



C3.3: PROJECT SPECIFICATIONS

AMENDMENTS TO THE STANDARD AND PARTICULAR SPECIFICATIONS

In certain clauses in the standard, standardized and particular specifications, allowance is made for a choice to be specified in the project specifications between alternative materials or methods of construction, and for additional requirements to be specified to suit a particular contract. Details of such alternative or additional requirements applicable to this contract are contained in this part of the project specifications. It also contains the necessary additional specifications required for this particular contract.

The number of each clause and each payment item in this part of the project specifications consists of the prefix PS followed by a number corresponding to the relevant clause or payment item in the standard specification.

The number of a new clause or payment item, which does not form part of a clause or a payment item in the standard specifications and which is included here, is also prefixed by PS, but followed by a new number which follows on the last clause or item number used in the relevant section of the standard specifications.

PART A: GENERAL

A1 SERVICES

Provision is made in the bill of quantities for payment for searching and exposing of known or unknown services.

PS2 PROGRAMME OF WORK

(a) General requirements

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

In compiling the programme of work, the contractor shall indicate and make due allowance for the following:

- a. Civil works as per the tender drawings, Bill of Quantities and Scope of Works;
- b. Electrical Contract. For the Electrical contractor, a provision of 22 months from appointment to successful completion of the 28-day Trial Operational Period must be provided. Thereafter the civil contractor and the Electrical contractor will be involved with the 2-months operation and training period.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



PS3 WORKMANSHIP AND QUALITY CONTROL

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

The Employer's Agent shall, for the purpose of acceptance control on products and workmanship, assess test results and measurements.

Where small quantities of work are involved, a lot shall mean a full day's production for a specific item of work subject to acceptance control testing.

PS4 PAYMENT

(b) Rates to be inclusive

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

(e) Materials on the site

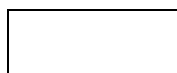
In addition, the Employer's Agent may at his sole discretion also allow payments under "Materials on Site" in respect of any construction materials if stored off-site providing that:

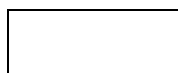
- (a) The site selected for this purpose is approved by the Employer's Agent;
- (b) Such land is physically separated from any production plant or operation;
- (c) Only materials for use under this contract is stockpiled on such land;
- (d) The contractor has provided proof of an agreement with the owner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

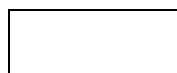
(f) Payments Certificates

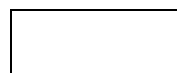
With reference to Sub-Clause 6 of the General Conditions of Contract, the Employer's Agent's certificate will be issued only after receipt by him of a draft certificate prepared by the Contractor in the form prescribed by the Employer's Agent.

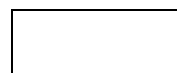
The cost of duplicating and delivering copies of the Employer's Agent's Certificate to the Contractor, the Employer's Agent and the Employer shall be borne by the Contractor. A total of three copies of the certificate (A-4 size) will be required by the Employer's Agent and the Employer.

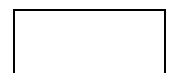

Tenderer


Witness 1


Witness 2


Employer


Witness 1


Witness 2



PS4 EXTENSION OF TIME RESULTING FROM ABNORMAL RAINFALL

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

- a) The Contractor shall, in his programme, allow for the anticipated number of working days on which work could be delayed - as given in the Schedule below.
- b) Extension of time will be calculated for each calendar month or part thereof over the full period for the completion of the Work, plus any approved extension thereof, as follows:
 - i) A delay caused by abnormal rainfall will only be accepted for extension of time if, in the opinion of the Employer’s Agent, it delays an item or items which lie on the critical path determined by the Contractor’s programme. Only delays on working days will be considered;
 - ii) Abnormal rainfall will be days, as approved, on which rain delayed operations, less the anticipated number of days given in the Schedule below;
 - iii) The net extension of time determined for each month, which may be negative, shall accumulate algebraically to determine the net number days for extension of time due to abnormal rainfall, but a negative total at the end of the construction period will not be considered;
 - iv) Where a portion of a month is involved, a pro rata number of days shall be calculated.

SCHEDULE:

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

Month	Days	Month	Days
January	6		
February	9		
March	3		
April	2		
May	2		
June	1		
July	0		
August		0	
September	0		
October		1	
November	2		
<u>December</u>	<u>5</u>		
Total	31		

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



Project No: 185487

**KING MABHOKO AND GOGO ESTHER MAHLANGU ROAD
IN DR JS MOROKA LOCAL MUNICIPALITY. (RE-ADVERT)**

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



PART B PROJECT SPECIFICATION

PSA GENERAL (SABS 1200 A)

PSA 1 STANDARDISATION MARK (CLAUSE 3.1)

Add the following to the Clause:

All material delivered to the site shall bear the Official Standardization Mark.

PSA 2 CONTRACTOR'S CAMP (CLAUSE 4.2)

PSA 2.1 Restrictions on employee accommodation (Sub-clause 4.2)

No housing is available for the Contractor's employees. The Contractor shall make his own arrangements to house his employees.

The Employer shall place an area at the disposal of the Contractor to enable him to erect his site offices, workshops and stores. Any temporary housing and facilities shall comply with the requirements of the local authority. The Contractor shall provide his own fencing and site security.

PSA 3 DEALING WITH WATER (SUBCLAUSE 5.5)

In addition to the items as set out in Subclause 5.5 the contractor shall also provide pumping equipment, pipes and other equipment as may be necessary.

PSA 4 MEASUREMENT AND PAYMENT

PSA 4.1 Fixed charge and Value Related Items (Sub-clause 8.2.1)

Replace the sub-clause with the following:

Payment shall be a lump sum to provide for the Contractor's expenses in connection with:

- (a) setting up and maintaining his organisation, camps and plant on the site;
- (b) effecting the insurances and indemnities required in terms of the General Conditions of Contract
- (c) meeting all other general obligations and liabilities which are not specifically measured for payment in these contract documents.

