CIVIL / STRUCTURAL
PROJECT SPECIFICATIONS
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1. **INTRODUCTION**

1.1 **Scope**

These project specifications consist of two parts:

PORTION 1 covers a general description of the project, site, circumstances, site facilities available and required, aspects requiring specific attention and requirements to be met by The Contractor.

PORTION 2 covers Amendments and Additions to the Standardised Specifications, applicable to the Contract.

1.2 **Status**

Should any requirement of the Project Specifications conflict with any requirement of the Standardized Specifications and Particular Specifications; the requirement of the Project Specifications shall prevail.
2. **PORTION 1: THE WORKS**

**PS 1: GENERAL DESCRIPTION**

The work comprises of the following main tasks at each quarantine camp:

- New loading and offloading facilities at the main entrance / exit areas
- New sewer reticulation at the cattle handling facilities and staff housing areas.
- Upgrading of existing staff and herders housings.
- Upgrading of cattle handling facilities.
- New herders houses and ablutions
- Upgrading of the water reticulation at various cattle handling facilities

These tasks are summarized in more detail under item PS 4 in this section of the document.

**PS 2: DESCRIPTION OF SITE AND ACCESS**

Katima quarantine camp can be accessed from the National Road (B8) turning onto the M125/C49. The camp is ±10km South of Katima Mulilo
Katima Staff Housing area co-ordinates: S17.56802 E24.26118 (WGS 84)

Kopano Quarantine Camp can be accessed from the National Road (B8) turning onto a gravel track. The camp is ±37km West of Katima Mulilo
Kopano Staff Housing area co-ordinates: S17.64067 E24.05667

Both quarantine camps road network consist mainly of very loose, fine graded sandy tracks (2 spoer tracks), that are intermediately over grown with small trees and shrubs, an off road vehicle is required, it is also recommended that the off road vehicle have 4x4 capabilities.
The topography of both camps is fairly flat but very overgrown in parts.

**PS 3: NATURE OF GROUND AND SUBSOIL CONDITIONS**

The general geology of the area consists of mainly sandy conditions.

No field tests have been carried out on the in-situ material but in general, the material in this area has a topsoil layer of sand with intermediate and possible hard rock excavations. It remains The Contractors responsibility to obtain sufficient material to meet the required specifications. Furthermore, The Contractor will be required to carry out all relevant tests on all materials to ensure compliance with the specifications throughout the Contract.
No responsibility is accepted for any conclusions drawn by Tenderers from the information supplied and Tenderers must satisfy themselves as to the nature of materials to be excavated under this Contract. Tenderers are at liberty to excavate any trial holes or carry out other investigations to satisfy themselves as to the nature of the ground that will be encountered in carrying out the works, provided that they advise the Engineer of their intention to carry out such hole excavation or other investigation and backfill such excavation immediately afterwards.

Prior to any material being imported to site, the relevant test results must be submitted to the Engineer for approval. Only upon written approval may the material be imported.

**PS 4: DETAILS OF CONTRACT**

The work to be carried out under this part contract mainly consists of the following:

1) Establishment of site

2) Locate all existing septic tanks and French drains

3) Setting out the works

4) Sewer network construction:
   - Construct new sewer reticulation consisting of pipe work, septic tanks and French drains with pipe diameter of 110mm.

5) New structural works:
   - New headers houses and ablutions facilities
   - Renovations of existing staff houses
   - Renovations of existing herders ablution facilities

6) Mechanical works:
   - Testing of pipe lines
   - Renovations of existing staff houses water reticulation
   - Renovations of existing herders ablution facilities water reticulation
- Renovations to existing feeding and water troughs
- New bulk storage tanks
- New water pipe lines

7) Electrical (Sub contract):

- Renovations of existing staff houses electrical reticulation
- Renovations of existing herders ablution facilities electrical reticulation

8) Correction of defects in the works in accordance with the requirements specified in the Contract Documents.

The description of the works is not necessarily complete and shall not limit the works to be carried out by The Contractor under this contract.

The Contractor will be responsible for ensuring that all his/her employees, and those of all Sub-Contractors, are fully conversant with all regulations laid down by the Local Authorities. The Contractor will not be allowed unrestricted use of the site but must agree with the Local Authorities and owner of the said property to the size and position of the areas required for the proper execution of the Works. All excess material excavated must be dumped and levelled in designated areas as approved by the Local Authority. The Contractor will be allowed areas for the storage of materials, erection of camp etc. and must limit himself to these areas, which are to be approved.

Approximate quantities of each type of work are given in the Schedule of Quantities.

**PS 5: CONSTRUCTION PROGRAMME**

The Contractor is to submit a construction programme. This should not be longer than 9 (nine) months.

All else being equal the tenderer offering the shortest duration will be favorably considered. The duration, which is to be in calendar days, will be the basis for the calculation of supervision costs.

If the programme submitted by The Contractor has to be revised because The Contractor is failing behind in his/her programme, he shall submit a revised programme of how he intends to regain lost
time to ensure completion of the works within the period defined or within a granted extension of time. Proposal to increase the tempo of work must incorporate positive steps to increase production either by more labour and plant on the site, or by using the available labour and plant in a more efficient manner.

Failure on the part of The Contractor to submit or to work according to the programme or revised programmes shall be sufficient reason for the Engineer to take necessary steps as described in the contract document.

The approval by the Engineer of a programme shall have no contractual significance other than that the Engineer will be satisfied if the work is carried out according to the programme. The said approval shall not limit the right of the Engineer to instruct The Contractor to vary the programme if necessary.

A Completion Certificate will only be issued when all testing and commissioning has been satisfactorily carried out. Issuing of a Certificate of Partial Completion will not be considered.

Tenders shall submit, together with their tenders, a realistic programme in the form of a Gantt bar chart showing the dates for the completion of the major activities of the works. This programme shall form the basis of the detailed programme, which shall be submitted to the Engineer not later than 7 calendar days after The Contractor has received the letter of acceptance.

This programme shall not be in the form of a bar chart only, but shall clearly show the anticipated quantities of work to be performed each week under each of the major operations.

If, during the progress of the work, the quantities of work performed per week fall below that originally programmed, or if the programme is deviated from in any other way, The Contractor shall, within one week after being notified by the Engineer, submit a revised programme at his/her own cost.

Such a revised programme shall be based on the rate of progress of the works achieved by The Contractor up to the date of revision. Any proposal to increase the rate of progress must be accompanied by positive steps to increase production and the use of labour and plant in a more efficient manner. Such a revised programme will not relieve The Contractor of his/her obligations to complete the works by not later than the Contractual completion date.

Continued failure on the part of The Contractor to work according to the programme or revised programmes shall be sufficient reason for the Engineer to take further steps.
PS 6: SITE FACILITIES AVAILABLE

PS 6.1 Campsites

The Engineer through the Local Authority will allocate a specific site to the Contractor for his/her construction camp and offices. The Contractor will, however, be responsible for the safeguarding of all plant and material, and he is free to provide his/her own security personnel on site. The Contractor must note that permission must be obtained from the client if personnel may remain on site after normal working hours.

