



## THEMBISILE HANI LOCAL MUNICIPALITY



PROJECT No: THLM/SCM12/2022 – 2023/RS04

### CONSTRUCTION OF PHOLA PARK BUS AND TAXI ROUTE – WORK PACKAGE 1 (WARD 6)

#### SCOPE OF WORK



## DESCRIPTION OF THE SCOPE OF WORKS

### 1.1. Employer's objectives

- 1.1.1. *The objective of the Employer is to construct Phola Park Bus and Taxi Route along with various intersections – Ward 6, over multiple financial years.*
- 1.1.2. ***Tenderers must note that preference will be given to locally based companies and that this Tender may be awarded to more than one company.***

### 1.2. Overview of the works

The works will comprise:

- The construction of Phola Park Bus and Taxi Route (King Nyabela Drive) from the end of paved section to its intersection with R515 South totalling approximately 2.512 km;
- The upgrade of intersection No.1 (Intersection of R515 and King Nyabela Drive) totalling 2 513.6m<sup>2</sup>; and
- Bhundu road structural patch connecting two existing asphalt surfaces totalling 133.94m.

### 1.3. Extent of the works

#### 1.3.1. The works entails the following:

- Contractor's site establishment, maintenance thereof and removal after completion;
- Accommodation of traffic;
- Clearing and grubbing of the road and road reserve;
- Mass earthworks;
- Install 300mm pioneer layer under the roadbed;
- Roadbed preparation by rip and compaction of 150mm thick;
- Construction of layer works. (Selected, Cement Stabilised Sub base, Bedding Sand and 80mm Segmental Paving Blocks) for Phola Park Bus and Taxi Route-Ward 6;
- Construction of layer works. (Lower Selected, Upper Selected, Cement Stabilised Sub base, Base and Asphalt Surfacing of 40mm thick) for intersections;
- Construction of layer works. (Selected, Cement Stabilised Sub base, Base and Asphalt Surfacing of 30mm thick) for the structural patch;
- Construction of kerbs (Fig.8c & Fig.3) kerbs;
- Construction of 600mm dia.; 750mm dia.; 825mm dia. stormwater concrete pipes; 1200x600 Box Culverts; 900x900 Box Culverts & 2400x900 Box Culverts;
- Construction of concrete channel of 1.1m top width x 0.5m bottom width x 0.5m deep & 2.2m top width x 0.8m bottom width x 0.8m deep;
- Installation of road signs and Road Markings;
- Rehabilitate the site, finish-off site and surroundings and clean-up site of all excess materials; and
- Dealing with a nominated CLO and local Project Steering Committee regarding social aspects and local labour recruitment.

**The actual scope of works for each financial year will be defined and issued by the Engineer As and when the budget becomes available per financial year.**



#### **1.4. Location of the works**

The project is located in Mpumalanga within the Thembisile Hani Local Municipal jurisdiction around the following coordinates:

##### **The works:**

- Phola Park bus and taxi route from the end of paved section to its intersection with R515 South. Start coordinates are 25°24'5.54"S and 28°44'42.50"E to 25°25'53.37"S, and 28°44'48.62"E. The road is known as King Nyabela Drive;
- Intersection No.1 (Intersection of R515 and King Nyabela Drive), 25°19'34.65"S and 28°45'38.11"E; and
- Bhundu street structural patch, 25°18'22.03"S and 29° 4'14.88"E.

#### **1.5. Temporary works**

**1.5.1.** The following items shall generally form most temporary works required under this Contract, however, shall not be limited to such, and might be expanded or changed by the Engineer should circumstances on site validate such decisions.

**1.5.2.** These works will be as follows:

- Clearing site and surroundings to create accessible working areas as required
- Provide temporary fencing around Contractor's camp site and Contractor's site office;
- Provide Contractor's Camp site and Contractor's site office;
- Provide site and administrative personnel, including security staff etc. as required;
- Setting out of the works by the Contractor;
- Monitor and report levels as construction progresses;
- Manage all site staff, CLO and local labourers, plant, equipment and materials etc.
- Manage all required quality control procedures as specified and as instructed by Engineer;
- Provide all personnel, equipment, clothing, accessories etc. in order to adhere to the OHS Act
- Attend official Site Meetings scheduled and chaired by the Engineer and managed sufficient additional meetings on site with all personnel and CLO to ensure compliance with the OHS Act and to ensure progress on site according to the accepted Construction programme.

#### **1.6. ENGINEERING**

##### **1.6.1. DESIGN**

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

##### **1.7. EMPLOYER'S DESIGN**

**1.7.1.** The Employer is responsible for the design of the entire scope of works, including site works.

##### **1.8. CONTRACTOR'S DESIGN**

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

#### **2. Drawings**



- 2.1. The Contractor shall use only the dimensions stated in figures on the Drawings in setting out the Works, and dimensions shall not be scaled from the Drawings, unless required by the Engineer. The Engineer will, on the request of the Contractor in accordance with the provisions of the Conditions of Contract, provide such dimensions as may have been omitted from the Drawings.
- 2.2. The Contractor shall ensure that accurate as-built records are kept of all infrastructure installed or relocated during the contract. The position of pipe bends, junction boxes, duct ends and all other underground infrastructure shall be given by either co-ordinates or stake value and offset. Where necessary, levels shall also be given. A marked-up set of drawings shall also be kept and updated by the Contractor. This information shall be supplied to the Engineer's Representative on a regular basis.
- 2.3. All information in possession of the Contractor, required by the Engineer and/or the Engineer's Representative to complete the as-built/record drawings, must be submitted to the Engineer's Representative before a Certificate of Completion will be issued.
- 2.4. The Drawings prepared by the Employed for the permanent Works are listed and bound at the back of this volume. The Employer reserves the right to issue amended and/or additional drawings during the Contract.
- 2.5. The following drawings are attached to the document:

DRAWING NO.	REV	DRAWING DESCRIPTION
0134-03U00	0	Drawing List
0134-03U01	0	Road and Stormwater Layout Plan
0134-03U02	0	Intersection of R515 and King Nyabela Drive Layout
0134-03L01	0	Road Layout Plan with Long Section (Sheet 1 of 3)
0134-03L02	0	Road Layout Plan with Long Section (Sheet 2 of 3)
0134-03L03	0	Road Layout Plan with Long Section (Sheet 3 of 3)
0134-05L01		Stormwater Layout Plan and Longsection (Sheet 1 of 4)
0134-05L02	0	Stormwater Layout Plan and Longsection (Sheet 2 of 4)
0134-05L03	0	Stormwater Layout Plan and Longsection (Sheet 3 of 4)
0134-05L04	0	Stormwater Layout Plan and Longsection (Sheet 4 of 4)
0134-03X01	0	Road Cross Section (Sheet 1 of 3)
0134-03X02	0	Road Cross Section (Sheet 2 of 3)
0134-03X03	0	Road Cross Section (Sheet 3 of 3)
STD01	0	Kerbing Details: Sloping Kerb, Semi-Vertical Kerbs and Edge Beam
STD02	0	Typical Speed Hump Details
STD03	0	Paving Block Typical Speed Hump Details
STD04	0	Stormwater Outlet & Field Inlet Structure Details for Low-Cost Development Drainage Structures
STD05	0	Stormwater Culvert Outlet (Type 1 & 1A) & Alternative Outlets (Type 1 & 2)
STD06	0	Stormwater Culvert Inlet (Type 1 & 2)
STD07	0	Junction Box & Manhole Details
STD08	0	Details for Low-Cost Development Road Cross-Section and Side Drain
STD10	0	Catchpit Details Isometric View & Cross Sections
STD11	0	Culverts and Channel Structures Details
STD12	0	Culvert Layout & Details

## 2.6. DESIGN PROCEDURES

- 2.6.1. New and existing infrastructure will be considered under this contract.



### **3. SUBCONTRACTING**

- 3.1. The contractor will be required to sub-contract at least of **30%** of the value of the construction work to designated local sub-contractors, suppliers and/ or SMME's identified by the engineer on behalf of and/ or in liaison with the employer, which will be selected from a local database.

### **4. CONSTRUCTION**

#### **4.1. GENERAL SPECIFICATION**

- 4.1.1. This section of the Contract documents should be read together with all other sections and Standardized and Particular Specifications included in the Contract documents or Standardized Specifications mentioned in the Contract documents, but separately available. The documents should be read and interpreted jointly to determine the full requirements of the Contract.

#### **4.2. SITE ESTABLISHMENT**

- 4.2.1. The Contractor is responsible for Site Establishment. The construction yard will not be serviced, and the Contractor shall make arrangements to connect all necessary services to specific points. The Contractor shall bring to the Site all his necessary construction equipment and install all stationary construction equipment and plant at locations and in the manner accepted by the Engineer. The Contractor shall submit sufficiently detailed plans showing the proposed locations of such stationary equipment and other pertinent data. No installation of such stationary equipment shall be undertaken unless the corresponding plans have been accepted by the Engineer.

### **5. Services and facilities provided by the Employer**

#### **5.1. Source of water supply**

- 5.1.1. The Contractor shall make his own arrangements for the supply of water for construction and testing purposes. The Contractor will be required to supply, install, operate, and maintain at his cost, such temporary pipework and storage facilities as may be necessary to ensure sufficient supply. The supply shall be metered. The Contractor will also be required to pay all connection fees, cost of water drawn from the water supply authority's system at the ruling tariffs in force at the time as well as include all such requirements throughout the duration of the Contract.

#### **5.2. Source of power supply**

6. The Contractor shall make his own arrangements temporary power supply for construction purposes. The Contractor will be required to make his own arrangements with, and pay all the requisite connection and consumption charges for whatever temporary power supplies he may require for his use on the site as well as include all such requirements throughout the duration of the Contract.

### **7. Facilities provided by the Contractor**

#### **7.1. Contractor's camp**

- 7.1.1. On this Site, the Contractor shall be responsible in establishing the final grade for his site establishment requirements including; construction offices, storage areas, warehouse, machine and repair shops, fuel tanks, storage tanks, power and water distribution lines and provide such related facilities and sanitary conveniences that are necessary for maintaining health, peace and order, and safety in the work areas. The positions of all buildings constructed by the Contractor for his own use will be subject to the acceptance of the Engineer. Temporary and permanent fencing around the Contractor's Site establishment areas and electrical and mechanical apparatus connected to the electrical supply shall be erected by the Contractor where needed. On completion of work on Site, buildings constructed by the Contractor for his own use shall be demolished, including foundations, and the ground reinstated. Underground services to these buildings shall be removed.



- 7.1.2. The Contractor shall be responsible for all temporary services required by him both for the site establishment area, camp site and for construction purposes, including water, electricity, sewage, and communication facilities.
- 7.1.3. Covered accommodation for perishable or corrodible materials, fittings and the like shall be adequate and suitable for their purpose and, particularly in the case of cement stores, shall be well ventilated, weatherproof and waterproof with floors raised off the ground, so as to keep the materials perfectly dry and freely aerated. All such accommodation shall be subject to the approval of the Engineer who shall always have free access to the premises.
- 7.1.4. In addition to the above, the Contractor shall provide one toilet per 10 workmen. Portable toilet facilities shall be made available to workers of both male and female genders, the number provided to be in proportion to the ration of the sexes. The toilets shall be in the vicinity of the work site, shall be screened from public view and the use thereof shall be enforced. The Contractor shall, where applicable, make the necessary arrangements for the regular removal of night soil. The Contractor is to ensure portable toilet facilities are cleaned on a regular basis.
- 7.2. Storage and laboratory facilities
- 7.2.1. The Contractor shall provide all storage and laboratory facilities required for the proper execution of the works.
- 7.3. Other services and facilities
- 7.3.1. The requirements of the Engineer's Site establishment are detailed in Project Specification PSA and PSAB.
- 7.4. Disposal of refuse
- 7.4.1. The Contractor shall be responsible for the disposal of refuse and waste generated by his staff daily. The site is to be kept clean, neat, and tidy, to the Employer's satisfaction.
- 7.5. Telephone facilities
- 7.5.1. The Contractor is to provide his own telephone facilities as well as facilities for the use of the Engineer, or his representative for the duration of the Contract.
- 7.6. Housing facilities
- 7.6.1. The Contractor will not be required to provide housing facilities for the Engineer's staff. No accommodation for the Contractor's employees will be permitted on site.
- 7.7. Notice boards
- 7.7.1. The Contractor will be permitted to display two notice boards advertising his Contract on or near the Site or access points to the project area. The notices shall be of a form and in a position accepted by the Engineer and shall include details of other parties involved (including the Employer) as well as the Contractor. No advertisement shall be displayed without the acceptance of the Engineer.
- 7.8. Site usage
- 7.8.1. Working with road reserves, Eskom servitudes, etc.
- 7.8.2. The Contractor is to confine his activities strictly to the indicated working areas and to the spoil sites and the direct access roads to these. He shall not work outside his designated working areas except with the prior approval of the Employer, in writing. It is advised that the Contractor takes note of damaged structures or parts thereof and report these to the Engineer in writing before work starts at or near an existing structure to prevent possible disputes with the occupant or owner.
- 7.9. Site safety and precautions against nuisance



