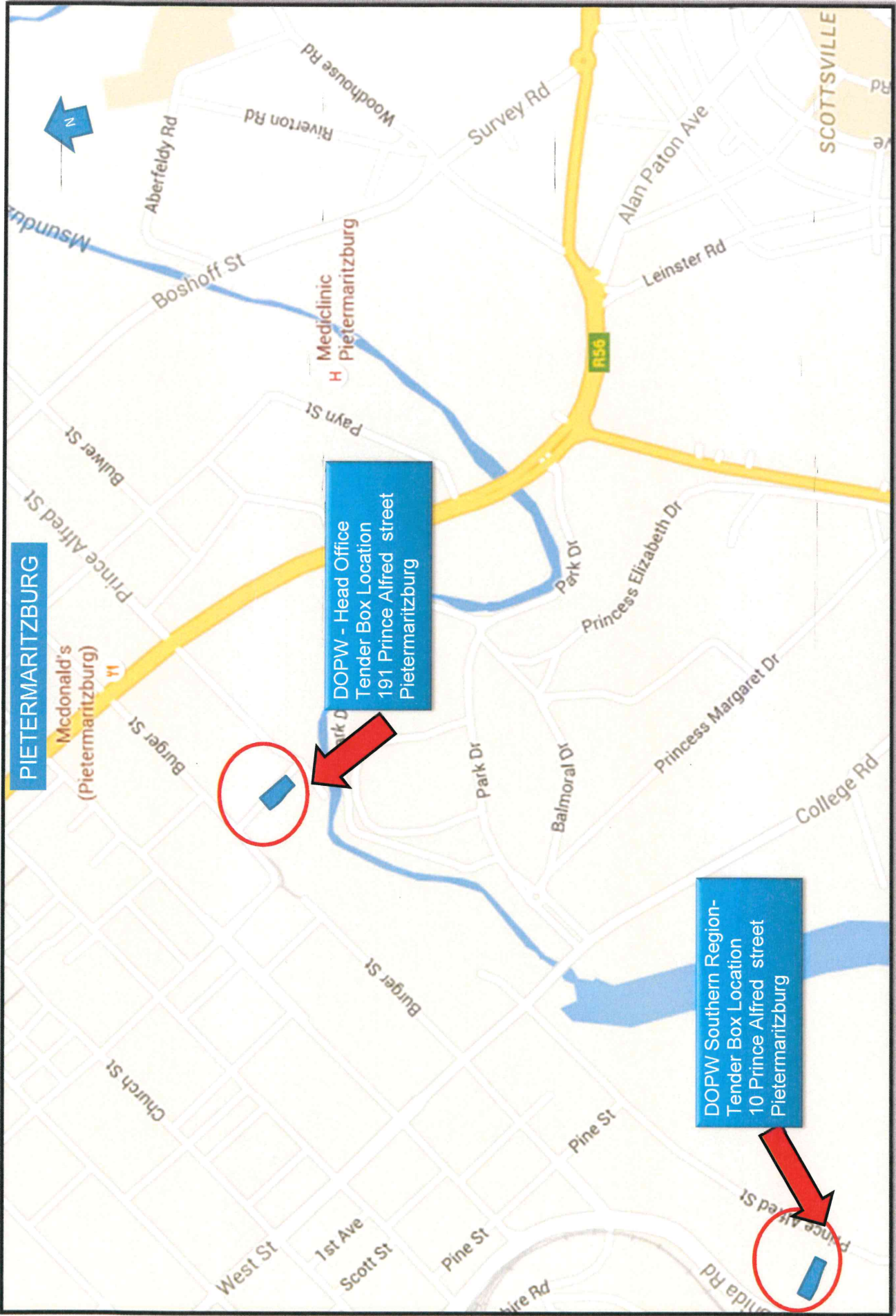


KWAZULU-NATAL PROVINCE

PUBLIC WORKS
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**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO
STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-
NATAL: NORTH COAST REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS**

ANNEXURE 4
Map of Tender Submission Location





KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

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SCHOOL - OPEN BIDS**

ANNEXURE 5
Joint Venture Agreement



Annexure 5
Joint Venture Agreement
(March 2004)
(First Edition of CIDB document 1017)

1. **PREAMBLE**

This agreement is made and entered into by and between

of the first part and

of the second part and

of the third part.

(allow for additional parties as necessary).

Whereas the foregoing parties have resolved to form a Joint Venture under the title of

for the exclusive purposes of securing and/or executing the Contract to be awarded by
(name of Employer)

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

for (brief description of Contract)

**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS
THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 90: MANQONDO JUNIOR
PRIMARY SCHOOL - OPEN BIDS**

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 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS**

ANNEXURE 6
Project Specific Health and Safety Specification

Annexure 6

Occupational Health and Safety Specification

(OHSE SPEC)



KWAZULU-NATAL PROVINCE

PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA

Project Name:

**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND
RENOVATIONS TO STORM DAMAGED SCHOOLS
THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH
COAST REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS**

Project Code:

063384

Agent Name:

Ms. L. Ntuli (Head Office)

Region:

Head Office

District:

Head Office

Ward no.:

13

**PROJECT SPECIFIC HEALTH AND SAFETY
SPECIFICATION AS RECEIVED FROM THE KZN DOPW
OFFICIAL APPOINTED TO THE PROJECT OR AN
APPOINTED PROFESSIONAL CONSTRUCTION HEALTH
AND SAFETY AGENT.**



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 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS**

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 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS**

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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

Site: School is in the Ethekeweni Region: Ilembe District: Ndwedwe Municipality: Manqondo Primary School - Coordinates S 29 28' 59.9" E 30 39' 43.4"

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
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NATAL: NORTH COAST REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS**

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
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NATAL: NORTH COAST REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS**

**ANNEXURE 10
EPWP Employment Contract**

SCOPE OF WORKS IN RESPECT OF WORK RELATING TO THE EXTENDED 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 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS		
Project Code:	063384	EPWP NO:	N/A

Introductory notes:

- 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.
- Payment for items which are designated to be constructed labour-intensively (either in this schedule or in the Scope of Works) will not be made unless they are constructed using labour-intensive methods. Any unauthorised use of plant to carry out work which was to be done labour-intensively will not be condoned and any works so constructed will not be certified for payment.

