

PART C3:

SCOPE OF WORK

PART C3: SCOPE OF WORKS
BID No: ALMT 28/2023 - UPGRADING OF THE CAROLINA WASTEWATER TREATMENT
WORKS BULK PIPELINES – WORK PACKAGE 2

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3.1 DESCRIPTION OF WORKS

C3.1.1 EMPLOYERS OBJECTIVES

This project forms part of the Chief Albert Luthuli Municipality's overall development of infrastructure within the municipality's boundaries.

C3.1.2 OVERVIEW OF THE WORKS

The project area covers the town of Carolina as well as the neighbouring townships of Silobela and Caropark. The Carolina WWTW is located to the south-west of the town. Carolina and Caropark are serviced by waterborne sewerage networks which convey sewage to the Carolina WWTW. The sanitation service levels within Silobela vary from waterborne sewerage (within Extensions 2 and 3) to septic tanks and ventilated improved pit latrines (within Extension 4).

The Carolina WWTW does not have sufficient capacity to treat the current volumes of effluent that it is receiving and therefore requires urgent upgrading. Furthermore, three existing sewage pump stations, namely Rooivaal, Silobela Ext. 2 and Silobela Ext. 3, also require upgrading in order to accommodate future estimated sewage loads over the project design horizon.

The scope of work for this project is split into two work packages as follows:

Phase 1 – was funded and completed in 2023 utilising Water Services Infrastructure Grant (WSIG):

- Refurbishment of the existing Carolina WWTW.
- Upgrading of the Rooivaal, Silobela Ext. 2 and Silobela Ext. 3 Sewage Pump Stations.
- Installation of new sewer reticulation infrastructure and the construction of Silobela Ext. 4 Sewage Pump Station.

Phase 2 – to be funded by the Regional Bulk Infrastructure Grant (RBIG):

- Construction of a new 6 Ml/day module of the Carolina WWTW.
- Upgrading of bulk sewer conveyance infrastructure supplying the Carolina WWTW.

Phase 2 therefore focuses on providing sufficient capacity at the Carolina WWTW as well as within the bulk sewers conveying effluent to the works in order to cater for the projected future sewage flows for the project area over a 20-year design horizon.

Labour-intensive works comprise the activities described in SANS 1921-5, Earthworks activities, which are to be performed by hand, and its associated specification data. Such works shall be constructed using local workers who are temporarily employed in terms of this Scope of Work.

C3.1.2.1 Extent of the Works

The work to be executed under this contract includes inter alia, for the supply of all prescribed materials, the plant and labour involved for the construction of the following, and not limited to the same for:

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Bulk Sewer Conveyance System to the Carolina WWTW

A conceptual scope of work required for the upgrading of the bulk sewer conveyance system to the Carolina WWTW would entail the following:

- Clearing and grubbing of the proposed sewer routes.
- Excavation of proposed sewer lines in all classes.
- Pipe bedding utilising imported material from commercial sources.
- Laying, jointing and bedding of proposed sewer rising mains ranging in diameter from 160 mm to 315 mm (total length of approximately 7 000 m).
- Laying, jointing and bedding of proposed sewer gravity mains ranging in diameter from 160 mm to 400 mm (total length of approximately 12 600 m).
- Selected backfill utilising imported material from commercial sources.
- Tie-in of new pipelines to existing collector manholes.
- Construction of new pre-cast concrete manholes and bases.
- Testing of all pipelines and manholes.
- Construction of Silobela Ext. 5 Sewage Pump Stations 1 and 2.

C3.1.2.2 Location of the Works

The Carolina Wastewater Treatment Works (WWTW) is located to the south-west of the town Carolina town within the Chief Albert Luthuli Local Municipality (CALLM) and falls under the jurisdiction of the Gert Sibande District Municipality (GSDM).

Co-ordinates Of The WWTW and Pump Stations

Infrastructure Description	Latitude	Longitude
Carolina Wastewater Treatment Works	26° 4'10.06"S	30° 5'26.19"E
Rooivaal Pump Station	26° 3'34.70"S	30° 6'59.22"E
Silobela Extension 2 Pump Station	26° 5'12.68"S	30° 7'17.55"E
Silobela Extension 3 Pump Station	26° 5'35.77"S	30° 6'36.18"E

C3.1.3 Labour Intensive Construction

Labour Intensive Construction shall mean the economically efficient employment of as great a portion of labour as is technically feasible to produce a standard of construction as demanded by the Specifications with completion by the Due Completion Date, thus the effective substitution of labour for equipment.

Appropriate portions of the Works included in the Contract shall be executed using Labour Intensive Construction methods.

Except where the use of plant is essential in order, in the opinion of the Engineer, to meet the specified requirements by the Due Completion Date, the Contractor shall use only hand tools and equipment in the construction of those portion(s) of the Works that are required in terms of these Project Specifications to be constructed using Labour Intensive Construction methods.

These portions of the Works shall be constructed utilising only locally employed labour and/or the labour of local sub-contractors, supplemented to the extent necessary and unavoidable by the Contractors key personnel as provided for in sub-clause C3.1.3 unless otherwise instructed by the Engineer and in accordance with the further provisions of the relevant sections of Part C3 of the Scope of Works.

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The portions of the Works to be executed using Labour Intensive Construction methods are:

- Clearing and grubbing of the Site;
- Excavation for structures up to 1,5 m deep;
- Bedding, selected fill, backfilling and compaction of all pipe trenches irrespective of depth, but assisted by mechanical compaction equipment in order to achieve the specified densities;
- Transportation and spoiling of all trench materials, where the disposal site is located within 20metres of source;
- Cleaning and tidying up of the Site;
- Dismantling and re-erection of fences;
- Construction of all brickworks required for structures;
- Mixing and placing of concrete work;

In respect of those portions of works which are not listed above, the construction methods adopted and plant utilised shall be at the discretion of the Contractor, provided always that the construction methods adopted and plant utilised by the Contractor are appropriate in respect of the nature of the Works to be executed and the standards to be achieved in terms of the Contract.

C3.1.4 Sub-Contracting

- C3.1.4.1** Contractor shall appoint such authorities and/or specialist subcontractors and suppliers as may be designated or nominated by the Employer or the Engineer.
- C3.1.4.2** The Contractor shall sub-let to local small sub-contractors appropriate portions of the works that are designated in Clause C3.1.3 as being reserved for labour intensive construction methods.
- C3.1.4.3** As required by Clause 4.4.5 of the Conditions of Contract, the Contractor shall be responsible for all work carried out by sub-contractors (whether nominated by the Employer or selected by the Contractor) on his behalf. The Engineer will not liaise directly with any such sub-contractor, nor will he become involved in any problems and/or disputes related to payments, programming, workmanship, etc. unless provided for in the Conditions of Contract. Such problems and/or disputes shall remain the sole concern of the Contractor and his sub-contractors.
- C3.1.4.4** The Engineer may at his discretion, upon receipt of a written and fully motivated application from the Contractor, and where he deems the circumstances so warrant, and provided always that the Contractor has complied fully and in all respects with the provisions of the Contract pertaining to subletting to local sub-contractors or has utilised his best endeavours to comply therewith, authorise in writing that the Contractor may employ local residents with the sole intent of executing on-the-job training of such local residents to suitable levels of skill that will enable the Contractor to sub-let appropriate portions of the Works to such local residents.

Without limiting the generality of application of this sub-clause, circumstances, which may be considered by the Engineer to warrant such authorization, include:

- a) non-receipt of valid or acceptable tenders/quotations from local sub-contractors;
- b) serious default or failure of appointed local sub-contractors;

The Engineer shall not grant such authority in cases where it may reasonably be concluded on the available evidence that the invitation of further tenders/quotations in accordance with the terms of the Contract, is likely to result in the successful completion of the portions of the Works concerned by local sub-contractors.

Should the Contractor, after suitable due endeavour, be unable to identify local residents suitable for and desiring to train as sub-contractors for portions of the Works as specified in Clause 3.1.4.2, then the Contractor shall be permitted to undertake the Works in question with his own workforce as provided for in Clause 3.1.3 above.

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The Engineer shall monitor progress achieved with subcontractor training, and successful completion of this training shall be subject to his approval or instruction. The Contractor shall tender rates for the training of sub-contractors and labour.

As specified in Clause C3.1.4, the Contractor shall approach the Labour Desk that is established for purposes of the Contract for assistance and advice regarding conditions of employment, minimum wages, disputes and disciplinary procedures in respect of local sub-contractors.

C3.1.5 CONSTRUCTION AND MANAGEMENT REQUIREMENTS

C3.1.5.1 General

The Contractor is referred to SANS 1921: 2004 parts 1, 2, 3 and 5: Construction and Management Requirements for Works Contracts. These specifications shall be applicable to the contract under consideration and the Contractor shall comply with all requirements relevant to the project.

Certain aspects however require further attention as described hereafter.

C3.1.5.2 Quality Assurance (QA) *(Read with SANS 1921 – 1: 2004 clause 4.4)*

The Contractor will be solely responsible for the production of work that complies with the Specifications to the satisfaction of the Engineer. To this end it will be the full responsibility of the Contractor to institute an appropriate Quality Assurance (QA) system on site. The Engineer will audit the Contractor's quality assurance (QA) system on a regular basis to verify that adequate independent checks and tests are being carried out and to ensure that the Contractor's own control is sufficient to identify any possible quality problems, which could cause a delay or failure.

The Contractor shall ensure that efficient supervisory staff, the required transport, instruments, equipment and tools are available to control the quality of his own workmanship in accordance with his QA-system. His attention is drawn to the fact that it is not the duty of the Engineer or the Engineer's representative to act as foreman or surveyor.

C3.1.5.3 Management and disposal of water *(Read with SANS 1921 - 1: 2004 clause 4.6)*

The Contractor shall pay special attention to the management and disposal of water and stormwater on the site. It is essential that all completed works or parts thereof are kept dry and properly drained. Claims for delay and for repair of damage caused to the works as a result of the Contractor's failure to properly manage rain and surface water, will not be considered.

C3.1.5.4 Disposal of spoil or surplus material *(Read with SANS 1921 - 1: 2004 clause 4.10)*

The Contractor shall dispose all surplus and unsuitable material at a legal and registered landfill sites within the Municipal area. He shall be responsible for all arrangements necessary to obtain such legal and registered landfill sites from the Municipality.

C3.1.5.6 Testing *(Read with SANS 1921 – 1: 2004 clause 4.11)*

- **Process control**

The Contractor shall arrange for all tests required for process control to be done by a laboratory acceptable to and approved by the Engineer.

The Contractor may establish his own laboratory on site or he may employ the services of an independent commercial laboratory. Whatever method is used, the Contractor must submit the results of tests carried out on materials and workmanship when submitting work for acceptance by the Engineer. The costs for these tests shall be deemed to be included in the relevant rates and no additional payment will be made for testing as required.

- **Acceptance control**

The process control test results submitted by the Contractor for approval of materials and workmanship may be used by the Engineer for acceptance control. However, before accepting any work, the Engineer may have further control tests carried out by a laboratory of his choice. The cost of such additional tests

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will be covered by a provisional sum provided in the schedule of quantities, but tests that failed to confirm compliance with the specifications, will be for the account of the Contractor.

C3.1.5.7 Survey beacons (*Read with SANS 1921 - 1 : 2004 clause 4.15*)

The Contractor shall take special precautions to protect all permanent survey beacons or pegs such as benchmarks, stand boundary pegs and trigonometrical beacons, regardless whether such beacons or pegs were placed before or during the execution of the Contract. If any such beacons or pegs have been disturbed by the Contractor or his employees, the Contractor shall have them replaced by a registered land surveyor at his own cost.

C3.1.5.8 Existing Services (*Read with SANS 1921 - 1 : 2004 clause 4.17*)

The Contractor shall make himself acquainted with the position of all existing services before any excavation or other work likely to affect the existing services is commenced.

The Contractor will be held responsible for any damage to known existing services caused by or arising out of his operations and any damage shall be made good at his own expense. Damage to unknown services shall be repaired as soon as possible and liability shall be determined on site when such damage should occur.

C3.1.6 Programme to be supplied by the Contractor

The Contractor's programme shall be essentially in accordance with the overall requirements of the project.

The programme shall not be in the form of a bar chart only but shall show clearly the anticipated quantities of work to be performed each month, together with the manner in which the listed plant and other resources are to be used, as well as the anticipated earnings for the various sections of work.

A network-based programme according to the precedence method shall be required by the Engineer. The programme shall be updated monthly in accordance with the progress made by the Contractor. The updated programme shall be submitted to the Engineer at least two working days prior to monthly meetings.

Failure to comply with these requirements will entitle the Engineer to use a programme based on his own assumptions for the purpose of evaluating claims for extension of time or additional payments.

If, during the progress of the work, the quantities of work performed per month fall below those shown on the programme, or if the sequence of operations is altered or if the programme is deviated from in any other way, the Contractor shall, within one week of having been notified by the Engineer, submit a revised programme and network.

If the programme has to be revised by reason of the contractor falling behind his programme, he shall produce a revised programme showing how he intends to regain lost time in order to ensure completion of the Works within the time of completion as defined in Clause 5.7 of the General Conditions of Contract or any granted extension of time. Any proposal to increase the tempo of work must be accompanied by positive steps to increase production by providing more labour and plant on site, or by using the available labour and plant in a more efficient manner.

Failure on the part of the Contractor to submit the programme or to work according to the programme or revised programmes shall be sufficient reason for the Engineer to take steps as provided in Clause 9.2 of the General Conditions of Contract.

The approval by the engineer of any programme shall have no contractual significance other than the Engineer will be satisfied if the work is carried out according to such programme and that the Contractor undertakes to carry out the work in accordance with the programme. It shall not limit the right to the Engineer to instruct the Contractor to vary the programme if required by circumstances. The Contractor is also referred to Clause 5.6 of the General Conditions of Contract when drawing up his programme. Progress in advance of the programme on certain portions or phases of the Works shall not be considered adequate reason for poor progress on another portion or phase.

C3.1.7 Overhaul

No payment will be made for overhaul on this contract unless provision is made therefore in specific items.

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C3.1.8 Site Facilities Available

C3.1.8.1 Location of Site and Depot

The Contractor is responsible to provide a suitable site for his camp and to provide accommodation for his personnel and labourers. If the Employer can make any specific site available to the Contractor, such site will be pointed out to the Contractor. The Contractor must obtain written permission from the landowner and subsequently from the Engineer for the establishment of his camp.

(a) Contractor's Camp Site/Store Yard

Any clearing of the site that is necessary and the making good after de-establishment will be the responsibility of the Contractor.

In addition to the requirements of SANS 1200A clause 8.3.2.2 the following conditions shall also apply:-

- (i) None of the existing roads shall be damaged in any way.
- (ii) No waterborne sewerage facilities or potable water connection are available on the site. The Contractor shall make his own arrangements in this regard.
- (iii) No electrical facilities exist on site.
- (iv) It shall be the responsibility of the Contractor to make good any damage caused to the campsite area or any improvements on it, including services, and for reinstating it to its former condition when vacated. The standard of reinstatement must be to the satisfaction of the Engineer or the owner. Particular attention should be directed to these requirements and written clearances from the relevant Departments or other owners will be required.

C3.1.8.2 Source of Water Supply

The Contractor shall be responsible under the Contract for the supply and distribution at his cost of all water that he may require for purposes of constructing the Works. Accordingly, the Contractor shall pay all connection fees and consumption charges, and at his cost provide all connections, consumption meters, pipe work, storage tanks, transport and other items associated with the supply of water for the Works.

The Contractor shall, subject to the approval of the Engineer, make any necessary arrangements with the relevant authority for the connection(s), and shall provide in his tender for the payment of all charges and costs that are associated with making water available for purposes of constructing the Works.

C3.1.8.3 Source of Power Supply

The Contractor shall be responsible under the Contract for the supply and distribution at his cost of all electricity that he may require for purposes of constructing the Works. Accordingly, the Contractor shall pay all connection and consumption charges, and at his cost provide all connections, transformers, consumption meters, cables, distribution boards and other items that are associated with the supply of electricity for construction of the Works.

The Contractor shall, subject to the approval of the Engineer, make any necessary arrangements with the relevant authority for the connection(s), and shall provide in his tender for the payment of all charges and costs that are associated with making electricity available for purposes of constructing the Works. The distribution of electricity shall be in accordance with the applicable bylaws and regulations of the supply authority.

C3.1.8.4 Accommodation of Employees

No employees except for security guards will be allowed to sleep or be accommodated on the site.

No housing is available for the Contractor's employees and the Contractor shall make his own arrangements to house his employees and to transport them to site.

No informal housing or squatting will be allowed.

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The Contractor shall provide the necessary ablution facilities at his campsite and the site of the works for the use of his employees. Chemical toilets only will be allowed where temporary facilities have to be provided.

C3.1.9 Features Requiring Special Attention

C3.1.9.1 Built-up Areas

The Contractor's attention is drawn to the fact that the Works will be constructed within built-up areas. The Contractor shall exercise all necessary precautions and take all necessary steps to ensure the safety and convenience of the public. In addition, the Contractor shall provide access for traffic over and through the works, and for residents to their places of abode, all as described in the Specifications. Allowance must be made by the Contractor in his programming for delays resulting from the aforesaid.

The Contractor shall give residents a minimum of 72 hours written notice of his intent to close access to residential stands. The Contractor shall acquire written confirmation from all owners that they are aware of any intended closures of access. No traffic access to a residential stand shall be closed for longer than 48 hours.

C3.1.9.3 Protection of Buildings and Structures

The Contractor shall give all residents or other parties owning a building or structure within an appropriate radius (not less than 100m) from any point of blasting, a minimum of 48 hours notice of his intent to execute any blasting work.

The Contractor shall note all aspects relevant to the condition of the affected buildings and/or structures prior to blasting, and shall acquire the signature of the owners/occupants agreeing to such conditions.

Subsequent to blasting, both the Contractor and the owners/occupants shall sign the form confirming the condition of the buildings and/or structures. In the event of damage to existing buildings and/or structures as a result of blasting, remedial work shall be done to the satisfaction of the owners/occupants at the Contractor's expense.

Compliance with this clause will not relieve the Contractor of any of his responsibilities in terms of the Contract.

C3.1.9.4 Care of the Site

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

C3.1.9.5 Control of Water

The Contractor shall at all times and in all respects be responsible for the handling of stormwater from higher-laying areas above the Works, and for the handling of any sub-surface water that may affect the Works. No separate payment shall be made in this regard, as all costs related thereto shall be deemed to be included in the rates tendered for the various items of work that are included in the Schedule of Quantities.

