THEMBISILE HANI LOCAL MUNICIPALITY

CONSTRUCTION OF PUMP STATION - GEMBOKSPRUIT RESERVOIR TO MAIN TWEEFONTEIN D BULK WATER SUPPLY WSIG – WORK PACKAGE 1 (MECHANICAL)

SCOPE OF WORK

Thembisile Hani Local Municipality hereby invites quotations from suitably qualified service providers for the CONSTRUCTION OF PUMP STATION - GEMBOKSPRUIT RESERVOIR TO MAIN TWEEFONTEIN D BULK WATER SUPPLY WSIG – WORK PACKAGE 1 (MECHANICAL).

The Contract will entail the construction of a pump station, supply delivery and installation of pumps and associated mechanical and electrical works, as well as the installation of a bulk pipeline (355mm diameter oPVC). The pipeline should be installed taking into consideration EPWP requirements, labour-intensive works comprise the activities described in SANS 1921-5, Earthwork activities which are to be performed by hand, and its associated specification data. Such works shall be constructed using local workers who are to be temporarily employed in terms of this Scope of Work. Time is of the essence for this contract. The Tenderer shall state the time in calendar months required by him/her to complete the Works.

1. CURRENT STATE

No work has been conducted.

2.2 EMPLOYER'S OBJECTIVES

The employer's objectives are to deliver clean water supply infrastructure using labour intensive methods, whereby the local community benefit throughout the entire project and in doing so provide work place training opportunities to learners.

Bidders must note that preference will be given to local based companies and that this bid may be awarded to more than one company.

2.2.1 Local SMMEs Development

The Contractor will be required to employ local SMMEs Sub-Contracting Company for work up to 30% of the project amount. The SMMEs Company will be responsible for the appointment of local labourers from the Thembisile Hani Local community.

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 rate of pay set in the SAFCEC tables (South African Federation of Civil Employer's Agenting Contractors). The rate of pay set in the SAFCEC tables (South African Federation of Civil Employer's Agenting Contractors). Sub-contractors must be paid fortnightly and the main contractor must allow for

financing such payouts. Sub-contractors must be paid within 7 days from presenting invoice and failure to adhere will be penalised R1 000/day. Failure of sub-contractors for non-payment of his labour will be penalised at 50% of his payment by the main contractor. Contractor must provide enter market-related rates.

The contractor must familiarise him/her with the abovementioned requirements and price this document accordingly.

2.2.2 Key Personnel

The Contractor shall maintain the involvement of the key personnel as the exigencies of this contract. Should it become necessary to replace any of the key personnel as detailed at the time of the tender during this contract, they may only replace by individuals with similar or better qualifications and experience and only when a written approval has been obtained from the municipality.

Sufficient suitably qualified professional staff must be made available by the contractor and sub-contractor to undertake the full scope of the project. The personnel must be knowledgeable and experienced in their fields of expertise and must be currently actively involved in these fields. The tenderer must include documentary evidence that each proposed key personnel meet these requirements.

The persons nominated to act as project site agents for the project must be registered with the Engineering Council of South Africa (ECSA) as a Candidate Engineering Technician and be in a possession of a diploma in Civil Engineering and Mechanical/Electrical Engineering respectively and have subsequent there of five-year experience in built enviromental.
The persons nominated for construction monitoring must have a certificate in Civil Engineering and Mechanical/Electrical Engineering respectively with five-year experience in supervision of treatment plant projects.

2.3 OVERVIEW OF THE WORKS

The Contract will entail the construction of a pump station, as well as the installation of a bulk pipeline (355mm diameter oPVC). The pipeline should be installed taking into consideration EPWP requirements, labour- intensive works comprise the activities described in SANS 1921-5, Earthwork activities which are to be performed by hand, and its associated specification data. Such works shall be constructed using local workers who are to be temporarily employed in terms of this Scope of Work. Time is of the essence for this contract. The Tenderer shall state the time in calendar months required by him/her to complete the Works.

2.4 EXTENT OF THE WORKS

- Establishment of camps on site
- Site clearance and earthworks
- Accommodation of traffic
- Protection of existing services.
- Provision of all materials, special fittings and accessories as required, to complete the work as prescribed.
- Supply & Install pump (Etanorm 125-100-200 or similar approved), complete with 75kW IP55 Cast Iron IE1 TEFC motor (WEG W20 or similar approved) including tyre coupling & guard. VSD operated - Pumps should be able to supply 312.5 m^3/h @ 54m head per pump, including transport, mechanical installation and comissioning.
- Supply, delivery and installation of mechanical pipework, including valves and meters as per designs.

- Supply, delivery and installation of associated electrical works, (including complete MCC's with switchgear, pump starters, metering, 2 x 75kW VSD, surge protections, cabling, automation, domestic lighting, earthing, testing and comissioning, etc.
- Laying, bedding and installation of pipes (oPVC) and accessories.
- Concrete work associated with the above-mentioned equipment.
- Construction of concrete anchor blocks associated with the above.
- Installation of pumps with pipes.
- Manage all site staff, CLO and local labourers, plant, equipment and materials
- Manage all quality controls as required by the Engineers
- Commissioning of the works.
- Maintenance of the works for a twelve-month period. (Defects Liability)

2.5 LOCATION OF THE WORKS

The project is situated within Nkangala District Municipality in Mpumalanga province and it falls under Thembisile Hani Local Municipality. Mzimuhle township also known as Gemsbokspruit is situated 90km north-east of Pretoria along the Absalom road. The GPS coordinates and Municipal wards of the townships are presented in a table below.

Table Error! No text of specified style in document.-1: Location of Area

No	Village name	Ward	Latitude (S)	Longitude (E)
1	Mzimuhle	10	25°24'14.9"S	28°53'56.5"E

Locality Details

- Province : Mpumalanga Province
- District : Nkangala District Municipality
- Municipality : Thembisile Hani Local Municipality

2.6 CONSTRUCTION PROGRAM

Construction work under this contract should start not later than two weeks after site handover and should be completed not later than 8 months after site handover.

It is required that the tenderer to submit a detailed construction program linked to the duration of the project and clearly indicating the key deliverables time frames coupled there to and sequence of events.

2.7 TEMPORARY WORKS

The Contractor shall provide, erect, maintain and remove on completion of the Contract, ample temporary offices and sheds for the proper storage of perishable materials and for the use of his workmen

3.1 DESIGN SERVICES AND ACTIVITY MATRIX

Works designed by, per design stage:

Description	Responsibility
Design of Works	Employer's Agent
Concept, feasibility and overall process	Client
Basic Engineering and detail layouts to tender stage	Employer's Agent
Final Design of Works	Employer's Agent
Final Design to approved for construction stage	Client
Preparation of tender documentation & adverts	Employer's Agent
Placement of Advertisements in newspapers	Client
Application of Eskom connection point	Client / Employer's Agent / Contractor
Payment of Eskom connection fees	Contractor
Appointment of sub-contractors	Contractor
Supervision	Employer's Agent
Preparation of as-built drawings	Contractor / Employer's Agent
Completion certificate	Employer's Agent / Client / Contractor

3.2 EMPLOYER'S DESIGN

The permanent works included in this contract has been designed by the Employer's agent. The detail of the works is indicated on the drawing and in the specifications. The tenderer may submit alternative offers for designs prepared by himself subject to the conditions specified in clause 05 of the standard specifications.

3.3 CONTRACTOR'S DESIGN

Where the contractor is to supply the design of designated parts of the permanent Works or temporary Works, he shall supply fill working drawings supported by a professional Employer's Agent's design certificate.
DRAWINGS

The Employer's Agent will provide the Contractor with one full set of drawings, which will be used exclusively for the recording of as built information by the Contractor.

Only dimensions, positions, levels, co-ordinates etc. that change from the original values, will be required to be entered on these drawings. These drawings, fully marked up, will be handed to the Employer's Agent at the issue of the Certificate of completion, which will not be issued until the as-built information has been received.

The drawings listed below are attached to give an overview of the project.

Additional construction drawings will, in terms of Clause 5.9 of the General Conditions of Contract (2015), be issued to the Contractor by the Employer's Agent/Employer on the commencement date and from time to time as required.

DRAWING DESCRIPTION	**DRAWING NO.**

The applicable drawings mentioned above are attached under Part C5.2.

3.4 DESIGN PROCEDURES

Designs shall be concluded by the Employer's Agent and issued to the Contractor on the day of the official site handover. The designs shall be approved by the local authority before construction commences. The contractor shall be liable for capturing all the relevant changes to the design on the as built drawing, thereafter the drawing shall be submitted to the Employer's Agent for capturing. Under no conditions will the contractor deviate from the issued design unless the Employer's Agent formally approves thereof in writing.

3.5 CONTRACTOR DUTIES

The Contractor's duties which include the following duties relating to the Works:

- Design.
- Manufacture.
- Supply.
- Delivery.
- Installation and Construction.
- Testing.
- Commissioning.
- Training the Employer's staff in operation and maintenance.
- Trial Operation.
- Upholding during the Defects Liability Period.

The Contractor, where listed, will be obligated to attend to some additional scope of works required by the Employer.

3.6 GENERAL CONDITIONS

The following site conditions shall be taken into consideration in the design and selection of the plant and equipment:

Altitude above sea level : approx. 1382.00 masl
Maximum Temperature : 42°C
Minimum Temperature : -8°C
Corrosion Conditions : High.
Lightning : Frequent.
The climate in the area is a hot summer with summer rainfall. Winters are generally very cold with little rainfall.

3.7 GROUND CONDITIONS

The contractor can request geotechnical report detailing the soil conditions.

3.8 CONTRACTOR CAMP

The Contractor shall arrange accommodation for personnel on-Site. The Contractor's personnel will only be allowed on Site for the duration of a working day. The only person to be allowed on Site for the duration of an entire day will be the Site security.

The Contractor shall furthermore provide a suitable camp to locate all facilities, including, as necessary, offices and stores required for the proper performance of the Contract.

The proposed position must be on-site and shall be submitted to the Engineer for approval.

The Contractor shall supply and maintain adequate and suitable protection for the storage of materials that might deteriorate if exposed to the weather.

On completion of the Works, or when the facilities provided by the Contactor are no longer required, the Contractor shall remove these facilities and clear away all indications of their presence.

3.9 SECURITY

The Contractor may be exposed to criminal actions, including theft and vandalism, and shall make the necessary security arrangements for the duration of the Contract.

Irrespective of whether the site is shared with other contractors, the Contractor shall make his own security arrangements. A closed and lockable container would be preferred.

The Contractor shall, as a minimum, enclose the whole camp with a security fence and have a security guard on duty during non-working times.

The Contractor shall remove the fencing and shall rehabilitate the camp site areas on completion of the Contract."

3.10 ELECTRICITY, WATER AND OTHER SERVICES

The Contractor shall, at his own expense, decide for providing water, electrical supply and other services required for the Works and shall pay all charges related to the supply of such services, including any installation charges.

No warranty is offered or given by the Employer that the existing available reticulated water and electrical power supply will necessarily be adequate for the Contractor's purposes nor that its supply is in any way guaranteed.

The provision of these services shall include for all activities related to the Works up to the issue of the Final Approval Certificate

The distribution of water shall be carried out by the Contractor strictly in accordance with the applicable laws and regulations.

The Contractor shall furthermore comply with all prevailing legislation in respect of the generation and distribution of electricity and shall, when required by the Engineer, produce proof of such compliance.

3.11 LIFTING EQUIPMENT

The Contractor shall make his own arrangements for lifting facilities.

3.12 COMMUNICATION FACILITIES

The Contractor shall be responsible for arranging their own telecommunication services.

3.13 DISPOSAL SITES

The Contractor shall dispose of rubble, or rubbish or unwanted material off Site, at an approved disposal site and shall be responsible for all associated charges.

3.14 ABLUTION FACILITIES

The Contractor shall provide and maintain adequate ablution facilities for staff.

Wastewater shall not be discharged to the local environment at any time during the Contract.

3.15 MAINTAINING AND CLEANING THE SITE

The Contractor shall maintain the Site in a clean, tidy, and orderly condition to the approval of the Engineer.

The Contractor shall make good any damage resulting from the Contractor's activities on Site.

This includes making good any damage to the Site, civil and building constructions, contractors' camp and plant and any of the Employer's and the Engineer's property.

3.16 SANITARY CONDITIONS

The Contractor shall ensure that sanitary conditions prevail throughout the Site and that all workers are aware of and comply with this requirement.

Unhygienic habits and any behaviour that may cause contamination of any part of the Works or the surrounding areas are strictly prohibited.

3.17 ADJACENT PROPERTIES, EXISTING STRUCTURES AND SERVICES

The Contractor shall so carry out operations as not to cause damage to the existing fences and structures and shall not trespass or encroach on to any adjacent property.

Care shall be taken by the Contractor to avoid dust, if any.

The Contractor shall take steps to protect the existing services on and in the vicinity of the Site against damage which may arise because of operations on Site.

The Contractor shall bear the cost of the repair of damage because of the Contractor's operations on Site, including damage to the civil and building constructions and to the Civil Contractor's camp and plant, and to any of the Employer's and the Engineer's property.

3.18 DEALING WITH WATER

The Contractor shall deal with water on the Site so that the Works are kept sufficiently dry for their proper execution. The Contractor shall:

a) Prevent flooding of the Works and by the Works.
b) Keep all completed Works properly drained.
c) Not inhibit surface drainage.

3.19 SAFEGUARDING EXCAVATIONS

Where excavations are required, these shall be safeguarded in accordance with the relevant safety specifications.

3.20 EXISTING SERVICES

The Contractor shall take care and make provision to ensure prevention of damage to Existing services.

3.21 FACILITIES FOR THE ENGINEER

The Contractor shall provide for the use of the Engineer, maintain and service, as applicable, the following facilities:

a) two nameboards,
b) one furnished office,
c) conference room (furnished),
d) latrine and ablution facilities,
e) notebook/laptop computer and printer / scanner, (refer to below)
f) two laboratory labourers,
g) a site instruction book,
h) protective clothing and additional 2x for visitors,
i) safety equipment and additional 4x for visitors,
j) medical facilities,
k) Dust and ear protection:
i) Disposable Dust Masks (FFP2) – provision for duration of project, inclusive for site meeting when Employer attends.
ii) Normal ear plugs, moulded silicone earplugs - provision for duration of project, inclusive for site meeting when Employer attends.

Unless specified otherwise, on completion of the Works these facilities above shall revert to the Contractor who shall remove them from the Site.

The term "use of the Engineer" will be deemed to include, as appropriate, use by the Engineer's staff and the Engineer's Representative and his staff.

C3.2.23.1 Computer hardware

(a) Computers

Notebook/Laptop Computers shall comply with the following minimum specifications (minimum or greater than):

- Intel Core i7-8550U 1.80GHz (8MB SmartCache, Up to 4.00GHz)
- 15.6" Full HD (1920x1080) Anti-Glare LED-Backlit Display
- 8GB (1x8GB) DDR4-2400MHz Memory
- AMD Radeon 520 2GB GDDR5 Graphics
- 1TB 5400RPM HDD
- 2x USB 3.1 Gen 1, 1x USB 2.0, 1x HDMI 1.4a
- 1x PS Card Reader, 1x 3.5mm Audio Jack
- Tray Load DVD Drive (Reads and Writes to DVD/CD)
- Non-Backlit Keyboard

- 802.11ac Dual Band 2.4/5GHz Wi-Fi
- Bluetooth v4.1
- Windows 10 Pro 64-bit
- 1 Year Collect and Return Warranty

(b) Printers

Printers shall, unless otherwise approved by the Employer's Agent, be an approved make of wireless or USB interface multifunction Inkjet. Must be capable of printing up to A3 size.