DESCRIPTION OF THE WORKS

Employer's objectives

The employer's objectives are to deliver public infrastructure using labour-intensive methods in accordance with EPWP Guidelines.

Labour-intensive works

Labour-intensive works comprise the activities described in the Labour-Intensive Specification. Labour-intensive works shall be constructed/maintained using local workers who are temporarily employed in terms of the scope of work.

LABOUR-INTENSIVE COMPETENCIES OF SUPERVISORY AND MANAGEMENT STAFF

Contractors shall only engage supervisory and management staff in labour-intensive works that have completed the skills programme including Foremen/ Supervisors at NQF level 4 "National Certificate: Supervision of Civil Engineering Construction Processes" and Site Agent/ Manager at NQF level 5 "Manage Labour-Intensive Construction Processes" or equivalent QCTO qualifications (See Appendix C). at NQF outlined in Table 1. (See GUIDELINES FOR THE IMPLEMENTATION OF LABOUR-INTENSIVE INFRASTRUCTURE PROJECTS UNDER THE EXPANDED PUBLIC WORKS PROGRAMME (EPWP) -THIRD EDITION 2015)

Emerging contractors shall have personally completed, or be registered on a skills programme for the NQF level 2 unit standard. All other site supervisory staff in the employ of emerging contractors must have completed, or be registered on a skills programme for the NQF level 2 unit standards or NQF level 4 unit standards. Table 1: Skills programme for supervisory and management staff.

Table 1: Skills programme for supervisory and management staff

Personnel	NQF level	Unit standard titles	Skills programme description
Team leader / supervisor	2	Apply Labour-Intensive Construction Systems and Techniques to Work Activities	This unit standard must be completed, and any one of these 3 unit standards
		Use Labour-Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	
		Use Labour-Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour-Intensive Construction Methods to Construct, Repair and Maintain structures	

Personnel	NQF level	Unit standard titles	Skills programme description
Foreman/supervisor	4	Implement Labour-Intensive Construction Systems and Techniques	This unit standard must be completed, and any one of these 3 unit standards
		Use Labour-Intensive Construction Methods to Construct and Maintain Roads and Storm water Drainage	
		Use Labour-Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour-Intensive Construction Methods to Construct, Repair and Maintain structures	
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 undertaken by sprigging, sodding, or seeding by hand.
15	Stone pitching and rubble concrete masonry All stone required for stone pitching and rubble concrete masonry, whether grouted or dry, must be collected, loaded, off loaded and placed by hand. Sand and stone shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150m. Grout shall be mixed and placed by hand.
16	Manufactured Elements Elements manufactured or designed by the Contractor, such as manhole rings and cover slabs, precast concrete planks and pipes, masonry units and edge beams shall not individually, have a mass of more than 320kg. In addition, the items shall be large enough so that four workers can conveniently and simultaneously acquire a proper handhold on them.

PAGE NO	ITEM NO	DESCRIPTION	UNIT	QUANTITY	RATE	AMOUNT
1		<u>BILL NO 2</u>				
1		<u>EMPLOYMENT AND TRAINING OF LABOUR ON THE EPWP BENEFICIARY INFRASTRUCTURE PROJECTS</u>				
1		<u>PREAMBLES</u>				
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		<u>TRAINING OF EPWP BENEFICIARY</u>				
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		<u>TRAVELLING AND ACCOMMODATION DURING OFF SITE TRAINING:</u>				
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		<u>EMPLOYMENT OF EPWP BENEFICIARY</u>				
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		<u>PROVISION OF EPWP DESIGNED OVERALLS TO YOUTH WORKERS</u>				
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		<u>PROVISION OF SMALL TOOLS FOR EPWP BENEFICIARY</u>				
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		<u>APPOINTMENT OF YOUTH TEAM LEADERS</u>				
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 Insurance Act 30 of 1966.

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 day.

SL 04.04 MEAL BREAKS

- (a) A worker may not work for more than five hours without taking a meal break of at least thirty minutes duration.
- (b) An employer and worker may agree on longer meal breaks.
- (c) A worker may not work during a meal break. However, an employer may require a worker to perform duties during a meal break if those duties cannot be left unattended and cannot be performed by another worker. An employer must take reasonable steps to ensure that a worker is relieved of his or her duties during the meal break.

SL 04.05 SPECIAL CONDITIONS FOR SECURITY GUARDS

- (a) A security guard may work up to 55 hours per week and up to eleven hours per day.
- (b) A security guard who works more than ten hours per day must have a meal break of at least one hour duration or two breaks of at least 30 minutes duration each.

SL 04.06 DAILY REST PERIOD

Every worker is entitled to a daily rest period of at least eight consecutive hours. The daily rest period is measured from the time the worker ends work on one day until the time the worker starts work on the next day.

SL 04.07 WEEKLY REST PERIOD

Every worker must have two days off every week. A worker may only work on their day off to perform work which must be done without delay and cannot be performed by workers during their ordinary hours of work ("emergency work").