C3.1.10 Management of the environment

The Contractor shall pay special attention to the following:

(a) Natural Vegetation

The Contractor shall confine his operation to as small an area of the site as may be practical for the purpose of constructing the works.

Only those trees and shrubs directly affected by the works and such others as the Engineer may direct in writing shall be cut down and stumped. The natural vegetation, grassing and other plants shall not be disturbed other than in areas where it is essential for the execution of the work or where directed by the Engineer.

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(b) Fires

The Contractor shall comply with the statutory and local fire regulations. He shall also take all necessary precautions to prevent any fires. In the event of fire the Contractor shall take active steps to limit and extinguish the fire and shall accept full responsibility for damages and claims resulting from such fires, which may have been caused by him or his employees.

C3.1.11 Community Liaison and Community Relations

In all dealings with nearby communities and beneficiaries of the project, and in all dealings with workers employed from within such communities, the Contractor shall take due cognisance of the character, culture and circumstances of the specific community and/or any group of beneficiaries, and shall at all times use his best endeavours to avoid the development of disputes and rather to foster a spirit of co- operation and harmony towards the project.

The Contractor shall at all times, keep the Engineer fully informed regarding all matters affecting or negotiated between the Contractor and the community and/or beneficiaries, and he shall attend all liaison meetings as may be arranged by the Engineer and/or the Employer. All matters concerning the community and/or beneficiaries shall be discussed and where possible, resolved at such meetings.

Where any resolution during such negotiations or at such meetings shall be contrary to the terms and provisions of the Contract, the Contractor shall not give effect thereto without a prior written instruction from the Engineer. Where the Contractor is of the opinion that any instruction of the Engineer issued in terms of this clause will result in the incurring of additional costs which were not provided for in his tendered rates and prices and/or that a delay in the progress of the Works will result, he shall be entitled to submit a claim in terms of Clause 10 of the Conditions of Contract, provided always that the period of twenty-eight (28) days referred to in Clause 10 shall be reduced to three (3) normal working days in respect of all claims submitted in terms of this clause.

C3.1.12 Workmanship and Quality Control

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

The cost of the Contractor's supervision and process control, including all testing carried out by the Contractor, will be deemed to be included in the rates tendered for the various items of work. The Contractor's attention is drawn to the provisions of the various Standardised Specifications regarding the minimum frequency of process control testing that is to be executed. The Contractor shall, at his own discretion, increase this frequency where necessary to ensure adequate control of the quality of the Works at all times.

Upon completion and submission of each portion of the Works to the Engineer for examination, the Contractor shall furnish the Engineer with the results of relevant tests, measurements and levels, thereby indicating compliance with the Specifications.

The Engineer will not examine or inspect any portion of work submitted for approval unless the request for inspection and approval is accompanied by relevant tests, measurements and levels indicating compliance.

C3.1.13 Samples

Materials or work that do not conform to the approved samples, submitted in terms of Clause 7.4 of the Conditions of Contract, will be rejected. The Engineer reserves the right to submit samples for testing to ensure that the material represented by the samples meet the specification requirements.

C3.1.14 Notices, Signs, Barricades and Advertisements

Notices, signs and barricades (required in terms of Clause 8 of the Conditions of Contract) as well as advertisements may only be erected where approved by the Engineer. The Contractor shall be responsible for their supply, erection, maintenance and ultimate removal and shall make provision for this in his tendered rates.

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The Engineer shall have the right to have any sign, notice or advertisement moved to another location, or to have it removed from the Site of the Works, should it in any way prove to be unsatisfactory, inconvenient or dangerous to the general public.

C3.1.15 Requirements for Accommodation of Traffic

General

The Contractor will be responsible for the safe and easy passage of public traffic past and on sections of roads of which he has occupation or where work has to be done near traffic.

Accommodation of traffic, where applicable shall comply with SANS 1921-2: 2004: Construction and Management Requirements for Works Contracts, Part 2: Accommodation of Traffic on Public Roads occupied by the Contractor. The Contractor shall obtain this specification from Standards South Africa if accommodation of traffic will be involved on any part of the construction works.

Basic Requirements

The travelling public shall have the right of way on public roads, and the Contractor shall make use of approved methods to control the movement of his equipment and vehicles so as not to constitute a hazard on the road.

The Contractor shall ensure that all road signs, barricades, delineators, flagmen and speed controls are effective and that courtesy is extended to the public at all times.

Failure to maintain road signs, warning signs or flicker lights, etc, in a good condition shall constitute ample reason for the Engineer to suspend the work until the road signs, etc, have been repaired to his satisfaction.

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

The Contractor shall construct and maintain all temporary drainage works necessary for temporary deviations.

The Contractor shall provide and grant access to persons whose properties fall within or adjoin the area in which he is working.

C3.1.16 Open Trenches

Trenches may not be left open during the builder's holidays, and shall be safeguarded at all times from danger to the public. Safe trench-crossings shall be provided at all intersections with accesses to properties and with public roads and paths. The length of trench left open at any one time may be restricted by the Engineer, should he consider such restriction to be in the interest of public safety.

C3.1.17 Statutory Regulations

The statutory requirement of the Occupational Health and Safety Act, Act 85 of 1993 (referred to as the Act below), and all regulations promulgated there under as well as the other relevant acts must be adhered to by the Contractor, with specific reference to the safety of all employees and the public, irrespective of whether such employees are employed by the Contractor or by his subcontractors (including local subcontractors). The Contractor, in entering into this Contract, hereby agrees with the Employer in terms of Section 37(2) of the Act, that the Contractor as an employer in its own right and in its capacity as Contractor for the execution of the Works, shall have certain obligations and that the following arrangement shall apply between the Contractor and the Employer to ensure compliance by the Contractor with the provisions of the Act, namely:-

- (a) The Contractor undertakes to acquaint the appropriate officials and the employees of the Contractor with all relevant provisions of the Act, and the regulations promulgated in terms of the Act;

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- (b) The Contractor undertakes that all relevant duties, obligations and prohibitions imposed in terms of the Act and regulations will be fully complied with; and
- (c) The Contractor hereby accepts sole liability for such due compliance with the relevant duties, obligations and prohibitions imposed by the Act and regulations, and expressly absolves the Employer and the Engineer from being obliged to comply with any of the aforesaid duties, obligations and prohibitions in respect of the Works; and
- (d) The Contractor shall be obliged to report forthwith to the Employer and the Engineer any investigation, complaint, or criminal charge which may arise as a consequence of the provisions of the Act and regulations pursuant to work performed on behalf of the Employer, and shall, on written demand, provide full details in writing of such investigation, complaint or criminal charge.
- (e) The Contractor shall sign the agreement bound into Section C1.2 of this document.

The Contractor shall comply with all the conditions of the Record of Decision in terms of Section 22(3) of the Environmental Conservation Act, 1989.

A time-related and a fixed-charge item have been provided in Schedule A of the Schedule of Quantities. The contractor shall allow for all obligations imposed by the Environmental Management Plan including the appointment of an environmental manager/control officer.

C3.1.18 Safety

"Pursuant to the provisions of the Conditions of Contract, and without in any way limiting the Contractor's obligations there under, the Contractor shall at his own expense (except only where specific provision (if any) is made in the contract for the reimbursement to the Contractor in respect of particular items), provide the following:

- (a) The Principal Contractor must do a Risk assessment and compile an OHS Plan to be evaluated and approved by the Safety Agent prior to commencement of Construction.
- (b) The Contractor must ensure that regular safety meetings be held, and that the minutes of such meetings be kept in a Safety File, which must be available on site at all times.
- (c) Provide to its Employees on the site of the works, all safety materials, clothing and equipment necessary to ensure full compliance with the provisions of the Occupational health and Safety Act, 1993 (Act No 85 of 1993) as amended (hereinafter referred to as the Act) at all times, and shall institute appropriate and effective measures to ensure the proper usage of such safety materials, clothing and equipment at all times;
- (d) Provide, install and maintain all barricades, safety signage and other measures to ensure the safety of workmen and all persons in, on and around the site, as well as the general public;
- (e) Implement on the site of the works, such procedures and systems and keep all records as may be required to ensure compliance with the requirements of the Act at all times;
- (f) Implement all necessary measures so as to ensure compliance with the Act by all subcontractors engaged by the Contractor and their employees engaged on the works;
- (g) Full compliance with all other requirements pertaining to safety as may be specified in the Contract (Also refer to Notice to Tenderers).

The Employer and the Engineer shall be entitled, although not obliged, to make such inspections on the site as they shall deem appropriate, for the purpose of verifying the Contractor's compliance with the requirements of the Act.

For this purpose, the Contractor shall grant full access to the site of all parts of the site and shall co-operate fully in such inspections and shall make available for inspection all such documents and records as the Employer's and/or Engineer's representative may reasonably require. Where any such investigations reveal, or where it comes to the Engineer's attention that the Contractor is in any way in breach of the requirements of the Act or is failing to comply with the provisions of this clause, the Engineer shall, in accordance with the provisions of clause 5.11 of the Conditions of Contract, be entitled to suspend progress

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on the works or any part thereof until such time as the Contractor has demonstrated to the satisfaction of the Engineer, that such breach has been rectified.

The Contractor shall have no grounds for a claim against the Employer for extension of time and/or additional costs if the progress on the works or any part thereof is suspended by the Engineer in terms of this clause, and the Contractor shall remain fully liable in respect of the payment of penalties for late completion in accordance with the provisions of clause 5.13.1 of the Conditions of Contract should the Contractor fail to complete the Works on or before the specified due completion date in consequence of the suspension.

Persistent and repeated breach by the Contractor of the requirements of the Act and/or this clause shall constitute grounds for the Engineer to act in terms of subclause 9.2.1 of the Conditions of Contract and for the Employer to cancel the Contract in accordance with the further provisions of the said clause 9.2.”

In addition to all above safety related requirements the Contractor shall take cognisance of the requirements of the construction regulations and OHS Specifications bound in C3.5.2 of this document.

C3.1.19 Safety Officer

OHS must be provided.

The Contractor is required to ensure compliance with the Occupational Health and Safety Act (Act 85 of 1993) and its regulations, in particular the Construction Regulations, 2014, to appoint a Health and Safety Officer for the works.

The safety officer shall have a sound knowledge of the Occupational health and Safety Act. He shall preferably have completed the Safety Management Training Course (SAMTRAC) presented by NOSA. The Contractor shall submit details of the proposed

C3.1.20 Source of Material/Borrow pit

The contractor will be held responsible for locating legal, licenced and approved sources of all materials complying with the relevant minimum requirements to be used in this contract. No separate payment shall be made for this, as all costs related thereto shall be deemed to be covered by the tendered rates.

Where possible materials manufactured or produced locally shall be procured to promote local enterprise.

C3.1.21 Photographic Record

Prior to the commencement of the work, and during the contract period, a photographic record shall be made of all existing stands and structures to be effected by the project, and forwarded to the Engineer prior to the authorisation of the first progress payment.

A payment item is included in the Schedule of Quantities to cover the Contractor's cost for compliance with the above requirements.

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C3.2 ENGINEERING

C3.2.1 Design

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

C3.2.2 Employer's Design

The Employer has designed the permanent works included in this contract. The detail of the works is indicated on the drawings and in the specifications. The Tenderer may submit alternative offers for designs prepared by himself subject to the conditions specified in clause 05 of the Standard Specifications.

C3.2.3 Drawings

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.

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.

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.

C2.3.1.1 Additional construction drawings will, in terms of Clause 5.9 of the General Conditions of Contract (2015), be issued to the Contractor by the Engineer/Employer on the commencement date and from time to time as required."

C3.3 PROCUREMENT

C3.3.2 Restriction of the Utilisation of Personnel in the Permanent Employment of the Contractor

The Contractor shall limit the utilisation of his permanently employed personnel to that of key personnel only on the Works, as defined below, and shall execute and complete the Works utilising a temporary workforce employed directly by the Contractor and/or by his sub-contractors, using the assistance of the labour desk that will be established for the project in consultation with the various communities that are established in proximity to the Works or which will be allocated within the development.

Without derogating from the Contractor's obligations to complete the Works within the specified time for completion in terms of clause 1.1.1.14 of GCC 2015, the numbers in each category of the Contractor's key personnel, as stated by the Contractor in Part T2 of this document, will be strictly controlled during the contract period and any increase in numbers will be subject to the prior approval of the Employer.

"Key personnel" means all contracts managers, site agents, site clerks, materials and survey technicians, quantity surveyors, trainers, supervisors, foremen, skilled plant operators, welders, shutter hands and the like, and all other personnel in the permanent employ of the Contractor or his sub-contractors who possess special skills, and/or who play key roles within the Contractor's or his subcontractor's operations.

The Engineer may at his discretion, upon receipt of a written and fully motivated application from the Contractor, and where he deems the circumstances so warrant, authorise in writing that the Contractor may utilise in the execution of the Works, workers not being his key personnel but who are in his permanent employ.

Without limiting the generality of application of this sub-clause, circumstances which may be considered by the Engineer to warrant authorisation of the use of the Contractor's permanent employees other than key personnel, include:

- (a) The unavailability from local sources of sufficient numbers of temporary workers and/or sub-contractors to execute the Works provided always that the Contractor has satisfied the Engineer that he has exercised his best endeavours and taken all reasonable actions to recruit sufficient temporary workers and sub-contractors from local sources as contemplated above.
- (b) The unavailability within the temporary worker pool and/or from subcontractor sources available to the Contractor in terms of the Contract, of sufficient skills necessary to execute the Works or specific portions thereof, in situations where the completion period allowed in the Contract is insufficient to facilitate the creation of the necessary skills through the provision of suitable training as contemplated in the Contract;
- (c) Any other circumstances which the Engineer may deem as constituting a warrant.

C3.3.3 Provision of Temporary Workforce for the Contract

The Contractor shall employ labour from the local community through the CLO except for approved key staff in the permanent employ of the Contractor, to the maximum extent that is compatible with the requirements of Clause 4.11 of the General Conditions of Contract 2015.

Although the Contractor shall adhere to the statutory minimum wage rates, he is however at liberty to negotiate additional incentive payments based on performance.

The Occupational Health and Safety Act must be adhered to with reference to the safety of any employee employed by the Contractor.

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The successful tenderer shall liaise with the Ward Councillor/Ward Committee whereby the Ward Councillor shall provide to the Contractor the following if necessary:

a) A Community Liaison Officer (CLO) for liaison with the recipient community for labour recruitment

The CLO shall attend all site and other meetings concerning the project.

- Only one CLO shall be appointed per project. If the project spans over more than one Ward, the relevant Ward Councillors shall agree on one CLO to be appointed by the Contractor. Should no agreement be found as envisaged, the relevant Project Manager together with the Engineer, will interview prospective appointees and in their discretion appoint such CLO.
- Notwithstanding the above, if the vastness of the project requires the use of more than one CLO, this will be permitted provided that the total monthly sum paid to all CLO's shall not exceed the amount allowed for in paragraph bill of quantities.
- Should the Contractor experience any difficulties with the community, these difficulties shall immediately be brought to the attention of the Municipality/Project Manager who shall arrange a meeting with the relevant Ward Councillor(s) and the CLO to resolve such difficulties.

The main Contractor shall ensure that any Sub-Contractor he may appoint shall adhere to these conditions but also subject to the provisos applicable to the duration of such sub-contract.

Should any of the above conditions be less favourable than any Bargaining Council Agreement or Act applicable to the Contractor, the more favourable condition will apply.

A contract of employment or subcontract should be signed between the Contractor and each of his employees or sub-contractors, as the case may be. Likewise contracts of employment must be entered into between each such sub-contractor, and each of the specific subcontractor's employees. Employment and subcontract agreements shall make clear reference to at least the following conditions.

- The minimum agreed wage rate per hour in respect of labourers;
- The agreed pay rate per unit of production where applicable;
- UIF and WCA payments;
- Minimum working hours per day;
- Start and end times of a daily shift;
- Lunch break times;
- Company policy regarding:
 - Rain time
 - Sickness and absenteeism
 - Disciplinary matters
 - Grievances
- Method and frequency of payment;
- Work clothes and safety equipment to be issued
- Labour Desk

C3.4 CONSTRUCTION

C3.4.1 Standard Specifications

C3.4.1.1 The Standard specification, are carried out strictly in accordance with SANS 1200 - "Standard Specification for Civil Engineering Construction" as approved by the Council of the South African National Standards.

C3.4.1.2 For the purpose of this Contract the latest issues of the following Standard Specifications for Civil Engineering Construction, applicable at the date of tender advertisement, shall apply –

SANS 1200

A	-	PRELIMINARY AND GENERAL
AB	-	ENGINEER'S OFFICE
C	-	SITE CLEARANCE
DA	-	EARTHWORKS (SMALL WORKS)
DB	-	EARTHWORKS (PIPE TRENCHES)
G	-	CONCRETE (STRUCTURAL)
GB	-	CONCRETE (ORDINARY BUILDINGS)
L	-	MEDIUM PRESSURE PIPELINES
LD	-	SEWER
LB	-	BEDDING (PIPES)
M	-	ROADS (GENERAL)
ME	-	SUBBASE
MF	-	BASE
MH	-	ASPHALT BASE AND SURFACING
MJ	-	SEGEMENTED PAVING

C3.4.1.3 The term "project specifications" appearing in any of the SANS 1200 standardised specifications must be replaced with the terms "scope of work".

C3.4.1.4 References from, and variations and additions to the Standard Specifications and Particular Specifications are included in section **C3.4.2**.

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C3.4.2 Variations and Additions to Standard and Particular Specifications

The following variations and additions to the Standard and Particular Specifications will be applicable to this Contract.

The various documents listed in section C3.4.1 shall be treated as mutually explanatory. However, should any requirement of section C3.4.2 conflict with any requirement of the Standardised Specifications or with any requirement of the Particular Specifications, then the requirement of section C3.4.2 shall prevail.

EPWP labour intensive specification

C3.4.3.1 Labour intensive competencies of supervisory and management staff

Contractors having a CIDB contractor grading designation of 4CE and higher shall only engage supervisory and management staff in labour intensive works who have either completed, or for the period 1 April 2004 to 30 June 2006, are registered for training towards, the skills programme outlined in Table 1.

The managing principal of the contractor, namely, a sole proprietor, the senior partner, the managing director or managing member of a close corporation, as relevant, having a contractor grading designation of 1CE, 2CE, 3CE and 4CE shall have personally completed, or for the period 1 April 2004 to 30 June 2006 be registered on a skills programme for the NQF level 2. All other site supervisory staff in the employ of such contractors must have completed, or for the period 1 April 2004 to 30 June 2006 be registered on a skills programme for, the NQF level 2 unit standards or NQF level 4 unit standards.