The lump sum total of items (a), (b) and (c) as measured and Fixed Charge Items and time Related Items shall not exceed 15% of the nett total Tender Amount. If the Tenderer should tender a higher amount for this item it shall be reduced to the amount allowed above and all other tendered prices increased in the proportion required to retain the same Nett Total Tender Amount.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



The tendered lump sum shall not be subject to any variation if the actual value of work done under the Contract exceeds, or falls short of, the Tender Amount, or as a result of an extension of time for completion in terms of Clause 5.12 of the General Conditions of Contract.

Any payment made under this item shall not be taken into account when determining whether the value of a certificate complies with the "minimum amount of monthly certificate" laid down in the Appendix.

Before any payment is made under this item the Contractor shall satisfy the Engineer that he has provided on site an establishment and plant of good quality and in value exceeding that of the first installment. The Contractor may be asked to furnish documented proof that he owns the offices and plant on site, the value of which should exceed the amount claimed in the first certificate. In the event that the Contractor cannot satisfy the Engineer as to the value or ownership, the Engineer shall have the right to withhold part of any payments to be made under this item, until the Works have been completed.

Payment of the lump sum shall be made in three separate installments as follows:

- (a) The first installment, 50% of the lump sum, will be paid in the first payment certificate after the Contractor has met all his obligations under this sub-clause and has made a substantial start on construction in accordance with the approved programme.
- (b) The second installment, 35% of the lump sum, will be paid when the value of the work done reaches one half of the Nett Total Tender Amount.
- (c) The third and final installment, 15% of the lump sum, will be paid when the works have been completed and the Contractor has fulfilled all requirements of this sub-clause. No payment for the scheduled Fixed Charge Items for this contract will not be made until the requirements regarding and the erection of name boards have been met.

PSA 4.2 Time-Related Items (Sub clause 8.2.2)

Replace this sub clause with the following:

Subject to the provisions of 8.2.3 and 8.2.4, payment of item 8.4.1 (time-related item) will take place in equal monthly amounts, calculated on the tendered amount for the item, divided by the contract period in months, with the understanding that the total of the monthly payments which was paid for this specific item does not exceed the proportion that the progress of the works to date bears in relation to the works as a whole.

Should the Engineer grant an extension of time, the Contractor is entitled to an increase in the amount tendered for time related items, and this increase must be kept in the same proportion to the original tender amount as the extension of time is to the original time of the completion of the works.

[Signature Box]

Tenderer

[Signature Box]

Witness 1

[Signature Box]

Witness 2

[Signature Box]

Employer

[Signature Box]

Witness 1

[Signature Box]

Witness 2



Payment for such increased amounts will be considered as full compensation for all time related, provisional and general costs which arise as a result of the extension of time.

PSA 4.3 Facilities for Engineer (Sub clause 8.3.2.1)

Change the item descriptions of the following items as follow:

PSA 4.3.1 Item:

a) Engineer's office

Unit: sum

The specifications for the items listed below should be provided in accordance with the "Facilities provided by the Contractor" in C3.1 Scope of Works:

The tendered sum shall provide for the following:

Provide the following units:

- 2 x Airconditioned Offices (minimum 10 m²)
- 1 x Airconditioned Boardroom (minimum 20 m²)
- 1 x Kitchen (7 m²)
- 2 x WC units (male and female)
- 6 x carports with crushed stone floor

Note that the areas surrounding the units in the Engineer's camp must be covers with gravel as specified in Section C3.1 Scope of Works

The Boardroom shall each be furnished with the following:

- Air conditioner
- 1 x conference table to seat 20 people
- 20 x new chairs
- White board mounted to wall (Minimum 1.2 x 2m)
- 1 x 10 kg Fire Extinguisher

The office shall be furnished with:

- Air conditioner
- 2 x office desks and 2 x chairs
- 1 x drawing table

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



- 2 x steel cabinets
- 1 x A1 drawing rack
- 1 A4/A3 Colour laser printer/Scanner/Copier
- 1 x 10 kg Fire extinguisher

The kitchen shall be furnished with:

- 2 Min 300 l fridge/freezer combination fridge
- Microwave of min 36 l and 1 000 W
- Cordless kettle
- 2 x 1.8 m steel folding table
- A set of 12 x each of knives, forks, spoons and teaspoons
- A set of 12 x each of white ceramic crockery including dinner plates, side plates, bowls, coffee mugs, tea cups and saucers
- A set of 24 x beer glasses
- 1 x large wooden cutting board
- 1 x kitchen knife set in knife block which includes at least a large carving knife, bread knife, medium knife, pairing knife and kitchen scissors
- 2 x braai tongs
- 1 x meat casserole with lid
- 1 x 10 kg Fire extinguisher

The contractor must supply the following equipment:

- New Dumpy Level and Staff
- New Dynamic Cone Penetrometer (DCP)
- Measuring wheel with electronic display
- Rain gauge
- 2 x 1m spirit level
- 2 x First Aid Kit

The contractor will provide the following additional services

- Uncapped WIFI coverage for the offices and boardroom (min 6 mbs speed)

PSA 4.3.2 Item:

c) Name board Unit: sum

The tendered sum shall provide for two contract nameboards as specified by the detail drawings.