SL 04.08 WORK ON SUNDAYS AND PUBLIC HOLIDAYS

- (a) A worker may only work on a Sunday or public holiday to perform emergency or security work.
- (b) Work on Sundays is paid at the ordinary rate of pay.
- (c) A task-rated worker who works on a public holiday must be paid –
 - (i) the worker's daily task rate, if the worker works for less than four hours;
 - (ii) double the worker's daily task rate, if the worker works for more than four hours.
- (d) A time-rated worker who works on a public holiday must be paid –
 - (i) the worker's daily rate of pay, if the worker works for less than four hours on the public holiday;
 - (ii) double the worker's daily rate of pay, if the worker works for more than four hours on the public holiday.

SL 04.09 SICK LEAVE

- (a) Only workers who work four or more days per week have the right to claim sick-pay in terms of this clause.
- (b) A worker who is unable to work on account of illness or injury is entitled to claim one day's paid sick leave for every full month that the worker has worked in terms of a contract.
- (c) A worker may accumulate a maximum of twelve days' sick leave in a year.
- (d) Accumulated sick-leave may not be transferred from one contract to another contract.
- (e) An employer must pay a task-rated worker the worker's daily task rate for a day's sick leave.
- (f) An employer must pay a time-rated worker the worker's daily rate of pay for a day's sick leave.
- (g) An employer must pay a worker sick pay on the worker's usual payday.
- (h) Before paying sick-pay, an employer may require a worker to produce a certificate stating that the worker was unable to work on account of sickness or injury if the worker is –
 - (i) absent from work for more than two consecutive days; or
 - (ii) absent from work on more than two occasions in any eight-week period.
- (i) A medical certificate must be issued and signed by a medical practitioner, a qualified nurse or a clinic staff member authorised to issue medical certificates indicating the duration and reason for incapacity.
- (j) A worker is not entitled to paid sick-leave for a work-related injury or occupational disease for which the worker can claim compensation under the Compensation for Occupational Injuries and Diseases Act.

SL 04.10 MATERNITY LEAVE

- (a) A worker may take up to four consecutive months' unpaid maternity leave.
- (b) A worker is not entitled to any payment or employment-related benefits during maternity leave.
- (c) A worker must give her employer reasonable notice of when she will start maternity leave and when she will return to work.
- (d) A worker is not required to take the full period of maternity leave. However, a worker may not work for four weeks before the expected date of birth of her child or for six weeks after the birth of her child, unless a medical practitioner, midwife or qualified nurse certifies that she is fit to do so.
- (e) A worker may begin maternity leave –
 - (i) four weeks before the expected date of birth; or
 - (ii) on an earlier date –
 - (1) if a medical practitioner, midwife or certified nurse certifies that it is necessary for the health of the worker or that of her unborn child; or
 - (2) if agreed to between employer and worker; or
 - (iii) on a later date, if a medical practitioner, midwife or certified nurse has certified that the worker is able to continue to work without endangering her health.
- (f) A worker who has a miscarriage during the third trimester of pregnancy or bears a stillborn child may take maternity leave for up to six weeks after the miscarriage or stillbirth.
- (g) A worker who returns to work after maternity leave, has the right to start a new cycle of twenty-four months employment, unless the EPWP on which she was employed has ended.

SL 04.11 FAMILY RESPONSIBILITY LEAVE

- (a) Workers, who work for at least four days per week, are entitled to three days paid family responsibility leave each year in the following circumstances –
 - (i) when the employee's child is born;
 - (ii) when the employee's child is sick;
 - (iii) in the event of the death of –
 - (1) the employee's spouse or life partner
 - (2) the employee's parent, adoptive parent, grandparent, child, adopted child, grandchild or sibling

SL 04.12 STATEMENT OF CONDITIONS

- (a) An employer must give a worker a statement containing the following details at the start of employment –
 - (i) the employer's name and address and the name of the EPWP;
 - (ii) the tasks or job that the worker is to perform;
 - (iii) the period for which the worker is hired or, if this is not certain, the expected duration of the contract;
 - (iv) the worker's rate of pay and how this is to be calculated;
 - (v) the training that the worker may be entitled to receive during the EPWP.
- (b) An employer must ensure that these terms are explained in a suitable language to any employee who is unable to read the statement.
- (c) An employer must supply each worker with a copy of the relevant conditions of employment contained in this specification.
- (d) An employer must enter into a formal contract of employment with each employee. A copy of a pro-forma is attached at the end of this specification.

SL 04.13 KEEPING RECORDS

- (a) Every employer must keep a written record of at least the following –
 - (i) the worker's name and position;
 - (ii) in the case of a task-rated worker, the number of tasks completed by the worker;
 - (iii) in the case of a time-rated worker, the time worked by the worker;
 - (iv) payments made to each worker.
- (b) The employer must keep this record for a period of at least three years after the completion of the EPWP.

SL 04.14 PAYMENT

- (a) A task-rated worker will only be paid for tasks that have been completed.
- (b) An employer must pay a task-rated worker within five weeks of the work being completed and the work having been approved by the manager or the contractor having submitted an invoice to the employer. Payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.
- (c) A time-rated worker will be paid at the end of each month and payment must be made in cash, by cheque or by direct deposit into a bank account designated by the worker.

- (d) Payment in cash or by cheque must take place –
 - (i) at the workplace or at a place agreed to by at least 75% of the workers; and
 - (ii) during the worker's working hours or within fifteen minutes of the start or finish of work;
- (e) All payments must be enclosed in a sealed envelope which becomes the property of the worker.
- (f) An employer must give a worker the following information in writing –
 - (i) the period for which payment is made;
 - (ii) the number of tasks completed or hours worked;
 - (iii) the worker's earnings;
 - (iv) any money deducted from the payment;
 - (v) the actual amount paid to the worker.
- (g) If the worker is paid in cash or by cheque, this information must be recorded on the envelope and the worker must acknowledge receipt of payment by signing for it.
- (h) If a worker's employment is terminated, the employer must pay all monies owing to that worker within one month of the termination of employment.

SL 04.15 DEDUCTIONS

- (a) An employer may not deduct money from a worker's payment unless the deduction is required in terms of a law.
- (b) An employer must deduct and pay to the SA Revenue Services any income tax that the worker is required to pay.
- (c) An employer who deducts money from a worker's pay for payment to another person must pay the money to that person within the time period and other requirements specified in the agreement law, court order or arbitration award concerned.
- (d) An employer may not require or allow a worker to –
 - (i) repay any payment except an overpayment previously made by the employer by mistake;
 - (ii) state that the worker received a greater amount of money than the employer actually paid to the worker; or
 - (iii) pay the employer or any other person for having been employed.

SL 04.16 HEALTH AND SAFETY

- (a) Employers must take all reasonable steps to ensure that the working environment is healthy and safe and that all legal requirements regarding health and safety are strictly adhered to.
- (b) A worker must:
 - (i) work in a way that does not endanger his/her health and safety or that of any other person;
 - (ii) obey any health and safety instruction;
 - (iii) obey all health and safety rules;
 - (iv) use any personal protective equipment or clothing issued by the employer;
 - (v) report any accident, near-miss incident or dangerous behaviour by another person to their employer or manager.

SL 04.17 COMPENSATION FOR INJURIES AND DISEASES

- (a) It is the responsibility of employers to arrange for all persons employed on a EPWP to be covered in terms of the Compensation for Occupational Injuries and Diseases Act, 130 of 1993.
- (b) A worker must report any work-related injury or occupational disease to their employer or manager.
- (c) The employer must report the accident or disease to the Compensation Commissioner.
- (d) An employer must pay a worker who is unable to work because of an injury caused by an accident at work 75% of their earnings for up to three months. The employer will be refunded this amount by the Compensation Commissioner. This does NOT apply to injuries caused by accidents outside the workplace such as road accidents or accidents at home.

SL 04.18 TERMINATION

- (a) The employer may terminate the employment of a worker provided he has a valid reason and after following existing termination procedures.
- (b) A worker will not receive severance pay on termination.
- (c) A worker is not required to give notice to terminate employment. However, a worker who wishes to resign should advise the employer in advance to allow the employer to find a replacement.
- (d) A worker who is absent for more than three consecutive days without informing the employer of an intention to return to work will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.
- (e) A worker who does not attend required training events, without good reason, will have terminated the contract. However, the worker may be re-engaged if a position becomes available for the balance of the 24-month period.

SL 04.19 CERTIFICATE OF SERVICE

- (a) On termination of employment, a worker is entitled to a certificate stating –
 - (i) the worker's full name;
 - (ii) the name and address of the employer;
 - (iii) the SPWP on which the worker worked;
 - (iv) the work performed by the worker;
 - (v) any training received by the worker as part of the EPWP;
 - (vi) the period for which the worker worked on the EPWP;
 - (vii) any other information agreed on by the employer and worker.

SL 05 EMPLOYER'S RESPONSIBILITIES

The employer shall adhere to the conditions of employment as stipulated in the *Code of Good Practice for Employment and Conditions of Work for Expanded Public Works Programmes*. Over and above the conditions stipulated above, he shall be responsible to:

- (a) formulate and design a contract between himself/ herself and each of the recruited EPWP beneficiary, ensuring that the contract does not contravene any of the Acts stipulated in South African Law, e.g. Basic Conditions of Employment Act, etc. (A copy of a pro-forma contract is attached at the end of this specification);
- (b) screen and select suitable candidates for employment from the priority list of EPWP beneficiary provided by the Umsobumvu Youth Fund (UYF);
- (c) ensure that the recruited EPWP beneficiary are made available to receive basic life skills training which will be conducted and paid for by the Umsobumvu Youth Fund;

- (d) ensure that all EPWP beneficiary receive instruction on safety on site prior to them commencing with work on site;
- (e) ensure that all EPWP beneficiary are covered under workmen's compensation for as long as they are contracted to the contractor. Payment to the Compensation Commissioner shall be the responsibility of the contractor;
- (f) assist in the identification and assessment of potential EPWP beneficiary to undergo advanced technical training in respective trades;
- (g) test and implement strict quality control and to ensure that the health and safety regulations are adhered to;
- (h) provide all EPWP beneficiary with the necessary protective clothing as required by law for the specific trades that they are involved in.
- (i) provide overall supervision and day-to-day management of EPWP beneficiary and/or sub-contractors; and
- (j) ensure that all EPWP beneficiary are paid their wages on time through a pre-agreed payment method as stipulated in the contract with the EPWP beneficiary.

SL 06 PLACEMENT OF RECRUITED EPWP BENEFICIARY

Employers will be contractually obliged to:

- (a) employ EPWP beneficiary from targeted social groups from the priority list provided by the Service Provider/ Umsobumvu Youth Fund.
 - (b) facilitate on-the-job training and skills development programmes for the EPWP beneficiary;
 - (c) achieve the following minimum employment targets:
 - (i) 55% people between the ages of 18 and 35
 - (ii) 55% women;
 - (iii) 2% people with disabilities.
 - (d) brief EPWP beneficiary on the conditions of employment as specified in sub clause SL 04.09 above;
 - (e) enter into a contract with each EPWP beneficiary, which contract will form part of the Employment Agreement;
 - (f) allow EPWP beneficiary the opportunity to attend life skills training through DOL. This shall be arranged at the beginning of the contract;
 - (g) ensure that payments to EPWP beneficiary are made as set out in sub clauses SL 04.14 and SL 04.15 above.
 - (h) set up of personal profile files as prescribed by EPWP beneficiary and as set out in sub clause SL 04.13 above.
 - (i) in addition to (h)
 - a copy of the I.D;
 - qualifications;
 - career progress;
 - EPWP Employment Agreement, and
 - list of small trade tools;
- must be included in the EPWP beneficiary's personal profile file.

SL 07 TRAINING OF EPWP BENEFICIARY

Three types of training are applicable, namely

- Life skills;
- On the job training and
- Technical Skills training.

Training will be implemented by training instructors accredited by DOL and/or CETA :

- EPWP beneficiary shall be employed on the projects for an average of 6 months.
 - EPWP beneficiary shall be deployed on projects in the vicinity of their homes. The same arrangements as for other workers regarding accommodation, subsistence and travel shall be applicable to EPWP beneficiary.
- (a) Life skills training
- All EPWP beneficiary are entitled to undergo life skills training. Training of this module will be flexible enough to meet the needs of the employer. Training should take place immediately after site hand-over and during the period of site establishment and pre-planning before actual construction starts, alternatively this will be spread over the duration of the contract period. The contractor will be required to work closely with the person to schedule the training sessions so that the timing of the training is aligned with the contractors work schedule and his demand for workers.
- (b) On-the job training
- The Employer shall provide EPWP beneficiary with on-the-job training to enable them to fulfil their employment requirements. The employer shall also be expected to closely monitor the job performance of EPWP beneficiary and shall identify potential EPWP beneficiary for skills development programmes.
- (c) Technical skills training
- The Employer shall assist in identifying EPWP beneficiary for further training. These EPWP beneficiary will undergo further technical training to prepare them for opportunities as semi-skilled labourers.

Such training will comprise of an off-site theoretical component and practical training on-site. The contractor will be responsible for on-site practical work under his supervision. EPWP beneficiary who graduate from the first phase of the training programme will be identified and given opportunities to register for skills development programmes. These can ultimately result in a accredited qualification. The programme will consist of theoretical instruction away from the construction site as well as on-site practical work under the supervision of the employer. Candidates will be entitled to employment to complete all training modules.

SL 08 BENEFICIARY (EPWP BENEFICIARY) SELECTION CRITERIA

SL 08.01 PREAMBLE

The *Code of Good Practise for Employment and Conditions of Work for Expanded Public Works Programmes* encourages:

- optimal use of locally-based labour in a Expanded Public Works Programme (EPWP);
- a focus on targeted groups which consist of namely youth, consisting of women, female-headed households, disabled and households coping with HIV/AIDS; and
- the empowerment of individuals and communities engaged in a SPWP through the provision of training.

SL 08.02 BENEFICIARY (EPWP BENEFICIARY) SELECTION CRITERIA

- (a) The EPWP beneficiary of the programmes should preferably be non-working individuals from the most vulnerable sections of disadvantaged communities who do not receive any social security pension income. The local community must, through all structures available, be informed of and consulted about the establishment of any EPWP

- (b) In order to spread the benefit as broadly as possible in the community, a maximum of one person per household should be employed, taking local circumstances into account.
- (c) Skilled artisans from other areas may be employed if they have skills that are required for a project and there are not enough persons in the local communities who have those skills or who could undergo appropriate skills training. However, this should not result in more than 20% of persons working on a programme not being from local communities.
- (d) Programmes should set participation targets for employment with respect to youth, single male- and female-headed households, women, people with disabilities, households coping with HIV/AIDS, people who have never worked, and those in long-term unemployment.
- (e) The proposed targets as set out in sub clause SL 06 (c)
 - 55% youth from 18 to 35 years of age;
 - 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)¹/₄.Unit: R/ worker-month

SL 11.04.02 Employment of EPWP beneficiary.....(Prov.Sum)¹/₄.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: %

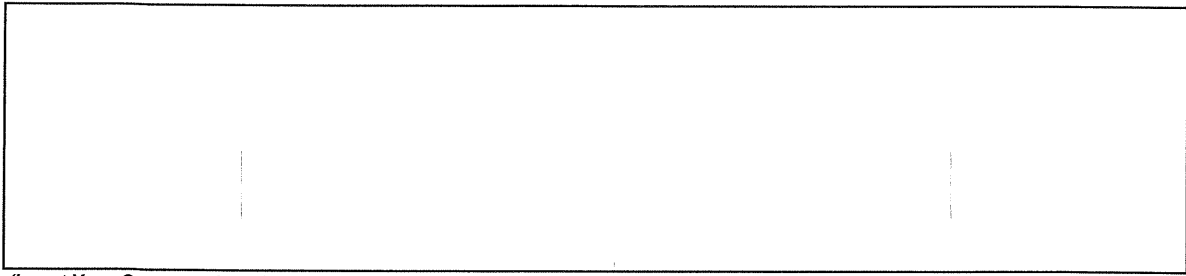
SL 11.07 APPOINTMENT OF EPWP BENEFICIARY TEAM LEADER/S

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 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS**

ANNEXURE 11
Attendance Register - Infrastructure and Other projects



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 90: MANQONDO JUNIOR
PRIMARY SCHOOL - OPEN BIDS

Project Code: **063384** Tender No **ZNTD 05381W**

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 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS**

ANNEXURE 12
EPWP Data Collection tool for Phase 3 system

KZN PUBLIC WORKS
Monthly Data collection for LOCAL Labour



Name of Contractor: _____ Project Code: 063384 Project location name (area): _____

Name of Project: _____ Reporting month: _____ Project location (Ward No.): _____

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM
DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST

Beneficiary 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	Experience/Literacy			Location Details			Household Details			
																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
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									

• Education Levels – use the codes (1,2,3) on the excel spreadsheet
o (1) Unknown (3) Grade 1-3 (Sub A – Std 1)
o (2) No Schol (4) Grade 4 (Std 2) ABET 1
(5) Grade 5-6 (Std 3-4) ABET 2 (7) Grade 9 (Std 7) ABET 4 (9) Grade 12 (Std 10)
(6) Grade 7-8 (Std 5-6) ABET 3 (8) Grade 10-11 (Std 8-9) (10) Post Matric

Contractor sign: _____
Designation: _____
Date: _____
Contact no: _____

DPW Official/Consultant sign: _____
Designation: _____
Date: _____
Contact no: _____

EPWP Official sign: _____
Designation: _____
Date: _____
Contact no: _____

BUSINESS PLAN

Reference No	
Profile ID	
Project Name	
Project Details	
Project Name	
Project Reference Number	
Project description	
Project Start Date	
Project End Date	
Estimated Budget	
Project Location	
Province	
District/Metro Municipality	
Local Municipality/Metro Region	
Latitude (in decimal format)	
Longitude (in decimal format)	
Public Body Details	
Public body sphere	
Reporting public body that is the project owner (and will report on the project)	
Implementing public body type	
Public body that will implement the project	
IDP reference number allocated to the project	
EPWP Details	
EPWP Sector	
EPWP Program	
EPWP Sub programme	
Budget Amount	
April 2014/March 2015	
April 2015/March 2016	
Total Budget Amount	
Wages	
UIF	
COIDA	
Training	
Administration	
Equipment and materials	
Other	
Describe other	
Outputs and Training	
Output	
Description	
Target Quantity	
Number of persons to be trained	
Contact person	
Title	
Initials	
First Name	
Surname	
Email	
Tel (Office)	
Fax Number	
Cell Number	
Physical Address 1	
Physical Address 2	
Physical Address 3	
Physical Address 4	
Postal Address 1	
Postal Address 2	
Postal Address 3	
Postal Address 4	

KZN PUBLIC WORKS

Worker payment capture form for LOCAL Labour



Name of Contractor: _____

Project Code: _____

063384

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 90: MANQONDO JUNIOR
PRIMARY SCHOOL - OPEN BIDS

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: _____

Worker Training capture form for LOCAL Labour



KWAZULU-NATAL PROVINCE
PUBLIC WORKS
REPUBLIC OF SOUTH AFRICA



Name of Contractor: _____

Name of Project: _____

Project Code: _____

063384

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO
STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-
NATAL: NORTH COAST REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY
SCHOOL - OPEN BIDS

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	



public works

Department:
Public Works
PROVINCE OF KWAZULU-NATAL

**PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM
DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST
REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS**

ANNEXURE 13

SCOPE OF WORKS MATRIX

PHASE 14: STORM DAMAGED PROGRAMME: REPAIRS AND RENOVATIONS TO STORM DAMAGED SCHOOLS THROUGHOUT THE PROVINCE OF KWAZULU-NATAL: NORTH COAST REGION: CLUSTER 90: MANQONDO JUNIOR PRIMARY SCHOOL - OPEN BIDS		SCOPE OF WORK MATRIX																						
Description	Block 1 - 1 Classroom	Block 2 - 2 x Classrooms	Block 3 - 2 x Classrooms	Block 4 - 2 x Classrooms	Block 5 - Building	Block 6 - Building	Block 7 - 4 x Classrooms	Block 8 - Standard Park Home -	Preliminaries	Provisional Sums	External Works	Electrical Installation												
BILL NO. 1 PRELIMINARIES																								
BUILDING AGREEMENT AND PRELIMINARIES																								
See C2.2 - Preliminaries for GCC for Construction works - 2nd Edition (2010) Preliminaries.																								
	X	X	X	X	X	X			X															
REMOVAL OF EXISTING WORK																								
<u>Breaking up and removing concrete</u> Unreinforced concrete surface beds		X	X																					
<u>Carefully breaking down and removing from site</u> Half brick walls in beamfilling One brick walls in beamfilling	X X	X X	X X	X X			X X	X X																
<u>Carefully take out and remove</u> Timber single door and steel frame 813 x 2032mm high overall from one brick wall to remain, including temporary propping and preparing opening to receive new frame (elsewhere measured) Door lock and furniture and preparing to receive new (elsewhere measured) Gypsum plasterboard or fibre cement ceilings including cornices and cover strips from brandering to remain, including preparing branders for new ceiling (elsewhere measured)	X X	X X	X X	X			X X	X																
<u>Taking off/out/down and removing from site</u> Chalkboard and frame exceeding 2.5m2 and not exceeding 5m2, including making good to plaster, etc. Pinboard and frame exceeding 2.5m2 and not exceeding 5m2, including making good to plaster, etc. Asbestos roof sheeting including timber purlins, underlay, etc complete and the provision of a certificate of safe disposal for asbestos. (measured on flat) Sheet iron roof sheeting including timber purlins, underlay, etc complete. (measured on flat) uPVC, fibre-cement or sheet metal rainwater pipes and holder bats uPVC, fibre-cement or sheet metal rainwater gutters Fibre-cement fascia and barge boards	X X X X X X X	X X X X X X X	X X X X	X X X X			X X X X																	
<u>Carefully taking out and removing doors and frames from brickwork to remain (new door and frame measured elsewhere)</u> Timber single door and frame not exceeding 2,5m² Steel security gate and frame not exceeding 2,5m²				X			X X																	
<u>Carefully taking out and removing</u> Glass from steel windows including cleaning out rebates and preparing for new glass (elsewhere measured) Putty from existing glazed window frames, prepare rebates for and re-putty. Window sliding stay Window latch Air vents	X X X X	X X X X	X X X X	X X X X	X X		X X X X																	
<u>Taking out/off and removing sanitary fittings including making good wall finishes, temporarily stopping off services and re-connecting to new fittings (paintwork & new fittings elsewhere measured)</u> Polyethylene pit WC pedestal and footpiece and preparing opening to receive new (elsewhere measured)							X																	
PREPARATORY WORK TO EXISTING SURFACES																								
<u>Hack up/off and remove floor screeds, plaster and prepare surfaces for new</u> 25mm Screed from floors		X	X	X																				
REMEDIAL WORK																								
<u>Make good internal cement plaster</u> Chase out plaster down to brick face ± 100mm wide either side of crack to form recess, insert galvanised chicken mesh strip and re-plaster with 1:4 cement mortar, including floating up smooth to match existing		X	X	X																				
TEMPORARY BARRIERS, SCREENS, ETC																								
<u>Temporary barriers, screens, etc including removal and allow for re-use</u> 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 maximum 3m spacing								X																
TEMPORARY ACCOMMODATION																								
<u>Provide temporary accommodation units (park homes) for Educational Facilities during construction in phases as herein measured, including levelling of area, positioning on site, two tier steps for access and connected to electrical supply. Park homes to be standard classroom size and need to be minimum 7m x 7m or nearest standard size</u> Rental of temporary accommodation unit approximate size 7m x 7m wide, including standard windows, burglar bars, curtains and tracks, two tier steps for access, light fittings and electrical certificate of compliance, for a period of Twelve (12) calendar months Electrical Compliance Certificate Transportation and establishment on site and de-establishment on completion, temporary accommodation units approximate size 7 x 7m																						X X X		
BILL NO. 3																								
EARTHWORKS (PROVISIONAL)																								
EXCAVATION, FILLING, ETC																								
<u>Excavation in soft material not exceeding 2 metres deep below natural or reduced ground level for</u> Reduce levels under surface bed Filling, etc <u>Approved earth filling supplied by the Contractor, well watered and compacted in layers not exceeding 150mm to a density as specified</u>		X X	X																					

[illegible]

[illegible]

[illegible]

Type E. Pole mounted flood-light luminaire, including pole, 2 x High-pressure die-cast aluminium light fitting. Heat & impact resistant diffuser. Minimum IP 65 compartments for lamp and control gear, with stainless steel screws including finger grips for aiming luminaire. All external bolts to be stainless steel. Minimum 20 000lm. Cool White, Colour Black or as per architect. Mounted on 4.6m Pole at 4m mounting height. Price to include pole, complete with 2x 250W Metal Halide fittings, lamp, electronic control gear and all necessary accessories.		X
<u>Re-lamp existing lights with lamps as noted below:</u>		
230V, 11W ES/BC Compact Fluorescent lamps. Colour Cool White.		X
230V, 1500mm T5 Fluorescent Tubes. Colour Cool White		X
MISCELLANEOUS		
Administration Block Alarm System including connection cables		X
Telephone Distribution Board		X
School Siren and Push Button with Latch in Timer		X
50mm PVC Sleeve		X
DISTRIBUTION BOARDS		
<u>Remove and replace distribution boards, complete with doors where applicable, frames, subframes, chassis, fixtures, fittings, spare space, busbar etc. as per specification and drawings. All shop drawings to be approved prior to manufacture. Refer to Schematic for full details and circuit breaker count.</u>		
Wall mounted Fan		X
16 Way Surface Mounted		X
12 Way Surface Mounted		X
Allow for Municipal Eskom Meter		X
<u>Upgrade DB to bring up to SANS standard and Supply & Install circuit breakers as required. All circuit breakers to match DB kA rating with minimum 6kA Schneider/ CBI breakers. To include all wiring, labels, blanks and safety labels for DB.</u>		
15Amp single phase Circuit breaker		X
20Amp single phase Circuit breaker		X
60Amp double pole Earth Leakage Unit		X
Class II 10kA single pole SPD unit		X
60Amp three phase 4-pole main Circuit Breaker		X
40Amp Double pole Single Phase Main Circuit breaker		X
LIGHT SWITCHES		
<u>Remove and replace, 16 Amp light switches in existing flush 50 x 100 x 50mm boxes, including white coloured cover plates.</u>		
Single Lever, one way switch		X
Two Lever one way switch		X
IP65 Single Lever switch		X
One Lever two way switch		X
SWITCHED SOCKET OUTLETS		
<u>Remove and replace 16Amp switched socket outlets in existing 100 x 100 x 50mm boxes with white coloured cover plates</u>		
16 Amp 3 pin double SSO (White)		X
16 Amp 3 pin Single (White)		X
Supply, installation and connection of 16Amp switched socket outlets in single, two or three compartment power skirting		
<u>Provisional - for changes in Computer Room</u>		
16 Amp 3-pin single (White)		X
16Amp 3 pin dedicated complete with plug top (Red)		X
Cradles and Blank covers for telephone/data outlet points.		X
RJ45 Data Outlet complete with cover		X
RJ11 Telephone Outlet complete with Cover		X
ISOLATORS		
<u>Remove and replace isolator in GRP extension box. To be supplied complete with 100 x 100 x 50mm box</u>		
30 Amp 2 pole 230V		X
30 Amp 2 pole 230V, weather proof		X
PHOTO CELLS		
Replace 10 Amp day light switch per SANS 1777		X
EARTHING, BONDING AND LIGHTNING PROTECTION		
<u>Install Earthing & Lightning Protection per SANS 10313, 62305 and 10142. To be undertaken by specialist earthing and lightning contractor. Refer to specification Part A, Item 14</u>		
Ø8mm Aluminium lightning protection conductor. To include all holding down clamps, down conductors and bonding to earth ring		X
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.		X
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.		X
50mm² stranded BCEW down conductor in surface mounted PVC conduit complete with saddles.		X
1200mm x 16mm diameter Copper earth electrodes driven in ground, including 'Cadweld' joining sleeves as required.		X
LOW VOLTAGE CABLES		
<u>Supply and installation and termination of copper PVC/SWA/ECC cables laid in ducts, trenches, horizontal racks or vertical ducts. Rates shall include the supply and fixing of supports with regard to installation of cables. Rates shall include the PVC cable ties as required. All cables are Copper PVC/SWA/ECC cables per SANS 1507.</u>		
6.0mm x 3 Core ECC.		X
6.0mm x 3 Core ECC - (Termination)		X
16mm x 3 Core ECC.		X
16mm x 3 Core ECC - (Termination)		X
<u>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.</u>		
In soft or pickable soil		X
Soft Rock		X
Hard Rock		X
Warning tape installed 300mm below ground level, above cables in trench		X
TESTING & COMMISSIONING		

Test and commission complete installation as per SANS 10142-1.							X
Provide Certificate of Compliance (CoC) as per SANS 10142-1. One for each DB and the associated circuits connected to the DB and one for the overall installation							X
Provide Earthing certificate for entire site, to include earth resistance test of each down conductor earth electrode, measured by an Earthing specialist by means of an approved instrument.							X
Remove all redundant equipment, store and dispose at an approved dump site. A disposal certificate to be supplied.							X
BILL NO. 14							
PLASTERING (PROVISIONAL)							
SCREEDS							
(1:4) Cement mortar screeds finished with a steel trowel on concrete:							
25mm Thick on floors		X	X	X			
INTERNAL PLASTER							
One coat (1:4) cement plaster finished with a steel trowel							
On walls	X	X	X	X		X	X
EXTERNAL PLASTER							
One coat (1:4) cement plaster finished with a wood trowel							
On walls	X	X	X	X		X	X
On narrow widths	X	X	X	X		X	X
BILL NO. 15							
GLAZING (PROVISIONAL)							
GLAZING TO STEEL WITH PUTTY							
6,38mm Clear Safety Glass							
Panes exceeding 0,1m² and not exceeding 0,5m²		X	X	X	X	X	
BILL NO. 16							
PAINTWORK (PROVISIONAL)							
PAINTWORK TO PREVIOUSLY PAINTED WORK							
ON PLASTER, ETC.							
Prepare and brush surface to remove all loose contaminants, clean down, make good cracks and minor defects with an approved interior/exterior filler paste, apply one coat approved all-purpose plaster primer, one coat approved universal undercoat and two coats approved durable and washable pure acrylic emulsion sheen paint on:							
Plastered walls internally	X	X	X	X		X	X
Plastered walls externally	X	X	X	X		X	X
ON METAL							
Prepare and brush surface to remove all loose contaminants, clean and apply one coat approved galvanised iron primer and two coats approved water-based enamel paint on:							
Window frames (both sides measured)	X	X	X	X		X	X
Security gates (both sides measured)			X				
Door frames	X	X	X	X			
ON WOOD							
Prepare, sand and apply three coats approved exterior clear low-gloss finish polywax sealer with UV-protection and water repellence, sanding lightly between coats on:							
Doors	X	X	X	X			
PAINTWORK TO NEW WORK							
ON PLASTER, ETC.							
Prepare and apply one coat approved all-purpose plaster primer, one coat approved universal undercoat and two coats approved durable and washable pure acrylic emulsion sheen paint on:							
Plastered walls externally	X	X	X	X		X	X
Gypsum plasterboard ceilings, coverstrips, cornices, etc., internally including priming and stopping up nail heads.	X	X	X	X			
Fibre-cement fascias & bargeboards	X	X	X	X		X	
ON METAL							
Prepare and brush surface to remove all loose contaminants, clean and apply one coat approved galvanised iron primer and two coats approved water-based enamel paint on:							
Door frames						X	X
ON WOOD							
Prepare, sand and apply three coats approved exterior clear low-gloss finish polywax sealer with UV-protection and water repellence, sanding lightly between coats on:							
Doors						X	X
On bumper rails, skirtings, etc. not exceeding 300mm wide	X	X	X	X			
BILL NO. 17							
EXTERNAL WORKS (PROVISIONAL)							
RAINWATER TANKS & STANDS							
Approved 5000 litre Polyethylene Low-Profile water tank with Ø40mm inlet, Ø40mm overflow and Ø40mm outlet, Ø480mm lid with 100 x 75mm opening for rainwater pipe and fitted with Ø20mm an approved threaded one piece uv stabilised ABS ball valve complete with 40/20mm uv stabilised ABS reducing bush, Ø20mm uv stabilised ABS long screw parallel thread and Ø20mm uv stabilised pp/nylon insert male elbow on outlet side of valve, embedded in pedestal to a minimum 400mm above ground level and tied down with 2 No. Ø4mm galvanised double strap stay wires tied to galvanised M12 eye bolts drilled and fixed to corners of concrete supporting base	X	X	X	X			
The following in Tank Stands							
Excavations in earth not exceeding 2m deep for trenches	X	X	X	X			
Risk of collapse to sides of trench and hole excavations not exceeding 1,5m deep.	X	X	X	X			
Keeping excavations free of all water other than subterranean water							
Backfilling from excavated material to trenches, holes, etc. and compact to 95% Mod AASHTO density	X	X	X	X			
Filling from excavated material under water tank slab including levelling and compacting to 95% Mod AASHTO density	X	X	X	X			
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 AASHHTO density	X	X	X	X			
Apply Chlordane or Aldrin type soil insecticides in strict accordance with manufacturers instructions and complying with SANS Specifications 1165 and 1165 respectively, to ground surfaces under surface beds, etc.	X	X	X	X			
25MPa/19mm unreinforced concrete in strip footings	X	X	X	X			
25MPa/19mm reinforced concrete in surface beds	X	X	X	X			
Finishing top surfaces of concrete smooth with a wood float to surface beds	X	X	X	X			
Smooth formwork to edges, risers, ends, etc. not exceeding 300mm high or wide	X	X	X	X			

[illegible]

Principal Agent

DOE Planner

**DPW Project
Leader**

School Principal

Contractor