Table 1: Skills programme for supervisory and management staff

Personnel	NQF level	Unit standard titles	Skills programme description
Team leader / supervisor	2	Apply Labour Intensive Construction Systems and Techniques to Work Activities	This unit standard must be completed, and
		Use Labour Intensive Construction Methods to Construct and Maintain Roads and Stormwater Drainage	Any one of these 3 unit standards
		Use Labour Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour Intensive Construction Methods to Construct, Repair and Maintain Structures	
Foreman/ supervisor	4	Implement labour Intensive Construction Systems and Techniques	This unit standard must be completed, and
		Use Labour Intensive Construction Methods to Construct and Maintain Roads and Stormwater Drainage	Any one of these 3 unit standards
		Use Labour Intensive Construction Methods to Construct and Maintain Water and Sanitation Services	
		Use Labour Intensive Construction Methods to Construct, Repair and Maintain Structures	
Site Agent / Manager (i.e. the contractor's most senior representative that is resident on the site)	5	Manage Labour Intensive Construction Processes	Skills Programme against this single unit standard

C3.4.3.2 Employment of unskilled and semi-skilled workers in labour-intensive works

C3.4.3.2.1 Requirements for the sourcing and engagement of labour

1. Unskilled and semi-skilled labour required for the execution of all labour intensive works shall be engaged strictly in accordance with prevailing legislation and SANS 1914-5, Participation of Targeted Labour.

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2. The rate of pay set for the EPWP obtained from the Municipality for the use of local labour is set at a minimum of R200,00 per day.

3. Tasks established by the contractor must be such that:

- a) the average worker completes 5 tasks per week in 40 hours or less; and,
- b) the weakest worker completes 5 tasks per week in 55 hours or less.

4. The contractor must revise the time taken to complete a task whenever it is established that the time taken to complete a weekly task is not within the requirements of C3.4.3.2.1.3.

5. The Contractor shall, through all available community structures, inform the local community of the labour intensive works and the employment opportunities presented thereby. Preference must be given to people with previous practical experience in construction and / or who come from households:

- a) where the head of the household has less than a primary school education;
- b) that has less than one full time person earning an income;
- c) where subsistence agriculture is the source of income.
- d) those who are not in receipt of any social security pension income

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

- a) 60 % women;
- b) 20% youth who are between the ages of 18 and 25; and
- c) 2% on persons with disabilities.

C3.4.3.3 Specific provisions pertaining to SANS 1914-5

1. Definitions

Targeted labour: Unemployed persons who are employed as local labour on the project.

2. Contract participation goals

- Is no specified contract participation goal for the contract. The contract participation goal shall be measured in the performance of the contract to enable the employment provided to targeted labour to be quantified.
- The wages and allowances used to calculate the contract participation goal shall, with respect to both time-rated and task rated workers, comprise all wages paid and any training allowance paid in respect of agreed training programmes.

C3.4.3.4 Terms and conditions for the engagement of targeted labour

Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.

C3.4.3.5 Variations to SANS 1914-5

1. The definition for net amount shall be amended as follows:

Financial value of the contract upon completion, exclusive of any value added tax or sales tax, which the law requires the employer to pay the contractor.

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2. The schedule referred to in 5.2 shall in addition reflect the status of targeted labour as women, youth and persons with disabilities and the number of days of formal training provided to targeted labour.

C3.4.3.6 Training of targeted labour

1. The contractor shall provide all the necessary on-the-job training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the contract in a manner that does not compromise worker health and safety.
2. The cost of the formal training of targeted labour will be funded by the provincial office of the Department of Labour. This training should take place as close to the project site as practically possible. The contractor, must access this training by informing the relevant provincial office of the Department of Labour in writing, within 14 days of being awarded the contract, of the likely number of persons that will undergo training and when such training is required. The employer must be furnished with a copy of this request.
3. A copy of this training request made by the contractor to the DOL provincial office must also be faxed to the EPWP Training Director in the Department of Public Works – Cinderella Makunike, Fax Number 012 328 6820 or email cinderella.makunike@dpw.gov.za Tel: 083 677 4026.
4. The contractor shall be responsible for scheduling the training of workers and shall take all reasonable steps to ensure that each beneficiary is provided with a minimum of six (6) days of formal training if he/she is employed for 3 months or less and a minimum of ten (10) days if he/she is employed for 4 months or more.
5. The contractor shall do nothing to dissuade targeted labour from participating in training programmes.
6. An allowance equal to 100% of the task rate or daily rate shall be paid by the contractor to workers who attend formal training, in terms of C3.4.3.6.2 above.
7. Proof of compliance with the requirements of items above must be provided by the Contractor to the Employer prior to submission of the final payment certificate.

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VARIATIONS AND ADDITIONS TO STANDARD SPECIFICATIONS

SANS 1200 A: GENERAL

PSA 1 QUALITY OF MATERIALS (Sub clause 3.1)

Add the following:

All materials used in this Contract shall be the official SANS mark where applicable.
All materials shall be new and of the best quality available unless otherwise specified.

PSA 2 CONTRACTOR'S OFFICES, STORES AND SERVICES (Clause 4.2)

Add the following to the provisions of Clause 4.2.

- a) The location of the Contractor's offices, stores and services on site shall be subject to approval by the Engineer.
- b) The Contractor's office is to include a facility with furniture suitable for the use during site meetings, accommodating 8 persons.
- c) The Contractor's designated site agent shall be in possession of a cellular telephone.

No additional payment is made for this service, and shall be deemed to be included in the preliminary and general.

PSA 3 SETTING OUT OF THE WORKS (Clause 5.1.1)

Substitute the first sentence of Clause 5.1.1 with the following. The engineer will provide information for setting out of the works.

Add the following:

Setting out the Works will not be measured and paid for directly, and compensation for the works involved in setting out shall be deemed to be covered by the rates and prices tendered and paid for in the various items of works included under this Contract.

PSA 4 WATCHING, BARRICADING, LIGHTING AND TRAFFIC CROSSINGS (Clause 5.2)

The Contractor shall make adequate provision for the supply of temporary warning signs, barriers drums etc to the satisfaction of the Engineer for the entire duration of the contract. Road and traffic signs shall comply with the requirements of the "South African Road Traffic Manual".

PSA 5 LOCATION AND PROTECTION OF EXISTING SERVICES (Clause 5.4)

Add the following provisions of Clause 5.4.1

PSA 5.1 Location of existing services

Before underground or excavation work is carried out, the Contractor shall ascertain the presence and position of all services likely to be damaged or interfered with by his activities. He shall obtain up-to-date plans from the Engineer for this purpose, showing the position of services in the area where he intends to work.

As services can often not be reliably located from such plans, the Contractor shall determine the exact position of such services by means of suitable detecting equipment and afterwards by careful hand excavation where necessary in order to expose the services at the positions of possible interference by

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his activities. This procedure shall also be followed in respect of services not shown on the plans but believed to be present.

All such services, the positions of which have been located at the critical points, shall be designated as “known” services and their positions shall be indicated on a separate set of Drawings, a copy of which shall be furnished to the Engineer.

While he is occupying the Site, the Contractor shall be liable for all damage caused by him to known services as well as for consequential damage, whether caused directly by his operations or by the lack of proper protection.

PSA 6 ACCOMMODATION OF TRAFFIC (New clause 5.9)

Temporary traffic signs shall be erected at all diversions.

The number and layout of the traffic signs shall comply with the Site Manual entitled “Safety at Roadwork’s in Urban Areas”, as published by the Department of Transport.

Traffic signs shall have a yellow background with either a red / black border.

PSA 7 TOLERANCES

PSA 7.1 General (New subclause 6.4)

No guarantee is given that the full specified tolerance will be available independently of each other, and the Contractor is cautioned that the liberal or full use of any one or more of the tolerances may deprive him of the full or any use of tolerances relating to other aspects of the work.

Except where the contrary is specified or then clearly not applicable all quantities for measurement and payment shall be determined from the “authorised” dimensions. These are specified dimensions or those shown on the Drawings or, if changed, as finally prescribed by the Engineers, without any allowances for the specified tolerances. Except if otherwise specified, all measurements for determining quantities for payment will be based on the “authorised” dimensions.

If the work is therefore constructed in accordance with the “authorised” dimensions plus or minus the tolerances allowed, quantities will be based on the “authorised dimensions regardless of the actual dimensions to which the work has been constructed.

When the work is not constructed in accordance with the “authorised” dimensions plus or minus the tolerances allowed, the Engineers may nevertheless, at his sole discretion, accept the work for payment. In such cases no payment shall be made for quantities of work or material in excess of those calculated for the “authorised” dimensions, and where the actual dimensions are less than the “authorised” dimensions minus the tolerance allowed quantities for payment shall be based on the actual dimensions as constructed.

PSA 9 MEASUREMENT AND PAYMENT

PSA 9.1 Contractual Requirements (sub clause 8.3.1)

Add to sub-clause 8.3.1:

“In addition, the sum tendered shall cover all initial costs incurred in complying with the requirements of the Special Conditions of Contract.

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PSA 9.2 Contractual Requirements (sub clause 8.4.1)

The Contractor shall tender a lump sum in the Schedule of Quantities to cover his time-related establishment costs. The amount tendered and paid shall be full compensation to the Contractor for:

- (i) The maintenance of his whole organisation as established for this Contract.
- (ii) The maintenance of all insurances, indemnities and guarantees required in terms of the Conditions of Contract or Tender where applicable.
- (iii) Compliance with all general conditions and requirements, which are not specifically, measured elsewhere for payment in these Contract Documents.

The Contractor shall tender a lump sum for the abovementioned items.

Payment of the lump sum shall be made monthly in compliance with the method laid down in Sub-clause 8.2.2 of SANS 1200:A.

The Contractor will not be paid Time-Related Preliminary and General charges for any Special Non-Working Days, as stipulated in the Appendix, which shall be deemed to have been allowed for in his rates.

PSA 9.3 Adjusted Payment for Time-Related Items

The payment to the Contractor for Time-Related Items shall be adjusted in accordance with the following formula in the event of the Contract being extended by means of a variation order:

Sum of Tendered amounts

for Time Related Items x $\frac{\text{Extension of Time authorised by variation order}}{\text{Tender contract period}}$

*For the purposes of applying this formula "Extension of Time" will exclude the Contractor's December/January close-down period, if applicable.

The abovementioned adjustment of the payment for Time-Related Items shall be made in the Completion Payment Certificate and shall be the only payment for additional Time-Related costs irrespective of the actual period required to complete the Contract including its authorised extensions.

In the case of fixed price contracts, the amount by which the Time-Related Items is adjusted shall not be subject to the Contract Price Adjustment formula.

In the case of contracts subject to Contract Price Adjustment the amount by which the time-related items are adjusted shall be subject to the Contract Price Adjustment formula.

**PSA 9.4 Compliance with OHS Act and Regulations
(Including The Construction Regulations 2014)**

unit: sum

The tendered sum shall include full compensation to the Contractor for compliance with all the requirements of the OHS Act and Regulations (including the Construction Regulations 2014) at all times for the full duration of the Contract.

This sum will be paid to the contractor in equal monthly amounts subject to proper/substantial compliance

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PSA 9.5 Accommodation of Traffic (Clause 8.8.2)

Where the new works interferes with the existing roads, the Contractor shall construct these sections of the works under traffic. The work will involve catering for the safe and easy passage of public traffic in all weather, both day and night for the full traffic control and signposting.

The Contractor may alternatively make his own arrangement for detours to be constructed, all subject to the Engineers approval.

Add the following after the first paragraph:

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

SANS 1200 A: PRELIMINARY AND GENERAL

PSA 3.1 Quality of Samples

All materials used shall be suitable for the purposes for which they are intended. Materials shall comply with the requirements of the South African Bureau of Standards, where such standards are available.

PSA 5 CONSTRUCTION

PSA 5.1 Setting out of the work and protection of beacons (Sub-clause 5.1)

The Contractor shall be responsible for the true and proper setting out of the Works from the basic control points shown on the Drawings or indicated by the Employer's Agent Representative on site and shall ensure the correct location of the Works in relation to such points. The Contractor has to ascertain himself of the correctness of the pegs and benchmarks in the field. Any discrepancy shall be immediately reported to the Employer's Agent Any costs arising from failure to do so, shall be the responsibility of the Contractor. The Employer's Agent may alter any part of the works to suit local conditions if necessary. No claim for incorrect setting out will be considered. Clause PS 10.6 shall also apply.

PSA 5.1.1 Services (Sub-clause 5.2)

All excavations to expose existing known services shall be excavated by hand in all materials by the contractor. Any existing service in the road reserve or municipal servitude that is damaged as a result of negligence by the contractor will be repaired by the contractor to the satisfaction of the Employer's Agent at his own cost. Clause PS 10.1 shall also apply.

PSA 5.2 Watching Barricading, lighting and traffic crossings, (Clause 5.2)

All open excavations shall be properly demarcated with reflective tape, barricading and any other requirements that the Local Authority has.

PSA 5.3 Protection of Structures (Clause 5.3)

The contractor must contact house owners at least two weeks prior to working in close proximity to existing buildings and to inspect buildings before and after work had been completed. Clause PS 10.2 shall also apply.

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PSA 5.7 Safety

Add the following:

1. The Contractor shall at all times observe adequate safety precautions on Site to ensure the safety of his own staff as well as that of the public and other persons engaged in or about the Works. In this respect he shall observe all laws, ordinances and regulations pertaining to his work.
2. The Contractor's attention is specifically drawn to the following Acts, and particularly to the relevant regulations under each Act, copies of which shall at all times be kept by him on the Site:
 - The Factories, Machinery and Building Work Act (Act 22 of 1941)
 - The Explosives Act (Act 26 of 1956)
 - The Mines and Works Act (Act 27 of 1956)
 - The Occupational Health and Safety Act (Act 85 of 1993)
3. The Contractor is also required to comply with the safety precautions set out in the following publications, copies of which shall also be kept by him on the Site:
 - i. The Code of Practice relating to the safety of men in civil engineering inspection pits and small – diameter vertical shafts. (Transactions of the South African Institution of Civil Engineers, Vol. 2, No. 11, November 1960, obtaining from the Secretary, S.A. Institution of Civil Engineers, PO Box 93495, Yeoville, 2143).
4. The Contractor shall provide suitable and safe access by way of ladders, gangways, etc. to all parts of the Works as may be required for construction purposes or for inspection by the Employer's Agent or the authorised Inspectors in terms of the above-mentioned Acts.
5. All precautions shall be taken to protect workmen against falling material and/or objects and other dangers whilst they are carrying out their duties. Trenches shall in every way be made and kept safe for persons working therein.
6. All persons working, inspecting or supervising in places where falling material and/or objects could be encountered shall be provided by the Contractor with hard hats of a type approved by the Inspector of Mines, the use of which shall be strictly enforced.
7. The Contractor shall provide a properly equipped first-aid box, which shall be accessible at all times.
8. Where adequate safety precautions are not being observed, the Employer's Agent may order the Contractor to comply with minimum safety requirements at the latter's expense. Compliance with such order will not absolve the Contractor from any of his responsibilities and obligations under the Contract.
9. The Contractor shall display on a prominent place the following emergency information:
 - i. Local Police: Telephone number
 - ii. Local Ambulance: Telephone number
 - iii. Local Fire Brigade: Telephone number
 - iv. Nearest Doctor
 - v. Name
 - vi. Telephone number (office hours)
 - vii. Telephone number (after hours)
 - viii. Consulting room street address
10. The Contractor shall furthermore comply with the requirements of the "Safety Instructions" contained at the end of this Document. (See Schedule 13)

PSA 6.2 Degree of accuracy (Sub-clause 6.2)

Degree of Accuracy shall apply to all components of the Works except where otherwise specified in the Schedule of Quantities and/or Drawings and provided that the minimum permissible deviation given for an element will prevail where more than one deviation can be interpreted in Clause 6.2.3(d).

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PSA 7 Testing (Sub-clause 7)

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

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

The Contractor's attention is drawn to the provisions of the various sections of the Specifications regarding the minimum frequency of the testing that will be required for process control. The Contractor shall at his own discretion increase the frequency where necessary to ensure adequate control.

The Contractor shall submit to the Employer's Agent the results of all relevant tests, measurements and levels indicating compliance with the specifications on completion of every part of the work for examination.

Should the results of any of these tests fall below the required standards as specified in the specifications, the cost of any additional tests required by the Employer's Agent will be to the account of the Contractor.

PSA 7.2 Laboratory (Sub-clause 5.2)

A Laboratory for the use of the Employer's Agent Representative is not required on site. A commercial laboratory approved by the Employer's Agent and appointed by the Contractor shall do all acceptance control tests required in terms of the Contract. All tests must be done according to the tests prescribed in the SANS 1200 under the relevant sections.

PSA 7.4 Statistical analysis of control tests (Sub-Clause 7.4)

Statistical control methods will not be applied under this contract.

PSA 8 MEASUREMENT AND PAYMENT

PSA 8.2.1 Fixed-Charge and Value-Related Items (Sub-clauses 8.2.1. and 8.3)

The tendered sums for the fixed-charge and value related items in the P&G Section of the Schedule of Quantities shall not be subject to any variation if the actual value of the work done exceeds or falls short of the accepted tendered amount within the limit stated in Clause 6.3 of the General Conditions of Contract 2015, or if extension of time for the completion of the works is granted.

Payment for fixed-charged and value-related items will be done in three separate payments as follow:

40% of total cost after the Contractor has stabilised and equipped the site office and after the Employer's Agent is satisfied that a substantial start of the actual construction work has been made;

40% of total cost after 50% of the actual work (excluding material on site) has been completed and approved by the Employer's Agent;

20% of total cost on issue of practical completion certificate by Employer's Agent, according to the guidelines of the GCC.

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PSA 8.2.2 Time-Related Items

The tendered amount for a time-related item will be increased if an extension of time for the completion of the works is awarded on the condition that the activity related to the item tendered for must be sustained during the extended period.

The ratio between the increased amount for a time-related item and the tendered amount must be the same as the ratio between the extension of the time period for the completion of the work and the original time period allowed for completion of the works.

If the works is completed before the end of the original time period allowed for completion of the works, the tendered amount of a time related item that is influenced by the earlier completion would be reduced similarly.

PSA 8.2.2.1 Standing time costs due to riot, etc. for the Contractor's total operation.

The unit for measurement shall be a working day, and a working week shall be held to consist of five working days and a working day of 9 hours, unless otherwise agreed upon. The sum per working day tendered under this time-related item shall represent that part of the Contractor's costs for standing time of whatever nature.