PSA 4.4 Exposing of existing services

Add the following new pay item:

PSA 4.4.1 Item:

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



(m³) Excavation by hand in all materials to expose existing services Unit: cubic meter

The tendered sum must include full compensation for all hand excavation as per the dimension approved by the Engineer for the locating, exposing and moving of existing services. Excavation outside of approved dimensions will not be paid. The rate must also include for backfill and compaction to 90% of mod AASHTO density and, if applicable, the removal of excess material not used for backfill, the securing of excavations, for handling surface and subsurface water, for protection of existing services and for any other activity necessary to complete the work. Free haul of 1,0 km will be applicable on the transport of excess material.

No distinction will be made between classes of material or types of services.

Note: The Contractor must provide sufficient supervision over labourers when services are exposed.”

PSA 4.5 Occupational Health and Safety

Add the following new pay items:

Provision for the cost related to the Occupational Health and Safety Act, 85 of 1993, and the relevant Regulations:

- a) Preparation of a Health & Safety Plan. Unit: Sum
- b) Compilation of a Risk Assessment prior to Construction. Unit: Sum
- c) Health & Safety induction Training of employees. Unit: Sum
- d) Compilation and keeping up to date the Health & Safety file which shall include all documentation required in terms of the act. Unit: Sum
- e) Implementation of the Health and Safety Plan over the entire construction period. Unit: Sum

The tendered sum shall include full compensation for providing the above services as required from the Occupational Health & Safety Act. The rate shall include all related costs incurred by the Act, remuneration of personnel, trainers, etc. and equipment required for the execution of the required services as depicted by the Act. The tendered amount for items a, b, c, d and e shall only be paid on the successful completion of the task as approved by the client. The tendered amount for item shall be paid on a monthly basis.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



PSA 4.6 SUMS STATED PROVISIONALLY BY THE ENGINEER

Add the following new pay items:

PSA 4.6.1 Item:

Project Liaison Officer

Unit: Prov Sum

The total cost is for the duration of the project.

PSA 4.6.2 Item:

Project Liaison Committee

Unit: Prov Sum

The total cost is for the duration of the project.

PSA 4.6.3 Item:

Additional laboratory testing

Unit: Prov Sum

PSA 4.6.4 Item:

AS BUILT Survey

Unit: Prov Sum

The rate shall cover the cost for a surveyor to conduct an AS BUILT survey of the works as required by the Clients Agent

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



PSC SITE CLEARING (SABS 1200 C)

PSC 1 GENERAL

The areas where work is to be carried out must be kept clean for the duration of the contract. All rubbish must be removed without delay and the site must be left clean and tidy on completion of the service.

PSC 2 DUMPING SITE

No dumping is allowed on site other than at the designated and approved fill areas. Dumping will only be allowed for filling sinkholes and dolines and may not be detrimental to the natural storm water drainage of the area. Only soil, rock, clean masonry and concrete rubble may be dumped in the designated dump areas.

PSC 3 REMOVAL OF TREES

No trees may be removed without written permission from the Engineer.

PSC 4 MEASUREMENT AND PAYMENT

PSC 4.1 Item:

Clear & Grub (Clause 8.2.1)

Unit: ha or m or km

Add the underlined text to the second sentence of the item description to read as follow:

“The rate shall cover the cost of clearing the surface, removing boulders of size up to 0,15 m³, grubbing of trees and tree stumps (except large trees (**with girth over 1m**) and stumps as specified in 8.2.2 below), cutting of trunks and branches exceeding 0,5m **up to 1,0m** in girth into transportable lengths.....”

Add the following to the pay item description:

“The rate shall include for transport and disposal of material and debris to unspecified site and disposal thereof.”

“The area (in ha) shall comprise the entire site to be cleared and grubbed within the limits to be indicated by the engineer on site in writing.

The area of clear and grub measured in linear meter (or km) shall be the sections outside the initial cleared area (measured in hectares), specifically applicable to pipeline routes outside the original cleared site area. The width and length shall be indicated by the engineer on site in writing.”

[Signature Box]

Tenderer

[Signature Box]

Witness 1

[Signature Box]

Witness 2

[Signature Box]

Employer

[Signature Box]

Witness 1

[Signature Box]

Witness 2



PSD SABS 1200 D: EARTHWORKS

PSD 1 MATERIALS (CLAUSE 3)

PSD 1.1 Classification (Clause 3.1)

Notwithstanding the provisions of Sub-clause 3.1 of SANS 1200 D, the unit rate for excavation shall cover excavation in all materials other than hard rock.

PSD 2 CONSTRUCTION (CLAUSE 5)

PSD 2.1 Excavations (Subgrade Preparation) (Sub-clause 5.2.2)

The Contractor shall allow 6 weeks in his programme for when bulk excavation has been completed for the Engineer to review the founding conditions and to instruct the Contractor to commence with soil improvement and implement these soil improvements, if required, before commencing with construction activities.

Bulk and restricted excavations shall be taken down to the underside of the concrete blinding layers for the various structures. After the earthworks operations have been carried out, the surface shall be watered so that the top 300mm is at optimum moisture content, and this layer shall then be compacted to 100% Mod AASHTO density. The subgrade shall then be carefully levelled and prepared to receive the concrete blinding. Surplus excavated materials shall be removed and spoiled as indicated by the Engineer. Payment for preparation of subgrade and compaction shall be included in the rate for excavations.

PSD 2.2 Excavation for working space (Sub-clause 5.2.2.1 b) and c)

Add the following to the clause:

Other than for the sides of strip or pad footings or where specifically authorized by the Engineer, no concrete shall be placed against the sides of excavations.

For external concrete faces below ground level, (other than concrete placed against the sides of excavations as above) the Contractor shall over-excavate to provide sufficient working space for the erection of formwork.

Tenderers shall allow in their rates for excavation for any over-excavation required for working space.

Excavation volumes for structures will be calculated as the nett volume of the structure below ground level after general site excavations have been completed. No additional payment shall be made for working space.