All computer hardware shall be provided complete with the requisite connecting cables and all interfacing devices and software necessary for its efficient operation as an integral system.

(c) Internet Modem

The contractor is to provide an internet modem to the equivalent of 30GB data per month or more as required by the Employer's Agent's Representative on site.

3.22 ENVIRONMENTAL MANAGEMENT

The Contractor shall comply with the requirements of the environmental regulations.

The Contractor must always keep site dust free during the construction period.

3.23 AIDS AWARENESS

The Contractor is to have sufficient signage regarding HIV/AIDS, notifying the workers of the dangers, and where to obtain the counselling etc.

3.24 SITE MAINTENANCE

During progress of the work and upon completion thereof, the Site of the Works shall be kept and left in a clean and orderly condition. The Contractor shall store materials and equipment for which he is responsible in an orderly manner and shall keep the Site free from debris and obstructions.

3.25 TESTING AND QUALITY CONTROL

3.25.1 Contractor to engage services of an independent laboratory

Notwithstanding the requirements of the Specifications pertaining to testing and quality control, the Contractor shall engage the services of an approved independent laboratory to undertake all testing of materials, the results of which are specified in, or may reasonably be inferred from, the Contract.

These results will be taken into consideration by the Engineer in deciding whether the quality of materials utilised, and workmanship achieved by the Contractor comply with the requirements of the Specifications. The foregoing shall apply irrespective of whether the specifications indicate that the said testing is to be carried out by the Engineer or by the Contractor.

The Contractor shall be responsible for arranging with the independent testing laboratory for the timeous carrying out of all such testing specified in the Contract, at not less than the frequencies and in the manner specified.

The Contractor shall promptly provide the Engineer with copies of the results of all such testing carried out by the independent laboratory. For the purposes of this clause, an "independent laboratory" shall mean a laboratory certified by the South African National Accreditation Systems (SANAS) or approved by the engineer in writing which is not under the management or control of the Contractor and in which the Contractor has no financial interest, nor which has any control or financial interest in the Contractor.

3.25.2 Additional testing required by the Engineer

In addition to the provisions of subclause, the Contractor to engage services of an independent laboratory, the Engineer shall be entitled at times during the Contract to require that the Contractor arrange with the independent laboratory to carry out any such tests, additional to those described in subclause, at such times and at such locations in the Works as the Engineer shall prescribe. The Contractor shall promptly

and without delay arrange with the independent laboratory for carrying out all such additional testing as required by the Engineer, and copies of the test results shall be promptly submitted to the Engineer.

3.25.3 Costs of testing

(a) Tests in terms of subclause

The costs of all testing carried out by the independent laboratory in accordance with the requirements of subclause above shall be borne by the Contractor and shall be deemed to be included in the tendered rates and prices for the respective items of work as listed in the Bill of Quantities and which require testing in terms of the Specifications. No separate payments will be made by the Employer to the Contractor in respect of any testing carried out in terms of subclause.

Where, because of the consistency of the materials varying or as a result of failure to meet the required specifications for the work, it becomes necessary to carry out additional tests (e.g., re-tests on rectified work and/or replacement materials), the costs of such additional testing shall be for the Contractor's account.

(b) Additional tests required by the Engineer

The costs of any additional tests required by the Engineer in terms of subclause, Additional testing required by the Engineer, shall be reimbursed to the Contractor against substitution of the Provisional Sum allowed therefore in the Bill of Quantities; provided always that the costs of any such additional tests ordered by the Engineer, the results of which indicate that the quality of the materials utilised and/or the standard of workmanship achieved are/is not in accordance with the specifications, shall not be reimbursable to the Contractor.

3.26 CONTRACTOR SUPPLIED EQUIPMENT

The Contractor shall when required to supply any testing, measuring and/or survey equipment for the Engineer's use provide calibration certificates or verification certificates (as appropriate) for all equipment.

This shall apply for both shared equipment as well as for equipment specified to be provided for the Engineer's use on site.

Calibration or verification, by certified authorities shall be subject to the Engineer's approval:

• prior to the delivery of any equipment to the Engineer and
• thereafter at intervals as prescribed for the relevant equipment but not less than every twelve (12) months

The calibration/verification certificate for each item of equipment shall be submitted to the Engineer for approval prior to its use or within seven (7) days of subsequent recalibration/verification.

Unless otherwise provided for in the bill of quantities the cost of providing the above specified equipment.

Failure to submit certificates shall result in payment for the equipment being withheld.

3.27 SUBCONTRACTORS

All matters pertaining to subcontractors and the work executed by them shall be dealt with directly between the Engineer and the Contractor in the context of all subcontract work being an integral part of the Works for which the Contractor is responsible.

The Engineer will not liaise directly with any subcontractors, nor will he issue instructions concerning the subcontract works directly to any subcontractor.

All matters arising from the subcontract agreements shall be dealt with directly between the Contractor and the subcontractors and the Engineer will not become involved.

3.28 OPENING UP AND CLOSING DOWN OF DESIGNATED BORROW PITS

Measurement and payment for opening and closing down designated borrow pits, including removing and stockpiling overburden and restoring the Site, shall be made under item 8.3.4 of SANS 1200 D. This item applies to all borrow material required under this Contract.

The requirements of subclause 5.2.2.2 of SANS 1200 D regarding the opening up, maintenance and closing down of borrow pits shall be adhered to.

3.29 MONTHLY STATEMENTS AND PAYMENT CERTIFICATES

The statement to be submitted by the Contractor in terms of Clause 6.10 of the Conditions of Contract shall be prepared by the Contractor at his own cost, strictly in accordance with the standard payment certificate prescribed by the Engineer, in digital electronic computer format. The Contractor shall, together with a copy of the digital electronic computer file of the statement, submit two (2) A4 size paper copies of the statement.

For the purposes of the Engineer's payment certificate, the Contractor shall subsequently be responsible, at his own cost, for making such adjustments to his statement as may be required by the Engineer for the purposes of accurately reflecting the actual quantities and amounts which the Engineer deems to be due and payable to the Contractor in the payment certificate.

The Contractor shall, at his own cost, make the said adjustments to the statement and return it to the Engineer within three (3) normal workings days from the date on which the Engineer communicated to the Contractor the adjustments required. The Contractor shall submit to the Engineer five (5) sets of A4 size paper copies of such adjusted statement, together with a copy of the electronic digital computer file thereof.

Any delay by the Contractor in making the said adjustments and submitting to the Engineer the requisite copies of the adjusted statement for the purposes of the Engineer's payment certificate will be added to the times allowed to the Engineer in terms of Clause 6.10.4 of the Conditions of Contract to submit the signed payment certificate to the Employer and the Contractor.

Any such delay will also be added to the period in which the Employer is required to make payment to the Contractor.

3.30 WORKMANSHIP AND QUALITY CONTROL

The onus to produce work that conforms in quality and accuracy of detail to the requirements of the Specifications and Drawings rests with the Contractor, and the Contractor shall, at his own expense, institute a quality control system and provide suitably qualified and experienced engineers, foremen, surveyors, materials technicians, other technicians and technical staff, together with all transport, instruments, and equipment to ensure adequate supervision and positive control of the Works always.

The cost of supervision and process control, including testing carried out by the Contractor, will be deemed to be included in the rates tendered for the related items of work.

The Contractor's attention is drawn to the provisions of the various Standardized Specifications regarding the minimum frequency of testing required. The Contractor shall, at his own discretion, increase this frequency where necessary to ensure adequate control. On completion and submission of every part of the work to the Engineer for examination and measurement, the Contractor shall furnish the Engineer with the results of the relevant tests, measurements and levels to demonstrate the achievement of compliance with the Specifications.

3.31 NOMINATED SUBCONTRACTORS

All matters pertaining to nominated subcontractor and the work executed by them shall be dealt with directly between the Engineer and the Nominated Sub-contractor in the context of all civil work being an integral part of the Works.

The Main Contractor is still responsible for the site, upkeep of site, Control of the Site, Local Labour issues.

The Engineer will liaise directly with any work under subcontractors, nor will he issue instructions concerning the subcontract works directly to any subcontractor.

All matters arising from the subcontract agreements shall be dealt with directly between the Contractor and the subcontractors and the Engineer will not become involved.

3.32 MEETINGS

The Contractor shall attend the following meetings during the Contract:

a) An inaugural Site Meeting on Site or as called by the Engineer.
b) Monthly Site Meetings, on Site or as called by the Engineer, from the order to commence the Works until the issue of the Certificate of Practical Completion.
c) The HAZOP study to be called by the Contractor.
d) Technical meetings on Site every second week with the Engineer, from the Inaugural Site meeting until all Contractor's designs are approved by the Engineer.
e) Monthly meetings called by the Engineer to discuss programming and coordination with other contractors.
f) A meeting with the Employer and Engineer to discuss the proposed SCADA and HMI displays and mimics.
g) Ad hoc technical meetings called by the Engineer.
h) Quarterly meetings during the Defects Liability Period called by the Engineer.
i) Servicing visits during the Defects Liability Period, as required.
j) The Contractor will attend a Contractual Meeting when called by Employer.

3.33 PLANNING, PROGRAMMING AND REPORTING

General
Planning and programming of the works is addressed in the Contract Data.

The Contractor shall maintain an updated programme and shall submit this to the Engineer whenever changes are required.

Programming Restrictions
The Contractor shall consider and allow for being on Site whilst civil and building construction work is on-going.

The Contractor shall liaise with the Civil Contractor to ensure safe working conditions and to programme work to minimise disruption of any nature. Disagreements shall be referred to the Engineer for decision.

The Contractor shall also liaise with local authorities regarding the interruption of services (e.g. connection to power supply) and during the commissioning.

Progress Reporting
The Contractor shall submit a written progress report to the Engineer two days before each site meeting.

The Contractor shall further review his progress each month and should progress lag behind the latest accepted programme, by more than 2 weeks, he shall submit a revised programme and method statement of how he proposes to make up the lost time.

If, in the opinion of the Engineer, such revised programme will not make up the lost time, the Engineer shall have the right to request the Contractor to reorganize his work in a manner which will ensure an acceptable programme.

Claims for additional payment to meet any costs incurred due to such reorganisation will not be accepted.

Document format
Programmes shall be submitted in Microsoft Project format in hardcopy and softcopy. Progress claims shall be in Microsoft Excel in accordance with the standard template provided by the Engineer.

3.34 Corrosion Protection

The Contractor shall provide adequate internal supervision to ensure that the requirements of the corrosion protection specifications are adhered to.

In addition, during any of the corrosion protection activities specified, there shall be a senior supervisor available to accept instructions from the Engineer (or an Engineer's Representative, e.g. an appointed inspection authority).

3.35 Weather conditions

Extension of time resulting from abnormal rainfall

Extension of time will not be considered for normal rainfall but only for abnormal rainfall or saturated conditions and will be calculated in accordance with the following method:

a) The Contractor shall, in his programme, allow for the anticipated number of working days on which work could be delayed - as given in the Schedule below.
b) Extension of time will be calculated for each calendar month or part thereof over the full period for the completion of the Work, plus any approved extension thereof, as follows:

i) A delay caused by abnormal rainfall will only be accepted for extension of time if, in the opinion of the Engineer, it delays an item or items which lie on the critical path determined by the Contractor's programme. Only delays on working days will be considered.
ii) Abnormal rainfall will be days, as approved, on which rain delayed operations, less the anticipated number of days given in the Schedule below.
iii) The net extension of time determined for each month, which may be negative, shall accumulate algebraically to determine the net number days for extension of time due to abnormal rainfall, but a negative total at the end of the construction period will not be considered.
iv) Where a portion of a month is involved, a pro rata number of days shall be calculated.

SCHEDULE

Anticipated number of working days on which work could be delayed because of rainfall and saturated conditions.

Month	Days	Month	Days
January	3	July	0
February	3	August	0
March	2	September	0
April	2	October	1
May	2	November	2
June	1	December	2

Extension of time in respect of delays resulting from wet climatic conditions on the Site will only be considered in respect of abnormally wet climatic conditions and shall be determined for each calendar month or part thereof, in accordance with the formula given below:

$$V = (Nw - Nn) + (Rw - Rn)/X$$

in which formula the symbols shall have the following meanings:

V = Potential extension of time in calendar days for the calendar month under consideration:
If V is negative and its absolute value exceeds Nn, then V shall be taken as equal to minus Nn.
When the value of V for any month exceeds the number of days in the particular month, V will be the number of days in the month.

Nw = Actual number of days in the calendar month under consideration on which a rainfall of Y mm or more was recorded on the Site

Nn = Average number of days, derived from existing records of rainfall in the region of the Site, on which a rainfall of Y mm or more was recorded for the calendar month

Rw= Actual rainfall in mm recorded on the Site in an approved rain gauge for the calendar month under consideration

Rn = Average rainfall in mm for the calendar month, derived from existing records of rainfall in the region of the Site

The factor (Nw - Nn) shall be deemed to be a fair allowance for variations from the average number of days during which the rainfall exceeds Y mm.

The factor (Rw - Rn)/X shall be deemed to be a fair allowance for variations from the average number of days during which the rainfall did not exceed Y mm but wet conditions prevented or disrupted work.

(b) The rainfall records at rainfall station number **30934 – Petit** for the period **January 2008** to **June 2018** are reproduced in the accompanying table, and the monthly averages (Rn) for this period shall, for the purposes of this Contract be taken as normal and as the values to be substituted for Rn in the formula above. Data for Nn will be availed once it is obtained. The values of X and Y shall be 20 and 10 respectively

The potential extension of time V has been calculated for each month and year of the period concerned to indicate the possible effect of the rainfall formula.
The values of V were obtained by applying the rainfall formula and using the actual rainfall figures and the calculated values of Rn indicated in the table and Nn that is still to be provided.

(c) The Contractor shall, at his own cost, provide and erect on the Site at a location approved by the Employer's Agent, an approved rain gauge, which shall be fenced off in a manner which will prevent any undue interference by workmen and others. The Contractor shall, at his own cost, arrange for the reading of the rain gauge on a daily basis for the duration of the Contract. The gauge readings, as well as the date and time at which the reading was taken shall be recorded in a separate record book provided by the Contractor for this purpose. All entries in the rainfall record books shall be signed by the person taking the reading and the gauge shall be properly emptied immediately after each reading has been taken. If required by the Employer's Agent, the Employer's Agent shall be entitled to witness the reading of the gauge.

(d) The Contractor's claims in terms of Subclause 42.2 of the Conditions of Contract for extension of time in respect of delays resulting from wet climatic conditions on the Site during each month, shall be submitted in writing to the Employer's Agent monthly;

provided always that

(i) the period allowed to the Contractor in terms of Clause 48 of the Conditions of Contract in which to submit his claim for each month shall be reduced to seven (7) days, calculated from the last day of the month to which the claim applies; and
(ii) the 28-day period allowed to the Employer's Agent in terms of Subclause 42.2 of the Conditions of Contract in which to give his ruling on the claim, shall be reduced to fourteen (14) days.

The Contractor's monthly claim shall be accompanied by a copy of the signed daily rainfall readings for the applicable month.