PS 6.2 Water and electricity

Water and electricity services are available in the vicinity of the site, and The Contractor shall, at his/her own expense, be responsible for connections to the available services, as well as for the distribution of water and electricity for construction and domestic use. The distribution of water and electricity shall be carried out in accordance with the applicable laws and regulations.

The Contractor shall make his/her own arrangements with the appropriate authority for water and electricity connections and the payment thereof.

PS 7: SITE FACILITIES REQUIRED

PS 7.1 Facilities for the Engineer

No separate office is required for the Engineer’s representative.

The Engineer’s representative shall be allowed free use of survey equipment and survey assistants to carry out control work as and when required.

PS 7.2 Water, electricity and sewerage

The Contractor shall, at his/her own expense, be responsible for obtaining and distribution of the water and electricity required for construction and domestic use. The distribution of water and electricity shall be carried out in accordance with the applicable laws and regulations.
No separate payment will be made for obtaining and distributing water and electricity, the cost of which will be deemed to be included in the tendered rates.

The Contractor shall at his/her own expense provide suitable latrines for his/her employees at the site.

All such latrines shall conform to the requirements of the Local Authority. Throughout the progress of the contract, The Contractor shall maintain all latrines in a clean, sanitary condition to the satisfaction of the Engineer.

On completion of the works, or when ordered by The Engineer, The Contractor shall remove all temporary accommodation, housing and latrines, and restore the site to a clean and sanitary condition to the satisfaction of the Engineer.

PS 7.3  Site instruction book

A triplicate book for site instructions shall at all times be kept on the site.

PS 8:  FEATURES REQUIRING SPECIAL ATTENTION

PS 8.1:  Site maintenance

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

The site to be restored to its original state after construction has been completed.

PS 8.2:  Testing and quality control

The Tenderer shall take notice that his/her rates shall include all testing required in terms of Sub-Clause 7 of the Standardized Specifications of SABS 1200. The Contractor shall carry out all check and control tests as specified and the results shall be forwarded to the Engineer for evaluation.

The analysis of test results will not be done by statistical analysis. Individual tests shall pass the minimum specified requirements.
The test results of all testing carried out by or on behalf of The Contractor shall be submitted to the Engineer. In the event that The Contractor is not forthcoming with the test results, the Engineer shall have the right to demand copies of the test results from the testing laboratory and/or the specialist, irrespective whether the tests pass or fail the specified standards. Should The Contractor’s test results not be submitted within 3 days of the request, The Engineer shall have the right to withhold the certificate of payment until such time when he has received the requested test results.

The Engineer may order control tests at his/her discretion. If the tests ordered by the Engineer pass the specified requirement, the Employer shall reimburse The Contractor. If the tests fail, The Contractor shall pay for the tests and he shall rectify the unsatisfactory work to specified standard. Only once the retesting ordered by the Engineer provides proof of workmanship of specified standard shall the Employer reimburse The Contractor.

Should The Contractor fail to reimburse the commercial laboratory and/or the specialist for the tests that have failed within the stipulated period of payment, the Engineer shall have the right to claim the monies due to the commercial laboratory and/or the specialist with his/her professional fee account. On receipt of the monies, the Engineer shall reimburse the commercial laboratory and/or the specialist. The monies paid together with a 10% (ten percent) handling fee shall be deducted from The Contractor’s next progress claim.

Typical tests to be carried out during the duration of the contract are concrete cube test, which are to be taken in lots of six from each concrete operation or 50m³ concrete placed, whichever is less. Cubes to be submitted to an approved materials laboratory for testing (3 cubes each for 7 and 28 day testing respectively), air and mirror tests on sewer lines, and in the case of constructing ponds – permeability tests will also be carried out as well as all tests on borrow material will be conducted on in-situ material as well, on borrow material – CBR, Mod AASHTO, sieve analysis, indicator tests and standard of compaction on all earthworks, including bedding, fill, backfill and roadworks. The frequency of all tests as per SABS1200. The Engineer will not approve a layer or item prior to test result being submitted as specified.

No separate payment will be made for such testing, the cost of which will be deemed to be included in The Contractor’s tendered rates for the items of work that require testing in accordance with the specifications.
PS 8.3: Facilities to other contractors

The Contractor must make allowances for any other possible contractors on the site. This may involve adapting his/her programme to accommodate the work of other contractors and ensuring access to their sites along prescribed routes over the site of this contract. (Refer to PS 2). No claims will be entertained due to The Contractors not liaising and causing delays to each other’s work.

PS 8.4: Subcontractors

The Contractor shall be responsible for work carried out by any subcontractor on his/her behalf. The Engineer will not liaise directly with such subcontractors. Problems related to payments, programming, workmanship, etc., shall be the concern of The Contractor and the subcontractor, and the Engineer will not become involved.

The Contractor shall state in his/her Tender, which sub-contractors he intends to employ for any of the works. The Employer reserves the right, to accept or reject the specialised sub-contractor if previous work was of an unsatisfactory standard.

PS 8.5: Opening up and closing down borrow pits (if required)

Measurement and payment for opening up, testing, excavating, stockpiling, loading, transporting for the freehaul distance and closing down designated borrow pits, including the removal and stockpiling of overburden and restoration of the site, shall be deemed to be included under the rate for the import to fill. The borrow pit will be considered a commercial source and the rate shall thus be all-inclusive. This item applies to all borrow material required under this contract. The Contractor is to make his/her own arrangements for the provision of required material from borrow pits.

PS 8.6 Occupational Health and Safety Act

All Occupational Health and Safety Act regulations pertaining to the work being carried out must be adhered to. The Contractor’s employees and sub-contractors’ (including their employees) shall at all times be supervised by a competent supervisor appointed in writing in terms of Reg. 11.1 of the General Safety Regulations of the Occupational Health and Safety Act and made aware of his/her responsibilities.
PS 9: CERTIFICATES OF PAYMENT

The statement to be submitted by The Contractor in terms of the contract documentation and shall be prepared in accordance with the standard payment certificate prescribed by the Engineer.

All costs for the preparation and submission of the statement shall be borne by The Contractor.

PS 10: CONSTRUCTION IN RESTRICTED AREAS

Working space is sometimes restricted. The construction method used in these restricted areas largely depends on The Contractor’s plant. However, The Contractor must note that measurement and payment will be according to the specified cross-sections and dimensions irrespective of the method used, and that the rates and prices tendered will be deemed to include full compensation for difficulties encountered while working in restricted areas. Neither extra payment nor any claim for payment due to these difficulties will be considered.

The Contractor must note that access to the site must be maintained at all times.

PS 11: DRAWINGS

All information in the possession of The Contractor that is required by the Engineer’s representative to complete the as-built drawings must be submitted to the Engineer’s representative before a certificate of completion will be issued.

Only figured dimensions shall be used and drawings shall not be scaled unless permitted by the Engineer. The Engineer will provide the dimensions that may have been omitted from the drawings.

PS 12: SAMPLES

Materials or work that does not conform to the approved samples, will be rejected. The Engineer reserves the right to submit samples to tests to ensure that the material represented by the sample meets the specification requirements.
**PS 13: NOTICES, SIGNS, BARRICADES AND ADVERTISEMENTS**

Notices, signs and barricades erected as well as advertisements may be used only if 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/her tendered rates.