This payment item will only be applicable to delays in the execution of the Works and additional costs which in the opinion of the Employer's Agent are incurred as a result of riot, commotion, politically motivated sabotage and acts of terrorism, or disorder outside the control of the Contractor.

The provision of this clause shall in no way prejudice the right of the Employer or the Contractor to terminate the Contract under the provisions of Clause 9 of the GCC (2015).

PSA 8.3.2.1 Facilities for Employer's Agent

The Contractor to provide one furnished site office for the use of the Employer's Agent and his representative sage to the requirements of SANS 1200 AB 3.2 or similar approved. A monthly time-related provisional sum has been included in the Schedule of Quantities to cover the rental costs of accommodation for the Employer's Agent Representative. These amounts shall be payable by the Contractor to the Employer's Agent according to the provisional sums allowed and upon receipt of a tax invoice for such amounts.

The Contractor shall provide and maintain one carport with waterproof roofing for the duration of the Contract for the use of the Employer's Agent. The floor shall consist of crushed aggregate to alleviate dusty and muddy conditions or similar approved.

a) Cellular Telephone

No cellular telephone has to be provided for the Employer's Agent Representative for the duration of the contract. Measurement and payment shall only be made for the relevant time related item.

b) Name Board

Number of name boards as per Bill of Quantity will be ordered by the Contractor according to the Employer's Agent's specifications, complete with dimensions, wording and specifications as prescribed, within one month form the commencement date. The Contractor shall be responsible to transport the name board to site and to erect it at the indicated position on suitable supporting posts. The Contractor shall remove the name board completely from site after construction is completed before the last payment certificate shall be approved.

PSA 8.4.2 Operation and Maintenance of facilities on site for the duration of construction, except where otherwise stated

The tendered sums for the fixed-charge and value related items in the P&G Section of the Schedule of Quantities would not be subject to any variation if the actual value of the work done exceeds or falls short of the accepted tendered amount within the limit stated in Clause 6.11 of the General Conditions of Contract (2015).

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PSA 8.4.2.1 Facilities for Employer's Agent (Time Related Items)

a) Cellular Telephone

No cellular telephone has to be provided for the duration of the contract. However, the contractor is responsible for costs up to R5000.00/month all-inclusive.

b) Name boards

Name boards shall be maintained for the duration of the Contract.

c) Survey Assistants and Materials

The contractor shall provide the following survey equipment on the site from the commencement to the completion of the works, which shall also be for the use of the Employer's Agent and his representatives.

a) 1 x 100m steel measuring tape;

b) Steel pegs, shovels, picks etc. which the Engineers Representative may require during the contract;

c) 1 Theodolite with tripod and 5m staff.

d) One complete Troxler test unit, with proof of recent calibration.

a. Hotel or other Accommodation or office required for the Employer's Agent Representative.

These items will include the cost of rented office accommodation and the provision of telecommunication facilities to the Employer's Agent. The Contractor will be responsible for this prime cost items to the amount of R6,000.00 per month. These services will be provided to the Contractor by the Employer's Agent and will be billed in advance. These items will include all overhead costs, maintenance and insurance with respect to the provision of office accommodation and cellular- and landline telecommunication facilities. This item shall be payable to the Employer's Agent prior to certification of the second construction payment certificate.

d) Administrative assistance to the Contractor

This item will entail the pension of administrative assistance to the Contractor by the Employer's Agent and will include assistance relating to the:

- Calculation and determination of project quantities;
- Compilation of construction payment certificates; and
- Copy and submission of construction payment certificate.

The Contractor will be responsible for this prime cost item to the amount of R5,000.00 per month. This item will be billed in advance and will be payable to the Employer's Agent prior to certification of the second construction payment certificate. This item will include all computer related / electronic work, facsimiles, printing and copying as well as travelling and time based work in this instance.

e) Health and Safety Inspections on Site

This item will include the provision of Health and Safety Inspections on Site by a certified Health & Safety Office under the auspices of the Employer's Agent. The Health and Safety Officer will ensure compliance the Contractor with the OHS Act and he will have the authority to stop construction work on Site will be responsible for this prime cost item to the amount of R7,500.00 per month. This service will be billed in advance and the item shall be payable to the Employer's Agent prior to certification of the second construction payment certificate.

f) Environmental Management Plan Audits

This item will include the provision of Environmental Management Plan (EMP) Audits on Site by an Environmental Control Officer (ECO) under the auspices of the Employer's Agent. The ECO will monitor compliance of the Contractor with the EMP and will be responsible for this prime cost item to the amount of R10,000.00 per month. This service will be billed in advance and the item shall be payable to the Employer's Agent prior to certification of the second construction payment certificate.

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PSA 8.9 Construction Monitoring

Construction monitoring costs will be claimed by the design engineer on a monthly basis for the duration of construction at a rate of R45,000 per month for construction monitoring services (Level 2 – Part time) rendered by the design engineer's representative (ER). The ER shall:

- a) Regularly visit the site at a frequency which may vary during the course of the project, and such visits may be daily or weekly according to the demand of the project;
- b) Regularly, review samples of materials and work procedures for conformity to the contract documentation and design specifications. The ER shall review regular samples of important completed work prior to covering up, or on completion as appropriate.

The Contractor will take ultimate responsibility for quality of work and remains responsible to put in place quality control processes to control its output in terms of the design specifications and requirements whereas the design engineer will conduct inspections and acceptance testing to confirm conformance to the design specifications prior to certification of the works.

PSA 9.1 Submit detail as-built drawings of existing services and adjustments to construction drawings

The contractor will be responsible for the submission of all as-built drawings of all existing services intersecting pipeline trenches as well as any applicable adjustments to the construction drawings. The lump sum tendered shall include full compensation for all information in the possession of the contractor as required above in order to complete the as-built drawings must be submitted to the Employer's Agent Representative before a certificate of completion will be issued for the works.

PSA 9.2 Detailed setting out of the work

The contractor will ensure that all the works be set out from existing survey beacons by a registered surveyor. The sum tendered shall be regarded as inclusive of all related survey work on site.

The Employer's Agent will provide survey beacons (of adequate type and in sufficient quantity) as bench marks. From information provided on drawings issued by the Employer's Agent, the Contractor shall be responsible to provide all positions and levels, of all intermediate points required for proper control of the works.

As bench marks may be disturbed during the execution of the works, all levels and setting out pegs shall be referred to at least two bench marks. The contractor will ensure that all works are set out from existing survey beacons by a professional registered land surveyor. The setting out data, including the elevation (obtain x, y, z coordinates) from these pegs shall be submitted to the Employer's Agent evaluate final natural ground levels (NGL) prior to the commencement of excavations. In the case of deviation from the original pipe route for whatever reason, the contractor will at his own cost survey the new proposed route, and submit the data to the Employer's Agent for approval.

Preservation and replacement of beacons and pegs will be subject to the Land Survey Act, 1927 (Act No 9 of 1927).

PSA 9.3 Compile and submit Health and Safety Plan

The lump sum tendered shall include full compensation for the provision and maintenance of a Health and Safety Plan, risk assessment, permit applications and notifications as called for in the Act and Regulations.

Eighty percent (80%) of this amount will be paid when an approved Health and Safety Plan has been achieved. A further 10% will be paid when the value of work certified by the Employer's Agent exceeds one half of the tender price and the remaining 10% will be payable upon issue of a completion certificate.

PSA 9.4 Implement Health & Safety Plan

The lump sum tendered shall include full compensation for the compliance with the approved H&S Plan

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and inter alia for the following:

- Provision and maintenance of Health & Safety File;
- Provision of construction supervisors and safety officers;
- Health and Safety training for employees and subs;
- Provision of protective clothing;
- Provision of safety fences, signs and barricades; and
- Scheduling of monthly safety meetings and providing monthly reports accordingly, etc.

PSA 9.6 Control of Water

The Contractors are warned that the water table might be high due to the location of the construction site, fact that this site is situated in a high rainfall area and considering that the construction period may run into rainy season.

The Contractor shall at all times and in all respects be responsible for the handling of stormwater from higher-laying areas above the Works and for the handling of any sub-surface water especially in excavations for terraces and trenches that may affect the Works and for the handling of all spoiled water when disconnecting existing water connections or valves. All payments to be made in this regard and all costs related thereto, shall be deemed to be included in the relevant items that are included in the Schedule of Quantities.

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SANS 1200 AB: ENGINEER'S OFFICE

PSAB 1 NAMEBOARDS (Clause 3.1)

Substitute the first paragraph of Clause 3.1 with the following.

The Contractor must supply and erect one name board at an approved site, and shall comply as regards site, painting and details municipalities standard name board. A sample is attached.

PSAB 2 SURVEY ASSISTANTS (Clause 5.5)

Substitute "two or more suitable educated survey labourers" in this paragraph with "one semi-skilled labourer".

The Engineer's Representative will occasionally need the assistance of a survey labourer to help with testing, survey, etc., envisaged at approximately 4 hours (non-consecutive) per week.

PSAB 3 SURVEY EQUIPMENT

The Contractor shall provide the following tested and approved survey equipment on site for the duration of the contract and for the use of the Engineer whenever needed.

- a) One automatic level plus tripod,
- b) One level staff, all graduated metrically and
- c) One 5m and one 25m-tape measure.

The above-mentioned equipment may, by arrangement be shared between the Contractor and the Engineer's Representative. The Contractor shall keep the equipment insured against any loss; damage or breakage and he shall indemnify the Engineer and the Employer against any claims in this regard.

PSAB 4 MEASUREMENT AND PAYMENT

PSAB 4.1 Survey Assistant ((New Clause)

Payment for the survey assistant shall be at the tendered day work rates for the hours worked in assisting the Engineer's Representative. No payment shall be made for the survey equipment all costs shall be deemed to be covered by the rates tendered for the Contractor's facilities. No payment shall be made for the survey equipment or survey assistant and all costs shall be deemed to be covered by the rates tendered for the Contractor's facilities.

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SANS 1200 C: SITE CLEARANCE

PSC 1 SCOPE (Clause 1.1)

Add the following:

“The specification also covers the removal of unreinforced and reinforced concrete, existing pipe culverts and existing roadway and layerworks, (at tie-ins and road widening), and saw cutting of existing road surfacing.”

PSC 2 MATERIALS

Disposal of Material (Subclause 3.1)

Delete the first two sentences of this clause and replace with:

“Debris arising from clearing operations or from the demolition of existing structures that are not suitable for re-use in the works or for landscaping in areas designated by the Engineer, shall be removed by the Contractor and disposed of at the approved tip site. Transport of such material shall not be paid separately, but shall be included in the relevant items for clearing

The rates tendered shall allow for any fees to be paid at the tip site.”

PSC 3 MEASUREMENT AND PAYMENT

PSC 3.1 Clear And Grub (sub - clause 8.2.1)

The location of disposal or dumping sites shall be the Contractor's responsibility and no overhaul shall be payable to the Contractor for loading, temporary and dumping of material thus cleared under this scheduled item.

Unit of measurement for "clear and grub", for road works shall be the square metre, and clearing for sewer and storm-water routes shall be metre.

**PSC 3.2 Removal of Brickwork, Reinforced And Unreinforced Concrete
(New Clause) unit: m3**

Separate items are scheduled. Measurement shall be net in place before removal. The rates shall cover the cost of complete demolition, all necessary excavation and associated works and disposal as per PSC 3.1.

SANS 1200 DA: EARTHWORKS (SMALL WORKS)

PSDA 1 CLASSIFICATION FOR EXCAVATION PURPOSES (Clause 3.1)

Delete Sub-Clause 3.1.1 and 3.1.2 and replace with the following:

PSDA 1.1 Method of Classifying

The Contractor may use any method he chooses to excavate any class of material but his chosen method of excavation shall not determine the classification of the excavation. The Engineer or his Representative will decide on the classification of materials. In the first instance classification will be based on inspection of the material to be excavated and on the criteria given in PSDA 1.2 (a) and (c).

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PSDA 1.2 Classes of Excavation

All materials encountered in any excavation for any purpose including restricted excavation will be classified as follows:

(a) Soft Excavation

Any material, which can be removed by bulldozers or backhoes, shall be classified as soft excavation.

Soft excavation shall be material not falling into the category of hard rock excavation.

(c) Hard rock excavation

Hard rock excavation shall be excavation in material (including undecomposed boulders exceeding 0.17 cubic metre in individual volume) that cannot be efficiently removed without blasting, wedging and splitting, or hydraulic hammers.

This classification includes materials such as:

- solid unfractured rock occurring in bulk
- solid ledges thicker than 200mm
- igneous rock intrusions
- cemented sedimentary rocks.

PSDA2 CONSTRUCTION

PSDA2.1 Conservation of Topsoil (5.2.1.2)

Add the following to Subclause 5.2.1.2:

“Topsoil shall not be stockpiled higher than 2,0m. Care shall be exercised to prevent the compaction of topsoil in any way especially by vehicles travelling over such material.”

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SANS 1200 DB: EARTHWORKS (PIPE TRENCHES)

PSDB 1 CLASSES OF EXCAVATION (Clause 3.1)

The excavation of material, for the purposes of measurement and payment shall be classified as specified in PSDA 1.

SABS 1200 G: CONCRETE (STRUCTURAL)

PSG 1 MATERIALS

PSG 1.1 Applicable Specifications (3.2.1)

Add the following:

All cement types shall comply with the requirements of SABS ENV 197-1

For this contract only OPC CEM I, Class 42.5, cement shall be used.

PSG 1.2 CEMENT (3.2.1 and 3.2.2)

The grade of concrete shall be as specified on the drawings or schedule of quantities. Cement shall not be kept in storage for longer than four weeks and shall be used in the order in which it has been stored.

PSG 2 PLANT

PSG 2.1 Ties (4.5.3)

Add the following:

Permanent metal ties shall have a minimum concrete cover of 40mm after formwork has been removed.

Tie holes shall be filled with “Durabed” grout supplied by ABE or similar approved. The product shall be prepared to a non-slump consistency, but where no cracking occurs when pressed into a firm ball. Trial mixes shall be made to arrive at the required working consistency.

PSG 3 CONSTRUCTION

PSG 3.1 Fixing (5.1.2)

The welding and the use of heat in cutting high tensile deformed bars (Y bars) shall not be permitted without the approval of the Engineer.

PSG 3.2 Cover (5.1.3)

The reinforcement shall be fixed with the minimum cover as specified on the drawings.

In the case of walls, columns, roof slabs, the minimum specified cover should be attained by one of the following methods, or as approved by the Engineer.

- (1) by using “cover block” manufactured from dense, strong cement/sand formed in a block with wire ties, cured under water for a minimum period of 7 days.
- (2) by the use of plastic spacers, set in an orientation so that no pockets of air can be trapped beneath them during vibration of the concrete.

PSG 4 FORMWORK

PSG 4.1 Design Of Forms

- (i) Forms shall conform accurately to the shape, lines, levels and dimensions of the concrete as shown on the drawings.
- (ii) The design of formwork and supports shall be the responsibility of the Contractor.
- (iii) Forms shall be designed as to support their mass, the load exerted by wet concrete and the vibration, construction or other loads that they may be subjected.
- (iv) All timber shall be free from holes, loose knots, cracks, splits, warps or other defects likely to affect the strength or appearance of the finished structures.
- (v) Wedges and clamps shall be used in preference to nails for securing the form components and wire ties or tie bolts in reinforced concrete, and must be capable of removal after use, except as otherwise specified.

PSG 4.2 Classification of Finishes (5.2.1)

Notwithstanding Sub-clause 5.2.1, finishes shall be classified as rough or smooth, as follows:

- (a) Rough

Concealed surfaces and surfaces more than 200mm below final ground level

- (b) Smooth

All surfaces not classified as “rough” in paragraph (a) shall be classified as “smooth”. All exposed areas, unless other indicated, shall be chamfered 20mm x 20mm by means of a fillet fixed to the formwork.

PSG 4.3 Removal of Formwork (5.2.5)

Add the following:

Removal of forms shall be determined by means of cubes cast with the concrete and cured in accordance with S.A.B.S. 863. The removal shall be carried out under the personal supervision of the Foreman, only after the permission of the Engineer has been obtained and in such a manner that the concrete is not jarred, vibrated or otherwise damaged. Where test cubes to determine stripping times are not made, the minimum periods which shall elapse between the time of the placing of the concrete and the time of removal of the forms, shall otherwise agreed with the Engineer, be in accordance with the table hereunder, where each day covers a full 24 hour period.

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Delete Table 2 and replace with the following:

Minimum stripping Times in Days

	CEM I	CEM I	CEM II	CEM II	CEM III	CEM III
Type of structural Member of Formwork	Normal Weather (Above 15° C)*	Cold weather (Below 5°C)*	Normal Weather (Above 15° C)*	Cold weather (Below 5°C)*	Normal Weather (Above 15° C)*	Cold weather (Below 5°C)*
Beam sides, wall or unloaded cols	1	2	2	4	2	6
Slabs, with props left underneath	4	7	5	8	6	10
Beam soffits. Props left underneath	7	12	8	14	10	17
Removal of Slab Props	10	17	10	17	12	21
Removal of beam Props	14	21	14	21	18	28

*Average daily temperature of the atmosphere adjacent to the concrete as measured by a maximum and minimum thermometer.

PSG 5 CONCRETE

PSG 5.1 General (5.5.1.1)

Concrete shall comply with the requirements for strength concrete. (See clause 5.5.1.7)

The maximum cement content for all grades of concrete shall not exceed 450kg per m³ without the permission of the Engineer. In addition, the following will be applicable for this project:

1. The concrete must be resistant to mild acid with a PH of approximately 6.
2. This may be facilitated by slowing the progress of the reaction by using a calcareous aggregate (e.g. limestone) which is susceptible to acid attack and will help to neutralize the acid.
3. Coarse aggregate used must be as large as possible i.e. 26.5 mm to reduce the proportion of paste in the concrete which is vulnerable to acid attack.
4. Fine aggregate must be well graded and able to produce a dense, impermeable matrix that will resist the ingress of aggressive materials. The grading curve given in Fulton's concrete technology and referred to as the preferred grading must be used and not the grading given in SANS 1083.
5. A high proportion of cement i.e. a minimum of 350 kg/m³ must be used to ensure a sufficient content of Ca(OH)₂ which is vulnerable to acid attack. This minimum cement content must be used irrespective of the water/cement ratio requirement for a 35 MPa concrete.
6. The concrete must be resistant to attack by sulphates which are present in sewage.
7. A cement must be used which is resistant to expansive reactions due to sulphates. The best cement available for this purpose will be a 50/50 blend of ground granulated blast furnace slag and clinker cement.