(e) The extent of any extension of time which may be granted to the Contractor in respect of wet climatic conditions (whether normal or abnormal) shall be determined as the algebraic sum of the "V" values for each month between the Commencement Date and the Due Completion Date of the Contract, calculated in accordance with subclause C3.4.2.6(a) above;
provided always that

(i) rainfall occurring within the period of the Contractor's Christmas shut-down period (referred to in Subclause 1.6 of the Conditions of Contract) shall not be taken into account in the calculation of the monthly "V" values;
(ii) rainfall occurring during any period during which the Contractor was delayed due to reasons other than wet climatic conditions on the Site, and for which delay an extension of time is granted by the Employer's Agent, shall not be taken into account in the calculation of the monthly "V" values;
(iii) if the algebraic sum of the "V" values for each month is negative, the time for completion will not be reduced on account of subnormal rainfall, and
(iv) where rainfall is recorded only for part of a month, the "V" value shall be calculated for that part of the month using pro rata values for Nn and Rn.

(f) The Employer's Agent shall, simultaneous with granting any extension of time in terms of this clause, revise the Due Completion Date of the Contract to reflect an extension of time having been granted in respect of wet climatic conditions, to the extent of the algebraic sum of all the "V" values for all the preceding months of the Contract, less the aggregate of the "Nn" values for the remaining (unexpired) months of the Contract (viz less aggregate of the potential maximum

negative "V" values for the remaining Contract Period). Thus, provided that where such period is negative, the Due Completion Date shall not be revised.

(g) Any extension of time in respect of wet climatic conditions granted in terms of this clause shall not be deemed to take into account delays experienced by the Contractor in repairing or reinstating damage to or physical loss of the Works arising from the occurrence of abnormal climatic conditions. Extension of time in respect of any such repairs or reinstatement regarding damage shall be the subject of a separate application for extension of time in accordance with the provisions of Clause 42 and Clause 48 of the Conditions of Contract.

LEGEND

"AVE" represents the average rainfall for the month

"N DAY RAIN" represents the average number of rain days per month (this data will be made available)

PERIOD: 2008-2018

30459 PETIT Lat:-- -25.55065 Lon: 28.73549 Altitude: 1405

Month	Average Rainfall (mm)	Rain Days (Per Month)
January	99.581	10.2
February	48.578	5.8
March	67.221	7.7
April	37.688	5.3
May	8.850	2.4
June	6.280	1.4
July	0.692	0.8
August	22.058	1.4
September	14.415	1.7
October	44.339	8.1
November	74.082	11.5
December	96.686	10.5

or

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 (3) working days per calendar month.
If normal rainy or inclement weather, resulting in delays, occurs for less than three (3) working days in any calendar month, the difference between the three (3) 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.

Recording of Weather
The Contractor shall provide a rain gauge close to the office of the Engineer or as directed by the Engineer and precautions shall be taken to restrict access to the rain gauge.

3.36 SEQUENCE OF THE WORKS
The Contractor receiving must sequence his programme and works to stay within his provided construction period and to liaise efficiently between the Civil, Mechanical and Electrical Work.

He must also ensure that the existing works is not influenced by the construction works.

3.37 RIGHT OF ACCESS TO SITE
The right of access to Site is specified in the General Conditions.

The Contractor's right of access to and possession of the Site is not exclusive.

3.38 COOPERATION WITH THE EMPLOYER
The Contractor shall ensure that:

a) The Contractor's site staff cooperate with the Employer's staff.
b) The Employer's rules and requirements for operations are adhered to.
c) Site staff are familiar with and comply with the Employer's emergency procedures.
d) Activities of the Site staff do not adversely affect the health and safety of the Employer's staff once the Works is put into operation.

3.39 METHODS AND PROCEDURES

Method statements
The Contractor shall submit the following method statements:

a) Grouting process for puddle pipes.
b) Method statements prescribed by the General Specifications, including the following:
i) Specification AO

Quality plans and control
The Contractor shall prepare a quality management to be followed during the Contract.

The quality management plan shall:

a) clearly indicate the methods, programmes, procedures, and other methods that the Contractor intends using to ensure compliance of materials and workmanship with the requirements of the Contract.
b) include calibration certification of measuring equipment to be used.

Quality Assurance System
The Contractor shall institute a quality assurance system and shall provide experienced personnel as well as all the necessary transport, instruments, and equipment, to always ensure adequate supervision and positive control of the works.

In addition, during any of the corrosion protection activities specified, there shall be a senior supervisor on Site to accept instructions from the Engineer (or an Engineer's representative, e.g. an appointed inspection authority).

3.40 ENGINEERING DESIGNS
This clause is additional to the General Conditions.

DESIGN RESPONSIBILITIES
The design responsibilities are as follows:
Concept Employer responsible
Engineering and layout to tender stage Employer responsible
Detailed design of the Works, including control system.
Contractor responsible for designing the Works in accordance with the Employer's requirements, including the tender drawings.

The Works shall be designed to function safely and effectively in conjunction with the infrastructure provided by others for this project. Where components of the Works are incorporated into structures provided by others, these components shall be designed accordingly.

DRAWINGS PREPARED BY THE EMPLOYER

General
The Contractor's design shall be based on the tender drawings, the existing structures and any existing equipment installations and the Contractor shall ensure that the design can be satisfactorily accommodated.

The Contractor shall accommodate actual dimensions and details measured on Site. Any inconsistencies, including any conflict between the Engineer's drawings and the actual dimensions measured on site, shall immediately be drawn to the attention of the Engineer,
in writing.

Works Constructed by Others
Work carried by others will comply with the terms of the SANS 1200 series of specifications.

The Contractor shall allow for and shall accommodate this level of accuracy and the associated tolerances in the design and execution of the Works:

a) Degree of Accuracy II in terms of SANS 1200G for all the work, as well as further accuracy requirements where so stated:
b) Degree of Accuracy I in respect of all other structures/components and in respect of the other specifications in the SANS 1200 series, unless specified otherwise or otherwise noted on the drawings.

The Contractor shall submit any special accuracy requirement to the Engineer.

3.41 DESIGN PRINCIPLES TO BE COMPLIED WITH

OHS Act
The Contractor is responsible for ensuring that the design of the equipment provided and the installation of this equipment comply with the Occupational health and Safety Act, Act 85 of 1993, and the regulations promulgated thereunder.

Installations which do not comply shall be corrected by the Contractor at no cost to the Employer.

General Safety Requirements
Safety of designs is an overriding consideration.

Equipment which is potentially dangerous shall be designed in accordance with a relevant South African or international Standard which deals with the hazard.

Hazards shall be avoided or guarded to the approval of the Engineer. Nip points shall be guarded. Sharp corners shall be rounded off. Items such as operating handles, supports and protrusions shall be kept clear of access ways or shall be marked clearly.

The Contractor shall cover all unsafe gaps and openings left in structures after installation of the equipment.

Each motor driven device shall be provided with an emergency stop station in an appropriate position.

Trip wires shall be provided along the accessible side/s of moving conveyor belts, chains, etc., irrespective of operating speed and in addition to any guards provided. These shall stop the driving motor when pulled.

General requirements
Design shall ensure safety, robust construction, reliability, durability, prevention of avoidable corrosion, neatness as well as ease of maintenance and operation.

The Contractor's design shall, as applicable, be based on:

• the full range of duties which can be reasonably anticipated.
• the maximum pressure or vacuum which can be produced under all conditions including blocked or closed inlet and outlet circuits.
• conservative service and safety factors based on approved standards or laid down in the printed specifications of reputable and approved manufacturers.
• twenty-four hour per day operation (unless specified otherwise).
• a minimum life of 100 000 hours before major part replacement.
• prevention of serious damage from normal operational problems such as blockages, blinding, jamming, seizure, malfunction and, as far as practical, maloperation.
• machines with non-overloading characteristics shall be selected wherever possible, eg: motors shall be sized so that they cannot be overloaded by the driven machine.

Hazardous Locations
Equipment which is to be installed in areas with hazardous area location zoning for gasses or for dusts in terms of SANS 10108, shall comply with the requirements of that Standard.

Fail Safe Operations
Where damage can occur from normal operational or other foreseeable problems, plant, equipment and systems shall be designed to be fail-safe (i.e. shall have built in redundant elements) or shall be fail-to-safe (i.e. shall return to a safe condition where no further damage can be done in the event of a failure, malfunction, maloperation, overload and, as far as practical, misuse). All reasonable and economically justifiable protections to prevent or limit damage to plant and equipment, particularly in high risk situations, shall be incorporated.

Protections
Protections shall:

• act quickly enough to prevent damage.
• stop, or prevent from starting, all equipment at risk.
• activate an alarm with a labelled indicator on the control panel whenever a protection operates.
• operate reliably after long inactive periods exposed to corrosive and dirty conditions.

Contractors shall highlight equipment limitations which can be exceeded during operation and cannot be guarded against.

Moving Parts
The following general requirements apply to machines and to all equipment with moving parts such as headstocks, extension spindles, swivelling davits, heavy duty hinges, pivots, and the like:

• Rotating or swivelling shafts, pins and the like, shall be adequately supported, guided and restrained by lubricated or self-lubricating bearings, collars and/or bushes.
• Swivelling joints on linkages and the like shall be of the "universal" or fork and rod type with bearings or bushes fitted to the eyes or forks.
• Abrasion resistant materials and slow speed operation shall be used for abrasive applications.
• Susceptibility to fatigue failure shall be minimised by proper design and manufacturing procedures. Sharp changes in section and badly contoured welding shall be avoided especially in components subject to fluctuating stress.
• The locking of nuts and pins in position shall be done to the approval of the Engineer.
• Wearing parts shall be designed for ease of removal and replacement.

Arrangement and Mounting
The design shall take the following requirements into consideration:

• Lifting eyes, lugs, hooks, etc., shall be provided on heavy or large items to facilitate handling.
• Castings and fabrications shall have machined pads for seating and shall be mounted on either soleplates or baseframes as appropriate.
• Where accurate alignment is required, positioning pins and/or jacking screws shall be provided.
• The needs of operation and maintenance including neatness, access, working space, safety, cleaning, adjustment, handling, assembly, alignment, disassembly, removal, etc., shall be accommodated.

Prevention of Corrosion
All items shall be designed to minimise corrosion in the environment in which they will be exposed.

Mastics, sealants, insertion rubber or suitable gasket material shall be used to seal unavoidable crevices between painted carbon steel surfaces or between unpainted stainless steel, e.g. bolted connections.

The design shall ensure that all surfaces to be coated shall be accessible for fettling, blast cleaning, painting and for maintenance of these surfaces.

Stainless steel surfaces shall be accessible for pickling and passivation. The use of back-to-back angles, partially open box sections or inaccessible stiffeners shall be avoided. Inaccessible surfaces which cannot be avoided shall be welded closed.

Particular attention shall be paid to the fabrication and inspection requirements for internal weld surfaces in pipework.

3.42 HAZOP STUDY
The Contractor shall commission a HAZOP study.

The Contractor shall employ a suitably experienced and independent consultant approved by the Engineer to lead the study in accordance with generally accepted industry practice.

The consultant shall provide a report detailing the findings of the study. The study shall be undertaken at a suitable location once the Contractor's Process and Instrumentation Diagrams have been approved by the Engineer for this purpose.

The Contractor's P&IDs shall be modified by the Contractor to reflect the decisions reached.

The Contractor's project manager, mechanical engineering designer and electrical engineering designer shall be present for the full duration of the study. Representatives of the Employer responsible for planning, design, maintenance, and operation will also be present.

3.43 CONTRACTORS DOCUMENTS
The Conditions of Contract requires the Contractor to submit the Contractor's Documents to the Engineer for review.

In accordance with the requirements of the Conditions, the Contractor shall also provide further documents that may be required by the Engineer.

3.44 CONTRACTOR'S NOTICE
In accordance with the Conditions, each submission of Contractor's Documents shall include a Contractor's Notice stating that they are ready for the Engineer's review.

In accordance with the Conditions, the Contractor shall sign each drawing submitted in order to indicate approval of it.

The Contractor's Notice shall include a register of all current Contractor's documents.

3.45 REQUIREMENTS FOR G.A. DRAWINGS & EQUIPMENT DRAWINGS
General arrangement drawings and equipment drawings submitted shall comply with the following:

• Drawings shall be prepared in accordance with the latest issue of SANS 10111 or an equivalent standard.
• Designs shall be represented by two dimensional drawings in first or third angle orthogonal projection.
• General Arrangement drawings shall be to A1 size or larger and shall incorporate the following:
• one plan view and two elevation views. Sectional views shall also be provided where this is necessary for clarity.
• item list which includes the equipment make, model, rating, duty, material of construction and quantity.
• pipework and pipe supports.
• layout dimensions.
• a descriptive drawing title.
• Drawings shall be to scale, with both the scale and the drawing being large enough to clearly show all relevant components of the plant and equipment.
• Requirements for civil and building details to be provided by others shall be specifically noted.
• Three hard copies and an electronic copy of all drawings shall be provided.

3.46 CONTRACTOR'S DOCUMENTS TO BE SUBMITTED

Introduction

The Contractor's Documents to be submitted are listed in the sub-clauses below.

General Arrangement Drawings
• General Arrangement Drawings of the proposed designs.

Operation and Control
• A written description of the control system. This shall include at least as much detail as appears in the specification.
• MFD or PFD (mechanical flow diagram or process flow diagram).
• Motor and instrumentation list.
• Functional Design Specification which complies with General Specifications
• P&ID (Piping and instrumentation diagram) indicating the following as a minimum:

– All items of equipment, instruments, pipe materials and diameters.
– All equipment and instruments shall be tagged in accordance with a system to be approved by the Engineer, and shall be supported by referenced detailed item lists showing brand name, manufacturer's reference number, model number, size, rating, source, duty, quantity etc.
– All pipework shall be labelled with the pipe material and class.
– The Contractor shall base his P&ID on the P&ID provided by the Engineer, updating, and expanding upon this to suit the equipment offered.

Equipment
• Equipment list; including every item of electronic, electrical, and mechanical equipment (e.g., pump, motor, switchgear, PLC, flow meter) to be provided on the Contract shall be listed. The equipment make, model, duty, application, and quantity shall be provided.
• Equipment certified drawings.
• Data sheets for equipment giving performance, sizing, physical and general technical data.
• All equipment inspection and testing reports.
• All pipe shop drawings.
• All pipe support design and drawings, including the calculations for supporting the weight of valves and for restraining thrust forces resulting from pipe reducers, check valves and bends.
• Pump selection design calculations including performance curves including head, power and NPSH required.
• Pump set plinth design and calculations, including the forces exerted on the plinths.
• Baseplate design, including design for anchoring to plinth.
• Design drawings of lifting equipment which indicate the vertical and horizontal limits of the hook bowl.
• Pump Room ventilation design calculations.

Corrosion Protection
• Technical data sheets for all coatings proposed.

LV Installation
• Design and Drawings.
• Cable Schedules and Cable Route Layout Drawings.

LV Motors
• Motor and terminal box construction drawings.
• Motor performance curves (starting current and torque versus speed).
• Type test reports.
• Routine test reports.

Diesel Powered Generator Sets.
• Design and Drawings.
• Fuel tank manufacturing drawing.

LV Switchgear and Control Gear Assemblies
• Design and Drawings.
• Switchgear and Control gear Design Documentation.
• General arrangement drawings.
• Schematic diagrams.
• Certificate of conformance.
• Design documentation as per SANS 1973-1.
• In-house FAT Test Report.
• Switchboard Design (Wiring Schematics, Cubicle component Layouts, Door Layouts, Bus bar arrangement) and General Arrangement Drawings
• LV switchgear Type Test Certificates (as applicable)
• Design calculations for air conditioning of MCC rooms.