The Engineer has the right to have any sign, notice or advertisement moved to another position 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.

The civil contractor will be required to provide one (1) construction name board as detailed, the cost of which shall be included in the rates tendered under item PSAD 3.1 of section 1200A.

**PS 14: WORKMANSHIP AND QUALITY CONTROL**

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

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

The Contractor’s attention is drawn to the provisions of the various standardized specifications regarding the minimum frequency of testing required. The Contractor shall, at his/her 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, measurements and levels to indicate compliance with the specifications.

In addition to the above quality control The Contractor shall engage the services of an approved independent laboratory for the testing of materials and quality testing to ensure that his/her work complies with the specifications (refer to PS 8.2).
PS 15: EXTENSION OF TIME DUE TO ABNORMAL RAINFALL

Provision has been made for extension of time due to abnormal climatic conditions as per Special Conditions of Contract.

PS 16: SPOIL MATERIAL

No indiscriminate spoiling of material is permitted. Surplus or unsuitable materials shall be spoiled at a site approved by the Local Authority and the spoiling shall comply with the applicable statutory and municipal regulations. No haulage will be paid for the spoiling of any material. The price for haulage should therefore be included in the tendered rate.

PS 17: NON-WORKING DAYS

The Contractor shall not work on the statutory public holidays as gazetted.

PS 18: TRANSPORT OF MATERIAL

All costs for transporting materials, including haulage, shall be included in the applicable tendered rates. All references in the specifications to transport, overhaul and haul distances shall be deleted irrespective of whether or not the deletion is included in these project specifications.

No overhaul will be paid on this contract, all haul will be regarded as freehaul.

PS 19: NOMENCLATURE

Any reference to a South African law in the contract documents shall be read as a reference to the equivalent law of the Republic of Namibia.

PS 20: LABOUR REQUIREMENTS AND SAFETY OF WORKMEN

The entire works shall be carried out in accordance with the requirements of all relevant Government Acts and Regulations. The Contractor shall not enter or work on, in or in close proximity of any existing structure, pump station, sump, manhole and such like without obtaining the prior permission of the Engineers. The Contractor shall provide suitable and safe access in form of ladders, gangways, etc. to all parts of the works as may be required for construction purposes of for inspection by the Engineer.
The Contractor shall take precautions to ensure the safety of his/her employees and other persons on the site of the works. All precautions shall be taken to protect workmen from falling material and other dangers whilst carrying out duties. Shafts and trenches shall in every way be kept safe for persons working therein.

Labour intensive construction methods shall be used throughout the contract where possible and local labourers shall be employed. Mechanical excavation of pipe trenches will only be allowed if motivated properly and approved in writing by the Engineer. The Contractor shall abide by the relevant laws governing the employment and accommodation of labour. All arrangements affecting his/her labour force shall be the sole responsibility of The Contractor.

**PS 21: APPLICABLE STANDARDIZED SPECIFICATIONS**

For the purpose of this Contract, the following standardised specifications and particular specifications shall apply:

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PS 22: FINAL QUANTITIES

It is of utmost importance to this project that the final contract amount is no higher than the awarded contract total.

Please therefore note the following in regard of the schedule of quantities and the contingency sum allowed:

a. The quantities given in the schedule of quantities have been prepared in accordance with the standard system of measurement of civil engineering quantities as published by the South African Institution of Civil Engineers. In accordance with this system, some quantities may be re-measured as the work progresses.

b. No payment will be made in any certificate on any item where the re-measured quantity exceeds the tendered quantity given in the document until the Employer has agreed to the increase in writing.

c. Should the appointed contractor become aware that any quantity when re-measured may exceed that in the Bill of Quantities the onus rest on him to report it to the employer or his/her representative at the earliest opportunity and before the work which exceeds the tendered quantity is conducted.

d. The appointed contractor shall not conduct any day works, additional works or variations without first agreeing in writing regarding the scope and value of such works with the employer.

No payment will be made for such works in any certificate unless the above is in place and the works have been conducted.

e. Should the appointed contractor become aware that any work is required that is not included in the tender the onus rests on him to report it to the employer or his/her representative at the earliest opportunity so that approval may be gained from the employer before such work is conducted.

PS 23: ORDERING OF MATERIALS

The quantities set out in the schedule of quantities have been carefully determined from calculations based on data available at the time and should therefore be considered to be approximate quantities only.
Before ordering materials of any kind, The Contractor shall check with the Engineer whether or not the scope of the work for which the materials are required is likely to change substantially. No liability or responsibility whatsoever shall be attached to the employer for materials ordered by The Contractor except when ordered in accordance with written confirmation issued by the Engineer.

**PS 24: SURVEY PEGS, BEACONS AND SETTING OUT THE WORKS**

The Contractor shall take proper care not to disturb or destroy property beacons, trigonometrical survey beacons or setting-out beacons.

Before commencing, the operations The Contractor shall locate and mark all survey pegs and beacons and shall immediately submit a written report in duplicate, listing any missing or damaged pegs and beacons, to the Engineer’s Representative, who shall verify the facts and return a countersigned copy for the report to The Contractor. The Contractor will be held responsible for the replacement by a registered Land Surveyor of all beacons and pegs found damaged or missing on completion of the Works, which were not reported as such by The Contractor before commencing operations. The cost of replacing all beacons that are disturbed or destroyed during the course of the contract shall be borne by The Contractor.

Survey records of beacons, benchmarks, etc., replaced, shall be submitted to the Engineer.

Benchmarks will be pointed out by the Engineer on site. The Contractor is responsible for the setting out of the Works and no separate payment will be made therefore as the cost involved for the setting out of the Works is deemed to be included in the tendered sum for the item “Contractual Requirements” in Section 1 of the Schedule of Quantities. The Contractor shall also ensure that no survey beacons, erf pegs and benchmarks are covered up or disturbed.

The Engineer shall establish the basic reference pegs and benchmarks on the site and give The Contractor the particulars thereof in sufficient time to enable The Contractor to meet his/her approved programme.

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

The checking of any setting-out or of any line or level by the Engineer shall not relieve The Contractor of his/her responsibility for the correctness thereof.
If at any time during the progress of the Works, any error shall appear or arise in the position, levels, dimensions or alignment of any part of the Works, The Contractor, on being to do so by the Engineer, shall at his/her own expense rectify such error to the satisfaction of the Engineer, but if such error is based on incorrect data supplied in writing by the Engineer or if there is any delay in providing the data, The Contractor shall, in respect of that delay and the Cost of such rectification, be entitled to make a claim in accordance with Clause 48 of the General Conditions of Contract.

**PS 25: TRENCHES**

Trenches may not be left open during the builders’ holidays unless with written permission from the Engineer. Generally, the length of open trench open prior to pipe laying will be limited to 600 metres maximum.

Open trenches to be sufficiently barricaded to avoid accidents, especially at night.
PORTION 2: AMENDMENTS AND ADDITIONS TO SABS 1200 AND PROJECT SPECIFICATIONS RELATING TO SABS 1200 SPECIFICATIONS

PSA GENERAL
(Applicable to SABS 1200 A)

PSA 3 Materials

PSA 3.1 Quality of materials

Add to the Sub-Clause:

No used or recycled material may be used in the Works unless expressly authorised by the Engineer.

