

1,5 A/mm². Each busbar shall be marked red, yellow and blue with black for the neutral bar. The busbars shall be able to withstand the thermal and dynamic forces resulting from short circuits without deformation taking place or parts breaking.

The specified consumer equipment shall be installed in the second section. The mounting panel and equipment shall be enclosed by a machine punched removable front panel through which the operating handles of the equipment and the face plates of the meters protrude.

(d) Equipment installed in kiosks

The equipment to be installed in the kiosks shall be as specified in the detail specification.

(e) Wiring of kiosks

The internal wiring in the kiosks shall be done with PVC insulated copper conductors. The wiring shall be done in neat horizontal and vertical columns. Each consumer circuit shall be wired from the phase busbars to the circuit breaker and from the circuit breaker to the meter.

Connections to busbars and terminals shall be done by means of cable lugs crimped in an approved manner to the conductor ends. Connections to the busbars shall be made by means of cadmium plated high tensile steel bolts and nuts with locking washers.

(f) Earthing

A 25 mm x 6 mm long tinned copper earth bar shall be installed at the bottom of the kiosk.

10 mm diameter holes shall be drilled through the earth bar to provide for the distribution cable and service cable earth conductors. All bolts used for the fixing of the earth conductors shall be cadmium plated and only one earth conductor shall be connected per bolt.

The metal work of the kiosk shall be earthed to the earth bar by means of a 70 mm² stranded copper conductor. An earth stud shall be provided on the kiosk housing for this purpose.

(g) Cable gland plate

The cables shall be terminated on a removable galvanised gland plate of suitable dimension and strength. The gland plate shall cover the full length of the kiosk.

The gland plate shall be at least 300 mm below the nearest terminal of switchgear allowing sufficient space for bending the cable ends. Sufficient space shall be provided underneath the gland plate to allow for the installation of the cables without removing the gland plate. The gland plate shall be earthed to the earthbar by means of a 70 mm² stranded copper earth conductor.

(h) Terminal blocks

A terminal block type suitable for the termination of 16 mm² stranded copper conductors shall be provided. Terminals shall be of the screw type and a terminal shall be provided for each service connection cable.

(i) Labels

The kiosks shall be supplied with the following labels:

- (i) An aluminium label with 40 mm high letters and numeral indicating the kiosk number.
- (ii) Engraved trafolite labels with 6 mm high numerals under each circuit breaker, meter, and terminal on the terminal block indicating the consumer stand number.

The labels shall have a white background and black letters. The 40 mm labels shall be fixed by means of rivets and the 6 mm high labels shall be inserted in 25 mm wide aluminium label holder mounted at the bottom of the relevant equipment.

(j) Danger signs

The requirements of Regulation C-52 of the Machinery and Occupational Safety Act No 6 of 1983 shall be complied with. All doors shall be fitted with a 150 x 100 mm Danger/Gevaar/Ingozi signs.

(k) Painting and finishing**(i) Post-weld cleaning and passivation of 3CR12**

Post-weld cleaning shall be undertaken on all welded areas. One of the following cleaning methods may be used to remove all surface discolouration and scale from welded areas.

- (1) Wire brushing : Where it is possible to remove the discolouration and detritus from weld areas by brushing, stainless steel wire brushes, that have not been used on other material other than 3CR12, may be used.
- (2) Grinding : Dedicated grinding wheels and discs based on alumina shall be used for the dressing of welds. The use of silicon carbide wheels and discs shall not be used.
- (3) Abrasive blast cleaning : The abrasive used shall be washed silica sand or alumina totally free of metallic iron, iron oxides or chlorides.

(ii) Chemical cleaning (pickling)

The pickling of 3CR12 shall be carried out using formulations based on nitric (HNO₃) and hydrofluoric (HF) acid. Formulations based on hydrochloric acids shall not be used. Acids used shall conform to commercial purity standards. Where proprietary pickling formulations are used, the manufacturer's directions concerning the application procedures shall be strictly adhered to.