- 7.9.1. The Works is to be conducted within residential areas with pedestrian and vehicular traffic. The watching, barricading, lighting, and traffic control on site shall be carried out where required in strict compliance with these specifications. The Contractor shall ensure that all safety measures are strictly adhered to.
- 7.9.2. Plant used on the Works shall be as efficiently silenced as possible and noisy operations will be permitted between the hours of 07:00 and 17:00 only. Any work outside normal working hours requires written approval by the Engineer 24 hrs in advance.
- 7.9.3. Dust suppression is required for all earthworks activities prone to form excessive dust. Any rock or debris falling from trucks on any haul road shall be removed immediately. Precautions shall be taken to prevent fouling of the site and public roads by trucks. The Engineer may instruct the Contractor to clean roads where any material or debris deposited by any construction vehicle may constitute a danger to the public.
- 7.9.4. The Contractor is solely responsible for the security of his camp, plant, and materials. The Contractor is to familiarise himself with the locality of the proposed site and allow sufficient security measures to protect the works. The Employer will not be held responsible for any damages, theft or
- 7.10. Permits and wayleaves
- 7.10.1. The Employer will make the arrangements for all security access permits and wayleaves necessary within the Works.
- 7.11. Alterations, additions, extensions, and modifications to existing works
- 7.11.1. Interfaces with existing works are indicated on the relevant drawings as far as possible. The Contractor shall take note of these and make appropriate allowances for dealing with, and where necessary, making modifications or tying into these services.
- 7.12. Inspection of adjoining properties
- 7.12.1. The Contractor will be required to inspect all properties within 50m radius of any excavation on site before and after completion of the works. A detailed written and photographic record of the inspections is to be submitted to the Engineer and Client prior to excavation activities commence.
- 7.13. Water for construction purposes
- 7.13.1. The Contractor is required to construct and maintain standpipes for construction water.
- 7.14. Survey control and setting out of works
- 7.14.1. Before commencing the operations, the Contractor shall locate and mark all survey pegs and beacons and shall immediately submit a written report in duplicate of any missing or damaged pegs and beacons to the Engineer's Representative, who shall verify the facts and return a countersigned copy of the report to the Contractor. Other than in the case of setting out pegs, the Contractor will be held responsible for the replacement by a registered land surveyor of all beacons or pegs found damaged or missing on completion of the Works which were not reported as such by the Contractor before commencing operations.
- 7.14.2. Survey records of beacons, bench marks, etc., replaced shall be submitted to the Engineer. Attention in this regard is drawn to Sections 35(1) and (2) of the Land Survey Act of 1927 which lays down the penalties applicable to those who are responsible for interfering with permanent survey beacons, bench marks, reference marks or trigonometric stations.

## 8. **PLANT & MATERIALS**

### 8.1. Materials supplied by the Employer

- 8.1.1. No materials will be supplied by the Employer. The construction yard will not be serviced, and the Contractor shall arrange to connect all necessary services.

### 8.2. Materials, samples, and shop drawings





- 8.2.1. All materials required for incorporation into the permanent works are to be supplied by the Contractor. Where possible, these materials shall be sourced from within the area, considering availability of supply, price, and continuity of supply. In-situ material can be used where suitable. Spoiling and spreading of material will not be permitted on site and suitable temporary stockpile areas must be identified by the Contractor and approved by the Engineer prior to stockpiling.

## 9. **CONSTRUCTION EQUIPMENT**

- 9.1. The Contractor shall provide all construction equipment and plant necessary to complete the works.

### 9.2. Requirements for equipment

- 9.2.1. All construction equipment shall be used for the purpose that it was designed for, should be in good working condition and shall be used in a safe manner and shall comply with all relevant legal and roadworthy aspects.

### 9.3. Equipment provided by the Employer

- 9.3.1. The Employer will not provide any plant and equipment required for construction purposes. All equipment and plant required shall be provided by the Contractor.

## 10. **EXISTING SERVICES**

### 10.1. Known services

- 10.1.1. The position of the known existing services is indicated on the layout drawings as far as reasonably possible. The Contractor shall, however, take note of the fact that this is a developed site which is adjoined and crossed by many services. The Contractor must therefore make provision for suitable means of locating and accommodating all services, including those not known or shown on the drawings. This, however, does not relieve the Contractor from responsibility of verifying if any additional services are present in the area by searching and probing the terrain in question for any existing services or indications of the presence of such services. The Contractor shall at all times exercise the utmost care when working in their vicinity and shall take all necessary steps to protect any existing services whatsoever against damage which may arise as a result of his operations on site. The Contractor shall bear the cost of the repair of damage to any service the possible existence of which could reasonably have been ascertained by him in good time. All cables and pipes shall be considered "live" unless confirmed otherwise by the relevant service authority.

### 10.2. Treatment of existing services

- 10.2.1. Work will be carried out in the vicinity of existing services and all such services shall remain in operation at all times, except where arrangements have been made for the interruption of the service for the purposes of carrying out the Works under this Contract.
- 10.2.2. Existing overhead and underground services may be indicated on drawings held by the respective service providers. Should the Contractor find evidence of possible buried services, he shall notify the Engineer immediately thereof. The Engineer will assess the situation and instruct the Contractor on an appropriate course of action to be taken.
- 10.2.3. The Contractor shall be responsible for checking the locations of all services and to ensure that no damage is caused by construction operations.
- 10.2.4. The Contractor, before starting any excavations or where indicated in the scope of work or site information that underground services either cross or are located adjacent to the Works that is to be constructed, such services shall be exposed by hand ahead of trenching operations to enable any changes that might be needed in the design of the pipelines to be made timeously. Care shall be taken in exposing such services to avoid damaging them. An item has been allowed for in the Bill of Quantities for hand excavation or other methods to search for existing services.





**10.2.5.** All cables and pipes shall be considered "live" unless confirmed otherwise by the relevant service authority.

**10.3.** Use of detection equipment for the location of underground services

**10.3.1.** The Contractor shall be allowed to use non-intrusive equipment for the location of existing services if so agreed. Should excavation be required to identify and or expose any services this shall be for the account of the contractor and shall only proceed once the relevant permits or approvals have been issued by the Employer.

**10.4.** Damage to services

**10.4.1.** Should any existing services be damaged by the Contractor, the Engineer shall be informed immediately. The Contractor shall repair the damaged service if so instructed by the Engineer or shall assist in the repair of the service as instructed by the Engineer at the Contractor's own cost.

**C3.4** CONSTRUCTION

**C3.4.1** WORKS SPECIFICATIONS



#### **C3.4.1.1 Applicable COLTO Standardized Specifications**

The following specifications shall apply for the construction of the Works.

- (a) COLTO Standard Specifications for Road and Bridge Works for State Road Authorities 1998 edition.
- (b) Various other specifications specified in the Project Specifications.

The applicable standardized specifications for this Contract shall be the following:

Section	1100	Definitions
Section	1200	General Requirements and Provisions
Section	1300	Contractor's Site Establishment on Site and General Obligations
Section	1400	Housing, Offices and Laboratories for the Engineer's Site Personnel
Section	1500	Accommodation of Traffic
Section	1600	Overhaul
Section	1700	Clearing and Grubbing
Section	B1800	Dayworks
Section	2100	Drains
Section	2200	Prefabricated Culverts
Section	2300	Concrete Kerbing, Concrete Channelling, Chutes and Down pipes and Concrete Linings for Open Drains
Section	3200	Selection, stockpiling and breaking-down the material from borrow pits, cuttings and existing pavement layers, and placing and compacting the
Section	3300	gravel layers Mass Earthworks
Section	3400	Pavement Layers of Gravel Material
Section	3500	Stabilisation
Section	5200	Gabions
Section	5600	Road Signs
Section	5700	Road Markings
Section	7300	Concrete Block Paving for Roads
Section	8100	Testing Materials and Workmanship

The term "project specification" must be replaced by "scope of works" wherever it appears in these standardized specifications.

#### **C3.4.1.2 Particular Specifications**

The following Particular Specifications for work not covered by the COLTO Standardized Specifications are also included hereunder:

PLI : Generic Labour Intensive Specification

#### **C3.4.1.3 National and International Standards**

Not Applicable.

#### **C3.4.2 VARIATIONS AND ADDITIONS TO THE COLTO STANDARDIZED SPECIFICATIONS**

##### **C3.4.2.1 Project Specifications Relating to Standard Specifications**

This part of the project specifications deals with matters relating to the standard specifications. Where reference is made in the standard specifications to the project specifications this part shall also contain the relevant information



e.g. the requirements where a choice of materials or construction methods are provided for the standard specifications. In certain clauses the standard specifications allow a choice to be specified in the project specifications between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternatives or additional requirements applicable to this contract are contained in this part of the project specifications. It also contains some additional specifications and amendments of the standard specifications required for this particular contract. The number of each clause and each payment item in this part of the project specifications refers to the number of the relevant clause or payment item in the standard specifications. The number of a new clause or a new payment item, which does not form part of a clause or a payment item in the standard specifications and is included here, is also prefixed by B followed by a new number. The new numbers follow on the last clause or item number used in the relevant section of the standard specifications.

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

Standard specifications that are applicable to this contract can be seen below. Variations to these standard specifications can be seen in the following section:

Section	1200	General Requirements and Provisions
Section	1400	Housing, Offices and Laboratories for the Engineer's Site Personnel
Section	1500	Accommodation of Traffic
Section	1700	Clearing and Grubbing
Section	2100	Drains
Section	2200	Prefabricated Culverts
Section	2300	Concrete Kerbing, Concrete Channelling, Chutes and Down pipes and Concrete Linings for Open Drains
Section	3300	Mass Earthworks
Section	3400	Pavement Layers of Gravel Material
Section	7300	Concrete Block Paving for Roads

## **PROJECT SPECIFICATIONS**

### **PART B VARIATIONS AND ADDITIONS TO THE STANDARDIZED SPECIFICATIONS AND PARTICULAR SPECIFICATIONS**

#### **SECTION 1200: GENERAL REQUIREMENTS AND PROVISIONS**

##### **B1202 SERVICES**

*Delete and replace the following words in the last paragraph:*

“...Clause 15 of the general conditions of contract” in the first sentence of the eleventh paragraph with “Clause 5.6 of the General Conditions of Contract for construction works 2015 edition.”

*Add the following to the fifth paragraph:*



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

## **B1204          PROGRAMME OF WORK**

### **(a)              General requirements**

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

*Add the following as a contribution of the first paragraph*

“In drawing up the programme the contractor shall make allowance for all special non-working days”

*Add the following after the third paragraph:*

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

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

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

### **(b)              Programme of work for rehabilitation work**

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

*Insert the following after the first sentence of the second paragraph:*

“The programme shall include the following details;

- (i) A work breakdown structure that identifies all major activities
- (ii) Scheduled start and end dates for each activity
- (iii) Linkages between activities that clearly identify sequence, floats and critical path
- (iv) Intended working hours and resource allocations (plant and labour).
- (v) Monthly cashflow projections
- (vi) Key dates in respect of information required or due delivery

*Add the following subclause*

#### **(a)              “Programme revisions**

The programme will be reviewed at the monthly site meetings at which the Contractor shall provide sufficient details that will allow the comparison of completed work per activity against the original approved programme. The Contractor shall indicate what resources and programme changes he/she intends to implement in order to remedy any activity that has fallen behind. The Engineer may demand from the Contractor a major revision of the programme. Such a revision shall be submitted for approval within fourteen days of the demand.”



## **B1205 WORKMANSHIP AND QUALITY CONTROL**

*Add the following:*

“Quality control (Scheme 1) as detailed in Section 8200 will be used for determining the acceptance levels with respect to the properties of the materials and workmanship executed by the contractor.”

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

*Replace “clause 14” in the paragraph with “clause 4.7”*

*Delete “and of clause 14 of the general conditions of contract” in the sixth paragraph*

*Add the following:*

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

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

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

## **B1209 PAYMENT**

### **(b) Rates to be inclusive**

*Add the following to the first paragraph:*

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

### **(c) The meaning of certain phrase in payment clause**

- (i) Procuring and furnishing.... (material)

*Add the following*

“Payment for procuring and furnishing material from commercial sources shall include all transports costs irrespective of distance hauled”

### **(e) Materials on the site**

*Replace “clause 52” in the first line with “subclause 6.10”*

*Add the following:*



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

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

#### **B1210 CERTIFICATE OF PRACTICAL COMPLETION OF THE WORKS**

*Delete and replace the words in the first paragraph:*

"Clause 54 of the general conditions of contract" in the fourth line of the first sentence with "Clause 5.14.1 of the General Conditions of Contract for construction works 2015 edition".

#### **B1212 ALTERNATIVE DESIGNS AND OFFERS**

*Add the following to the end of sub clause (m):*

"The provision for contract price adjustment in the original tender summary must not under any circumstances be altered in an alternative tender"

#### **B1215 EXTENSION OF TIME RESULTING FROM ABNORMAL RAINFALL**

*Delete and replace the words in the first paragraph:*

"Clause 45 of the general conditions of contract" in the first line of the first sentence with "Clause 5.12 of the general conditions of contract for construction works 2015 edition".