MV Installation
• Design and Drawings.
• Cable Route Layout Drawing.
• PLC panel layouts, schematic diagrams and PLC I/O lists.
• Internal construction drawings of the MV equipment
• Detailed datasheets of all components of MV equipment, supplier detail, etc.
• Type Test Certificates for MV Switchgear
• Type Test Certificates for Transformers and minisubs
• Earthing survey report and design
• Lightning protection survey report and design
• Cable schedule for power, data, control, and instrumentation cables. This shall include the cable type, conductor material, insulation, protection, voltage rating, start and finish points, route length, duty, load, voltage drop, core area, no. of cores, no. of cores used and gland size. For cable voltages above 400 Volts, the schedule shall also include the purchase details, specification and date of manufacture.
• Complete wiring and protection diagrams of MV equipment
• Routine Test Reports of MV Switchgear
• Routine Test Reports of Transformers and minisubs

Panels
• Control panel layouts.
• PLC panel layouts, schematic diagrams and PLC I/O lists.

Programmable Logic Controller
• PLC Wiring Schematics
• In-house FAT Test Report

Instrumentation
• Instrumentation data sheets.
• Instrumentation layout drawing.
• Loop diagrams.
• Hook-up drawings

Actuators

• Actuator list (including failsafe positions)
• Actuator and Valve position sensing terminal junction box design drawings
• Distribution junction box design drawings

Operation and Maintenance Manual (Special Conditions)
• Contents List for Manual.
• Two draft copies of the Operation and Maintenance Manual shall be submitted. The Contractor shall correct and re-submit the Manual until it is approved by the Engineer.
• Six copies of the approved Operation and Maintenance Manual.

Training
• Training Schedule.
• Operator Training Manual.

Hazop
• Hazop study report.

2.52 General Items
• Documentation confirming the SANS 347 hazard category and the conformity assessment module applicable to air receivers and other pressure vessels.
• Design drawings of lifting equipment which indicate the loads exerted by lifting equipment on structures as well as the vertical and horizontal limits of the crane hook bowl.
• Floor tolerance and finish requirements for electrical equipment rooms.
• Transformer plinth drawings.
• Marked up drawings of the building and civil structures which indicate the dimensions of the contractor's requirements for items such as plinths, pockets, trenches, ducts, penetrations, conduits, etc. as well as any loads and forces involved.
• Proposed designs of pipe supports and the calculation for pipe supports designed to withstand the thrust from reducers, bends and check valves,
• Signage design.

3.47 Administrative

• Quality Assurance Plans for the Works.
• Quality Control Procedures (QCPs) for all items to be fabricated and coated, showing hold points for inspection by the Engineer.
• Contractor’s Health and Safety Plan.

3.48 Tests on Completion

• Report containing the records of commissioning tests undertaken and the results of these, demonstrating that the Works have passed the commissioning tests. If applicable, the report shall include the SCADA system commissioning procedure and schedule of alarm messages.
• Training logs and weekly reports detailing the plant performance, problems and equipment failures during the Trial Operation Period.
• At the end of the Trial Operation Period, an overall report.
• Reports during the Defects Liability Period.

3.49 PREPARATION

Installation work shall be complete and approved by the Engineer prior to commissioning.

The Contractor shall advise the Engineer when instructions may be given to the contractor to execute any necessary screeding and finishing around the Works if this is specified. Contractors shall allow a reasonable period in their installation programme for this work to be done and no compensation for delay in the commencement of testing and commissioning shall accrue to the Contractor during such period.

Before starting up any section of the Works, the Contractor shall make all necessary checks to ensure that the installation has been correctly carried out, that all ducts, pipework, tanks, etc., are clean, that all equipment is correctly aligned, lubricated, and connected, and is in all respects ready to start with safety.

The Contractor shall provide initial fill requirements, such as lubricating oil.

3.50 CONTROL SYSTEM

Function Testing

The Contractor shall submit a schedule of all control functions to be checked on Site. This shall be submitted to the Engineer before commissioning. The format shall be as follows, or similar:

COMMISSIONING - CONTROL SYSTEM TESTS
Date
Test Function
Test Method
Result (e.g. SCADA message, etc.)
Proposed Corrective Action

3.51 STARTING UP

The Contractor shall arrange for the Engineer to be present at initial start-up and also for electrical and control instrumentation sub-contractors to be present.

The Contractor shall start up and test each section of the Works. These tests shall be carried out to certify that the Works is operating in accordance with the requirements specified and must be witnessed by the Engineer.

All necessary modifications and rectifications shall be carried out during this period.

Setpoints for equipment and process parameters which are required for the operation of control systems shall be confirmed and recorded.

3.52 PERFORMANCE ACCEPTANCE

The Contractor shall demonstrate to the Engineer that the Works operates as specified by operating the control system over a period of at least three consecutive days.

3.53 COMMISSIONING

General

When all tests have been completed to the approval of the Engineer, the Works shall be commissioned.

Unless the Engineer states otherwise, all the Works, including control functions and control systems shall be commissioned together and the process performance requirements shall be achieved during normal operation.

Report

A comprehensive commissioning test report, including the SCADA system commissioning procedure and schedule of alarm messages, shall be submitted by the Contractor prior to issue of the Certificate of Practical Completion.

A copy shall be inserted in the Manual.

3.54 TRIAL OPERATION PERIOD

Once the Works has been commissioned to the approval of the Engineer, the Trial Operation Period shall start and shall consist of a continuous period of operation free from trouble.

Unless otherwise stated, this period shall be Twenty-four (24) weeks.

During the first half of the Trial Operation Period, the Contractor shall operate the Works and shall carry out all necessary servicing and any adjustments required.

During the second half of the Trial Operation Period, the Contractor shall supervise the Employer’s staff who will operate the Works.

The Contractor shall provide operational and maintenance training during this Period.

3.55 TRAINING

General

Prior to the Trial Operation Period, the Contractor shall provide training in water treatment principles to the Employer's operational and maintenance staff members. This training shall be provided by an approved, accredited service provider for one to two weeks.

During the Trial Operation Period, the Employer's site staff will assist the Contractor in operating the plant and the Contractor shall train these staff in the operation of the plant and shall train the Employer's maintenance staff on the maintenance requirements and procedures.

Tuition shall be for 4 operational staff members and 2 maintenance staff members. The Contractor shall liaise directly with the Employer to arrange a mutually convenient time for the training to be undertaken, bearing in mind that the staff work on a shift basis and all shift workers are to be trained.

The Contractor shall also provide each trainee with a printed copy of the Operating and Training Manual which forms part of the Operation and Maintenance Manual.

Further training during the Defects Liability Period is specified elsewhere.

Operational and Maintenance Tuition
The Contractor shall provide the following tuition (as applicable to the Contract):

a) Start up, shut down and operating instruction for all operational modes for the Works shall be provided. This shall be comprehensive and shall include actions to be taken in the case of all alarm conditions and basic fault finding.
b) A layout drawing of the installation, a process flow diagram, and a P&ID shall be provided for each Operator.
c) If the specified control system is SCADA based, the tuition shall include instruction on the SCADA system.

Electrical Engineering Staff Tuition
The Contractor shall provide the following tuition (as applicable to the Contract):

a) Control system software instruction.
b) Detailed overview of 11 kV protection and settings.
c) Tuition on setting of 11 kV protection.
d) Motor protection relay and settings.
e) Overview of PLC programming for the purposes of making changes and re-loading programs if PLCs are replaced.

Certificates
Each trainee shall be provided with certification for each training session if the trainee has demonstrated understanding thereof. Certificates shall indicate the Contractor's name and shall be signed by the trainer.

3.56 INSPECTION BEFORE COMPLETING THE WORKS

At the end of the Trial Operation Period, an inspection shall be done by the Contractor and the Engineer for the purpose of completing the Works in terms of the Conditions of Contract.

3.57 DEFECTS LIABILITY

The Contractor's responsibilities during the Defects Liability Period are specified in the General Conditions of Contract.

Additionally, the Contractor shall also identify defects and damage to the Works or part thereof. This shall take place on the day of the Site meetings planned during the Defects Liability Period, prior to the Engineer's arrival. These Site meetings will be held 3, 6, 9, 12, 15, 18 and 24 months after the issue of the Certificate of Practical Completion at 12:00 on dates designated by the Engineer.

In addition, the Contractor shall make regular monthly visits to the installation during the Defects Liability Period to service, train and supervise the operation and maintenance of the equipment. During these visits, the Contractor shall make all adjustments and do everything necessary to ensure the proper running of the equipment and shall undertake all monthly servicing requirements of the equipment for the Works, including all costs thereof.

The Contractor shall submit a monthly report to the Engineer on:

a) indicating the condition of equipment and servicing work carried out,
b) any adjustments which have been made,
c) any further instruction to the operator, including identification of weak areas and training provided,
d) the degree to which the operator has been conversant with the equipment,
e) the contractor will keep record of the upkeep of the plant and pumps etc.

The defects and damage shall be communicated to the Engineer at these Site meetings.

The Engineer will inspect the Works and instruct the Contractor on work required to be remedied, including issues identified by the Engineer.

CIVIL SPECIFICATIONS

C3.4 : CONSTRUCTION

C3.4.1 STANDARD SPECIFICATIONS

The standard specifications on which this contract is based on the following SANS specifications are also referred to in this document and the Contractor is advised to obtain them from Standards South Africa (a division of SABS) in Pretoria.

PART A: GENERAL
A1 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 Employer's Agent."

PS2 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 Employer's Agent. 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.
- Expected weather conditions and their effects.
- Known physical conditions or artificial obstructions
- The requirements and effects of local Labour.
- The accommodation and safeguarding of public access and traffic
- Period within the works shall commence.
- Months during which surfacing limitations should apply.

(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".

PS2 WORKMANSHIP AND QUALITY CONTROL

Add the following to the third paragraph:
"The Employer's Agent 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 Employer's Agent 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 Employer's Agent 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."

PS3 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 Employer's Agent. 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 Employer's Agent shall be borne by the Contractor."

PS4 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 Employer's Agent 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 Employer's Agent
(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."

Add the following to this clause (1209)
"(g) Brandnames
Where materials have been specified by brandnames, the rates tendered will be held to have been based on that material. Other similar materials may be submitted to the Employer's Agent for approval.
(h) Payments Certificates
With reference to Sub-Clause 52(1) of the General Conditions of Contract, the Employer's Agent's certificate will be issued only after receipt by him of a draft certificate prepared by the Contractor in the form prescribed by the Employer's Agent.
The cost of duplicating and delivering copies of the Employer's Agent's Certificate to the Contractor, the Employer's Agent and the Employer shall be borne by the Contractor. A total of three copies of the certificate (A-4 size) will be required by the Employer's Agent and the Employer."

PS5 EXTENSION OF TIME RESULTING FROM ABNORMAL RAINFALL

(a) Extension of time in respect of delays resulting from wet climatic conditions on the Site will only be considered in respect of abnormally wet climatic conditions and shall be determined for each calendar month or part thereof, in accordance with the formula given below:

$$V = (Nw - Nn) + (Rw - Rn)/X$$

in which formula the symbols shall have the following meanings:

V = Potential extension of time in calendar days for the calendar month under consideration:
If V is negative and its absolute value exceeds Nn, then V shall be taken as equal to minus Nn.
When the value of V for any month exceeds the number of days in the particular month, V will be the number of days in the month.

Nw = Actual number of days in the calendar month under consideration on which a rainfall of Y mm or more was recorded on the Site

Nn = Average number of days, derived from existing records of rainfall in the region of the Site, on which a rainfall of Y mm or more was recorded for the calendar month

Rw= Actual rainfall in mm recorded on the Site in an approved rain gauge for the calendar month under consideration

Rn = Average rainfall in mm for the calendar month, derived from existing records of rainfall in the region of the Site

The factor (Nw - Nn) shall be deemed to be a fair allowance for variations from the average number of days during which the rainfall exceeds Y mm.

The factor (Rw - Rn)/X shall be deemed to be a fair allowance for variations from the average number of days during which the rainfall did not exceed Y mm but wet conditions prevented or disrupted work.

(b) The rainfall records at rainfall station number 30934 – Petit for the period January 2008 to June 2018 are reproduced in the accompanying table, and the monthly averages (Rn) for this period shall, for the purposes of this Contract be taken as normal and as the values to be substituted for Rn in the formula above. Data for Nn will be availed once it is obtained. The values of X and Y shall be 20 and 10 respectively
The potential extension of time V has been calculated for each month and year of the period concerned to indicate the possible effect of the rainfall formula.
The values of V were obtained by applying the rainfall formula and using the actual rainfall figures and the calculated values of Rn indicated in the table and Nn that is still to be provided.

(c) The Contractor shall, at his own cost, provide and erect on the Site at a location approved by the Employer's Agent, an approved rain gauge, which shall be fenced off in a manner which will prevent any undue interference by workmen and others. The Contractor shall, at his own cost, arrange for the reading of the rain gauge on a daily basis for the duration of the Contract. The gauge readings, as well as the date and time at which the reading was taken shall be recorded in a separate record book provided by the Contractor for this purpose. All entries in the rainfall record books shall be signed by the person taking the reading and the gauge shall be properly emptied immediately after each reading has been taken. If required by the Employer's Agent, the Employer's Agent shall be entitled to witness the reading of the gauge.
(d) The Contractor's claims in terms of Subclause 42.2 of the Conditions of Contract for extension of time in respect of delays resulting from wet climatic conditions on the Site during each month, shall be submitted in writing to the Employer's Agent monthly;

provided always that

(i) the period allowed to the Contractor in terms of Clause 48 of the Conditions of Contract in which to submit his claim for each month shall be reduced to seven (7) days, calculated from the last day of the month to which the claim applies; and
(ii) the 28-day period allowed to the Employer's Agent in terms of Subclause 42.2 of the Conditions of Contract in which to give his ruling on the claim, shall be reduced to fourteen (14) days.

The Contractor's monthly claim shall be accompanied by a copy of the signed daily rainfall readings for the applicable month.

(e) The extent of any extension of time which may be granted to the Contractor in respect of wet climatic conditions (whether normal or abnormal) shall be determined as the algebraic sum of the "V" values for each month between the Commencement Date and the Due Completion Date of the Contract, calculated in accordance with subclause C3.4.2.6(a) above;
provided always that

(i) rainfall occurring within the period of the Contractor's Christmas shut-down period (referred to in Subclause 1.6 of the Conditions of Contract) shall not be taken into account in the calculation of the monthly "V" values;

(ii) rainfall occurring during any period during which the Contractor was delayed due to reasons other than wet climatic conditions on the Site, and for which delay an extension of time is granted by the Employer's Agent, shall not be taken into account in the calculation of the monthly "V" values;
(iii) if the algebraic sum of the "V" values for each month is negative, the time for completion will not be reduced on account of subnormal rainfall, and
(iv) where rainfall is recorded only for part of a month, the "V" value shall be calculated for that part of the month using pro rata values for Nn and Rn.

(f) The Employer's Agent shall, simultaneous with granting any extension of time in terms of this clause, revise the Due Completion Date of the Contract to reflect an extension of time having been granted in respect of wet climatic conditions, to the extent of the algebraic sum of all the "V" values for all the preceding months of the Contract, less the aggregate of the "Nn" values for the remaining (unexpired) months of the Contract (viz less aggregate of the potential maximum negative "V" values for the remaining Contract Period). Thus, provided that where such period is negative, the Due Completion Date shall not be revised.