(iii) Passivation

The passivation of the 3CR12 shall be carried out as soon as possible after the post-weld cleaning has taken place. A solution made up of nitric acid shall be used for the passivation of the 3CR12. The solution shall be generously applied to the steel by brush, cloth, spray or dipping. Care shall be taken that the solution does not dry on the steel surface. The steel shall be thoroughly washed with clean cold water to remove all traces of the acid use.

(iv) General

The entire process of cleaning, pickling, passivation and neutralization shall be completed in one working day.

Tenderers shall submit full details of the post weld process their suppliers intend to use.

(v) Painting

All interior metal work shall be thoroughly derusted and degreased and shall be prepared for painting in accordance with SANS 066.

Immediately after cleaning a zinc chromate red oxide primer with a dry film thickness of 25 micrometre shall be applied in accordance with SANS 679. An intermediate enamel coat shall be applied to the primed surface and thereafter the finishing coat of white enamel paint shall be applied to the interior and "light stone", colour C37 SANS 1091 to the exterior.

The bases and under sides must be treated in an approved manner and finished with two coats epoxy-tar paint.

(l) Drawings and information

Tenderers shall submit full details of the cubicles offered with the following drawings with the tender

- a drawing indicating all dimensions of the kiosks
- a drawing indicating the dimensions of the plinth with fixing arrangements

- a drawing indicating the general internal equipment layout of the kiosks.

The successful tenderer shall, before the manufacturing of the kiosks commences, submit the final drawings to the Engineer for approval.

A schematic wiring diagram of the kiosk, as wired and colour coded, shall be submitted at the completion of the contract.

(m) Inspection

The successful tenderer shall allow the representative of the Engineer access to the manufacturer's works at all reasonable times to inspect the progress of the work and to witness all tests

<u>Item</u>	<u>Unit</u>
HE 08.06(ah) <u>Replace door hinges on meter and distribution kiosks.</u>	No.

The tendered rate shall include full compensation for the removal of damaged hinges, the supply, delivery and installation of new hinges.

<u>Item</u>	<u>Unit</u>
HE 08.06(ai) <u>Supply and install handles.</u> (Perano type lockable turn catch door handle (heavy duty))	No.

The unit of measure shall be the total number of handles installed.

The tendered rate shall include full compensation for the removal of the old handle and ordering, supply and installation of a lockable turn catch handle.

HE 09 AREA LIGHTING : TECHNICAL DETAILS

HE 09.01 Installation description

This section describes the electrical distribution network that will be repaired and maintained in terms of this contract.

Luminaries are suspended on fibreglass poles of various lengths. Area lights are controlled by means of photocells and manual on/off switches.

HE 09.02 Scope of repair work

Open each pole cover and inspect fuse or circuit breaker, tray and shield plate as well as earthing connection. Check and replace cover seal if required.

Service each luminaire, open control gear enclosures and treat for moisture ingress and corrosion. Wash luminaires with detergent and clean lenses. Check and replace neoprene seals.

Re-lamp luminaires.

Replace luminaires: Remove existing damaged luminaires, supply and install similar and approved luminaires complete with lamps and control gear, if applicable.

Open upstream distribution board. Check and fasten cable terminations, fit labelling and blank face-plate covers. Check locking mechanism and fit padlock.

Open distribution kiosk. Clean inside and add termite and rodent poison. Fit circuit labelling. Check locking mechanism and fit padlock.

Service luminaries by washing with detergent and re-lamping where necessary. Clean lenses. Check condition of seals and glands and test for earth continuity.

Check consistency of aiming angles and tighten mounting bracket bolts

HE 09.03 Repair work: Measurement and payment

<u>Item</u>	<u>Unit</u>
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(a) <u>Relamp luminaire</u>	No
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The unit of measurement shall be the number of lamps replaced.