*Add the following after the first paragraph:*

Method (ii) (Critical-path method) shall be used on this contract.

##### **Method (ii) (Critical-path method)**

*Delete and replace the words in the second paragraph with the following:*

Replace the word "five-day" in the second paragraph with "six-day".

The value of "n" is zero (0).

- (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:

$$V = (N_w - N_n) + (R_w - R_n)/X$$

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 Cradock for the period 1985 to 2006 are reproduced in the accompanying table, and the monthly averages (Rn and Nn) for this period shall, for the purposes of this Contract be taken as normal and as the values to be substituted for Rn and Nn in the formula above. 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 and Nn indicated in the table.

- (c) The Contractor shall, at his own cost, provide and erect on the Site at a location approved by the Engineer, 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 Engineer, the Engineer shall be entitled to witness the reading of the gauge.
- (d) The Contractor's claims in terms of Subclause 5.12.1 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 Engineer monthly; provided always that
- (i) the period allowed to the Contractor in terms of Clause 10.1 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 Engineer in terms of Subclause 5.12.1 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.

**Table 5.1: Statistical rainfall**

STATISTICAL INFORMATION: RUST DE WINTER DAM: Last ten years		
Month	RAINFALL	
	Nn = Actual number of days during the calendar months in which a rainfall of more than Y-mm has been received	Rn = Average monthly rainfall





January	10.2	99.5
February	5.8	48.5
March	7.7	67.2
April	5.3	37.6
May	2.4	8.8
June	1.4	6.2
July	0.8	0.6
August	1.4	22.0
September	1.7	14.4
October	8.1	44.3
November	11.5	74.0
December	10.5	96.6
<b>TOTAL</b>	<b>66.8</b>	<b>519.7</b>

- (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 Engineer, 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  $N_n$  and  $R_n$ .
- (f) The Engineer 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 " $N_n$ " 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 5.12 and Clause 10.1 of the Conditions of Contract.

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

*Delete and replace the words in the first paragraph:*



“Clause 35 of the general conditions of contract” in the second line of the first sentence with “Clause 8.1 of the General Conditions of Contract for construction works 2015 edition”.

#### **B1224 THE HANDING-OVER OF THE ROAD RESERVE**

*Add the following:*

“The full extent of the road reserve will be handed over to the Contractor at the beginning of the contract. He shall be responsible for the maintenance along this portion of the road until completion of the contract”.

#### **B1229 SABS CEMENT SPECIFICATIONS**

The standard cement specifications SABS 471, SABS 626, SABS 831 and SABS 1466 have been withdrawn and are replaced by the new SANS 50197-1 and -2: Common cements, and SANS 50413-1 and -2: Masonry cement. These specifications will be applicable to this contract, and the descriptions and types of cements specified, will be based on the designations as defined in these specifications.

*Add the following subclause:*

#### **“B1230: IN-SERVICE AND STRUCTURED TRAINING**

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

##### **(a) Details of in-service and structured training**

- (i) The 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”.

*Add the following clause:*

**“B1231 COMMUNITY LIAISON OFFICER (CLO)**

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

**(a) Duties of the Community Liaison Officer**

The Community Liaison Officer’s duties will be:

- To be available on site daily between the hours of 07:00 and 17:00 and at other times as the need arises. His normal working day will extend from 07:00 in the morning until 17:00 in the afternoon.
- To determine, in consultation with the Contractor, the needs of the temporary labour for relevant skills training. He/she will be responsible for the identification of suitable trainees and will attend one of each of the training sessions.
- To communicate daily with the Contractor and the Engineer to determine the labour requirements with regard to numbers and skill, to facilitate in labour disputes and to assist in their resolution.
- To assist in and facilitate in the recruitment of suitable temporary labour and the establishment of a “labour desk”.
- To attend all meetings in which the community and/or labour are present or are required to be represented.
- To assist in the identification, and screening of labourers from the community in accordance with the Contractor’s requirements.
- 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.
- To attend disciplinary proceedings to ensure that hearings are fair and reasonable.
- To keep a daily written record of his interviews and community liaison.



- (x) To attend monthly site meetings to report on labour and RDP matters.
- (xi) All such other duties as agreed upon between all parties concerned.
- (xii) To submit monthly returns regarding community liaison as illustrated in Part C5.1 of this document (form RDP 12(E)).

**(b) Payment for the community liaison officer**

A special pay item is incorporated in section 1200 of the bill of quantities relating to payment of the liaison officer on a prime cost sum basis. This payment shall only be made for the period for which the duties of the liaison officer are required. The remuneration of the CLO shall be R3 500.00/month unless otherwise advised by the Employer in terms of the Sectorial determination 2: Civil Engineering Sector (Task grade 3).

**(c) Period of employment of the community liaison officer**

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

*Add the following clause:*

**“B1232 WORKMEN'S COMPENSATION ACT**

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

*Add the following clause:*

**“B1232 CARE OF WORKS, DAMAGE, INJURY AND INSURANCE**

Compliance with Road Traffic Act:

When a service necessitates vehicles or plant travelling or working on a public road the following shall apply:

- The vehicles and plant shall be licensed in terms of the National Road Traffic Act 1996 (Act No. 93 of 1996) as amended.
- Every driver and operator of a vehicle or an item of plant shall be in possession of a valid permit in respect of the class of vehicle or item of plant he is driving or operating.

The contractor shall provide, erect and maintain sufficient road signs, barricades, fencing and guarding as may be necessary or required by the Engineer or by any act, regulation or statutory authority in order to minimise the danger and inconvenience caused to vehicle and pedestrian traffic.

The Contractor by accepting this contract shall be deemed to have indemnified the Employer and the Engineer against any claims, damages and / or costs that may arise in this regard

*Add the following clause:*



**"B1233 MEASUREMENT AND PAYMENT**

Add the following items:

ITEM	UNIT
<b>B12.01 Protection, removal, realignment and replacement of services</b>	
a) Utility services	
i. Locating existing services (known and unknown) .....	No
(ii) Relocating of measured by length services	
a) Relocating water services .....	km
b) Relocating sewer services.....	km
(iii) Relocate other services (eg. Eskom, Telkom).....	Prov Sum
(iv) Handling cost and profit in respect of sub item B12.01 (a)( iii) above ).....	percentage (%)

Locating (including use of detection devices) all services including water sewer, electricity and gas.

The rate should be used as instructed by the Engineer, for the supply or hiring of specialised detecting equipment, for the use of such equipment and for drawing up plans of the located services as specified and the physical movement of such services as necessary. Alternatively an approved specialist firm may be employed to carry out the

<b>B12.02 Community Liaison Officer</b>	
a) Community Liaison Officer.....	Provisional (Prov) Sum
b) Project Steering Committee.....	Provisional (Prov) Sum
c) Contractor's charge to allow for handling costs and all other charges	
1. in respect of subitems B12.02 (a) and (b).....	percentage (%)

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

The Tendered percentage is a percentage of the amount actually spent under the sub-items B12.01 and B12.02 which shall include full compensation for the handling costs of the contractor, and the profit.

The provisional and 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."

<b>B12.03 Social Responsibility</b>	
a) Community Empowerment.....	Provisional (Prov) Sum
b) Contractor's charge to allow for handling costs and all other charges	
in respect of subitems B12.03 (a) and (b).....	percentage (%)

Expenditure under this item shall be made in accordance with the community requirements as indicated by the Ward Councillor or Committee in consultation with the local authority.

The Tendered percentage is a percentage of the amount actually spent under the sub-items B12.03, which shall include full compensation for the handling costs of the contractor, and the profit.



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

### B1302 GENERAL REQUIREMENTS

#### (a) Camps, constructional plant and testing facilities

*Add the following:*

"(d) Contractor's ablution facilities

The Contractor shall, at each area where work is being undertaken, provide on a daily basis at least one (1) portable chemical latrine unit per fifteen (10) 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 Engineer. No separate payment shall be made for this requirement and shall be deemed to be included in the rates Tendered for the contractor's time-related obligations."

*Add the following after the last paragraph:*

"The combined total Tendered for Item 1300 sub-items (a), (b) and (c) and Item 1400 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 & 1400, 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."



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

### B1402 OFFICES AND LABORATORIES

#### (a) General

*Add the following new subclause:*

##### “(i) Computers and printers

When instructed by the Engineer, the Contractor shall provide approved new computer equipment, including software, and printers for use by the Engineer's site personnel. The type of equipment and software shall be as instructed by the Engineer and payment for equipment and maintenance shall be made through item B14.11.

All equipment provided shall be kept fully serviceable at all times by the Contractor. The Contractor shall repair/replace any defective equipment within 48 hours after notification by the Engineer's staff. The Contractor shall also be responsible to provide all paper and ink cartridges required by the Engineer.

At the end of the Contract, the equipment and software shall revert back to the contractor”

*Add the following new subclause:*

##### “(j) Survey Equipment and Assistants

Survey equipment shall be provided, maintained and insured by the Contractor for the duration of the Contract and shall consist of a theodolite and an automatic level each fitted with an optical plumb as well as the necessary tripods, metric staffs with built-in plumb bubbles, ranging rods and tapes.

The instruments and accessories shall be approved by the Engineer and shall be serviced and adjusted for accuracy prior to bringing them onto the Site. A certificate stating that this has been done shall be provided.

The equipment shall be for the exclusive use of the Engineer's supervisory staff and shall, when no longer required, be returned to the Contractor.

The Contractor shall also make available to the Engineer's supervisory staff at least two capable survey assistants as and when required.”

### B1406 MEASUREMENT AND PAYMENT

*Add the following sub-item:*

#### ITEM

#### UNIT

##### “B14.12 Provision of survey equipment and assistants

(a) Dumpy level.....day

(b) Tachometer.....day

(c). Survey assistants.....per day (pd)





The unit of measurement shall be the day for the item of equipment or personnel. Non-working days shall not be measured. The day shall be taken from the day that the personnel and/or equipment start until depart.

The Tendered rates for labour under item B14.12(c) shall include full compensation to cover leave pay, bonuses, subsistence, allowances, employer's contributions, additional payment for overtime where applicable, insurances, housing, operative and contingent costs, relating to the supply of personnel.

The Tendered rates for equipment under item B14.12(a) & B14.12(b) shall be an all-inclusive hire charge for the use of the equipment and shall apply only to equipment nominated in writing by the Engineer.

*Add the following sub-item:*

ITEM	UNIT
<b>"B14.13 Contract Notice Board.....No.</b>	

The unit of measurement shall be the number of units supplied in accordance with the specification, drawings and the Engineer's instruction.

The Tendered rates shall include full compensation for supply, transport to site and erect contract notice board as directed on drawings or as indicated by the Engineer.

*Add the following after the fifth paragraph:*

"The combined total Tendered for Item 1300 sub-items (a), (b) and (c) and Item 1400 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 & 1400, 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."



## SECTION 1500: ACCOMMODATION OF TRAFFIC

### B1501 SCOPE

*Add the following to Clause 1501:*

The scope of this section shall also include the preparation and submission to the Engineer for approval of traffic management plans. The traffic management plans shall demonstrate how the Contractor intends accommodating and controlling traffic through the site. The plans must incorporate all the requirements of the specifications in respect of the accommodation of traffic, including the traffic control devices and the personnel involved. A traffic safety officer shall be specifically named in the Plan together with 24 hr contact details. Copies of the plans shall be made available to the Engineer, the Employer, Local Authorities, the Police and Emergency Services.

The accommodation of traffic shall generally be undertaken in the following manner:

- (a) Via gravel diversions, where practical in terms of space and the terrain.
- (b) By dealing with traffic under construction where no diversions are possible.
- (c) By diverting traffic along the existing road where the route is being realigned.

### B1502 GENERAL REQUIREMENTS

#### (b) Providing Temporary Deviations

*Add to Sub-clause 1502(b) the following:*

The contractor shall keep the provincial traffic police, the municipal traffic departments and the Engineer fully informed with regard to any changes in the normal traffic flow and obtain their approval for these changes.

During the non-working hours, all unnecessary obstructions to the traffic shall be removed and all signs no longer applicable to the situation shall be removed or effectively covered.'

It is a condition of this contract that not more than 1.5 km of deviation should be open to public traffic at any one time, and that not more than three separate deviations should be open at any one time. No additional payments will be made where situations arise that the contractor has deviations cross over the roadway under construction.

#### (i) Traffic Safety Officer

*Add to Sub-clause 1502(i) the following:*

The Contractor shall submit a CV of the candidate to the Engineer for approval before the Traffic Safety Officer is appointed. The Traffic Safety Officer shall be made available to discuss road safety and traffic accommodation matters whenever required by the Engineer.

*Delete Sub-clause 1502(ii) and (iii) and replace with the following:*



- (ii) Record on neat and dimensioned sketches and submit to the Engineer the position and sign reference number where applicable of each sign, barricade, delineator, cone, amber flicker light, guardrail and permanent or temporary painted road marking feature. The position of each unit shall be adequately referenced to identifiable permanent features located along the site of the works.