(g) Any extension of time in respect of wet climatic conditions granted in terms of this clause shall not be deemed to take into account delays experienced by the Contractor in repairing or reinstating damage to or physical loss of the Works arising from the occurrence of abnormal climatic conditions. Extension of time in respect of any such repairs or reinstatement regarding damage shall be the subject of a separate application for extension of time in accordance with the provisions of Clause 42 and Clause 48 of the Conditions of Contract.

LEGEND

"AVE" represents the average rainfall for the month

"N DAY RAIN" represents the average number of rain days per month (this data will be made available)

PERIOD: 2008-2018

30459 PETIT Lat:-- -25.55065 Lon: 28.73549 Altitude: 1405

Month	Average Rainfall (mm)	Rain Days (Per Month)
January	99.581	10.2
February	48.578	5.8
March	67.221	7.7
April	37.688	5.3
May	8.850	2.4
June	6.280	1.4
July	0.692	0.8
August	22.058	1.4
September	14.415	1.7
October	44.339	8.1
November	74.082	11.5
December	96.686	10.5

or
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 (3) working days per calendar month.
If normal rainy or inclement weather, resulting in delays, occurs for less than three (3) working days in any calendar month, the difference between the three (3) 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.

PS6 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, e.g. 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

Old product nomenclature	Typical new product nomenclature	
	Cement type	Cement strength class
OPC	CEM I CEM I	32,5 32,5R
RHC	CEM I CEM I	42,5 42,5R
LASRC	No provision made	No provision made
PC15SL	CEM II/A-S CEM II/A-S CEM II/A-S	32,5 32,5R 42,5
PC15FA	CEM II/A-V CEM II/A-V CEM II/A-W CEM II/A-W	32,5 32,5R 32,5 32,5R
RH15FA	CEM II/A-V CEM II/A-V CEM II/A-W CEM II/A-W	42,42,5R 42,5 42,5R
PBFC	CEM III/A CEM III/A	32,5 32,5R
PFAC	CEM II/B-V CEM II/B-W	32,5 32,5
PFAC	CEM II/B-V CEM II/B-W	32,5 32,5
RH30SL	CEM II/B-S CEM II/B-S	32,5R 42,5
RH40SL	CEM III/A CEM III/A	32,5R 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:

"PS7: IN-SERVICE AND STRUCTURED TRAINING

The contractor shall in addition to the structured (accredited) training if any, 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 contractor shall attach to form RDP 1(E) basic details of his proposed in-service training programme, which details shall inter alia include the following:

- the details of training to be provided
- the manner in which the training is to be delivered
- the number and details of trainers to be utilised.

(ii) 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.

(iii) The contractor shall provide on site, 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.

(iv)All labourers shall be remunerated in respect of all time spent undergoing training.

(v) 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".

PS8 COMMUNITY LIAISON OFFICER (CLO)

The contractor or his appointed agent will appoint a Community Liaison Officer (CLO) after consultation with the local communities, the Employer's Agent 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 07h00 and 17h00 and at other times as the need arises. His normal working day will extend from 07h00 in the morning until 17h00 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 Employer's Agent 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 (CLO).

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 and not necessarily for the full duration of the contract. The remuneration of the CLO shall be determined by the Employer with a minimum salary of R 5 000.00 per month.

(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, Employer's Agent and employer at a maximum period of a six months basis, but with the option of renewal.

PS9 SUBCONTRACTORS
Over and above the stipulations of clause 4 of the General Conditions of Contract 2015, 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 Employer's Agent. Subletting shall in all cases be critically considered by the Employer's Agent.
In addition to the provisions of clause 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 Employer's Agent. Subcontracting shall in all cases be critically considered by the Employer's Agent. The Employer's Agent 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.

PS10 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 Obligation rates in Section 1300 of the SOQ.

PS11 HEALTH AND SAFETY ACT 1993
The contractor shall provide the following:

- Contractors initial obligations in respect of the OHS Act and Constructions regulations
- Provision of full-time Health and Safety officer
- Submission of the Health and Safety file

PS12 MEASUREMENT AND PAYMENT

Add the following items:

"ITEM UNIT

PS12.01 a) Protecting and relocating of existing services Provisional Sum

b) Handling costs and profit in respect of sub item B1201 a) Percentage (%)

ITEM UNIT

PS12.02 Provision for a Community Liaison Officer

Provisional sum for the payment of the Community Liaison Officer (R 6,000.00 / month) 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

PS12.03 Payment of PSC member

a) Provisional sum for the payment of the PSC (at R600/month) Provisional Sum

b) Handling cost and profit in respect of sub-item B12.34 a) Percentage (%)

Item Unit

PS12.36 Occupational Health and Safety obligations

a) Contractors initial obligations in respect of the Occupational Health and Safety Act and Construction Regulations Provisional sum

b) Contractors time related obligations in respect of the Occupational Health and Safety Act and Construction Regulations Month

c) Provision of full time health and safety officer Month

d) Submission of the health and safety file Lump sum

e) Handling cost in relation to B1236 d) Percentage (%)

Payment of the rate per month for sub-item B12.36 b) shall include full compensation for all the contractors' obligations relevant to the Occupational Health and Safety Act No 85 and Amendment Act No 181 of 1993, and the OHSA 1993 Construction Regulations 2003 issued on 18 July 2003 by the Department of Labour.

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.

CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS

PSA 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 thirty (30) workers 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 Employer's Agent. 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.

(1) Housing

The Contractor shall not erect any housing on the site of the works. The Contractor shall make all the necessary arrangements for accommodation of his personnel in approved areas.

(2) Services

The Contractor shall at his own expense, make the necessary connections to any utility services required by him for the execution of the works.

(3) Sanitation

The Contractor shall provide suitable sanitary arrangements for his staff at his campsite. If outside latrines are provided, they shall be of a neat construction and shall be provided with doors and locks. They shall be to the satisfaction of the Employer's Agent and the Local Authorities.

The Contractor shall provide at each work site at least one portable chemical latrine for use by construction workers. The latrines shall be serviced daily and maintained in good condition.

The Contractor shall be responsible for providing all necessary services to keep the latrines for himself, the Employer's Agent and the subcontractors and the Site in a clean, neat and hygienic condition, including the cost of refuse removal and disposal from the Site and from all accommodation provided by him.

If the Contractor fails to provide and / or maintain all Site sanitation facilities in a clean and hygienic condition the Employer's Agent may order the Contractor to suspend any or all work on the Site until the requirements of the Specifications are met. No payment shall be made for any delays or disruption of the Works caused thereby nor shall extensions of time be granted for such delays.

On completion of the Contract, the Contractor shall remove the sanitation system and reinstate the area to the satisfaction of the Employer's Agent. No separate payment will be made for this work and the Contractor shall allow for this in his tendered rates for establishment.

(4) Security

The Contractor shall provide adequate security and strict control of access to the campsite on a 24-hour basis including weekends and public holidays. The campsite area shall be adequately fenced with security fencing and security lights placed at strategic points. Notices to indicate that unauthorised persons may not enter the campsite area shall be erected at prominent locations as agreed with the Employer's Agent.

All costs in connection with the provision of security shall be allowed for by the Contractor in his tendered rates for establishment on site.

(5) Environmental Protection

Construction will take place within the existing road reserve and every precaution must be taken to protect the established vegetation and roadside facilities. It is therefore essential that the Employer's Agent be continually consulted throughout the contract period to ensure that environmental considerations are satisfied.

Failure to show adequate consideration to the environmental aspects of this contract will be sufficient for the Employer's Agent to have the Contractor's representative or any other Contractor's employee(s) removed from the site in terms of Clause 24 of the General Conditions of Contract.

The following conditions have been imposed and shall be strictly complied with:

Personnel and plant shall not enter property beyond the road reserve boundary irrespective of whether the boundaries are fenced off or not.

The Contractor shall, to the satisfaction of the Employer's Agent, take every necessary precaution to prevent the contamination of any watercourses.

The Contractor shall plan his activities so that materials, in so far as is possible, can be transported direct to and placed at the point where they are to be used. However, where utilising materials in this manner is impractical, it shall be temporarily stockpiled for later loading and transportation to where it will be used.

Stockpiling areas shall be indicated to and approved by the Employer's Agent. Before any stockpiling of material may be done, the site shall be cleaned, and all loose stones or any plant or other material which may cause pollution shall be removed. After the stockpiled material has been removed, the site shall be reinstated as closely as possible to its original condition.

The Contractor shall be responsible for the establishment of a refuse control system for the collection and removal of refuse from the campsite and working areas.

The Contractor shall ensure that waste and surplus food, food packaging plastic and organic waste are not deposited by his employees anywhere on the site except in refuse bins for removal. If his employees are to eat elsewhere on site than in the campsite, the Contractor shall designate restricted places for eating in his working areas, shall provide adequate refuse containers in all these places and shall remove the refuse and clean up any remaining food containers immediately after mealtimes.

The Contractor has no right to the trees and shrubs on the site.
No bituminous material or waste material shall be dumped within the road reserve, even if only as a temporary measure. Provision shall be made to remove such excess material directly off the site to spoil areas to be provided by the Contractor".

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.

Should the contractor be of the opinion that 15% is inadequate to cover his costs in terms of section 1300, he shall indicate separately with his Tender where such costs have been allowed for in his Tender. If no such indication is given, the contractor shall not at any stage during the contract for any reason whatsoever claim additional compensation under this item."

PSAB: HOUSING, OFFICES AND LABORATORIES FOR THE EMPLOYER'S AGENT'S SITE PERSONNEL

PSAB 1 OFFICES AND LABORATORIES

(a) General

"The facilities to be provided for the Employer's Agent 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 Employer's Agent's establishment may be incorporated within the contractor's establishment provided that the preceding requirements are met to the satisfaction of the Employer's Agent.
Separate payment shall be made for the provision and erecting of the security fence and gate, 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 Employer's Agent'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."

Provision of Photostat facilities

(xix) The contractor shall provide for general use the photo copying equipment with the necessary ink and paper to produce black and white as well as colour copies complete with power supply.

(xx) Supply of computers, printers and related equipment.

The contractor shall supply the Employer's Agent with HP Probook 470 G2 core 17 or higher complete windows 7 professional, with latest version of office and Ms Projects, the up to date antivirus and Winzip. The contractor shall also provide a print, scan and copy combo machine for the exclusive use of the Employer's Agent`s staff.

(xxi) Supply of survey services, assistants and survey equipment. The contractor shall provide the services of a qualified Engineering surveyor complete with assistants and equipment.

PSAB 3 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 call 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 Employer's Agent'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 Employer's Agents site staff of the supplied cellular telephones."

ITEM		UNIT
B1411 1.	Supply of Computer, Printer and related equipment (HP with windows 7)	Number (No)
Computers		
Personal computer (Laptop type with windows 7)		Number (No)
Printer		
Colour printer with scan and fast capabilities		Number (No)
Software as specified		
(ii)	Microsoft office professional	Number (No)
(iii)	Ms Project (latest version)	Number (No)
Antivirus software		Number (No)
Winzip (latest version)		Number (No)
Handling cost and profit in respect of B1407		Percentage (%)

ITEM	UNIT
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 Employer's Agent. 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 Employer's Agent's supervisory staff at the completion of the contract."

Supply of survey services, assistants and survey equipment (for the duration of the project)

Supply of GPS and dumpy level	Number (No)
Provision of survey assistants	Number (No)

DAYWORK SCHEDULE

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

B1801 SCOPE

This section covers the listing of day work 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 Employer's Agent 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 Employer's Agent.

B1802 ORDERING OF DAYWORK

No day work shall be undertaken unless specific written authorisation is obtained from the Employer's Agent.

B1803 MEASUREMENT AND PAYMENT

The Employer's Agent may order the following day work items:

ITEM	DESCRIPTION	UNIT
B18.01	Labourers:	
	Unskilled	Hour (h)
	Semi-skilled	Hour (h)
	Skilled	Hour (h)
B18.02	Foreman	Hour (h)
B18.03	Tipper trucks:	
	3 – 5 ton	Hour (h)
	5,1 – 10 ton	Hour (h)
B18.04	Loader (0,5m3)	Hour (h)
B18.05	Grader (CAT 140G or similar)	Hour (h)
B18.06	LDV	Hour (h)
B18.07	Compaction Rollers:	
	Vibrator roller	Hour(h)
	Tamping roller	Hour (h)
	Grid roller	Hour(h)
B18.08	Hand Controlled Compactors	
	Pedestrian roller (Bomag BW90)	
	Vibratory plate	Hour(h)
	Rammers	Hour(h)
	Water truck (min 10000 l)	Hour(h)
B18.09	Dozer (D7 or similar)	Hour(h)
B18.10	Provisional sum allowed for day	Hour(h)
B18.11	works	Sum

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 40(3) 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 day work items listed in the bill of quantities in terms of the above specifications. In the event of new day work 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 Employer's Agent regarding the classification and composition of all labourers in terms of "unskilled" and "skilled" labourers required for the work as ordered by the Employer's Agent."

CB 2.5 MANAGEMENT OF THE WORKS

CB 2.5.1 Planning and Programming

The program referred to in Clause 5.6 of the GCC shall be a network-based program in accordance with the precedence method; a detailed cash flow graph indicating projected monthly invoice amounts shall also be provided. The critical path of the program of work shall be clearly indicated and the program monitored continually and updated monthly by the Contractor in accordance with his progress.

1. In compiling the program of work, the Contractor shall incorporate the following important specific requirements and constraints:

(a) The identification and marking of affected services prior to commencing construction works.

(b) The requirements of the Environmental Management Plan (EMP) as specified in the relevant sections of the Particular Specifications and the requirements in respect of inspections and community liaison.

(c) The requirements of the Occupational Health Safety (OHS) Act of 1993 and the Construction Regulations, 2003.

(d) The relocation of services.

(e) An allowance to accommodate "normal" rain days.

(f) The recorded water table in certain parts of the site and a requirement to make timeous arrangements in this regard to enable the permanent work to proceed in an orderly manner.

2. Particular attention shall be given to the concurrent construction activities of the Employer and/or his Contractors responsible for the mechanical, electrical and electronic works. In this regard, the Contractor shall ensure that access is provided timeously for the purpose of the erection, installation and commissioning of the plant, equipment and cabling at appropriate times during the contract period.

3. The sequence for completion of the Works required to acknowledge the constraints imposed by operating exciting facilities either uninterrupted until additional processing capacity is provided by the completion of portion of the new work included in this contract, or partially interrupted in consultation with the Employer.

4. The program submitted shall include at least the following details:

(a) A work breakdown structure identifying the major activity groups.

(b) For each activity group further details shall be provided with regard to the start and end dates of the separate work sites as identified in the Schedules of Quantities and as shown on the drawings.

(c) The critical path shall be indicated and floats on non-critical activities shall be shown.
(d) The working hours per day, week and month allowed for in the program with details of resource allocations per activity.
(e) Production rates for key activities e.g. excavate and place, compaction, concrete, etc.

5. In addition the Contractor shall submit to the Employer's Agent at monthly intervals a progress report indicating the following details:

(a) Work completed in previous month and total progress to date, per activity.

(b) Activities behind program, for which the Contractor shall detail all reasons for such delays as well as the measures to be implemented to make up delays.

(c) A GANTT chart showing the original program, the latest approved version of the program, actual progress achieved and revised completion dates, if and when applicable. Failure to comply with all of the foregoing requirements shall entitle the Employer's Agent to use a program based on his own assumptions to evaluate claims for extension of time for completion of the works, or for additional compensation.