Curing of concrete

Curing of concrete by means of surface water retention or use of an acceptable curing compound must be included to improve the impermeability of the concrete surface to chemical ingress.

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Permeability and resistance to chemical attack can be enhanced by using the various proprietary materials available for the purpose which can be used as a coating, either barrier or penetrating. Information must be obtained from the manufacturer/supplier and included in your submission.

PSG 5.2 Sample and Trial Concrete mixes

The concrete mixes for the grade of strength shall be designed by an approved design laboratory. The Contractor at his own cost shall supply to the laboratory samples of the cement and aggregate he proposes to use for the works. The proposed slumps and proportions of the materials to be used for each grade of concrete shall be submitted to the Engineer for his approval.

No structural concrete shall be placed on the job until the Contractor has satisfied the Engineer as to the suitability of the mixes concerned.

Trial panels for durability concrete (W class concrete)

As part of the durability class concrete mix design approval process, trial panels shall be constructed on the site (or at the laboratory) before construction of structural elements commences, to ensure that the contractor can successfully achieve the oxygen permeability and sorptivity targets set for the in-situ concrete with method of construction to be adopted. Each trial panel shall be constructed using the same type of concrete mix, shuttering type, placing and curing methods (including application rates of curing compounds if applicable) as to be used on the final structural element to be constructed. The dimensions of such a trial panel shall be 0.40m wide, 0.60m high and 150mm thick. The panel shall be constructed vertically. It is suggested that 2 lifting hooks be cast into the panel to facilitate lifting, moving or disposal of panel. It most likely will be that one trial panel will be required for substructures (piers, columns, retaining walls, etc) if the same grade concrete is specified for all substructures.

The test area for taking of cores (taken in horizontal direction) shall not be less than 100mm from all horizontal and vertical edges. The number of cores to be extracted and tested is described below.

Test panels for durability concrete (W class concrete)

During casting of concrete on site, test panels shall be constructed on the site adjacent to where the concrete element is being placed. Each test panel shall be constructed with the same concrete, shutter type, compaction and curing methods being used in the element being cast (including same vibrator frequency and curing compound application rates), and be left to cure for 28 days adjacent to the concrete element. Thereafter it shall either be cored on site or transported to the laboratory for testing of the required durability parameters. The dimensions of the test panels shall be 0,4m wide, 0,6m high and 150mm thick and be cast vertically to simulate vertical casts of the substructures and vertical faces of all structures. It is suggested that 2 lifting hooks be installed at both top ends of the test panel to assist with transport. For precast concrete, test panels will not be constructed, as cores will be drilled from the concrete elements at the Precast yard before being placed at its final location. For the horizontal faces of Columns/Surface Bed Slabs, Water Retaining Walls and All bases/foundations, test panels will also not be constructed. Instead cores will be extracted from the top surface of the test panels.

The frequency of the testing and number of cores to be extracted is described under below.

The test area for the taking of cores (taken in a horizontal direction) shall not be less than 100mm all horizontal and vertical edges.

Testing for concrete durability

Durability predictions for durability concrete prefixed 'W' will be based on the following tests that shall be carried out by an accredited laboratory approved by the Engineer:

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- (i) Oxygen permeability
- (ii) Water sorptivity
- (iii) Chloride conductivity

Notes:

The test methods shall be as described below.

For test no's (i) and (ii) (and (iii) when required), cores of 70 ± 2 mm diameter shall be extracted from the test panels when the concrete reaches the age of at least 28 days and tested.

Test No. (iii) may only be required where specified (e.g. within a chloride environment along the coast or where chlorides are present in ground water).

A sample for the purposes of durability testing is as defined in Table B8106/1. The cores for durability testing shall be extracted from the test panels for process and acceptance control (at the frequency as shown in Table B8106/2). Durability testing shall only be required for concrete specified as durability concrete with the prefix "W". The number of samples to be taken shall be as shown in Table B8106/2.

Table B8106/1: NUMBER OF CORE RESULTS REQUIRED FOR A SINGLE SAMPLE FOR DURABILITY TESTING

Durability Parameter	No. of Core Results
a. Sorptivity	1
b. Oxygen Permeability	2
c. Chloride conductivity	1

* Test undertaken only if specified and within a chloride environment.

Table B8106/2: Number of test panels required for durability testing

Element	No. of Test Panels to be taken (see Table B8106/1 for number of core results required for a single sample)
Water Retaining walls	1 (per element/pour) ²
All bases/foundations	1 (per element/pour) ²
Columns/Surface Bed Slabs	1 (per element/pour) ²

Note:

1. Test panels required to be cast vertically. Additional cores required to be extracted from roof slabs/beams, i.e. in-situ cores.
2. Note that where group of elements are cast on the same day, only one test panel will be required, but only if the same grade concrete is used.

For cores to be extracted from precast elements, the engineer will indicate the positions at which the cores will be extracted. Filling of the holes left by the drilling of the cores shall be the responsibility of the contractor and shall be carried out using an approved proprietary non-shrink repair mortar so as to restore structural integrity and durability of the structural element tested.

The methodology and latest revisions for the durability index tests are available at the University of Cape Town's web address at www.civil.uct.ac.za. In addition, the results of all the durability testing shall be submitted at least once a month in the required format to the University of Cape Town, where the present contact person is: Dr. H Beushausen - email: hans.beushausen@uct.ac.za.

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WORKS BULK PIPELINES – WORK PACKAGE 2

Testing for concrete cover

Concrete cover testing shall be conducted using an approved calibrated electromagnetic cover meter, able to comply to requirements as defined in linear and block scans and has the ability to save and calculate data measured.

The testing (non-destructive) shall be conducted to confirm that the specified depth of concrete cover has been achieved. The cover meter tests shall cover at least 1m² for every 20m² surface area of concrete placed. Readings shall be taken to identify individual bars, with at least 3 readings at 100mm spacing on every single bar within 1m². The cover meter must be calibrated whenever being used to test for cover on each project. Standard Calibration block must be used on each project, and where substantial testing is required, the calibration block shall be kept on site. Cover meters shall comply with the relevant modern standards (e.g. EN55011, 50082-1, 6100-6-1, 6100-6-2, 6100-6-3, 6100-6-4 and BS18881 Part 204).

Critical elements for cover surveys are Columns/Surface Bed Slabs, Water Retaining Walls and All bases/foundations. The engineer will identify other critical areas required to be surveyed. Should any of these areas shows deficiencies, the engineer may order additional cover tests on other areas at the contractor's costs.

The procedure for testing for depth of reinforcement from concrete surface shall be in accordance with the manufacturer's requirements for the relevant electromagnetic cover meter. All cover meters shall be calibrated on site under the control of the engineer. The number of readings taken of the layer of rebar closest to the concrete surface to each 1m² to be tested shall be such that an accurate average cover can be determined for the tested area. For the purposes of calculating the average depth of cover bars that have covers 15mm or greater than what is specified shall be capped at specified cover plus 15mm in the calculations.

Example, where Specified cover = 40mm, test as 35mm, then apply limits, $85\% \times 35 = 30\text{mm}$.

Quick Scan readings are to be taken perpendicular to the layer of rebar closest to the concrete surface for each scan area (+/- 30 per m²), so that an average cover to reinforcement can be determined for the tested area.

Readings are to be taken to identify individual bars within each 1m². At least three cover readings, at 150mm spacing, per an individual bar shall be shown in the test results but only overall cover measurement would be used for payment purposes. Reports generated by the equipment shall be used for determining payment. Where more than 10% of readings are below specified lower limit, the area shall be re-scanned, by Image, Block or Grid scan method, to verify the average cover.

Cognizance to be taken of the effect to cover depth measured, where spliced bars are measured in same area as single bars. The size of rebar shall be corrected manually on the device by means of applying the following formula (approximately $1.41 \times$ diameter of rebar as shown in design).

Where insufficient cover are established before placing of concrete, e.g. Starter bars from base not correct position, remedial action to be performed before continuing with next concreting – these actions to be clearly recorded and area identified.

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WORKS BULK PIPELINES – WORK PACKAGE 2
SABS 1200 GB: CONCRETE (ORDINARY BUILDINGS)

PSGB 1 SCOPE (Clause 1.1)

This section includes specifications for various aspects of concrete referred to in other sections of the standard specifications as well as the construction of cement screeds and waterproofing of concrete roof slabs.

PSGB 2 GENERAL

PSGB 2.1 WATERPROOFING

Waterproofing materials shall be transported, handled and stored with care and laid strictly in accordance with the manufacturer's instruction. A clean, dry, smooth, firm and structurally adequate base with a fall of at least 1 in 50 (depending on the material selected) is required with drainage to gutters and/or rainwater outlets on roof edges, as relevant. Attention shall be given to the detailed design of openings, projections, gutters, down pipes and finishes to make adequate provision for run-off water and to minimise blockages.

Corners and edges shall be covered or angle-rounded. Run-off over the edges of slabs shall be eliminated as this causes stains to the building. Fillets of 75 x 75 mm shall be provided at upstand corners.

The necessary gradient for waterproof membranes are normally provided on top of structures in low-density screeds and then finished, if necessary, with a cement/mortar topping.

PSGB 2.2 CEMENT SCREEDS

CEMENT

The grade of concrete shall be as specified on the drawings or schedule of quantities. Cement shall not be kept in storage for longer than four weeks and shall be used in the order in which it has been stored.

Mechanised plant e.g. scabblers or abrasive blasters must be used for complete removal of all laitance from the existing surface of the floor slab. Dust pollution should be kept to a minimum during these operations. Once the coarse aggregate of the slab is exposed, all dust and debris should be removed, surface thoroughly wetted and maintained for approximately 12 hours. A bond coat (1:1 mix of cement and fine sand) should be spread evenly over the surface using a stiff fibre brush. The screed must be laid and compacted in 1 layer.

Screeds and toppings shall be of sufficient quality to provide a firm base. The following screed characteristics are suggested for waterproofing purposes:

- (a) Compressive strength of at least 25Mpa at 28 days;
- (b) Steel-trowel finish (light);
- (c) Drying shrinkage of less than 0.2% when tested in accordance with the testing conditions specified in SABS 836;
- (d) Minimum screed thickness of 40mm;
- (e) Maximum moisture content of screeds:
- (i) Applications with a density of less than 500 kg/m³ : 10%
- (ii) Applications with a density exceeding 500 kg/ m³ : 7%

The screed should be cast or sawn into panels that do not exceed 9m² to cater for drying shrinkage and to control cracking.

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WORKS BULK PIPELINES – WORK PACKAGE 2

PSGB 3 MEASUREMENT AND PAYMENT

PSGB 3.1 Cement Screeds for:

- | | | |
|-----|---------------------------|----------|
| (a) | 25mm screed on floors | unit: m2 |
| (b) | 25mm screed on roof slabs | unit: m2 |

The unit of measurement shall be the square metre of exposed surfaces to be screed.

The tendered rate shall include all costs for supplying, delivering, storing on site, handling, etc of the materials necessary for the screed, including mixing and laying of screeds currents and falls and forming of sundry items such as fillets, etc complete. The tendered rate shall also cover the cost for forming of screeds around outlets, waste and of all scaffolding, temporary supports, hoisting facilities, etc.

PSGB 3.2 Waterproofing of roof slabs with Derbigum or similar approved unit: m2

The unit of measurement shall be the square metre of the horizontal and vertical surfaces of waterproofing to the approval of the Engineers. All turn-ups and turn-downs will be deemed to be included in the area measured for the waterproofing and will not be paid for separately.

The tendered rate shall include all costs for supplying, delivering, storing on site, handling, moving, installing and fixing the waterproofing system complete with all necessary sundry items, such as flashing strips, dressing waterproofing around pipes and into outlets and channels. The tendered rate shall also cover the cost of cutting and waste and for scaffolding, hoisting facilities, etc.

SANS 1200 GA: CONCRETE (SMALL WORKS)

PSGA 1 SCOPE (Clause 1.1)

This section includes specifications for various aspects of concrete referred to in other sections of the standard specifications.

PSGA 2 CEMENT (3.2.1 and 3.2.2)

The grade of concrete shall be as specified on the drawings or schedule of quantities. Cement shall not be kept in storage for longer than four weeks and shall be used in the order in which it has been stored.

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WORKS BULK PIPELINES – WORK PACKAGE 2
SANS 1200 LB: BEDDING (PIPES)

PSLB 1 SCOPE (Clause 1.1)

This section includes bedding for water pipelines.

PSLB 2 BEDDING MATERIALS (Clause 3.4.1)

PSLB 2.1 Source of material

It is anticipated that selected fill will have to be obtained from commercial sources.

PSLB 2.2 Selective excavation for bedding materials

Notwithstanding the requirements of Clause 3.7 of SANS 1200 DB and Clause 3.4.1 of SANS 1200 LB regarding the use of selective methods of excavation, selective method of excavation and plant shall be adopted by the Contractor as to enable him to avoid burring or contaminating material that is suitable and is required for bedding. The details contained in SANS 1200 LB shall be used for all relevant bedding details as applicable.

PSLB 3 CRUSHED STONE BEDDING (New clause)

Where the conditions on the trench bottom are so wet that the use of selected granular material is not practical, use will be made of 13.2 or 19mm single sized crushed stone material from commercial sources. The use of such stone will be entirely at the Engineer's discretion.

PSLB 4 FREEHAUL (Clause 8.1.6)

All material for bedding cradle and selected fill obtained from excavations on site shall be regarded as free haul. No overhaul will be payable for obtaining bedding material from within the site.

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SANS 1200 LD: SEWERS

PSLD 1 SCOPE (Clause 1.1)

This section provides for the supply and installation of 110mm and 160mm diameter sewers with appurtenant manholes and connections.

PSLD 2 TYPES OF PIPES, PIPE JOINTS AND FITTINGS (Clause 3.1)

PSLD 2.1 The sewer pipes and couplings shall be of the following as detailed on the relevant drawings and included in the Schedule of Quantities:

- 110mm and 160mm diameter heavy duty uPVC pipes with flexible coupling to SABS 791 and appurtenant plain junctions for house connections

PSLD 3 STEP IRONS (Clause 3.5.7)

The provision of step irons is not required.

PSLD 4 MANHOLE COVERS AND FRAMES (Clause 3.5.8)

Manhole covers located in roadways or as directed by the Engineer must be supplied with Type (2A) – 153 kg heavy-duty Polymer Concrete manhole covers and frames cast integrally with the top slab. (National Manhole Covers Product No. 119105 or similar approved).

PSLD 5 CONNECTIONS TO MANHOLES (Clause 5.4)

Notwithstanding the provisions of clause 5.4, Drawing No. LD-2 (a) shall apply to uPVC pipes. In addition, the short pipe that is built into the manhole shall have clean coarse sand glued to the outside surface to facilitate a watertight bond.

PSLD 5.1 Finished Cover Levels (New Clause)

Unless otherwise ordered or dimensioned explicitly on the working drawings, the level of the top surface of the cover shall be

- flush with the final surface of a carriageway, footway or any paved areas
- 50 mm above the surface of a grassed or gravelled verge, or service lane
- 250 mm above the finished ground level for manholes situated at the mid block of private or municipal property.
- 500 mm above ground level in undeveloped open space.

PSLD 6 WATERTIGHTNESS OF MANHOLES (Clause 7.2.6)

All manholes will be subjected to a test for water tightness.

PSLD 7 TOLERANCES (Clause 6.0)

PSLD 7.1 The permissible deviation of the location in plan, of the centre line of the sewer and of the position of manholes and junctions, from the designated location shall be $\pm 50\text{mm}$.

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PSLD 7.2 The permissible deviation from the designated level to the invert at each manhole shall be $\pm 5\text{mm}$ and the fall between successive manholes shall be at least 90% of that specified.

PSLD 8 TESTING (Clause 7.0)

PSLD 8.1 Torch and Mirror Test (New Clause)

For the pipeline to be acceptable the visibility of the plug/reflector shall be at least 50% of its area.

PSLD 8.2 Acceptance Criteria (New Clause)

The acceptance of the pipe length or manhole shall depend upon whether it satisfies the criteria set out in SABS 1200 LD clauses 6 and 7.

Where pipes other than vitro clay pipes are laid, only tests carried out on the pipelines after completion of the backfilling to ground level (excluding surface restoration) and completion of the construction of manholes to roof height, including benching, will be considered for acceptance purposes.

In the case where vitro clay pipes are being laid, no pipelines are to be covered prior to inspection and approval by the Engineer. Once the pipeline has been laid and bedded in the compacted bedding cradle (to half pipe) between control points, the Engineer must be called out to inspect the installation. The Contractor is to provide the necessary equipment in order for the Engineer to adequately assess that the pipeline has been laid to the specified tolerances. Further, an air test, in accordance with the specifications, is to be conducted and witnessed by the Engineer prior to the placing of the Fill Blanket.

PSLD 8 CONNECTIONS TO EXISTING SEWERS AT MANHOLES (New clause)

The contractor shall under no circumstances connect the new reticulation into the existing without the prior written instruction of the Engineer. This instruction will only be given after acceptance, by the Engineer, of the sewer lines and manholes of the new reticulation upstream of the connection point.

The rate for this item shall allow for accommodation of flow in existing sewer mains and all other incidental labour and material required while making connections into and altering benching in existing manholes.

PSL SANS 1200 L: MEDIUM PRESSURE PIPELINES

PSL 1 SCOPE

All water pipelines in this contract shall be deemed to be medium pressure pipelines.

PSL 2 MATERIALS (Sub-clause 3.1)

PSL 1.1 CI PIPES FITTINGS AND SPECIALS

Add: " All cast iron fittings to be cement mortar or coated with Rilsan or fusion-bonded epoxy"

PSL 1.2 STEEL PIPES, FITTINGS AND SPECIALS

Delete sub items 3.4.2 and 3.4.3 and replace with the following:

- "All steel pipes, fittings and specials, larger than 150mm diameter to be 4.5mm wall thickness, grade B steel to SANS 719/1971.
- All steel pipes, fittings and specials, 150mm diameter and smaller to be heavy duty to SANS 62.
- All bolts, nuts and washers to be stainless steel.
- All steel pipes, fittings and specials to be Rilsan coated. "

PSL 1.3 uPVC PIPES AND SPECIALS

uPVC pipes and specials to comply with to SANS 966 part 1 specification.

PSL 1.4 FLEXIBLE COUPLINGS

Add: "The shortest length of pipe which may be used in the pipeline is 0,5m, thus the shortening of an adjacent pipe may be necessary so as to ensure compliance with the position of the specials. When pipes of 1,0m or less, in length, are used they shall be jointed by means of C.I. short collar detachable couplings".