Materials bearing the SABS or BS mark will not be subjected to tests to determine whether they comply with the relevant specifications. The Engineer may in his/her discretion require any material not bearing such mark to be tested in accordance with the relevant specifications; should he do so The Contractor shall arranged for such tests to be carried out at The Contractor’s cost by the South African Bureau of Standards or other approved body.

Add the following sub-clause:

PSA 3.3 Delay due to supply of materials

Add the following new sub-clause:

The Contractor shall ensure that the work is not delayed, due to the lack of materials on the site of the works, by placing orders with suppliers for the materials required under this contract timeously.

The Contractor shall, by producing copies of written orders or written enquiries for supplies, prove to the satisfaction of the Engineer that any delay occasioned by non-availability of materials has been caused by the inability of suppliers to supply and not by his/her own lack of timely ordering or lack of exhaustive enquiry for supplies, before any extensions of the contract time will be allowed due to such delays.
Add the following sub-clause:

PSA 3.4 Ordering of materials

The quantities set out in the schedule of quantities have been carefully determined from calculations based on data available at the time and should therefore be considered to be approximate quantities only. Before ordering materials of any kind, The Contractor shall check with the Engineer whether or not the scope of the work for which the materials are required is likely to change substantially. No liability or responsibility whatsoever shall be attached to the employer for materials ordered by The Contractor except when ordered in accordance with written confirmation issued by the Engineer.

PSA 4 PLANT

PSA 4.2 Contractor’s Office, Stores and Services

The extent of The Contractor’s camp shall be restricted to the area allocated by the Engineer through the Local Authority.

No housing is available for The Contractor’s employees and The Contractor shall make his/her own arrangements to house his/her employees off site and to transport them to site.

The Contractor will be required to provide for his/her own facilities, for example, fence and a shed within this yard for storage of all material and plant. The cost of providing and removal of the fence and shed etc. shall be paid for under provision of facilities on site and removal of site establishment respectively.

PSA 4.3 Suitability of Constructional Plant

Add the following new sub-clause:

If the Engineer considers that any constructional plant in use is in any way inefficient or is inadequate in capacity to complete the Works properly or on time, he/she shall have the right to call upon The Contractor to provide such additional plant or equipment as may be required to meet the needs of the works.
PSA 5 CONSTRUCTION

PSA 5.2 Watching, barricading, lighting and traffic crossings

Add the following:

The Contractor shall be responsible for the protection of persons, animals, vehicles and property from injury or damage by reason of the works, and shall employ complete watchmen and guard the works both by day and by night.

All poles and warning notices shall be clearly marked by means of an approved reflecting material.

PSA 5.4 Protection of overhead and underground services

Replace the heading and the contents of this subclause with the following:

“PSA 5.4 Location and protection of existing services

PSA 5.4.1 Location of existing services

It is the responsibility of The Contractor to find the exact position of existing services. The relocation of these will require coordination between The Contractor and the relevant authorities, which is The Contractor’s responsibility.

The Contractor is to search for the existing services with hand excavation. Any damage done to the existing services must be repaired at the expense of The Contractor, and must be repaired as soon as possible, and may under no circumstances be left in a damaged form overnight.

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/her activities. He/she shall obtain up-to-date plans from the local authority 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 his/her 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/she 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/her operations or by the lack of proper protection.

PSA 5.4.2 Protection during construction

The Contractor shall exercise all the necessary care to prevent damage to known services during construction operations. Major excavating equipment and other plant shall not be operated dangerously close to these services. Where necessary, excavation in close proximity to these services shall be carefully carried out with suitable hand tools, excluding picks wherever their use could damage the services. No additional payment will apply to such more difficult work.

Services left exposed shall be suitably protected from damage.

PSA 5.4.3 Alterations and repairs to existing services

Unless the contrary is clearly specified or ordered, The Contractor shall not carry out alterations to existing services. When this is necessary, The Contractor shall inform the Engineer, who will either make arrangements for such work to be executed by the owner of the service, or instruct The Contractor to make such arrangements himself.

When existing services are damaged by The Contractor, he/she shall immediately inform the Engineer, or when this is not possible, the relevant authority, and obtain instructions as to who should carry out repairs. In urgent cases, The Contractor shall take the necessary steps to minimize damage to and interruption of the service. No repairs of telecommunication cables or electric power lines and cables shall be attempted.

The employer will accept no liability for damages due to a delay in having such alterations or repairs effected. The Contractor shall provide all reasonable opportunity, access and assistance to persons carrying out alterations or repairs of existing services.”
PSA 5.7  Safety

Add to the Sub-Clause:

All work and particularly work carried out in the proximity of buildings, bridges, tanks or other structures shall be carried out in conformance with the relevant regulations.

The Contractor shall make available for the duration of the contract safety helmets, gumboots and any other necessary safety equipment for sole use by the Engineer and his/her representative(s).

PSA 6: TOLERANCES

Add the following subclause:

“PSA 6.4: General

No guarantee is given that the full specified tolerances will be available independently of each other, and The Contractor is cautioned that the liberal or full used 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 when 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 Engineer, without any allowance for the specified tolerances. Except if otherwise specified, all measurements for determining quantities for payment will be based on the ‘authorised’ dimensions.

When the work is not constructed in accordance with the ‘authorised’ dimensions plus or minus the tolerances allowed, the Engineer may nevertheless, at his/her 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 allowed, quantities for payment shall be based on the actual dimensions as constructed.”
PSA 7: TESTING

PSA 7.1.1: Checking

Replace the last sentence with the following:

“The Contractor shall obtain the services of an independent testing laboratory at his/her own expense (refer to PS 8 in portion 1 of the project specifications) to carry out the checks prescribed in the various standardized specifications.”

PSA 7.1.2: Standard of finished work not to specification

Replace the words “Where the Engineer’s checks reveal …” with “Where the checks by the approved laboratory reveal…..”

PSA 7.2: Approved laboratories

Add the following:

“The independent laboratory used by The Contractor and approved by the Engineer shall also be deemed an approved laboratory.”

PSAB ENGINEER’S OFFICE

(Applicable to SABS 1200 AB)

PSAB 3 Materials

PSAB 3.1 Name boards

In the third line delete and substitute “The Association of Consulting Engineers of Namibia”

PSAB 3.2 Office Building(s)

Replace with:

No office is required for the Engineer.
PSAB 4  **Plant**

PSAB 4.1  **Telephone**

Delete the Sub-Clause and substitute the following:

The Contractor shall, subject to availability from Telecom Namibia, arrange for the installation of a telephone, cell or regular communication for the use of the Engineer or his/her representative.

PSAB 5  **CONSTRUCTION**

Add the following sub-clause:

PSAB 5.6  **Survey Equipment**

The Contractor shall provide the following survey equipment on the Site from the commencement to the completion of the Works, for the use by the Engineer:

One automatic level.

One levelling staff (5 m long, 1 cm gradations)

One 100 m stilon tape

One 25 m stilon tape

Steel pegs in sufficient quantities as required

The Contractor shall keep the equipment continuously insured against any loss, damage or breakage and he shall indemnify the Engineer and the Employer against any claims in this regard.