CB 2.5.2 **Quality Management**

CB 2.5.2.1 **General**

The Contractor's Quality Management System stall include quality management objectives, policies, organization, procedures and work instruction that comply with the requirements of ISO 9001/2000.

CB 2.5.2.2 **Project Quality Plan**

The Contractor shall within 20 days from the commencement date submit a Project Quality Plan for the Contract. The Plan shall indicate how the Quality System shall apply to the specific requirements of the Contract to ensure compliance of the Works with the requirements of the Specifications. The Project Quality Plan shall be subject to the approval of the Employer's Agent.

CB 2.5.2.3 **Quality Control Plans**

Quality Control Plans shall be prepared by the Contractor and/or his subcontractors for each group of activities. Where applicable, approved plant, equipment or services required to realize the specific component shall be included.
Quality Control Plans shall be submitted to the Employer's Agent for approval and for the inclusion of his construction monitoring activities before any construction of the permanent works may commence.

The following surveillance requirements shall be included for affirmation by the Employer's Agent or his representative.

Record (R) Documentary evidence of the activity and statistical analysis of the data to be retained and copied to the Employer's Agent.

Verification (V) The Employer's Agent or his representative will not necessarily be present during the activity but documentary evidence to permit verification of compliance with the requirements is generated, retained and copied to the Employer's Agent.

Witness (W) The Employer's Agent or his representative requires notification to permit witnessing of the activity. The notice period shall be agreed to depending on the nature of the activity and shall be reviewed from time to time. Documentary evidence shall be retained and copied to the Employer's Agent.

Hold (H) The Contractor may not proceed to the following activity until the Employer's Agent or his representative has approved the proceeding activity. Documentary evidence shall be retained and copied to the Employer's Agent.

Random (R) Construction monitoring by random inspection. Random construction monitoring may be carried out at any stage of the activity or preparation for the activity. Documentary evidence shall be retained and copied to the Employer's Agent.

CB 2.5.2.4 Categorisation

The following categories shall apply in determining the requirement for a Quality Control Plan

Category	Clarification	Quality Control Plan
Critical	A component, group of components, structure, and the failure of which to comply with the specifications may affect the performance of the works of which it is a part and /or will cause a detrimental environmental impact, and /or may result in hazardous or unsafe conditions.	Required for all components.
Major	A component, group of components, structure, element of a structure or facility, other than categorized as critical, the failure of which to comply with the specifications may compromise the performance of the works of which it is a part, result in increased, maintenance and/or impact negatively on the quality of the works.	As determined by the Contractor and to the approval of the Employer's Agent.
Minor	All items other than those categorized as Critical or Major and which are visible and capable of rectification during routine inspections.	As determined by the Contractor

CB 2.5.2.5 Quality Management Audit

The Contractor shall carry out periodic assessments of the adherence to the Quality Plan and Quality Control Plans by senior qualified staff who are not normally employed on the Site. The Employer's Agent and/or his representative shall be invited to attend at the periodic assessments meeting and be afforded the opportunity to report on the implementation of the Quality System at the Site. The assessment reports shall be copied to the Employer's Agent.

CB 2.5.2.6 Corrective Action

Failure to confirm to the specified requirements will result in the moue by the Employer's Agent of a Corrective Action Request. Failure to rectify the deficiencies covered by a Corrective Action Request within the period stated will result in the Employer's Agent invoking the provisions of GCC Clause 7.9 – Removal of Improper Work and Materials.

CB 2.5.3 Environmental Management during Construction

The contractual requirements for environmental management are comprehensively set out in Section C.3.4.7 Additional Specifications: PC Environmental Management during Construction.

C3.4.3 PROJECT SPECIFICATIONS: ADDITIONAL SPECIFICATIONS

CONTENTS

C3.4.3.1 OCCUPATIONAL HEALTH AND SAFETY ACT 1993: HEALTH AND SAFETY SPECIFICATION

CONTENTS

C3.4.3.1 OCCUPATIONAL HEALTH AND SAFETY ACT 1993: HEALTH AND SAFETY SPECIFICATION

C3.4.3.1.1 Introduction

In terms of the Construction Regulation 4(1) (a) of the Occupational Health and Safety Act, No. 85 of 1993, Thembisile Hani Local 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 Thembisile Hani Local 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.

C3.4.3.1.2 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.

C3.4.3.1.3 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 Thembisile Hani Local Municipality as possibly applicable to the abovementioned contract work. It is, by no means, exhaustive and is offered as assistance to Contractors intending to tender.

(ii) Development of Risk Assessments

Every Principal Contractor performing Construction work shall, before the commencement of any Construction work or work associated with the aforesaid Construction work and during such work, cause a Risk Assessment to be performed by a competent person, appointed in writing, and the Risk Assessment shall form part of the OH&S Plan and be implemented and maintained as contemplated in Construction regulation 5(1).

The Risk Assessment shall include, at least:

- the identification of the risks and hazards to which persons may be exposed to
- the analysis and evaluation of the risks and hazards identified
- a documented plan of safe work procedures to mitigate, reduce or control the risks and hazards that have been identified
- a monitoring plan and
- a review plan

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 Risk Assessments, together with the site-specific OH&S rules must be submitted to the Thembisile Hani Local Municipality before mobilisation on site commences.
Despite the Risk Assessments listed in Annexure 7, 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.

(iii) 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 Thembisile Hani Local 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 19960 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 OHS Act

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

The Principal Contractor must, furthermore, provide Thembisile Hani Local 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.

Where necessary, or when instructed by the Thembisile Hani Local Municipality or an Inspector of the Department of Labour, the Principal Contractor must appoint a competent OH&S Officer subject to the approval of the Thembisile Hani Local Municipality
In addition Thembisile Hani Local 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)

Where the Principal Contractor employs more than 20 persons (including the employees of other Contractors (sub-contractors) he has to appoint one OH&S Representatives for every 50 employees or part thereof. General Administrative Regulation 6 requires that the appointment OR election and subsequent designation of the OH&S Representatives are executed in consultation with Employee Representatives or Employees. (Section 17 of the Act and General Administrative Regulation 6. & 7)

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

Greater Giyani Municipality 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 Thembisile Hani Local 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 Thembisile Hani Local 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 Thembisile Hani Local 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 Thembisile Hani Local Municipality OH&S meetings and a list of dates, times and venues will be provided to the Principal Contractor by Thembisile Hani Local Municipality

(i) Checking, Reporting and Corrective Actions

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

Thembisile Hani Local Municipality 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 Thembisile Hani Local Municipality:

Thembisile Hani Local Municipality 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 Thembisile Hani Local 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)

T he 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 Thembisile Hani Local 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 Thembisile Hani Local Municipality and the Provincial Director of the Department of Labour forthwith by telephone, telefax or E-mail.

The Principal Contractor is required to provide Thembisile Hani Local 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 Thembisile Hani Local 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 Thembisile Hani Local Municipality reserves the right to hold its own investigation into an incident or call for an independent external investigation.

C3.4.3.1.4 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 Thembisile Hani Local 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 AL, 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.

(e) Structures (Construction Regulation 9)

The Principal Contractor must ensure that:

- Steps are taken to ensure that no structure becomes unstable or collapses due to construction work being performed on it or in the vicinity of it
- No structure is overloaded to the extent where it becomes unsafe
- He/she has received from the designer the following information:
- Information on known or anticipated hazards relating to the construction work and the relevant information required for the safe execution of the construction work
- A geo-scientific report (where applicable)
- The loading the structure is designed to bear
- The methods and sequence of the construction process
- all drawings pertaining to the design are on site and available for inspection

(f) Formwork & Support Work (Construction Regulation 10.)

- Formwork & Support work (F&SW) must be carried out under the supervision of competent person designated in writing
- F&SW structures must be so designed, erected, supported, braced and maintained that it will be able to support any vertical or lateral loads that may be applied
- No load to be imposed onto the structure that the structure is not designed to carry
- F&SW must be erected in accordance with the structural design drawings for that F&WS and, if there is any uncertainty, the designer must be consulted before proceeding with the erection/use of the F&WS
- All drawings pertaining to the F&SW must be kept available on site

- All equipment used in the erection of F&WS must be checked by a competent person before use
- The foundation or base upon which F&SW is erected must be able to bear the weight and keep the structure stable
- Employees erecting F&SW must be trained in the safe work procedures for the erection, moving and dismantling of F&SW
- Safe access (and emergency escape) must be provided for workers
- A competent person must inspect F&SW structures that have been erected before, during and after pouring of concrete or the placing of any other load and thereafter daily until the F&SW is stripped. The results of all inspections must be recorded in a register kept on site
- The F&SW must be left in place until the concrete has reached sufficient strength to bear its own weight plus any additional weight that may be imposed upon it and not until the designated competent person has authorised its stripping in writing
- Any damaged F&SW must be repaired/rectified immediately
- Deck panels must be secured against displacement
- The slipping of persons on release agents on deck panels prevented
- Persons health must be protected against the use of solvents, oils or other similar substances

(g) Excavations (Construction Regulation 11.)

Where excavations will exceed 1, 5 m in depth the Contractor will be required to submit a Method Statement to Thembisile Hani Local Municipality for approval before commencing with the excavation and Thembisile Hani Local Municipality will issue a permit to proceed once the Risk Assessment and Method Statement are approved.

- Excavation work must be carried out under the supervision of a competent person who has been appointed in writing
- Before excavation work begins the stability of the ground must be evaluated
- Whilst excavation work is being performed, the contractor must take suitable and sufficient steps to prevent any person from being buried or trapped by a fall or dislodgement of material
- No person may be required or permitted to work in an excavation that has not been adequately shored or braced or where:
  - the excavation is in stable material or where
  - the sides of the excavation are sloped back to at least the maximum angle of repose measured relative to the horizontal plane
- The shoring or bracing may not be left out unless written permission has been obtained from the appointed competent person and shoring and bracing must be designed and constructed to safely support the sides of the excavation
- Where uncertainty exists regarding the stability of the soil the opinion of a competent professional Employer's Agent or professional technologist must be obtained whose opinion will be decisive. The opinion must be in writing and signed by the Employer's Agent or technologist as well as the appointed excavator
- No load or material may be placed near the edge of an excavation if it is likely to cause a collapse of the trench unless suitable shoring has been installed to be able to carry the additional load
- Any neighbouring building, structure or road that may be affected or endangered by the excavation must be protected from damage or collapse
- Every excavation must be provided with means of access that must be within 6 metres of any worker within the excavation
- The location and nature of any existing services such as water, electricity, gas etc. must be established before any excavation is commenced with and any service that may be affected by the excavation must be protected and made safe for workers in the excavation
- Every excavation including the shoring and bracing or any other method to prevent collapse must be inspected by the appointed competent person as follows:
  - Daily before work commences
  - After every blasting operation
  - After an unexpected collapse of the excavation

- After substantial damage to any supports
- After rain

The results of any inspections must be recorded in a register kept on site

• Every excavation accessible to the public or that is adjacent to a public road or thoroughfare or that threatens the safety of persons, must be adequately barricaded or fenced to at least one metre high and as close to the excavation as practicable and
• Provided with warning lights or visible boundary indicators after dark or when visibility is poor
• Upon entering an excavation the requirements of General Safety Regulation 5 must be observed:
- any confined space may only be entered after the air quality has been tested to ensure that it is safe to breathe and does not contain any flammable mixture or
- the confined space has been purged and ventilated of any hazardous or flammable gas, vapour, dust or fumes and
- the safe atmosphere must be maintained or
- employees have to be using breathing apparatus and wearing a safety harness with a rope with the free end of the rope being attended to by a person outside the confined space, furthermore,
- an additional person trained in resuscitation must be in full-time attendance immediately outside the confined space and
- additional breathing and rescue apparatus must be kept immediately outside the confined space for rescue purposes
- all pipes, ducts etc. that may leak into the confined space to be blanked off sufficiently to prevent any leakage or seepage
- the employer must ensure that all employees have left the confined space after the completion of work
- where flammable gas is present in a confined space no work may be performed in close proximity to the flammable atmosphere that may ignite the flammable gas or vapour.

(h) Demolition Work (Construction Regulation 12.)

• Demolition work to be carried out under the supervision of a competent person who has been appointed in writing
• A detailed structural Engineering survey of the structure to be demolished to be carried out and a method statement on the procedure to be followed in demolishing the structure to be developed by a competent person, before any demolition may be commenced
• As demolishing progresses the structural integrity of the structure to be checked at intervals as determined in the method statement by the appointed competent person in order to prevent any premature collapse
• Steps must be taken to ensure that where a structure is being demolished:
 no floor. roof or any other part of the structure is overloaded with debris or material that would make it unsafe
 precautions are taken to prevent the collapse of the structure when any frame or support is cut or removed
 shoring or propping is applied where necessary
 No person must be required or allowed to work under unsupported overhanging material

THE STABILITY OF AN ADJACENT BUILDING, STRUCTURE OR ROAD MUST BE MAINTAINED AT ALL TIMES

• The location and nature of any existing services such as water, electricity, gas etc. must be established before any demolition is commenced with and any service that may be affected by the demolition must be protected and made safe for workers
• Every stairwell in a building being demolished must be adequately illuminated
• Convenient and safe means of access must be provided

• A catch platform or net must be erected over every entrance to the building or structure being demolished where the likelihood exists of material or debris falling on persons entering and leaving and every other area where the likelihood exists of material or debris falling on persons, must be fenced or barricaded
• No material may be dropped on the outside of the building unless the area into which it is dropped is fenced off or barricaded

• Waste and debris may only be disposed of from a height in a chute with the following design:
- Adequately constructed and rigidly fastened
- If inclined >45 degrees enclosed on all four sides
- Fitted with a gate or control mechanism to control the flow of material that may not freefall down the chute
- Discharged into a container or a barricaded area
- Demolition equipment may only be used on floors or slabs that are able to support it
• Asbestos related work must be conducted to the requirements of the Asbestos regulations promulgated under the OHS Act and in particular Asbestos Regulation 21:

- Demolition of asbestos may only be carried out by a registered (with the Department of Labour) Asbestos Contractor
- All asbestos materials likely to become airborne must be identified
- A Plan of Work must be submitted for approval to an Approved Asbestos Inspection Authority (AAIA) (approved by the Department of Labour) 30 days prior to commencement of demolishing work unless the Plan was drawn up by an AAIA and a signed (by all parties) copy must be submitted to the Department of Labour 14 days before commencement of the demolishing

During demolition work:
• all asbestos containing material must be disposed of safely workers must be issued with appropriate PPE and the proper use thereof enforced
• After the demolition has been completed the area/premises must be thoroughly checked to ensure that all asbestos waste has been removed

• No person is allowed to:
 Use compressed air or permit the use of compressed air to remove asbestos dust from any surface or person
 Smoke, eat, drink or keep food or beverages in an area not specifically designated for this
 Apply asbestos by spraying

Lead related work must be conducted to the requirements of the Lead regulations promulgated under the OHS Act
Where demolition work will involve the use of explosives a method statement must be developed by a competent person in accordance with applicable explosives legislation.
(i) Tunnelling (Construction Regulation 13.)
• To be performed in accordance with the Tunnelling Regulations as published under the Mines Health & Safety Act (29 of 1996)
• No person shall enter a *tunnel that has a height dimension less than 800 mm
* Definition of Tunnelling: “the construction of any tunnel beneath the natural surface of the earth for the purpose other than the searching for or winning of a mineral
(j) Access Scaffolding (Construction Regulation 14)
Access Scaffolding must be erected, used and maintained safely in accordance with Construction Regulation 14 and SA Bureau of Standards Code of Practice, SANS 085 entitled, “The Design, Erection, Use & Inspection of Access Scaffolding.
Detailed consideration must be given to all scaffolding to ensure that it is properly planned to meet the working requirements, designed to carry the necessary loadings and maintained in a sound condition. It must also be ensured that there is sufficient material available to erect the scaffolding properly.
Scaffolding may only be erected, altered or dismantled by a person who has adequate training and experience in this type of work or under the supervision of such a person.