These records shall also show the date and time at which the recorded traffic accommodation features are certified correct by the Traffic Safety Officer, and shall be signed by the Traffic Safety Officer before being submitted to the Engineer.

The records shall be amended whenever changes are made in the field and the revised detailed sketches shall be submitted to the Engineer. This shall include the recording of the position of flagmen and stop/go control men and their associated traffic accommodation equipment wherever they are used."

- (iii) Personally inspect the position and condition of each traffic accommodation feature on the whole site of works twice each day by 9:30 and by 16:30, to record all irregularities discovered and the remedial action taken, and to sign off as correct and submit to the Engineer such record sheets by 10:00 and by 17:00 each day. The traffic Safety Officer shall keep a duplicate book for this specific purpose.

The Traffic Safety Officer shall also submit to the Engineer by 10:00 each morning, a record of all matters pertinent to site safety and traffic accommodation throughout the site of works the previous day. He shall also record the daily labour returns of flagmen, stop/go and traffic signal control men employed.

The traffic safety officer shall be equipped with a cellular telephone and shall have a vehicle and 3 labourers at his disposal 24 hrs a day and he shall be directly answerable to the Contractor's Site Agent. The Traffic Safety vehicle shall be a truck with a capacity of 5 tons and shall be equipped with a high visibility rear panel as shown on Figure 24 of Road Signs Note No.13. The traffic Safety Officer shall have a direct line of communication at all times with the police and traffic officers responsible for the area within limits of the Contract. The provision of the Road Safety Vehicle, driver, three labourers and the cost of the cellular telephone shall be deemed to be included in the rates tendered for the Contractor's establishment on site.

*Add to Sub-clause 1502(i) the following new sub-sub-clauses:*

- (viii) Ensure that all obstructions, soil and gravel heaps, related to the Contractors activities be removed before nightfall where applicable and as instructed by the Engineer and that the roads are safe for night traffic.
- (x) The Traffic Safety Officer shall, in addition to the duties listed in Clause 1502 (i), also be responsible for removal of broken down vehicles off the roadway and implementing actions requested by the traffic authorities with regard to the work to be carried out, and shall be responsible for the erection and maintenance of all traffic signs necessary for the accommodation of traffic."

*Add the following new Sub-clauses to Clause 1502:*

- (j) **Public traffic**



The contractor must plan and conduct his activities so as to bring about the least possible disruption to the traffic on the road. All halting of traffic will require the prior approval of the Engineer and must be pre-arranged with the appropriate traffic authorities.

In all dealings with the public the Contractor shall bear in mind the public's right to enjoy the use of the road, and the Employer's desire to interfere as little as possible with this right. At all points of contact with the public, the Contractor shall deal with deliberate courtesy and understanding in any discussions or disputes.

**(k) Failure to comply with provisions**

The failure or refusal of the Contractor to provide barricades or traffic signs at the proper time, or to take the necessary precautions for the safety and convenience of public traffic as specified or instructed by the Engineer, shall be sufficient cause for the suspension of all work under this Contract without any additional compensation to the Contractor until the required accommodation of traffic has been completed to the satisfaction of the Engineer. The above shall be sufficient cause for the Engineer to deduct penalties as follows:

- A fixed penalty of R5 000,00 per occurrence shall be deducted for each and every occurrence of non-compliance with any of the requirements of Section 1500 of the standard specifications and section B1500 of the Project Specifications.
- In addition, a time-related penalty of R500,00 per hour over and above the fixed penalty shall be deducted for non-compliance to rectify any defects in the accommodation of traffic within the allowable time after an instruction to this effect has been given by the Engineer. The Engineer's instruction shall state the allowable time, which shall be the time in hours for reinstatement of the defects. Should the Contractor fail to adhere to this instruction, the time-related penalty shall be applied from the time the instruction was given.

The penalties shall be deducted from the payment certificate for the month in which the non-compliance occurs.

Payment will also be deducted in accordance with Payment Item B15.01 of these Project Specifications.

**(l) Access to work area**

Construction traffic will only be permitted to enter or leave the work area at points approved by the Engineer and as clearly indicated on the traffic management plans. When any access point is in use, flagmen shall be provided for each such point. At least two flagmen shall be stationed at the access point to control the movement of construction traffic, and to warn public traffic on both lanes of the existing road. It is not the purpose of these flagmen to stop public traffic flow.

**(m) Extension of time for completion**

Accommodation of public traffic on the works or any delays caused thereby, as well as any suspensions due to failure by the Contractor to comply with the provisions for the accommodation of traffic, will not be regarded as special circumstances for an extension of time.

**B1503 TEMPORARY TRAFFIC-CONTROL FACILITIES**

*Delete and replace the words in the first sentence of the first paragraph of Clause 1503 with the following:*

“South African Road Traffic Signs Manual” to read “South African Road Traffic Signs Manual in conjunction with the latest edition of Road Signs Note No.13 Roadworks”.



*Replace the third paragraph of Clause 1503 with the following:*

The type of construction, spacing and placement of traffic-control devices shall be in accordance with the latest edition of Road Signs Note No.13, Roadworks, these special provisions, the drawings and the South African Road Signs Manual. The recommended arrangements of the traffic control devices illustrated in Appendices 1 to 6 of Road Signs Note No.13 and/or drawings shall not be departed from without prior approval of the Engineer. Typical arrangements expected to be used in the Contract are given on the tender drawings.

However, this shall not absolve the Contractor of his obligations in preparing traffic management plans as per this Project Specification.

The details shown for spacing and placement of traffic-control facilities may however, be revised at the discretion of the Engineer where deemed necessary to accommodate local site geometry and traffic conditions

**(b) Road signs and barricades**

*Add to Sub-clause 1503(b) the following:*

The Contractor shall be responsible for the protection and maintenance of all signs, and shall at his own cost replace any that have been damaged, or lost, or stolen.

All temporary road signs shall be mounted on portable supports for the easy moving of signs to temporary positions. The only permitted method of ballasting the sign supports shall consist of durable sandbags filled with sand of adequate mass to prevent signs from being blown over by wind. The cost of the sandbags shall be included for in the tendered rates for the various types of temporary road signs.

The traffic-control devices, temporary signs and devices required in the Contract are those designated in Road Signs Note No.13.

The covering of permanent road signs, if applicable, shall be by utilising a hessian bag, which shall be pulled over the sign in the form of a hood and fastened to the sign posts. Plastic bags or other materials and fastening by means of adhesive tape shall not be permitted. The cost of covering of permanent road signs shall be deemed to be covered by the tendered rates of items B15.03.

No work may proceed on any section where accommodation of traffic is required until such time as the relevant requirements with regards to signposting are met and written approval of the Engineer is obtained. The Contractor shall keep sufficient surplus signs, delineators and barricades on the site to allow for the immediate replacement of damaged or missing items, in any case, within three hours of instructions having been given by the Engineer. Delineators shall be of the flexible plastic reversible variety and not of the rigid metal variety.

Should the Contractor fail to respond to an instruction to re-erect a road sign within the designated time or fail to comply with the requirements, the work on that section will be suspended without any compensation to the Contractor.

**(c) Channelisation devices and barricades**

*Add to Sub-clause 1503(c) the following:*

Delineators shall be of plastic and shall be capable of withstanding winds caused by passing traffic in typical working conditions without falling over. To achieve this, the base shall be ballasted using sand bags.



Traffic cones manufactured in a fluorescent red-orange or red plastic material shall be used only at short term lane deviations during daylight. Cones used on all deviations shall be 750 mm high. Lane closures which continue into the night time shall be demarcated by delineators only.

The use of steel drums as channelization devices will not be allowed on this Contract unless instructed by the Engineer. Channelization shall be effected by the use of delineators or cones as detailed in Road Signs Note No. 13 - Roadworks.

**(e) Warning devices**

*Add to Sub-clause 1503(e) the following:*

All construction vehicles and plant used on the works shall be equipped with rotating amber flashing lights and warning boards as specified. All vehicles and plant shall obtain a clearance permit from the Engineer before being allowed onto the site.

Rotating lights shall have an amber lens of minimum height of 200 mm and shall be mounted to ensure clear visibility from all directions. The lights on construction vehicles shall not be switched on while vehicles are being operated on unrestricted sections of a public road, but shall be switched on while construction vehicles are operating within the accommodation of traffic area, as the vehicles decelerate to enter a construction area, and as the vehicles accelerate to the general speed when entering the road from a construction area. Lights on plant shall operate continuously while the plant is working alongside sections of road open to public traffic.

All LDV's and cars operating on site shall also be equipped with rotating amber flashing lights which shall be placed so as to be clearly visible and operated continuously while the vehicles are maneuvering in or out of traffic or are travelling or parked alongside roads open to public traffic.

Rotating lights and the "Construction Vehicle" signs on the Contractor's vehicles and plant shall not be paid for separately but shall be included in the rates covering the use of the vehicles.

The Contractor shall apply and maintain lights together with temporary mounting brackets, to the approval of the Engineer. Vehicles and plant that do not comply with these requirements shall be removed from the site.

The Contractor shall ensure that all his personnel, excluding those who are permanently office bound, are equipped with reflective safety jackets and that these are worn at all times when working on or near to the travelled way. Any person found not wearing a reflective jacket under these circumstances shall be removed from the site until such time as he is in possession of and wearing a reflective jacket. Reflective safety jackets shall be kept in good condition and any jackets that are, in the opinion of the Engineer, ineffective shall be immediately replaced by the Contractor.

*Add the following New Sub-clauses to Clause 1503:*

**(g) Other signs and facilities**

The Engineer may instruct the Contractor to provide any other road sign, reflective tape, etc not measured in standard pay items. The road signs shall conform to the requirements of the South African Traffic Signs Manual, Road Note 13 or specification provided by the Engineer.



The Contractor shall inform the general public of the intended road works, construction period and accommodation of traffic proposal through press releases in local and provincial newspapers.”

Cones shall be manufactured and positioned in accordance with the details specified on the drawings.

All traffic cones and road signs shall be kept clean and visible at all times. All bituminous or other foreign material shall be removed by the Contractor, or the dirty traffic cones and road signs shall be replaced with new ones at the cost of the Contractor, as directed by and to the satisfaction of the Engineer.

**(h) Safety jackets**

The Contractor will be responsible to ensure that all construction workers, staff of the Engineer and visitors shall wear safety jackets when moving around on site. The jackets shall be of an approved type, orange in colour and shall be to the approval of the Engineer. The Contractor shall provide the Engineer with two jackets. Payment for Engineer`s jackets will be as indicated in item B15.03 in the bill of quantities.

**B1517 MEASUREMENT AND PAYMENT**

*Add the following item:*

ITEM	UNIT
------	------

**“B15.14 Penalties to be deducted for non-compliance with requirements for accommodation of traffic**

- |            |  |
|------------|--|
| <b>(a)</b> | Fixed penalty per occurrence.....Number (No) |
| <b>(b)</b> | Time related penalty.....Hour (h)            |

Failure or refusal on the part of the contractor to take necessary steps to ensure the safety and convenience of the public traffic, accommodation of traffic, plant and personnel in accordance with these specifications or as required by statutory authorities or ordered by the engineer, shall be sufficient cause for the engineer to deduct penalties as follows:

- A fixed penalty of R10 000,00 shall be deducted for each and every occurrence of non-compliance with any of the requirements of section 1500 of the standard specifications and section B1500 of the project specifications.
- In addition, a time-related penalty of R500,00 per hour over and above the fixed penalty shall be deducted for non-compliance to rectify any defects in accommodation of traffic within the allowable time after an instruction to this effect has been given by the engineer. The engineer’s instruction shall state the allowable time, which shall be the time in hours for reinstatement of the defects. Should the contractor fail to adhere to this instruction, the time related penalty shall be applied from the time the instruction was given.”





## SECTION 1700: CLEARING AND GRUBBING

### B17.04 MEASUREMENT AND PAYMENT

*Add the following new item:*

"ITEM	UNIT
<b>B17.07 Demolish and spoil material for structures, buildings etc</b>	
(a) 100mm thick un-reinforced concrete paving	m <sup>2</sup>
(b) 150mm thick un-reinforced concrete paving	m <sup>2</sup>
(c) 100mm thick reinforced concrete paving	m <sup>2</sup>
(d) 150mm thick reinforced concrete paving	m <sup>2</sup>



The unit of measurement shall be the square meter of material removed from the paving or apron as instructed by the engineer.

The Tendered rate shall include full compensation for all work necessary for breaking or demolishing and removing all undesirable material from structures, transport and dispose of these materials, all as specified in this section.”

*Add new section B1800:*

## **SECTION 1800: DAYWORK SCHEDULE**

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

### **B1801 SCOPE**

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

### **B1802 ORDERING OF DAYWORK**

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

### **B1803 MEASUREMENT AND PAYMENT**

**ITEM**

**UNIT**



**B18.01 Personnel during normal working hours:**

- (a) Unskilled labour ..... hour (h)
- (b) Semi-skilled labour ..... hour (h)
- (c) Skilled labour ..... hour (h)
- (d) Ganger ..... hour (h)

**ITEM**

**UNIT**

**B18.02 Personnel outside normal working hours:**

**(a) Outside normal hours and Saturdays**

- (i) Unskilled labour ..... hour (h)
- (ii) Semi-skilled labour ..... hour (h)
- (iii) Skilled labour ..... hour (h)
- (iv) Ganger ..... hour (h)
- (v) Foreman..... hour (h)

**ITEM**

**UNIT**

**B18.04 Materials:**

- (a) Procurement of materials .....Provisional (Prov) Sum
- (b) Contractor's handling costs, profit and all other charges in respect of Sub-item B18.04(a) ..... percentage (%)

The unit of measurement for items B18.01 and B18.02 shall be the hour for the item of equipment or personnel. Non-working hours for transport breakdown, lack of operator or any other reason shall not be measured. The time shall be taken from the time that the personnel and/or equipment depart until return.

The Tendered rates for labour under item B18.01 shall include full compensation to cover overhead charges and profit, leave pay, bonuses, subsistence, allowances, employer's contributions, additional payment for overtime where applicable, insurances, housing, site supervision, use of small hand tools and appliances, non -mechanical plant and equipment and consumable stores, for all administrative, supervisory, operative and contingent costs, relating to the supply of personnel.

The Tendered rates for plant for item B18.02 shall be an all-inclusive hire charge for the use of the vehicle and driver or plant/equipment and operator and shall apply only to vehicles plant and equipment nominated in writing by the engineer, for all administrative, supervisory, operative and contingent cost, and profit relating to the running of the plant.

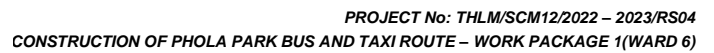


## SECTION 2100: DRAINS

### B21.07 MEASUREMENT AND PAYMENT

*Amend the following sub-items as follows:*

"ITEM	UNIT
<b>B21.01</b> <b>Excavation for open drains</b>	
(b)      Extra over subitem 21.01 (a) for excavation in hard material, irrespective of depth <b>(the rate should be inclusive of other methods of excavation/drilling/rock breaking)</b>	m <sup>3</sup>



## B22.18 MEASUREMENT AND PAYMENT

ITEM	UNIT
B22.01	Excavation:
(b)	Extra over subitem 22.01 (a) for excavation in hard material, irrespective of depth (the rate should be inclusive of other methods of excavation/drilling/rock breaking)
	m <sup>3</sup>

ITEM	UNIT
<b>B22.17</b>	<b>Manholes, catchpits, precast inlet and outlet structures complete</b>
(f)	Wingwall outlet structure complete with cast-in site floor slab, see drawing
0210-03D01	No

The Tendered rate shall include full compensation for all work necessary for procuring, furnishing and installing, and laying where applicable, the complete unit including excavation and backfilling.”

## 196



**B2301 SCOPE**

**B2304 CONSTRUCTION**

**(e) Cast in situ kerbs and channels**

*Add the following:*

"Cast in situ kerbs, channels and edge beams shall be provided with a contraction joint every 2 m and an expansion joint every 20 m. The contact area of the contraction joint shall be painted with two coats of bitumen. Alternatively, joints may be cut and finished to a depth of 50 mm. The expansion joint shall consist of 12 mm thick Flexcell or an approved equivalent placed between adjoining concrete sections. The top part of the joint shall be sealed with a 12 mm x 12 mm silicone sealant. All joints shall be provided for the full depth of the concrete."

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

**(i) Construction sequence**

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

"In all cases where kerbing and/or channelling and/or concrete edge beams constructed at intersections and access points adjoin the bituminous surface of the road, the kerbing and/or channelling and/or concrete edge beams may only be constructed after the bituminous surface has been completed.

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

**B23.07 MEASUREMENT AND PAYMENT**

*Amend the following sub-items as follows:*

**"ITEM**

**UNIT**



**B23.07 Trimming of excavation for concrete-lined open drains:**

- (b) In hard material **(the rate should be inclusive of other methods of excavation/  
drilling/rock breaking)** m<sup>3</sup>

**SECTION 3300: MASS EARTHWORKS**

**B33.12 MEASUREMENT AND PAYMENT**

*Amend the following sub-items as follows:*

**"ITEM**

**UNIT**





**B33.01** Cut and borrow to fill, including free-haul up to 10km:

**B33.04** Cut to spoil, including free-haul up to 10km. Material obtained from:

- (c) Hard material (the rate should be inclusive of other methods of excavation/  
drilling/rock breaking)

m<sup>3</sup>

## **SECTION 3400: PAVEMENT LAYERS OF GRAVEL MATERIAL**

**B3402** MATERIALS

**(a)** General

*Add the following:*

"Material requirements for gravel pavement layers are in accordance with TRH4 and shall be indicated on the drawings."



Add the following at the end of the second paragraph:

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

Add the following after the second paragraph:

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

Replace Table 3402/5 with:

"TABLE B3402/5:

**REQUIREMENTS FOR CHEMICALLY STABILIZED LAYERS**

<b>Classification</b>	<b>C1</b>	<b>C2</b>	<b>C3</b>	<b>C4</b>
Material before treatment	At least G2 quality	At least G4 quality	At least G5 quality	At least G6 quality
PI after treatment	Non-plastic	Non-plastic	6 max. *(1)	6 max. *(1)
UCS (MPa) *(2)	6 min.	4 min.	1,50 min.	0,75 min.
ITS (kPa) *(3)	-	-	250 min.	200 min.
WDD (% loss) *(4)	5 max.	10 max.	20 max.	30 max.

Note \*

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

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

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

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

**(b) Compaction requirements**

"The minimum in situ dry density for the various layers shall be as indicated on the drawings and Pricing Schedule."

**B34.07 MEASUREMENT AND PAYMENT**

Amend the following item:

<b>"ITEM</b>	<b>UNIT</b>
<b>B34.01 Pavement layers constructed from gravel obtained from cut or borrow, including free-haul up to 10km:</b>	

Add the following new item:

<b>"ITEM</b>	<b>UNIT</b>
<b>B34.14 Pavement layers constructed from gravel obtained from</b>	



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**Commercial sources or approved sources provided by the Contractor,  
including all haul:**

- (a)** Gravel selected layer (unstabilised-G7) compacted to
  - i. 95% mod. AASHTO density (specify compacted layer thickness) ..... cubic metre (m<sup>3</sup>)
- (b)** Gravel sub-base (G6 min. unstabilised material) compacted to
  - i. 95% mod. AASHTO density (specify compacted layer thickness) ..... cubic metre (m<sup>3</sup>)

The Contractor shall locate and prove his own sources of material for pavement layers.

The unit of measurement shall be the cubic meter of compacted pavement layer and the quantity shall be calculated from the authorized dimensions of the completed layer.

The Tendered rate shall include full compensation for procuring the material from commercial sources, breaking down, placing and compacting the material, including transporting the material over an unlimited free-haul distance, protection and maintenance of the layer and the conducting of control tests, all as specified.”



## SECTION B3500: STABILISATION

### B3502 MATERIALS

#### (a) Chemical stabilizing agents

*Delete subclauses "(ii) Ordinary Portland cement" and "(iii) Portland blast-furnace cement" and replace with the following:*

"Cement shall comply with the relevant requirements of SANS 50197-1:2000. The use of strength classes greater than 32,5 shall not be permitted."

*Add the following:*

"The Contractor must receive confirmation from the Engineer on the type and quantity of stabilizing agent before ordering."

#### (e) Water

*Add the following before the first paragraph:*

"Water used in the compaction and curing of stabilised layers shall comply with the requirements of Water Quality Code H3 as specified in table B1219."

### B3503 CHEMICAL STABILISATION

#### (b) Applying the stabilizing agent

*Add the following to the first paragraph:*

"The Contractor's spreading method must be submitted to and approved by the Engineer before any spreading can take place."

#### (d) Mixing in the stabilizing agent

*Add the following:*

"The Contractor shall prepare a trial section for each type of material without any extra payment to demonstrate his proposed mixing process before extensive mixing commences. The cost of the trial section shall be deemed to be included in the rates Tendered."

After approval has been obtained, the mixing process and equipment shall remain unaltered unless otherwise instructed by the Engineer.

The fact that the Engineer has approved the mixing process shall not relieve the Contractor of his obligations in respect of the mixing specified elsewhere in the Specifications. It will serve only as a guideline to ensure that the specified mixing requirements can actually be met."



**B3507 CONSTRUCTION OF TRIAL SECTION**

*Add the following to the last paragraph:*

"The fact that the Engineer has approved the mixing process shall not relieve the Contractor of his obligations in respect of the mixing specified elsewhere in the specifications. It will serve only as a guideline to ensure that the specified mixing requirements can actually be met."

**B3509 QUALITY OF MATERIALS AND WORKMANSHIP**

*Add the following paragraphs:*

"The Engineer shall be notified in good time to enable him to conduct or witness tests himself.

Spreading shall only commence when the Engineer is satisfied that the correct quantity of stabilizing agent has been placed on the layer and has given permission that the stabilizing agent may be spread."



## SECTION 7300: CONCRETE BLOCK PAVING FOR ROADS

### B73.04 MEASUREMENT AND PAYMENT

*Add the following new item:*

“ITEM	UNIT
<b>B73.04 Construction of Speed Hump complete</b> (Description of type with reference to a drawing).....Number (No)	

The unit of measurement shall be the number of speed humps constructed complete as specified on the drawings.

The Tendered rate shall include full compensation for the procuring the material from commercial sources, furnishing and installation of all the items required for a complete speed hump, excavation, placing and compacting the material, including transporting the material over an unlimited free-haul distance, protection and maintenance of the layer and the conducting of control tests, all as specified.”



### C3.5.1 Management of works

#### C3.5.1.1 Planning and programming

The Contractor shall ensure that he:

- is well informed about the *Employer's* overall implementation programme for construction and investigative projects and makes available resources as required to efficiently complete required services; and
- compiles designs, documentation, reports, and drawings timeously as not to unnecessarily delay the implementation of the construction or investigative projects.

The programme shall at minimum contain:

- Time Scale (minimum): Days, where the project period does not exceed three months. Weeks, where the project period exceeds three months.
- Time Scale (maximum): Months, where the project period does not exceed one year. Years, where the project period exceeds one year.
- Tasks: All construction tasks and activities shall be shown. Where phases or stages are anticipated, this shall be the highest level of division and all tasks related to the successful accomplishment of that phase of the project shall be grouped. Resources allocation and task dependency shall be indicated.
- Multiple Project Programming: Where multiple projects are part of the same Contract documentation, the Contractor shall provide a programme per project. However, where interdependency exists the programmes shall be integrated, but divided on the highest level per project followed subsequently by further divisions per phase or stage.
- Start and Finish Dates: All tasks shall have specific start and finish dates.
- Critical Path: All tasks forming the programme line that will establish any delays in the overall project period shall be clearly indicated and an indication of their sensitivity characteristics shall be provided.
- Progress Tracking: The Contractor shall be required to periodically (at minimum monthly) indicate the project progress per task graphically and on a percentage basis.
- Non-working Time: All South African public holidays, weekends, and the local traditional annual builder's break (as identified in the contract data) shall be incorporated in the programme.

The Contractor's Programme shall include:

- Dates for submission (by the Contractor) of designs and or design documents.
- Dates for ordering of special and/or long delivery items.
- Dates for issue of or approval of drawings for planning purposes.
- Dates for issue of or approval of drawings for manufacture and construction purposes requiring the approval of the Engineer.
- Dates for the placement of orders for material, receipt of material, fabrication, and manufacture, works (factory) testing, shipment, erection and commissioning.
- Dates showing start and completion of site construction of each section and each major component of the permanent works.
- Dates showing the delivery of all built-in steelwork, anchor bolts, etc.
- Dates for start and completion of Engineering Design (including allowances for review/approval by the Engineer).
- Dates for submittal and acceptance of drawings.
- Dates for submittal of operation and maintenance manuals.
- Dates for submittal of commissioning check lists and detailed commissioning schedules for acceptance (3 months before the commencement of commissioning).



- Dates for submittal of commissioning check lists and detailed schedules of approval (3 months before the commencement of commissioning).
- Dates for submission of complete schedules for all manufactured items.
- Dates for Test on Completion as defined in the Contract Data.

Activities shall be timed in week units except for commissioning or similar detailed programmes, which shall have activities, specified in days. Activities on which it is intended to operate multiple shifts working shall be clearly defined.

Method and resources statements are required for all critical items to prove that the period allocated to them fits the overall programme and that the Contractor's plant and labour are consistent with the time allowed. Critical items shall include (as a minimum) all reinforced, structural steelwork, pipework, tie-ins to existing services and specialist work.

The Contractor shall update and revise the Programme once a week or when required by the Engineer.

The submission to and acceptance by the Engineer of such updated and revised Programme, shall not relieve the Contractor of any of his duties or responsibilities under the Contract and existing laws.

#### Sequence of the Works

Whenever work being done by other Contractors is contiguous or related to the Works included in this Contract, the sequence of handling the Works shall be such that the least delay possible will result to each Contractor and such sequence may be determined by the Engineer. The Engineer will establish the respective rights of the various interests involved to secure the completion of the various portions of the Works in general harmony.

The Contractor shall be responsible for the co-ordination and proper execution of the Works, including co-ordination with other Contractors and organizations to the extent specified in the Contract Documents. The Contractor shall, as specified in the Contract Documents, afford all reasonable opportunities for carrying out their work to:

- any other Contractors employed by the Employer,
- the staff and workmen of the Employer, and
- the staff and workmen of any legally constituted public authorities who may be employed in the execution on or near the site of any work not included in the Contract, which the Employer may require.

The Contractor shall obtain, co-ordinate and submit to the Engineer for his information all details (including details of work to be carried out off the Site) from Sub-contractors. The Contractor shall be responsible for the locations of their work or materials, in order to ensure that there is no conflict with the work of other Sub-contractors, the Contractor or other Contractors.

The Contractor shall give the *works* the constant attention necessary to facilitate the progress thereof and shall cooperate with the Engineer and other Contractors in every way possible.

#### **C3.5.1.2 Software application for programming**

Only the "Microsoft Project" software package will be accepted.

The Contractor shall make the programme available in MS Project format and in print version. The Contractor shall also ensure that all necessary hardware and software in this regard are always available on site and that at least one member of the permanent site staff is competent on their operation.

#### **C3.5.1.3 Methods and procedures**





### C3.5.1.3.1 Monthly report

The Contractor shall prepare and submit to the Engineer within 15 days after the first day of every month a written progress report together with a monthly progress schedule summarizing the progress of the various sections of the work both at the place of manufacture and at site. Three (3) copies of the monthly progress report shall be submitted in accordance with the correspondence procedures.

Such progress reports shall indicate accurately the status of different activities covering design, material procurement, manufacture, works (factory) tests, shipping, erection, testing and commissioning and shall be related to key dates identified in the programmes referred to in the *conditions of contract*. The report shall also include data on labour strength and equipment employed. The programme submitted with the monthly report shall show cumulative progress towards scheduled completion, expressed as a percentage, of all items shown in the contract schedule.

The reports shall indicate the degree of criticality on each section of the Work, together with the slippage or impending slippage on any key event and shall be directly related to the contract schedule and supporting detail program for sections of work.

The monthly progress report shall be in the format acceptable to the Engineer and written in the English language and shall include:

- Photographs and detailed descriptions of progress, including each stage of design (if applicable), procurement, manufacture, delivery to the Site, construction, erection, testing and commissioning.
- Charts showing the status of construction documents, drawings, purchase orders, manufacture, and construction.
- For the manufacture of each main item of plant and materials, the name of manufacturer, manufacture location, percentage progress, and the actual or expected dates of commencement of manufacture, Contractor's inspections, tests and delivery.
- Records of personnel and Contractor's equipment on the Site.
- Copies of quality assurance documents, test results and certificates of materials.
- Safety statistics, including details of any hazardous incidents and activities relating to environmental aspects and public relations; and
- Comparisons of actual and planned progress, with details of any aspects which may jeopardize the completion in accordance with the Contract, and the measures being (or to be) adopted to overcome such aspects.
- Financial status of Contract.

### C3.5.1.3.2 Weekly report

The Contractor's Site Manager shall prepare a weekly summary report covering all the site activities and submit it to the Engineer. This report shall include projected work activities for at least 2 weeks ahead of those being reported upon. In addition, this report shall include a weekly site labour return giving imported and local labour and each *Sub-Contractor's* labour, broken down into trades. Full details of site labour disputes (or off-site disputes affecting the Contract) shall be reported to the Engineer immediately. The weekly statement shall give details of all construction plant machinery, offices, and materials. The Contractor shall submit three (3) copies of weekly report to the Engineer which shall include.

- Summary of progress.
- Potential problems and proposed solutions.
- Project schedule update.



- Project permit status.
- Construction photographs.
- Status of orders and procurement.
- Drawing list.
- Plant test schedule.
- Construction schedule (critical path method, S-curve).

The Contractor shall submit to the Engineer a weekly return detailing the numbers of the various classes of workmen employed by him on the Site, the plant and Contractor's equipment on the Site or on order and any other information that may reasonably be required.

### **C3.5.1.3.3 Detailed programme and progress reports**

Detailed monitoring of the progress of the Contract by the Contractor is to be achieved using critical path network planning and review techniques.

Following approval of the Programme, the Contractor shall submit within thirty (30) days, detailed program for all work to be executed during the Contract. These programs, which shall embrace design, supply, manufacture, and site construction shall be based on the Contract Programme and be used as target program and may be subject to revision. Further detailed program for progressive stages of the Contract shall be prepared by the Contractor as required by the Engineer.

The Contractor shall, whenever required by the Engineer, also provide in writing for his information a general description and drawing or sketch of the arrangements and methods which the Contractor proposes to adopt for the execution of the Works.

The Contractor shall plan in detail his section of the work using bar charts to record progress of the design, manufacturing, and delivery elements and using the critical path network procedure for work on site. The issue and approval of drawings shall be covered in detail using appropriate check points in the detailed programme, including design information interface events with others. The manufacturing work shall be broken down into check points in the detailed programme. The manufacturing work shall be broken down into sufficient detail for the information supplied to relate correctly to the erection detailed programme on which the activity durations shall not exceed four weeks. Activities shall cover all aspects for which the Contractor or his Sub-contractors are responsible and indicate site access, points at which terminals and access will be available to or required from others and services required from the *Employer*.

The Contractor shall ensure that the resources required to meet these programs are available to him and his Sub-contractors. A table shall be prepared indicating the expected level of each type of resource for the duration of the site work.

The detailed programs must be analyzed by the Contractor, either manually or by computer, and three copies of the following tabulations presented:

- A schedule tabulated in order of increasing total float showing for each activity:
  - event numbers,
  - brief description of activity and responsibility,
  - duration,
  - early and late starting and finishing dates,
  - total float.
- A schedule tabulated in order of early start date by total float for eight weeks ahead of the 'up-date' date. The information given in this schedule shall be the same as that indicated above.



All programs and progress reports shall be provided by the Contractor in a form acceptable to the Engineer. Full access shall be made available to the Engineer to visit the Contractor's and Sub-contractor's works to verify the status of design and manufacture.

Other requirements in respect of programs are given in the Conditions of Contract.

#### **C3.5.1.3.4 Progress meetings**

The Contractor will be required to attend regular formal construction progress meetings with the Engineer during manufacture and on site. The site meetings will also involve the other Contractors so that the progress of construction both on this Contract and the entire Project may be reviewed. Such meetings may be monthly and may require the up-dating of the Contractor's Contract and detailed Programs, in which case three copies of the up-dated programme shall be submitted to the Engineer within 7 days of the agreed up-dating.

The Contractor shall also attend informal weekly meetings with the Engineer on site and provide a weekly estimate of the work anticipated on each work section.

The updated programme, if necessary, after reconciliation and incorporation of changes, shall become the new basis for further execution of the *Works* without any modification of the Contract's *completion date*. The updating of the programme shall not give rise either to any extension of time or to any entitlement for any additional payment.

#### **C3.5.1.3.5 Interface meetings**

The Contractor shall hold regular interface meetings with all other contractors who may be performing work on behalf of the Employer and with representatives of the Employer involved with the activities related to or in the vicinity of the works to be performed under this Contract.

The purpose of the interface meetings shall be to ensure that the work the Contractor is performing on the project is efficiently and effectively coordinated without duplication or miscommunication and that there is full compatibility between sections that are designed and constructed by the various contractors.

#### **C3.5.1.4 Quality plans and control**

##### **C3.5.1.4.1 General**

The Contractor shall have a well-organized Quality Control and Assurance System (QAS) based on ISO 9000 Series or equivalent (Quality System Model for Quality Assurance in design/development, production, installation and servicing) to assure that items and services, including subcontracted items and services, comply with the Works Information.

This clause specifies the minimum requirements necessary to ensure that proper attention is given to the materials used, the standard of workmanship, the manufacturing and construction processes, and the quality of all components.

The Contractor shall include in all his orders to Sub-contractors a note stating that materials and plant covered are subject to inspection by the Engineer.

##### **C3.5.1.4.2 Quality Control and Assurance System**



All design, manufacturing, processing, testing and inspection operations affecting the plant or material shall be governed by Quality Assurance procedures in accordance with the directives of the ISO 9001 standards while the production and installation shall be governed by quality assurance procedure in accordance with the directives of the ISO 9002 standards or equivalent. These may be subject to surveillance by the Engineer. A tentative QAS shall be submitted together with the tender and shall meet the requirements stated in the Design Procedure. Within thirty (30) days of the Commencement Date, the Contractor shall submit six (6) copies of his complete quality control and assurance procedures, manuals for review and acceptance by the Engineer. The manual shall include pro-forma checklists for all requirements of the Contractor's quality control and assurance program and those called for in the Works Information.

The Quality Control and Assurance System to be submitted shall include but not necessarily be limited to the following:

Programme requirements for materials and plant procurement and manufacture with description of design control, purchased material control, quality verification tools, manufacturing control, materials and components selection, handling, and packaging, etc.

- Programme requirements for plant production with detailed description of Quality Assurance organization of the Contractor, Quality Assurance Functions and Procedures and Performance Monitoring.
- Quality Assurance Programme Tests with detailed description of the test procedures to be conducted.
- Quality Assurance Programme requirements for installation and commissioning (for turnkey Contracts with detailed description of Quality Assurance Organization of the Contractor, Quality Assurance Functions and Procedures, etc.).
- In addition to the requirements of these ISO Standards or their equivalents the Contractor shall:
- Establish procedures for adequate planning and resourcing of all quality related activities including the preparation of quality plans.
- Establish measures for the identification and control of items throughout all stages of the Contract. This shall include measures to maintain traceability as identified in agreed quality plans.
- Arrange for the protection of quality of the product to include delivery to the specified destination.
- Control their measuring and test equipment in accordance with established procedures for measurements and calibration systems and ensure that such equipment that may be used by Sub-contractors to verify work is similarly controlled.

Where any site installation and/or test and commissioning work is involved, the Contractor shall prepare contract specific quality assurance procedures in agreement with the Engineer prior to commencements of such works.

The Contractor shall be responsible for specifying the quality assurance requirements to his Sub-contractors, for approving Sub-contractor's quality assurance programme and for ensuring compliance with the requirements.

The Contractor shall ensure that all appropriate technical information is extracted from the Contract documents and specifications and passed on to the Sub-contractors.

The Contractor shall ensure that all computer systems and software to be utilized on the project is qualified for the application under consideration and such qualification is documented.

The following surveillance requirements shall be included for affirmation by the Engineer or his representative:



**Record (R).** Documentary evidence of the activity and statistical analysis of the data to be retained and copied to the Engineer.

**Verification (V).** The Engineer 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 Engineer.

**Witness (W).** The Engineer 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 Engineer.

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

**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 Engineer.

### Categorization

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, 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 Engineer.
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

#### C3.5.1.4.3 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 Engineer 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 Engineer.



#### **C3.5.1.4.4 Corrective action**

The Contractor's quality assurance programme shall provide for prompt detection and correction of all events and conditions adversely affecting quality, including failures, malfunctions, incidents, trends, deficiencies, deviations, non-conformances, and defective materials.

The Contractor shall establish and maintain methods for verifying and determining the cause of an adverse condition and for initiating necessary improvement and corrections to preclude repetition. Quality trends shall be analyzed to furnish a basis for improvement in work performance. The Contractor's corrective action system shall extend to the performance of other participating Contractors and Sub-contractors when necessary and shall provide for the interchange of corrective action information. Identification of the adverse condition, its cause, and the corrective action taken shall be recorded and reported to appropriate levels of management.

The Contractor shall establish and implement procedures for reporting, verifying, analyzing, and correcting failures, including those that occur during development and qualification testing. The procedure shall provide assurance that the cause and mode of each failure are determined that the potential safety and availability implication is evaluated, and that corrective action is taken.

A failure report shall be prepared to identify the failed item and its origin or source of manufacture and shall describe the failure, the test status at time of failure, and the probable cause and mode of failure, and recommended corrective action.

Failure to confirm to the specified requirements will result in the issuing by the Engineer of a Corrective Action Request. Failure to rectify the deficiencies covered by a Corrective Action Request within the period stated will result in the Engineer invoking the provisions of GCC.

#### **C3.5.1.4.5 Design revision and substitution of material**

Any revision affecting the design and manufacturing of the *Works*, or any substitution of materials that is deemed necessary shall be notified by the Contractor to the Engineer for the latter's review and approval.

#### **C3.5.1.4.6 Contractor's responsibility**

Acceptance by the Engineer of the Contractor's quality assurance programme, quality plans and inspection and test plans, or of those of his Sub-contractors will not relieve the Contractor of his obligation to provide goods and services which meet the requirements of the Contract.

#### **C3.5.1.5 Environment**

The Contractor shall strictly comply with the requirements of the EMP issued for this *Works*. He shall be liable for any damages/destruction to the environment including penalties that will be imposed by the relevant government agency arising from non-compliance of the requirements of EMP occasioned in any manner by his acts or neglect, or his agents, employees, or workmen in the execution of the *works*.

#### **C3.5.1.6 Accommodation of traffic on public roads occupied by the Contractor**

The Contractor shall draft a traffic accommodation plan and submit to the Engineer prior to commencement of work on any road. The approval by the Engineer shall not relieve the Contractor of any of his responsibilities or obligation in terms of the legislation and plan.

#### **C3.5.1.7 Other Contractors on site**



The Contractor needs to take note that other contractors may also be working on the same site and allow therefore in his planning/work scheduling.

### **C3.5.1.8 Testing, completion, commissioning, and correction of defects**

#### **C3.5.1.8.1 General requirements**

The Contractor shall be responsible for conducting all testing as described herein. Work under this section shall include all labour, materials, and support services required to completely test all hardware and software.

If a type of equipment does not meet the specifications or requirements as stated in these Specifications or the System Design Document, it shall be the Contractor's responsibility to correct the problem in all units of that equipment furnished, at no additional cost to the Employer.

All the components, sub-systems, interfaces and systems processes constituting the works shall be tested individually and together to demonstrate that they meet the contract requirements and provide a system that functions in accordance with the contract.

The Contractor shall be responsible for the performance of all the tests described below to satisfy the objectives of each testing phase as determined by the Engineer.

The Employer shall have the right to witness all tests.

Test plans shall be submitted to the Engineer a minimum twenty-one (21) days prior to the planned start of testing. Testing shall not commence until the plans have been approved.

Unless otherwise specified, all test plans shall include at a minimum the following:

- Overview of test including test objectives
- Pass/fail criteria
- Traceability matrix listing of all requirements and specifications from the Contract that are included/to be verified in the test and their cross-reference to the Specifications and System Design Document.
- Test setup and test measuring equipment (including descriptive diagrams)
- Listing of tools, test applications, simulators, etc. required to perform the test
- Entry/start-up conditions
- Exit/closing conditions
- Test procedures and scripts to be executed
- Test recording form
- Test comments form
- Signatures and verification form

The Employer reserves the right to direct, at no additional cost, the following changes to the test plans:

- The addition of procedural changes and other reasonable tests to reasonably assure System performance and conformance.
- Investigation into any apparent troubles or anomalies with respect to the System
- An audit of all test reports and verification of any or all previous tests and Measurements.

The Contractor shall provide written notification of readiness to test for all required test stages a minimum of two (2) weeks in advance of the testing.





Upon successful completion of any test, the Contractor shall prepare and submit within two (2) weeks a report summarizing the results with relevant test records appended. All such test reports will be reviewed by the Engineer.

#### **C3.5.1.8.2** Test suspension criteria and defect resolution

The Contractor shall maintain a database of and shall track the status of all defects.

The Contractor shall develop and maintain a standard set of regression tests for each device or subsystem. Regression tests shall be run for any affected device or subsystem if any testing is halted and restarted in accordance with the requirements of the defect resolution.

#### **C3.5.1.9** Training

##### **C3.5.1.9.1** General

The Contractor needs to take note that the Employer aims to use the infrastructure contracts to expose students from various institutions to construction activities as part of their training programme. Full support needs to be provided by the Contractor in this programme to obtain maximum benefits for the students allocated to the contract.

The Contractor shall be responsible to train the Employer's designated personnel according to the requirements specified herein. The Contractor shall be responsible for the supply of all training materials including, at a minimum:

- a) Training setups of equipment, including mounting and all power supplies and simulators required to simulate normal operation.
- b) Instructor guides.
- c) Student guides.
- d) Operations manuals.
- e) Training presentations.
- f) Training handouts.
- g) Quick reference guides.
- h) Interactive videos or demonstrations.
- i) Course and instructor comments sheets.

A Training Program shall be developed and submitted a minimum forty-five (45) days before delivery of training materials that describes:

- Each course to be conducted.
- An overview of delivery methods for each course, including hands-on and group work experience.
- The course objectives for trainees.
- An evaluation plan, including criteria for success of the course, based upon the goals and objectives, and evaluation steps and instruments to be employed.
- A proposed schedule for each class, keyed to the installation process and constrained by availability of trainees away from regular duties.
- A plan for developing or customizing course material.
- Resumes of personnel proposed to be trainers for each class, demonstrating that they are experienced, effective training professionals.

Training shall include course development, providing instructors, and supplying all handouts, materials, classroom aids, etc. required to conduct the training. Training shall take place at the site facilities. Practical training on equipment shall occupy a significant portion of all training classes. The training presentations and material shall be in English.





#### **C3.5.1.10 Recording of weather**

The Contractor shall be permitted to take his own rainfall measurements on site subject to the Engineer's approval, but access to the measuring gauge(s) shall be under the Engineer's control. The Contractor is to provide and install all the necessary equipment for accurately measuring the rainfall as well as to provide, erect and maintain a security fence plus gate, padlock, and keys at each measuring station, all at his own cost.

#### **C3.5.1.11 Format of communications**

All Contract communication shall be in English and in writing (letters, faxes, and electronic mail).

#### **C3.5.1.12 Key personnel**

The Contractor shall be required to allocate sufficiently experienced personnel to execute the Contract successfully.

#### **C3.5.1.13 Management meetings**

The Contractor and such other persons as may be nominated by the Engineer shall be required to attend periodic site meetings, the date and place for which will be set by the Engineer in consultation with the *Employer* and Contractor.

A main purpose of the site meetings will be to review and discuss progress and programme, and all persons attending the site meetings must be empowered to act on behalf of the firms they represent.

#### **C3.5.1.14 Forms for contract administration**

The Contractor shall maintain a file or files (hard copy and electronically) per Contract project, which shall contain:

- the details of the Sub-contractors, if any;
- project programme, with commencement and completion date;
- procurement information;
- progress reports, minutes, letters, faxes, emails of all project or project related correspondence;
- record documentation, reports, designs, and drawings;
- a copy of the Health and Safety Plan and the Environmental Management Plan;
- record of cost implications, variations, claims and disputes; and
- empowerment records.
- copy of quality (QMS) plan and all related documentation/procedures.

At the end of this Period of Performance the Contractor shall hand-over such hard copy files to the *Employer*, including all electronic records, documentation, reports, designs, and drawings.

#### **C3.5.1.15 Daily records**

The Contractor is to provide a site diary, which is to be kept on site, for the purpose of keeping daily records in respect of work performed on the site. This shall be made available to the Engineer upon request.

#### **C3.5.1.16 Bonds and guarantees**



If the Tenderer, when notified of the acceptance of his tender, fails to provide a guarantee within the period stipulated in the Contract Data and the *Employer* elects to cancel the contract on that ground, the *Employer* may demand a sum of R1 000 per day, or the *Employer* may take other action whether by way of a claim for loss or damage suffered by the *Employer* arising out of such breach.

#### **C3.5.1.17 Payment certificates**

The Contractor shall be required to complete a progress report before he will be allowed to complete the standard payment certificate required to be submitted with his tax invoice.

#### **C3.5.1.17.1 Measurement of work for payment**

All measurements for the purpose of payment shall be made by the Contractor and accepted by the Engineer. The Contractor shall be responsible for obtaining the Engineer's acceptance not later than one week after the measurements have been made.

#### **C3.5.1.18 Permits**

The Contractor shall acquire all permits, approvals and/or licenses from all local or national government authorities or public service undertakings in South Africa and abroad, which such authorities or undertakings require the Contractor to obtain and which are necessary for the performance of the Contract, including without limitation, visas for the Contractor's and *Sub-Contractor's* personnel and entry permits for all imported Contractor's plant and equipment.

#### **C3.5.1.19 Lock-out procedure**

Lock-out systems consist of isolation of electrical, hydraulic, pneumatic, mechanical systems and isolating valve and pipeline systems. Where the Contractor uses his own procedure, this procedure will be forwarded to the Engineer for review prior to commencement of work.

A lock-out procedure shall be available at all electrical distribution boards. Valves isolated shall be locked and the Contractor shall be in possession of the keys. The Contractor and his employees shall be trained in accordance with this procedure and declared competent by the Contractor to lock out electrical equipment. They shall always adhere to the procedure's requirements.

#### **C3.5.1.20 Permit to work**

A system shall be implemented to control identified high risk activities. The Contractor shall ensure that the proper permit is issued as agreed upon and authorized by an appointed competent person before commencing with the work.

Some of the activities that may require a permit to work within a construction or plant area are:

- Cold work in areas where operational plant or equipment can pose a threat
- Radiographic works
- Working in confined spaces
- Excavation work (cable clearance permit)
- Blasting
- Piling
- Work being done within 50 m of an overhead power line
- Use of a hazardous substance, e.g. lead



Contractors are to ensure that all personnel who will be signing on work permits within the Site are trained in the work permit procedures and declared competent.

**C3.5.1.21 Use of documents by the *Employer***

All information (communications, designs, drawings, documents, or reports) provided to the *Employer* by the Contractor, in the course of performing the service required for this Contract, are intended to ensure that the projects are implemented successfully.

**C3.5.1.22 Property provided for the service provider's use**

The Contractor shall provide all physical resources, including properties, for the successful execution of the project.

**C3.5.1.23 Proof of compliance with the law**

The Contractor shall ensure that he complies to all prevailing legislation that applies to the provision of his services as part of this Contract and indemnifies the *Employer* where he deliberately neglects compliance with such legislation.

**C3.5.2 Health and safety**

**C3.5.2.1 Health and safety requirements and procedures**

The Contractor shall comply with the *Employer's* Occupational Health and Safety requirements detailed in the Contract.

In addition, the Contractor shall comply with the following requirements in respect to Health and Safety.

The Contractor shall comply with the Occupational Health and Safety Act (OHS Act No 85 of 1993) and the Construction Regulations, 2003 as amended (Gazette 10113 of 7/02/2014). The "minimum safety requirements" referred to above shall be those contained in the Construction Regulations, 2003 of the OHS Act. Furthermore, the Contractor shall comply with any additional current statutory requirements of any relevant Government Departments regarding health and safety and specifically environmental health issues.

The Contractor shall establish and enforce rules to ensure the health and safety of his own employees and those of its Sub-contractors so that high standards of personnel health and safety are achieved and maintained. The Contractor shall exercise and enforce all necessary care and measures to preclude exposure of personnel, labour and nearby residents (if any) to potential health hazards and environmental pollutants. The Contractor shall, in collaboration with and to the requirements of the local health authorities, ensure that medical and first aid staff, first aid facilities, sick bay and ambulance service are available at the accommodation and on the Site at all times, and



that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. The Contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Engineer may reasonably require.

The Contractor shall appoint a member of his staff at the Site to be responsible for maintaining the safety, and protection against accidents, of personnel on the Site. This person shall be qualified for his work shall have the authority to issue instructions and take protective measures to prevent accidents. The Contractor shall send in additional to the legislated parties, to the Engineer, details of any accident as soon as possible after its occurrence.

Except for the *Employer's* risks, as defined in the *conditions of contract*, the Contractor is solely responsible for the safety, protection, and security of his personnel, third persons, the *works*, Plant, installations, and the like. Accordingly, the Contractor shall comply faithfully with all pertinent South African laws, decrees, regulations and ordinances, and shall take all necessary safeguards to prevent occurrences of accidents, loss or damage of any kind during the execution of the *works*. He shall provide, erect, and maintain all necessary and suitable barricades and sufficient warning lights, danger signals and other signs and shall take all necessary precautions for the protection of the *works* and the safety of his personnel and the public.

#### **C3.5.2.2 Contractor's Health and Safety System**

The Contractor shall submit to the Engineer its Health and Safety Management System documentation for acceptance and shall implement its system prior to the start of the construction.

The Health and Safety Management System shall cover but not be limited to the following:

- Skills and qualifications required by employees.
- Training and supervision of employees.
- Auditing of and reporting on health and safety practices and performance.
- Reporting and investigation of incidents.
- Identification and removal of hazards.
- Provision and use of protective equipment and clothing.
- Proper use and care of tools and equipment.
- Informing employees and Sub-contractors of health and safety hazards they may be exposed to, including hazards that may be created by other Contractors.
- Development and implementation of emergency procedures.
- Development and implementation of maintenance isolation systems and procedures to ensure the safety of personnel while working on plant which could be energized, activated, or made hazardous by other means.
- Provision of access zones for employees which are appropriately designated (e.g. "hard hat area", "out of bounds", "ear protection must be worn", "eye protection must be worn").
- Provision of safety engineers and provision of suitably qualified first aiders.
- Provision of first aid facilities equipped to a standard sufficient to cope with minor injuries and provide care and comfort before treatment by professional medical staff for more serious cases.