The tendered rate shall include full compensation for the supply and installation of the lamp according to the manufacturer's instructions.

<u>Item</u>	<u>Unit</u>
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(b) <u>Service luminaire</u>	No
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The unit of measurement shall be the number of luminaires opened and serviced.

The tendered rate shall include full compensation for the servicing of the luminaire, including washing, corrosion protection, checking of seals and glands, cleaning of the lenses, tightening of stirrup bracket bolts and the checking of earthing continuity, connections and aiming angle.

<u>Item</u>	<u>Unit</u>
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(c) <u>Service light distribution kiosk or DB</u>	No
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The unit of measurement shall be the number of distribution boards or kiosks serviced.

The tendered rate shall include full compensation for the cleaning and opening of kiosk or DB, vermin protection, checking of MCB's, checking and

tightening of wire terminations, fitting of labels and blank covers. The contractor is to submit a report on the general condition of the kiosk or distribution boards (damaged, rust marks, etc.)

<u>Item</u>	<u>Unit</u>
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(d) <u>Supply and install padlocks</u>	No
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The unit of measurement shall be the number of 75mm padlocks installed.

The tendered rate shall include full compensation for the ordering, supply, engraving and installation of the padlocks, locking devices and seals. Locks shall be "key alike".

<u>Item</u>	<u>Unit</u>
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(e) <u>Service area light pole</u>	No
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The unit of measurement shall be number of area light poles opened and serviced.

The tendered rate shall include full compensation for the opening of pole cover, visual inspections, tightening all connections and straightening of pole

<u>Item</u>	<u>Unit</u>
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(f) <u>Replace luminaire</u>	No
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The unit of measurement shall be number of luminaires replaced.

The tendered rate shall include full compensation for the supply and installation of the specified luminaire complete with lamp and control gear according to manufacturer's instructions.

<u>Item</u>	<u>Unit</u>
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(g) <u>Replace pole</u>	No
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The unit of measure shall be the number of poles replaced.

The tendered rate shall include full compensation for the removal of all equipment from the existing pole, removal of the existing pole from site, ordering, supply and installation of the pole in the position specified.

The contractor shall install all existing equipment onto the new pole

<u>Item</u>	<u>Unit</u>
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(h) <u>Supply and install 25m High Scissor Light Mast</u>	No
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The unit of measurement shall be the number of 25m high scissor light mast hot dip galvanised to SANS 121 ISO 1461 specification supplied and installed.

The tendered rate shall include full compensation for the manufacturing, delivery, assemble and erection of the 25m high scissor light mast complete with brackets to carry 9 x 400W HPS Floodlight luminaires, cabling, ring, wiring of luminaires, electrical distribution board and splitter box.

The tendered rate shall further include full compensation for grouting the gap between the mast base plate and the foundation with a Prostruct 531 mixture.

The earthing, excavations and casting of foundation of the mast will be measured elsewhere.

HIGH MAST SPECIFICATION

1. Construction

The masts shall be constructed from conical sections which, when assembled, will form a tapered column of circular cross section. There shall be no fillet welds of the overlaps. The sections shall be joined by friction fit only.

The masts shall be of lightweight construction and a base plate shall be welded to the bottom end of the lowest section suitably drilled for foundation bolts.

All welding to be subject to S.A.B.S. Spec 044 Part 3 Grade B and shall be carried out by S.A.B.S. coded welders only. Proof that all welders have been tested by the S.A.B.S. must be submitted on request. Inspection and acceptance certificates shall be furnished on request.

The steel used in the manufacture of the mast shall have an ultimate tensile strength of between 450 and 620 MPa and identical to SABS 1431 grade 300WA steel.

Proof must be supplied that the manufacturer is ISO 9001 accredited.

2 Dimensions

The masts offered shall give an overall floodlight mounting height of 25 m. The cross-section and wall thickness of the mast is determined on the basis of the working loads.