The Contractor shall ensure that the equipment is kept in clean and good condition at all times, sufficient for the accurate measuring required by this contract.

Payment for the above shall be deemed to have been included in the rate for Facilities required by the Engineer.
PSC: SITE CLEARANCE
(Applicable to SABS 1200 C)

PSC 3: MATERIALS

PSC 3.1: Disposal of material

Add the following:

“The Contractor shall obtain his/her own dumping sites for the disposal of material and all transport costs shall be included in the rates tendered for site clearance. The dumping site shall be pointed out to and approved by the Engineer prior to any material being disposed.”

PSC 5: CONSTRUCTION

PSC 5.2: Cutting of trees

PSC 5.2.3: Preservation of trees

PSC 5.2.3.2: Individual trees

Replace the last sentence with the following:

“An amount of N$1 500.00 will be deducted from monies due to The Contractor as a penalty for every tree that is damaged or removed unnecessarily.”

PSC 5.5: Reclearing of vegetation

Add the following:

“When areas have to be cleared on the written instructions of the Engineer, such reclearing shall be carried out at The Contractor’s own cost and The Contractor is therefore advised not to clear the areas too soon.”

Add the following sub-clause:
PSC 5.9: Existing fences:

Where the pipeline route crosses an existing fence, a section of fencing not exceeding 10.0 m in length may be removed temporarily during construction and thereafter reinstated to a condition not worse than the original as soon as the pipeline has been installed and backfilled in the immediate vicinity of the crossing. For the period while the existing fence is dismantled, The Contractor shall erect, at the end of each days operations, a temporary fence to close the gap in the existing fence.

PSC 8: MEASUREMENT AND PAYMENT

PSC 8.2.1: Clear and grub

Replace the first line with the following:

“The area designated by the Engineer to be cleared and grubbed will be measured in square metre to the nearest square metre or,”

PSD: EARTHWORKS

(Applicable to SABS 1200 D)

PSD 3: MATERIALS

PSD 3.1.1: Method of classifying

Add the following:

The Contractor shall immediately inform the Engineer if and when the nature of the material being excavated changes to such an extent that a new classification is warranted for further excavation. Failure on the part of The Contractor to advise the Engineer in good time shall entitle the Engineer to reclassify, at his/her discretion, such excavated material.

PSD 3.3: Selection

Add the following subclauses:

"PSD 3.3.3: Selection in borrow pits and excavations"
Approval of a borrow area for a certain purpose does not necessarily mean that all the material in that area is suitable for the specified purpose. What it does mean is that the borrow area contains some suitable material. The onus shall rest on The Contractor to ensure that only material that is indeed suitable is removed and used for the specified purpose.

Approval or designation of the material in a particular borrow pit or excavation for a particular purpose does not imply that all the material in the borrow pit or excavation is suitable for that purpose or should be used for that purpose. The Contractor shall select suitable material from that source, discard unsuitable material and reserve material for other purposes as necessary. When required and as ordered by the Engineer, material shall be stockpiled for later use.

When The Contractor has to select excavated material for a specific purpose, the above provisions relating to borrow areas shall apply.

The Contractor shall not waste or contaminate material that has been selected for a specific purpose.

**PSD 3.3.4: Commercial source**

For the purposes of this specification, a commercial source shall mean a source for material provided by The Contractor, not the employer. The borrow pit located by The Contractor is thus classified as a commercial source.

When the specification stipulate materials to be obtained from commercial sources, The Contractor shall include in his/her prices for finding a source of suitable material, for making arrangements with owner of the source for procuring the material, for the payment of royalties, charges or damages, and for transporting material to the site regardless of the distance involved. No payment will be made for the removal of overburden or stockpiling at the commercial source and no extra over payment shall apply for excavating in intermediate, hard or boulder material.”

**PSD 5 CONSTRUCTION**

**PSD 5.1.1.3 Explosives**

The use of explosives is prohibited on this project.

**PSD 5.2 Methods and Procedures**
PSD 5.2.2.1: Excavation for general earthworks and for structures

Add the following:

Where excavations have been carried below the authorised levels, The Contractor shall backfill such excavations to the correct level with approved gravel compacted to 90% of modified AASHTO density or to the density, of the surrounding material.

PSD 5.2.2.3: Disposal

Add the following:

"The Contractor shall provide the necessary spoil sites, shall make the necessary arrangements with the owner of the site where the material is disposed of, and shall make provision in his/her rates for all charges in this regard and for transporting the material regardless of the distance involved."

PSD 7 TESTING

PSD 7.2: Taking and testing of samples

Replace the contents of this subclause with the following:

"The Contractor shall arrange with the approved laboratory to carry out sufficient tests on a regular basis as agreed between him and the Engineer to determine whether the degree of compaction, and, where applicable, the quality of materials used, comply with the specifications and shall submit the results of these tests to the Engineer in a form approved by him.

The analysis of test results will not be done by statistical analysis. Individual tests shall pass the minimum specified requirements.

PSD 8 MEASUREMENT AND PAYMENT

PSD 8.3.3.c.: Restricted excavation

Add the following sub-item:

"Excavated for restricted excavation in all materials and use for backfill or dispose ...............Unit:m³"
This item shall apply to hand excavation ordered by the Engineer or when the Engineer considers that, owing to circumstances, excavation by mechanical excavators is not practicable. It shall not apply to hand excavation for trimming or finishing an excavation made by mechanical means.

The tendered rate shall include full compensation for the additional cost of excavating by means of hand tools."

**PSDA: EARTHWORKS (SMALL WORKS)**

(Applicable to SABS 1200 DA)

**PSDA5: METHODS AND PROCEDURES**

Add the following sub-clause:

**PSDA5.2.2.(h): Disposal of Excavated Material**

All surplus material and/or unsuitable material from bulk excavation shall be dumped in areas specified by the Engineer or at the approved dumpsite (see clause PSC-3.1).

**PSDA 5.1.3 Existing Services**

Add to the Sub-Clause:

All existing services on the Site may not be shown on the Drawings or be visible on the Site. The Engineer may order excavation by hand in order to search for and expose services. An item has been included in the Schedule of Quantities to cover the cost of such work if so ordered by the Engineer.

Where a service is damaged because of The Contractor's negligence, he shall be liable for the costs involved in the repair of the service and any other costs consequent upon the interruption of the damaged service.

**PSDA 5.2.1 Site Preparation**

Delete the last sentence and substitute:

"Material so removed shall be disposed of by The Contractor to Sites designated by the Engineer".
PSDA 5.2.2 Excavation

Delete paragraph (f) of the Sub-Clause and substitute:

(f) Borrow pits where and when ordered shall be so maintained that they do not become a danger to persons and livestock. The necessary access shall be constructed to each site. Topsoil and overburden shall be stockpiled temporarily and, on completion of the work, returned to and spread over the area of the borrow pit in such a manner that the sides are graded 1:2 and the floor is self draining, or otherwise as directed. Any access constructed by The Contractor shall be scarified and the area reinstated.

PSDA 5.2.3.2 Backfill of Unavoidable Over-Excavation in Boulder Formation

Add new Sub-Clause:

Upon completion of the excavation in boulder formation, the excavation is to be backfilled, in part or in total as instructed by the Engineer, with approved material obtained from other excavations or from borrow pits or with selected material compacted to achieve a 90% modified AASHTO density.

PSDA 5.2.6.1 Freehaul

Delete the wording of Sub-Clause 5.2.6.1 and replace with the following:

All haul of material will be regarded as freehaul on this contract.

No overhaul will be paid on this contract.

PSDA 6 TOLERANCES

PSDA 6.1 Degree of Accuracy

Delete the Sub-clause and substitute:

The work shall, subject to Sub-Clause 6.2, be finished off within the limits of Degree of Accuracy II as set out in Sub-Clause 6.1 of SABS 1200 D.
PSDA 6.2 Permissible Deviations

Add the following permissible deviations for work to Degree of Accuracy II:

6.2(a)

1      ± 300 mm
2      ± 100 mm
3      ± 50 mm
4 From direction of slope  Nil
   Between 1/100 and 1/300  10%
   1/400 and flatter  5%

6.2(b)

1      ± 35 mm
2      ± 50 mm
3      ± 50 mm
4      ± 15 mm

6.2(c)

1   Read "-2% +1%" in place of "± 2%".

PSDA 7 TESTING

PSDA 7.2 Determination of Compaction

Add to the Sub-Clause:

Determination of the standard of compaction achieved shall be carried out in accordance with Standard methods of testing road construction materials published by the Department of Transport Division of National Roads, Publication TMH.1.

PSDA 8 MEASUREMENT AND PAYMENT

PSDA 8.1.1 Basic Principles

Delete the third line of the first sentence and substitute:
“material in backfilling, forming embankments, etc., including any necessary additional off loading, stock-piling and reloading and the cost of disposal of any”

**PSDB: EARTHWORKS (TRENCHES)**

(Applicable to SABS 1200 DB)

**PSDB 3: MATERIALS**

**PSDB 3.5: Backfill materials**

Add the following paragraphs:

“(c) **Cement-stabilised backfilling (where applicable – refer to Schedule of Quantities)**

Backfilling shall be stabilised with 5% cement where directed by the Engineer. The aggregate shall consist of approved soil or gravel containing stones not bigger than 38 mm and with a plasticity index not exceeding 10.

The soil or gravel shall be mixed with 5% cement and shall be compacted in layers of 100 mm thick to 90% of modified AASHTO density.

(d) **Soilcrete backfilling (where applicable – refer to Schedule of Quantities)**

The aggregate for soilcrete shall be mixed with 10% cement and shall consist of approved soil or gravel containing stones not bigger than 38 mm and with a plasticity index not exceeding 10.

The soil or gravel shall be mixed in a concrete mixer with the cement and enough water to require a consistency that allows the mixture to be placed with vibrators to fill all voids between the pipe and the sides of the trench. Shuttering shall be used where necessary.”
PSDB 3.6  Materials for Reinstatement of Roads and Paved Areas

Add the following to the Sub-Clause:

Material, excluding asphalt and bitumen construction, used in the reinstatement of roadways shall fall into the following relevant categories:

(a)  Foundation material recovered from the excavation of trenches across existing roadways, which, if so instructed by the Engineer, shall be set aside and re-used as sub-base material.

(b)  New material which shall conform to the requirements of

i) Clause 3.2.1 of SABS 1200 ME for the Subbase

ii) Clauses 3.2 and 3.3 of SABS 1200 MF for the Base course

iii) Clause 3.2.2 of SABS 1200 ME for the Gravel Wearing Course

PSDB 5.1.3: Accommodation of traffic and access to properties

Add the following to item (b):

“The Contractor shall at all times provide and allow pedestrian and vehicular access to properties within or adjoining or affected by the area in which he is working. In this respect The Contractor’s attention is drawn to clause 20 of the General Conditions of Contract. The Contractor shall at all times, wherever possible keep open and maintain all existing roads on or about the site that may be affected by his/her operations in connection with the contract, and he shall construct and maintain, to the satisfaction of the Engineer, temporary access roads and steel or timber bridges over excavations in roads, pavements, entrances or access to properties. Temporary pedestrian access bridges shall be at least 1.2 m wide and temporary access bridges for vehicles shall be at least 3.6 m wide. All temporary access bridges shall be fitted with handrails as well as protective mesh fencing on both sides.

On completion of the work, The Contractor shall dismantle and remove all such temporary construction and reinstate these areas to their former condition. Full compensation for providing access to properties, excluding temporary access bridges, shall be included in the rate tendered for item PSA 8.9.”
Add the following subclause:

**PSDB.5.4: Excavation**

Add the following:

“Trenches shall be of such a depth that the minimum cover shall be as indicated on the drawings. At road crossings the minimum cover for all services shall be 1 000 mm.”

**PSDB.5.6: Backfill**

**PSDB.5.6.3: Disposal of soft excavation material**

Replace the contents of this subclause with the following

“Surplus excavated material from the trench shall be used as fill if suitable or shall be disposed of at an approved site provided by The Contractor.”

**PSDB.5.7: Compaction**

Add the following:

“Where pipelines cross existing gravel roads, backfilling shall be carried out as specified in subclause 5.7.2 and payment therefore will be made under subitem 8.3.3.3.”

**PSDB.8: MEASUREMENT AND PAYMENT**

**PSDB.8.3.2(b): Extra over item (a) above for:**

Add the following subitems:

“(3) Backfill stabilised with 5% cement where directed by the Engineer  
Unit: m³

(4) Soilcrete backfill where directed by the Engineer  
Unit: m³
The tendered rate for subitem (3) shall include full compensation for supplying the cement and for selecting, mixing, backfilling and compacting the stabilised material to 90% of modified AASHTO density.

The tendered rate for subitem (4) shall include full compensation for supplying the cement and for selecting, mixing and placing the soilcrete as well as for the cost of shuttering if required.”

PSDB.8.3.3.3: Compaction in road reserves

Replace the heading of this subitem with the following:

“PSDB.8.3.3.3: Compaction in road crossing”

Replace the sentence, “The volume will be measured as specified in 8.2.2, 8.2.3 and 8.3.3.1 with the following:

“In the case of gravel roads, the volume will be measured from the underside of the gravel wearing course to the top of the fill blanket, and in the case of bitumen roads, from the underside of the subbase to the top of the fill blanket.

The rest of the trench shall be backfilled as specified in clauses 5.9.3, 5.9.4 and 5.9.5, as applicable, and payment will be made under item 8.3.6.1.”

PSDB.8.3.4: Overhaul

Delete this item.

No overhaul will be paid for material in terms of this contract and costs for transporting material shall be included in the applicable tendered rates and amounts.

Add the following:

“PSDB.8.3.8: Provision of temporary bridges for maintaining access to properties

(a) Temporary pedestrian bridges ............................................................ .Unit: number
(b) Temporary vehicular bridges ................................. Unit: number

The unit of measurement shall be the number of temporary pedestrian and vehicular bridges actually provided in accordance with the Specifications.

The tendered rates shall include full compensation for the supply, first installation, maintenance and final dismantling and removal of the temporary access bridges when no longer required, as specified in Subclause PSDB 5.1.3. No distinction shall be made between temporary pedestrian and temporary vehicular bridges for payment purposes.

PSDB.8.3.9: Moving of temporary bridges as necessary during contract:

(a) Temporary pedestrian bridges ................................. Unit: number
(b) Temporary vehicular bridges ................................. Unit: number

The unit of measurement shall be sum charged by The Contractor to move or relocate the bridges during the whole of the contract. The number of relocations will not be paid for separately but The Contractor will receive one lump sum figure for the total number of relocations.

The tendered rates shall include full compensation for the total number of relocations."

**PSDM: EARTHWORKS (ROADS, SUBGRADE)**
(Applicable to SABS 1200 DM)

**PSDM 3: MATERIALS**

PSDM 3.2.3: Selected layer

Replace the contents of this subclause with the following:

The following requirements shall apply in respect of the selected layer/material/gravel wearing course/capping material:

(a) Unstabilized layers:
   (1) Gravel wearing course, Min CBR 45 at 95% MOD AASHTO
   (2) Selected Subgrade, Min CBR 15 at 95% MOD AASHTO
PSDM 5: CONSTRUCTION

PSDM 5.2.2.3: Use of material

"(e) Commercial sources

The provisions of subclause PSD 5.2.2.5 of SABS 1200 D as amended shall apply."

PSDM 5.2.3.2: Removal of unsuitable ground

Replace the second sentence of paragraph (a) with the following:

"The excavated spaces shall then be backfilled with approved imported material compacted to the required density."

Add the following sentence to paragraph (b):

"Unsuitable excavated material will be paid for as cut to spoil."

PSDM 5.2.3.3: Treatment of roadbed

Add the following:

“After reducing levels to roadbed level the top 150mm of subgrade is to be scarified and watered to the required O.M.C and then compacted to minimum 93% mod. AASHTO in the case of material other than sand, 100% in the case of sand.”

PSDM 8: MEASUREMENT AND PAYMENT

"PSDM 8.3.17 Extra over items 8.3.4 and 8.3.5 for obtaining material from commercial sources ................................................................. Unit: m³

The tendered rate shall include full compensation for the additional cost of finding a suitable source of material, for procuring the material and paying all royalties or other charges to the owner of the source, for transporting the material to the point of use regardless of the distance hauled and for excavating intermediate, hard or boulder material as required.
"PSDM 8.3.18 Final finishing and cleaning up- of the site of the works

The tendered sum shall include full compensation for the clearing, disposal of material, finishing, tidying and all other work required to finish and clean up the site of the works and affected areas by removing excess earth, stones, boulders, debris and other waste material, by clearing stormwater inlets and outlets and pipe barrels, by clearing the surfacing of all dirt, mud and foreign material, and by neatly finishing off all junctions, intersections and kerbing.

All material resulting from the finishing operations shall be disposed of to a spoil site furnished by The Contractor.

The tendered rate shall make provision for the reinstatement of existing driveways "to their original condition where these have been affected by the works, as these items will not be measured and paid for separately."

**PSG: CONCRETE (STRUCTURAL)**

(Applicable to SABS 1200 G)

**PSG 3: MATERIAL**

PSG 3.1: Concrete Material

The Contractor is advised to make his/her own arrangements on site with regard to crushed stone, sand and cement. The Engineer must approve in writing, aggregate that is to be used. Cement used for construction purposes of the permanent works shall be of Ordinary Portland Cement.

PSG 3.2.3 Cement Storage

Add to the Sub-Clause:

OPC and PFA shall not be kept in storage for longer than 4 weeks without the Engineer's permission.

**PSG 5 CONSTRUCTION**

PSG 5.5.1.6: Prescribed Mix Concrete and placing of concrete
The required grade of concrete will be shown on the drawings. The Contractor shall arrange for his/her own mix design to obtain the required component proportions for the relevant prescribed concrete strengths.

No concrete shall be placed directly on or against the excavation. All areas, where fresh concrete comes in direct contact with the soil, shall be covered with 150 micron plastic sheeting before concrete is placed. The costs for the plastic sheeting shall be included in the tendered rate for the prescribed concrete.

PSG 5.5.10: Concrete Surface

Concrete surfaces shall generally be smooth finish. All exposed surfaces shall be wood-floated unless otherwise specified. The cost of wood floating shall be deemed to be included in the rates for concrete.

PSG 5.1.3: Reinforcement

Concrete cover shall be as shown on the drawings, but not less than 30mm.

PSG 5.2.1: Formwork

All exposed concrete corners and edges shall have a 25 mm x 25 mm chamfer. The unit rates tendered for formwork shall include for the provision of such chamfers.

PSG 5.5.1.5: Durability

The exposure conditions of the manholes and pump stations’ concrete are classified as "severe".

PSF 5.5.3.2: Ready – mixed concrete

"Ready-mixed concrete may be used on the Site. The Contractor shall take samples for testing from every load delivered to the Site."

PSG 6 TOLERANCES
PSG 6.2: Permissible Deviations

Degree of accuracy II shall be applicable. Every specified permissible deviation is binding in itself. The cumulative effect of permissible deviations will not be considered.

PSG 7 TESTS

PSG 7.2.3 Laboratory Testing

Add to the Sub-Clause:

Should The Contractor not have a certified concrete cube-testing machine, then he must have the cubes tested at an approved laboratory. The rate for structural concrete shall cover the cost of sampling, storing, transporting (in an acceptable manner) and testing of the cubes. The frequency for testing the crushing strength on the structural components of the manholes shall be 1 set of 6 cubes from each concrete operation or 50m³ concrete placed, whichever is less. Cubes to be submitted to an approved materials laboratory for testing, (3 cubes each for 7 and 28 day testing respectively). Test results obtained from the supplier of ready-mix concrete will not be accepted for evaluation terms but samples for testing, shall be taken of such concrete at the point of placing.

PSG 8 MEASUREMENT AND PAYMENT

PSG 8.1.2 Reinforcement

Replace the contents of this subclause with the following.

"The unit of measurement for steel bars shall be the ton of reinforcement in place, in accordance with the drawings or as authorised by the Engineer.

The unit of measurement of welded steel fabric shall be the kilogram of fabric reinforcement in place, and the quantity shall be calculated from the net area covered by the mesh, excluding overlaps.

Clips, ties, separators, stools and other steel used for positioning reinforcement will not be measured, unless these are shown on the bending schedules."
The tendered rate shall include full compensation for the supply, delivery, cutting, bending, welding, placing and fixing of the steel reinforcement, including all tying wire, stools, supports and waste.”

**PSLB: BEDDING (PIPES – WATER MAINS, SEWER PIPES AND DUCTS)**

(Applicable to SABS 1200 LB)

**PSLB 3: MATERIAL**

**PSLB 3.3: Bedding Materials**

Unplasticised polyvinyl chloride (uPVC) and high-density polyethylene (HDPE) pipes are to be regarded as flexible pipes, and asbestos cement pipes are to be regarded as rigid pipes for this contract. Refer to Dwg No. LB1 & LB2 (SABS 1200 LB) for details.