PSL 1.5 Flanges and Accessories

Add to sub clause 3.8.3:

"The insertion piece shall be such as to cover the full face of the flange (i.e. the O/D). Bolts and nuts shall comply with SANS 135. Drilling shall conform to BS4504 Table 16/11".

PSL 1.6 Loose Flanges

With regard to sub clause 3.8.4 the following standard shall apply:

"Bolts and nuts shall comply with requirements of SANS 135".

PSL 1.7 VALVES

Delete the contents of this Sub clause and replace by:

"Only one type of valves is acceptable:

- a) Wedge gate type valve

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Valves shall comply with the requirements of SANS 664 1989 as amended, and shall bear the SANS quality mark. A test certificate as per Clause 3.5.20 of compliance with SANS 664 will be acceptable.

Valves shall display the following features;

- A minimum of 250 microns coating of Rilsan Nylon 11.
- Class 16
- Clockwise closing
- Non rising spindle type with cap.
- May have spigotted, socketted or flanged end connections. When flanged valves are specified, the drilling shall be to Table 16/11 of BS 4504".

PSL 2 CONSTRUCTION (Sub clause 5)

PSL 2.1 General

Add to sub clause 5.1.1

"The center line of the pipeline shall normally be 2,5m from the road reserve boundary inside the road reserve. The pipeline is to be laid continuously and leaving gaps for fittings will not be allowed.

PSL 2.2 Depths and Cover

Unless otherwise shown on the drawings or instructed by the Engineer, cover to pipes shall be as follows:

During Construction:

Where construction traffic is liable to cross over pipes, they shall be laid so that there is not less than 0,75m of cover over the pipe. Road crossings shall be constructed after the construction of the road layers has reached the stage where 0,75m cover is available.

Pipes beneath Verges and Open Spaces:

The tops of pipes beneath verges shall be not less than 0,75m and not more than 1,25m below the final verge level.

Supply Connection:

The tops of pipes shall not be less than 450mm and not more than 600mm below the final road surface.

Pipes beneath existing roadways:

The tops of pipes beneath a road shall not be less than 1m and not more than 1,25m below the road level.

PSL 2.3 SETTING OF VALVES, SPECIALS AND FITTINGS

Add to Clause 5.3:

"The hydrant shall be bolted to the tee such that the outlet is in line with the pipeline. Valves shall be positioned opposite the erf splay peg at intersections".

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PSL 3 TOLERANCES

PSL 3.1 CONTROL POINTS

Add: "Valves shall be located as indicated on the plan layout opposite the boundary peg of the erf, and to within a longitudinal tolerance of 100mm."

PSL 3.2 ALIGNMENT (PLAN AND LEVEL)

Add to last sentence: "provided this does not result in a reversal of the grade of the pipeline."

PSL 3.3 Testing of pipelines

PSL 3.3.1 Test pressure (sub-clause 7.3.1)

All pipes shall for test purposes be assumed to have a working pressure of 600kPA for class 6 pipes, 900kPA for class 9 pipes, 1200kPA for class 12 pipes and 1600kPA for class 16 pipes. Test pressure for field-testing shall be 1.25 times the working pressure. The Contractor shall allow for the testing of pipes in short sections so that the difference in minimum and maximum pipe elevation does not exceed 60m for class 6 pipes, 90m for class 9 pipes, 120m for class 12 pipes and 160m for class 16 pipes.

PSL 3.3.2 Method of testing

- a) The Contractor shall provide an approved test pump, an accurate water meter, sealed pressure gauge, tested and certified by an independent testing organization, and all other equipment, materials and labour required for the test.
- b) The section of pipeline to be tested shall be clean and closed off at the ends by isolating valves, end caps or approved end-closure pieces. Free ends shall be firmly strutted against solid supports or trust blocks designed to withstand safely 2 times the calculated and thrust under maximum test pressure. It shall be incumbent on the Contractor to establish the need for blank flanges or isolating valve flanges in order to limit leakage rates past gates, blades and seals.
- c) During this initial filling stage, the pipeline joints and all specials, fittings and valves shall be visually inspected for visible leaks and same rectified before proceeding with the test.
- d) The pressure shall be maintained for one hour and if a pressure drop occurs, more water shall be added to reinstate the test pressure and the valve closed again. The quantity of water added shall be measured by recording the readings before and after pumping.

This procedure shall be repeated for a period of 24 hours, with water added at hourly intervals where necessary to reinstate pressure and water meter reading recorded. At the end of the 24-hour period, the aggregate quantity of water required to reinstate pressure over 24 hours shall be determined.
- e) The contractor shall give the Engineer 48 hours written notice of his intention to commence pressure testing and the Engineer may attend and supervise all or any part of tests. All records and recording charts shall be handed to the Engineer as soon as tests over any section have been completed.
- f) All valves, specials, fittings and exposed joints, shall be inspected visually during the 24 hours pipeline test and all visible signs of leaks, sweating and distress shall be reported and attended to without delay.

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PSL 3.3.3 Remedial Measures

- a) Should the maximum leakage limits as specified be exceeded; the contractor shall determine the position and cause of the leaks and shall take remedial measures at his own expense and to the satisfaction of the Engineer to stop such leaks to ensure the specified degree of water tightness.
- b) If during the contract period of maintenance, the number of leaks and other defects is considered by the Engineer to be more than could reasonably be expected from a well-laid pipeline operating under normal conditions, he may order the contractor to retest parts or the whole of the pipeline at the Contractors own expense and no claims for escalation in costs or for whatever other reasons the Contractor might consider to submit claims shall be considered, except where such retests are the result from damages caused to the pipeline by the Employer.

PSL 3.4 Anchor / thrust blocks and pedestals

Dimensions at all anchor / thrust blocks shall be supplied by the Engineer as and when required. The Contractor shall request such information not less than seven (7) calendar days in advance.

PSL 4 MEASUREMENTS AND PAYMENT

PSL 4.1 Supply, lay and bed of pipes complete with couplings Unit: m

Notwithstanding the provision of sub clause 8.2.4, 8.2.6 & 8.2.7, separate items will not be scheduled for the cutting of pipes. The rates tendered shall include the supply & fixing of extra coupling, supply & installing joints special couplings, and the encasing of joints.

PSL 4.2 Extra over PSL 4.1 for the supply lay and bed of fittings and specials complete with couplings

Notwithstanding the provision of sub-clause 8.2.4, 8.2.6 and 8.2.7, separate items will not be scheduled for the cutting of the pipe. The supply and fixing of the extra couplings, supply and installing joints with machined collars and special coupling, and the encasing of joints will therefore be deemed to be included in the rates tendered.

PSL 4.3 CONNECTION INTO MAINS (New Clause)

The contractor shall under no circumstances connect the new reticulation into the existing without the prior written instruction of the Engineer. The Engineer will only give this instruction after acceptance of the new reticulation system

THE CONTRACT PART C3: SCOPE OF WORKS

Particular Specifications

Occupational Health and Safety Specification for Principal Contractors and Contractors for Construction Work

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Appendices

Annexure:	A	Notification of Construction Work
	B	Appointment Form [Example]
	C	Recording and Investigation of Incidents
	D	Agreement with Mandatories

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1. Introduction

In terms of Construction Regulation 7 this document describes the health and safety specifications required for any principal contractor whom is making a bid for or whom has been appointed to perform construction work on behalf of the client. [Ref. CR 5(1)(a)]

- A principal contractor is required to compile their Health and Safety Plans based on these specifications detailed and referred to, in this document.
- In other words, the Health and Safety Plan must specify how the Principal Contractor will control and manage all health and safety aspects on the construction site.
- The Health and Safety Plan must be relevant to the construction work being carried out and if possible refer to the numbering system of this document.
- A principal contractor is to ensure that these specifications are communicated to all contractors under his/her agreement.

2. Reference Documents

The following documents are referred to:

2.1. Occupational Health and Safety Act, (Act No. 85 of 1993) - [OHSA] and Regulations.

2.2. Civil, Mechanical, Structural and Electrical Drawings [CME]

1..1 Drawing References:

1..1.1 Drawing No:___

1..1.2 Drawing No:___

1..1.3 Drawing No:___

1..1.4 Drawing No:___

1..1.5 Drawing No:___

2.3 Compensation for Occupational Injury and Diseases Act – [COIDA]

3. Scope of Work

Detailed Description of work to be carried out

- Earthworks
- Excavations
- Work @ Height
- Pressure Testing
- Vehicle & Mobile Plant
- Concrete Works
- Support and Formwork
- Structures
- Electrical Works

List of plant, machinery and tools to be used during the project:

- Construction & Mobile Plants
- Hand Tools
- Portable Electrical Tools
- Ladders
- Further Information to be provided by contractor

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List of Major hazards identified in the design risk assessments:

- Working at Heights
- Earth Works & Excavation
- Construction vehicles and Mobile plants
- Pouring Concrete
- Use of Power Tool
- Structures / False Work
- Shuttering
- Steel work

4. Definitions

The following definitions apply. (Abbreviations and legal references in brackets where applicable):

Construction Work

Means any work in connection with –

- a) The erection, maintenance, alteration, renovation, repair, demolition or dismantling of or an addition to a building or any similar structure;
- b) The installation, erection, dismantling or maintenance of a fixed plant where such work includes the risk of a person falling;
- c) The construction, maintenance, demolition or dismantling of any bridge, dam, canal, road, railway, runway, sewer or water reticulation system or any similar civil engineering structure; or
- d) The moving of earth, clearing of land or making of an excavation or work on any similar type of work.

Hazard Identification, Risk Assessment and Risk Control (HIRA)

Means a documented plan, which identifies hazards, assesses the risks and detailing the control measures and safe working procedures, which are to be used to mitigate and control the occurrence of hazards and risks during construction or operation phases.

Site

Means the area in the possession of the Contractor for the construction of the works. Where there is no demarcated boundary it will include all adjacent areas, which are reasonably required for the activities for the Contractor, and approved for such use by the client.

Hazard

Means a source of or exposure to danger (source which may cause injury or damage to persons, or property)

Risk

Means the probability or likelihood that a hazard can result in injury or damage.

Construction Supervisor [CR 8(7)]

Means a full time, competent employee appointed in writing by the Contractor to supervise construction work. The appointment, as required by the OHSA, shall stipulate health and safety responsibilities, area of responsibility and the proposed duration of the project.

Construction Plant

Encompasses all types of plant including but not limiting to, cranes, piling frames, boring machines, and excavators, dewatering equipment and road vehicles with or without lifting equipment

Contractor

Means an employer who performs construction work and includes principal contractors and sub-contractors.

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Health and Safety Plan (HSP)

Means a documented plan, which addresses hazards identified and includes safe work procedures to mitigate, reduce or control the hazards identified.

The plan shall be applied from the date of commencement of and for the duration of construction work.

Health and Safety File (HSF)

The file holding all documentation and records on health and safety for the project, which shall be available at all, times for evaluation, and a copy of which will be forwarded to the client upon completion of the project.

Disabling Injury Frequency Rate (DIFR)

The number of disabling injuries (DI"s) multiplied by a constant (man hours relative to period worked) divided by total man hours worked over a rolling period (usually 12 months, but can be less)

Disabling Injury Severity Rate (DISR)

The number of days lost due to DI"s multiplied by a constant (man hours relative to period worked) divided by total man hours worked over a rolling period (usually 12 months, but can be less)

Confined Space

An enclosed, restricted or limited space in which, because of it's construction, location or contents, or any work carried on therein, a hazardous substance may accumulate or an oxygen deficient atmosphere may occur, and includes any chamber, tunnel, pipe, pit, sewer, container, valve, machinery or object in which a dangerous liquid or dangerous concentration of gas, vapour, dust or fumes may be present

5. Responsibilities of Contractors for Construction Work

5.1. Notification of Intention to Commence with Construction Work

The principal contractor shall notify the Provincial Director of the Department of Labour before any work commences, in accordance with the following requirements:

- The demolition of a structure exceeding a height of 3 meters; or
- The use of explosives to perform construction work; or
- The dismantling of fixed plant at a height greater than 3 meters; or
- The work exceeds 30 days or will involve more than 300 person days of construction work; and
- Includes excavation work deeper than 1 meter; or
- Includes working at a height greater than 3 meters above ground or a landing.

The notification must be completed in the **Annexure 2** form and a copy of the proof of fax or delivery to the Department of Labour to be kept in the Health and Safety File for inspection by an inspector, the client or an employee.

5.2. Principal Contractor's Responsibilities

Compile a Health and Safety Plan

Ensure co-operation between all contractors to comply to the Act

- Ensure compliance to the Act in terms of:
 - a) Provide relevant sections of these specifications to contractors as required
 - b) Appoint each contractor in (a) above in writing. Only contractors who have the necessary competencies and resources may be appointed
 - c) Ensure each contractor's Health and Safety Plan is implemented and maintained on site
 - d) Stop any contractor from work which is not in accordance with Health and Safety Plan's or which pose a threat to health and safety of persons

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- e) Sufficient information is provided to contractors where there are changes to design and construction
- f) Ensure every contractor is registered and in good standing with the Compensation Commissioner
- g) Ensure potential contractors have made provision for the cost of health and safety measures. Negotiate and approve the Health and Safety Plan of each contractor.

- All Health and Safety File's including the principal contractor's to be available on site.
- A consolidated Health and Safety File to be handed over to the client on completion of construction including records of drawings, designs etc.
- Health and Safety File to include updated list of all contractors, the agreements and their type of work.

5.3 Contractor's Responsibilities (including sub-contractors)

- Provide their Health and Safety Plan to the principal contractor.
- Where a contractor appoints another contractor (sub-contractor) it is the responsibility of that contractor to apply 4.2 above as if he were the principal contractor.
- No contractor to appoint another contractor (sub-contractor) unless the latter has the necessary competency and resources to perform the required work.
- To provide any information which affects the health and safety of any persons at work to the principal contractor.

5.4 Legal Appointments

The principal contractor shall ensure copies of the appointment letters of all responsible persons appointed on site will be kept in the Health and Safety File. All legal appointments shall be conducted in accordance with the requirements set out in the OHSa and as per this specification. The tables below set out the appointment protocols for CR and OHSaCT. It should be noted that these represent a complete list and not all these appointments may be required:

Construction Regulations

Reg.	Appointment	Appointee	Competency Required
CR 7 (1)	Principal Contractor	16(2) for the company	Curriculum Vita on file and Supervisor training (legal liability)
CR 5 (3b)	Contractor	Competent person	Proof of induction
CR 8 (1)	Contracts Manager	Competent Person	Certificate & CV
CR 8 (2)	Ass Construction Manager	Competent Person	Certificate & CV
CR 8 (7)	Construction Supervisor	Competent person	Curriculum Vita on file and Supervisor training (legal liability)
CR 8 (8)	Assistant Construction Supervisor	Competent person	Curriculum Vita on file and Supervisor training (legal liability)
CR 8 (5)	Safety Officer	Competent person	Curriculum Vita on file and SAMTRAC or similar
CR 9 (1)	Risk Assessor	Competent person	Curriculum Vita on file and HIRA or similar
CR 10 (1)	Fall Protection Planner	Competent person	Curriculum Vita on file and Fall Plan Developer
CR 12 (1)	Temporal Works	Competent person	Curriculum Vitae
CR 13 (1)	Excavation Work Inspector	Competent person	Curriculum Vita on file and Supervisor training (legal liability)
CR 23 (1j)	Construction Vehicle Inspector	Competent person	

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CR 23 (1d)	Construction Vehicle Operator	Competent person	Certificate of Competency for relevant construction vehicle
CR 28 (a)	Stacking and Storage Supervisor	Competent person	
CR 29 (h)	Fire Equipment Inspector	Competent person	
CR 29 (i)	Fire Team Members	Competent person	Fire Fighting Certificate

OHS Act

Reg.	Appointment	Appointee	Competency Required
OHSA 17 (1)	Health & Safety Rep	Nominated employee	Health and Safety Representative Certificate
OHSA 19 (1)	Health & Safety Committee Member	Management representative	Curriculum Vita on file and Supervisor training (legal liability) and IRCON or similar
GAR 9 (2)	Incident Investigator	Competent person	Curriculum Vita on file and RCAT or similar
GSR 3 (4)	First Aider	Competent person	First Aid Certificate
GSR 13	Ladder Inspector	Competent person	In house Training
DMR 18 (11)	Lifting Equipment Operator	Competent person	Code 1, 2, 3, 32, 33, 35 or 46
DMR 18 (5)	Lifting Equipment Inspector	Competent person	
	Hand Tools Inspector	Competent person	In house Training
	Pneumatic Tools Inspector	Competent person	In house Training
EMR 9(4)	Portable Electrical Equipment Inspector	Competent person	

The responsibilities of each appointment are detailed in the relevant form, which are signed by both the authorised person and the appointee and kept in the Health and Safety file. An example of an appointment form for a Construction Supervisor can be found under **Annexure B**.

5. Documentation and Procedures

All required documentation for the construction work, shall be kept in the Health and Safety File, which shall be available on site. The Construction Supervisor shall be responsible for the file on site and the Project Manager shall ensure that documentation is valid and up to date.

It is required that the documentation is filed in an orderly fashion for easy access. The following sections are suggested:

1. Company insurances and information

- Letter of good standing
- Public liability
- Emergency contact numbers
- Notification of construction work
- Company organogram
- Health and Safety policy
- HIV & Aids Policy
- Drug & Alcohol policy

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- Personal Protective Equipment Policy

2. Health and safety plan and specifications

3. Appointments

4. Inspection registers and checklists

5. Risk assessments

- Risk matrix
- Risk assessments
- Method statements
- Record of internal training
- Review of risk assessments

6. Safe work procedures

- Safe Working procedure training
- Planned task observations
- Emergency procedures
- Fall protection plan
- Permits to work

7. Incident management

- WCL2 forms
- Annexure 1 forms
- Injury on duty reporting and investigation procedure
- Resumption reports

8. Training records and medical fitness certificates

- Certificates of formal training
- Induction training records
- Medical fitness certificates for all employees

9. Audits

- Client's Health and Safety audits
- Site inspection reports
- Site safety instructions

10. Contractor control

- List of contractor's and type of work
- Contractor appointments
- 37 (2) agreements

11. Health and safety communication

- Toolbox talks to be held weekly
- Health and Safety notice board
- Schedule D
- Memo's to employees

12. OHS Act and Regulations

6. Application of COIDA and OHSA to Construction Work

6.1 Compensation of Occupational Injuries and Diseases Act, Act No. 130 of 1993 (COIDA)

Every contractor shall provide proof of registration and an updated letter of good standing with the Compensation Commissioner or a licensed compensation insurer.