3. Working Loads

The masts shall be designed in accordance with the S.A.B.S. 0225 Code of Practice for the design and construction of lighting masts. The following site factors shall be considered:

Design wind speed	=	40m/s
Class of structure	=	B
Category of terrain	=	2
Altitude of site	=	1200 m

The mast shall carry at its top 9 x 400W HPS Floodlights evenly around its circumference.

Data on wind induced oscillations and the dynamic behaviour of the mast shall be submitted.

4. Access Opening

An access door adequately protected against the weather shall be provided in the mast, with the bottom lintel 600mm above the base plate. The door shall be adequately protected against vandalism and secured by three screws requiring a special opening tool.

A doorframe shall reinforce the opening in the mast.

The mounting strips welded opposite the door opening shall be drilled for the mounting of a control board. Earth terminals, as well as a support bar for the incoming supply cables, shall be provided below the door opening.

5. Corrosion Protection

All parts of the mast and raising and lowering device, not specified as manufactured from stainless steel, shall be hot dip galvanised to SAB Specification No. 763/1977 and inspection certificates provided if required.

No welding, drilling, punching, bending or removal of burrs shall be carried out after galvanising.

6. Electrical Connection to the Luminaires

A fully enclosed distribution board shall be provided for each mast, containing:

- 1 x 3 pole isolator (main switch)
- 3 x single pole MCB's (lights)
- 1 x single phase switched socket outlet for the use of a power tool
- 1 x two pole earth leakage unit protecting the single phase outlet
- 1 x 7pinCEEsocket
- 1 x adequately rated contactor
- 1 x single pole MCB acting as by-pass switch
- 1 x single pole MCB protecting the contactor

All circuit breakers and isolators shall have a rupturing capacity of 5 kA and shall bear the mark of the S.A.B.S. and shall be accessible through cut-outs in the cover without having to remove the cover.

All equipment shall be clearly marked with engraved labels. No stick-on embossed tape shall be used.

The distribution board shall be fully wired and ready for connection to the incoming supply cables.

7. FOUNDATIONS

Each mast shall be supplied with foundation bolts and templates. The bolts shall be hot dip galvanised over their entire length to S.A.B.S. Specification No. 763/1977. Two galvanised nuts, two washers and one spring washer shall be supplied for each bolt. The number of foundation bolts shall be determined according to the design of I .3 above. Calculations shall be submitted upon request.

A foundation plan, adequately designed for the conditions as per I .3 of this specification, and based on a soil bearing capacity of 150 kPa, giving details of the reinforcing required shall be submitted. Soil pressure and overturning safety factor shall be stated.

All reinforcing and foundation bolts shall have a minimum of 100mm concrete cover. The 28 days cube strength of the concrete shall be 25 MPa.

All foundations shall have a circular flat base from which a square plinth shall rise to above the surrounding ground level.

One or two PVC, Class B cable sleeves shall be provided from the centre of the top of the foundation plinth, through the concrete to a point below ground level on the side of the plinth.

After casting of the foundation, the slab shall be covered by earth, properly compacted. The area around the plinth shall be brought to the original level and shall be left neat and tidy.

8. LUMINAIRES

- The floodlight luminaire shall be beam type 400W HPS.
- The floodlight shall be suitable for HST 1000W lamp.
- The body of the luminaire shall be of die-cast aluminium with polyurethane finish.
- The reflector shall be high purity bright anodised aluminium and shall provide a narrow asymmetrical beam.
- The peak intensity shall not be less than 48000 lumens.

- The front glass shall be heat resistant armoured glass.
- The gaskets shall be silicone rubber.
- The fasteners shall be stainless steel.
- The luminaire control gear shall be housed in an integral weatherproof container.

HE 10 SECURITY FENCE LIGHTING: TECHNICAL DETAILS

HE 10.01 Installation description

This section describes the electrical distribution network that will be repaired and maintained in terms of this contract.