(k) Suspended Platforms & Boatswains Chairs (Construction Regulation 15 & 16)
The Contractor to design, erect, use and maintain suspended platforms in accordance with the requirements of Construction Regulation 15.
Boatswains chairs are to be erected, used maintained and inspected in accordance with the requirements of Construction Regulation 16.

(l) Batch Plants (Construction Regulation 18)

The Contractor to erect, operate and maintain Batch Plants in accordance with the `requirements of Construction Regulation 18

Explosive Powered Tools (Construction Regulation 19)

Every Explosive Powered Tools (EPT) must be:

- Provided with a guard around the muzzle to confine flying fragments or particles
- A firing mechanism that will prevent the EPT from firing unless it is pushed against the surface and at right angle (where the EPT is fitted with an intermediate piston between the charge and the nail this requirement is waived)

The Contractor or user must ensure that:

- Only the correct type of cartridge is used
- The EPT is cleaned inspected and cleaned daily before use by an appointed competent person who keeps register with the findings of his inspection and the details of cleaning, service and repairs
- The safety devices are in good working order before the EPT is use
- When the EPT is not being used it is stored in an unloaded condition together with the cartridges in a safe/secure place inaccessible to unauthorised persons
- A warning notice is displayed at the point where the EPT is in use
- The issue and return of cartridges must be by issue/returns register signed by both issuer and user and empty cartridge cases must be returned with unspent cartridges
- Users/operators of the EPT have received the necessary training and has been authorised as competent to use/operate the EPT
- Users/operators must wear the prescribed PPE whilst using/operating the tool

(m) Cranes & Lifting Equipment (Construction Regulation 20)

Cranes and Lifting equipment must be designed and constructed in accordance with generally accepted technical standards and operated, used, inspected and maintained in accordance with the requirements of Driven Machinery Regulation 8 of the OHS Act:

- to be clearly and conspicuously marked with the maximum mass load (MML) that it is designed to carry safely. When the MML varies with the conditions of use, the a table should be used by the driver/operator
- each winch on a lifting machine must al all time have, at least, three full turns of rope on the drum when the winc has been run to its lowest limit
- fitted with a brake or other device capable of holding the MML. This brake or device to automatically prevent the downward movement of the load when the lifting power is interrupted
- fitted with a load limiting device that automatically arrest the lift when
- the load reaches its highest safe position or
- when the mass of the load is greater than the MML
- every chain or rope on a lifting machine that forms an integral part of the machine must have a factor of safety as prescribed by the manufacturer of the machine and where no standard is available the factor of safety must be:
  - chains – 4 (four)
  - steel wire ropes - 5 (five)
  - fibre ropes - 10 (ten)
- every hook or load attaching device must be designed such or fitted with a device that will prevent the load from slipping off or disconnecting
- every lifting machine must be inspected and load tested by a competent person every time it has been dismantled and re-erected and every 12 months after that. The load test must be in accordance with the manufacturers prescription or to 110% of the MML
- in addition all ropes, chains, hooks or other attaching devices, sheaves, brakes and safety

 devices forming an integral part of a lifting machine must be inspected every 6 months by a competent person
 all maintenance, repairs, alterations and inspection results must be recorded in a log book
 and each lifting machine must have its own log book.
 no person may be lifted by a lifting machine not designed for lifting persons unless in a cradle approved by the inspector of the Department of Labour
 every jib crane with an MML of 5 000 kg or more at minimum jib radius must be provided
 with a load indicator or a load lifting limiting device

Lifting Tackle:

- to be manufactured of sound material, well constructed and free from patent defects
- to be clearly and conspicuously marked with ID number and MML
- factor of safety:
  - Natural fibre ropes - 10(ten)
  - Man-made fibre ropes & woven webbing - 06(six)
  - Steel wire ropes – single rope - 06(six)
  - Steel wire ropes – combination slings - 08(eight)
  - Mild Steel chains - 05(five)
  - High tensile/alloy steel chains - 04(four)
- steel wire ropes must be discarded (not used any further for lifting purposes) when excessive wear and corrosion is evident and must be examined by a competent person every three months for this purpose and the results recorded.
- Operator
- Every lifting machine operator must be trained specifically for the type of lifting machine that he/she is operating
- Operators of Jib cranes with a MML of 5 00 kg or more must be in possession of a certificate of training issued by an accredited (by The Department of Labour) training provider.

Construction Regulation 20:

Where tower cranes (TC) are used:
- account must be taken of the effects of wind force on the structure
- account must be taken of the bearing capacity of the ground on which the TC is to be erected
- the bases for the TC and tracks for rail mounted TC's must be firm and level
- must be erected at a safe distance from excavations
- clear space must be provided and maintained for erection, operation, maintenance and dismantling
- TC operators must be competent to carry out the work safely

TC operators must be in possession of a valid medical certificate testifying that the holder is physically and psychologically fit to work on a TC.

All lifting operations where the lift will exceed 2000 kg must be planned by a competent person and the plan submitted to Thembisile Hani Local Municipality for approval and permission to carry out the lift.

(n) Construction Vehicles & Mobile Plant (Construction Regulation 21)

Construction Vehicles and Mobile Plant will be inspected by Thembisile Hani Local Municipality prior to being allowed on a project site and suppliers of hired vehicles, plant and equipment will be required to comply with this specification as well as the OHS Act and Regulations.
Construction Vehicles and Mobile Plant (CV&MP) to be:

- of acceptable design and construction

- maintained in good working order
- used in accordance with their design and intention for which they were designed
- operated/driven by trained, competent and authorised operators/ drivers. No unauthorised persons to be allowed to drive CV&MP
- operators and drivers of CV&MP must be in possession of a valid medical certificate declaring the operator/drive physically and psychologically fit to operate or drive CV&MP
- provided with safe and suitable means of access
- fitted with adequate signalling devices to make movement safe including reversing
- excavations and other openings must be provided with sufficient barriers to prevent CV&MP from falling into same
- provided with roll-over protection
- inspected daily before start-up by the driver/operator/user and the findings recorded in a register/log book
- CV&MP to be fitted with two head and two tail lights whilst operating under poor visibility conditions
- No loose tools, material etc. is allowed in the driver/operators compartment/cabin nor in the compartment in which any other persons are transported
- CV&MP used for transporting persons must have seats firmly secured and sufficient for the number of persons being transported

No person may ride on a CV&MP except for in a safe place provided for the purpose
The construction site must be organised to facilitate the movement of CV&MP and that pedestrians and other vehicles are not endangered. Traffic routes to be suitable, sufficient in number and adequately demarcated
CV&MP left unattended after hours adjacent to roads and areas where there is traffic movement must be fitted with lights reflectors or barricades to prevent moving traffic to come into contact with the parked CV&MP.
In addition CV&MP left unattended after hours must be parked with all buckets, booms etc. full lowered, the emergency brakes engaged and, where necessary, the wheels chocked, the transmission in neutral and the motor switched off and the ignition key removed and stored safely
Workers employed adjacent or on public roads must wear reflective safety vests

All CV&MP inspection records must be kept in the OH&S File

(o) Electrical Installations (Construction Regulation 22)

The installation of temporary electricity for Construction shall be in accordance with the Construction regulation 22 and the Electrical Installation Regulations.

The Contractor must ensure that:

- existing services are located and marked before construction commences and during the progress thereof
- where the abovementioned is not possible, workers with jackhammers etc. are protected against electric shock by the use of suitable protective equipment e.g. rubber mats, insulated handles etc
- electrical installations and -machinery are sufficiently robust to withstand working conditions on site
- temporary electrical installations must be inspected at least once per week by a competent person and a record of the inspections kept on the OH&S File
- electrical machinery used on a construction site must be inspected daily before start-up by the competent driver/operator or any other competent person and a record of the inspections kept on the OH&S File
- all temporary electrical installations must be controlled by a competent person appointed in writing

(p) Electrical & Mechanical Lock-Out

An electrical and mechanical lock-out procedure must be developed by the Principal Contractor and submitted to Thembisile Hani Local Municipality for approval before construction commences. This lock-out procedure to be adhered to by all Contractors on site

(q) Use & Storage of Flammables (Construction Regulation 23)

The Contractor to ensure that:

- No person is required or permitted to work in a place where there is the danger of fire or an explosion due to flammable vapours being present unless adequate precautions are taken
- No flammable is used or applied e.g. in spay painting, unless in a room or cabinet or other enclosure specially designed and constructed for the purpose unless there is no danger of fire or explosion due to the application of adequate ventilation
- The workplace is effectively ventilated. Where this cannot be achieved:
  - Employees must wear suitable respiratory equipment
  - No smoking or other sources of ignition is allowed in the area
  - The area is conspicuously demarcated as “flammable”
- Flammables stored on a construction site are stored in a well-ventilated, reasonably fire-resistant container, cage or room that is kept locked with access control measures in place and sufficient fire fighting equipment installed and fire prevention methods practised e.g. proper housekeeping
- Flammables stored in a permanent flammables store are stored so that no fire or explosion is caused i.e.:
  - stored in a locked well-ventilated reasonably fire resistant container, cage or room conspicuously demarcated as “Flammable Store – No Smoking or Naked Lights”
  - the flammables store to be constructed of two-hour fire retardant walls and roof and separated from adjoining rooms or workplaces by means of a two-hour fire retardant fire wall
  - Adequate and suitable fire fighting equipment installed around the flammables store and marked with the prescribed signs
  - All electrical switches and fittings to be of a flameproof design
  - Any work done with tools in a flammables store or work areas to be of a non-sparking nature
  - No Class A combustibles such as paper, cardboard, wood, plastic, straw etc. to be stored together with Flammables
  - The flammable store to be designed and constructed to, in the event of spillage of liquids in the store, to contain the full quantity + 10% of the liquids stored
  - A sign indicating the capacity of the store to be displayed on the door
  - Only one day’s quantity of Flammable is to be kept in the workplace
  - Containers (including empty containers) to be kept closed to prevent fumes/vapours from escaping and accumulating in low lying areas
  - Metal containers to be bonded to earth whilst decanting to prevent build-up of static
  - Welding and other flammable gases to be stored segregated as to type of gas and empty and full cylinders

(r) Working on or Near Water (Construction Regulation 24)

The Principal Contractor must ensure that, where construction work is being carried out over or in close proximity to water:

- Measures are in place to prevent workers from falling into the water and drowning. These measure to include the availability of lifejackets
- Measures are in place to rescue any worker/ that has fallen into the water
- Measures for the timeous warning of flooding are in place

(s) Housekeeping (Construction Regulation 25)

The Contractor to ensure that:

- Housekeeping is continuously implemented
- Materials & equipment are properly stored
- Scrap, waste & debris are removed regularly
- Materials placed for use are placed safely and not allowed to accumulate or cause obstruction to free flow of pedestrian and vehicular traffic
- Waste & debris not to be removed by throwing from heights but by chute or crane
- Where practicable, Construction sites are fenced off to prevent entry of unauthorised persons

- Catch platforms or –nets are erected over entry and exit ways or over places where persons are working to prevent them being struck by falling objects
- An unimpeded work space is maintained for every employee
- Every workplace is kept clean, orderly and free of tools etc. that are not required for the work being done materials
- As far as is practicable, every floor, walkway, stair, passage and gangway is kept in good state of repair, skid-free and free of obstruction, waste and materials
- The walls and roof of every indoors workplace is sound and leak-free
- Openings in floors, hatchways, stairways and open sides of floors or buildings are barricaded, fences , boarded over or provided with protection to prevent persons from falling

(t) Stacking & Storage (Construction Regulation 27)

The Contractor/Employer must ensure that:

- A competent person is appointed in writing to supervise all stacking and storage on a construction site
- Adequate storage areas are provided and demarcated
- The storage areas are kept neat and under control
- The base of any stack is level and capable of sustaining the weight exerted on it by the stack
- The items in the lower layers can support the weight exerted by the top layers.
- Cartons and other containers that may become unstable due to wet conditions are kept dry
- Pallets and containers are in good condition and no material is allowed to spill out
- The height of any stack does not exceed 3X the base unless stepped back at least half the depth of a single container at least every fifth tier or
- the approval of an inspector has been obtained to build the stacks higher with the aid of a machine. (The operator of the machine must be protected against items falling from overhead off the stack and no items may overhang)
- The articles that make up a single tier are consistently of the same size, shape and mass
- Structures for supporting stacks are structurally sound and able to support the mass of the stack
- No articles are removed from the bottom of the stack first but from the top tier first
- Anybody climbing onto a stack can and does do it safely and that the stack is sufficiently stable to support him/her
- Stacks that are in danger of collapsing are broken down and restacked
- Stability of stacks are not threatened by vehicles or other moving plant and machinery
- Stacks are built in a header and stretcher fashion and that corners are securely bonded
- Stepped back at least half the depth of a single container at least every fifth tier
- Persons climbing onto stacks do not approach unguarded moving machinery or electrical installations

(u) Storage of Flammables and Hazardous Chemicals (Hazardous Chemical Substances Regulations)

See (u) above and (v) below.

Fire Prevention and Protection

The Principal Contractor must ensure that:

- The risk of fire is avoided
- Sufficient & suitable storage of flammables is provided
- Sources of ignition is obviated wherever flammable or highly combustible material is present in the workplace e.g.:
  - notices prohibiting smoking is displayed and enforced
  - welding and flame cutting is only allowed under controlled conditions that includes written hot work permits
  - only spark-free hand and power tools are used
  - no grinding, cutting and shaping of ferrous metals are allowed using electrically driven power tools that produces sparks
  - flameproof switches & fittings are to be used in the flammable atmosphere

- Good housekeeping is maintained to prevent the accumulation of unnecessary combustibles
- Adequate ventilation is maintained
- Adequate and suitable fixed and portable fire appliances is provided and maintained in good working order.
- Maintenance must include:
- Regular inspection by a competent person appointed in writing and keeping a register
- Annual inspection and service by an accredited service provider
- All employees are instructed in the use of the Fire equipment and know how to attempt to extinguish a fire
- A sufficient number of employees are appointed and trained to act as Emergency Team to deal with fires and other emergencies
- Employees are informed re. emergency evacuation procedures and escape routes
- Emergency escape routes are kept clear at all times
- After evacuation assembly points are demarcated
- Evacuation is practised to ensure that all is evacuated timeously
- Roll-call is held after evacuation to account for all personnel and ensure that no-one has been left behind.
- A clearly audible to all persons on site siren or alarm is fitted

w) Eating, Changing, Washing & Toilet Facilities (Construction Regulation 28)

The following will be the minimum requirements:
Toilets
The provision of Toilets is required in terms of the National Building Regulations and Construction Regulation 28. Chemical toilets are allowed instead of the water borne sewerage type. Toilets have to be provided at a ratio of 1 toilet per 30 workers
Showers
At least cold water showers of some sort have to be provided to a ratio of 1 shower per 15 workers.
Change Rooms
Some form of screened off changing facility must be provided separately for each sex.
Eating Facility
Some form of shelter from the sun, wind and rain must be provided

Living Accommodation

Where the site is in a remote location and transport home is not readily available, reasonable and suitable living accommodation must be provided.