No hard lumps or stones shall be used or part of the bedding material and selected fill blanked up to 300 mm above the top of the pipe, i.e. the position of the warning tape.

Where no suitable bedding materials is available from the trench excavations along the route, The Contractor will have to obtain material from the surrounding area or off site.

**PSLB 6: TOLERANCES**

**PSLB 6.2: Compactibility Factor**

Details of the method to be used in determining the Compactibility Factor are given in SABS 0120 Part 3 Section LB, but for The Contractor's benefit the relevant section of the SABS are given below:

4.4 Test for suitability of Material for use as a selected Granular Material as Bedding for pipes

4.4.1 Grading

Obtain a representative sample of the material as follows:

Heap about 40 kg of the material on a clean surface, mix it thoroughly, divide it into two parts of approximately equal size, and discard one part. Repeat the mixing, division and discarding
procedure until a sample of a mass of 2.5 kg is obtained.

Wash a representative sample through 3 sieves of nom. operative size respectively 37.5 mm, 19 mm and 0.6 mm.

a) any particles retained on the 37.5 mm sieve of;
b) more than 5% by mass of the sample is retained on the 0.6 mm sieve; or
c) less than 95% by mass of the sample is retained on the 0.6 mm sieve, regard the material as suitable for use in bedding.

4.4.2 Compactibility Test

4.4.4.2 Apparatus

a) Cylinder. An open-ended cylinder of length approximately 250 mm and nom. internal dia. 150
   mm.
   b) Rammer. A metal rammer of mass approx. 1 kg and having a face dia. of ± 38 mm.
   c) Rule. A steel rule graduate in mm.

4.4.4.3 Procedure

a) Obtain a representative sample as follows:

Heap about 160 kg of material on a clean surface, mix it thoroughly, divide it into two parts of approximately equal size and discard one part. Repeat the mixing, division, and discarding procedure until a sample of mass ± 10 kg is obtained. Ensure that the moisture content of the sample is approximately the same as that of the main body of bedding material at the time that it will be used in the trench.

b) Place the cylinder on a flat surface and gently pour the sample into it, taking care not to compact the material in any way. Strike off the top surface of the material level with the top of the cylinder, and remove all surplus material from the flat surface. Lift the cylinder up clear of its contents and place it on a fresh area of the flat surface.

c) Return about one quarter of the sample material to the cylinder and tamp vigorously until no
further compaction can be obtained. Repeat this procedure with each of the other quarters, adding each, in turn, to the material in the cylinder and tamping the final surface as level as possible.

d) Measure the distance from the level of the compacted sample to the top of the cylinder and record this distance divided by the height of the cylinder as the Compatibility Factor of the bedding material.

4.4.4.4 Evaluation of Results

<table>
<thead>
<tr>
<th>Compatibility Factor</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to and including 0.1</td>
<td>Material suitable for bedding</td>
</tr>
<tr>
<td>Over 0.1 up to and including 0.4</td>
<td>Material suitable (except for flexible pipes that may be subjected to waterlogged conditions after laying), but requires extra care in compaction.</td>
</tr>
<tr>
<td>Above 0.4</td>
<td>Material unsuitable</td>
</tr>
</tbody>
</table>

**PSLB 8: MEASUREMENT AND PAYMENT**

**PSLB 8.2.1: Provision of Bedding**

The rate shall cover the cost of acquiring such bedding materials (each of which shall comply with the applicable requirements of SABS 1200 LB), delivering it to points alongside the trench, place it to suit The Contractor’s method of working and of disposing of any material displaced by any importation.

The rate shall apply to any material regardless of whether The Contractor acquires the bedding materials by selection from excavated materials alongside the trench or from any source off site. The Contractor’s rates for the provision of bedding material shall include the costs of importing the material irrespective of the haul distance to the respective sites, royalties and incidentals as the case may be.
PSLD: SEWER PIPES
(Applicable to SABS 1200 LD)

PSLD3: MATERIAL

PSLD 3.1.3 Pipes

Add to the Sub-Clause:

uPVC pipes shall be the heavy duty structured walled with a wall stiffness of 400kPa and shall comply with the relevant requirements of SABS 791-1976.

PSLD5: CONSTRUCTION

PSLD 5.2 Laying and Bedding

Add to the Sub-Clause:

Notwithstanding the requirements of Sub-Clause 5.2, The Contractor shall, prior to the construction of any sewers, prepare and lay a trial section for inspection by the Engineer. The trial section shall be at least 30 m long and shall include at least two adjacent completed manholes and a property connection. Such trial section shall be approved by the Engineer before authority is granted to proceed with the laying of any further sections.

PSLD 7: TESTING

PSLD 7.1.6 Testing of pipe network

Add the following:

All sewer lines are to be subjected to the specified air test.

The sewer shall be tested between manholes or chambers, as applicable. The section of the sewer under test shall be suitably "plugged" at the open ends and erf connections using plugs or stoppers which have been braced adequately.
Testing will be conducted after bedding and cradle have been completed but prior to backfill. It is The Contractor’s responsibility to ensure that the relevant equipment is available on site and in a working condition.

Testing will commence as soon as the first pipes have been laid and will be continue for the duration of the project.

The Water Test will not be acceptable under this Contract.

**PSLD 8 MEASUREMENT AND PAYMENT**

**PSLD 8.2.11 Connection to Existing Sewer**

The Tendered rate shall include full compensation for excavation, for accommodating the existing sewage flow, installing new pipes in the new opening, for breaking out and modifying to suit the new pipe layout, ensuring the water tightness of the new connection, supplying all the necessary materials, removing surplus material and debris, all labour and equipment required to make the connection, for carrying out the work under live conditions, and liaison with the local authorities.

**PSME: SUBBASE**

(Applicable to SABS 1200 ME)

**PSME 3 MATERIALS**

**PSME 3.2.1 Subbase material**

Add the following:

“Material for the selected subgrade shall be G6 quality imported from an approved off-the-site source, with CBR 25 at 95% Mod AASHTO. Material for the sub-base is to be obtained from a borrow pit (approximately 5km from the site). The cost of locating the borrow pit, opening, closing, testing, selecting, excavating, stockpiling, loading, watering, mixing and compacting the material as specified and transporting for the freehaul distance shall be deemed to have been included in The Contractor’s rates as supplied in the Bill of Quantities.”
PSME 3.2.2 Gravel wearing course

Add the following:

“Material for the gravel wearing course shall be G5 quality imported from an approved off-the-site source, with CBR 45 at 95% Mod AASHTO. Material for the wearing course is to be obtained from a borrow pit (approximately 5km from the site). The cost of locating the borrow pit, opening, closing, testing, selecting, excavating, stockpiling, loading, watering, mixing and compacting the material as specified and transporting for the freehaul distance shall be deemed to have been included in The Contractor’s rates as supplied in the Bill of Quantities.”

PSME 5 CONSTRUCTION

PSME 5.7.1 Freehaul

Replace the contents of this subclause with the following:

“All haul will be regarded as freehaul.”

PSME 5.7.2 Overhaul

Replace the contents of this subclause with the following:

“No overhaul will be paid on this contract; all hauling shall be regarded as free haul. The tenderer should include the haulage of materials in his/her rates.”