All water retaining structures shall be shuttered externally on vertical and on other faces inclined within 45° from the vertical.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



PSD 2.3 Inspection (Sub-clause 5.2.2.1 d))

Add the following to the clause:

Excavation to final level soil improvement, ready to achieve a binding layer or concrete footing, shall be completed less than 24 hours before such layer or footing is cast.

The Contractor shall arrange for the inspection by the Engineer or his Representative of all surfaces immediately before casting concrete.

PSD 2.4 Over-excavation to sides of excavation (Sub-clause 5.2.2.1 e))

Add the following to the clause:

Where the sides of excavations are over-excavated to establish safe slopes, provide access to excavations, or for other purposes not specifically required by the Engineer, such over-excavation shall be backfilled with material as required by the Engineer and compacted to a minimum density of 95% Mod AASHTO.

No separate payment will be made for this work.

PSD 2.5 Over-excavation (Sub-clause 5.2.2.1 e))

Add the following to the clause:

If the material in the bottom of an excavation is loosened, or if there is any over-excavation, any loose or disturbed soil shall be removed, and the over-excavation shall be replaced by mass concrete mix 15 MPa.

No separate payment will be made for replace over-excavation with concrete. No separate payment will be made for over excavation as defined in PSD 2.4 and PSD 2.5.

PSD 2.6 Trimming of surface of bulk earthworks (add the following sub-clause 5.2.2.1 f))

Where blinding, mass or structural concrete is to be cast or where precast elements are to be placed on surfaces established by bulk earthworks, the Contractor shall:

- a) Arrange his bulk excavation operation so that over-excavation is avoided, taking into account the requirements in PSD 2.4.
- b) Over-fill embankments while placing fills as necessary to allow for trimming and arrange his compaction operations to ensure that the specified density is achieved throughout the finally trimmed embankment; and
- c) Shortly before casting concrete or placing precast elements, carefully remove the final layer and trim such surfaces to the design levels and profiles within Grade II degree of accuracy.

PSD 2.7 Disposal of surplus material (Sub-clause 5.2.2.3)

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



Add the following to the clause:

All surplus material from bulk excavation for concrete units and for pipework shall be dumped, leveled and spread on site at the areas as indicated by the Engineer. No dumping shall be undertaken prior to obtaining detailed instructions from the engineer.

PSD 2.8 Freehaul (Sub-clause 5.2.5.1)

Replace the sub-clause with the following:

All haul within the site of works or within a distance of 1.0 km outside the extremities of the boundaries of the contract as indicated on the drawings shall be regarded as freehaul.

**PSD 3
MEASUREMENT AND PAYMENT (CLAUSE 8)**

PSD 3.1 Restricted excavation (add the following to sub-clause 8.3.3)

Add the following to this item:

The volume of restricted excavation will be calculated from the net plan dimensions and the difference between the original ground profiles (or terraces), and the blinding layer (or no-fines) levels shown on the drawings. On the sides, the volume will only be calculated to the outside dimensions of the concrete structures. No additional payment will be made for the provision of working space, although it will be provided.

PDS 3.2 Additional Lateral Support / Shoring (Sub-clause 8.3.7)

The contractor must at all times ensure that excavations are safe to work in. Should the excavations exceed 2 meters and appear unstable shoring must be installed. Allowance in the Bill of Quantities has been made for shoring. No claims for extension of time, additional costs or damages for doing shoring will be entertained.

The unit in the Bill of Quantities is m².d. the Contractor shall submit his shoring design proposal to the Engineer for approval. The unit rate shall cover the product of the surface area of the shoring and the number of days it is required.

PSDB SABS1200DB: EARTHWORKS - PIPE TRENCHES

PSDB 1 CONSTRUCTION

PSDB 1.1 Freehaul Distance

All haul within the site of works or within a distance of 1.0 km outside the extremities of the boundaries of the contract as indicated on the drawings shall be regarded as freehaul.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



PSDB 2 MEASUREMENT AND PAYMENT

PSDB 2.1 Dewatering (Sub clause 8.1.1)

Add the following to this item:

The scheduled rates for excavation shall include dewatering of trenches.

PSDB 2.2 Excavations (Sub clause 8.3.2b)

Replace the clause with the following:

Extra-over item:

Only two types of excavations are defined and paid for under this contract. These items are soft excavation and hard rock excavation. No intermediate excavations will be paid for. Hard rock excavations qualifies when blasting or mechanical breaking are applied to break the rock.

PSDB 2.3 Shoring (Sub-clause 8.3.4(a))

The contractor must at all times ensure that excavations are safe to work in. Should the excavations exceed 2 meters and appear unstable shoring must be installed. Allowance in the Bill of Quantities has been made for shoring. No claims for extension of time, additional costs or damages for laying pipes in shored trenches will be entertained.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



PSG SABS 1200 G: CONCRETE (STRUCTURAL)

PSG 1 SCOPE OF WORKS

This specification covers the construction of all structural concrete elements.

PSG 2 MATERIALS (CLAUSE 3)

PSG 2.1 Concrete

PSG 2.1.1 Cement (Sub-clause 3.2.1)

Add the following to the sub-clause:

The type of cement to be used for concrete structures shall be approved by the Engineer.

PSG 2.1.2 Storage of cement (Sub-clause 3.2.3)

Add the following to the sub-clause:

Cement shall not be kept in storage for longer than eight weeks without the Engineer's permission.

Cement which has been damaged in any way or which has been stored on site for a period exceeding three months shall be condemned and removed from site.

PSG 2.1.3 Aggregates (Sub-clause 3.4)

Add the following to the sub-clause:

Concrete with reactive aggregates:

The Contractor shall supply a test certificate for the aggregate confirming that it is not reactive.

With each delivery of materials under this clause the Contractor shall supply acceptable written evidence that this clause is being complied with.

PSG 2.1.5 Use of plumbs (Sub-clause 3.4.2)

Add the following to the sub-clause:

The use of plumbs shall not be permitted.

PSG 2.1.6 Admixtures (Sub-clause 3.5)

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



Replace this sub-clause with the following

Admixtures may only be used with the prior approval of the Engineer. No air-retaining properties will be tolerated.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



PSG 2.2 Joint materials (add the following new sub-clause 3.9)

All primers, fillers, sealers, admixtures and breakers shall be suitable for use on potable water.

PSG 2.2.1 Primer

An approved primer, fully compatible with and/or manufactured for the specified jointing and sealing materials shall be applied to the joint surfaces.

PSG 2.2.2 Filler

Fillers shall be closed-cell expanded polyethylene.

Fillers shall be pre-cut to suit the application with a tear-out strip for forming the specified recess for the bondbreaker and sealant.

PSG 2.2.3 Sealer and breaker

The elastomeric sealant shall be a two-pack polyurethane type (gun grade for vertical joints) generally conforming with the physical properties specified in SABS 110, and used with primers as specified above.

The bondbreaker placed immediately prior to application of the sealant shall be a self-adhesive vinyl type (or similar approved material) with a width the same as the joint recess into which it is to be applied.

PSG 3 CONSTRUCTION (CLAUSE 5)

PSG 3.1 Classification of finishes (Sub-clause 5.2.1)

Add the following to the sub-clause:

Concrete surfaces which will be in contact with the natural ground or which will otherwise be covered on completion of the works, shall have a rough finish as specified in sub clause 5.2.1 (a).

Horizontal surfaces and surfaces with a slope not exceeding one vertical to two horizontal shall be finished to a woodfloat finish. For this finish the surface must be given a finish as specified in sub-clause 5.5.10.1 and after the concrete has hardened sufficiently, it shall be floated to a uniform surface free of trowel marks.

The finished concrete surfaces shall be accurate to degree 1 as defined in sub-clause 6.2.

The visible vertical or near vertical surfaces of valve chambers, and culvert head walls or parapets shall be finished to a smooth surface, repaired and rubbed to remove projections.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



The bagging of concrete surfaces to repair defects will not be permitted.

All concrete edges shall be provided with 25 mm x 25 mm chamfers.

[Signature box]

Tenderer

[Signature box]

Witness 1

[Signature box]

Witness 2

[Signature box]

Employer

[Signature box]

Witness 1

[Signature box]

Witness 2



PSG 3.2 Cover (Sub-clause 5.1.3 and 5.5.1.5)

Add the following to the sub-clauses:

The exposure conditions for all structures in the works shall be deemed to be “severe”. The minimum cover to reinforcement shall be 50 mm for water retaining concrete and 50 mm for all other concrete, unless otherwise specified on the Engineers drawings and bending schedules.

PSG 3.2.1 Spacers for reinforcement (sub-clause 5.1.3)

Add the following to the sub-clause:

Spacers of approved design include purpose made precast mortar blocks. No plastic spacer blocks will be allowed.

Where mortar blocks are used, they shall be properly shaped so as not to slip out of position and shall be made of the same mix as the mortar of the concrete in which they are to be placed.

The mortar shall be well compacted by approved means into the moulds to result in blocks with a density of at least 2 300 kg/m³; and which are free from honeycombing. They shall be cured in water for at least seven days. Mortar blocks which have not been manufactured and cured strictly in accordance with these requirements or which are in any other way considered unsatisfactory by the Engineer, will be rejected and shall be removed from the Site.

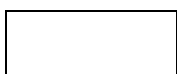
PSG 3.3 Holes, Chases and Fixing Blocks (Concrete Boxouts) (Sub-clause 5.3)

Where pipes are to be cast into concrete, the Contractor shall provide a box-out in the wall and grout the unit in at a later stage. When constructing such a box-outs, reinforcement shall not be cut, but shall run through the opening. Reinforcement shall be cut and/or bent out at a later stage to suit the item being cast in. After installation of the item the remaining reinforcement shall be bent back in position.

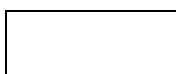
Where box-outs for pipes/specials have been provided in the walls, the Contractor shall be responsible for the grouting in of such pipes/specials regardless of whether or not these have been supplied by himself.

An approved non-shrink grout shall be used for the grouting in of pipes and specials after they have been positioned. The details and method statement are to be submitted to the Engineer for approval prior to the commencement of any grouting. The approval by the Engineer shall not relieve the Contractor from his obligation to provide a watertight joint between the concrete and grout used.

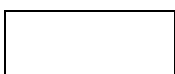
PSG 3.4 Strength concrete (Sub-clause 5.5.1.7)



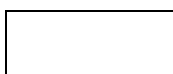
Tenderer



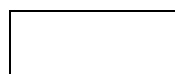
Witness 1



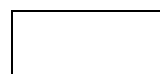
Witness 2



Employer



Witness 1



Witness 2



Add the following sub-clause:

The grade of strength concrete for each portion of the works will be indicated on the drawings and/or specified in the Schedule of Quantities. The grade of concrete will be designated as "Class S/A", where "S" is the characteristic strength in Mpa and "A" is the maximum nominal size of coarse aggregate in mm.

With the exception of mixes weaker than 15 Mpa, all concrete for the Works shall be considered to be strength concrete in terms of Sub-clause 5.5.1.7.

No concrete shall be cast until the mix designs have been approved by the Engineer. The Engineer may call for revised mix designs at any stage during the contract.

Contractor to supply and test 6 No. cube test results for approval prior to commencement of the works.

Unless otherwise specified on the drawings or in the Schedule all structural concrete shall have a strength of 35/19 Mpa.

The concrete to be used on this contract shall be as follows:

- (a) For all water retaining structures (including reservoir roofs), 35/19 MPa. The slump limits shall be 75 mm. The water/cement ratio shall not be greater than 0,5. A waterproofing agent (Crystalline Admix) shall be added as per supplier's specification to a minimum of 1% by weight of cement.
- (b) For all other structures not in contact with water 25/19 MPa concrete.
- (c) For anchor blocks, benching and mass concrete, 20/19 MPa concrete.
- (d) For no-fines concrete 15/19 Mpa concrete
- (e) All sizes of aggregate used shall be 19 mm granite.

These mixes shall be designed for vibration. All data reports prepared by the Institute shall be submitted to the Engineer for information and approval.

DESIGN OF CONCRETE MIX:

The concrete mix design shall be prepared by an approved independent laboratory and submitted to the Engineer for approval. Historical data shall be provided for a similar mix design to the same strength.

The successful Tenderer will be required to submit samples of the fine and coarse aggregate which he proposes using, to an approved laboratory for tests regarding the suitability of such aggregates. The laboratory shall prepare trial mixes of the two stronger grades of concrete required for the contract to establish acceptable design mixes.

PSG 3.5 Formwork and finishes (Sub-clause 5.2)

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



Add the following to the sub-clause:

FORMWORK TIES

The use of sleeves through the concrete for formwork ties will not be permitted. Ties, when cast in, shall have some form of positive shear key to prevent any rotation when loosening formwork.

The formwork ties and bolt holes shall be placed with regularity and precision.

The finish of exposed concrete surfaces of concrete structures shall be “smooth” as detailed in (b) of sub-clause 5.2.1.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



FILLETS AND CHAMFERS

All internal and external angles in concrete works shall have 25 mm x 25 mm fillets and chamfers unless shown otherwise on the drawings.

The units rate tendered for formwork shall cover the cost of forming these chamfers and fillets.

PSG 3.6 Joints (Clause 5.5.7)

Add the following to the sub-clauses:

PSG 3.6.1 General

Notwithstanding Sub-clause 2.4.3 “designated joints” shall only be joints shown on the drawings and in the Schedule. Further joints required by the Contractor because of construction limitations or any other reason, shall be deemed to be “undesigned joints”.

The position and pattern of all joints (designated or undesigned) shall be to the Engineer’s approval.

All joints (designated or undesigned) except expansion and contraction joints shall be treated in accordance with Sub-clause 5.5.7.3.

Joints between tank bottoms, floors or wall bases and the walls and columns standing on them, shall not be made flush with the supporting surface, but shall be made in the wall or the column a distance of 140 mm above the base. The 140 mm high “riser” shall be cast as an integral part of the bottom, floor or base, i.e. the concrete in the riser shall be deposited at the same time as the concrete in the bottom, floor or base adjacent to it.

In cases where there is a fillet at the bottom of the wall or column, the construction joint shall be made 140 mm above the fillet.

The Contractor should note that the details of the undesigned joints shall be identical to the designated joints shown on the drawings where the joint is in a similar situation and performs the same duty.

The Contractor shall further note that the position and the type (where no identical designated joints exist) of undesigned joints shall be subject to the Engineer’s approval.

PSG 3.6.2 Construction joints (Sub-clause 2.4.3 and 5.5.7)

All joints other than expansion, contraction or other movement joints, shall be treated as follows:

As soon as practical, but not before 15 hours after placing, the joint surface shall be prepared to receive fresh concrete.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



This preparation, as specified in Sub-clause 5.5.7.3 (a) to (d) shall be such as to remove all laitance or inert and strengthless material which may have formed and the specified chipping and sand blasting shall be such as to produce a roughened surface all over.

Concrete surfaces, where concreting is interrupted, shall be protected from the sun as specified in Sub-clause 5.5.8 (d).

Floor slab concrete shall be cast in one continuous pour. Should the Contractor wish to deviate from this requirement for the larger pours, a water bar shall be placed in the centre of the joint. This deviation should first be discussed with the Engineer before construction commences.

A kicker joint shall be formed at all external floor/wall intersections. The kicker shall be formed with the floor pour and shall include a 200mm PVC water bar, of the dumbbell kind. The water bar shall be provided with eyelets so that the water bar can be held in its correct position. A rate item for construction joints is provided in the Bill of Quantities.

PSG 3.6.3 Construction joints (Sub-clause 5.5.7.3)

No vertical construction joints other than those shown on the Drawings may be formed without prior approval. Horizontal construction joints may be formed if the method of construction does not allow for one continuous pour. However, these construction joint will be indicated to and approved by the Engineer. It must be noted that should the Contractor wish to form a construction joint in water retaining concrete, the watertightness of this joint will remain the responsibility of the Contractor. In addition to the precautions to be taken as prescribed under clause 5.5.7.3, the Contractor may ensure watertightness by providing additional means (such as a bandage on the joints or wet to dry epoxy) to the approval of the Engineer. No additional payment will be made to the Contractor for ensuring that construction joints are watertight and the Contractor will have to include such costs in the rate for the concrete.

PSG 3.6.4 Expansion and construction joints

Expansion and contraction joints shall be made in the position and to the details shown on the drawings.

The specified filler strips shall be attached to the complete side of the straight or grooved concrete joint by means of an approved adhesive.

PSG 3.7 Items to be casted in or grouted into concrete (sub-clause 5.4)

Add the following to the sub-clauses:

PSG 3.7.1 Fixing for equipment and pipe specials supplied under this Contract

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



- a) The Contractor will be responsible for the forming of pockets and grouting in of pipe items and/or holding down bolts for equipment supplied under the contract.
- b) Upon completion of the positioning and alignment of equipment, the Contractor shall, grout up pipe items, pockets and base plates (subject to (c) below) necessary for the permanent installation of the equipment.
- c) Only after the Engineer is satisfied with the alignment and the level of each item of plant shall the Contractor grout up the base plates/pipe specials with an approved non-shrink grout.

PSG 3.7.2 Fixing for equipment supplied under this contract

Holding down bolts or other fixings required for the installation of handstops, crane beams, ladders, handrails and other items supplied under the Contract, shall be provided by the Contractor. These fixings shall be cast in or grouted into pockets or installed by other means as approved by the Engineer.

Where anchor bolts are used which are installed into holes drilled into concrete or masonry, these shall be a type approved by the Engineer.

All anchor bolts shall be stainless steel grade 316.

PSG 3.7.3 Pipes and conduits embedded in concrete

Except with the written approval of the Engineer, no pipes other than those shown on the drawings shall be embedded in concrete and the approval of the Engineer for the position of all services to be embedded shall be obtained before concreting commences.

The clear space between pipes of any kind embedded in reinforcement concrete and the clear space between such pipes and reinforcement shall not at any point be less than:

- (a) 40 mm, or
- (b) 5 mm plus the maximum size of coarse aggregate, whichever is the greater.

PSG 3.8 Curing and protection (Sub-clause 5.5.8)

Add the following to the sub-clauses:

Level or gently sloping surfaces shall be cured by one of the methods described in Sub-clause 5.5.8 (a) or (b) and vertical surfaces by the methods described in Sub-clause 5.5.8 (e) for a period of five days after casting for an ambient temperature of 5°C or above and for eight days for an ambient temperature of below 5°C.

PSG 3.9 Concrete surfaces (Sub-clause 5.5.10)

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



Add the following to the sub-clauses:

PSG 3.9.1 Screed finish

After placing and compacting, the concrete on a top (unformed) surface shall be struck off with a template to the designated grades and tamped with a tamping board to compact the surface thoroughly and to bring mortar to the surface, leaving the surface slightly ridged but generally at the required elevation. No mortar shall be added, and noticeable surface irregularities caused by the displacement of coarse aggregate shall be made good by re-screeding after the interfering aggregate has been removed or tamped.

PSG 3.9.2 Wood float finish

Where wood floating is ordered or scheduled, the surface shall first be given a finish as specified in PSG 3.6. and, after the concrete has hardened sufficiently, it shall be wood-floated, either by hand or machine, only sufficiently to produce a uniform surface free from screed marks.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



PSG 3.9.4 Power floated finish

Where power floating is required the surface shall be treated as specified in PSG 3.11.2 to a degree necessary.

PSG 3.10 Screeds (add the following sub-clause 5.5.16)

GRANOLITHIC SCREED

Granolithic screed shall consist of: Cement - 1 part; Sand - 1.25 part; Coarse aggregate - 2 parts.

The coarse aggregate shall consist of granite or other approved chips which shall pass a 10 mm sieve and be retained on a 5mm sieve.

The cement/water ration of the mix shall be at least 2,0 mass.

PSG 3.11 Repairs and defects (add the following sub-clause 5.5.14)

All defects to the concrete shall be attended to, in full, as soon as possible after the formwork is removed. Further concreting of the element concerned may be prohibited by the engineer until he is satisfied that this remedial work has been satisfactorily attended to.

PSG 3.12 Porous Concrete

Porous concrete shall be laid under foundations and floor slabs, and behind walls, etc., where shown on the drawings and where directed by the Engineer.

Porous concrete shall be placed behind shuttering to form a vertical layer against the external face of foundations, etc. where shown on drawings and where directed by the Engineer.

The thickness of the horizontal, sloping and vertical layers shall not be less than that shown on the drawings.

The exposed faces, both horizontal and vertical, of the porous concrete shall be finished with a cement mortar seal, as specified in Clause PSG2.11.3, where reinforced concrete is to be cast against it.

The schedule rates for porous concrete shall include the cost of the mortar seal and steel float finish.

Porous concrete shall comprise water, cement, coarse aggregate and not more than 5 % by mass of fine sand. Every size of aggregate shall be a single size aggregate, graded in accordance with SABS 1083.

The voids ratio of porous concrete shall not be less than 27,5 %.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



No-fines concrete shall be classified by the prefix NF and the size of the aggregate to be used. Class NF19 means a no-fines concrete with a 19 mm nominal size. The volume of aggregate per 50 kg of cement is to be as follows:

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



Class	Aggregate Size	Aggregate per 50kg cement	Minimum Average Strength of a set of three test cubes after 28 days (MPa)
NF38	38	0.33 m ³	5.5
NF19	19	0.30 m ³	5.5
NF13	13	0.27 m ³	5.5

PSG 3.12.1 Batching and Mixing

The quantity of water to be added shall be just sufficient to form a smooth grout which will adhere to and coat completely each and every particle of aggregate, and which is just wet enough to ensure that at points of contact of aggregate the grout will run together to form a small fillet to bond the aggregate together. The mix shall contain no more than 20 liters of water per 50 kg of cement.

Mixing shall be carried out in an approved batch type mechanical mixer. The whole batch of aggregate together with half of the water shall be placed into the mixer and mixed together for at least half a minute. The cement, followed by the balance of water, shall subsequently be added and the mixing shall continue for at least 1,5 minutes or as much longer as is necessary to ensure that all aggregates are uniformly coated with cement grout.

Testing of porous concrete shall be carried out in accordance with test method 3 of BS 1881 Part 3 : 1970.

PSG 3.12.2 Placing

The Engineer shall be timeously advised to enable him to inspect the excavations or form work before no-fines concrete is placed.

After the placing of the concrete has commenced, it shall be continued uninterrupted and may only be halted at the construction joints approved by the Engineer. Control shall be exercised to ensure that no placed green concrete lies for longer than 30 minutes before being covered with fresh concrete and that the concrete is placed in its final position within 20 minutes after the cement has been loaded into the mixer.

The concrete shall be worked sufficiently to ensure that it completely fills the space to be concreted and that adjacent aggregate particles are in contact with one another. Excessive tamping or ramming shall be avoided and under no circumstances shall the concrete be vibrated.

PSG 3.12.3 Mortar seal over porous concrete

Where concrete is to be cast against previously cast porous concrete, the surface of the porous concrete shall be sealed with a 5 mm thick layer of mortar composed of one part normal Portland cement to two parts of fine aggregate by mass, trowelled on before screed

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



to provide a dense, smooth, uniform plane surface without filling any of the internal voids of the porous concrete. The surface of the seal shall have a steel float finish.

[Signature box]

Tenderer

[Signature box]

Witness 1

[Signature box]

Witness 2

[Signature box]

Employer

[Signature box]

Witness 1

[Signature box]

Witness 2



PSG 3.12.4 **Protection**

All no-fines concrete shall be protected from the elements, particularly from strong wind, flowing water, damage to the surface and loss of moisture. Protection against loss of moisture shall be accomplished by one or more of the following methods :-

- (a) Keeping form work in place.
- (b) Covering exposed surfaces with sacking or other approved material that is kept continuously wet.
- (c) Covering exposed surfaces with plastic sheeting.

PSG 3.12.5 **Sealing of surface of no-fines concrete**

Where indicated on the drawings or instructed by the Engineer, the surface of the no-fines concrete shall be sealed with a layer of 1:8 cement mortar to prevent loss of moisture from the structural concrete.

This seal shall be placed after the no-fines concrete has hardened and must be leveled off to the same level as the top of the no-fines concrete.

PSG 3.13 **Water tightness testing and cleaning (add the following sub-clause 5.5.11)**

On completion of concreting and when the concrete has attained its required strength, all structures shall be tested for water tightness. As a result, structures shall not be backfilled until the water test has been successfully completed. No water is available on site and the contractor must make his own arrangements for water for water tight testing of all the structures.

Each structure shall be filled with water and shall be allowed to stand for 48 hours. Thereafter the water level in the structure shall be monitored over a period of 10 days. The effects of evaporation shall be taken into account during this period. The structure will be deemed to have passed the test if it loses no more than 5mm of water after the drop due to evaporation is deducted.

Where there are visible signs of sweating, seepage or leakage, the affected areas shall be brought to standard. Where it is obvious that there is harmful leakage, the test shall be discontinued and the tank emptied without delay. The Contractor shall then, at his own expense, rectify the leak and re-test that tank. After the said tank has successfully passed the water tightness testing the tank shall be emptied again.

In order to conserve water, it shall be sequentially pumped from structure to structure as successful testing is completed. The rate tendered for testing shall include for the cost of testing as described above and the supply and operation of any pumping equipment required.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



After the watertight test the water retaining structures shall be disinfected by applying water containing 20mg/liter free chlorine residual for a period of 24 hrs. The water retaining structures will not be accepted and cleaning of the water retaining structures have been passed by Engineer.

[Signature Box]

Tenderer

[Signature Box]

Witness 1

[Signature Box]

Witness 2

[Signature Box]

Employer

[Signature Box]

Witness 1

[Signature Box]

Witness 2



PSG 4 TOLERANCES (CLAUSE 6)

PSG 4.1 Permissible deviations (Sub-clause 6.2)

Add the following to the sub-clause:

The degrees of accuracy of construction shall be as follows:

- (a) All structures (including water retaining structures) – Degree I accuracy.
- (b) All weirs (concrete) and weir plates shall have a tolerance of +1/-1 mm

PSG 5 TESTING (CLAUSE 7)

PSG 5.1 Grouting (add the following new sub-clause 7.4)

The Contractor shall, where so ordered, carry out a site test for each grouting procedure and each grouting gang to be used. The tests shall be carried out on a dummy bedplate similar in configuration to that which is to be grouted, but not exceeding 1 m² in area unless otherwise ordered.

When the dummy bedplate is dismantled, the underside shall show a minimum grout contact area of 80 % with reasonably even distribution of the grout over the surface grouted except that, in the case of expanding grout, the minimum grout contact area shall be 95 %. The test shall show evidence of good workmanship and materials and the results shall be to the satisfaction of the Engineer.

The Contractor shall, when so ordered, make standard test cubes from various grout mixtures and also subject them to compression tests to determine whether the specified strength has been achieved.

Test procedures shall comply with the relevant requirements of Sub-clause 7.2.1 to 7.2.3.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2



PSL 3.10.2 Brickwork (Sub-clause 5.14)

Add sub-clause 5.14 as follows:

- a) Brickwork is to be built to the dimensions, thicknesses and heights as shown on the drawings.
- b) All exposed brickwork shall be plastered and shall have joints raked out to a depth of 12 mm to ensure good plaster bond.
- c) Mortar shall consist of one part cement to four parts approved sand by volume and shall be used within one hour of mixing.
- d) Brickwork shall be built in stretcher bond and all common bricks shall be well wetted before being laid.

PSL 4.3 Reinstatement Road Surface

Add the following payment item:

Item:

Reinstatement road surface as per detail drawings:

- a) Cut and remove existing gravel layer in windrow and stockpile Unit: m³
- b) Reinstatement existing gravel layers to original state (98% MAMDD) Unit: m³

The above item covers the complete repair of the road surface where the pipeline trench excavation is required over an existing gravel or surfaced road. The rate shall cover all materials, plant, watering, stabilizing, labour and tests to repair the road surface and related layer works back to its original state.

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2