(x) Personal & Other Protective Equipment (Sections 8/15/23 or the OHS Act)

The Contractor is required to identify the hazards in the workplace and deal with them. He must either remove them or, where impracticable take steps to protect workers and make it possible for them to work safely and without risk to health under the hazardous conditions.
Personal Protective equipment (PPE) should, however, be the last resort and there should always first be an attempt to apply Engineering and other solutions to mitigating hazardous situations before the issuing of PPE is considered.
Where it is not possible to create an absolutely safe and healthy workplace the Contractor is required to inform employees regarding this and issue, free of charge, suitable equipment to protect them from any hazards being present and that allows them to work safely and without risk to health in the hazardous environment.
It is a further requirement that the said equipment be maintained by the Contractor, that he instructs and trains the employees in the use of the equipment and ensures that the prescribed equipment is used by the employee/s. Employees do not have the right to refuse to use/wear the equipment prescribed by the employer and, if it is impossible for an employee to use or wear prescribed protective equipment through health or any other reason, the employee cannot be allowed to continue working under the hazardous condition/s for which the equipment

was prescribed but an alternative solution has to be found that may include relocating or discharging the employee.
The Contractor may not charge any fee for protective equipment prescribed by him/her but may charge for equipment under the following conditions:

- Where the employee requests additional issue in excess of what is prescribed
- Where the employee has patently abused or neglected the equipment leading to early failure
- Where the employee has lost the equipment

All employees shall, as a minimum, be required to wear the following PPE on any Thembisile Hani Local Municipality projects:

- Protective overalls
- Protective footwear
- Protective headwear
- Eye/face protection

(y) Portable Electrical Tools & Equipment (Electrical Machinery Regulation 9)

Portable electrical tools and equipment includes every unit that takes electrical power from a 15 amp. plug point and is moved around for use in the workplace i.e. drills, saws, grindstones, portable lights, etc. In addition electrical appliances such as fridges, hotplates, heaters, etc. must be inspected and maintained to the same standards as portable electrical tools and appliances.
The use, inspection and maintenance of portable electrical tools and equipment must be governed by the following:

- Regular inspections by a competent person appointed in writing
- Inspection results must be recorded in a register
- Only competent authorised persons are allowed to use portable electrical tools and equipment
- The correct protective equipment is worn/used whilst operating portable electrical tools and equipment

Portable Electrical Tools

- Must be maintained in good condition at all times to prevent an electrical shock to the user
- The main source must incorporate an earth leakage protection device or receive power through a double wound transformer or be double insulated and clearly marked as such
- All equipment must be fitted with a switch to allow for safe & easy starting and stopping

Portable Lights

- Must be fitted with a robust non-hygroscopic non-conducting handle
- Live metal parts/parts which may become live must be protected against contact
- The lamp must be protected by a strong guard
- The cable lead-in must withstand rough handling
- It is suggested that a register be kept for each piece of equipment and findings of regular
- inspections must be entered
- Inspections must concentrate on plug, cord, switch and any obvious faults
- When used in wet/damp/metal container conditions, it must be protected as for portable
- electrical tools, above

(z) Public Health & Safety (Section 9 of the OHS Act)
The Principal Contractor will be responsible for ensuring that non-employees affected by the construction work are made aware of the dangers likely to arise from said construction work as well as the precautionary measures to be observed to avoid or minimise those dangers. This includes:

- Non- employees entering the site for whatever reason
- The surrounding community
- Passers by to the site

Appropriate signage must be posted to this effect and all employees on site must be instructed on ensuring that non-employees are protected at all times
All non-employees entering the site must receive induction into the hazards and risks and the control measures for these.

(z) Hazardous Chemical Substances

The Contractor/Employer must ensure that:

- Employees receive the necessary information & training to be able to use and store HCS safely
- Employees obey lawful instructions regarding:
- the wearing and use of protective equipment
- the use and storage of HCS
- the prevention of the release of HCS
- the wearing of exposure monitoring and measuring equipment
- the cleaning up and disposal of materials containing HCS
- housekeeping, personal hygiene and the protection of the environment
- the Risk Assessments required in terms of Construction Regulation 7 include employee exposure to HCS and that the necessary to protect persons from being detrimentally affected by HCS present or used in the workplace, are taken
- suppliers provide the necessary information in the form of a Material Safety Data Sheet (MSDS) regarding an HCS required to ensure the safe use and storage of that HCS
- an up-to-date list is kept on site of HCS's stored and used together with the MSDS's of the said HCS's
- HCS containers are clearly marked as to the contents and main hazardous category e.g. "Flammable" or
" Corrosive" and the reference number of the HCS on the list indicated above
- HCS e.g. Asbestos dust is not cleared by the use of compressed air but is vacuumed
- No person eats or drinks in a HCS workplace
- HCS waste is disposed of safely in terms of hazardous waste disposal requirements

(aa) Project/Site Specific Requirements

See Annexure 3
Annexure 1: Measuring Injury Experience
Annexure 2: Executive 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
Man-hours Worked
Include:* Hourly Paid Employees
* Sub-contactors (No. of Employees X *220 each)
* Staff (No. of Employees X *220 hours each)
220 man-hours: 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
Man-hours worked
2.
2. Disabling Injury Incidence Rate (DIIR)
DIIR = No. Disabling Injuries X 200 000
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

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
15
3 Induction
OH&S Reps
Crane Drivers Internal
Consultant
External
February 23
17 Induction
OH&S Reps Internal
Consultant
March 43
9
3
3 Induction
OH&S Reps
Bomag Rollers
First Aiders Internal
Consultant
Supplier
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 AIND 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.

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.

C3.4.3.2 ENVIRONMENTAL MANAGEMENT PLAN

CONTENTS

C3.4.3.2.1. 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 Roads Agency Limpopo 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.

C3.4.3.2.2. 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.

C3.4.3.2.3. 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 Employer's Agent'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.

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

C3.4.3.2.4. 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.

C3.4.3.2.5. 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 Employer's Agent 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 Employer's Agent to make a decision. The Employer's Agent 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 Employer's Agent 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 Employer's Agent, but not less frequently than once a month.
The Employer's Agent shall have the authority to instruct the contractor to replace the DEO if, in the Employer's Agent'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 Employer's Agent 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 Employer's Agent whenever there is a change or variation to the original.
The Employer's Agent 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 11.11 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.

C3.4.3.2.6. 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:
- 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 Employer's Agent when and how he/she intends concluding his environmental training obligations.

C3.4.3.2.7. 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.

C3.4.3.2.8 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 Employer's Agent 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 Employer's Agent for consultation during rehabilitation of the site.

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 Employer's Agent. Only trees and shrubs directly affected by the works, and such others as may be indicated by the Employer's Agent 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. 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 Employer’s Agent.

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 Employer’s Agent.

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 mann

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 Employer’s Agent. 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, or anywhere else on the site, including the approved solid waste disposal site.

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..

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 Employer's Agent.

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 Employer's Agent.

The contractor shall provide proof to the Employer's Agent 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 Employer's Agent 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 Employer's Agent 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 Employer's Agent 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.

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 Employer's Agent. 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 Employer's Agent, 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 Employer's Agent 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.

ii) Excavation, hauling and placement

The contractor shall provide the Employer's Agent 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, and 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.

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 Employer's Agent for his approval. The location of these spoil sites shall have signed approval from the affected landowner before submission to the Employer's Agent. 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 Employer's Agent 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 Employer's Agent for other acceptable stabilising methods. The Employer's Agent 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 Employer's Agent's certificate certifying slope stability.
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 Employer's Agent 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 Employer's Agent and the relevant Authority is received.
Material milled from the existing road surface that is temporarily stockpiled in areas approved by the Employer's Agent 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 Employer's Agent
In all cases, the Employer's Agent 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.

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 Employer's Agent 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 Employer's Agent 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 Employer's Agent 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 Employer's Agent 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 Employer's Agent.

The Designated Environmental Officer will assess the situation in consultation with the Employer's Agent 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 Employer's Agent. Areas cleared of hazardous waste shall be re-vegetated according to the Employer's Agent'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 Employer's Agent.

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 Employer's Agent 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 Employer's Agent 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.

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 Employer's Agent informed of the discovery. The South African Heritage Research Agency (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.

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 minim

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.

C3.4.3.2.9. RECORD KEEPING

The Employer's Agent and the DEO will continuously monitor the contractor's adherence to the approved impact prevention procedures and the Employer's Agent 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 Employer's Agent 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.

C3.4.3.2.10. 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). : R 1 000 to R5 000 per incident
- Unauthorised blasting activities. : R 5 000 per incident
- Pollution of water sources. : R10 000 per incident

The Employer's Agent'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 Employer's Agent'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.

C3.4.3.2.11. MEASUREMENT AND PAYMENT

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

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, a nd/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 Employer's Agent'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

CONTENTS ENVIRONMENTAL IMPACTS

POLLUTION TYPE DEFORMATION OF LANDSCAPE SOIL EROSION ALIEN VEGETATION SENSITIVE AREAS

(to be completed by compiler)

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
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
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
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
Clearing and grubbing Waste treatment
Hazardous waste
Water supply
Noise /lights
Dust control Selection of site
Preserve indigenous vegetation
Preserve topsoilSelection of site
Preserve indigenous vegetation
Preserve topsoilProtection of indigenous vegetation
Preserve topsoil
Drainage Waste treatment
Hazardous waste
Water supply
Spillage
StorageSelection of site
Preserve indigenous vegetation
Preserve topsoilSelection of site
Preserve indigenous vegetation
Preserve topsoilPreserve indigenous vegetation
Preserve topsoil
Management of weeds
Borrow pits Waste treatment
Hazardous waste
Water supply
Spillage
StorageSelection of site
Preserve indigenous vegetation
Preserve topsoilSelection of site
Preserve indigenous vegetation
Preserve topsoilPreserve indigenous vegetation
Preserve topsoil
Management of weeds
Stockpiling Waste treatment
Hazardous waste
Water supply
Spillage
StorageSelection of site
Preserve indigenous vegetation
Preserve topsoilSelection of site
Preserve indigenous vegetation
Preserve topsoilPreserve indigenous vegetation
Preserve topsoil
Management of weeds
Mass Earthworks Waste treatment
Hazardous waste
Water supply
Spillage
StorageSelection of site
Preserve indigenous vegetation
Preserve topsoilSelection of site

Preserve indigenous vegetation
Preserve topsoilPreserve indigenous vegetation
Preserve topsoil
Management of weeds
Pavement layers 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 topsoilPreserve indigenous vegetation
Preserve topsoil
Management of weeds
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 topsoilPreserve indigenous vegetation
Preserve topsoil

Ancillary roadworks Waste treatment
Hazardous waste
Water supply
Spillage
StorageSelection of site
Preserve indigenous vegetation
Preserve topsoilSelection of site
Preserve indigenous vegetation
Preserve topsoilPreserve indigenous vegetation
Preserve topsoil
Management of weeds
Structures Waste treatment
Hazardous waste
Water supply
Spillage
StorageSelection of site

Preserve indigenous vegetation
Preserve topsoilSelection of site
Preserve indigenous vegetation
Preserve topsoilPreserve indigenous vegetation
Preserve topsoil
Management of weeds
Concrete pavements etc Waste treatment
Hazardous waste
Water supply
Spillage
StorageSelection of site
Preserve indigenous vegetation
Preserve topsoilSelection of site
Preserve indigenous vegetation
Preserve topsoilPreserve indigenous vegetation
Preserve topsoil
Management of weeds

C3.4.3.4 HIV/AIDS REQUIREMENTS

CONTENTS

C3.4.3.5 HIV/AIDS REQUIREMENTS

SH 01 SCOPE

This specification contains all requirements applicable to the Contractor for creating HIV/AIDS awareness amongst all of the Workers involved in this project for the duration of the construction period, through the following strategies:

- Raising awareness about HIV/AIDS through education and information on the nature of the disease, how it is transmitted, safe sexual behaviour, attitudes towards people affected and people living with HIV/AIDS, how to live a healthy lifestyle with HIV/AIDS, the importance of voluntary testing and counselling, the diagnosis and treatment of Sexually Transmitted Infections and the closest health Service Providers

  Informing Workers of their rights with regard to HIV/AIDS in the workplace
- Providing Workers with access to condoms and other awareness material that will enable them to make informed decisions about sexual practices

SH.02 DEFINITIONS AND ABBREVIATIONS

SH 02.01 DEFINITIONS

Worker: Person in the employ of the Contractor or under the direction or supervision of the Contractor or any of his Sub-contractors, who is on site for a minimum period of 30 days in total.

SH 02.02 ABBREVIATIONS

HIV	:	Human Immunodeficiency Virus
AIDS	:	Acquired Immune Deficiency Syndrome
STI	:	Sexually Transmitted Infection

SH 03 HIV/AIDS EDUCATION AND TRAINING
DISPLAYING OF PLASTIC LAMINATED POSTERS AND DISTRIBUTION OF INFORMATION BOOKLETS

The Contractor shall obtain a set of four laminated posters conveying different key messages and information booklets, which are available from all Regional Offices of the Department of Public Works

The above-mentioned posters and information booklets have been prepared to raise awareness and to share information about HIV/AIDS and STI's

Posters or display stands shall be displayed on site as soon as possible, but not later than 14 days after the date of site handover

Posters shall be displayed in areas highly trafficked by Workers, including toilets, rest areas, the site office and compounds

The posters on display must always be intact, clear and readable

Information booklets must be distributed to all Workers as soon as possible, but not later than 14 days after site handover, or as soon as the Worker joins the site

SH 04 PROVIDING WORKERS WITH ACCESS TO CONDOMS

The Contractor shall provide and maintain condom dispensers and make both male and female condoms, complying with the requirements of SABS ISO 4074, available at all times to all Workers at readily accessible points on site, for the duration of the contract.

The Contractor may obtain condom dispensers from the Department of Health and condoms may be obtained from the Local Clinic or the Department of Health.

At least one male and one female condom dispenser and a sufficient supply of condoms, all to the approval of the Representative/Agent, shall be made available on site within 14 days of site hand over. Contractors should note that arrangements to obtain condoms from the Department of Health Clinics prior to site hand over may be necessary, to ensure that condoms are available within 14 days of site handover.

Condoms shall be made available in areas highly trafficked by Workers, including toilets, the site office and compounds.

SH 05 ENSURING ACCESS TO HIV/AIDS TESTING AND COUNSELLING FACILITIES AND TREATMENT OF SEXUALLY TRANSMITTED INFECTIONS (STI)

The Contractor shall provide Workers with the names of the closest Service Providers that provide HIV/AIDS testing and counselling and Clinics providing Sexually Transmitted Infection (STI) diagnosis and treatment. Information on these Service Providers and Clinics must be displayed on a poster of a size not smaller than A1 in an area highly trafficked by Workers

SH 06. MONITORING

The Contractor shall grant to the Representative/Agent reasonable access to the construction site, in order to establish that the Contractor complies with his obligations regarding HIV/AIDS awareness under this contract

The Contractor must report problems experienced in implementing the HIV/AIDS requirements to the Representative/Agent

The attached SITE CHECKLIST (SCHEDULE A) shall be completed and submitted at every construction progress inspection to the Representative/Agent

C3.5 MANAGEMENT

C3.5.1 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

C3.5.2 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.