Luminaires are suspended on fibreglass poles. Lights are controlled by means of photocells and manual on/off switches.

HE 10.02 Scope of repair work

Open each pole cover and inspect fuse or circuit breaker, tray and shield plate as well as earthing connection. Check and replace cover seal if required. Wash luminaire and lens, replace neoprene seal and re-lamp luminaires.

Replace luminaires: Remove existing damaged luminaires, supply and install similar and approved luminaires complete with lamps and control gear, if applicable. Check aiming angle and adjust if necessary.

Open upstream distribution board. Check and fasten cable terminations, fit labelling and blank face-plate covers. Check locking mechanism and fit padlock.

Open distribution kiosk. Clean inside and add termite and rodent poison. Fit circuit labelling. Check locking mechanism and fit padlock.

Open each distribution Kiosk, clean inside provide termite and rodent poison. Check earth bar and earth continuity. Check and fasten cable terminations, fit labelling and blank face-plate covers. Check locking mechanism and fit padlock. Check earth connection to electrode.

Service luminaires by washing with detergent and re-lamping where necessary. Clean lenses. Check condition of seals and glands and test for earth continuity.

HE 10.03 Repair work: Measurement and payment

<u>Item</u>	<u>Unit</u>
(a) <u>Service security light pole</u>	No
<p>The unit of measurement shall be the number of security light poles opened and serviced.</p> <p>The tendered rate shall include full compensation for the opening of pole box, visual inspections, corrosion protection, straightening of poles if necessary, treating of wooden poles with cresote and securing circuit breakers and terminations.</p> <p>The contractor shall give a general report on the condition of the pole and equipment. The report should indicate if poles are wrotten (wood poles), bent (steel poles), broken (wood, steel, concrete or fiberglass poles) or if the pole should be painted (steel). Strap all cable to pole.</p>	
<u>Item</u>	<u>Unit</u>
(b) <u>Re-lamp luminaire</u>	No
<p>The unit of measurement shall be the number of security lamps replaced.</p> <p>The tendered rate shall include full compensation for the supply and installation of the lamp according to the manufacturer's instructions.</p>	
<u>Item</u>	<u>Unit</u>
(c) <u>Service distribution kiosk</u>	No
<p>The unit of measurement shall be the number of distribution kiosks or boards opened and serviced.</p> <p>The tendered rate shall include full compensation for the opening of kiosk or distribution board, vermin protection, cleaning of circuit breakers, earth testing, secure circuit breakers and terminations and fitting of blank covers. The contractor is to submit a report on the general condition of the kiosk or distribution board (damaged, rust marks, etc.)</p>	
<u>Item</u>	<u>Unit</u>
(d) <u>Replace luminaires</u>	No
<p>The unit of measurement shall be the number of security floodlight luminaires replaced.</p> <p>The tendered rate shall include full compensation for the supply and installation of the luminaire complete with the lamp and control gear according to the manufacturer's instructions.</p>	
<u>Item</u>	<u>Unit</u>
(e) <u>Service luminaire</u>	No
<p>The unit of measure shall be the number of luminaires serviced.</p> <p>The tendered rate shall include full compensation for the service of the luminaire, including washing, corrosion protection, checking of seals and glands, cleaning of lenses, tightening of brackets bolts, checking of earthing continuity, checking of aiming angle and adjust if necessary</p>	

HE 11 STREETLIGHTING: TECHNICAL DETAILS**HE 11.01 Installation description**

This section describes the electrical distribution network that will be repaired and maintained in terms of this contract.

Luminaires are suspended on steel, wood, concrete and fibreglass poles of various lengths. Street lights are controlled by means of photocells and manual on/off switches.

HE 11.02 Scope of repair work.

Open distribution kiosk, check locks, clean inside, provide termite and rodent poison.

Open each mast cover and inspect fuse or circuit breaker, tray and shield plate as well as earthing connection. