



BA-PHALABORWA MUNICIPALITY

BID No. 09/21/22

FOR

THE UPGRADING OF B1-EXTENSION PHASE 2 IN LULEKANI OF BA-PHALABORWA MUNICIPALITY

THE CONTRACT

PART C3	SCOPE OF WORKS
PART C4	SITE INFORMATION



BA-PHALABORWA MUNICIPALITY

BID No. 09/21/22

FOR

UPGRADING OF B1-EXTENSION PHASE 2 IN LULEKANI OF BA-PHALABORWA MUNICIPALITY

PART C3: SCOPE OF WORK

C3.1	DESCRIPTION OF WORKS	C.36
C3.2	ENGINEERING.....	C.38
C3.3	CONSTRUCTION.....	C.39
C3.4	MANAGEMENT	C.142

C3.1 DESCRIPTION OF WORKS

The description of the project contained in this section is merely an outline of the contract works and does not limit the work to be carried out by the Contractor under this contract. The extent and scope of the work to be carried out as part of the contract can change, due to changes to the priority of certain portions of the work, as determined by the client, changes to budgetary constraints or emergency works that have to be completed.

C3.1.1 Employer's Objectives

The employer's objective is to deliver public infrastructure in a sustainable and environmentally friendly manner, in close consultation with the community. In this project, labour intensive construction methods will be used.

C3.1.2 Overview and Location of Works

The Works to be carried out is as described on the drawings (Part C5.3: Contract Drawings) and summarized below:

This project comprises **THE UPGRADING OF B1-EXTENSION PHASE 2 IN LULEKANI OF BA-PHALABORWA MUNICIPALITY**

C3.1.3 Extent of Works

The major activities for the project will include, among other, the following;

- Clearing and grubbing of the road and road reserve.
- Mass earthworks
- Construction of layer works.
- Installation of relief culverts
- Construction of v-drains and installation of kerb
- Prime coating
- Asphalt surfacing
- Installation of road signs
- Road Markings
- Finishing of the road and road reserve

C3.1.4 Location of the Works

The Works to be carried out is as described on the drawings (Part C5.3: Contract Drawings) and summarized below:

This project comprises the **THE UPGRADING OF B1-EXTENSION PHASE 2 IN LULEKANI OF BA-PHALABORWA MUNICIPALITY**

C3.1.5 Temporary Works

No temporary works are anticipated.

C3.1.6 General Information

The Scope of works forms an integral part of the Contract documents and supplements the COLTO standard specification of Road and Bridge works for State Road authorities march 1998 edition (Standard Specification)

In the event of any discrepancy with part or parts of the Standard Specifications, the schedule of Quantities or Drawings, the scope of work shall take precedence.

The Standard Specifications which from part of this contract have been written to cover all phases or work normally required for road contracts, and they may therefore, cover items not applicable this particular Contract

C3.1.6.1 Drawings

The reduced drawings contained in Annexure C5.2 that form part of the tender document shall be used for tender purposes only. Further drawings are to be provided on an on-going basis by the engineer.

The contractor will be supplied with an unreduced 0,05 mm thick transparent polyester print of each of the drawings. These polyester prints are issued free of charge and the contractor shall make any additional prints he may require at his own cost.

Any information in the possession of the contractor, which the resident engineer requires to complete the as-built drawings, shall be supplied to the resident engineer before a certificate of completion will be issued.

Only figured dimensions shall be used and drawings shall not be scaled unless so instructed by the engineer. The engineer will supply all figured dimensions omitted from the drawings.

C3.1.6.2 Power, Water Supply and Other Services

The contractor shall make his own arrangements concerning the supply of electrical power and all other services. No direct payment will be made for the provision of electrical and other services. The cost of providing these services will be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required.

C3.1.6.3 Contractor's Camp Site and Security

The contractor shall make his own arrangements regarding the establishment of a camp site and housing for his construction personnel and all regulations stipulated by the local authority shall be adhered to.

It is anticipated that the contractor's choice of a camp site will be influenced by the availability of telephone and electrical connections as well as the supply of potable water.

Provision is made in these specifications for the erection of a security fence around the site offices. The contractor shall be responsible for the security of his personnel and constructional plant on and around the site of the works and for the security of his camp, and the employer will consider no claims in this regard.

C3.1.6.4 Additional Requirements for Construction Activities

C3.1.6.4.1 The contractor may not commence constructional activities before adequate provision has been made to accommodate traffic in accordance with the requirements of this document and the South African Road Traffic Signs Manual.

C3.1.6.4.2 The contractor shall submit proposals in connection with directional signs to the engineer for approval.

C3.1.6.5 Programme Requirements for Construction Activities

The contractor shall programme his activities to be suitable in terms of his resources to complete the contract inside the stipulated time period.

C3.1.6.6 Construction in Confined Areas

It may be necessary for the contractor to work in confined areas. In certain areas the width of the fill material and pavement layers may reduce to zero and the working space may be confined. The method of construction in these confined areas depends on the contractor's construction plant. However, the contractor must note that measurement and payment will be in accordance with the specified cross-sections and dimensions, irrespective of the method used to achieve these cross-sections and dimensions, and that the rates and amounts tendered will be deemed to include full compensation for any special equipment or construction methods or for any difficulty encountered in working in confined areas and narrow widths, and at or around obstructions, and that no extra payment will be made nor will any claim for payment be considered on account of these difficulties.

C3.1.7 Labour Regulations

C3.1.7.1 Payment for the labour-intensive component of the works

Payment for works identified in clause 2.3 "the Extent of the Project" in the Project Specifications 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.

C3.1.7.2 Applicable labour laws

Sectorial determination 2: Civil engineering sector

C3.2 ENGINEERING

C3.2.1 Design

- (a) The **Employer** is responsible for the design of the permanent Works as reflected in these Contract Documents unless otherwise stated.
- (b) The **Contractor** is responsible for the design of the temporary Works and their compatibility with the permanent Works.
- (c) The **Contractor** shall supply all details necessary to assist the engineer in the compilation of the as-built drawings.

C3.2.2 Employer's Design

- (a) Detail description of Works
- (b) General Works
- (c) Sign Gantries. e.g.

C3.2.3 Contractor's Design

Where contractor is to supply the design of designated parts of the permanent Works or temporary Works he shall supply full working drawings supported by a professional engineer's design certificate.

C3.2.4 Design procedures

All designs and modifications thereto shall be communicated in writing and the contractor and engineer shall maintain master lists to record and track all transactions.

C3.3 CONSTRUCTION**C3.3.1 STANDARD SPECIFICATIONS**

- (a) The following specifications shall apply for the construction of the Works.
 - (i) The COLTO Standard Specifications for Road and Bridge Works for State Road Authorities (1998).

The contractor may purchase copies of Volume (i) from the South African Institution of Civil Engineers.

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- (b) SANS or BS Specifications and Codes of Practice

Wherever any reference is made to the South African Bureau of Standards (SANS) and the British Standards Specification (BSS) in either these Bill of Quantities or the Specification of Materials and Methods to be Used (OOG-001E), this reference shall be deemed to read "SABS or equivalent standard" and BS or equivalent standard" respectively.

- (c) Various other specifications specified in the COLTO Standard Specifications or the Project Specifications.
- (d) Latest **Sabita Manual**, Manual 25 entitled "*Quality Management in the Handling and Transport of Bituminous Binders*".

C3.3.2 PROJECT SPECIFICATIONS RELATING TO STANDARD SPECIFICATIONS

C3.3.2.1 General Conditions of Contract Referred to in the Standard Specifications

The references to the General Conditions of Contract appearing in the COLTO Standard Specifications refer to the COLTO General Conditions of Contract which is superseded in this contract by the General Conditions of Contract for Construction Works 2010. The corresponding clause in the latter document pertaining to the reference in the COLTO Standard Specifications is listed in the table below.

Clause No. in the Standard Specifications	Clause No. in COLTO General Conditions	Equivalent Clause No. in General Conditions of Contract 2010
1202	15	5.6.1
1206	14	Deleted
1209	52	6.10.2
1210	54	51.1
1212(1)	49	6.10.1
1215	45	5.12.1
1217	35	8.2.1
1303	49	6.8
1303	53	6.11
1303	12	5.6
1303	45	5.12.1
1403	40(1)	6.4.1
1505	40	6.4
31.03	40	6.4
3204(b)	40	6.4
3303(b)	2	3
5803(c)	40	6.4
5805(d)	40	6.4
6103(c)	40	6.4
Item 83.03	22	5.15
ALL SECTIONS	48	6.6

C3.3.2.2 Amendments to the Standard Specifications

There are no amendments to the Standard Specifications as issued by the Committee of Land Transport Officials (COLTO).

C3.3.2.3 Project Specifications Relating to Standard Specifications

This part of the project specifications deals with matters relating to the standard specifications. Where reference is made in the standard specifications to the project specifications this part shall also contain the relevant information e.g. the requirements where a choice of materials or construction methods are provided for the standard specifications.

In certain clauses the standard specifications allow a choice to be specified in the project specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternatives or additional requirements applicable to this contract are contained in this part of the project specifications. It also contains some additional specifications and amendments of the standard specifications required for this particular contract.

The number of each clause and each payment item in this part of the project specifications consists of the prefix B followed by a number corresponding to the number of the relevant clause or payment item in the standard specifications. The number of a new clause or a new payment item, which does not form part of a clause or a payment item in the standard specifications and is included here, is also prefixed by B followed by a new number. The new numbers follow on the last clause or item number used in the relevant section of the standard specifications.

Clauses and pay items referring to labour intensive methods are prefixed by L in the project specifications.

Clauses and pay items referring to emerging contractors are prefixed by E in the project specifications.

C3.3.2.4 EPWP Clauses

Use of local Workers for LI designated activities

Labour-intensive works shall be constructed/maintained using local workers who are temporarily employed in terms of this Scope of Work

Competencies of LI Management and Supervisory staff

Contractors shall engage supervisory and management staff in labour-intensive works that have completed the skills programme including Foremen/Supervisors at NQF “National Certificate: Supervision of Civil Engineering Construction Processes” and Site Agent/Manager at NQF level 4 “Manage labour-intensive Construction Processes” or equivalent QCTO qualifications.

Wage Dispute (Contractor default to pay beneficiaries)

- (a) Any dispute between the Contractor and labourers, regarding delayed payment or default in payment of fair wages, if not resolved immediately may compel the Employer to intervene.
- (b) The Employer may, upon the Contractor defaulting payment, pay the moneys due to the workers not honoured in time, out of any moneys due or which may become due to the Contractor under the Contract.

Provision of Hand tools

The Contractor shall provide his labour force with hand tools of adequate quality, sufficient in numbers and make the necessary provisions to maintain the tools in good and safe working conditions

Reporting requirement of Contractor

The Contractor should submit the following at the beginning of the Contract:

- (a) Contracts of all the workers employed on the contracts including their certified identity documents;
- (b) Proof of Registration for COIDA and UIF;
- (c) OHS Files

The Contractor shall submit monthly returns/reports as specified below:

- (a) Signed Muster rolls/pay sheets of temporary workers and permanent staff detailing the number, category, gender, rate of pay and daily attendance.
- (b) Copies of certified identity documents of workers
- (c) Number of persons who have attended training including nature and duration of training provided
- (d) Assets created, rehabilitated or maintained in accordance with indicators in the EPWP M&E framework
- (e) Plant utilization returns
- (f) Progress report detailing production output compared to the programme of works

MATTERS RELATING TO THE STANDARD SPECIFICATIONS

SECTION 1200 : GENERAL REQUIREMENTS AND PROVISIONS	C.44
SECTION 1300: CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS	C.53
SECTION 1400: HOUSING, OFFICES AND LABORATORIES FOR THE ENGINEER'S SITE PERSONNEL.....	C.55
SECTION 1500: ACCOMMODATION OF TRAFFIC	C.57
SECTION 1700 : CLEARING AND GRUBBING	C.62
SECTION 1800: DAYWORK SCHEDULE.....	C.64
SECTION 2100: DRAINS.....	C.66
2200: PREFABRICATED CULVERTS	C.67
SECTION 2300: CONCRETE KERBING, CONCRETE CHANNELLING, CHUTES AND DOWNPIPES AND CONCRETE LININGS FOR OPEN DRAINS.....	C.72
SECTION 3100: BORROW MATERIALS.....	C.73
SECTION 3200: SELECTION, STOCKPILING AND BREAKING-DOWN THE MATERIAL FROM BORROW PITS, CUTTINGS AND EXISTING PAVEMENT LAYERS, AND PLACING AND COMPACTING THE GRAVEL LAYERS	C.75
SECTION 3300: MASS EARTHWORKS.....	C.76
SECTION 3400: PAVEMENT LAYERS OF GRAVEL MATERIAL.....	C.78
SECTION 5600: ROAD SIGNS.....	C.84
SECTION 5700: ROAD MARKINGS	C.87
SECTION 5900 : FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS.....	C.88
SECTION 6100: FOUNDATIONS FOR STRUCTURES.....	C.89

SECTION 1200 : GENERAL REQUIREMENTS AND PROVISIONS

B1202 SERVICES

Add the following to the fifth paragraph:

“Provision is made in the bill of quantities for payment for searching and exposing of known or unknown services as well as the relocation and/or protection of existing services. Any moving of existing services which may be required within the proclaimed road reserve will be undertaken by the relevant service authorities or by a selected subcontractor if so ordered by the engineer.”

B1204 PROGRAMME OF WORK

(a) General requirements

Amend the word “network” in the fourth line of the first paragraph to read as “bar (Gantt) chart”.

Add the following after the third paragraph:

“The bar-chart programme to be provided by the contractor shall show the various activities in such detail as may be required by the engineer. Progress in terms of the programme shall be updated monthly by the contractor in accordance with the progress made by the contractor.

In compiling the programme of work, the contractor shall indicate and make due allowance for the following, as specified elsewhere in the contract documents:

- The requirements regarding the accommodation of traffic and areas that may be occupied at any time for construction purposes (as indicated on the drawings and specified in Section 1500 of the specifications)
- Requirements regarding the training of labourers and Emerging Contractors (EC's).
- The requirements for work to be undertaken by labourers and work to be undertaken by EC's.

(b) Programme of work for rehabilitation work

Amend the word “network” in the fourth line of the second paragraph to read as “bar (Gantt) chart”.

B1205 WORKMANSHIP AND QUALITY CONTROL

Add the following to the third paragraph:

“The engineer shall, however, undertake acceptance control tests for the judgement of workmanship and quality, without accepting any obligations vested with the contractor in terms of the contract with specific reference to quality of materials and workmanship. Such acceptance control test done by the engineer shall not relieve the contractor of his obligations to maintaining his own quality control system.”

Add the following at the end of this clause:

"The engineer shall, for the purpose of acceptance control on products and workmanship, assess test results and measurements in accordance with the provisions of section 8300 of the standard specifications. Where small quantities of work are involved, a lot shall mean a full day's production for a specific item of work subject to acceptance control testing."

B1206 THE SETTING-OUT OF THE WORK AND PROTECTION OF BEACONS

Add the following:

“The contractor shall be responsible for the true and proper setting out of the Works and for the correctness of the position, levels, dimensions and alignment of all parts of the Works and for the provision of all necessary instruments, appliances and labour in connection therewith.”

The Contractor shall take care that property beacons, trigonometrical survey beacons or setting-out beacons are not displaced or destroyed without the consent of the Engineer. Property beacons and trigonometrical survey beacons that have been displaced or destroyed shall be replaced by a registered land surveyor, who shall certify such replacement.

The cost of replacing all beacons displaced or destroyed during the course of the Contract without the consent of the Engineer shall be borne by the Contractor.”

B1209 PAYMENT**(b) Rates to be inclusive**

Add the following:

“VAT shall be excluded from the rates and provided for as a lump sum in the Summary of Bill of Quantities”.

(e) Materials on the site

Add the following:

"In addition, the engineer may at his sole discretion also allow payments under "Materials on Site" in respect of any construction materials if stored off-site providing that:

- (a) The site selected for this purpose is approved by the engineer
- (b) Such land is physically separated from any production plant or operation
- (c) Only materials for use under this contract is stockpiled on such land
- (d) The contractor has provided proof of an agreement with the owner of such land that the owner has no claim whatsoever on any materials stockpiled on such land
- (e) Materials obtained by the contractor for or on behalf of emerging subcontractors (SMME's) shall remain the responsibility of the contractor after payment has been made in respect of materials on site.”

B1215 EXTENSION OF TIME RESULTING FROM ABNORMAL RAINFALL

Add the following after the first paragraph of this clause:

"For the purposes of this contract, extension of time resulting from abnormal rainfall or other forms of inclement weather shall be determined according to the requirements of Method ii (critical-path method).”

Method (ii) (Critical path method)

Delete “(based on a five-day working week)” in the fifth and sixth lines of the second paragraph of the description of this method.

Delete the last sentence of the second paragraph of the description of this method and replace with the following:

“The value of “n” shall be taken as three (03) working days per calendar month.

If normal rainy or inclement weather, resulting in delays, occurs for less than three (03) working days in any calendar month, the difference between the three (03) working days and the actual number of working days on which normal rainy or inclement weather occurred, shall be ignored and not accumulated for the duration of the contract period for the purposes of determining an extension of time due to normal rainy weather, nor due to any other reason.

Items of work on the critical path of the programme of work which are subject to climatic limitations shall also be considered for extension of time if such items of work are delayed by e.g. cold weather, high winds or other inclement weather conditions.

In this regard, reference shall be made to weather limitations specified for the application of various bituminous products. However, for months during which seal-work cannot be undertaken in terms of the specifications, no extension of time shall be claimed for.

Rainfall records for **Phalaborwa**

MONTH	AVERAGE RAINFALL (mm)	RAIN DAYS (per month)
JANUARY	95.8	12
FEBRUARY	82.9	11
MARCH	65.4	10
APRIL	25	6
MAY	9.7	3
JUNE	14.4	2
JULY	2.4	1
AUGUST	2.8	1
SEPTEMBER	4.1	3
OCTOBER	37.3	7
NOVEMBER	111	14
DECEMBER	92.6	13

B1217 PROTECTION OF THE WORKS AND REQUIREMENTS TO BE MET BEFORE CONSTRUCTION OF NEW WORK ON TOP OF COMPLETED WORK IS COMMENCED

Add the following subclause:

"(h) No concrete kerbing or concrete drains directly adjoining the bituminous surfacing shall be constructed prior to the completion of the bituminous surfacing."

B1222 USE OF EXPLOSIVES

Add the following subclause:

"(h) Where blasting operations are undertaken in close proximity of temporary deviations, the contractor shall implement all such safeguarding measures as may be required and instructed by the engineer."

B1224 THE HANDING-OVER OF THE ROAD RESERVE

Add the following:

"The total length of the road reserve between the specified limits of construction will be handed over to the contractor on the commencement date. Reference shall, however, be made to the requirements of section 1500 of these specifications where limitations in respect of work-areas are specified. In the event of the non-adherence by the contractor in terms of the mentioned specifications, the engineer shall withdraw such sections of the road reserve as may be justified to ensure suitable progress of the works or safe passage of traffic."

B1229 SABS CEMENT SPECIFICATIONS

Replace the last paragraph of this clause with the following:

"Where reference is made in this specification or the standard specifications to the cement specifications, eg. SABS 471: Portland cement and rapid hardening Portland cement, it shall be replaced with the new specification:

SABS ENV 197-1: Cement-composition, specifications and conformity criteria.

Part 1: Common cements.

Furthermore, where reference is made in this specification or the standard specifications to the different cement types, the following new names/types shall apply:

Typical new product nomenclature	
Cement type	Cement strength class
CEM I	32,5
CEM I	32,5R
CEM I	42,5
CEM I	42,5R
No provision made	No provision made
CEM II/A-S	32,5
CEM II/A-S	32,5R
CEM II/A-S	42,5
CEM II/A-V	32,5
CEM II/A-V	32,5R
CEM II/A-W	32,5
CEM II/A-W	32,5R
CEM II/A-V	42,5
CEM II/A-V	42,5R
CEM II/A-W	42,5
CEM II/A-W	42,5R
CEM III/A	32,5
CEM III/A	32,5R
CEM II/B-V	32,5
CEM II/B-W	32,5

Typical new product nomenclature		
Cement type		Cement strength class
	CEM II/B-S	32,5R
	CEM II/B-S	42,5
	CEM III/A	32,5R
	CEM III/A	42,5

CEM I 32,5, CEM II A-S 32,5, CEM II/A-V 32,5, or CEM III A may be used for the manufacture of reinforced concrete members.”

Add the following new clauses:

“B1230: IN-SERVICE AND STRUCTURED TRAINING

The contractor shall in addition to the structured (accredited) training as provided for in Part C of this document implement an in-service training programme, from the commencement of the contract, in which the various skills required for the execution and completion of the works are imparted to the labourers engaged thereon, in a programmed and progressive manner. Labourers shall be trained progressively throughout the duration of the contract, in the various stages of a particular type of work.

(a) Details of in-service and structured training

- (i) The in-service training programme shall be submitted with the initial works programme. The progress in relation to this programme will be recorded monthly and attached to the site meeting minutes and payment certificate.
- (ii) The contractor shall provide onsite, sufficient skilled and competent trainers to train all labourers engaged on the contract, in the various skills required for the execution and completion of the works.
- (iii) All labourers shall be remunerated in respect of all time spent undergoing training.
- (iv) Every worker engaged on the contract shall on the termination of his participation on the contract, be entitled to receive from the contractor, a certificate of service in which the following information shall be recorded:
 - the name of the contractor
 - the name of the employee
 - the name of the project/contract
 - the nature of the work satisfactorily executed by the worker and the time spent thereon
 - the nature and extent of training provided to the worker
 - the dates of service.

The cost of the above obligations shall be deemed to be covered by the sums and rates tendered for items B13.01(a), (b) and (c) in the bill of quantities. The performance of the contractor in providing in-service training, shall be taken into consideration should the contractor fail to reach his CPG at the completion of the project.

(b) Lead time for training

The training of labour as specified shall, as far as possible, take place before commencement of each activity and the contractor shall take into account in his programme the lead-time he requires for such training. All training herein specified shall be deemed to be a construction activity and a non-negotiable condition of the contract”.

B1231 COMMUNITY LIAISON OFFICER (CLO)

The contractor or his appointed agent will appoint a Community Liaison Officer (CLO) after consultation with the local communities, the engineer and the employer. The contractor shall direct all his liaison efforts with the local communities through the appointed officer. The contractor shall, however, accept the appointed as part of his management personnel.

(a) Duties of the Community Liaison Officer

The Community Liaison Officer’s duties will be:

- (i) To be available on site daily between the hours of _____(insert time) and _____ (insert time) and at other times as the need arises. His normal working day will extend from _____ (insert time) in the morning until _____ (insert time) in the afternoon.
- (ii) To determine, in consultation with the contractor, the needs of the temporary labour for relevant skills training. He will be responsible for the identification of suitable trainees and will attend one of each of the training sessions.
- (iii) To communicate daily with the contractor and the engineer to determine the labour requirements with regard to numbers and skill, to facilitate in labour disputes and to assist in their resolution.
- (iv) To assist in and facilitate in the recruitment of suitable temporary labour and the establishment of a “labour desk”.
- (v) To attend all meetings in which the community and/or labour are present or are required to be represented.
- (vi) To assist in the identification, and screening of labourers from the community in accordance with the contractor’s requirements.
- (vii) To inform temporary labour of their conditions of temporary employment and to inform temporary labourers as early as possible when their period of employment will be terminated.
- (viii) To attend disciplinary proceedings to ensure that hearings are fair and reasonable.
- (ix) To keep a daily written record of his interviews and community liaison.
- (x) To attend monthly site meetings to report on labour and RDP matters.
- (xi) All such other duties as agreed upon between all parties concerned.
- (xii) To submit monthly returns regarding community liaison as illustrated in Part C5.1 of this document (form RDP 12(E)).

(b) Payment for the community liaison officer

A special pay item is incorporated in section 1200 of the bill of quantities relating to payment of the liaison officer on a prime cost sum basis. This payment shall only be made for the period for which the duties of the liaison officer are required. The remuneration of the CLO shall be determined by the Employer in terms of the Sectorial determination 2: Civil Engineering Sector (Task grade 3).

(c) Period of employment of the community liaison officer

The period of employment of the community liaison officer shall be as decided upon jointly by the contractor, engineer and employer at a maximum period of a six months basis, but with the option of renewal.

B1232 SUBCONTRACTORS

Over and above the stipulations of clause 4.4 of the General Conditions of Contract 2010, regarding subletting of part of the works, it is a condition of the contract that an approved subcontractor shall not sublet part of his work, covered in his appointment by the main contractor, to another subcontractor without the consent and approval of the engineer. Subletting shall in all cases be critically considered by the engineer.

In addition to the provisions of clause 4.4 of the general conditions of contract regarding subcontracting of the works, it is a requirement of this contract that an approved subcontractor shall not further subcontract work subcontracted to him by the main contractor, to another subcontractor without the consent and approval of the engineer. Subcontracting shall in all cases be critically considered by the engineer. The engineer reserves the right to limit the extent or the volume of work subcontracted by the contractor, should he deem it necessary in terms of progress or quality of workmanship.

B1233 WORKMEN'S COMPENSATION ACT

All labour employed on the site shall be covered by the Compensation for Occupational Injuries and Deceases Act (COIDA). The contractor shall pay in full, including the payment of the necessary levies, such amounts, as are due in terms of the Act. The contractor at the commencement of the contract shall resolve the manner in which Workmen's Compensation will be handled. Amounts paid by the contractor shall not be included in the wage rates but shall be covered by the Contractor to be deemed as included in his General Obligations rates in Section 1300 of the Bill of Quantities.

Add the following clause:

B1234 MINE HEALTH AND SAFETY ACT 1996, ACT 29 OF 1996**(a) Introduction**

The main objective of this Act is to protect the health and safety of persons at mines. This specification is therefore aimed at promoting health and safety specifically at borrow pits. Borrow pits are classified as mines.

(b) General Provisions

The contractor shall be responsible for controlling his operations at every borrow pit where material is being excavated to ensure compliance with all the requirements of the Mine Health and Safety Act, 1996. The contractor shall also ensure that the works, shaping and finishing off of the borrow pit are done in accordance with the provisions as specified in section 3100 of the COLTO Standard Specifications and this Act. The contractor shall also comply to the requirements as set out in C3.4.3.2 Environmental Management Plan.

The minimum requirements for operations at borrow pits are:

- Borrow pits are worked in such a way that the health and safety of employees and the public will not be endangered.
- A monthly report shall be submitted to the engineer on health and safety aspects at the borrow pits.
- The contractor shall appoint a manager to manage the borrow pits in accordance with the Mine Health and Safety Act.
- The contractor shall take the necessary steps to ensure that the work area of the borrow pits are safe at all times. This shall include items such as the provision of fencing and security guards.

(c) Duties of the Manager

The minimum duties of the manager supervising the activities at borrow pits shall be:

- Maintain a healthy and safe borrow pit environment.
- Identify hazards and related risks to which persons and employees are exposed.
- Establish a health and safety policy that
 - o Describes the organisation of work.
 - o Contains aspects concerning the protection of the employees and other persons' health and safety.
 - o Contains a risk analysis.
- Supply and erect the necessary safety and warning signs.

Add the following pay items and change the clause number.

B12.35 MEASUREMENT AND PAYMENT

Add the following items:

"ITEM	UNIT
B12.01 Excavation	
Excavating material within the following depth ranges below ground level for the exposing of/or searching for services	
(a) 0m to 2m	
(i) soft material	cubic metre (m ³)
(ii) hard material	cubic metre (m ³)
(b) Extra over item B12.01(a) for excavation by means of hand tools such as picks, crowbars and pneumatic tools or mechanical breakers in close vicinity of services where no machine excavation is permitted	
(i) soft material	cubic metre (m ³)
(ii) hard material	cubic metre (m ³)

Measurement and payment shall be as specified for item 22.01 in the standard specifications.

ITEM	UNIT
B12.02 Backfilling	
(a) Using the excavated material	cubic metre (m ³)
(b) Using imported selected material	cubic metre (m ³)

Measurement and payment shall be as specified for item 22.02 in the standard specifications.

ITEM	UNIT
B12.03 (a) Allow a provisional sum for existing services to be relocated and/or protected as ordered by the engineer	provisional sum
(b) Handling costs and profit in respect of sub item B12.03 (a) above	percentage (%)

Measurement and payment shall be in accordance with the general conditions of contract.”

ITEM	UNIT
B12.04 Provision for a Community Liaison Officer	
a) Provisional sum for the payment of the Community Liaison Officer Provisional Sum	
b) Handling costs and profit in respect of sub-item B12.04(a)	Percentage (%)

Expenditure of the above item shall be made in accordance with the general conditions of contract.

The tendered percentage is a percentage of the amount actually spent under the sub-item B12.04 (a), which shall include full compensation for the handling costs of the contractor, and the profit in connection with providing the community liaison officer.”

ITEM	UNIT
B12.05 (a) Mine Health and Safety obligations	Month
(b) Special information signs	Prime Cost Sum (PC Sum)
(c) Provision of security guards	Prime Cost Sum (PC Sum)
(d) Handling cost and profit in respect of sub-item B12.05(b) and (c)	Percentage (%)

Payment of the rate per month for sub-item B12.05(a) shall include full compensation for all the contractor’s obligations relevant to the Mine Health and Safety Act.

The prime cost sums shall be paid in accordance with the provisions of the General Conditions of Contract. The tendered percentage is a percentage of the amount actually spent under the prime cost items, which shall include full compensation for the profit in connection with providing the specified service.

SECTION 1300: CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS

B1302 GENERAL REQUIREMENTS

(a) Camps, constructional plant and testing facilities

Add the following:

"The contractor shall, at each area where work is being undertaken, provide on a daily basis at least one (1) portable chemical latrine unit per fifteen (15) for use by construction workers employed on the project. The latrine units shall be serviced daily and kept in a hygienic and orderly state to the satisfaction of the engineer. No separate payment shall be made for this requirement and shall be deemed to be included in the rates tendered for the contractor's time-related obligations."

B1303 PAYMENT

ITEM

UNIT

B13.01 The contractor's general obligations (As specified)

Add the following after the fifth paragraph:

"The combined total tendered for sub-items (a), (b) and (c) shall not exceed 15% of the tender sum, excluding VAT.

B1304 EPWP REQUIREMENTS

EPWP Special Project Specification

As much as is economically feasible all work shall be implemented by employing Labour Intensive Construction methods. Over and above the normal Building and Allied works to be implemented by employing skilled and unskilled labour the works specified in the "Guidelines for the Implementation of Labour-Intensive Infrastructure Projects under the Expanded Public Works Programme (EPWP)" shall be undertaken using Labour Intensive Construction methods.

Requirement for Sourcing and engagement of Labour

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.

The minimum rate of pay set for the EPWP is R per task or per day.

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.
- (c) 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 of the EPWP Infrastructure Guidelines.
- (d) 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) those who are not in receipt of any social security pension income

Employment demographics

The Contractor shall endeavour to ensure that the expenditure on the employment of temporary workers is in the following proportions:

- a) 60 % women;
- b) 55% youth who are between the ages of 18 and 35; and
- c) 2% on persons with disabilities.

SECTION 1400: HOUSING, OFFICES AND LABORATORIES FOR THE ENGINEER'S SITE PERSONNEL

B1402 OFFICES AND LABORATORIES

(a) General

Add the following:

“The facilities to be provided for the engineer in terms of these specifications shall be fenced off by a two-metre-high veranda type security fence with diamond mesh on the vertical portion and barbed wire on the overhang. A security gate shall be provided in the fence which shall be guarded at all times by an acceptable watchman provided by the contractor.

The engineer's establishment may be incorporated within the contractor's establishment provided that the preceding requirements are met to the satisfaction of the engineer.

Separate payment shall be made for the provision and erecting of the security fence and gate as indicated on the drawings, but the cost in respect of the provision of a watchman at all times by the contractor shall be deemed to be included in the contractor's tendered rate for item B13.01(c).”

(b) Offices

Add the following new sub-sub-clause:

“(xviii) The engineer's site supervisory staff shall be provided with cellular telephones by the contractor for site communication purposes. Provision is made in the bill of quantities for separate payment of the supply and operating costs of such cellular phones.”

B1403 HOUSING

(c) Rented accommodation

Add the following:

“The engineer may arrange for the obtaining of rented accommodation for his supervisory personnel on site. Payment of such rent shall be made under the provisional sum in sub-item 14.07(a) and shall be expended on a monthly basis by the contractor as ordered by the engineer.”

B1406 MEASUREMENT AND PAYMENT

Add the following sub-item:

ITEM	UNIT
B1403 (b) (ix) 1. Provision of cellular telephones	Number (No)
2. Provisional sum for the costs of cellular calls and other charges	Provisional sum
3. Handling cost and profit in respect of sub-item B14.03(b)(ix) 2	Percentage (%)

The unit of measurement for sub-sub-item B14.03 (b) (ix)1 shall be the number of cellular telephones supplied to the engineer's site supervisory staff. The tendered rate shall include full compensation for the purchasing of the cellular phones inclusive of any fixed contract costs with the service provider.”

Measurement and payment in respect of the provisional sum item shall be made in accordance with the provisions of the general conditions of contract.

The tendered percentage is a percentage of the amount actually spent under sub-item B.14.03 (b)(ix) 2, which shall include full compensation for the handling costs of the contractor, and the profit in connection with the payment of the cost of calls and other charges relating to the use by the engineers site staff of the supplied cellular telephones."

ITEM	UNIT
B14.11 Provision and erection of security fencing (Including gate)	metre (m)

The unit of measurement shall be the metre of security fence supplied and erected as indicated on the drawings and/or ordered by the engineer. The tendered rate shall include full compensation for procuring and furnishing of all material, including one vehicle gate, labour and equipment required to erect the specified security fence and maintain it for the duration of the contract."

General: Method of payment

Add the following:

"The tendered rates under this section of the bill of quantities shall also include full compensation for the dismantling and removal from site of all offices, laboratories and other facilities provided for the engineer's supervisory staff at the completion of the contract."

SECTION 1500: ACCOMMODATION OF TRAFFIC**B1502 GENERAL REQUIREMENTS****(e) Access to properties**

Add the following:

“Where the alignment of the new road coincides with the alignment of the existing road, a number of accesses to private properties will have to be operational and maintained during the constructional period. No separate payment will be made for providing acceptable and safe access across the new road at all times during construction of the road.”

(i) Traffic safety officer

Add the following after subclause (viii):

“(ix) be responsible for contacting all the relevant authorities in the event of an accident on the site of the Works

(vi) arrange for the removal of broken down vehicles that obstruct the normal traffic flow

The Contractor shall provide the traffic safety officer with all the necessary resources to carry out his duties as specified, inter alia, light delivery van (LDV), personnel, warning signs and revolving amber flashing lights. A warning sign with the words “CONTRACTOR TRAFFIC CONTROL” and/or “AANNEMER VERKEERSBEHEER” in clearly legible letters shall be mounted on the vehicle at least 1,5m above ground level to be clearly visible. The vehicle shall be equipped with two revolving amber-coloured flashing lights with a minimum intensity of 55W. The flashing lights shall be switched on and the warning sign be displayed at all times when the vehicle is used on the site.

No separate payment will be made for the traffic safety officer, his vehicle, personnel and equipment and the cost thereof shall be included in the Contractor’s cost for his establishment and general obligations (Section 1300).”

Add the following new sub clauses:

“(j) Handing over the site

The total extent of the site between the limits of construction as described in this document and indicated on the drawings will be handed over to the contractor at the commencement of the contract period. The engineer however reserves the right to adjust this arrangement should progress or safe passage of traffic warrant such a change.

(k) Use of explosives in close proximity of temporary deviations

The contractor shall arrange all necessary traffic control and other requirements to safeguard the traffic on temporary deviations during blasting operations.

(l) Land taken up for deviations

Negotiations with landowners to obtain the land taken up by temporary deviations will be undertaken by the employer. A prime cost sum is allowed in the bill of quantities for payment of compensation to affected landowners. All other negotiations regarding temporary access to properties, land-use, fencing requirements etc. shall be dealt with by the contractor in conjunction with the engineer and be confirmed in writing and be kept on record by the contractor.

“(m) Maximum lengths of construction areas

A temporary deviation, where the proposed road follows the existing route shall be constructed along the length of existing road. Traffic shall generally be accommodated as follows:

On a two-way two lane gravel deviation (Class 1) constructed partially outside or adjacent to the existing road reserve boundaries of road.

- (i) On one-way single lane gravel deviation (Class 2) constructed inside the existing road reserve boundaries and on either side of road. In this instance special cognisance shall be taken to accommodate traffic to private properties.

A maximum length of one section of approximately 5,0km or two sections of 3,0km each of deviation (Class 1 or 2) shall be operational at a time and no relieve of this limitation shall be considered by the engineer except where the programme necessitates such at the construction of bridges.”

B1503 TEMPORARY TRAFFIC CONTROL FACILITIES

Add the following after the first paragraph:

“All temporary road signs, devices, sequences, layouts and spacing shall comply with the requirements of the Road Traffic Act, 1996 (Act 93 of 1996), the National Road Traffic Regulations, 2000, the South African Road Traffic Signs Manual, the requirements of the relevant road authority and the drawings. All temporary traffic control facilities shall comply with the guidelines set in SA Road Traffic Signs Manual, Volume 2, Chapter 13: Road works Signing, (SARTSM, June 1999, obtainable from the Government Printer, Pretoria).”

(b) Road signs and barricades

Add the following:

“All the temporary road signs are to be mounted on posts as specified in section 5600 of the specifications. Provision shall be made for the supply and erection of the signs and the maintenance of the signs during the construction period. Provisions shall also be made for the removal of the temporary road signs on completion of the construction work when such signs are no longer required.

Temporary road signs and channelization devices shall be manufactured in accordance with the latest edition of the South African Road Traffic Signs Manual (June 1999) and placed as shown on the drawings and in Road Signs Note 13. Delineators shall be manufactured from a non-metal material and shall be mounted on a base section also manufactured of non-metal material. Single as well as back-to-back mounted delineators are required.

The obligation to arrange safe passage of traffic shall always be vested with the contractor regardless what is indicated on the drawings of the engineer.”

(c) Channelization devices and barricades

Add the following:

“Drums shall not be used as channelization devices.

TW 401 and TW 402 delineators shall comply with the following requirements:

- a) It shall be manufactured from a flexible material and shall comply with SABS 1555. The blade portion of the delineator shall be positively affixed to a base unit which in turn shall be stable on its own or be stabilized by means of sandbags when used on the road.
- ii) The blade shall be retro-reflectorised, with class 1 yellow sheeting on the side facing oncoming traffic.
- iii) It shall nominally be 1000mm high x 250mm wide and the bottom edge of the delineator shall not be more than 200mm above the road surface.
- iv) It shall be subject to the approval of the Engineer.

The maximum spacing between centres of delineators shall be as shown on the drawings or as directed by the Engineer.”

(e) Warning devices

Add the following:

“It is a requirement of this contract that all construction vehicles and plant used on the works will be equipped with rotating amber flashing lights and warning boards as specified in the standard specifications. Construction vehicles travelling outside the limits of construction areas shall however, not operate the warning lights.

The warning lights shall have a base diameter of at least 170mm and the amber bulb cover a height of at least 150mm high. It shall be a requirement that the contractor also provides the engineer’s site personnel with warning lights for their vehicles (a maximum of two lights are required) without any payment applicable.

B1514 TEMPORARY FENCING AND GATES

Replace the contents of this clause with the following:

“Where temporary fencing is ordered by the engineer, it shall be paid for under item 55.06 of the standard specifications. The temporary fencing shall be new fencing material, which shall subsequently be dismantled and removed and erected at an alternative position as directed by the engineer. When ordered by the engineer, temporary fences and gates shall be moved to new locations or either left in place or when no longer required be dismantled and removed from site if so directed. Allowance is made in the bill of quantities for moving existing fences and gates.”

Add the following clause:

B1517 RETRO-REFLECTIVE MATERIAL

“Retro-reflective material for temporary signs shall comply with the requirements of SABS 1519-1 for weathered material. Tests shall be carried out with a field retro-reflectometer and the testing procedure and classification are described in Clause B 8118. The value of the coefficient of Retro-Reflection shall be at least 60% of the values indicated in Table B 8118/1.”

B1518 MEASUREMENT AND PAYMENT

Renumber item 15.01 as B15.01 and add the following:

“The tendered rate shall also include for all measures necessary to safeguard traffic on temporary deviations during blasting operations as well as all temporary traffic-control facilities for temporary deviations.”

Delete all references to half width construction under payment item 15.01. Half width construction will be measured under payment item 15.10.

Renumber item 15.03 as B15.03 and add the following

“This section provides only for additional traffic-control facilities as and when required on instruction by the Engineer and does not provide for facilities already included under payment item B15.01”

Add the following sub-item:

“ITEM	UNIT
B15.03 Temporary traffic control facilities	

(n) Provision of high visibility safety jackets and safety hats	number (No)
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The unit of measurement shall be the number of safety jackets supplied to the supervisory staff.

The tendered rate shall include full compensation for providing and maintaining hats and the jackets equipped with high visibility retro-reflective and/or fluorescent panels in red, yellow and white for the duration of the contract”.

Add the following items:

“ITEM	UNIT
B15.14 Allow provisional sum for:	
(a) repair of damaged temporary road signs and delineators	provisional sum
(b) replacement of damaged temporary road signs and delineators	provisional sum

The provisional sums allowed under sub-items (a) and (b) shall be expended on a daywork basis in terms of the provisions of the general conditions of contract.

Payment shall only be made in respect of repair work or replacement of such temporary traffic-control facilities arising from damage or loss occasioned by the travelling public and which did not arise from negligence or non-compliance with the requirements of the specifications on the part of the contractor.

ITEM	UNIT
B15.15 Prime cost sum for:	
(a) Compensation to landowners for land taken up by deviations	prime cost (PC) sum
(b) Handling cost and profit in respect of sub-item B15.15(a) above	percentage (%)

The prime cost sum shall be expended in accordance with the provisions of the general conditions of contract. Payment to the landowner shall be made within fourteen (14) days after such order has been given by the engineer. The contractor shall provide detailed proof of payment before payment shall be certified to the contractor.

The tendered percentage in item B15.15(b) is an extra over percentage on the amount actually spent under sub-item B15.15(a) which shall include full compensation for the handling costs and profit of the contractor.”

SECTION 1700 : CLEARING AND GRUBBING**B1702 DESCRIPTION OF WORK****a) Clearing**

Add the following:

“Clearing shall include the removal of material to a thickness of up to 150mm in-situ material as ordered by the engineer. No payment shall be made for temporary stockpiling of topsoil material in the case where this material is applied as topsoil after completion of road side slopes.

Should the required depth exceed 150mm, the total volume of material removed shall either be classified as “temporary stockpiling of topsoil” or “unsuitable roadbed material” or “cut to spoil” whichever is applicable as allowed for in the standard specifications. In these cases no payment shall be made for clearing and grubbing.

Clearing as described shall in all cases be undertaken in such a manner that the topsoil is preserved and not contaminated with other debris or rubbish. Cross-sections for the determination of earthworks quantities shall be taken after clearing (topsoil or unsuitable roadbed material) and roadbed preparation if applicable.

Payment for gabion boxes and mattresses which have to be removed and the material sorted and stacked shall be made under section 5200”

B1703 EXECUTION OF WORK**(a) Areas to be cleared and grubbed**

Add the following:

“Apart from normal clearing and grubbing, the fill embankments of the existing roads are also to be cleared and grubbed over the areas where the new horizontal alignment coincides with the alignment of the existing road, or where repairs are required to the fill embankments of the approaches of bridges. Provision is made for separate payment for clearing and grubbing of the existing fill embankments where conventional machinery might be suitable to undertake the work due to the steep side slopes of the embankments. An additional pay-item is allowed for in the bill of quantities for this type of clearing and grubbing which may have to be undertaken by hand or similar manner.”

B1704 MEASUREMENT AND PAYMENT

Change item 17.01 to read as follows:

ITEM	UNIT
B17.01 Clearing and grubbing of:	
a) Normal areas:	
i) Within the road reserve	hectare (ha)
ii) In borrow pits	hectare (ha)
b) Existing fill embankments with Slopes steeper than 1:4	hectare (ha)

Measurement and payment for sub-items (a) and (b) shall be as specified for item 17.01 of the standard specifications. Where distinction is made for clearing and grubbing existing fill embankments with slopes steeper than 1:4 (vertical: horizontal), payment shall be made under item B17.01."

SECTION 1800: DAYWORK SCHEDULE

Note: This is a new section added to the Standard Specifications.

Add the following:

B1801 SCOPE

This section covers the listing of daywork items for use in determining payment for work which cannot be quantified in specific pay item “units” in the bill of quantities or work ordered by the engineer during the construction period which was not foreseen at tender stage for which no applicable rate exists in the schedule or for work of a special or different character warranting special payment as decided by the engineer.

B1802 ORDERING OF DAYWORK

No daywork shall be undertaken unless specific written authorisation is obtained from the engineer.

B1803 MEASUREMENT AND PAYMENT

The engineer may order the following daywork items:

ITEM	DESCRIPTION	UNIT
B18.01	Labourers:	
	(i) Unskilled	Hour (h)
	(ii) Semi-skilled	Hour (h)
	(iii) Skilled	Hour (h)
B18.02	Foreman	Hour (h)
B18.03	Tipper trucks:	
	(i) 3 – 5 ton	Hour (h)
	(ii) 5,1 – 10 ton	Hour (h)
B18.04	Loader (0,5m ³)	Hour (h)
B18.05	Grader (CAT 140G or similar)	Hour (h)
B18.06	LDV	Hour (h)
B18.07	Compaction Rollers:	
	(i) Vibrator roller	Hour(h)
	(ii) Tamping roller	Hour (h)
	(iii) Grid roller	Hour(h)
B18.08	Hand Controlled Compactors	
	(i) Pedestrian roller (Bomag BW90)	Hour(h)
	(ii) Vibratory plate	Hour(h)
	(iii) Rammers	Hour(h)
B18.09	Water truck (min 10000 l)	Hour(h)
B18.10	Dozer (D7 or similar)	Hour(h)

The unit of measurement shall be the actual number of hours worked by labourers or foremen or an item of plant.

The tendered rates shall include full compensation for all cost items including overheads, head-office expenses and profits as described in subclause 6.5 of the general conditions of contract and shall be subject to contract price adjustment as provided for in the contract.

The mark-ups on daywork items in accordance with the Appendix to the Tender shall not be applicable on daywork items listed in the bill of quantities in terms of the above specifications. In the event of new daywork rates being requested for items not appearing in the bill of quantities, then the provisions of the general conditions of contract and the Appendix to the Tender shall apply.

Prior to the commencement of any work by the labourers described under item B18.01, the contractor must obtain written consent from the engineer regarding the classification and composition of all labourers in terms of “unskilled” and “skilled” labourers required for the work as ordered by the engineer.”

SECTION 2100: DRAINS**B2103 BANKS AND DYKES**

Add the following:

“Mitre banks at culvert inlets should be considered at such a skew angle that it guides the water into the inlet with a minimum loss of velocity (energy).”

B2104 SUBSOIL DRAINAGE**(a) Materials****(i) Pipes**

Delete the last sentence of the fifth paragraph and substitute it with the following:

“Perforation for 100mm pipes shall be spaced in two rows, one on each side of the vertical centre line of the pipe, and at one third of the circumference. The perforation for the 150mm pipes shall be spaced in four rows, two as described for 100mm pipes, and the other two rows at two thirds of the circumference.”

(ii) Synthetic-fibre filter fabric

Add the following:

“All filter fabric shall be a non-woven needle punched type material and must be approved by the engineer. Filter fabrics shall have a minimum co-efficient of permeability of 3×10^{-3} m per second.”

B2107 MEASUREMENT AND PAYMENT

Change item 21.09 to read as follows:

ITEM	UNIT
B21.09 Polyethylene sheeting, 0,25mm thick, or similar approved material, for lining subsoil draining systems	square metre (m ²)

Measurement and payment shall be as specified for item 21.09 in the standard specifications.”

Add the following new items:

ITEM	UNIT
B21.20 Galvanised wire mesh 250 x 250mm, at the outlets of subsoil drainage systems. Mesh 10mm x 2,5mm wire diameter	Number (No)

The unit of measurement shall be the number of 250mm x 200mm pieces of wire mesh, with a 10mm x 10mm mesh and 2,5mm wire diameter built into the subsurface drain outlet structure as shown on the drawings.

The tendered rate shall include for procuring, furnishing and installing the material, cutting, waste and keeping the mesh in the pipe opening clean during installation.

ITEM	UNIT
B21.21 Subsoil drainage markers	Number (No)

Measurement and payment shall be as specified for item 22.24 in the standard specifications.”

2200: PREFABRICATED CULVERTS**B2201 SCOPE**

Add the following:

“All rectangular culverts with spans from 0,9m up to and including 2,4m shall be constructed with precast units.

The attention of the contractor is drawn to the fact that information given on the plans, longitudinal sections or drainage schedules may have to be altered to suit actual site conditions and, therefore, the contractor shall only construct these culverts after the engineer has verified the information on the drawings from detail surveys taken on site by the contractor as directed by the engineer.

Precast units shall be ordered by the contractor from actual measurements of length acquired on the site and not from lengths stated in the drainage schedule or from the bill of quantities.

No precast units shall be ordered until the engineer has satisfied himself that the proposed units have been manufactured to the required tolerances and loading standards. The engineer must be given the opportunity to load test units if he considers this necessary”.

B2203 MATERIALS**(f) Skewed Ends**

Delete the second and third paragraphs and substitute with the following:

“Precast portal and rectangular culverts placed on a skew shall be supplied with cast in situ skewed ends as shown on the drawings. In situ skew ends are to be constructed simultaneously with the wingwalls and headwalls”.

B2204 CONSTRUCTION METHODS

Add the following:

“In all cases where soft founding materials is classified as suitable for culvert bedding construction, the in-situ material shall be ripped, moistened and compacted to 90% or 93% modified AASHTO density. The depth of preparation and compaction of founding material shall be as indicated on the drawings or as specified by the engineer. Allowance for measurement and payment for this work is made in the bill of quantities under this section.”

(c) Excavation by hand

Where circumstances prevent the use of mechanical excavators and material can be removed only by hand tools, the engineer shall authorise the supplementary payment to the contractor for such work at the tendered rates for excavation by hand should he be satisfied that the contractor had been unable to prevent the necessity for excavation by hand by proper planning and precautionary measures. The supplementary rate for excavation by hand shall not apply to minor finishing or clearing jobs in excavations which are otherwise being done by mass excavation plant.

Payment for hand excavation shall be an "extra over" payment to normal excavation as allowed for in item 22.01.”

B2205 EXCAVATION FOR CONSTRUCTION BY TRENCH METHOD

Add the following sub clauses:

"(c) Excavation by hand

Where circumstances prevent the use of mechanical excavators and material can be removed only by hand tools, the engineer shall authorise the supplementary payment to the contractor for such work at the tendered rates for excavation by hand should he be satisfied that the contractor had been unable to prevent the necessity for excavation by hand by proper planning and precautionary measures. The supplementary rate for excavation by hand shall not apply to minor finishing or clearing jobs in excavations which are otherwise being done by mass excavation plant.

Payment for hand excavation shall be an "extra over" payment to normal excavation as allowed for in item 22.01.

(d) Drainage of excavations

The contractor shall apply suitable, effective drainage and dewatering methods for preventing the ingress of water into the excavation and to keep them dry.

Drainage measures, with the exception of pumping, shall be maintained until the backfilling has been completed. Between various construction stages, pumping may be interrupted in consultation with the engineer.

Any draining or pumping of water shall be done in a manner as will preclude the concrete or materials or any part thereof from being carried away.

Allowance for measurement and payment for dewatering and keeping dry of culvert excavations is made in the schedule in this section".

B2210 LAYING AND BEDDING OF PREFABRICATED CULVERTS**B2210(b)(i) Cast in situ invert slabs**

Replace with the following:

"In accordance with the drawings, transverse construction joints are required in cast in situ concrete invert slabs for portal culverts. In addition, longitudinal construction joints as shown on the drawings between the invert slabs of each of the barrels of multiple culverts are required. Allowance for measurement and payment for a Class F1 surface finish and soft board in these joints is made in the bill of quantities. No payment shall be made for formwork on the outside edges of invert slabs (closest to excavated face).

All culverts (precast as well as in situ) shall be constructed with an in situ reinforced concrete floor laid on a 75mm concrete screed".

Delete subclause B.2210(b)(ii) : "Prefabricated floor slabs."

B2211 BACKFILLING OF PREFABRICATED CULVERTS

Change the last sentence in the fourth paragraph to read "90% or 93% as shown on the drawings or as directed by the engineer."

B2212 INLET AND OUTLET STRUCTURES, CATCHPITS AND MANHOLES**(b) Concrete work**

Add the following:

"The type of surface finish for in situ concrete in the culverts shall be as indicated on the drawings. Generally, all exposed faces shall be of Class F2 formwork and faces covered by backfill shall be Class F1. The top of parapet walls and wingwalls shall be finished to a Class U2 surface finish."

(h) Prefabricated inlet and outlet structures

Add the following:

"The use of precast concrete inlets and outlets as described in clause 2212(h), shall not be allowed under any circumstances. Cast in situ concrete wingwall type inlets and outlets shall be constructed as indicated on the drawings and shall be in accordance with section 6000 of the Standard Specifications. Allowance for measurement and payment for wingwall type inlets and outlets is made in the schedule in this section."

B2218 MEASUREMENTS AND PAYMENT

Add the following:

"ITEM	UNIT
B22.01 (c) Extra over subitem B22.01(a) for excavation by hand using hand tool	cubic metre (m ³)

Measurement shall be as specified for pay item 22.01 of the standard specifications.

The tendered rate shall include full compensation for carrying out the excavations by hand where circumstances prevent the use of mechanical excavators.

ITEM	UNIT
B22.07 (f) Formwork for joints in cast in situ concrete invert slabs	
(i) Transverse construction joints (type indicated)	square metre (m ²)
(ii) Longitudinal joints (as per drawing)	metre (m)

Measurement and payment shall be as specified in item 22.07 of the standard specifications with the exception that formwork for construction joints in cast in situ invert slabs in trench conditions as indicated on the drawings, shall be measured and paid for in accordance with section 6200 of the standard specifications. No payment shall be made for formwork to the outside edges of invert slabs (closest to excavated face)."

Add the following to pay item 22.08:

"In addition to the requirements for measuring concrete backfill to rectangular culverts as specified for item 22.08, the following shall apply:

Concrete backfill shall be measured to the actual dimensions of the precast units, i.e. actual volumes between ribs and haunches shall be taken into account. For the purpose of calculating concrete backfill quantities, the horizontal dimensions of the concrete backfill on the outside of the culvert(s) (closest to excavated face), shall be taken as 100mm maximum irrespective of what type or make of precast portal is used or the actual width of the excavation.

The width of the concrete backfill between portals in the case of multiple culverts, shall be taken as 80mm for precast units with a leg height of 1500mm and 100mm for precast units with a leg height exceeding 1500mm. The vertical dimensions, in both cases, shall be equal to the height of the portal".

Add the following new items:

"ITEM	UNIT
B22.29 Tie bars for joining in situ concrete invert slabs to inlet and outlet structures, as indicated on the drawings (Type, diameter and length indicated)	Number (No.)

The unit of measurement shall be the number of tie bars installed as specified and indicated on the drawings.

The tendered rate shall include full compensation for supply and installation of the tie bars.

ITEM	UNIT
B22.30 a) Preparation and compaction of in-situ bedding material to 90% of Mod. AASHTO density (depth indicated)	cubic metre (m ³)
b) Extra over sub-item B22:30(a) for compaction to 93% of Mod. AASHTO density (depth indicate)	cubic metre (m ³)

The unit of measurement shall be the cubic metre of material ripped and compacted as specified.

The tendered rate shall include full compensation for the ripping of the in-situ material to the specified width and depth, wetting of the material to such an extent that the specified density can be achieved.

ITEM		UNIT
B22.31	Dewatering and keeping dry of culvert excavations	

The unit of measurement shall be the number of culverts constructed. The tendered rate shall be full compensation for dewatering and keeping dry of the culvert excavations until the backfill is completed.

Payment shall be as follows:

- (i) 80% of the payment shall be made after the barrel of the culvert has been constructed and backfilled.
- (ii) Remaining 20% of the payment shall be made after the wingwalls have been constructed and backfilled.

ITEM		UNIT
B22.32	Cutting of concrete pipes	
	a) Diameter indicated	Number (No.)

The unit of measurement shall be the number of pipes that have been cut. The tendered rate shall be full compensation for the cutting, by means of mechanical saw (angle grinder) and finishing off of the pipes for the specific angle of skew at which the pipes must be laid.

Cutting of pipes shall only be paid for if the headwall of the wingwalls are at such a skew angle in respect to the centre line of the pipes that cutting is required and where non-standard lengths are required. The maximum skew angle at which pipes are allowed to be cut shall be 30 degrees and the minimum length of pipe, measured along the shortest side, shall be 1,5m.”

Classification of soft/hard materials as well as all quantities shall be agreed upon and finalised as the work progresses.

SECTION 2300: CONCRETE KERBING, CONCRETE CHANNELLING, CHUTES AND DOWNPIPES AND CONCRETE LININGS FOR OPEN DRAINS

B2301 SCOPE

Add the following:

“The position and length of the following types of concrete kerbs and channels are indicated on the geometric layout plans, typical drawings and on the drainage plans.

Type A	:	In situ concrete channel, 0,8m wide on fills
Type B	:	Precast concrete kerbing, semi-mountable (SABS 927-1969)
Type C	:	In situ concrete kerbing at intersections
Edge beam	:	In situ concrete kerbing at farm access and bus stops
Type E, F1 & F2	:	In situ concrete “V”-shaped channels in side drains and open drains.”

B2302 MATERIAL

Add the following new subclauses:

(e) Metal pipes

“Metal pipes down side slopes shall comply with the requirements of clause 2203 of the standard specifications.”

B2304 CONSTRUCTION

(d) Slip form kerbing

Add the following:

“Slip-form kerbing shall under no circumstances be allowed.”

(e) Cast in situ kerbs and channels

Add the following:

“Forming and templates used to form joints between alternate sections shall be of steel plate of which the thickness shall not be less than 5mm.”

Add the following new subclauses:

(i) Construction sequence

Replace paragraphs (i), (ii) and (iii) with the following:

“In all cases where kerbing and/or channelling adjoin the bituminous surface of the road, the kerbing and/or channelling may only be constructed after the bituminous surface has been completed.

Before commencing with the kerbing and/or channelling, the surfacing and the base, shall be accurately cut to line with a mechanical saw to a minimum depth of 75mm. After excavation the concrete shall then be cast against the cut surface without formwork. All material outside the cut line must be carefully removed to the required thickness of concrete without damaging the edge before commencing with the casting of the concrete. No payment shall be made for repair work as instructed by the engineer to damage caused by the cutting/excavating process of surfacing and base layers. Any concrete spilt onto the surfacing shall immediately be removed and cleaned. Where so required by the engineer, the contractor shall, without any additional compensation, paint emulsion over the stained surface.

Add the following subclause:

(k) Formwork and finish

“Formwork and finish of concrete kerbs shall comply with the requirements of section 6200. All visible edges on the sides or at joints of cast in situ concrete kerbs or channels shall be rounded with a rounding tool.”

SECTION 3100: BORROW MATERIALS**B3102 NEGOTIATIONS WITH OWNERS AND AUTHORITIES**

Add the following to sub-clause 3102(a):

“Arrangements regarding to access to borrow pits and the alignment of haul roads shall be made between the contractor and the owners of the land on which borrow pits are situated. The engineer’s representative on site shall be present at all such negotiations, which shall be confirmed in writing by the contractor. All costs involved with such negotiations as well as the requirements contained in clause 3102 and clause 1225 of the specifications shall be borne entirely by the contractor.”

B3103 OBTAINING BORROW MATERIALS**(a) General**

Add the following:

“The expropriation and compensation for land from which borrow materials is obtained shall be negotiated and paid for by the employer.”

(b) Use of borrow materials

Add the following to the second paragraph of this subclause:

“Compensation to owners (only on private land) and arrangements with owners for taking material from alternative borrow pits proposed by the contractor shall be the contractor’s responsibility and entirely at his own expenses.”

B3104 OPENING AND WORKING BORROW PITS AND HAUL ROADS**(c) Excess overburden**

Add the following:

“All excess overburden removed at borrow pits shall be replaced over the entire area of the borrow pit after initial shaping has been undertaken in an even layer. Payment for this requirement shall be deemed to be included in pay item 31.01

(f) Protecting borrow pits

Add the following:

"It is a requirement of the contract that each borrow pit or pits shall be provided with fencing around the perimeters, including a access gate, of the borrow areas, including the supply of danger warning signage fixed to the fencing, visible at all sides approaching the borrow pit area. The fencing shall be erected prior to entering the land for borrowing purposes and shall on final finishing of the borrow areas as specified by the employer, be dismantled and removed or left in-place as instructed by the employer. Payment for fencing around borrow pits shall be made in accordance with the stipulations of section 5500 in these specifications."

In addition to fencing, Security Guards shall be supply on a 24 hour, 7 days a week basis, with full time communication to the Site Manager or site camp for the duration of the contract and activities at the borrow pits.”

Add the following new sub clause:

“(h) Haul roads

Haul roads to designated borrow pits along the road shall be constructed along alignments as instructed by the engineer and shall be maintained at the contractor’s own cost to the satisfaction of the engineer.”

B3105 FINISHING-OFF BORROW AREAS AND HAUL ROADS

Add the following to this clause:

“Should the employer, engineer or any other authority approved by the engineer, require a higher standard of shaping and finishing off of borrow pits than specified in the standard specifications, measurement and payment for such extra work shall be made using daywork items as scheduled under this section.”

B3108 MEASUREMENT AND PAYMENT

Change item 31.01 to read as follows:

"ITEM	UNIT
B31.01 Excess overburden:	
(a) Depth up to and including 0,5m	cubic meter (m ³)
(b) Depth exceeding 0,5m and up to 1,0m	cubic meter (m ³)

Measurement and payment shall be as specified for item 31.01 of the standard specifications with the abovementioned depth ranges applicable.”

Add the following new item:

“ITEM	UNIT
B31.04 Compensation to landowners:	
(a) Prime cost sum for compensation to landowners	prime cost (PC) sum
(b) Handling cost and profit in respect of sub-item B31.04(a) above	percentage (%)

Measurement and payment shall be in accordance with the provisions of clause 6.6 of the general conditions of contract. Payment to the landowner shall be made within fourteen (14) days after such order has been given by the engineer. The contractor shall provide detailed proof of payment before payment shall be certified to the contractor.

The tendered percentage is an extra over percentage on the amount actually spent under sub-item B31.04(a) which shall include full compensation for the handling costs and profit of the contractor.”

SECTION 3200: SELECTION, STOCKPILING AND BREAKING-DOWN THE MATERIAL FROM BORROW PITS, CUTTINGS AND EXISTING PAVEMENT LAYERS, AND PLACING AND COMPACTING THE GRAVEL LAYERS

B3204 BREAKING-DOWN THE MATERIAL

(a) Initial breaking-down of the material in cuttings, borrow pits and existing pavement layers

Add the following to the table in the second paragraph of this subclause:

"Pioneer layers - 500mm maximum dimension

Not more than 20% of pioneer layer material shall pass through the 2,0mm sieve."

(b) Further breaking-down of pavement material

Add the following:

"Material used for the construction of selected, and wearing course layers shall be broken down by means of normal grid-rolling or additional normal grid-rolling to such an extent that the compacted pavement layer shall contain material of which 95% of the aggregate size shall not exceed 65mm. All oversize material, after breaking-down, shall be removed".

B3209 PLACING AND COMPACTING THE MATERIALS IN LAYER THICKNESSES IN EXCESS OF 200mm AFTER COMPACTION

Add the following new sub clause:

(d) Pioneer layer

"The maximum size rock used in pioneer layers shall be 500mm and the layer thickness before compaction shall not be more than one-and-a-half times the maximum actual size of the rock. Not more than 20% of pioneer layer material shall pass through the 2,0mm sieve. Pioneer layer processing and compaction shall be as specified in subclause 3307(c) of the standard specifications".

SECTION 3300: MASS EARTHWORKS

B3305 TREATING THE ROADBED

(a) Removing unsuitable material

Add the following to the third paragraph:

"For the purpose of this contract, excavation and removal of in-situ clayey material over areas where the road is in a fill condition, shall be classified as removal of unsuitable material, irrespective of the stability or moisture condition of the in-situ material".

(c) Preparing and compacting the roadbed

Delete the last sentence of the first paragraph "If necessary, roadbed.....depth of compaction" and replace as follows:

"Where demarcated by the engineer, prior to the roadbed being scarified, the excess in situ material forming part of the present roadway, and within the limits of the roadbed, and in close proximity of the layer works, but falling within the limits of the layer-works, shall be bladed to controlled level in order to achieve the required level and necessary depth of compaction."

B3307 FILLS

(c) Constructing a pioneer layer

Add the following to the first paragraph:

"For the purpose of this contract, pioneer layers shall be completed by means of eight-pass roller compaction using vibratory rollers as specified in sub clause 3304(b) of the standard specifications."

(d) Benching

Add the following:

"Benching of fill and pavement layer material is required to be undertaken into the existing fill embankments and pavement layers. No additional payment shall be made over and above the normal pay items applicable to earthworks and pavement layers where benching is required for widening of the existing road formation. Benching shall be undertaken as shown on the drawings.

It is a requirement that benching shall always be started at the bottom of the existing fill progressing to the top of the formation. The dimensions and details of benching are shown on the drawings."

B3308 FINISHING THE SLOPES**(d) General**

Add the following:

“Where existing cut and fill slopes are excessively eroded or where slippages occurred in slopes, the slopes are to be reinstated by means of backfilling with suitable gravel material. All loose material and vegetation shall first be removed from the eroded cut and fill slopes before backfilling may commence from the bottom of the cut or fill. The backfill material shall be benched into the existing slopes and compacted to 90% of modified AASHTO density, using suitable small compaction equipment e.g. Bomag walk-behind rollers or hand-held compaction tools. Benching shall be executed to the dimensions shown on the drawings. Upon completion of the backfilling operation the cut and fill slopes shall be neatly finished as specified.”

B3312 MEASUREMENT AND PAYMENT

Add the following sub-item to item 33.10:

“ITEM	UNIT
B33.10 (e) Extra over sub-items 33.10(a), (b) and (d) for blading to controlled levels (existing road)	cubic metre (m ³)

The unit of measurement in respect of the material bladed as specified in subclauses 33.05 (c) shall be the cubic metre of material bladed, measured in the original position before blading, in accordance with the method of average end areas.

The tendered rate shall include full compensation for blading of such material to level.

Only material bladed on the instruction of the engineer for exposing the underlying roadbed material for treatment will be measured and paid for as described above.”

SECTION 3400: PAVEMENT LAYERS OF GRAVEL MATERIAL**B3402 MATERIALS****(a) General**

Add the following at the end of the second paragraph:

"For chemically stabilised layers the material shall conform to the requirements in table B3402/5."

Add the following after the second paragraph:

"Distinction shall be made between crushed and natural G4, G5 and G6 materials. Where the crushing and/or screening of these materials have been specified, the combined grading shall conform to the grading limits specified for G4 class material in Table 3402/1."

Replace Table 3402/5 with:

Table B3402/5: Requirements for Chemically Stabilised Layers

Classification	C1	C2	C3	C4
Material before treatment	At least G2 quality	At least G4 quality	At least G5 quality	At least G6 quality
PI after treatment	Non-plastic	Non-plastic	6 max. *(1)	6 max. *(1)
UCS (MPa) *(2)	6 min.	4 min.	1,5 min	0,75 min.
ITS (kPa) *(3)	-	-	250 min.	200 min.
WDD (% loss)	5 max.	10 max.	20 max.	30 max.

Note

* (1). For materials derived from the basic crystalline rock group, the Plasticity Index after stabilisation shall be non-plastic.

* (2). Unconfined Compressive Strength @ 100% Mod. AASHTO density

* (3). Indirect tensile Strength @ 100% Mod. AASHTO density

* (4). Wet/Dry Durability according to Method B 8110"

(b) Compaction requirements

The lower and upper stabilised sub-base layers shall be compacted to 95% and 97% of modified AASHTO density respectively.

B3405 CONSTRUCTION TOLERANCES**(a) Level**

Replace the table in the sub-clause with the following:

	<u>H 90</u>	<u>H max</u>
Selected layer	25 mm	33mm
Lower sub-base layer	20 mm	25 mm
Upper sub-base layer	15 mm	20 mm
Base layers	12 mm	15 mm
Shoulders and wearing course	30 mm	25 mm

The difference of the deviation from the design level of two consecutive levels of the base layer shall not exceed 10mm”

Add the following:

“Level control for the various pavement layers shall be done at least at the following minimum intervals in the longitudinal direction:

Layer	Interval
Selected layer, sub-base, shoulders and wearing course	20 m
Base	10 m”

(b) Layer Thickness

Replace the table in the sub-clause with the following:

	<u>“D₉₀</u>	<u>D_{max}</u>	<u>D_{ave}</u>
Selected layer	30 mm	40 mm	10 mm
Lower sub-base layer	25 mm	33 mm	8 mm
Upper sub-base layer	20 mm	25 mm	5 mm
Base layers	15 mm	22 mm	5 mm
Shoulders and wearing course		30 mm	10 mm”

B3407 MEASUREMENT AND PAYMENT

Amend the payment description of Item 34.03 as follows:

“ITEM

UNIT

B34.03 Pavement layers constructed from gravel obtained from existing pavement layers (Including free-hall up to 1.0 km):

- (a) Gravel selected layer compacted to 93% Modified AASHTO density using:
- (i) Recovered milled G5/G6 from stockpile Cubic Metre (m³)
- (f) Gravel sub-base (chemical stabilized material) compacted to 95% of modified AASHTO density using:

- (i) Recovered milled G5/G6 material from stockpile compacted to in 150mm layer thickness to reach UCS of 0.75 MPa. Cubic Metre (m³)
- (g) Gravel sub-base (chemical stabilized material) compacted to 97% of modified AASHTO density using:
 - (i) Recovered milled G5/G6 material from stockpile compacted to in 150mm layer thickness to reach UCS of 1.5 MPa. Cubic Metre (m³)

The unit of measurement shall be the cubic meter (m³) of compacted pavement layer material calculated from the authorized dimensions of the completed layer. The tendered rate shall include full compensation for loading the material at the stockpile area, hauling the material for a free haul distance of 1.0 km, placing and compacting the material, removal and transporting for a distance of 1.0 km of up to 5% by mass of oversize material and protection and maintenance of the layer and for the conducting of control tests, all as specified."

Amend the payment description of Item 34.04 (a) as follows:

“ITEM

UNIT

B34.04 In situ reconstruction of existing pavement layers as:

- (a) Gravel selected layer compacted to 93% of modified AASHTO density using:
 - (i) Non-cemented material and compacted in 150mm layer thickness. Cubic Metre (m³)
 - (ii) Non-cemented material stabilized and Compacted in 150mm layer thickness C4 (UCS >0.5 MPa). Cubic Metre (m³)

Add new sub payment item to Item 34.06 as follows

“ITEM

UNIT

B34.06 Extra over item B33.04 for adding extra Material as specified in sub-clause 3207(b) (iii):

- (f) Gravel selected layer material obtained from:
 - (i) Surplus milled material temporary stockpiled and then loaded hauled, placed, spread and mixed where required, including free-haul of 1.0 km free haul each way to and from temporary stockpile. Cubic metre (m³)

The unit of measurement shall be the cubic meter (m³) of material added on the instruction of the engineer, which quantity shall be taken as 70% of the loose volume measured in trucks, unless instructed by the engineer that the quantity be determined by way of cross-sections.

The tendered rate shall include full compensation for loading, transporting, adding the material to the in situ broken-down pavement layer and for haul over a free-haul distance of 1.0km.”

Add the following new payment items:

“ITEM

UNIT

B34.14	Pavement layers constructed from gravel obtained from commercial sources or sources provided by the contractor, including haul	
(a)	Gravel selected layer compacted to:	
	(i) 95% of modified AASHTO density (150mm layer Thickness using material with CBR >20 at 93%Modified AAHTO density: GM >0.75 and PI 3GM + 10.)	Cubic Metre (m ³)
(b)	Gravel sub-base (chemical stabilized material) compacted to:	
	(i) Gravel upper sub-base compacted to 97% of modified AASHTO density (150mm layer thickness using C3 material with minimum UCS 1.5; GM 1.5 And PI > 6.)	Cubic Metre (m ³)
(c)	Gravel base (chemical stabilized material) compacted to:	
	(i) Gravel base compacted to 97% of modified AASHTO density (150mm layer thickness using C3 material with minimum UCS 1.5; GM 1.5 And PI > 6.)	Cubic Metre (m ³)
(d)	Gravel shoulder layer compacted to:	
	(i) 95% of modified AASHTO density (150mm layer Thickness using material with CBR >20 at 93%Modified AAHTO density: GM >0.75 and PI 3GM + 10.)	Cubic Metre (m ³)

The unit of measurement shall be the cubic meter (m³) of compacted pavement layer material calculated from the authorized dimensions of the completed layer.

The tendered rate shall include full compensation for procuring, breaking down and or crushing the material to the specified grading, finishing and placing the specific pavement layer material and for hauling the material over an unlimited free-haul haul distance. The tendered rate shall also include all procurement cost payable to the commercial supplier to supply the specified pavement layer in accordance with the specification.”

“ITEM**UNIT**

**B34.15 In-situ recycling of existing pavement layers
And compacting to 97% of modified AASHTO,
Using 2% cement and 1.5% emulsion**

(i) Depth of 200mm Square metre (m²)

The unit of measurement shall be the square meter (m²) of existing pavement layer material calculated from the authorised dimensions of the complete layer

“ITEM**UNIT**

**B34.16 Establish a recycler on site capable of
Recycling to a depth of 300mm (including
Moving to alternative locations on site and
Possible re-establishments)**

Lump Sum

A lump sum shall be provided for the establishment of a recycler on site that has the capability to recycle to a depth of 300mm, including the possible re-establishment as directed by the Engineer.

“ITEM**UNIT**

**B34.17 Extra over item B34.15 for adding extra
Material of G5 quality, from a commercial
source provided by the contractor as specified
In sub-clause 3207 (b) (iii) and including haul**

Square metre (m²)

SECTION 3800: BREAKING UP EXISTING PAVEMENT LAYERS**B3804 PLANT AND EQUIPMENT****(a) Milling equipment**

Add the following:

“No payment shall be made for moving the milling machine on the site.”

B3805 CONSTRUCTION**(b) Milling****(iii) Asphalt**

Add the following paragraph:

“The material originating from the milling of the existing asphalt layers shall remain the property of the employer and material shall as far as possible be re-used for fill and layer works. The disposal of surplus materials to an approved dump site shall be the responsibility of the contractor. The cost for disposing of the milled material, inclusive of loading and haulage, shall be deemed to be included in the tendered rate for the milling of the asphalt layers unless specifically stated otherwise.”

B3807 MEASUREMENT AND PAYMENT

Add the following payment Item:

“ITEM	UNIT
B38.02 Milling out existing bituminous material and pavement layer material in one operation	
(c) Average milling depth exceeding 200mm	Cubic Metre (m³)

Delete the third paragraph in the description of payment and replace with the following:

“The tendered rate shall also include full compensation for loading, transporting and disposing of the material at an approved site for re-use, including and overhaul distance of 1 km.

Material that is not re-used elsewhere on the project shall be spoiled.

The rates shall also include for transverse saw-cutting at the start and end of sections prior to the commencement of the milling operations. ”

“ITEM	UNIT
B38.14 Providing a milling machine on site capable of milling up to 200mm deep into existing surfacing and pavement layers (including moving to alternative locations on site and possible re-establishment)	
	Number (No.)

A lump sum shall be provided for the establishment of a recycler on site that has the capability to recycle to a depth of 250mm, including possible re-establishment as directed by the Engineer.”

SECTION 5600: ROAD SIGNS**B5601 SCOPE**

“This section also covers the supply and erection of permanent danger plates at culverts and bridges at the locations indicated on the drawings or as directed by the engineer.”

B5603 MANUFACTURING OF ROAD SIGN BOARDS AND SUPPORTS**(a) Road signboards**

Add the following:

“The contractor shall make every effort to ensure that signboards are correct in all respect and before dispatching the boards from the manufacturer’s factory shall provide the Engineer with a 100mm x 150mm colour photograph of each sign face for approval of the correctness of the legend. Such approval will not imply final acceptance of the board. If the Contractor is in any doubt as to the correctness of the sign detail, the sign designer shall be contacted for verification.”

(a) (ii) Steel profile road signboards

Add the following:

“Where the letter or legends cross the horizontal joints of the sign panels, the letter shall be cut on the joint and both ends folded around the radius.

Retro-reflective material to adjoining Chromadek panels on a sign shall be practical visual match of the specified colour.”

B5604 ROAD SIGN FACES AND PAINTING

Add the following new subclause:

“(e) Application of retro-reflective material

All sign faces shall be faced with class 1 grade retro-reflective material. Painted front sign faces shall not be used.

Where applied to Chromadek sections, retro-reflective material shall be applied as specified for aluminium section in Clause 5603(d) of the Standard Specification, and of Clause B5603(a)(ii) of this project Specification. All sign lettering and symbols are to be class 1 retro-reflective material with the exception of direction signs which is to be Class III retro-reflective material.

For W405, W406, R1 and W409 signs, the sign faces shall be Class III retro-reflective material and the lettering and symbols shall be Class III retro-reflective material.”

B5605 STORAGE AND HANDLING

Add the following:

“The following shall not be allowed on the sign face:

Drilling of holes, except for the fastening of overlays

Application of any form of adhesive

Cleaning with any chemicals that are not specifically approved by the manufacturer of the retro-reflective material

Covering the sign face with an impermeable material that does not allow free circulation of air.”

B5606 ERECTING ROAD SIGNS**(c) Erection**

Add the following:

“After erection the signboard shall be thoroughly cleaned with a cleaning agent approved by the retro-reflective material’s manufacturer.

All vegetation obstructing the new or replaced sign board shall be removed and disposed of as instructed by the Engineer.”

B5608 DISMANTLING, STORING AND RE-ERECTING EXISTING ROAD SIGNS

Add the following:

“Existing overhead and ground mounted road signs that are being replaced by new signs shall be dismantled and disposed of by the Contractor. Where possible the dismantling of the signs shall not be before the replacement sign is erected and displayed. Where dismantling of the sign is required before erection of the replacement sign, the dismantling shall not take place until immediately before work is to commence on the replacement, and the replacement shall be completed and the new sign displayed as soon as possible thereafter (within 72 hours).

Dismantling shall include sign panels and ground mounted sign supports.

Ground mounted sign supports shall be cut off just below ground level. Material excavated for removal of buried poles shall be replaced, and any depression made good using excess material from excavation for new signs.

Pay items are provided in the Bill of Quantities. Payment will differentiate between different types of sign panels.”

B5609 MEASUREMENT AND PAYMENT

ITEM	UNIT
<p>B56.01 Road sign boards with painted or coloured semi-matt background. Symbols, lettering, and borders in diamond grade retro-reflective material, where the sign board is constructed from:</p> <p style="margin-left: 40px;">Amend the last two lines of the second paragraph to read:</p> <p style="margin-left: 40px;">“Completion, delivery, installation of the road sign board complete as specified, and the removal and disposal of all vegetation obstructing the motorists’ view of the new or replaced sign board.</p>	

Add the following pay items:

“ITEM	UNIT
B56.10	Danger plates at culverts/structures
(a)	Type A at storm water culverts (size indicated) number (No.)
(b)	Type B at bridges (size indicated) number (No.)

The unit of measurement shall be the number of danger plates provided and erected in accordance with the drawings.

The tendered rate shall include full compensation for all labour and material, painting, posts, excavation, backfilling with soil etc., as may be necessary for completing the work in accordance with the details shown on the drawings.”

“ITEM	UNIT
B56.11	Replace marker boards on existing kilometre posts number (No)

The unit of measurement shall be the number of reference marker boards provided and attached to existing kilometer posts in accordance with the drawings.

The tendered rate shall include full compensation for the manufacturing and supplying of the completed marker boards, for attaching the marker board to existing posts along the route and for all materials equipment, labour, nuts and bolts necessary for attaching the marker board as specified.”

The tendered rate shall include full compensation for all the labour and material, painting, retro-reflective material, posts, excavation, backfilling, etc. as may be necessary for completing the work in accordance with the details shown on the drawings.”

SECTION 5700: ROAD MARKINGS

B5706 SETTING OUT THE ROAD MARKINGS

Add the following:

“Where road markings are to be replaced after milling/overlay seal, it is essential that all existing barrier lines and other road marking lines be accurately referenced before commencement of milling or other operations which will obliterate the existing road markings. The position of barrier lines shall be re-assessed on site by the Engineer before the Contractor commences with the road marking.”

B5707 APPLYING THE PAINT

Add the following:

“The Contractor’s establishment on site and general obligation shall be deemed to fully include the establishment of the road-marking team, irrespective of the number of times the road-marking team is required to be onsite or is required to move within the site.”

B5711 GENERAL

Insert the following into the last sentence of the last paragraph between “black paint” and “or chemical paint remover”:

“, bituminous emulsion, slurry”

Add the following to the last paragraph:

“Where black paint is used, it shall be matt.”

Add the following new clause:

“B5715 REMOVAL OF EXISTING ROAD STUDS

The existing road studs shall be removed from the road surface prior to milling.”

B5714 MEASUREMENT AND PAYMENT

ITEM	UNIT
B57.06 Setting out and pre-marking the lines (excluding traffic island markings, lettering and symbols)	

Add the following:

“Referencing of existing barrier lines and other road marking lines prior to milling and other operations, shall be included in the tendered rate for setting out and pre-marking.”

ITEM	UNIT
B57.05 Roadstuds	

Add the following after the first sentence of the second paragraph:

“No additional payment will be made should temporary or permanent road studs be replaced if lost or broken during the construction period or the maintenance period.”

SECTION 5900 : FINISHING THE ROAD AND ROAD RESERVE AND TREATING OLD ROADS

B5902 FINISHING THE ROAD AND ROAD RESERVE

Add the following to the first paragraph:

“The contractor shall pay special attention to the collection and removal of all waste materials originating from the construction activities. All materials trimmed or excavated from the road shall be collected and removed from the road reserve to the satisfaction of the engineer.

This requirement shall be deemed to be incorporated in the tendered rates for item 59.01 of the bill of quantities or such other items as the contractor may decide upon.

The engineer may order additional finishing of the road reserve which will entail the collection and disposal of loose rocks etc. Payment for this work will be made under daywork items included in section 5900 of the bill of quantities as described in section 1800 of these project specifications.”

SECTION 6100: FOUNDATIONS FOR STRUCTURES**B6106 FOUNDING**

Add the following paragraph:

"Where founding takes place in soils or at "founding level" before the placing of foundation fill the in-situ material in the bottom of the excavation shall be compacted to a density of 90% or 93% of modified AASHTO density as directed by the engineer. The depth of preparation and compaction of founding material shall be specified by the engineer. Allowance for measurement and payment for this work is made in the bill of quantities under this section."

B6108 BACKFILL AND FILL NEAR STRUCTURES**(a) General**

Add the following:

- (iv) "During backfilling within 1,0m of any concrete structure, or as directed by the Engineer, only hand operated mechanical compaction equipment shall be used to achieve the required density."

B6109 FOUNDATION FILL

Add the following after the 3rd paragraph:

"Granular foundation fill shall be constructed from selected subgrade material.

Add the following after the 6th paragraph:

Concrete screeds shall extend 200mm beyond the horizontal dimensions of all footings to facilitate the placing of formwork, unless otherwise directed by the engineer.

In the case of structures where excessive ground water is encountered, the screed shall extend over the full plan area of the base of the excavation. Payment shall be made for the quantity of concrete calculated as the product of the specified thickness of the screed and the actual area of screed specified by the engineer up to a maximum area of the product of the neat footing length plus 750mm and the neat footing width plus 750mm."

B6115 MEASUREMENT AND PAYMENT

Add the following new items:

"ITEM	UNIT
B61.51 (a) Preparation and compaction of in situ founding material to 90% Mod. AASHTO density (depth indicated) cubic metre (m ³)	
(b) Extra over item B61.51(a) for compaction to 93% of Mod. AASHTO density (depth indicated) cubic metre (m ³)	

The unit of measurement shall be the cubic metre of founding material prepared and compacted to the density as specified in accordance with Clause B6106 of these project specifications.

The tendered rates shall include full compensation for shaping, scarifying, mixing of in-situ and imported material if required, and preparing and compacting the material as specified."

6400: CONCRETE FOR STRUCTURES

B6402 MATERIALS

(a) Cement

Replace this sub-section with the following:

"Refer to section 1142 for specification of cement."

CEM I 32,5, CEM II A-S 32,5, CEM II/A-V 32,5, or CEM III A may be used for the manufacture of reinforced concrete members.

B6404 CONCRETE QUALITY

(b) Strength concrete

Add the following paragraph:

"The cement content for any class of structural concrete or mass concrete used in structures shall not be less than 300kg/m³ of concrete.

The contractor must provide the engineer with complete mix designs and materials for strength concrete at least six (6) weeks before the first concrete is cast on the project".

B6405 MEASURING THE MATERIALS

(c) Aggregates

Add the following:

"All concrete for structures shall be manufactured by mechanical mass batching unless authorised otherwise by the engineer for minor concrete structures or for labour-intensive methods."

B6407 PLACING AND COMPACTING

(a) General

Add the following after the third paragraph:

"Concrete shall only be placed up to 20:00 at the latest. Under exceptional circumstances the Engineer may allow night work on condition that proper lighting arrangements can be made and a new and rested shift for night work is provided and ambient temperatures are such as to not adversely affect the setting of the concrete."

B6408 CONSTRUCTION JOINTS**(a) General**

Add the following:

"No construction joints other than those indicated on the drawings will be permitted without the written approval of the engineer".

B6409 CURING AND PROTECTING

Add the following:

The surface area of bridge and culvert floor slabs and decks shall be cured as follows:

- (i) The area of freshly cast and finished concrete surface shall be immediately covered as specified in clause 6409(e).
- (ii) After the concrete has set sufficiently the entire area shall be treated with an approved curing compound as specified in clause 6409(f)."

B6414 QUALITY OF MATERIALS AND WORKMANSHIP**(a) Criteria for compliance with the requirements**

Add the following:

"Quality control shall be carried out by the engineer as specified in Section 8200 : Quality Control (Scheme 1)."

Add the following new paragraph:

(d) Concrete cores - strength requirements

"Cores will only be drilled if authorised by the engineer. This will only be considered if the contractor's own cubes, when crushed by the engineer, attained the required 28-day cube strength."

B6416 MEASUREMENT AND PAYMENT

ITEM	UNIT
B64.01 Cast in situ concrete:	cubic metre (m ³)

Add the following after the first paragraph:

"Where foundation slabs are set directly against the face of excavations, the volume of concrete measured for payment shall include the total volumes of concrete placed, allowing for up to a maximum over the neat footing dimensions of 200mm where in the opinion of the engineer accurate excavation to neat lines and levels indicated on the drawings is not possible. (No formwork to the footing shall be measured when the concrete is cast against the face of the excavations)."

C3.3.3 PROJECT SPECIFICATIONS: ADDITIONAL SPECIFICATIONS

CONTENTS

- C3.3.3.1 REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT REGULATIONS
- C3.3.3.2 ENVIRONMENTAL MANAGEMENT PLAN
- C3.3.3.3 PROVISION OF STRUCTURED TRAINING
- C3.3.3.4 PROVISION OF THE TEMPORARY WORKFORCE

C3.3.3.1 OCCUPATIONAL HEALTH AND SAFETY ACT 1993: HEALTH AND SAFETY SPECIFICATION

CONTENTS

- C3.3.3.1.1 INTRODUCTION
- C3.3.3.1.2 SCOPE
- C3.3.3.1.3 GENERAL OCCUPATIONAL HEALTH AND SAFETY PROVISIONS
- C3.3.3.1.4 OPERATIONAL CONTROL
- ANNEXURE 1: MEASURING INJURY EXPERIENCE
- ANNEXURE 2: EXECUTIVE SHE RISK MANAGEMENT REPORT
- ANNEXURE 3: LIST OF RISK ASSESSMENTS

C3.3.3.1.1 Introduction

In terms of the Construction Regulation 4(1) (a) of the Occupational Health and Safety Act, No. 85 of 1993, Ba-Phalaborwa Municipality as the Client, is required to compile a Health & Safety Specification for any intended project and provide such specification to any prospective tenderer.

The Client's further duties are as in C3.5.1.3.1.1. below and in the Construction Regulations, 2003.

This specification has as objective to ensure that Principal Contractors entering into a Contract with the Ba-Phalaborwa Municipality achieve an acceptable level of OH&S performance. This document forms an integral part of the Contract and Principal and other Contractors should make it part of any Contracts that they may have with Contractors and/or Suppliers.

Compliance with this document does not absolve the Principal Contractor from complying with minimum legal requirements and the Principal Contractor remains responsible for the health & safety of his employees and those of his Mandataries.

C3.3.3.1.2 Scope

Development of a health & safety specification that addresses all aspects of occupational health and safety as affected by the abovementioned contract work.

The specification will provide the requirements that Principal Contractors and other Contractors will have to comply with in order to reduce the risks associated with the abovementioned contract work that may lead to incidents causing injury and/or ill health, to a level as low as reasonably practicable.

C3.3.3.1.3 General Occupational Health & Safety Provisions

(a) Hazard Identification & Risk Assessment (Construction Regulation 7)

(i) Risk Assessments

Annexure 3 contains a list of Risk Assessment headings that have been identified by the municipality as possibly applicable to the abovementioned contract work. It is, by no means, exhaustive and is offered as an assistance to Contractors intending to tender.

Based on the Risk Assessments, the Principal Contractor must develop a set of site-specific OH&S rules that will be applied to regulate the OH&S aspects of the construction.

The Municipality Assessments, together with the site-specific OH&S rules must be submitted to the municipality before mobilisation on site commences.

Despite the Risk Assessments listed in Annexure 3, the Principal Contractor is required to conduct a baseline Risk Assessment and the aforesaid listed Risk Assessments must be incorporated into the base-line Risk Assessment. The baseline Risk Assessment must further include the Standard Working procedures (SWP) and the applicable Method Statements based on the Risk Assessments

All out-of-scope work must be associated with a Risk Assessment.

(ii) Review of Risk Assessments

The Principal Contractor is to review the Hazard Identification, Risk Assessments and SWP's at each Production Planning and Progress Report meeting as the Contract work develops and progresses and each time changes are made to the designs, plans and construction methods and processes.

The Principal Contractor must provide the Client, other Contractors and all other concerned-parties with copies of any changes, alterations or amendments as contemplated in above.

(b) Legal Requirements

All Contractors entering into a Contract with the municipality shall, as a minimum, comply with the

- Occupational Health & Safety Act and Regulations (Act 85 of 1993). A current, up-to-date copy of the OHS Act must be available on site at all times
- Compensation for Occupational Injuries & Diseases Act (Act 130 of 1993). The principal Contractor will be required to submit a letter of Registration and "good-standing" from the Compensation Insurer before being awarded the Contract. A current, up-to-date copy of the COID Act must be available on site at all times.
- Where work is being carried out on mines' premises the Contractor will have to comply with the Mine Health & Safety Act and Regulations (Act. 29 of 1996) and any other OH&S requirements that the mine may specify. A current, up-to-date copy of the OHS Act must be available on site at all times.

(c) Structure and Responsibilities

(i) Overall Supervision and Responsibility for OH&S

* It is a requirement that the Principal Contractor, when he appoints Contractors (Sub-contractors) in terms of Construction Regulations 5(3), (5), (9), (10) and (12) he includes an OHS Act Section 37(2) agreement: "Agreement with Mandatary" in his agreement with such Contractors.

* Any OH&S Act (85/1993), Section 16(2) appointee/s as detailed in his/her/their respective appointment forms

(ii) Further (Specific) Supervision Responsibilities for OH&S

The Contractor shall appoint designated competent employees and/or other competent persons as required by the Act and Regulations. Below is a list of identified appointments and may be used to select the appropriate appointments for the current contract:

	Ref. Section/Regulation in OHSAct
Batch Plant Supervisor	(Construction Regulation 6(1))
Construction Vehicles/Mobile Plant/Machinery Supervisor	(Construction Regulation 21)
Demolition Supervisor	(Construction Regulation 12)
Drivers/Operators of Construction Vehicles/Plant	(Construction Regulation 21)
Electrical Installation and Appliances Inspector	(Construction Regulation 22)
Emergency/Security/Fire Coordinator	(Construction Regulation 27)
Excavation Supervisor	(Construction Regulation 11)
Explosive Powered Tool Supervisor	(Construction Regulation 19)
Fall Protection Supervisor	(Construction Regulation 8)
First Aider	(General Safety Regulation 3)
Fire Equipment Inspector	(Construction Regulation 27)
Formwork & Support work Supervisor	(Construction Regulation 10)
Hazardous Chemical Substances Supervisor	(HCS Regulations)
Incident Investigator	(General Admin Regulation 29)
Ladder Inspector	(General Safety Regulation 13A)
Lifting Equipment Inspector	(Construction Regulation 20)
Materials Hoist Inspector	(Construction Regulation 17)
OH&S Committee	(OHS Act Section 19)
OH&S Officer	(Construction Regulation 6(6))
OH&S Representatives	(OHS Act Section 17)
Person Responsible for Machinery	(General Machinery Regulation 2)
Scaffolding Supervisor	(Construction Regulation 14)
Stacking & Storage Supervisor	(Construction Regulation 26)
Structures Supervisor	(Construction Regulation 9)
Suspended Platform Supervisor	(Construction Regulation 15)
Tunneling Supervisor	(Construction Regulation 13)
Vessels under Pressure Supervisor	(Vessels under Pressure Regulations)
Working on/next to Water Supervisor	(Construction Regulation 24)
Welding Supervisor	(General Safety Regulation 9)

The appointments must be in writing and the responsibilities clearly stated together with the period for which the appointment is made. This information must be communicated and agreed with the appointees.

Copies of appointments must be submitted to the Municipality together with concise CV's of the appointees. All appointments must be officially approved by Municipality. Any changes in appointees or appointments must be communicated to Municipality forthwith.

The Principal Contractor must, furthermore, provide the municipality with an organogram of all Contractors that he/she has appointed or intends to appoint and keep this list updated on a weekly basis.

In addition Municipality may require that a Traffic Safety Officer be appointed for any project.

(iii) Designation of OH&S Representatives (Section 18 of the OHS Act)

OH&S Representatives have to be designated in writing and the designation must include the area of responsibility of the person and term of the designation.

(iv) Duties and Functions of the OH&S Representatives (Section 19 of the OHS Act)

The Principal Contractor must ensure that the designated OH&S Representatives conduct a minimum monthly inspection of their respective areas of responsibility using a checklist and report thereon to the Principal Contractor

OH&S representatives must be included in accident/incident investigations

OH&S representatives must attend all OH&S committee meetings.

(v) Appointment of OH&S Committee (Section 20 of the OHS Act)

The Principal Contractor must establish an OH&S Committee consisting of all the designated OH&S Representatives together with a number of management representatives that are not allowed to exceed the number of OH&S representatives on the committee and a representative of the Client who shall act as the chairman without a vote. The members of the OH&S committee must be appointed in writing.

The OH&S Committee must meet minimum monthly and consider, at least, the following Agenda:

1. Opening & Welcome
2. Present/Apologies/Absent
3. Minutes of previous Meeting
4. Matters Arising from the previous Minutes
5. OH&S Reps Reports
6. Incident Reports & Investigations
7. Incident/Injury Statistics
8. Other Matters

9. Endorsement of Registers and other statutory documents by a representative of the Principal Contractor
10. Close/Next Meeting

(d) Administrative Controls and the Occupational Health & Safety File

(i) The OH&S File (Construction Regulation 5 (7))

As required by Construction Regulation 5(7), the Principal Contractor and other Contractors will each keep an OH&S File on site containing the following documents as a minimum:

- * Notification of Construction Work (Construction Regulation 3.)
- * Copy of OH&S Act (updated) (General Administrative Regulation 4.)
- * Proof of Registration and good standing with a COID Insurer (Construction Regulation 4 (g))
- * OH&S Programme agreed with the Client including the underpinning Risk Assessment/s & Method Statements (Construction regulation 5 (1))
- * Copies of OH&S Committee and other relevant Minutes
- * Designs/drawings (Construction Regulation 5 (8))
- * A list of Contractors (Sub-Contractors) including copies of the agreements between the parties and the type of work being done by each Contractor (Construction Regulation 9)
- * Appointment/Designation forms as per (a)(i) & (ii) above.
- * Registers as follows:
 - * Accident/Incident Register (Annexure 1 of the General Administrative Regulations)
 - * OH&S Representatives Inspection Register
 - * Asbestos Demolition & Stripping Register
 - * Batch Plant Inspections
 - * Construction Vehicles & Mobile Plant Inspections by Controller
 - * Daily Inspection of Vehicles, Plant and other Equipment by the Operator/ Driver/User
 - * Demolition Inspection Register
 - * Designer's Inspection of Structures Record
 - * Electrical Installations, -Equipment & -Appliances (including Portable Electrical Tools)
 - * Excavations Inspection
 - * Explosive Powered Tool Inspection, Maintenance, Issue & Returns Register (incl. cartridges & nails)
 - * Fall Protection Inspection Register
 - * First Aid Box Contents

- * Fire Equipment Inspection & Maintenance
- * Formwork & Support work Inspections
- * Hazardous Chemical Substances Record
- * Ladder Inspections
- * Lifting Equipment Register
- * Materials Hoist Inspection Register
- * Machinery Safety Inspection Register (incl. machine guards, lock-outs etc.)
- * Scaffolding Inspections
- * Stacking & Storage Inspection
- * Inspection of Structures
- * Inspection of Suspended Platforms
- * Inspection of Tunnelling Operations
- * Inspection of Vessels under Pressure
- * Welding Equipment Inspections
- * Inspection of Work conducted on or Near Water
- * All other applicable records

RAL will conduct an audit on the OH&S file of the Principal Contractor from time-to-time.

- (e) OH&S Goals & Objectives & Arrangements for Monitoring & Review of OH&S Performance

The Principal Contractor is required to maintain a CIFR of at least 8 (See Annexure 1. to this document: "Measuring Injury Experience) and report on this to the municipality on a monthly basis

- (f) Notification of Construction Work (Construction Regulation 3.)

The Principal Contractor must, where the Contract meets the requirements laid down in Construction Regulation 3, within 5 working days, notify the Department of Labour of the intention to carry out construction work and use the form (Annexure A in the Construction Regulations) for the purpose. A copy must be held on the OH&S File and a copy must be forwarded to the municipality for record keeping purposes.

- (g) Training, Awareness and Competence

The contents and syllabi of all training required by the Act and Regulations are to be included in the Principal Contractor's OH&S Plan.

- (i) General Induction Training

All members of Contractor's Site management as well as all the persons appointed as responsible for OH&S in terms of the Construction and other Regulations will be required to attend a general induction session by the Client

All employees of the principal and other Contractors to be in possession of proof of General Induction training.

(ii) Site Specific Induction Training

The Principal Contractor will be required to develop Contract work project specific induction training based on the Risk Assessments for the Contract work and train all employees and other Contractors and their employees in this.

All employees of the Principal and other Contractors to be in possession of proof of Site Specific OH&S Induction training at all times.

(iii) Other Training

All operators, drivers and users of construction vehicles, mobile plant and other equipment to be in possession of valid proof of training.

All employees in jobs requiring training in terms of the Act and Regulations to be in possession of valid proof of training as follows:

OH&S Training Requirements: (as required by the Construction Regulations and as indicated by the OH&S Specification & the Risk Assessment/s):

- * General Induction (Section 8 of the Act)
- * Site/Job Specific Induction (also visitors) (Sections 8 & 9 of the Act)
- * Site/Project Manager
- * Construction Supervisor
- * OH&S Representatives (Section 18 (3) of the Act)
- * Training of the Appointees indicated above
- * Operators & Drivers of Construction Vehicles & Mobile Plant (Construction Regulation 21)
- * Basic Fire Prevention & Protection (Environmental Regulations 9 and Construction regulation 27)
- * Basic First Aid (General Safety Regulations 3)
- * Storekeeping Methods & Safe Stacking (Construction Regulation 26)
- * Emergency, Security and Fire Co-coordinator

(iv) Awareness & Promotion

The Principal Contractor is required to have a promotion and awareness scheme in place to create an OH&S culture in employees. The following are some of the methods that may be used:

- Toolbox Talks
- OH&S Posters
- Videos
- Competitions
- Suggestion schemes
- Participative activities such as OH&S Safety circles.

(v) Competence

The Principal Contractor shall ensure that his and other Contractors personnel appointed are competent and that all training required to do the work safely and without risk to health, has been completed before work commences

The Principal Contractor shall ensure that follow-up and refresher training is conducted as the contract work progresses and the work situation changes.

Records of all training must be kept on the OH&S File for auditing purposes.

(h) Consultation, Communication and Liaison

OH&S Liaison between the Client, the principal Contractor, the other Contractors, the Designer and other concerned parties will be through the OH&S committee as contemplated in above.

In addition to the above, communication may be directly to the Client or his appointed Agent, verbally or in writing, as and when the need arises.

Consultation with the workforce on OH&S matters will be through their Supervisors, OH&S Representatives, the OH&S committee and their elected Trade Union Representatives, if any.

The Principal Contractor will be responsible for the dissemination of all relevant OH&S information to the other Contractors e.g. design changes agreed with the Client and the Designer, instructions by the Client and/or his/her agent, exchange of information between Contractors, the reporting of hazardous/dangerous conditions/situations etc.

The Principal Contractor will be required to do Site Safety Walks with the municipality at least on a basis to be determined between the two parties.

The Principal and other Contractors will be required to conduct Toolbox Talks with their employees on a weekly basis and records of these must be kept on the OH&S File. Employees must acknowledge the receipt of Toolbox Talks which record must, likewise be kept on the OH&S File.

The Principal Contractors most senior manager on site will be required to attend all municipality OH&S meetings and

a list of dates, times and venues will be provided to the Principal Contractor by municipality .

(i) Checking, Reporting and Corrective Actions

(i) Monthly Audit by Client (Construction Regulation 1(d))

RAL will be conducting a Monthly Audit to comply with Construction Regulation 4(1)(d) to ensure that the principal Contractor has implemented and is maintaining the agreed and approved OH&S Plan.

(ii) Other Audits and Inspections by the municipality:

RAL reserves the right to conduct other ad hoc audits and inspections as deemed necessary. This will include Site Safety Walks.

(iii) Conducting an Audit

A representative of the Principal Contractor must accompany Municipality on all Audits and Inspections and may conduct his/her own audit/inspection at the same time. Each party will, however, take responsibility for the results of his/her own audit/inspection results.

(iv) Contractor's Audits and Inspections

The Principal Contractor is to conduct his own monthly internal audits to verify compliance with his own OH&S Management system as well as of with this specification.

(v) Inspections by OH&S Representative's and other Appointees

OH&S Representatives must conduct weekly inspections of their areas of responsibility and report thereon to their foreman or supervisor whilst other appointees must conduct inspections and report thereon as specified in their appointments e.g. vehicle, plant and machinery drivers, operators and users must conduct daily inspections before start-up.

(vi) Recording and Review of Inspection Results

All the results of the abovementioned inspections to be in writing, reviewed at OH&S committee meetings, endorsed by the chairman of the meeting and placed on the OH&S File.

(vii) Reporting of Inspection Results

The Principal Contractor is required to provide the Client with a monthly report in the format as per the attached Annexure 2: "SHE Risk Management Report"

(j) Incident Reporting and Investigation

Reporting of Accidents and Incidents (Section 24 and General Administrative Regulation 8 of the OHS Act)

The Principal Contractor must report all incidents where an employee is injured on duty to the extent that he/she:

- * Dies
- * Becomes unconscious
- * Loses a limb or part of a limb
- * Is injured or becomes ill to such a degree that he/she is likely either to die or to suffer a permanent physical defect or likely to be unable for a period of at least 14 days either to work or continue with the activity for which he/she was usually employed

OR where:

- * a major incident occurred
- * The health or safety of any person was endangered
- * Where a dangerous substance was spilled
- * The uncontrolled release of any substance under pressure took place
- * Machinery or any part of machinery fractured or failed resulting in flying, falling or uncontrolled moving objects
- * Machinery ran out of control

to the Municipality within two days and to the Provincial Director of the Department of Labour within seven days (Section 24 of the Act & General Administrative Regulation 8.) EXCEPT that, where a person has died, has become unconscious for any reason or has lost a limb or part of a limb or may die or suffer a permanent physical defect, the incident must be reported to both the municipality and the Provincial Director of the Department of Labour forthwith by telephone, telefax or E-mail.

The Principal Contractor is required to provide the municipality with copies of all statutory reports required in terms of the Act within 7 days of the incident occurring.

The Principal Contractor is required to provide the municipality with copies of all internal and external accident/incident investigation reports including the reports contemplated below within 7 days of the incident occurring.

Accident and Incident Investigation (General Administrative Regulation 9)

The Principal Contractor is responsible for the investigation of all accidents/incidents where employees and non-employees were injured to the extent that he/she/they had to be referred for medical treatment by a doctor, hospital or clinic

The results of the investigation to be entered into the Accident/Incident Register listed in above.

The Principal Contractor is responsible for the investigation of all minor and non-injury incidents as described in Section 24 (1) (b) & (c) of the Act and keeping a record of the results of such investigations including the steps taken to prevent similar accidents in future.

The Principal Contractor is responsible for the investigation of all road traffic accidents and keeping a record of the results of such investigations including the steps taken to prevent similar accidents in future.

The municipality reserves the right to hold its own investigation into an incident or call for an independent external investigation.

C.3.3.3.1.4 Operational Control

(a) Emergency Preparedness, Contingency Planning and Response

The Principal Contractor must appoint a competent person to act as Emergency Controller/Coordinator.

The Principal Contractor must conduct an emergency identification exercise and establish what emergencies could possibly develop. He/she must then develop detailed contingency plans and emergency procedures, taking into account any emergency plan that the municipality may have in place.

The Principal Contractor and the other Contractors must hold regular practice drills of contingency plans and emergency procedures to test them and familiarise employees with them.

(b) First Aid (General Safety Regulation 3)

The Principal Contractor must provide First Aid equipment (including a stretcher) and have qualified First Aider/s as required by General Safety Regulation 3 of the OHS Act.

The Contingency Plan of the Principal Contractor must include the arrangements for speedily and timeously transporting injured/ill person/s to a medical facility or of getting emergency medical aid to person/s that may require it.

The Principal Contractor must have firm arrangements with his other Contractors in place regarding the responsibility of the other Contractors injured/ill employees

(c) Security

The Principal Contractor must establish site access rules and implement and maintain these throughout the construction period. Access control must include the rule that non-employees will not be allowed on site unaccompanied.

The Principal Contractor must develop a set of Security rules and procedures and maintain these throughout the construction period

(d) Fall Protection (Working in Elevated Positions (Construction regulation 8.)). A pre-emptive Risk Assessment will be required for any work to be carried out above two metres from the ground or any floor level and will be classified as "Work in Elevated Positions".

As far as is practicable, any person working in an elevated position will work from a platform, ladder or other device that is at least as safe as if he/she is working at ground level and whilst working in this position be wearing a single belt with lanyard that will be worn to prevent the person falling from the platform, ladder or other device utilised. This safety belt will be, as far as is possible, secured to a point away from the edge over which the person might fall and the lanyard must be of such a length that the person will not be able to move over the edge.

Alternatively any platform, slab, deck or surface forming an edge over which a person may fall may be fitted with guard rails at two different heights as prescribed in SABS 085: Code of Practice for the Design, Erection, Use and Inspection of Access Scaffolding.

Where the requirement in is not practicable, the person will be provided with a full body harness that will be worn and attached above the wearer's head at all times and the lanyard must be fitted with a shock absorbing device OR the person must be attached to an approved, by the municipality, fall arrest system.

Where the requirements are not practicable, a suitable catch net must be erected. Workers working in elevated positions must be trained to do this safely and without risk to health

Where work on roofs is carried out, the Risk Assessment must take into account the possibility of persons falling through fragile material. Skylights and openings in the roof.

C3.3.3.1.5 Measurement and Payment

Payment for the contractor's obligations in respect of the Occupational Health and Safety act and Construction Regulations shall be made through three payment items described below. The three payment items together shall include full compensation for all personnel (including a dedicated full time Construction Safety Officer), cost and incidentals in respect of compliance with the enforcement of the Health and Safety Specifications, which shall include for the compilation, presentation, implementation and maintenance of the Health and Safety Plan as contemplated. In tendering rates for the three items the contractor shall ensure that the sum of the amounts for the three items shall not be less than one percent (1%) of the Tender Amount.

Item	Unit
C1.1 Contractor's initial obligations in respect of the Occupational Health and Safety Act and Construction Regulations	Lump Sum

The full amount will be paid in one instalment only once:-

- (a) The contractor has notified the Provincial Director of the Department of Labour in writing of the project.
- (b) The contractor has made the required initial appointments of employees and sub-contractors.
- (c) The client has approved the contractor's Health and Safety Plan.
- (d) The contractor has set up his Health and Safety File.

Item	Unit
C1.2 Contractor's time related obligations in respect of the Occupational Health and Safety Act and Construction Regulations	Month

The tendered monthly amount shall represent full compensation for that part of the contractor's general obligations in terms of the Occupational Health and Safety Act and the Construction Regulations which are mainly a function of time. This includes inter alia payment of all costs for the appointment of all staff contemplated in the construction regulations and the transport of employees on site. Payment will be monthly only after payment for Item **C1.1** has been made.

Item	Unit
C1.3 Submission of the Health and Safety File	Lump Sum

The tendered lump sum shall represent full compensation for the contractor meeting all his obligations in respect of the Occupational Health and Safety Act and the Construction Regulations and for the preparation and submission of his Health and Safety File complete as envisaged on this specification to the Client's satisfaction.

This amount will be paid only once the contractor has met all his obligations in respect of the Occupational Health and Safety Act and the Construction Regulations and has submitted his Health and Safety File complete as envisaged on this specification to the Client's satisfaction.

C3.3.3.1.6 Project/Site Specific Requirements

See Annexure 3

Annexure 1: Measuring Injury Experience

Annexure 2: SHE Risk Management Report

Annexure 3. List of Risk Assessments

ANNEXURE 1: MEASURING INJURY EXPERIENCE

Injury experience has traditionally been measured by the use of a disabling injury frequency rate, the so-called "DIFR". The DIFR is calculated by multiplying the number of disabling injuries by 1 million and dividing by the number of man-hours worked.

Lately the DIFR has been replaced internationally with a DIIR: disabling injury incidence rate. The only difference between the two rates are that the 10 million in the calculation is replaced with 200 000. (200 000 purported to be the number of hours and average person works in a lifetime.)

The use of the two rates above has proved to be somewhat problematical as they are open to manipulation and disabling injuries are often "hidden" by returning the injured employee to the workplace so as not to lose a shift and therefore having to register a disabling injury.

The Construction Industry recently decided to promote the use of a new frequency rate based on the number of compensation injury claims as these are more difficult to hide or manipulate because the reporting of compensable injuries is a legal requirement.

The industry is hoping that adoption of this new measurement of injury experience will enable the industry to monitor itself as far as work related injuries are concerned.

Below follows an explanation of this new rating system.

COMPENSATION INCIDENCE FREQUENCY RATE (CIFR)

FORMULA

No. of Compensation Claims X 200 000 /

*220 man hours X No. of Employees

DEFINITIONS

No. of Compensation

Claims: **The number of claims lodged with the COID insurer for the period under review**

200 000: The fixed factor to align the rate with other rates used internationally

Manhours Worked

Include: *

- * Hourly Paid Employees
- * Sub-contractors (No. of Employees X *220 each)
- * Staff (No. of Employees X *220 hours each)

220 manhours: The *average number of hours worked by one employee in one month in the Construction industry.

* Overtime, absence on leave or sick leave, unrecorded after hours' time worked by senior and middle management factored into this average.

No. of Employees: The actual or average number of employees employed for the period under review.

2002/03CIFRSystem

ANNEXURE 2: EXECUTIVE SHE RISK MANAGEMENT REPORT

The SAFCEC OH&S committee recently developed the following report in an attempt to standardise on reporting and assist contractors in obtaining a clear picture of their SHE Risk Management performance. It is hoped that clients will also accept this standardised report. Your comments/suggestions for improvement is invited.

EXAMPLE ONLY: ALL INFORMATION IS FICTITIOUS

XYZ construction

*SHE RISK MANAGEMENT REPORT

PERIOD JANUARY TO MARCH 2002

*(SHE = Safety, Health & Environment)

1. Introduction

We hope that this new format of quarterly SHE Risk Management reporting will provide a clear picture of the company's performance as far as occupational health & safety is concerned.

The first quarter of 2002 generally reflected an improvement in injury experience and shows a decline in the number of injuries. Although Building was the only division where there was an increase in compensation claims, figures are still well down from the average 2001 figures. A sub-contractor experienced one fatality.

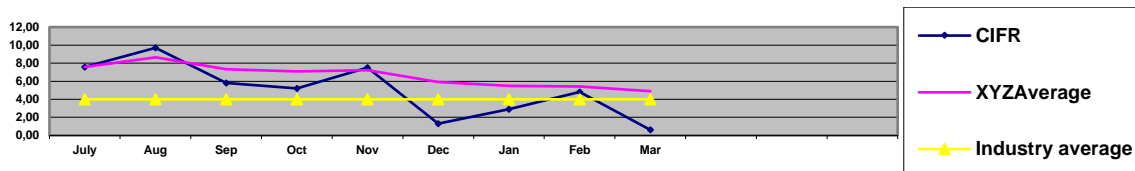
All divisions are eagerly awaiting the final implementation in May of the new electronic SHE Management system that will make the tools to implement the SHE programme available to all management and supervisory staff.

2. Incident Statistics

Compensation Incident Frequency Rate (CIFR)

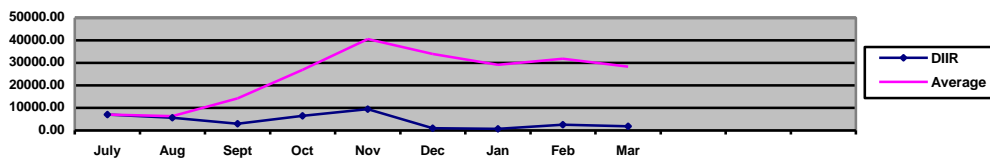
CIFR = Total No. of Claims against the Workmen's Compensation Fund X 200 000

Manhours worked



2.2. Disabling Injury Incidence Rate (DIIR)

DIIR =
$$\frac{\text{No. Disabling Injuries X 200 000}}{\text{Manhours worked}}$$



2.3. Other Major Incidents

Three other major incidents were experienced in the period under review:

- 2.3.1. A major trench collapsed at Job. 00123: XYZ Head Office, Bochum: No personnel injured, extensive damage to foundations: 3 days delay.
- 2.3.2. A concrete dumper ran away when its brakes failed. It smashed into the glass façade of the building on Job 00332: McDonalds, Polokwane. The driver jumped off and was not injured. Cost of damage to façade: R45 000.
- 2.3.3. A storage hut on Job 00567: BP Petrol Station, Swartruggens was demolished by fire when the night watchman made a fire inside the storage hut which contained concrete vibrators and levelling machines. Cost of replacing the hut and machines: R30 000

3. RISK AREAS

The following items of concern need priority consideration by management:

- 3.1. New employees must undergo pre-employment medical examinations to:
 - protect XYZ from claims at a later stage
 - ensure that only healthy persons are employed
 - prevent injuries and illness in the workplace
 - enhance XYZ image
- 3.2. Vehicle drivers and plant operators must be instructed to inspect their vehicles daily before start-up using the prescribed checklists to ensure that these are safe to operate and in good condition.

4. AUDITS

Three SHE audits were conducted in February and March:

- | | | | |
|------|------------|----------------------|-----------------------|
| 4.1. | Job 00432: | Gillooly's Mall | Compliance: 56%(*) |
| | Job 00786: | Cullinan Head Office | Compliance: 83%(****) |
| | Job 00589: | Cleveland Station | Compliance: 76%(***) |

5. TRAINING

One hundred and forty two employees, representing 7% of employees, attended nine training courses. *Our objective is to train 5,5% of employees quarterly.

Month	No. of Employees Trained	Course	Source
January	26	Induction	Internal
	15	OH&S Reps	Consultant
	3	Crane Drivers	External
February	23	Induction	Internal
	17	OH&S Reps	Consultant
March	43	Induction	Internal
	9	OH&S Reps	Consultant
	3	Bomag Rollers	Supplier
	3	First Aiders	St. John's

6. LEGAL ISSUES

- 6.1. An inspector of the Department of Labour issued an improvement notice on Job 00987: Gillooly's Mall. The notice requires that all scaffolding comply with the SABS standards for the Erection and Maintenance of Access Scaffolding (SABS 085). This is currently being attended to and the inspector will return on 15 April 2002 to ascertain if the notice has been complied with.

8. OCCUPATIONAL AND OTHER HEALTH MATTERS

8.1. HIV Aids

The proposed SAFCEC clinic will soon be operational and we will then be able to send our employees who have tested positive to the clinic for counselling and eventual treatment when necessary

The mobile clinic saw and tested fifty employee volunteers at 3 sites this month. Eighteen of them tested positive.

8.2. Tuberculosis

The mobile clinic will be calling at Gillooly's Mall and Cleveland Station on 15 and 16 October respectively to screen employees for TB.

8.3. Noise

All suspected noise pollution areas have been tested and the results are awaited. Employees working in areas testing over 85dBa will be issued with suitable hearing protectors.

9. ENVIRONMENTAL MEASURES

Inspectors from the Botswana Department of the Environment visited Djwaneng and inspected the site and yard. They gave it a "clean bill of health" and advised that we should increase the dust control measures by spraying roads three times per day instead of the present twice per day.

10. ACHIEVEMENTS/AWARDS

10.1. The client at Djwaneng (Job 00786) awarded the XYZ site first position in the housekeeping competition conducted bi-monthly by the client's SHE managers. The project manager and his team are to be congratulated for this sterling effort.

10.2. Job 0987: Refurbishment of Pretoria Main Railway Station has just completed 1million compensation claim free days. This was no easy achievement if we consider the conditions being worked under after the extensive fire that caused major damage.

SHE Risk Manager

2002.09.27

ANNEXURE 3: LIST OF RISK ASSESSMENTS

- * Clearing & Grubbing of the Area/Site
- * Site Establishment including:
 - Office/s
 - Secure/safe storage for materials, plant & equipment
 - Ablutions
 - Sheltered eating area
 - Maintenance workshop
 - Vehicle access to the site
- * Dealing with existing structures
- * Location of existing services
- * Installation and maintenance of temporary construction electrical supply, lighting and equipment
- * Adjacent land uses/surrounding property exposures
- * Boundary and access control/Public Liability Exposures (NB: the Employer is also responsible for the OH&S of non-employees affected by his/her work activities.)
- * Health risks arising from neighbouring as well as own activities and from the environment e.g. threats by dogs, bees, snakes, lightning etc.
- * Exposure to noise
- * Exposure to vibration
- * Protection against dehydration and heat exhaustion
- * Protection from wet & cold conditions
- * Dealing with HIV/Aids and other diseases
- * Use of Portable Electrical Equipment including
 - Angle grinder
 - Electrical drilling machine
 - Skill saw
- * Excavations including
 - Ground/soil conditions
 - Trenching
 - Shoring
 - Drainage of trench
- * Welding including
 - Arc Welding
 - Gas welding
 - Flame cutting
 - Use of LP gas torches and appliances
- * Loading & offloading of trucks
- * Aggregate/sand and other materials delivery
- * Manual and mechanical handling
- * Lifting and lowering operations
- * Driving & operation of construction vehicles and mobile plant including
 - Trenching machine
 - Excavator
 - Bomag roller
 - Plate compactor
 - Front end loader
 - Mobile cranes and the ancillary lifting tackle
 - Parking of vehicles & mobile plant
 - Towing of vehicles & mobile plant
- * Use and storage of flammable liquids and other hazardous substances
- * Layering and bedding

- * Installation of pipes in trenches
- * Pressure testing of pipelines
- * Backfilling of trenches
- * Protection against flooding
- * Gabion work
- * Use of explosives
- * Protection from overhead power lines
- * As discovered by the Principal Contractor's hazard identification exercise
- * As discovered from any inspections and audits conducted by the Client or by the Principal Contractor or any other Contractor on site
- * As discovered from any accident/incident investigation.

C3.3.3.2 ENVIRONMENTAL MANAGEMENT PLAN

CONTENTS

- C3.3.3.2.1 SCOPE
- C3.3.3.2.2 DEFINITIONS
- C3.3.3.2.3 IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND IMPACTS
- C3.3.3.2.4 LEGAL REQUIREMENTS
- C3.3.3.2.5 ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS
- C3.3.3.2.6 TRAINING
- C3.3.3.2.7 ACTIVITIES/ASPECTS CAUSING IMPACTS
- C3.3.3.2.8 ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES
- C3.3.3.2.9 RECORD KEEPING
- C3.3.3.2.10 COMPLIANCE AND PENALTIES
- C3.3.3.2.11 MEASUREMENT AND PAYMENT

C3.3.3.2.1 SCOPE

This environmental management programme (EMP) sets out the methods by which proper environmental controls are to be implemented by the contractor. The duration over which the contractor's controls shall be in place cover the construction period of the project as well as the limited time after contract completion defined by the General Conditions of Contract, and the project specifications, as the defects notification period (maintenance period).

The provisions of this EMP are binding on the contractor during the life of the contract. They are to be read in conjunction with all the documents that comprise the suite of documents for this contract. In the event that any conflict occurs between the terms of the EMP and the project specifications or Record of Decision, the terms herein shall be subordinate.

The EMP is a dynamic document subject to similar influences and changes as are brought by variations to the provisions of the project specification. Any substantial changes shall be submitted to the Ba-Phalaborwa Municipality in writing for approval.

The EMP identifies the following:

Construction activities that will impact on the environment.

Specifications with which the contractor shall comply in order to protect the environment from the identified impacts.

Actions that shall be taken in the event of non-compliance.

C3.3.3.2.2 DEFINITIONS

Alien Vegetation: alien vegetation is defined as undesirable plant growth which shall include, but not be limited to, all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.

Construction Activity: a construction activity is any action taken by the contractor, his subcontractors, suppliers or personnel during the construction process as defined in the

South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7, 1998)

Environment: environment means the surroundings within which humans exist and that could be made up of -

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part or combination of (i) and (ii) and the interrelationships among and between them; and
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Aspect: an environmental aspect is any component of a contractor's construction activity that is likely to interact with the environment.

Environmental Impact: an impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct or indirect consequence of a construction activity.

Record of Decision: a record of decision is a written statement from the Limpopo Department of Economic Development, Environment and Tourism, that records its approval of a planned undertaking to improve, upgrade or rehabilitate a section of road and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.

Road Reserve: the road reserve is a corridor of land, defined by co-ordinates and proclamation, within which the road, including access intersections or interchanges, is situated. A road reserve may, or may not, be bounded by a fence.

Road Width: for the purposes of the EMP, the road width is defined as the area within the road reserve i.e. fence line to fence line, but also includes all areas beyond the road reserve that are affected by the continuous presence of the road, e.g. a reach of a water course.

C3.3.3.2.3 IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND IMPACTS

The contractor shall identify likely aspects before commencing with any construction activity. Examples of environment aspects include:

- waste generation
- stormwater discharge
- emission of pollutants into the atmosphere
- chemical use operations
- energy use operations
- water use operations
- use of natural resources
- noise generation

Thereafter the contractor shall programme his work in such a way that each cause and effect of a construction activity is also identified and the activity planned so as to prevent any impact from happening. If prevention is not practicable, or in the event of mishap or misapplication, the contractor shall provide plans and measures for the engineer's approval, which will limit and contain the magnitude, duration and intensity of the impact. The

contractor shall demonstrate that he/she is capable of carrying out any repair and reinstatement of the damaged environment. These requirements shall be concurrent with the time constraints to produce an approved construction programme according to subclause 8.3 as amended by Particular Condition of the general conditions of contract and clause B1204 of these project specifications.

Listed below are some environmental impacts that could adversely alter an aspect of the environment through usual construction activities:

Pollution of atmosphere, soil or water

Destruction or removal of fauna and flora and effect on biological diversity

Deformation of the landscape

Soil erosion

Destruction of historical/heritage sites

Effect on the built environment

Effect on agricultural land and wetlands

General good construction practice will play an important role in avoiding the occurrence of an Impact. The contractor's attention is drawn, in this regard, to C1008. Environmental Management of Construction Activities

C3.3.3.2.4 LEGAL REQUIREMENTS

a) General

Construction will be according to the best industry practices, as identified in the project documents. This EMP, which forms an integral part of the contract documents, informs the contractor as to his duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The contractor should note that obligations imposed by the EMP are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter shall prevail.

b) Statutory and other applicable legislation

The contractor is deemed to have made himself conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

C3.3.3.2.5 ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS

a) Appointment of a Designated Environmental Officer (DEO)

For the purposes of implementing the conditions contained herein, the contractor shall submit to the engineer for approval the appointment of a nominated representative of the contractor as the DEO for the contract. The request shall be given, in writing, at least fourteen days before the start of any work clearly setting out reasons for the nomination, and with sufficient detail to enable the engineer to make a decision. The engineer will, within seven days of receiving the request, approve, reject or call for more information on the nomination. Once a nominated representative of the contractor has been approved he/she shall be the DEO and shall be the responsible person for ensuring that the provisions of the EMP are complied with during the life of the contract. The engineer will be responsible for

issuing instructions to the contractor where environmental considerations call for action to be taken. The DEO shall submit regular written reports to the engineer, but not less frequently than once a month.

The engineer shall have the authority to instruct the contractor to replace the DEO if, in the engineer's opinion, the appointed officer is not fulfilling his/her duties in terms of the requirements of the EMP or this specification. Such instruction will be in writing and shall clearly set out the reasons why a replacement is required.

There shall be an approved DEO on the site at all times.

b) Administration

Before the contractor begins each construction activity the DEO shall give to the engineer a written statement setting out the following:

The type of construction activity.

Locality where the activity will take place.

Identification of the environmental aspects and impacts that might result from the activity.

Methodology for impact prevention for each activity or aspect.

Methodology for impact containment for each activity or aspect.

Emergency/disaster incident and reaction procedures.

Treatment and continued maintenance of impacted environment.

The contractor may provide such information in advance of any or all construction activities provided that new submissions shall be given to the engineer whenever there is a change or variation to the original.

The engineer may provide comment on the methodology and procedures proposed by the DEO, but he shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems. However, the contractor shall demonstrate at inception and at least once during the contract that the approved measures and procedures function properly.

c) Good Housekeeping

The Contractor shall undertake "good housekeeping" practices during construction as stated in clause 1217 of the COLTO Standard Specifications for Roads and Bridges and subclauses 4.3.1 and 4.3.2 of the General Conditions of Contract. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods that leaves production in a safe state from the ravages of weather to include the care for and preservation of the environment within which the site is situated.

C3.3.3.2.6 TRAINING

The designated environmental officer (DEO) must be conversant with all legislation pertaining to the environment applicable to this contract and must be appropriately trained in environmental management and must possess the skills necessary to impart environmental management skills to all personnel involved in the contract.

The contractor shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. The environmental training should, as a minimum, include the following:

C.117

- The importance of conformance with all environmental policies
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Agency's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities.

In the case of permanent staff the contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the contractor shall inform the engineer when and how he/she intends concluding his environmental training obligations.

C3.3.3.2.7 ACTIVITIES/ASPECTS CAUSING IMPACTS

A list of possible causes of environmental impacts that occur during construction activities is given in Table 7/1: Aspects or Activities that Cause Environmental Impacts during Construction Activities, which is to be found at the end of this part. This list is not exhaustive, and shall be used for guideline purposes only.

C3.3.3.2.8 ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES

a) Site Establishment

i) Site Plan

The contractor shall establish his construction camps, offices, workshops, staff accommodation and testing facilities on the site in a manner that does not adversely affect the environment. However, before construction can begin, the contractor shall submit to the engineer for his approval, plans of the exact location, extent and construction details of these facilities and the impact mitigation measures the contractor proposes to put in place.

The plans shall detail the locality as well as the layout of the waste treatment facilities for litter, kitchen refuse, sewage and workshop-derived effluents. The site offices should not be sited in close proximity to steep areas, as this will increase soil erosion. Preferred locations would be flat areas along the route. If the route traverses water courses, streams and rivers, it is recommended that the offices, and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles are located as far away as possible from any water course as possible. Regardless of the chosen site, the contractor's intended mitigation measures shall be indicated on the plan. The site plan shall be submitted not later than the first site meeting. Detailed, electronic colour photographs shall be taken of the proposed site before any clearing may commence. These records are to be kept by the engineer for consultation during rehabilitation of the site. Read with COLTO Specification 1302(a), 1402 (e).

ii) Vegetation

The contractor has a responsibility to inform his staff of the need to be vigilant against any practice that will have a harmful effect on vegetation.

The natural vegetation encountered on the site is to be conserved and left as intact as possible. Vegetation planted at the site shall be indigenous and in accordance with instructions issued by the engineer. Only trees and shrubs directly affected by the works, and such others as may be indicated by the engineer in writing, may be felled or cleared. In wooded areas where natural vegetation has been cleared out of necessity, the same species of indigenous trees as were occurring, shall be re-established.

The project specification for the rehabilitation of the grass cover shall be strictly adhered to. Any proclaimed weed or alien species that propagates during the contract period shall be cleared by hand before seeding. (Read in conjunction with COLTO Specification 5801(b), 5802(b), (c), (d) and (e), 5804, 5805, 5806 and 5807). Fires shall only be allowed in facilities or equipment specially constructed for this purpose. A firebreak shall be cleared and maintained around the perimeter of the camp and office sites.

iii) Rehabilitation

The area where the site offices were erected will require rehabilitation at the end of the contract. All construction material, including concrete slabs and braai areas shall be removed from the site on completion of the contract.

iv) Water for human consumption

Water for human consumption shall be available at the site offices and at other convenient locations on site.

All effluent water from the camp / office sites shall be disposed of in a properly designed and constructed system, situated so as not to adversely affect water sources (streams, rivers, pans dams etc). Only domestic type wastewater shall be allowed to enter this drain.

v) Heating and Cooking fuel

The contractor shall provide adequate facilities for his staff so that they are not encouraged to supplement their comforts on site by accessing what can be taken from the natural surroundings. The contractor shall ensure that energy sources are available at all times for construction and supervision personnel for heating and cooking purposes.

b) Sewage treatment

Particular reference in the site establishment plan shall be given to the treatment of sewage generated at the site offices, site laboratory and staff accommodation and at all localities on the site where there will be a concentration of labour. Sanitary arrangements should be to the satisfaction of project management, the local authorities and legal requirements.

Safe and effective sewage treatment will require one of the following sewage handling methods: septic tanks and soak-aways, dry-composting toilets such as "enviro loos", or the use of chemical toilets which are supplied and maintained by a subcontractor. The type of sewage treatment will depend on the geology of the area selected, the duration of the contract and proximity (availability) of providers of chemical toilets. Should a soak-away system be used, it shall not be closer than 800 metres from any natural water course or water retention system. The waste material generated from these facilities shall be serviced on a regular basis. The positioning of the chemical toilets shall be done in consultation with the engineer. Read with COLTO Specifications 1402(g) and 1404(a).

Toilets and latrines shall be easily accessible and shall be positioned within walking distance from wherever employees are employed on the works. Use of the veld for this purpose shall not, under any circumstances, be allowed.

Outside toilets shall be provided with locks and doors and shall be secured to prevent them from blowing over. The toilets shall also be placed outside areas susceptible to flooding. The contractor shall arrange for regular emptying of toilets and shall be entirely responsible for enforcing their use and for maintaining such latrines in a clean, orderly and sanitary condition to the satisfaction of the engineer.

c) Waste Management

The contractor's intended methods for waste management and waste minimisation shall be implemented at the outset of the contract. All personnel shall be instructed to dispose of all waste in the proper manner.

i) Solid Waste

Solid waste shall be stored in an appointed area in covered, tip proof metal drums for collection and disposal. A refuse control system shall be established for the collection and removal of refuse to the satisfaction of the engineer. Disposal of solid waste shall be at a Department of Water Affairs and Forestry (DWAF) licensed landfill site or at a site approved by DWAF in the event that an existing operating landfill site is not within reasonable distance from the site offices and staff accommodation. No waste shall be burned or buried at or near the site offices, nor anywhere else on the site, including the approved solid waste disposal site. Read with COLTO Specification 1404(a).

ii) Litter

No littering by construction workers shall be allowed. During the construction period, the facilities shall be maintained in a neat and tidy condition and the site shall be kept free of litter.

Measures shall be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. At all places of work the contractor shall provide litter collection facilities for later safe disposal at approved sites. (Read with COLTO Specification 1302(b)).

iii) Hazardous waste

Hazardous waste such as bitumen, tar, oils etc. shall be disposed of in a Department of Water Affairs and Forestry approved landfill site. Special care shall be taken to avoid spillage of tar or bitumen products such as binders or pre-coating fluid to avoid water-soluble phenols from entering the ground or contaminating water.

Under no circumstances shall the spoiling of tar or bituminous products on the site, over embankments, in borrow pits or any burying, be allowed. Unused or rejected tar or bituminous products shall be returned to the supplier's production plant. Any spillage of tar or bituminous products shall be attended to immediately and affected areas shall be promptly reinstated to the satisfaction of the engineer.

d) Control at the workshop

The contractor's management and maintenance of his plant and machinery will be strictly monitored according to the criteria given below, regardless whether it is serviced on the site (i.e. at the place of construction activity or at a formalised workshop).

i) Safety

All the necessary handling and safety equipment required for the safe use of petrochemicals and oils shall be provided by the contractor to, and used or worn by, the staff whose duty it is to manage and maintain the contractor's and his subcontractor's and supplier's plant, machinery and equipment.

ii) Hazardous Material Storage

Petrochemicals, oils and identified hazardous substances shall only be stored under controlled conditions. All hazardous materials e.g. tar or bitumen binders shall be stored in a

secured, appointed area that is fenced and has restricted entry. Storage of tar or bituminous products shall only take place using suitable containers to the approval of the engineer.

The contractor shall provide proof to the engineer that relevant authorisation to store such substances has been obtained from the relevant authority. In addition, hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure. Before containment or storage facilities can be erected the contractor shall furnish the engineer with details of the preventative measures, he proposes to install in order to mitigate against pollution of the surrounding environment from leaks or spillage. The preferred method shall be a concrete floor that is bunded. Any deviation from the method will require proof from the relevant authority that the alternative method proposed is acceptable to that authority. The proposals shall also indicate the emergency procedures in the event of misuse or spillage that will negatively affect an individual or the environment.

iii) Fuel and Gas Storage

Fuel shall be stored in a secure area in a steel tank supplied and maintained by the fuel suppliers. An adequate bund wall, 110% of volume, shall be provided for fuel and diesel areas to accommodate any leakage spillage or overflow of these substances. The area inside the bund wall shall be lined with an impervious lining to prevent infiltration of the fuel into the soil. Any leakage, spillage or overflow of fuel shall be attended to without delay.

Gas welding cylinders and LPG cylinders shall be stored in a secure, well-ventilated area.

iv) Oil and Lubricant Waste

Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank and sent back to the supplier. Water and oil should be separated in an oil trap. Oils collected in this manner, shall be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials. Oil collected by a mobile servicing unit shall be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company.

All used filter materials shall be stored in a secure bin for disposal off site. Any contaminated soil shall be removed and replaced. Soils contaminated by oils and lubricants shall be collected and disposed of at a facility designated by the local authority to accept contaminated materials.

e) Clearing the Site

In all areas where the contractor intends to, or is required to clear the natural vegetation and soil, either within the road reserve, or at designated or instructed areas outside the road reserve, a plan of action shall first be submitted to the engineer for his approval.

The plan shall contain a photographic record and chainage/land reference of the areas to be disturbed. This shall be submitted to the engineer for his records before any disturbance/stockpiling may occur. The record shall be comprehensive and clear, allowing for easy identification during subsequent inspections.

The contractor shall be responsible for the re-establishment of grass within the road reserve boundaries for all areas disturbed during road construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for, or from, road construction has to be stored temporarily or otherwise within the road

reserve, or at designated or instructed areas outside the road reserve. This responsibility shall extend until expiry of the defects notification period.

f) Soil Management

i) Topsoil

Topsoil shall be removed from all areas where physical disturbance of the surface will occur and shall be stored and adequately protected. The contract will provide for the stripping and stockpiling of topsoil from the site for later re-use. Topsoil is considered to be the natural soil covering, including all the vegetation and organic matter. Depth may vary at each site. The areas to be cleared of topsoil shall include the storage areas. All topsoil stockpiles and windrows shall be maintained throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil shall be removed by hand. Soils contaminated by hazardous substances shall be disposed of at an approved Department of Water Affairs and Forestry waste disposal site. (Read with COLTO Specifications 3104(a), 5802(a), (g), 5804(a), (b) and (c)). The topsoil stockpiles shall be stored, shaped and sited in such a way that they do not interfere with the flow of water to cause damming or erosion, or itself be eroded by the action of water. Stockpiles of topsoil shall not exceed a height of 2m, and if they are to be left for longer than 6 months, shall be analysed, and if necessary, upgraded before replacement. Stockpiles shall be protected against infestation by weeds.

The contractor shall ensure that no topsoil is lost due to erosion – either by wind or water. Areas to be topsoiled and grassed shall be done so systematically to allow for quick cover and reduction in the chance of heavy topsoil losses due to unusual weather patterns. The contractor's programme shall clearly show the proposed rate of progress of the application of topsoil and grassing. The contractor shall be held responsible for the replacement, at his own cost, for any unnecessary loss of topsoil due to his failure to work according to the progress plan approved by the engineer. The contractor's responsibility shall also extend to the clearing of drainage or water systems within and beyond the boundaries of the road reserve that may have been affected by such negligence.

ii) Subsoil

The subsoil is the layer of soil immediately beneath the topsoil. It shall be removed, to a depth instructed by the engineer, and stored separately from the topsoil if not used for road building. This soil shall be replaced in the excavation in the original order it was removed for rehabilitation purposes.

g) Drainage

The quality, quantity and flow direction of any surface water runoff shall be established prior to disturbing any area for construction purposes. Cognisance shall be taken of these aspects and incorporated into the planning of all construction activities. Before a site is developed or expanded, it shall be established how this development or expansion will affect the drainage pattern. Recognised water users / receivers shall not be adversely affected by the expansion or re-development. No water source shall be polluted in any way due to proposed changes.

Streams, rivers, pans, wetlands, dams, and their catchments shall be protected from erosion and from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous or tar products.

The contractor shall submit to the engineer his proposals for prevention, containment and rehabilitation measures against environmental damage of the identified water and drainage systems that occur on the site. Consideration shall be given to the placement of sedimentation ponds or barriers where the soils are of a dispersive nature or where toxic fluids are used in the construction process. The sedimentation ponds must be large enough to contain runoff so that they function properly under heavy rain conditions.

h) Earthworks and Layerworks

This section includes all construction activities that involve the mining of all materials, and their subsequent placement, stockpile, spoil, treatment or batching, for use in the permanent works, or temporary works in the case of deviations. Before any stripping prior to the commencement of construction, the contractor shall have complied with the requirements of sections C1008 (e) and C1008 (g). In addition, the contractor shall take cognisance of the requirements set out below.

i) Quarries and borrow pits

The contractor's attention is drawn to the requirement of the Department of Minerals and Energy, that before entry into any quarry or borrow pit, an EMP for the establishment, operation and closure of the quarry or borrow pit shall have been approved by the Department. It is the responsibility of the contractor to ensure that he is in possession of the approved EMP or a copy thereof, prior to entry into the quarry or borrow pit. The conditions imposed by the relevant EMP are legally binding on the contractor and may be more extensive and explicit than the requirements of this specification. In the event of any conflict occurring between the requirements of the specific EMP and these specifications the former shall apply. The cost of complying with the requirements shall be deemed to be included in existing rates in the Bill of Quantities. (Read with COLTO Specification 3100 and 3200).

ii) Excavation, hauling and placement

The contractor shall provide the engineer with detailed plans of his intended construction processes prior to starting any cut or fill or layer. The plans shall detail the number of personnel and plant to be used and the measures by which the impacts of pollution (noise, dust, litter, fuel, oil, sewage), erosion, vegetation destruction and deformation of landscape will be prevented, contained and rehabilitated. Particular attention shall also be given to the impact that such activities will have on the adjacent built environment. The contractor shall demonstrate his "good housekeeping", particularly with respect to closure at the end of every day so that the site is left in a safe condition from rainfall overnight or over periods when

there is no construction activity. (Read with COLTO Standard Specification clauses 1217 and 3309)

iii) Spoil sites

The contractor shall be responsible for the safe siting, operation, maintenance and closure of any spoil site he uses during the contract period, including the defects notification period. This shall include existing spoil sites that are being re-entered. Before spoil sites may be used proposals for their locality, intended method of operation, maintenance and rehabilitation shall be given to the engineer for his approval. The location of these spoil sites shall have signed approval from the affected landowner before submission to the engineer. No spoil site shall be located within 500m of any watercourse. A photographic record shall be kept of all spoil sites for monitoring purposes. This includes before the site is used and after re-vegetation.

The use of approved spoil sites for the disposal of hazardous or toxic wastes shall be prohibited unless special measures are taken to prevent leaching of the toxins into the surrounding environment. Such special measures shall require the approval of the relevant provincial or national authority. The same shall apply for the disposal of solid waste generated from the various camp establishments. The engineer will assist the contractor in obtaining the necessary approval if requested by the contractor.

Spoil sites will be shaped to fit the natural topography. These sites shall receive a minimum of 75mm topsoil and be grassed with the recommended seed mixture. Slopes shall not exceed a vertical: horizontal ratio of 1:3. Only under exceptional circumstances will approval be given to exceed this ratio. Appropriate grassing measures to minimise soil erosion shall be undertaken by the contractor. This will include both strip and full sodding. The contractor may motivate to the engineer for other acceptable stabilising methods. The engineer may only approve a completed spoil site at the end of the defects notification period upon receipt from the contractor of a landowner's clearance notice and an engineer's certificate certifying slope stability (Read with COLTO standard Specifications clause 1214). The contractor's costs incurred in obtaining the necessary certification for opening and closing of spoil sites shall be deemed to be included in the tendered rates for spoiling.

iv) Stockpiles

The contractor shall plan his activities so that materials excavated from borrow pits and cuttings, in so far as possible, can be transported direct to and placed at the point where it is to be used. However, should temporary stockpiling become necessary, the areas for the stockpiling of excavated and imported material shall be indicated and demarcated on the site plan submitted in writing to the engineer for his approval, together with the contractor's proposed measures for prevention, containment and rehabilitation against environmental damage.

The areas chosen shall have no naturally occurring indigenous trees and shrubs present that may be damaged during operations. Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of the stockpiles the contractor shall at all times ensure that they are:

- Positioned and sloped to create the least visual impact;
- Constructed and maintained so as to avoid erosion of the material and contamination of surrounding environment; and
- Kept free from all alien/undesirable vegetation.

After the stockpiled material has been removed, the site shall be re-instated to its original condition. No foreign material generated / deposited during construction shall remain on site. Areas affected by stockpiling shall be landscaped, top soiled, grassed and maintained at the contractor's cost until clearance from the engineer and the relevant Authority is received.

Material milled from the existing road surface that is temporarily stockpiled in areas approved by the engineer within the road reserve, shall be subject to the same condition as other stockpiled materials. Excess materials from windrows, in-situ milling or any detritus of material from road construction activities may not be swept off the road and left unless specifically instructed to do so in the contract drawing or under instruction from the engineer

In all cases, the engineer shall approve the areas for stockpiling and disposal of construction rubble before any operation commences and shall approve their clause only when they have been satisfactorily rehabilitated. (Read with COLTO Specification 3203 and 4306).

v) Blasting activities

Wherever blasting activity is required on the site (including quarries and/or borrow pits) the contractor shall rigorously adhere to the relevant statutes and regulations that control the use of explosives. In addition, the contractor shall, prior to any drilling of holes in preparation for blasting, supply the engineer with a locality plan of the blast site on which shall be shown the zones of influence of the ground and air shock-waves and expected limits of fly-rock. The plan shall show each dwelling, structure and service within the zones of influence and record all details of the dwellings/structures/services including existing positions, lengths and widths of cracks, as well as the condition of doors, windows, roofing, wells, boreholes etc. The contractor, alone, shall be responsible for any costs that can be attributed to blasting activities, including the collection of fly-rock from adjacent lands and fields. The submission of such a plan shall not in any way absolve the contractor from his responsibilities in this regard. The contractor shall also indicate to the engineer the manner in which he intends to advertise to the adjacent communities and/or road users the times and delays to be expected for each individual blast.

i) Batching sites

Asphalt plants are considered scheduled processes listed in the second schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965). Should the use of an asphalt plant be considered on site, the contractor shall be responsible to obtain the necessary permit from the Department of Environmental Affairs and Tourism, regardless of where they are sited.

Crushing plants and concrete batching plants, whether sited inside or outside of defined quarry or borrow pit areas, shall be subject to the requirements of the Department of Minerals and Energy legislation as well as the applicable industrial legislation that governs gas and dust emissions into the atmosphere. Such sites will be the subject of regular inspections by the relative authorities during the life of the project. In addition, the selection, entry onto, operation, maintenance, closure and rehabilitation of such sites shall be the same as for those under section C1008(h)(iii), with the exception that the contractor shall provide additional measures to prevent, contain and rehabilitate against environmental damage from toxic/hazardous substances. In this regard the contractor shall provide plans that take into account such additional measures as concrete floors, bunded storage facilities, linings to drainage channels and settlement dams. Ultimate approval of these measures shall be from the relevant national authority, as shall approval of closure. The engineer will assist the contractor in his submissions to the relevant authority.

Effluent from concrete batch plants and crusher plants shall be treated in a suitable designated sedimentation dam to the legally required standards to prevent surface and groundwater pollution. The designs of such a facility should be submitted to the engineer for approval.

The contractor shall invite the relevant department to inspect the site within 2 months after any plant is commissioned and at regular intervals thereafter, not exceeding 12 months apart

j) Spillages

Streams, rivers and dams shall be protected from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and tar or bituminous products. In the event of a spillage, the contractor shall be liable to arrange for professional service providers to clear the affected area.

Responsibility for spill treatment lies with the contractor. The individual responsible for, or who discovers a hazardous waste spill must report the incident to his/her DEO or to the engineer. The Designated Environmental Officer will assess the situation in consultation with the engineer and act as required. In all cases, the immediate response shall be to contain the spill. The exact treatment of polluted soil / water shall be determined by the contractor in consultation with the DEO and the engineer. Areas cleared of hazardous waste shall be re-vegetated according to the engineer's instructions

Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice will be sought for appropriate treatment and remedial procedures to be followed. The requirement for such input shall be agreed with the engineer. The costs of containment and rehabilitation shall be for the contractor's account, including the costs of specialist input.

k) Areas of Specific Importance

Any area, as determined and identified within the project document as sensitive or of special interest within the site shall be treated according to the express instructions contained in these specifications or the approved EMP. The contractor may offer alternative solutions to the engineer in writing should he consider that construction will be affected in any way by the hindrance of the designated sensitive area or feature. However, the overriding principle is that such defined areas requiring protection shall not be changed. Every effort to identify such areas within the site will have been made prior to the project going out to tender. The discovery of other sites with archaeological or historical interest that have not been identified shall require ad hoc treatment.

i) Archaeological Sites

If an artefact on site is uncovered, work in the immediate vicinity shall be stopped immediately. The contractor shall take reasonable precautions to prevent any person from removing or damaging any such article and shall immediately upon discovery thereof inform the engineer of such discovery. The South African Heritage Research Agency (SAHRA) is to be contacted who will appoint an archaeological consultant. Work may only resume once clearance is given in writing by the archaeologist. (Read with COLTO General Condition of Contract Subclause 4.24 as amended by Particular Condition).

ii) Graves and middens

If a grave or midden is uncovered on site, or discovered before the commencement of work, then all work in the immediate vicinity of the graves/middens shall be stopped and the engineer informed of the discovery. SAHRA should be contacted and in the case of graves, arrangements made for an undertaker to carry out exhumation and reburial. The Employer will be responsible for attempts to contact family of the deceased and for the site where the exhumed remains can be re-interred. (Read with COLTO General Conditions of Contract Subclause 4.24 as amended by Particular Condition).

l) Noise Control

The contractor shall endeavour to keep noise generating activities to a minimum. Noises that could cause a major disturbance, for instance blasting and crushing activities, should only be carried out during daylight hours. Compliance with the appropriate legislation with respect to noise, shall be mandatory.

Should noise generating activities have to occur at night the people in the vicinity of the drilling shall be warned about the noise well in advance and the activities kept to a minimum.

m) Dust Control

Dust caused by strong winds shall be controlled by means of water spray vehicles. Dust omission from batching plants shall be subject to the relevant legislation and shall be the subject of inspection by the relevant office of the Department of Minerals and Energy.

n) Alien Vegetation

The contractor shall be held responsible for the removal of alien vegetation within the road reserve disturbed during road construction. This includes, for example, service roads, stockpile areas, stop/go facilities, windrows and wherever material generated for or from road construction has been stored temporarily or otherwise within the road reserve. This responsibility shall extend for the duration of the defects notification period.

C3.3.3.2.9 RECORD KEEPING

The engineer and the DEO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the engineer shall issue to the contractor a notice of non-compliance whenever transgressions are observed. The DEO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance shall be documented and reported to the engineer in the monthly report.

Copies of any record of decision or EMP's for specific borrow pits or quarries used on the project shall be kept on site and made available for inspection by visiting officials from the employer or relevant environmental departments.

C3.3.3.2.10 COMPLIANCE AND PENALTIES

The contractor shall act immediately when such notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. This record shall be submitted with the monthly reports and a verbal report given at the monthly site meetings.

Any avoidable non-compliance with the above-mentioned measures shall be considered sufficient ground for the imposition of a penalty

The following penalties shall apply for environmental violations:

a) Unnecessary removal or damage to trees

- | | | |
|---|---|------------------|
| • 2600mm girth or less | : | R 5 000 per tree |
| • Greater than 2600mm, but less than 6180mm girth | : | R10 000 per tree |
| • Greater than 6180mm girth | : | R30 000 per tree |

b) Serious violations:

- | | | |
|--|---|-------------------------------|
| • Hazardous chemical/oil spill and/or dumping in non-approved sites. | : | R10 000 per incident |
| • General damage to sensitive environments. | : | R 5 000 per incident |
| • Damage to cultural and historical sites. | : | R 5 000 per incident |
| • Uncontrolled/unmanaged erosion (plus rehabilitation at contractor's cost). | : | R1 000 to R5 000 per incident |
| • Unauthorised blasting activities. | : | R 5 000 per incident |
| • Pollution of water sources. | : | R 10 000 per incident |

The engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final.

c) Less serious violations:

• Littering on site.	:	R1 000 per incident
• Lighting of illegal fires on site.	:	R1 000 per incident
• Persistent or un-repaired fuel and oil leaks.	:	R1 000 per incident
• Excess dust or excess noise emanating from site.	:	R1 000 per incident
• Dumping of milled material in side drains or on grassed areas:	:	R1 000 per incident
• Possession or use of intoxicating substances on site. :	:	R 500 per incident
• Any vehicles being driven in excess of designated speed limits.	:	R 500 per incident
• Removal and/or damage to flora or cultural or heritage objects on site, and/or killing of wildlife.	:	R2 000 per incident
• Illegal hunting.	:	R2 000 per incident
• Urination and defecation anywhere except in designated areas.	:	R 500 per incident

The engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final. The calculation shall include allied construction activities in the same way as the calculation of reduced payments under section 8200. The imposition of such a penalty shall not preclude the relevant provincial or national authority from applying an additional penalty in accordance with its statutory powers. Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as it deems fit.

C3.3.3.2.11 MEASUREMENT AND PAYMENT

The cost of complying to this specification shall be deemed to be included in the rates tendered for this project.

Item	Unit
C100.01	Penalty for unnecessary removal or damage to trees for the following diameter sizes
(a) 2600mm girth or less	number (No)
(b) Greater than 2600mm, but less than 6180mm girth	number (No)
(c) Greater than 6180mm girth	number (No)

The unit of measurement shall be the number of trees by diameter size removed unnecessary or damaged. The penalty rates applied shall be those stated in clause C3.5.2.10.

Item	Unit
C100.02	Penalty for serious violations
(a) Hazardous chemical/oil spill and/or dumping in non-approved sites	number (No)
(b) General damage to sensitive environments	
(c) Damage to cultural and historical sites	number (No)
(d) Pollution of water sources	number (No)

- | | | |
|-----|--|-------------|
| (e) | Unauthorised blasting activities | number (No) |
| (f) | Uncontrolled/unmanaged erosion
per incident, depending on environment impacts, plus
rehabilitation at contractor's cost) | number (No) |

The unit of measurement for C100.02 (a) to (f) shall be the number of serious violation incidents. The penalty rates to be applied shall be those stated in clause C3.5.2.10.

Item	Unit
C100.03	Penalty for less serious violations
• Littering on site	number (No)
• Lighting of illegal fires on site	number (No)
• Persistent or un-repaired fuel and oil leaks	number (No)
• Excess dust or excess noise emanating from site	number (No)
• Dumping of milled material in side drains or on grassed areas	number (No)
• Possession or use of intoxicating substances on site	number (No)
• Any vehicles being driven in excess of designated speed limits	number (No)
• Removal and/or damage to flora or cultural or heritage objects on site, and/or killing of wildlife	number (No)
• Illegal hunting	number (No)
• Urination and defecation anywhere except in designated areas	number (No)

The unit of measurement shall be the number of less serious violation incidents. The penalty rates applied shall be those stated in clause C3.5.2.10.

The engineer's decision with regard to what is considered a violation, its seriousness and the penalty imposed shall be final. The calculation shall include allied construction activities in the same way as the calculation of reduced payments under section 8200. The imposition of such a penalty shall not preclude the relevant provincial or national authority from applying an additional penalty in accordance with its statutory powers. Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed.

Failure to redress the cause shall be reported to the relevant authority for them to deal with the transgression, as it deems fit.

Table 1: Mechanisms that Cause Environmental Impacts during Construction Activities

SECTION	CONTENTS	ENVIRONMENTAL IMPACTS				SENSITIVE AREAS (to be completed by compiler)
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	
1300	Camp Establishment	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
1400	Housing, Offices and laboratories	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
1500	Accommodation of Traffic	Waste treatment Hazardous waste Water supply Spillage Storage Noise/lights Dust control	Selection of site Preserve indigenous vegetation Preserve topsoil Demarcate sensitive areas Maintenance of windrows	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
1600	Overhaul	Spillage Storage Noise/lights Dust control Exhaust fumes Washing waste	Turning circles Parking areas	Restrict access to sensitive areas	Protection of indigenous vegetation Preserve topsoil	
1700	Clearing and	Waste treatment	Selection of site	Selection of site	Protection of indigenous	

SECTION	CONTENTS	ENVIRONMENTAL IMPACTS					SENSITIVE AREAS (to be completed by compiler)
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION		
	grubbing	Hazardous waste Water supply Noise /lights Dust control	Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil	vegetation Preserve topsoil		
2100 2400	- Drainage	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds		
3100	Borrow pits	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds		
3200	Stockpiling	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds		
3300	Mass Earthworks	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds		
3400 3900	- Pavement layers	Waste treatment Hazardous waste Water supply Spillage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation	Preserve indigenous vegetation Preserve topsoil		

SECTION	CONTENTS	ENVIRONMENTAL IMPACTS				
		POLLUTION TYPE	DEFORMATION OF LANDSCAPE	SOIL EROSION	ALIEN VEGETATION	SENSITIVE AREAS (to be completed by compiler)
		Storage Noise / lights Dust control	Demarcate sensitive areas Maintenance of windrows	Preserve topsoil	Management of weeds	
4100	Asphalt works / sealing operations	Waste treatment Hazardous waste Water supply Spillage Storage Noise / lights Dust control Smoke control Storage of materials	Selection of site Preserve indigenous vegetation Preserve topsoil Turning circles Parking areas	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil	
5000	Ancillary roadworks	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
6000	Structures	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	
7000	Concrete pavements etc	Waste treatment Hazardous waste Water supply Spillage Storage	Selection of site Preserve indigenous vegetation Preserve topsoil	Selection of site Preserve indigenous vegetation Preserve topsoil	Preserve indigenous vegetation Preserve topsoil Management of weeds	

C3.3.3.3 PROVISION OF STRUCTURED TRAINING

CONTENTS

- C3.3.3.3.1 SCOPE
- C3.3.3.3.2 GENERIC TRAINING
- C3.3.3.3.3 ENTREPRENEURIAL SKILLS TRAINING
- C3.3.3.3.4 MEASUREMENT AND PAYMENT

C3.3.3.3.1 SCOPE

This specification covers the requirements for the provision of structured training to be arranged by the contractor over the period of this contract.

C3.3.3.3.2 GENERIC TRAINING

C3.3.3.3.2.1 The contractor shall, from the commencement of the contract, implement a structured progressive training programme.

C3.3.3.3.2.2 Training shall be at or by an approved accredited organisation and shall be delivered by suitably qualified and experienced trainers.

C3.3.3.3.2.3 The contractor shall be responsible for the provision of everything necessary for the delivery of the generic training programme, including the following:

- (a) A suitable venue with sufficient furniture, lighting and power.
- (b) All necessary stationery consumables and study material.
- (c) Transport of the students (as necessary).

C3.3.3.3.2.4 The contractor's training programme shall be subject to the approval of RAL and the contractor shall if so, instructed by the municipality alter or amend the programme and course content if a need is identified once the contract commences.

C3.3.3.3.2.5 The contractor shall keep comprehensive records of the training given to each student and whenever required shall provide copies of such records to the engineer. At the successful completion of each course each student shall be issued with a certificate indicating the course contents as proof of attendance and completion.

In addition to the above, a monthly return shall be submitted by the contractor. An example of the form is illustrated in Part C5 of this document (form RDP 11 (E))

C3.3.3.3.3 ENTREPRENEURIAL SKILLS TRAINING

C3.3.3.3.3.1 Small contractors, subcontractors and the Project Steering Committee (PSC) will be entitled to receive a structured training programme, which will comprise both management skills as well as business development skills.

C3.3.3.3.3.2 The contractor shall closely monitor the performance of all small subcontractors in the execution of their contracts and shall identify all such subcontractors who, in his opinion, display the potential to benefit from structured training as may be provided for in the contract and where required by the engineer,

shall make recommendations in this regard. The final list of candidates will be decided between the contractor and the engineer.

C3.3.3.3.3 The training will be delivered by trainers who are accredited by the Civil Engineering Training Scheme (CEITS) or other institutions recognised by the Department of Labour. Accredited training refers to both the trainers as well as to the training material.

C3.3.3.3.4 The contractor shall facilitate in the delivery thereof, by instructing and motivating the subcontractor regarding attendance and participation therein.

C3.3.3.3.5 The contractor shall further make all reasonable efforts to co-ordinate the programming of the subcontractor's work with that of the delivery of the structured training.

C3.3.3.3.7 The contractor shall be responsible for the provision of everything necessary for the delivery of the entrepreneurial training programme, including the following:

- (a) A suitably furnished venue (if required) with lighting and power.
- (b) All necessary consumables, stationery and study material.
- (c) Transport of the subcontractors (as necessary).

C3.3.3.3.7 All entrepreneurial training shall take place within normal working hours.

C3.3.3.3.8 The contractor's training programme shall be subject to the approval of the municipality and the contractor shall if so instructed by the municipality alter or amend the programme and course content if a need is identified once the contract commences.

C3.3.3.3.10 The contractor shall keep comprehensive records of the training given to each subcontractor and whenever required shall provide copies of such records to the engineer. At the successful completion of each course each subcontractor shall be issued with a certificate indicating the course contents as proof of attendance and completion.

In addition to the above, a monthly return shall be submitted by the contractor. An example of the form to be used is illustrated in Part C5 of this document, (form RDP 12 (E)).

C3.3.3.4 MEASUREMENT AND PAYMENT

<u>ITEM</u>	<u>UNIT</u>
E12.05 Provision for accredited training	
(a) Generic skills	Provisional sum
(b) Entrepreneurial skills	Provisional sum
(c) Handling cost and profit in respect of sub-item E12.05(a) and (b) above	percentage (%)
(d) Training venue (only if required)	lump sum

The prime cost sums are provided to cover the actual costs (including wages and the daily PSC reimbursement) for attendance of accredited training courses as agreed with the engineer and shall be expended in accordance with the provisions of sub-clause 48(2) of the general conditions of contract. The tendered percentage in sub-item E12.05 (c) is a percentage of the amount actually spent under sub-items E12.05(a) and (b) which shall include full compensation for the contractor's handling cost, profit, mentoring, record keeping, reporting and all other costs in connection therewith.

The lump sum tendered for E12.05(d) shall include full compensation for the provision of the training venue, for all necessary lighting, power, furniture, stationery, consumables and study material and for transportation of the students to and from the training venue.

Payment of the lump sum will be made after the provision of all the accredited training, issuing of all certificates and submission of all records as specified in the document.

C3.3.3.4 PROVISION OF THE TEMPORARY WORKFORCE

CONTENTS

C3.3.3.4.1 SCOPE

C3.3.3.4.2 INTERPRETATIONS

C3.3.3.4.3 PERMITTED SOURCES OF TEMPORARY WORKERS

C3.3.3.4.4 EMPLOYMENT RECORDS TO BE PROVIDED

C3.3.3.4.5 VARIATIONS IN WORKER PRODUCTION RATES

C3.3.3.4.6 TRAINING OF THE TEMPORARY WORKFORCE

C3.3.3.4.7 RECRUITMENT AND SELECTION PROCEDURES

C3.3.3.4.8 TERMS AND CONDITIONS PERTAINING TO THE EMPLOYMENT OF THE TEMPORARY WORKFORCE

C3.3.3.4.9 LABOUR RELATIONS AND WORKER GRIEVANCE PROCEDURES

C3.3.3.4.10 THE SUBCONTRACTORS' WORKFORCES

C3.4.3.4.11 MEASUREMENT AND PAYMENT

C3.3.3.4.1 SCOPE

This Specification covers the provisions and requirements relating to the provision of the temporary workforce. Reference is also made to the Basic Conditions of Employment Act (Act 75 of 1997) with specific reference to the Sectorial Determination 2: Civil Engineering Sector

C3.3.3.4.2 INTERPRETATIONS

C3.3.3.4.2.1 Supporting documents

The Tender Rules, Conditions of Contract, Standard and Project Specifications, Drawings and statutory minimum requirements relating to the employment and remuneration of labour shall *inter alia* be read in conjunction with this Specification.

C3.3.3.4.2.1.2 Definitions and abbreviations

For the purposes of this specification, the definitions given in the Conditions of Contract, the Standard Specifications and the Project Specifications, together with the following additional definitions shall, unless the context dictates otherwise, apply:

- (a) "Key Personnel" means all contracts managers, site agents, materials and survey technicians, trainers, supervisors, foremen, skilled plant operators, artisans and the like, and all other personnel in the permanent employ of the Contractor or Subcontractor who possess special skills and/or who play key roles in the Contractor's or Subcontractor's operation
- (b) "Project Committee" means a committee consisting of the Employer, the Engineer, the Contractor, (or their nominated representatives) as well as representatives of the temporary workforce, which is convened from time to time at the discretion of the Engineer, for the purposes of acting as an avenue for effective communication and liaison between all the parties referred to, in all matters pertaining to the Contract

- (c) "Subcontractor" means any person or group of persons in association, or firm, or body corporate (whether formally constituted or otherwise) not being the Contractor, to whom specific portions or aspects of the Works are sublet or subcontracted by the Contractor in accordance with the provisions of the Contract
- (d) "Worker" for the purposes of this Specification means any person, not being one of the Contractor's key personnel, nor any key personnel of any Subcontractor, who is engaged by the Contractor, a Subcontractor or the Employer to participate in the execution of any part of the Contract Works and shall include unskilled labour, semi-skilled and skilled labour, clerical workers and the like
- (e) "Workforce" means the aggregate body comprising all workers and shall, unless the context dictates otherwise, include the workforces of the Contractor and all Subcontractors
- (f) "Project Steering Committee (PSC)" means a committee comprising mainly of representatives (to a maximum of 10) of the affected communities with additional members from the municipality, the Contractor, Consultants and the Municipality. The PSC convenes at least once a month as well as when the need so dictates, for the purpose of recruiting labour for the project, to address community issues and for acting as an avenue for effective communication and liaison between all the parties.
- (g) "Liaison Officer" means a local representative of the temporary workforce, duly appointed through the PSC processes, to act on behalf of the workers and through whom all matters pertaining to the temporary workforce can be channelled.

C3.3.3.4.2.1.3 Status

Where any provisions or requirements of this Specification are in conflict with anything elsewhere set out in the Contract, the provisions and requirements of this Specification shall take precedence and prevail.

C3.3.3.4.3 PERMITTED SOURCES OF TEMPORARY WORKERS

The Contractor shall as far as possibly make optimum use of the human resources outside his own workforce and the workforces of all subcontractors. The temporary workforce that is to be used in the execution of the Works in terms of Part C3 may consist of the workers of local communities, and shall not be bound to one particular community.

C3.3.3.4.4 EMPLOYMENT RECORDS TO BE PROVIDED

- (a) The Contractor shall maintain accurate and comprehensive records of all workers engaged on the Contract and shall provide the Engineer at monthly intervals from the commencement of the Contract, with interim records substantiating the actual numbers of employment opportunities that shall have been generated to date and the amounts actually paid in respect thereof. Such interim records shall be in a RAL approved format. An example of the forms to be used is illustrated in Part C5 of this document, (forms RDP 9 and 10 (E)).
- (b) The Contractor shall, on completion of the Contract, and as a pre-requisite event to the release of any retention money in terms of the Conditions of Contract, provide the Engineer with copies of the Terms of Employment as well as independently audited documentary evidence of the total number of temporary and permanent employment opportunities actually generated during the Contract.

C3.3.3.4.5 VARIATIONS IN WORKER PRODUCTION RATES

Notwithstanding anything to the contrary as may be stated in or inferred from any other provision of this Contract, the Contractor shall not be entitled to any additional payment or compensation whatever, in respect of any differences as may result between the production rates actually achieved by workers in the course of the execution of the Contract Works and those production rates on which he has based his tender.

C3.3.3.4.6 TRAINING OF THE TEMPORARY WORKFORCE

- (a) Selected members of the workforce are to be provided with structured training in accordance with the provisions of Part C3.4.3.3.
- (b) The Contractor shall make all necessary allowances in his programme of work to accommodate and facilitate the delivery of such structured training and shall comply fully with the requirements of Part C3.4.3.3.
- (c) The provision of structured training as described in Part C3.4.3.3. shall not relieve the Contractor of any of his obligations in terms of the Conditions of Contract and the Contractor shall remain fully liable for the provision, at his own cost, of all training of the workforce, additional to that as provided for in Part C3.4.3.3, as may be necessary to achieve the execution and completion of the works strictly in accordance with the provisions of the Contract.

C3.3.3.4.7 RECRUITMENT AND SELECTION PROCEDURES

C3.3.3.4.7.1 The Project Steering Committee, through the assistance of the Social Facilitator and the Contractor, shall be responsible for the recruitment and selection of the Community Liaison Officer and the workers to constitute the temporary workforce.

C3.3.3.4.7.2 The Contractor shall advise the Engineer in writing of the numbers of each category of temporary worker which he requires, together with the personal attributes which he considers desirable that each category of worker shall possess (taking due cognisance of the provisions of the Contract relating to training).

C3.3.3.4.7.3 The Social Facilitator shall take the necessary actions to advertise within the affected local communities comprising the personnel resources, the fact that temporary employment opportunities exist and the time and place where recruiting will occur

C3.3.3.4.7.4 The Social Facilitator shall record in writing, the details of all persons applying for employment, including *inter alia*:

- (a) Name, Identity Number, Date of Birth, age and sex
- (b) Marital status and number of dependants
- (c) Qualifications and previous work experience (whether substantiated or not)
- (d) On the job training programmes attended
- (e) Period since last economically active
- (f) Preference for type of work or task.

C3.3.3.4.7.5 The selection of workers from amongst the applicants should take into cognisance the Contractor's requirements for the workforce and the provisions of the contract in regard to the provision of training to the workforce and in accordance with the following principle:

- (a) No potential temporary worker shall be precluded from being employed by the Contractor on the execution of the Works, by virtue of his lack of skill in any suitable operation forming part of the Works, unless -
 - (i) all available vacancies have been or can be filled by temporary workers who already possess suitable skills, or
 - (ii) the Time for Completion allowed in the Contract, or the remaining portion of the Contract Period (as the case may be) is insufficient to facilitate the creation of the necessary skills.
- (b) Preference shall be given to the unemployed and single heads of households.
- (c) The Contractor shall, in so far as is reasonably practicable, give priority to accommodating the applicants' expressed preferences regarding the types of work for which they are selected.
- (d) The selection process shall not be prejudicial to youth (over the age of fifteen years) and women. The Contractor should strive to achieve the participation target for employment set for this project which is 60% female and 20% youth.

C3.3.3.4.7.6 After making the selection, the Social Facilitator shall forward the list in writing and without undue delay, to the Engineer for record keeping.

C3.3.3.4.7.7 The provisions of this clause shall apply *mutatis mutandis* in respect of the selection of additional or replacement members of the workforce as may be necessary from time to time during the Contract.

C3.3.3.4.7.8 The Contractor shall, after appointing his temporary workforce, arrange at his own cost for the appointment of the Liaison Officer as representative of the workforce to act on their behalf with regards to all matters pertaining to the workforce.

C3.3.3.4.8 TERMS AND CONDITIONS PERTAINING TO THE EMPLOYMENT OF THE TEMPORARY WORKFORCE

C3.3.3.4.8.1 All temporary workers engaged in accordance with the provisions of Part A of the Project Specifications, shall be employed on the terms and conditions of employment as are consistent with those as set out in this Contract. The Contractor shall implement and adhere strictly to such terms and conditions relating to the employment of the temporary workforce, and subject only to the provisions of this Contract, shall not employ any temporary worker on terms and conditions which are less favourable to the worker or inconsistent with the standards and norms generally applicable to temporary workers in the Civil Engineering Industry and applicable to the particular area. Refer to the Contract of Employment drafted/published by Department of Labour.

C3.3.3.4.8.2 RATE OF REMUNERATION. The Contractor shall pay to all workers engaged in terms of the contract, not less than the applicable gazetted minimum rate of remuneration in terms of the Sectorial Determination 2: Civil Engineering Sector.

The remuneration of the CLO shall be paid monthly at the rate equivalent to Task Grade 3 in accordance with the provisions of the Basic Conditions of Employment Act, No. 75 of 1997, Amendment to Sectorial Determination 2: Civil Engineering Sector, South Africa

Compensation for transport for the members of the Project Steering Committee shall be made at a rate of R200 / month. This will cover for transport cost to and from the PSC meeting, site meeting and any other meeting deemed necessary to fulfil their obligations.

C3.3.3.4.8.3 NON-PAYMENT OF LABOURERS. Under this contract it is expected of the Main Contractor to ensure that all labourers are paid in time on a monthly basis, whether they are employed by him/her directly or by any of his/her subcontractors. In the event of non-compliance, the employer reserves the right to use any remedies available at its disposal.

C3.3.3.4.9 LABOUR RELATIONS AND WORKER GRIEVANCE PROCEDURES

C3.3.3.4.9.1 The Contractor, as the Employer of the workforce, shall be fully responsible for the establishment and maintenance at his own cost, of satisfactory labour relations on site and the resolution of all grievances of temporary workers as may occur. Refer to Disciplinary Procedures for Small Business drafted/published by Department of Labour.

C3.3.3.4.9.2 The Contractor shall at all times adhere to the accepted norms and standards of labour relations prevailing generally in the Civil Engineering Construction Industry and shall conduct himself in a fair and reasonable manner, within the constraints as may be imposed upon him by the terms of the Contract.

C3.3.3.4.9.3 In the event of any temporary worker engaged by the Contractor in terms of the Contract, being aggrieved with regard to his Terms of Employment, working conditions and training, he shall have the right, at his discretion, to be supported in any inquiry or disciplinary hearing or investigation instituted by the Contractor in terms of Subclause C3.4.3.4.9.2 above, by one member of the temporary workforce and one member of the Project Committee, which persons shall be nominated by the worker.

C3.3.3.4.9.4 In the event of any grievance not being satisfactorily resolved through the application of normal dispute resolution procedures in accordance with Sub clauses C3.3.3.4.9.2 and C3.4.3.4.9.3, then either the Contractor or the worker concerned may require that the matter be referred to the Project Committee for further consideration, with a view to facilitate the resolution thereof.

C3.3.3.4.10 THE SUBCONTRACTORS' WORKFORCES

C3.3.3.4.10.1 The provisions of this Part C shall apply *mutatis mutandis* to the workforces employed by all subcontractors engaged by the Contractor and the Contractor shall be fully responsible for ensuring, at his own cost, that the terms of every subcontract agreement entered into are such as to facilitate the application of these provisions in respect of the workforces of all subcontractors.

C3.3.3.4.10.2 The Contractor shall at his own cost and to the extent necessary, assist and monitor all subcontractors in the application of the provisions of this Specification, and shall, in terms of the Conditions of Contract, remain fully liable in respect of the acts, omissions and neglects of all subcontractors, in respect of the application of the provisions of this Specification.

C3.3.3.4.11 MEASUREMENT AND PAYMENT

The Contractor will not be separately reimbursed or compensated in respect of the provision of the workforce and creation of temporary employment opportunities and all the Contractor's costs associated with compliance with the provisions of this part of the Project Specifications shall, except to the extent provided for in Part C3.4.3.3. as relevant, be deemed to be included in the rates tendered for the various items of work listed in the Schedule of Quantities.

C3.4 MANAGEMENT

C3.4.1 MANAGEMENT MEETINGS

The following meetings will be required as minimum for the management of the contract.

- (a) Monthly client site meeting (using standard agenda for management control).
- (b) Technical meetings as required for each phase of the work.
- (c) Monthly safety meetings in terms of the OHS requirements.
- (d) Weekly progress meetings

C3.4.2 QUALITY CONTROL

Contractor to supply details of quality plan and procedures. These shall include:

- Accommodation of traffic.
- Inspection and test plans.
- Approval process.
- Hold-points.
- Milestones.



BA-PHALABORWA MUNICIPALITY

BID No. 09/21/22

FOR

THE UPGRADING OF B1-EXTENSION PHASE 2 IN LULEKANI OF BA-PHALABORWA MUNICIPALITY

PART C4: SITE INFORMATION

C4.1	SITE INFORMATION.....	C.144
C4.2	LOCALITY PLAN.....	C.145



BA-PHALABORWA MUNICIPALITY

BID No. 09/21/22

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THE UPGRADING OF B1-EXTENSION PHASE 2 IN LULEKANI OF BA-PHALABORWA MUNICIPALITY

C4.1 SITE INFORMATION

C4.1.1 Material site investigation

One borrow pit was investigated. The centreline investigation of the road to be re-gravelled was conducted. Geotechnical report will be supplied to the successful contractor.

C4.1.2 Pavement and layer works design

Taking into account the insitu sub-grade material and the expected material available from borrow pits, the following pavement design is proposed:

- a) Surfacing:** 30mm Continuous Graded Asphalt.
- b) Base:** 150mm thick stabilized gravel compacted to 97% of Modified AASHTO Density, with minimum desired UCS = 1000Kpa at 97% of Modified AASHTO Density **(C4)**.
- c) Sub-base:** 150mm thick natural gravel compacted to 93% of Modified AASHTO Density, with minimum CBR = 15 at 93% of Modified AASHTO Density **(G6)**.
- d) Upper Selected:** 150mm thick natural gravel compacted to 93% of Modified AASHTO Density, with minimum CBR = 15 at 93% of Modified AASHTO Density **(G7)**.

C4.1.3 Structures

No major structure will be constructed. Only Concrete storm water pipes will be installed

C4.1.4 Services

The following services were noticed on site. No further details of existing services were available during design stage.

- Overhead Eskom power lines
- Overhead Telkom lines
- Water pipes
- Sewer lines
- Fences



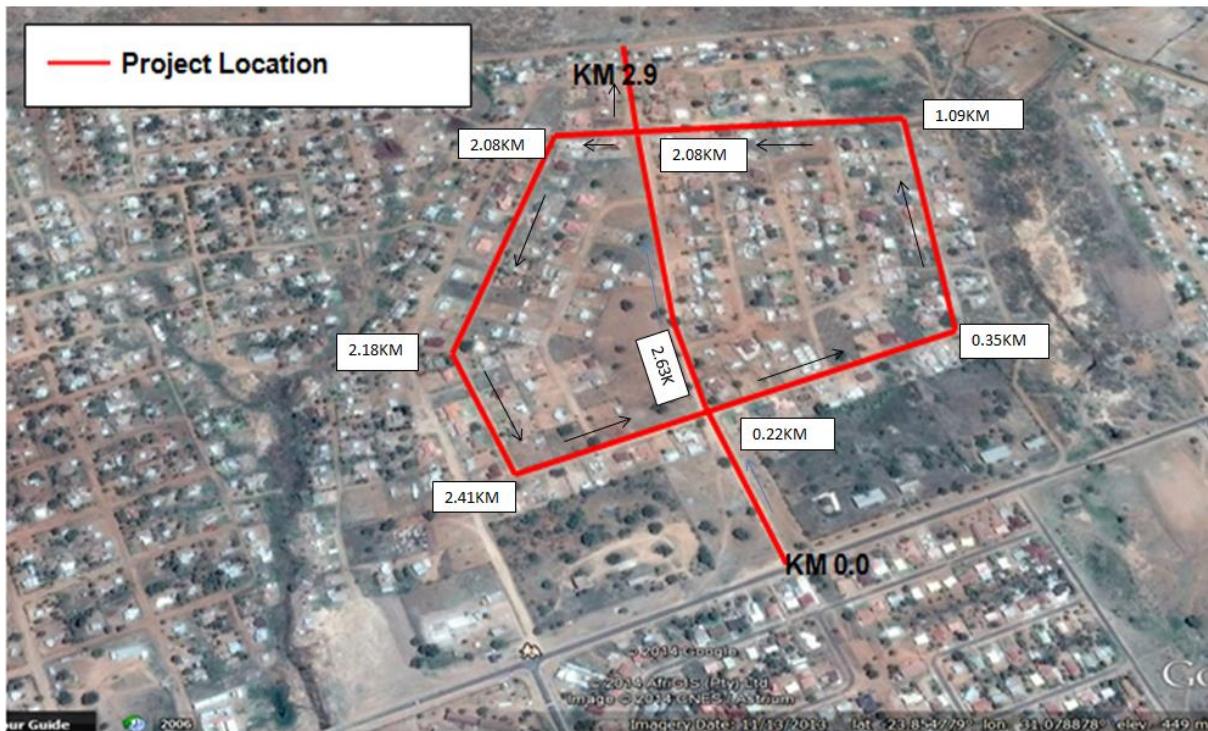
BA-PHALABORWA MUNICIPALITY

BID No. 09/21/22

FOR

THE UPGRADING OF B1-EXTENSION PHASE 2 IN LULEKANI OF BA-PHALABORWA MUNICIPALITY

C4.2 LOCALITY PLAN





BA-PHALABORWA MUNICIPALITY

BID No. 09/21/22

FOR

THE UPGRADING OF B1-EXTENSION PHASE 2 IN LULEKANI OF BA-PHALABORWA MUNICIPALITY

PART C5: ANNEXURES

C5.1	PROFORMA DOCUMENTS	C.147
C5.2	COVID-19 REGULATION	C.158
C5.3	CONTRACT DRAWINGS	C.159



BA-PHALABORWA MUNICIPALITY

BID No. 09/21/22

FOR

THE UPGRADING OF B1-EXTENSION PHASE 2 IN LULEKANI OF BA-PHALABORWA MUNICIPALITY

C5.1 PROFORMA DOCUMENTS

The following is a list of pro forma documents and examples that are required to be completed by the successful tenderer.

C5.1.1	RETENTION MONEY GUARANTEE PROFORMA.....	C.148
C5.1.2	EXAMPLE OF SMME DECLARATION AFFIDAVIT	C.150
C5.1.3	FORM RDP 9(E) : CONTRACT EMPLOYMENT REPORT	C.152
C5.1.4	FORM RDP 10(E) : EMPLOYMENT OF SUPERVISORY STAFF REPORT	C.153
C5.1.5	FORM RDP 11(E) : GENERIC TRAINING REPORT	C.154
C5.1.6	FORM RDP 12(E) : ENTREPRENEURIAL TRAINING REPORT	C.155
C5.1.7	FORM RDP 13(E) : ENGINEERING TRAINING REPORT	C.156
C5.1.8	FORM RDP 14(E) : COMMUNITY LIAISON MEETING REPORT.....	C.157

C5.1.1 RETENTION MONEY GUARANTEE PROFORMA

EXAMPLE

Ba-Phalaborwa Municipality
Private Bag X01020
Phalaborwa
1390

FOR INFORMATION ONLY:
This Guarantee is not to be completed and signed by the Guarantor.
A separate form will be issued to the successful Tenderer

Notes to Tenderer

1. **This pro forma is for information only. The successful tenderer’s guarantor will need to reproduce it without amendment, omission or addition for completion and lodgement with the Employer.**
2. **The tenderer’s guarantee will have to be on letterheads indicating the contact details of the guarantor, shareholders/board of directors, guarantee number and the company registration number.**

CONTRACT NO.

FOR

DESCRIPTION OF THE CONTRACT

The guarantee is issued on behalf of

Registration No

(hereinafter referred to as “the Contractor”) in connection with the above mentioned contract (hereinafter referred to as “the Contract”).

Whereas you have agreed that the Contractor may provide a guarantee in lieu of the retention monies provided for under the Contract.

Now therefore we, the undersigned, being duly authorised to represent the

.....

(full name of guarantor) registration number

undertake to pay you such amounts as you may from time-to-time demand from us, immediately upon receipt of a written demand from you.

1. Each demand shall be in writing and delivered to us at or such other address as we shall in writing notify to you.
2. Our liability to make the payments herein referred to shall be unconditional and not be affected or diminished by any disputes, claims or counterclaims between you and the Contractor.
3. Our aggregate liability under this guarantee is limited to (R.....) and is restricted to payment of monies only.
4. This guarantee shall expire on the date on which the last of the retention monies, which but for this guarantee would have been retained by you, becomes payable to the Contractor.

5. This guarantee is neither negotiable nor transferable and must be returned to us against final payment of our aggregate liability or on the date of the expiry of the guarantee in terms of Clause 4 (above), whichever is the earlier.

Signed atfor and on behalf of
on this the day ofin the year

GUARANTOR:

AS WITNESS:

1. 2.

NAME(Print): NAME(Print):

ADDRESS ADDRESS

.....

.....

C5.1.2 EXAMPLE OF SMME DECLARATION AFFIDAVIT

- 1. Name of SMME firm :
- Postal address :
- Physical address of Head Office:
- Telephone no. : Fax no
- Cell no :
- Contact person :
- VAT registration no. :

- 2. Type of firm (tick as appropriate)
 - Partnership.....
 - One person business/sole trader.....
 - Close corporation: registration no.....
 - Date of registration.....
 - Company: registration no.....
 - Pty Ltd: registration no.....

[ATTACH LATEST CIPRO PRINTOUT TO PROVE ABOVE INFORMATION]

- 3. Principal Business Activities :.....
- 4. Service/work to be performed on this contract:
- 5. CIDB registration no (if applicable):

[ATTACH LATEST CIDB INFORMATION AS PROOF]

- 5. SMME status (mark the appropriate category)
 - 5.1. Total full time equivalent of paid employees:
 - 5.2. Total Annual turnover:
 - 5.3. Total gross asset value (fixed property excluded):

[ATTACH CONFIRMATION LETTER OF AUDITER OR INCOME STATEMENT TO SUBSTANTIATE AND PROVE ABOVE INFORMATION]

8. Declaration

I,,
being duly authorised to sign on behalf of the firm, affirm that the SMME status as
stated above and the information as furnished is true and correct.

Signature

Name (print)

Date

Signed on behalf of (print name)

Address

.....

Telephone no.

Commissioner of Oath

Date

Note: In the case of a Company a certificate of authority for signatory must be provided.

EXAMPLE

C5.1.3 FORM RDP 9(E) : CONTRACT EMPLOYMENT REPORT

CONTRACT NO.....

REPORT ON EMPLOYMENT ON THE ABOVE CONTRACT FOR THE MONTH OF _____ 2021										
NAME OF COMPANY OR FIRM AND VENDOR NUMBER	AGE OF COMPANY OR FIRM	EMPLOYMENT GROUP	EMPLOYMENT							
			MALE	FEMALE	TOTAL	PERSON/HOURS			VALUE (RAND)	
						MALE	FEMALE	TOTAL	MALE	FEMALE
		Unskilled (US)								
		Semi-Skilled (SS)								
		Skilled (SK)								
		Lab.Tech (LT)								
		Surveyor (SUR)								
		Eng. Tech (ET)								
		Engineer (EN)								
		Admin (AD)								
		Others (o)								
									TOTALS	
									GRAND TOTALS	

EXAMPLE

C5.1.4 FORM RDP 10(E) : EMPLOYMENT OF SUPERVISORY STAFF REPORT

CONTRACT NO.....

REPORT ON THE EMPLOYMENT OF SUPERVISORY STAFF ON THE ABOVE CONTRACT FOR THE MONTH OF _____ 2021				
POSITION HELD	NAME	PDI	NON-PDI	TOTAL
Site Agent				
Senior Materials Technician				
Senior Surveyor				
Earthworks Surveyor				
Compaction Supervisor				
Surfacing Supervisor				
Structures Supervisor				
Others: - List				
TOTALS				

EXAMPLE

C5.1.5 FORM RDP 11(E) : GENERIC TRAINING REPORT

CONTRACT NO.....

REPORT ON GENERIC TRAINING ON THE ABOVE CONTRACT FOR THE MONTH OF _____ 2021											
DATES OF TRAINING COURSES		EMPLOYER OF TRAINEE		NAME OF TRAINING INSTITUTE OR IF IN-HOUSE WRITE IH	ATTENDANCES				TOTAL COST OF TRAINING PER TYPE OF TRAINING		
START	FINISH	NAME	VENDOR NO.		NUMBER ATTENDING		CERTIFICATES AWARDED		MALE	FEMALE	
					MALE	FEMALE	MALE	FEMALE			
TOTAL											
TOTAL ALL TRAINEES											

EXAMPLE

C5.1.6 FORM RDP 12(E) : ENTREPRENEURIAL TRAINING REPORT

CONTRACT NO.....

REPORT ON ENTERPRENEURIAL TRAINING ON THE ABOVE CONTRACT FOR THE MONTH OF 2021										
DATES OF TRAINING COURSES		EMPLOYER OF TRAINEE		NAME OF TRAINING INSTITUTE OR IF IN-HOUSE WRITE IH	ATTENDANCES				TOTAL COST OF TRAINING PER TYPE OF TRAINING	
START	FINISH	NAME	VENDOR NO.		NUMBER ATTENDING		CERTIFICATES AWARDED		MALE	FEMALE
					MALE	FEMALE	MALE	FEMALE		

EXAMPLE

C5.1.7 FORM RDP 13(E) : ENGINEERING TRAINING REPORT

CONTRACT NO.....

REPORT ON ENGINEERING TRAINING ON THE ABOVE CONTRACT FOR THE MONTH OF _____ 2021										
DATES OF TRAINING COURSES		EMPLOYER OF TRAINEE		NAME OF TRAINING INSTITUTE OR IF IN-HOUSE WRITE - IH	ATTENDANCES				TOTAL COST OF TRAINING PER TYPE OF TRAINING	
START	FINISH	NAME	VENDOR NO.		NUMBER ATTENDING		CERTIFICATES AWARDED		MALE	FEMALE
					MALE	FEMALE	MALE	FEMALE		
TOTAL										
TOTAL ALL TRAINEES										

EXAMPLE

C5.1.8 FORM RDP 14(E) : COMMUNITY LIAISON MEETING REPORT

CONTRACT NO.....

REPORT ON COMMUNITY LIAISON MEETINGS ON THE ABOVE CONTRACT FOR THE MONTH OF 2021						
DATE OF MEETING	COMPANY/FIRM OR ORGANISATION RESPONSIBLE FOR ARRANGING THE MEETING		NUMBER OF COMMUNITY MEMBERS PRESENT	DURATION OF MEETING (hours)	TOTAL COST OF THE MEETING	COMMENTS
	NAME	VENDOR NO.				



BA-PHALABORWA MUNICIPALITY

BID No. 09/21/22

FOR

THE UPGRADING OF B1-EXTENSION PHASE 2 IN LULEKANI OF BA-PHALABORWA MUNICIPALITY

C5.2 COVID-19 REGULATION



BA-PHALABORWA MUNICIPALITY

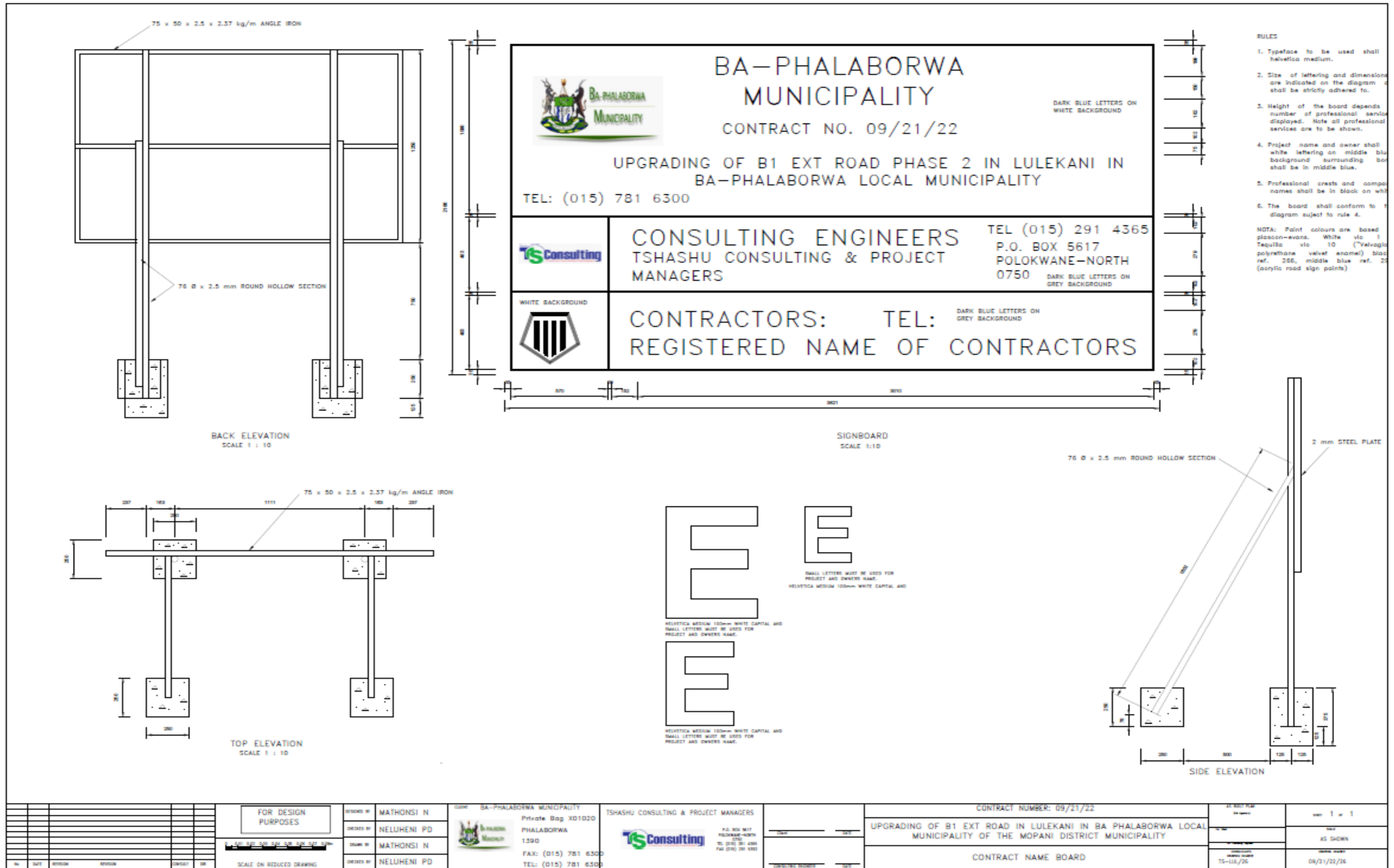
BID No. 09/21/22

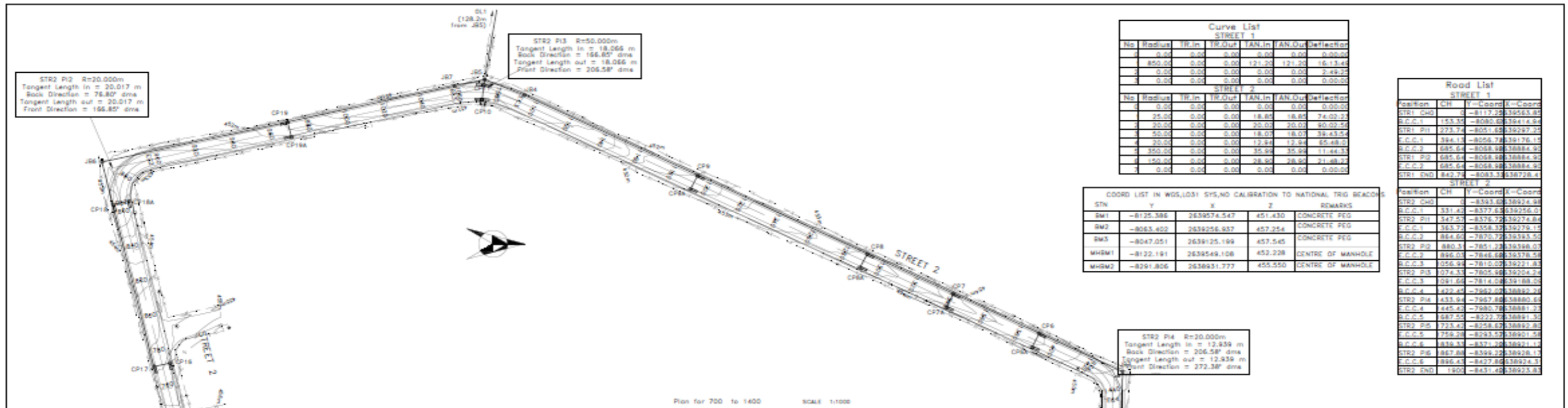
FOR

THE UPGRADING OF B1-EXTENSION PHASE 2 IN LULEKANI OF BA-PHALABORWA MUNICIPALITY

C5.3 CONTRACT DRAWINGS

The lists of contract drawings included in this document.





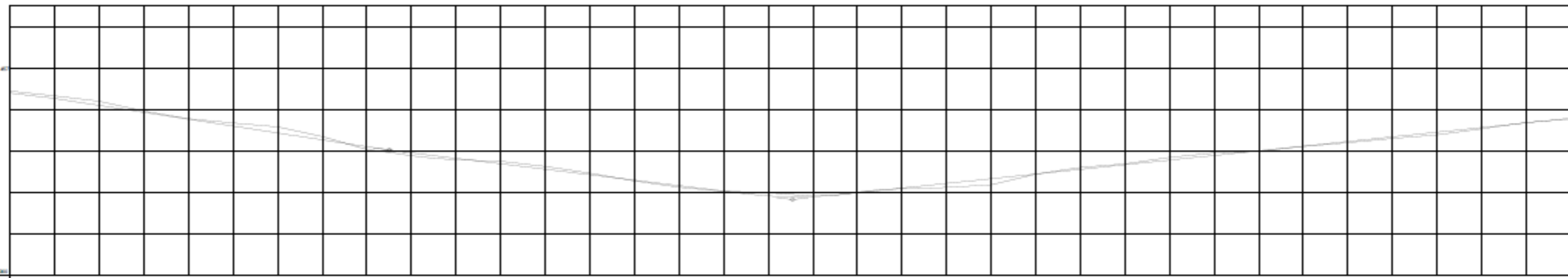
Curve List						
STREET 1						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
1	0.00	0.00	0.00	0.00	0.00	0.00/0
2	850.00	0.00	0.00	121.30	121.30	16.13.45
3	0.00	0.00	0.00	0.00	0.00	2.49.37
4	0.00	0.00	0.00	0.00	0.00	0.00/0

STREET 2						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
1	0.00	0.00	0.00	0.00	0.00	0.00/0
2	25.00	0.00	0.00	18.80	18.80	74.02.22
3	20.00	0.00	0.00	20.00	20.00	90.02.56
4	50.00	0.00	0.00	18.00	18.00	36.43.54
5	20.00	0.00	0.00	12.94	12.94	65.48.0
6	350.00	0.00	0.00	35.99	35.99	11.44.3
7	150.00	0.00	0.00	28.90	28.90	21.48.27
8	0.00	0.00	0.00	0.00	0.00	0.00/0

Road List			
STREET 1			
Station	CH	E-Coord	N-Coord
STR1 CH0	0	-8117.22	339563.81
P.C.C.1	153.30	-8080.60	339414.94
STR1 P11	373.77	-8051.63	339297.37
P.C.C.2	585.67	-8056.98	33884.92
STR1 P12	594.17	-8056.78	339176.14
P.C.C.3	685.67	-8058.98	33884.92
STR1 P13	685.67	-8058.98	33884.92
P.C.C.4	842.71	-8083.32	338728.41
STR1 END	842.71	-8083.32	338728.41

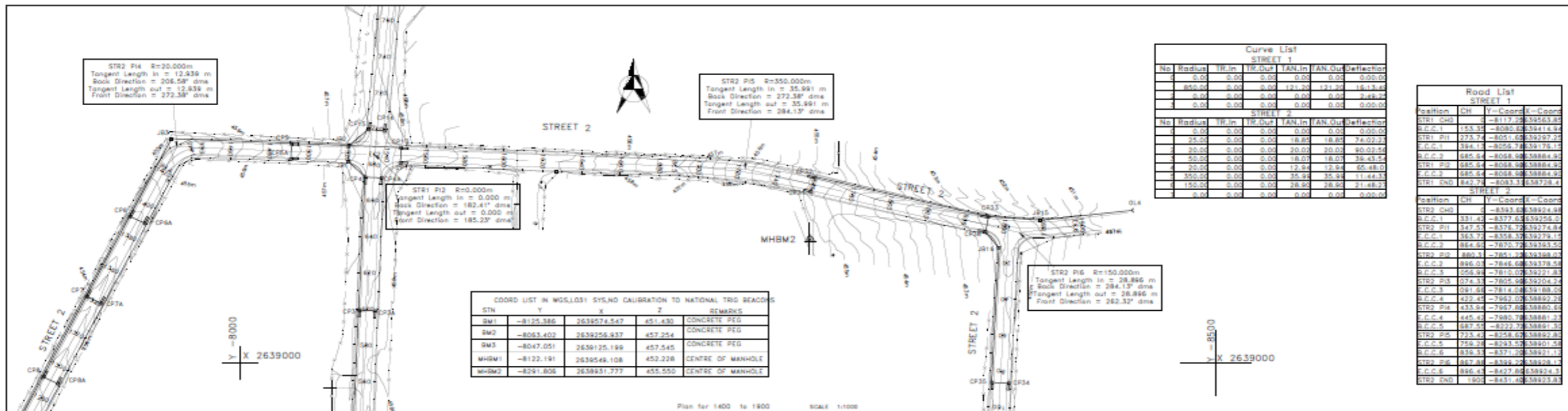
STREET 2			
Station	CH	E-Coord	N-Coord
STR2 CH0	0	-8393.60	33824.92
P.C.C.1	331.40	-8377.60	33256.01
STR2 P11	347.50	-8376.72	33274.84
P.C.C.2	563.72	-8358.32	33279.10
P.C.C.3	864.60	-7870.72	33393.50
STR2 P12	880.31	-7851.22	33398.01
P.C.C.4	896.02	-7848.68	33378.58
P.C.C.5	1056.90	-7810.00	33221.83
STR2 P13	1074.31	-7805.68	33204.24
P.C.C.6	1291.60	-7814.00	33169.00
P.C.C.7	1372.40	-7852.00	33892.30
STR2 P14	1333.90	-7867.80	33880.80
P.C.C.8	1445.40	-7880.70	33881.30
P.C.C.9	1687.50	-8222.70	33891.30
STR2 P15	1723.40	-8258.60	33892.80
P.C.C.10	1756.20	-8293.50	33901.50
P.C.C.11	1836.30	-8371.20	33921.10
STR2 P16	1867.80	-8399.20	33928.10
P.C.C.12	1896.40	-8427.80	33924.30
STR2 END	1900	-8431.40	33923.80

COORD LIST IN WGS,LOSI SYS,NO CALIBRATION TO NATIONAL TRIG BEACONS				
STN	Y	X	Z	REMARKS
RM1	-8125.386	2639574.547	451.430	CONCRETE PEG
RM2	-8063.400	2639256.937	457.354	CONCRETE PEG
RM3	-8047.051	2639125.199	457.545	CONCRETE PEG
MHRM1	-8122.191	2639549.108	452.228	CENTRE OF MANHOLE
MHRM2	-8291.806	2638931.777	455.550	CENTRE OF MANHOLE



C/L/ Peg Levels		CH 700	CH 750	CH 800	CH 850	CH 900	CH 950	CH 1000	CH 1050	CH 1100	CH 1150	CH 1200	CH 1250	CH 1300	CH 1350	CH 1400
Vertical Alignment	Design Road Levels	3.5 m Left	3.5 m Left	3.5 m Left	3.5 m Left	3.5 m Left	3.5 m Left	3.5 m Left	3.5 m Left	3.5 m Left	3.5 m Left	3.5 m Left	3.5 m Left	3.5 m Left	3.5 m Left	3.5 m Left
	Centre Line	Centre Line	Centre Line	Centre Line	Centre Line	Centre Line	Centre Line	Centre Line	Centre Line	Centre Line	Centre Line	Centre Line	Centre Line	Centre Line	Centre Line	Centre Line
	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right	3.5 m Right
Grades		-1.800 N														
Vertical Curves		S 100m														
Superelevation		-														
Horizontal Curves		-														
Chainages		-														

FOR DESIGN PURPOSES		DRAWN BY: MATHONSI N CHECKED BY: NELUHENI PD DRAWN BY: MATHONSI N CHECKED BY: NELUHENI PD	CLIENT: BA-PHALABORWA MUNICIPALITY Private Bag X01020 PHALABORWA 1390 FAX: (015) 781 6300 TEL: (015) 781 6300	CONSULTANT: TSHASHU CONSULTING & PROJECT MANAGERS P.O. BOX 9617 HILKOMBE NORTH 2010 TEL: (015) 361 4288 FAX: (015) 361 4882	CONTRACT NUMBER: 09/21/22 UPGRADING OF B1 EXT ROAD IN LULEKANI IN BA PHALABORWA LOCAL MUNICIPALITY OF THE MOPANI DISTRICT MUNICIPALITY LAYOUT & LONGITUDINAL SECTION : STR2 : CH 700 to CH 1400	SHEET NO: 3 of 3 HOR SCALE: 1:1000 VER SCALE: 1:100 DATE: 09/21/22/05
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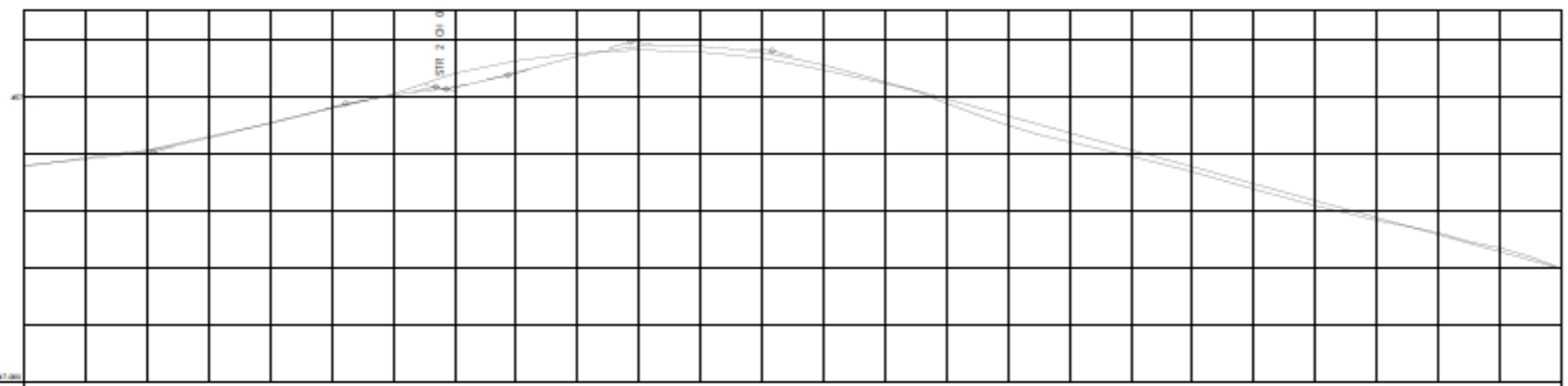
Curve List						
STREET 1						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
1	0.00	0.00	0.00	0.00	0.00	0.00.00
2	850.00	0.00	0.00	121.20	121.20	16.13.45
3	0.00	0.00	0.00	0.00	0.00	2.68.22
4	0.00	0.00	0.00	0.00	0.00	0.00.00

STREET 2						
No	Radius	TR.In	TR.Out	TAN.In	TAN.Out	Deflection
1	0.00	0.00	0.00	0.00	0.00	0.00.00
2	25.00	0.00	0.00	18.85	18.85	74.02.23
3	20.00	0.00	0.00	20.00	20.00	90.02.54
4	50.00	0.00	0.00	18.07	18.07	39.43.54
5	20.00	0.00	0.00	12.94	12.94	65.48.00
6	350.00	0.00	0.00	35.94	35.94	11.44.31
7	150.00	0.00	0.00	28.92	28.92	21.48.21
8	0.00	0.00	0.00	0.00	0.00	0.00.00

Road List			
STREET 1			
Location	CH	Y-Coord	X-Coord
STR1 CH0	0	-8117.25	263953.85
P.C.C.1	153.37	-8092.02	263914.94
STR1 P11	273.74	-8051.62	263927.25
P.C.C.1	394.13	-8056.78	263975.15
P.C.C.2	685.00	-8068.08	263884.92
P.C.C.2	685.00	-8068.08	263884.92
STR1 P12	685.00	-8068.08	263884.92
P.C.C.2	685.00	-8068.08	263884.92
STR1 CH0	842.72	-8083.13	263828.44

STREET 2			
Location	CH	Y-Coord	X-Coord
STR2 CH0	0	-8393.62	263924.98
P.C.C.1	331.42	-8377.62	263925.02
STR2 P11	347.52	-8376.72	263927.84
P.C.C.1	363.72	-8358.32	263929.12
P.C.C.2	864.00	-7870.72	263935.50
STR2 P12	880.12	-7861.22	263938.02
P.C.C.2	886.02	-7846.02	263938.54
P.C.C.3	956.94	-7810.02	263921.83
STR2 P13	974.12	-7805.92	263924.24
P.C.C.3	991.04	-7814.02	263918.02
P.C.C.4	432.42	-7962.02	263892.26
STR2 P14	433.94	-7967.82	263880.64
P.C.C.4	445.42	-7980.72	263881.22
P.C.C.5	687.52	-8222.72	263891.50
STR2 P15	723.42	-8256.62	263892.80
P.C.C.5	756.22	-8243.02	263891.54
P.C.C.6	839.12	-8371.22	263892.12
STR2 P16	847.82	-8369.22	263892.12
P.C.C.6	866.42	-8427.82	263824.33
STR2 CH0	1900	-8431.42	263823.83

COORD LIST IN WGS1984 SYS,NO CALIBRATION TO NATIONAL TRIG BEACONS				
STN	Y	X	Z	REMARKS
RM1	-8125.386	2639574.547	451.430	CONCRETE PEG
RM2	-8063.402	2639256.837	457.254	CONCRETE PEG
RM3	-8047.051	2639125.199	457.545	CONCRETE PEG
MHW1	-8122.191	2639549.108	452.228	CENTRE OF MANHOLE
MHW2	-8291.806	2639931.777	455.550	CENTRE OF MANHOLE

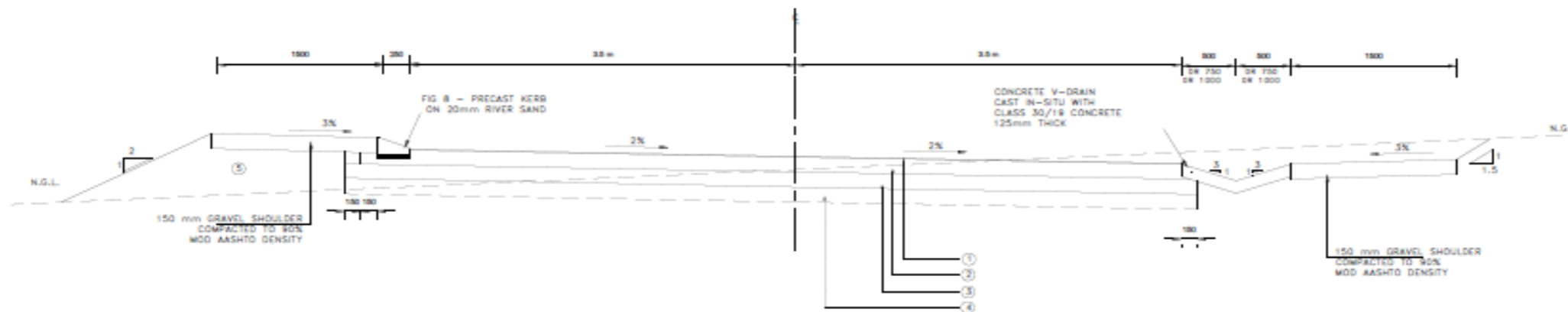


Vertical Alignment	C/L/ Peg Levels		Grades	Vertical Curves	Superelevation	Horizontal Curves	Chainages
	3.5 m Left	3.5 m Right					
Design Road Levels	1400.00	1400.00	1.028 N	40.000m VC	0.00%	0.00%	1400.00
Centre Line	1400.00	1400.00	0.708 N	40.000m VC	0.00%	0.00%	1400.00
3.5 m Right	1400.00	1400.00	0.000 N	40.000m VC	0.00%	0.00%	1400.00

Longsection CH 1400 to CH 1900 Horizontal Scale: 1000 Vertical Scale 1:100

<p>FOR DESIGN PURPOSES</p> <p>SCALE ON REDUCED DRAWING</p>	DESIGNED BY: MATHONSI N	<p>BA-PHALABORWA MUNICIPALITY</p> <p>Private Bag X01020</p> <p>PHALABORWA</p> <p>1390</p> <p>FAX: (015) 781 630</p> <p>TEL: (015) 781 630</p>	<p>TSHASHU CONSULTING & PROJECT MANAGERS</p> <p>TS Consulting</p> <p>P.O. BOX 1017</p> <p>PHALABORWA-NORTH</p> <p>0780</p> <p>TEL: (015) 781 430</p> <p>FAX: (015) 781 430</p>	CONTRACT NUMBER: 09/21/22	OF 3 OF 3
	DESIGNED BY: NELUHENI PD			UPGRADING OF B1 EXT ROAD IN LULEKANI IN BA PHALABORWA LOCAL MUNICIPALITY OF THE MOPANI DISTRICT MUNICIPALITY	HDR 1 : 1 : 500
	DRAWN BY: MATHONSI N			LAYOUT & LONGITUDINAL SECTION : STR2 : CH 1400 to CH 1900	VER 1 : 100
	DESIGNED BY: NELUHENI PD				DATE: 08/21/22/06

MATERIAL REQUIREMENTS						
LAYER NO.	LAYER	THICKNESS (mm)	MIN UCS (KPa)	MIN CBR	TRH 4	DESCRIPTION
①	SURFACE TREATMENT	30			S	CONTINUOUS GRADED ASPHALT
②	BASE	150	1000		C4	STABILISED LAYER @ 97% MOD AASHTO DENSITY
③	SUB-BASE	150		15	G5/G6	NATURAL GRAVEL COMPACTED TO 97% MOD AASHTO DENSITY
④	IN-SITU ROADBED	150				IN-SITU RIP & RECOMPACT TO 90% MOD AASHTO DENSITY
⑤	FILL				G10	COMPACT TO 90% MOD AASHTO DENSITY

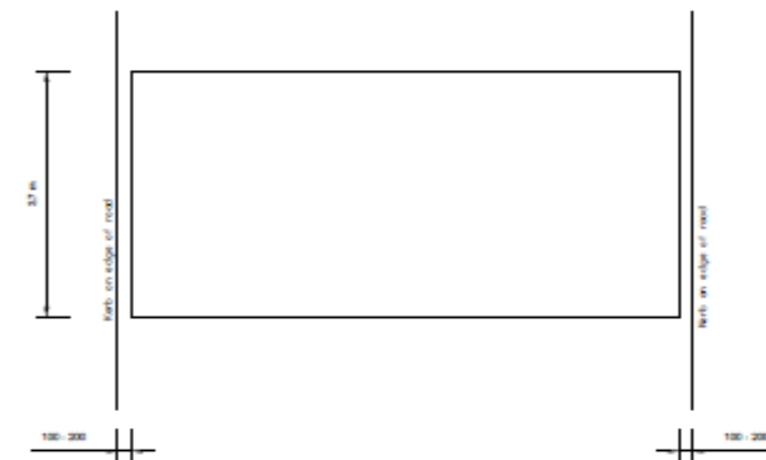


TYPICAL CROSS SECTION : STREET 2

FOR DESIGN PURPOSES		DESIGNED BY: MATHONSI N	CLIENT: BA-PHALABORWA MUNICIPALITY	TSHASHU CONSULTING & PROJECT MANAGERS		CONTRACT NUMBER: 09/21/22		AS BUILT PLAN	1 of 1
SCALE ON REDUCED DRAWING		CHECKED BY: NELUHENI PD	Private Bag X01020 PHALABORWA 1390	P.O. BOX 9117 PHELANE-NORTH 0150		UPGRADING OF B1 EXT ROAD IN LULEKANI IN BA PHALABORWA LOCAL MUNICIPALITY OF THE MOPANI DISTRICT MUNICIPALITY		DATE: 17/02/25	1 : 5 000
		ISSUED BY: MATHONSI N	FAX: (015) 781 6300	TSHASHU CONSULTING		TYPICAL CROSS SECTIONS		DATE: 09/21/22/18	
		DESIGNED BY: NELUHENI PD	TEL: (015) 781 6300	TEL: (015) 781 4390 FAX: (015) 781 5350				TS-118/18	09/21/22/18



Section through Semi-Round circular hump
Scale 1 : 10



Plan of hump
Scale 1 : 50

Design Speed (km/h)	Height (h in mm)	Decision sight distance (m)
30	120	50 km/h 135 - 195
40	100	60 km/h 170 - 235
50	80	70 km/h 200 - 275



h1 = 4 mm	h5 = 67 mm
h2 = 16 mm	h6 = 84 mm
h3 = 38 mm	h7 = 96 mm
h4 = 50 mm	h8 = 100 mm

Section through Speed hump
Scale 1 : 10

Maximum desired speed between speed humps (km/h)	Spacing (m)
35	50
40	100
45	150
50	200

NOTE :
POSITIONS OF SPEED HUMPS
WILL BE POINTED OUT ON SITE BY THE ENGINEER

FOR DESIGN PURPOSES		DESIGNED BY: MATHONSI N	CLIENT: BA-PHALABORWA MUNICIPALITY	TSHASHU CONSULTING & PROJECT MANAGERS		CONTRACT NUMBER: 09/21/22		DATE: 04/21/24	NO. 1 of 1
SCALE ON REDUCED DRAWING		CHECKED BY: NELUHENI PD	Private Bag X01020 PHALABORWA 1390	P.O. BOX 8117 PHALABORWA-4074 0701		UPGRADING OF B1 EXT ROAD IN LULEKANI IN BA PHALABORWA LOCAL MUNICIPALITY OF THE MOPANI DISTRICT MUNICIPALITY		DATE: 04/21/24	AS SHOWN
		DRAWN BY: MATHONSI N	FAX: (015) 781 6300	TEL: (015) 781 4389		DETAIL OF SPEED HUMPS		DATE: 04/21/24	
		CHECKED BY: NELUHENI PD	TEL: (015) 781 6300	FAX: (015) 781 6300					