#### **C3.5.2.3 Safety Officer**

The Contractor shall formally appoint a suitably qualified member of his staff to be responsible for safety aspects of the work on site and shall ensure compliance with all safety requirements. Particular attention shall be given by the Contractor to such aspects as risk assessment for individual tasks, lighting, and handrails and especially around dangerous openings, access stairs, toe plates and general cleanliness. Regular safety meetings will be held. The Contractor shall take appropriate



action immediately following any instructions which the Engineer may make concerning matters of safety. The relevant OH&S procedures and specification developed for the project shall be strictly adhered to during execution of Works forming part of the project. The specifications and procedures form part of this tender document. The work under this contract is defined as “Construction Work” and regulated under the Occupational Health and Safety Act, 1993 (latest amendment) and the Contractor shall adhere to all the legislative requirements as per Construction Regulations 2003.

The Contractor shall provide for the cost of the health and safety measures in the Bill of Quantities.

The Contractor shall notify the Provincial Director in writing of the construction activities before work commences, if required.

The Site representative shall be present on site during working hours and any orders or instructions, which the Engineer may give to the Site Representative, shall be deemed to have been given to the Contractor.

The Contractor shall develop and demonstrate to the Engineer a suitable and sufficiently documented Health and Safety plan based on the safety specification.

The Contractor shall if called upon to do so, submit a preliminary Health and Safety Plan, failing to do so may lead to the disqualification of this tender.

#### **C3.5.2.4 Risk management**

The Contractor ensures that his risks are managed to enable the successful execution of the project.

The Contractors’ risk that occurs or develops during construction is brought to the *Employer’s* attention in writing immediately. A risk register must be kept for the duration of the project.

A general risk analyses is performed prior to starting with the construction work, which must form part of the Safety Plan. All work will be carried out in conformance to the Occupational Health and Safety Act, 1993 (latest amendment) and the Contractor shall adhere to all the legislative requirements as per Construction Regulations 2003.

#### **C3.5.2.5 Health and safety specification (Employers)**

- The Contractor shall appoint and notify the Engineer in writing, a competent Site representative, with the duty of supervising the construction work.
- The Contractor shall appoint, and notify the Engineer in writing, a competent person to perform a risk assessment before construction work commences, during construction work and which shall form part of the Health and Safety Plan.
- The Contractor shall appoint and notify the Engineer in writing, a competent person responsible for the preparation of a fall protection plan, amending, maintaining and adherence thereto.
- The Contractor shall execute the necessary steps to prevent uncontrolled collapse of new or existing structures and no part shall be loaded in a manner that would render it unsafe.
- The Contractor shall appoint and notify the Engineer in writing, a competent person responsible that all formwork and support work structures are adequately designed, erected, supported, braced and maintained.
- The Contractor shall appoint and notify the Engineer in writing, a separate competent person with relevant experience for each of the operations whose first duty will be to, and who shall, supervise all stages in the operation. The operations are:
  - i. Excavation, blasting and trimming of the excavations, backfilling and formation of embankments.



- ii. Supply of concrete aggregates and the batching, mixing, transporting, placing, compacting and curing of concrete.
  - iii. Loading, unloading, transport and installation of steel pipes including areas where pipe jacking has occurred.
  - iv. Cutting and welding of steel pipes
  - v. Installation of valves, dirt boxes and water meters
- All scaffolding shall comply with the Occupational Health and Safety Act 1993 (latest amendment).
- The Contractor shall appoint and notify the Engineer in writing, a competent person responsible for suspended platform and that all erectors, operators and inspectors are competent to carry out their work.
- Every material hoist and its tower shall be constructed of sound material in accordance to the Construction Regulations 2003 (latest amendments).
- All explosive power tools shall comply to and be in accordance to Construction Regulations 2003 (latest amendment).
- Notwithstanding the provisions of the Driven Machinery Regulations (Government Notice No R533, latest amendment), the Contractor shall ensure that work is carried out in a safe manner where tower cranes are used.
- The Contractor shall ensure that all construction vehicles and mobile plant are maintained, operated and used in a safe manner by competent operators.
- Notwithstanding the provision of the Electrical Installations Regulations (Government Notice R2920 latest amendment) and the Electrical Machinery Regulations, (Government Notice R1953 latest amendment), the Contractor shall take the necessary steps to provide a safe environment for construction work to proceed.
- Notwithstanding the provisions for the use and storage of flammable liquids as determined in the General Safety Regulations (Government Notice No R1031, latest amendment), flammable liquids shall be stored in such a manner to prevent fires and explosions.
- The Contractor shall provide lifejackets for workers where construction work is done near or over water.
- Notwithstanding the provisions of the Environment Regulations for Workplaces (Government Notice No R2281, latest amendment), implement and maintain suitable housekeeping.
- Notwithstanding the provisions for the stacking of articles in the General Safety Regulations (Government Notice R1031, latest amendment) the Contractor shall appoint a competent person in writing, responsible for supervising all stacking and storage on site.
- Subject to the provisions of the Environment regulations for Workplaces (Government Notice No R2281, latest amendment), the Contractor shall take appropriate measures to avoid risk of fire.
- Notwithstanding the provisions of the Facilities Regulations (Government Notice No R1593, latest amendment), the Contractor shall provide clean and maintained facilities as required.
- The Contractor shall take all reasonable steps to ensure co-operation between all Sub-contractors to enable each Sub-contractor to comply with provisions of the Act.

## **C3.6 HEALTH AND SAFETY**

The following particular and generic specifications are applicable to this contract.



(1) Occupational Health & Safety

**C3.6.1 HEALTH AND SAFETY REQUIREMENTS AND PROCEDURES**

**C3.6.1.1 Framework for an occupational health and safety plan**

**C3.6.1.1.1 Introduction**

The Principal Contractor must demonstrate to the Employer that it has a suitable and sufficiently documented Occupational Health and Safety plan as well as the necessary competencies, experience and resources to perform the construction work safely. The Principle Contractor could be required to submit the following documentation for perusal and verification by the Employer:

- Management structure.
- Quality plan.
- Human resources plan.
- Registered workplace skills plan.
- “Letter of good standing” from the Compensation Commissioner or licensed compensation insurer.
- Proof of Induction and other training of employees.
- Example copy minutes of previous Occupational Health and Safety Committee meetings and copies of Incident Investigation reports.

The following specifications are supplied as a guide only. The Employer’s Health and Safety Agent may amend and/or expand on the specifications by means of an addendum to Tender or after the award of the Contract.

**C3.6.1.1.2 OH&S plan at tender stage**

Tenderers shall submit an OH&S plan with their tender document. This shall be a preliminary plan that may be expanded on and finalised after the award of the contract. The OH&S Plan should be based on the following principles:

- A proper risk assessment of the construction work.
- Pro-active identification of potential hazards and unsafe working conditions.
- Informing and/or training of employees in hazards and risk areas.
- Provision of a safe-working environment and safety equipment.
- Ensuring the safety of sub-Contractors through their safety plans.
- Monitoring the health and safety on the construction works on a regular basis.
- Using competent safety officers.

**C3.6.2 Contents of an occupational health and safety plan**

**C3.6.2.1 Occupational Health and Safety Management Programme**

- Management of Occupational Health and Safety risks.
- Occupational Health and Safety structures and appointments.
- Programme of Occupational Health and Safety inspections.
- Occupational Health and Safety Representatives.
- Occupational Health and Safety committee.

**C3.6.2.1.1 Communication and management of the work**





- Management structure and responsibilities.
- Details of the construction supervision and his appointed assistants.
- Details of the Construction Safety Officer.
- Occupational Health and Safety goals for the project and arrangements for monitoring and review of Occupational Health and Safety performance.
- Arrangements for:
  - Regular liaison between parties on site.
  - Consultation with the workforce.
  - The exchange of design information between the Employer, designers, supervisors and Contractors on site.
  - Handling design changes during the project.
  - Selection and control of Contractors.
  - The exchange of Occupational Health and Safety information between all Contractors.
  - Security.
  - Site induction and onsite training.
  - Facilities and first-aid.
  - The reporting and investigation of accidents and incidents.
  - The production and approval of risk assessments and method statements.
  - Site OH&S rules.
  - Fire and emergency procedures.
  - Reporting to the Employer i.e. results of Occupational Health and Safety inspections, incident and incident investigations and committee meetings.
  - Reporting of incidents to the Department of Labour and Compensation insurer where appropriate.

#### **C6.2.1.2 Arrangements for controlling significant site risks**

The following are some examples of the arrangements for controlling the most significant site risks:

#### **C3.6.2.1.3 Safety risks**

- Services, including temporary electrical installations.
- Preventing employees from falling into excavations, from trucks etc.
- Work with, on or near fragile materials.
- Control of lifting operations.
- The maintenance of plant and equipment.
- Traffic routes and segregation of vehicles and pedestrians.
- Traffic control during pipeline crossing of existing roads.
- Handling and storage of hazardous materials.
- Dealing with existing unstable structures/land.
- Working in confined spaces.
- Working at elevated heights (> 3,0 m).
- Other significant safety risks as and when identified.
- Working in excavations to a depth of 7,0 metres.

#### **C3.6.2.1.4 Health risks**

- Working environment.
- Handling, storage and use of hazardous chemical substances.
- Dust containing cement, silica and other hazardous substances.
- Dealing with contaminated land or material.





- Manual handling.
- Reducing noise and vibration.
- Provision of adequate lighting.
- Ventilation considerations.
- Extreme heat and cold temperature considerations.
- Dealing with HIV/Aids and other illnesses.
- Provision of and maintaining ablution and eating facilities.
- Other significant health risks as and when identified.

#### **C3.6.2.1.5 Special risks**

Contractors are to take note of the special risks that may be encountered during the project and to include these special risks in the OH&S plan.

#### **C3.6.2.1.6 Working environment**

- Rotating machinery (and pumps if required).
- Electrical infrastructure not indicated on “As Built” drawings.
- Electrical storms during summer months.
- Traffic control during pipeline crossings of existing roads.

#### **C3.6.2.1.7 Installation work**

- Use of electricity may be hazardous in wet conditions.
- Working space may be limited.
- Lifting and placing of heavy equipment, pipes and manhole rings and covers.

#### **C3.6.2.1.8 Preparation of an occupational health and safety operational reference file/manual**

The Principle Contractor shall open and maintain an OH&S file for the duration of the contract. On completion of the contract the Principle Contractor shall hand the OH&S file to the Employer.

#### **C3.6.2.1.9 Following are some of the requirements to be addressed**

- Layout, format and content requirements.
- Arrangement for the collection and gathering of information.
- Storage and archiving of all the information.
- Copy to the Client at completion of project.
- Appointment of a health and safety officer in writing.

#### **C3.6.2.1.10 Contents of an OH&S file/manual**

- OH&S Policy.
- Notice of new project.
- Site start-up.
- Security measures.
- Written designations and appointments.
- Arrangements with Contractors / mandatory's
- OH&S rules and procedures.
- Induction.



- OH&S training.
- OH&S promotion.
- OH&S representatives.
- OH&S committees.
- Workplace facilities e.g. ablutions, sheltered eating areas etc.
- Protective equipment.
- Workplace inspections and audits.
- Investigation and reporting of incidents/accidents.
- Mechanical safeguarding.
- Electrical safeguarding.
- Safeguarding against trench excavations with depths ranging between 2 to 7 metres.
- Safeguarding against hazardous substances.
- Lifting machinery and equipment.
- Construction vehicles and mobile plant.
- Welding, heating and flame cutting.
- Protection of the environment affected by construction activities.
- Keeping of records in terms of the OH&S Act (85 of 1993).
- General details of construction methods and materials used.
- Details of equipment and maintenance facilities within the structures.
- Maintenance requirements and procedures for structures / equipment / plant.
- Manuals produced by suppliers and specialist Contractors, including operating and maintenance procedures and schedules for plant and equipment.
- Details of the location and nature of utilities and services, including emergency and fire-fighting systems.

**(a) Construction Regulations, 2003**

The Contractor shall be required to comply with the Occupational Health and Safety Act, 1993: Construction Regulations, 2003 (the regulations) as promulgated in Government Gazette No 25207 and Regulation Gazette No 7721 of 18 July 2003. (Not included in this Volume). Non-compliance with these regulations, in any way whatsoever, will be adequate reason for suspending the Works.

The proposed type of work, materials to be used and potential hazards likely to be encountered on this Contract are detailed in the Project Specifications, Schedule of Quantity and Drawings, as well as in the Employers' health and safety specifications (regulation 4(1)) of the Construction Regulations 2003, which are bound in the Contract document

The Contractor shall in terms of regulation 5(1) provide a comprehensive health and safety plan detailing his proposed compliance with the regulations, for approval by the Employer.

The Contractor shall at all times be responsible for full compliance with the approved plan as well as the Construction Regulations and no extension of time will be considered for delays due to non-compliance with the abovementioned plan or regulations.

Payment items are included in the Schedule of Quantities to cover the Contractor's cost for compliance with the OHS Act and the abovementioned regulations.

**C3.6.2 PROTECTION OF THE PUBLIC**



The Contractor shall at all times ensure that his operations do not endanger any member of the public.

**C3.6.3 BARRICADES AND LIGHTING**

All excavation must be marked with drum, reflecting tape and warning signs to satisfaction of the engineer and OHS appointed official.