6.2 Occupational Health and Safety Policy

- Every contractor's Occupational Health and Safety Policy statement should be available for scrutiny and as evidence of their commitment their employees'

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occupational health and safety and the environment.

- Every contractor's Occupational Health and Safety Policy statement is to be signed off by the Chief Executive Officer.
- Proof of communication to all is to be available on requests.

6.3 Health and Safety Training and Competency

Training of personnel is a necessity and a legal requirement when required. A record of all training shall be kept and provided on request.

6.3.1 Induction Training

- The principal contractor shall be responsible to co-ordinate all inductions on site to ensure that no contractor allows or permits any employee/s or person/s to enter any construction site, unless such employee, visitor or person has undergone induction training which is pertinent to the hazards prevalent on the site at the time of entry.
- Every employee, visitor or person on site shall be in possession of proof of the Health and Safety induction.
- Records of attendance shall be kept on the Health and Safety file for the duration of the contract.

6.3.2 Awareness Training

- Awareness training to be carried out weekly in the form of Toolbox Talks on relevant topics e.g. manual lifting, wearing PPE, safe use of portable electric tools etc.
- All attendees are to be made to sign an attendance register and such register is to be held on the Health and Safety file for the duration of the project.

6.3.3 Competency and CV's

- All supervisors and where applicable, valid copies of certificates of competency of appointed personnel to be provided and kept in the Health and Safety file. (Reference can be made to pages 10, 11 and 12 of this document).
- Other training requirements such as those identified through the High-risk Assessment process, to be completed and proof of that training also kept in the Health and Safety File.
- Where competency is achieved through experience, a brief CV will be required.

6.3.4 Specific OH&S training

- Valid certificates of training from registered service providers preferably accredited by the appropriate SETA are required for First Aiders, H&S reps, Fire Fighters etc.

6.3.5 Medical Fitness

- All work in elevated positions [tower crane operators, workers on elevated structures requiring fall protection, suspended platform workers and;
- Operators of construction vehicles and mobile plant require certificates of physical and psychological fitness carried out by an occupational medical practitioner.
- All employees who are employed in a construction site must have medical Fitness done by an Occupational Health & safety Practitioner before commencement of work.
- No employee will be allowed to perform any duties except deemed to be medical fit to do so.

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6.4 Health and Safety Reps [OHSA 17 and 18]

- Where 20 or more employees are employed at a workplace, one health and safety representative shall be appointed in writing.
- The Principal Contractor shall ensure that a minimum of one health and safety representative is appointed for ratio of each 50 employees employed.
- Each health and safety representative shall be in possession of a certificate of competency.
- The employer is to ensure that a delegation process has been followed and recorded in term of the requirement of General Administrative Regulation 6
- Monthly checks are to be conducted by the appointed representatives in their designated areas and all finding are to be recorded in a register. Such register is to be held on the health and safety file for the duration of the project.
- Health and Safety Representative are to investigate any staff complaints and ensure that documented feedback is forwarded to the respective managers.

6.5 Health and Safety Committee [OHSA 19 and 20]

- Where two or more representatives have been appointed the employer shall ensure that a health and safety committee is formed.
- The number of management representatives shall not outweigh the number of representatives.
- Meetings shall be held at a minimum of three monthly.
- Minutes of such meeting shall be kept and place on the health and safety file for the duration of the project.
- A register of attendance is to be kept of attendees at such meetings; such a register is to be attached to the minutes.

6.6 General Record Keeping

All contractors shall ensure that all Health and Safety records, required by OHSA and Regulations are kept up to date for reference purposes and auditing.

6.6.1 Inspections

- All contractors shall keep all records of inspections undertaken during the duration of the project.
- An example of the total list of minimum legally required inspections can be found under **Annexure C**.
- An assessment list must be draft of what inspections are required and their frequency.
- The principal contractor is responsible to ensure compliance to this requirement by all contractors.

6.6.2 Audits

- The client's agent shall carry out regular audits on the principal contractor at least once per month.
- Principal contractors shall be responsible for carrying out regular audits on their contractors at least once per month
- The Principal contractor is to draft a table which reflects contractors company name, description of work, dates of audits and scores achieved.
- The results shall be tabled for action and discussed at the Health and Safety Committee meetings or the site meetings, as appropriate.

6.7 Incident management and emergency plans

- The principal contractor shall create an Emergency Plan for the construction site.
- The plan is to be clearly displayed in conspicuous locations around the site.
- The plan shall be clearly laid out for all types of emergencies including responsibilities, evacuation routes, siren, emergency no."s etc.
- The plan shall be fully explained to all personnel during the induction training.
- All contractors will become completely familiar with the requirements of the plan and will participate in any evacuation drills that may take place

6.7.1 First Aid [GSR 3]

- Where an employer has 5 or more employees in his employment, he/she shall ensure that at least one first aid box is made available in the workplace.
- Such first aid box is to be stocked covering the 18 items addressed in the Annexure attached to the General Safety Regulations as a minimum requirement.
- Where an employer has 10 employees or more in his/her employment, he/she shall ensure the at least one person readily available at the workplace whom is in possession of a valid first aid certificate.
- Every employer shall ensure that a minimum of one trained persons is made available for every 50 person in the workplace.
- All identified hazardous chemical are to have a material safety data sheet which is to be kept for first aid emergencies in the first aid box.
- All special needs addressed in the Material Safety Data Sheets are to be made available in addition to stock required in the Annexure.

6.7.2 Incidents and Injuries

Incidents

- A record of all incidents which have occurred shall be opened and held open until the handover of the project.
- All incidents such as near misses, unsafe situations, first aid injuries, etc shall be investigated fully and the result of such investigation shared with the Health and Safety Committee.
- The employer shall ensure that an investigation team is formulated which will consist of management representative, safety representative and an employee representative as a minimum requirement.
- All incidents that occur shall be filtered into a statistic format which is to determine the sites Incident Rate. Such rate is to be shared with all employees and all contractors on a monthly basis.
- Exclusion of incidents in record keeping shall result in fines being issued.

Injuries

- A first aid register is to be held in the first aid box as to record all first aid injuries that may occur.
- An injury on duty procedure is to be created which detail the process of treating an injured and methodology which may be use in order to ensure their safe arrival at a local hospital.
- All injuries are to be recorded in an Annexure 1

6.7.3 Accident and Incident Reporting and Investigation

Should an incident or accident investigation need to be conducted, the appointed incident investigator (competent person with a valid certificate of training on file) shall conduct the said investigation. The procedure to be followed will be in accordance with Annexure 1 of GAR 9 – “Recording and Investigation of incidents”. A copy of this annexure can be found under **Annexure D** in this document.

Particular attention is also drawn to OHSA 24, the reporting of certain incidents to an inspector of the Department of Labour.

The principal contractor shall ensure that the investigations are kept for record purposes and he shall ensure that the outcome of the investigation is communicated to all affected parties as required i.e. the client and contractors.

The client reserves the right to participate in all investigations into accidents or incidents and to conduct their own investigation if required.

6.8 Contractors and suppliers [OHSA 37(2)]

The client shall enter into an “Agreement with Mandatory” in terms of Section 37(2) of the Occupational Health and Safety Act, 85 of 1993, with all appointed principal contractors, a copy of which can be found under **Annexure E**. Likewise all principal contractors shall enter into a similar agreement with all contractors, sub-contracted to them for any period of the contract. Please note that if contractors hire any construction vehicles or mobile plant, the companies from which the equipment is hired must provide any maintenance and test certification as required. In addition, if operators are hired with the equipment, proof of competence and medical certification must be provided.

The principal contractor shall ensure that all contractors are issued with this safety specification where reasonably practicable including any contractor pack for the project, should they not be contained in the safety specification.

The principal contractor shall assist and ensure that contractors engaged comply with all of these requirements and adhere to the requirements set out in the OHSA. Contractors will be stopped from working in the event of unsafe conditions and activities being observed.

All contractors shall be subject to the requirements specified in the HSP and will be issued with a copy of the plan. If the contractor is not able to comply with the requirements set out in the plan, he shall not be appointed as contractor.

6.9 Personal Protective Equipment, Intoxication, Signage and Access Control [GSR 2]

6.9.1 Personal Protective Equipment (PPE) [GSR 2]

- The principal contractor shall through the Risk Assessment process identify all specific PPE needs per each activity. Such identified PPE shall be captured in the form of a PPE matrix and displayed in the site office. Such matrix is to make reference to the task and the specific PPE requirements required to do the task.
- All Contractors will be responsible for the issuing of the required PPE as identified by the matrix.
- Should PPE be lost or stolen, then the employee will be issued with new PPE.
- No person/s shall be permitted entry into the site unless they are properly equipped with the required PPE as identified in the matrix.
- Should PPE be worn out or damaged, the user shall return the worn or damaged PPE and will be issued with a replacement.
- Training in the use, care and limitation of such PPE is to be provided and proof of such training is to be held in the health and safety file.
- Visitors shall be informed of PPE requirements **prior** to their visit so that they may make necessary arrangements to ensure their arrival well equipped with the correct PPE.

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6.9.2 Intoxication [GSR 2A]

The principal contractor shall be responsible to ensure that no persons may enter or remain at the construction site if under or apparently under the influence of intoxicating liquor or drugs. It may become necessary from time to time for contractors and their workers could be required to do a breathalyser test before entering the site.

6.9.3 Display of signs [GSR 2B]

The principal contractor should make use of signage to assist in enforcing compliance to any requirement specified in this document or as required by law. Standard symbolic signs are acceptable for conveying these requirements where applicable.

6.9.4 Access control [GSR 2C]

The principal contractor shall be responsible to ensure control of access to all persons entering the construction site. The reasons for this are as follows:

- The principal contractor is the „employer“ on the site and for all intents and purposes is responsible for section 8 of OHSWA for employees and contractors and section 9 for any other person on site such as visitors and inspectors
- All persons entering the site must undergo induction training to inform them of the hazards present on the site. This includes contractors, visitors, inspectors etc
- The construction supervisor will be aware of who is on site and their function
- The construction supervisor will be able to control tasks that may impact on other work being carried out on the site by a permit to work system
- The number of people and their purpose on the site must be known in case of emergency and evacuation security reasons

The principal contractor shall post conspicuous notices at the site informing all those entering the site of these requirements

6.10 Ladders [GSR 13A]

The following requirements shall be complied with regarding Ladders and Ladder work:

- A competent person shall be identified and appointed as the ladder inspector.
- Where aluminium ladders cannot be used, then wooden ladders shall be straight grained, unpainted to allow for proper inspection of the grain for cracking.
- Ladders shall be secured at the top and chocked at the base to prevent slipping.
- Where chocking of the base is not possible, then the user shall ensure that the ladder is held in position by another employee when ascending the ladder.
- No person is permitted to work longer than 15 minutes on a ladder. Should work take longer than 15 minutes to complete then alternative means of elevation is to be used.
- Ladders shall be inspected a minimum once per month and results recorded in a register by the person appointed as the ladder inspector.
- Proper storage shall be provided for all ladders when not in use.

6.11 Portable Electrical Tools [EMR 9]

This regulation shall be complied to as a minimum requirement. Regular inspections of all Portable Electrical Tools such as drills, angle grinders etc, shall be carried out. In particular:

- Only trained personnel shall operate such equipment.
- The Construction Supervisor shall ensure operation of the equipment is in accordance the HRA requirements and Safe Working Procedure (SWP).

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- All users shall undergo regular awareness training (toolbox talk) to ensure compliance.
- The Construction Supervisor shall ensure the required PPE is used.

6.12 Permit to work

The permit holder shall be responsible to ensure that:

- All work being carried out on the site has been approved through the necessary project control system
- All work is being done in compliance with the issued permits.
- Permits required from third parties such as town councils for utility and sewage services are in place
- A permit system is operational so that work consisting of many tasks related to the construction on site, can be carried out without endangering the health and safety of personnel on site, neighbours and the public surrounding the site and/or causing damage to property.
- In particular, attention is drawn to GSR 9, which details the requirements for welding, flame cutting, soldering and similar operations (hot work)

6.13 Work in confined spaces

The permit holder shall be responsible to ensure that:

- All work being carried out on the site has been approved the necessary project control system
- All work is being done in compliance with the issued permits.
- Permits required from third parties such as town councils for utility and sewage services are in place

7. Application of the Construction Regulations [CR]

[Please note: this is the complete list. Item 7.1 is compulsory and the rest are applicable if relevant to the work being carried out]

7.1 Hazard Identification, Risk Assessment and Risk Control (HIRA) [CR 9]

- The contractor shall prior to the commencement of any construction work perform a HIRA exercise, which will form part of the HSP for the project.
- A copy of the HIRA shall be made available for viewing to the client's agent and shall be kept in the Health and Safety File.
- The contractor shall ensure that the outcome of all HIRA exercises will be conveyed to all relevant employees with respect to the hazards and the related control measures before any work commences.

The control of several of these risks may be specified in the OHSA does not mean that the HIRA exercise does not have to be carried out.

7.2 Fall Protection [CR 10]

Section 1 (a) of this regulation states that a contractor shall cause the designation of a competent person, responsible for the preparation of a fall protection plan. The control of several of these risks may be specified in the OHSA or the CR but this does not mean that the HIRA exercise does not have to be carried out.

7.3 Structures [CR 11]

The appointed civil contractor shall meet the requirements of this regulation. Attention is drawn, which requires the designer to inspect the structure at appropriate times and the record of these inspections to be available on site.

7.4 Excavations [CR 13]

Section 1 of this regulation states that this work must be carried out under the supervision of a competent

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person who has been appointed in writing. All the requirements of CR 13 shall be met. For inspection of excavations, attention is drawn to section 3 (h), the records of which must be available on site.

7.5 Construction vehicles and mobile plant [CR 23]

It will be the responsibility of each contractor on site to ensure compliance of their vehicles and mobile plant to these regulations. This includes vehicles to be used for transporting personnel to and from site, which will be subject to relevant requirements such as licensing and roadworthiness checks. In addition the following will apply:

- Safe transport for personnel working on the project to and from the workplace, which shall include proper seating, side restraints and cover.
- Road safety principles shall be adhered to on and off staff.

If a mobile crane or other mobile plant is hired, only approved hire companies shall be contracted to provide such equipment. The Construction Supervisor shall ensure compliance of the provider to these regulations. In particular, attention is drawn to the competence and fitness of the operator [section 1 (d)] and the inspection of the equipment [section 1 (j)]

7.6 Temporal Electrical installations[CR 24], including [EIR] and [EMR]

The requirements of these regulations shall be met as required, by the appointed electrical contractor. A competent person will be appointed for inspection and control of all temporary electrical installations as per CR 24 (d) and (e) respectively.

7.7 Water Environments [CR 26]

The requirements of this regulation shall be met.

7.8 Housekeeping [CR 27] including [ERW(6)]

All contractors shall ensure that housekeeping standards as per these regulations shall be maintained at all times.

7.9 Stacking of Materials [CR 28] including [GSR (8)]

All contractors shall ensure that materials are only stored in defined and allocated storage areas and that materials being stored are stacked in accordance with sound stacking principles as per these regulations.

7.10 Fire Precautions [CR 29]

All contractors on site will comply fully with the requirements of this regulation. In particular, the principal contractor will be responsible for the evacuation plan (section (I)) the details of which will be imparted to contractors, visitors etc through the site induction.

7.11 Construction welfare facilities [CR 230]

The principal contractors shall be responsible for implementing this regulation and shall ensure that adequate facilities are provided for the personnel on site in terms of the following:

- Change room facilities
- Sheltered eating area
- Adequate toilets
- Hand wash facility
- Potable water.

No food preparation shall be conducted on site. Eating and drinking will only be permitted in the designated eating areas, which must be provided with adequate seating. Waste bins shall be strategically placed and cleared regularly.

8 Site-specific and Design Risks

Please note: this is not a complete or exhaustive list. The principal contractor is expected to assess all

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risks to which his employees may be exposed during the construction and/or demolition process, as well as the hazards identified and listed below.

The following jobs or activities are classified as High

- Confined Space Entry
- Excavation
- Construction vehicles and mobile plant
- Traffic accommodation
- Pouring Concrete
- Working at Heights

8.1 Hazard Identification and Risk Assessment Methodology

8.1.1 Baseline Risk Assessment

A Baseline Hazard Identification and Risk Assessment must be carried out during the preliminary stages of the construction/demolition project for the purposes of attempting to reduce the possibility of accidents or ill health occurring.

Taking into account the constraints of time and resources, every effort must be made to identify the hazards and recommend possible solutions. It is not reasonably practicable to expect the baseline risk assessment to identify all hazards, which is why task risk assessments are carried out on site.

8.1.2 Task risk assessment

Once on site, every contractor shall perform task risk assessments, using the baseline risk assessment as a guide.

The Risk Assessment should be reviewed once on site and thereafter after any incident or every one-year period, whichever occurs first. Additional hazards highlighted or a change in the risk factor should have a separate risk assessment carried out and filed.

The Risk Assessment is based on the combination of the CONSEQUENCE and PROBABILITY associated with each hazard.

8.1.3 Definitions

<i>Term</i>	<i>Meaning</i>
HAZARD:	Anything that can cause harm
RISK:	The chance, great or small, that someone will be harmed by the hazard
CONSEQUENCE:	The possible outcome of an accident / incident, e.g. broken leg, explosion
PROBABILITY:	The possibility of the accident / incident occurring

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8.1.4 Risk assessment

The following evaluation must be used to determine risk:
 Probability X Consequence = RISK

Risk Matrix:

Consequence	(3) Critical (Fatal/Permanent Disabling Injury)	(3) Medium risk	(6) High risk	(9) CRITICAL
	(2) Major (Temporary Disabling Injury)	(2) Low risk	(4) Medium risk	(6) High risk
	(1) Manageable	(1) Low risk	(2) Low risk	(3) Medium risk
		(1) Remote	(2) Possible	(3) Likely
		Probability (Likelihood)		

RED = High Risk (6 – 9)
 ORANGE = Medium Risk (3 – 4)
 GREEN = Low Risk (1 – 2)

Activity	Hazard	Risk Eval.	Precautions and Control Measures
			1. Eliminate the risk 2. Control the risk at its source 3. Follow a safe working procedure 4. Provide PPE
1. describe task	Hazard 1	9, 6, 4, 3, 2, or 1	- Precaution 1 - Precaution 2 - Etc.
	Hazard 2		- Precaution 1 - Precaution 2 - Etc.

8.2 Site-specific risks

The following site-specific risks have been identified for this project. These must be catered for in the contractor's health and safety plan (that which is applicable to their scope of work), and included in the site-specific risk assessment:

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8.2.1 Traffic – restrictions, existing systems, site traffic

Traffic accommodation must be arranged with the principal agent.

8.2.2 Site security and access –

This is controlled by the individual contractor responsible.

8.3 Design risks

The following design risks have been identified by the designer for this project. These must be catered for in the contractor's health and safety plan (that which is applicable to their scope of work), and included in the site-specific risk assessment:

8.3.1 Excavations

8.3.2 Traffic Accommodation

8.3.3 Vehicle and mobile plants

9 Fines and Penalties

9.1 Minor Health or Safety Transgression

Not wearing PPE; e.g. safety helmet, eye protection, high visibility vests or foot protection. Fine: R1000-00 will be issued to the contractor.

9.2 Serious Health or Safety Transgression

Not contributing to good housekeeping practices, improper stacking and storage, lack of supervision on site, failure to carry out risk assessments for tasks or activities, failure to carry out toolbox talks, failure to train employees in risk assessments and/or safe work procedures, failure to issue PPE to employees. Fine: R2000-00 will be issued to the contractor

9.3 Major Health or Safety Transgression

A life-threatening activity, condition, act or contribution by an employee in creating an unsafe working environment for himself or herself or other persons, failure to wear critical PPE (safety harness, eye protection, respiratory equipment, or as stipulated in the risk assessment).

Fine: Up to R3000.00 will be issued to the contractor

9.4 Repeat Offences

A contractor that receives more than three (3) major transgressions for the same offence and may, at the discretion of the project manager, be required to leave site

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ANNEXURE A (Notification of Intention to Commence Construction Work)

ANNEXURE 2

NOTIFICATION OF CONSTRUCTION WORK

Regulation 4 of the Construction Regulations, 2014

1. (a) Name and postal address of principal contractor:
(b) Name and telephone number of principal contractor's contact person:
2. Principal contractor's compensation registration number:
3. (a) Name and postal address of client:
(b) Name and telephone number of client's contact person or agent:
4. (a) Name and postal address of designer(s) for the project:
(b) Name and telephone number of designer's contact person:
5. Name and telephone number of principal contractor's construction manager on site appointed in terms of regulation 8(1):
6. Name/s of principal contractor's sub-ordinate manager on site appointed in terms of regulation 8(2):
7. Exact physical address of the construction site or site office:
8. Nature of the construction work:
9. Expected commencement date:
10. Expected completion date:
 1. Estimated maximum number of persons on the construction site:
 - Total _____ Male _____ Female _____
 -
12. Planned number of contractors on the construction site accountable to principle contractor:
13. Name(s) of contractors already chosen:

Principal contractor

Date

Client

Date

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ANNEXURE B (Example: Appointment - Construction Supervisor)

APPOINTMENT OF A CONSTRUCTION MANAGER

CONSTRUCTION REGULATION 8 (1)

8(1) The contractor shall appoint a full time, competent employee in writing as the construction supervisor with the duty of supervising construction work

APPOINTMENT

I, _____ (contractor's name), having been appointed in terms of section 16 (2) of the Occupational Health and Safety Act (85 of 1993) to ensure full compliance with the Act, do hereby appoint:

_____ (name of appointee), being a full-time employee, as the **Construction Manager** responsible for:

_____ (site address)
,to supervise construction work for the duration of the project/ contract or until you are relocated to another site/ project or leave the employ of the company.

You are reminded that you are required to be conversant with all relevant statutory provisions and regulations of the Occupational Health and Safety Act (85 of 1993) in the regard to carrying out of construction work.

Signature _____ Date _____

Designation _____

ACCEPTANCE

I, _____ (name of appointee)
hereby accept and understand the requirements of this appointment as **Construction Manager** and confirm that I have the necessary competence required and that I am conversant with all the relevant statutory provisions of the Occupational Health and Safety Act (85 of 1993).

Signature _____ Date _____

Designation _____

Certificate(s)
Training&CV _____

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ANNEXURE C Inspection List

Inspections Required

No.	Inspection	By who	Frequency	Record
1	Excavations	Appointed Person	Daily before shift, plus other	Checklist
2	Construction Vehicles and Mobile Plant	Appointed Person	Daily	Inventory/ checklist
3	Electrical Installations (temporary)	Appointed Person	Weekly	Inventory/ checklist
4	Fire Equipment	Appointed Person	Manufacturer's spec	Inventory/ checklist
5	First Aid Box Contents	First Aider	Monthly	Inventory
6	Ladders	Competent Person	Monthly	Inventory/ checklist
7	Lifting Tackle	Appointed Person	3- monthly	Inventory/ checklist
8	Hand Tools	Appointed Person	Monthly	Inventory/ checklist
9	Portable Electrical Equipment	Appointed Person	Monthly	Inventory/ checklist
10	Health & Safety Rep	H&S Rep/ Safety Officer	Monthly	Checklist
11	Good Housekeeping	H&S Rep/ Safety Officer	Monthly	Report
12	Stacking and Storage	Appointed Person	Monthly	Report
13	Change Rooms and Toilets	H&S Rep/ Safety Officer	Monthly	Inventory/ checklist
14	Pneumatic Tools	Appointed Person	Monthly	Inventory/ checklist

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ANNEXURE D (Recording and Investigation of Incidents)

OCCUPATIONAL HEALTH AND SAFETY ACT, 1993(ACT NO 85 OF 1993)

REGULATION 9 OF THE GENERAL ADMINISTRATIVE REGULATIONS

RECORDING AND INVESTIGATION OF INCIDENTS

A. RECORDING OF INCIDENT

1. Name of Employer _____
2. Name of affected person _____
3. Identity Number of affected person _____
4. Date of incident _____
5. Time of Incident _____

6. Part of the body affected*

Head or neck	Eye	Trunk	Finger	Head	
Arm	Foot	Leg	Internal	Multiple	
Sprains or strains	Contusions or wounds	Fractures	Burns	Amputation	
Electric Shock	Asphyxiation	Unconsciousness	Poisoning	Occupational Diseases	
0-13 days	2-4 weeks	>4-16 weeks	>16-52 weeks	>52 weeks or permanent disablement	Killed

7. Effect on the person. *

8. Expected period of
disablement. *

9. Description of Occupational disease** _____

10. Machine/ process involved/ type of work performed/ exposure* _____

11. Was the incident reported to the Compensation Commissioner and Provincial Director?

Yes	No
-----	----

Make a cross in the appropriate square

12. Was the incident reported to the Police?

Yes	No
-----	----

13. SAPS office and reference _____

- *To be completed in case of a fatal incident
- **in case of a hazardous chemical substance, indicate substance exposed to.

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B. INVESTIGATION OF THE ABOVE INCIDENT BY A PERSON DESIGNATED THERETO

1 Name of investigator _____ 2 Date of investigation _____

3 Designation of investigator

4 Short Description of incident

5 Suspected cause of incident

6. Recommended steps to prevent a recurrence

Signature of investigator

Date

C. ACTION TAKEN BY THE EMPLOYER TO PREVENT THE RECURRENCE OF A SIMILAR INCIDENT

Signature of investigator

Date

D. REMARKS BY HEALTH AND SAFETY COMMITTEE

Remarks _____

Signature of chairperson of health and safety committee

Date

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ANNEXURE E (Section 37(2) – Agreement with Mandatory)

AGREEMENT WITH MANDATORY

OCCUPATIONAL HEALTH AND SAFETY ACT, (Act No 85 of 1993)

AGREEMENT WITH MANDATORY In terms of Section 37(1) and (2)

WRITTEN AGREEMENT ENTERED INTO AND BETWEEN

(Hereinafter referred to as the Company) AND

CONTRACTOR
(Hereinafter referred to as The Contractor) Compensation Fund Number:

AGREEMENT WITH MANDATORY TO BE COMPLETED IN BLACK INK. INITIAL EACH PAGE AND ANY CHANGES.

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Definition of MANDATORY

Includes an agent, a contractor or sub-contractor for work, but without derogating from his status in his own right as an employer or user.

Occupational Health and Safety Act (No. 85 of 1993)

1. You are requested to, as far as you reasonably can, comply with the requirements of the OHS ACT and Regulations.

2. Your attention is drawn to “**General Duties of Employers to their Employees**” as required by Sect 8 of the Act.

3. You are required to:

3.1 Sign a written “**Agreement with Mandatory**” as required by Sect 37(1)(2) of the Act with us before you commence any work on my / our premises / site.

3.2 Provide the **client / principal contractor** with a documented health and safety plan.

3.3 Provide the **client / principal contractor** with written appointment of the person who is going to supervise the construction work as per Construction Regulation 6(1).

Note: Electrician to provide copy of certificate of registration as per Elect. Install Reg. 9(3).

3.4 Provide the **client / principal contractor** with written designation of your nominated Health and Safety Representative as per Sect 17(1).

3.5 If you employ more than five (5) persons, you are required to provide your own First Aid Box. (General Safety Regulation 3 (2).)

3.6 If you employ more than ten (10) persons, you are required to provide your own qualified First Aider as per General Safety Regulation 3(4).

3.7 When working with hazardous chemical substances, comply with Hazardous Chemical Substances Regulation

3. *Note: Asbestos and Lead regulations are separate.*

3.8 When using a Materials Hoist , comply with Construction Regulation 17.

3.9 When using Lifting Machines and Lifting Tackle, comply with Driven Machinery Regulation 18.

3.10 When using Explosive Powered Tools, comply with Construction Regulation 19.

3.11 When using Scaffolding, Formwork and support work, comply with Construction Regulation 10 and 14.

3.12 When Excavating or Demolishing, comply with Construction Regulation 11 and 12.

3.13 When Welding, Flame Cutting, Soldering, comply with General Safety Regulation 9.

3.14 When working in confined spaces, comply with General Safety Regulation 5.

4. You are responsible for providing your own **legal safety documents and registers** to comply with the Act's requirements. *A copy of the OHS Act of 1993 should be available in the main contractors office.*

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5. You are required to comply with General Safety Regulation 2(1) to (7) and provide employees with: personal protective equipment which will allow them to carry out their work in a safe manner, e.g. hard hats, safety belts, gloves, safe footwear, eye protection, ear protection, waterproof clothing etc.

5. Reporting of Incidents and Occupational Diseases shall be done as per General Admin. Regulation 6. (Also see Sect 24 of the Act.)

•

Compensation for Occupational Injuries and Diseases Act (No 130 of 1993)

You are required to provide the **client** proof of registration with the Compensation Commissioner/Federated Employer's Mutual within seven (7) days after signing this agreement. Failure to do so would result in the **client** notifying the agent of the Commissioner to investigate and make an assessment of your wage return and the applicable levy you have to pay, which will be liable for a deduction from your monthly progress payments and paid over to the Commissioner. (Copies of proof of payment will be provided to the contractor) **See Section 89(1) of the COID**

C3.5 MANAGEMENT

C3.5.1 Applicable SANS and SABS standards

a) The following SANS 1921 Construction Works standards and associated specification data are applicable:

- i) SANS 1921-1, General
- ii) SANS 1921-2, Accommodation of traffic on public roads occupied by the contractor
- iii) SANS 1921-4, Third party management support
- iv) SANS 1921-5, Earthworks activities which are to be performed by hand
- v) SANS 1921 -6, HIV/AIDS Awareness

The abovementioned South African National Standards make several references to the Specification Data for data, provisions and variations that make these standards applicable to this contract. The Specification Data shall have precedence in the interpretation of any ambiguity or inconsistency between it and these standards.

Each item of Specification Data given below is cross-referenced to the clause in the standard to which it mainly applies.

The associated Specification Data is as follows:

SANS 1921-1, Construction and management requirements for works contracts – Part 1: General engineering and construction works	
Clause	Specification data
Essential data	
4.1.7	There are no requirements for drawings, information and calculations for which the contractor is responsible
4.3.1	Refer to scope of works
4.7.3	No over break allowances for blasting is provided for
4.14.3	Refer to scope of works
4.14.5	The Contractor is required to provide latrine and ablution facilities

SANS 1921-5, Construction and management requirements for works contracts – Part 5: Earthworks activities which are to be performed by hand	
Clause	Specification Data
Essential Data:	
5.1	The depth of trenches which are to be excavated by hand is 1,5 metres
SANS 1921-6, Construction and management requirements for works contracts – Part 6: HIV/AIDS awareness	
4.2.1(a)	A qualified service provider is one that is accredited or a provisionally accredited training service provider in the HIV/AIDS field. A list of accredited service providers can be obtained from the Construction SETA (CETA) (tel 011-265 5900), Health and Welfare SETA (HWSETA) (011-622 6852) or on the Health and Welfare SETA website: www.hwseta.org.za
Additional clauses	
	The duration of each workshop is not to be less than 2 ½ hours.

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C3.5.2 Planning and Programming

The time for completion will be 18 months, which includes the allowance for inclement weather. All statutory holidays for the Civil Engineering Industry falling within the authorised contract period, will be allowed as extensions to this period, but the Contractor will not be paid additional Time-Related charges for these days (Ref. PSA 8.4.1).

The Contractor shall submit to the Engineer within 14 days of the Commencement Date, a detailed programme setting out clearly the sequence of work, and the resources, which he intends to use.

C3.5.3 Environment

a) Sand and dust control

The Contractor shall, for the duration of the contract, take appropriate measures to control the dust and soil movement, which may arise due to his operations.

b) Precautions Against Nuisance

Operations are being conducted in an urban area and in the presence of passing traffic. Precautions shall be taken to protect the public and to prevent unnecessary noise, dust or other nuisance.

Any rock or debris falling from trucks on the roads in use by the public shall be removed immediately. Precautions shall be taken to prevent fouling of public roads and completed construction by trucks transporting muddy material. The Engineer may order the Contractor to broom off and clean roads continuously where the mud tracking of vehicles or falling debris may constitute a danger to the travelling public.

c) Silencing of Plant

Plant used on the Works shall be efficiently silenced and comply with the Noise Control By-Laws as appeared in the Administrator's Notice No. 1784 of 29 November 1978. Noise operations will be permitted only between the hours of 7:00 am and 5:00 p.m. Any work outside normal hours will be permitted only on the written authority of the Engineer, laid down in Clause 26 of the General Conditions of Contract.

C3.5.4 Accommodation of Traffic On Public Roads Occupied By The Contractor

The works involves the construction of new roadways and stormwater within an established residential community. The works will be undertaken in such a manner to provide access to residential property accesses and special attention must be drawn to the accommodation/deviation of traffic on the affected area of the works.

The need to accommodate the traffic safely and with the least amount of inconvenience to the travelling public is necessary throughout the construction period. The travelling public shall have the right of way on public roads and the Contractor shall make use of approved methods to control the movement of his equipment and vehicles so as not to constitute a hazard on the road.

Failure to maintain road signs, warning signs or flicker lights, etc, in a good condition shall constitute ample reason for the Engineer to stop the execution of the works until the road signs, etc, have been repaired to his satisfaction. The Contractor may not commence constructional activities before adequate provision has been made to accommodate traffic in accordance with the specifications.

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C3.5.5 Testing, Completion, Commissioning, and Correction of Defects

Materials of work that do not conform to the approved samples submitted in terms of the General Conditions of Contract will be rejected. The Engineer reserves the right to submit samples to tests, to ensure that the material represented by the samples meet the specification requirements.

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

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

The Contractors attention is drawn to the provisions of the various Specifications regarding the minimum frequency of testing required. The Contractor shall at his own discretion increase this frequency where necessary to ensure adequate control.

On completion and submission of every part of the work to the Engineer for examination, the Contractor shall furnish the Engineer with the results of the relevant tests to indicate compliance with the specifications.

C3.5.6 Recording Of Weather

Daily temperature and rainfall data shall be recorded in the site diary, and a copy shall be provided to the engineer's representative on a weekly basis. A rainfall gauge shall be located at the contractor's site camp. Temperature readings shall be taken at commencement and closure of the site on a daily basis. Additional readings will be required during construction of layer works, concrete works and surfacing.

C3.5.7 Format of Communications

Communication throughout the contract will be undertaken via written communication either by fax, site instruction or post. Email communication will only be considered as proof of communication when followed up by a written communication on the letterheads of the author or via a site instruction. Request for inspection of the works will be accepted telephonically, however this request must be recorded in the site diary and site instruction book.

C3.5.8 Key Personnel

A schedule of key personnel to be employed with curriculum vitae of relevant experience shall be provided to the employers' representative prior to site handover.

C3.5.9 Management Meeting

The Engineer will conduct site meetings, prepare and circulate minutes, as determined by him at the beginning of the contract. The Contractor shall attend these meetings and shall ensure that when necessary, the required sub-contractor is represented. The approved minutes shall become part of the contract documents.

The Contractor shall be required to conduct safety meetings at intervals agreed to between the Employer or his Safety Agent and the Contractor as specified in the Health and Safety Specification bound in this document.

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C3.5.10 Payment Certificates

The contractor shall submit to the engineer after the end of each month a statement in the required format, showing the estimated amount due to him, calculated in accordance with the General Conditions of Contract. The statement to be submitted by the contractor shall consist of 2 copies of the schedule of quantities.

C3.5.11 Protection of the Public

The Contractor shall at all times ensure that his operations do not endanger any member of the public. As the area is adjacent to a residential area the Contractor shall take special precautions to prevent public access to any danger areas on the Works, e.g. by temporary barricades and/or fencing.

C3.5.12 Site Visitors Book

A Site Visitors Book must be kept on site. All visitors visiting to the site must report to the site office and sign in the Site Visitors book before entering the construction site. The Agent and/or the Safety Officer must always accompany the Visitor. The Visitor must wear a hard hat, safety shoes and safety clothing when required.

C3.5.13 Information In Respect Of Plant

Information relating to plant on Site shall be recorded in the Daily Site Diary. In addition, the Contractor shall deliver to the Engineer, on a monthly basis, a detailed summary of construction plant kept on the Site, full particulars given for each day of the month. Distinction shall be made between plant in working order and plant out-of-order. Such inventory shall be submitted by the first day of the month following the month to be reported.

C3.5.14 Information In Respect Of Employees

Information relating to labour and management on Site shall be recorded in the Daily Site Diary, in addition, the Contractor shall deliver to the Engineer, on a monthly basis, a detailed summary of supervisory staff, labour employed (own and local labour) by category, and sub-contractors (both local and imported) for each day of the month. Such return shall be submitted by the first day of the month following the month to be reported.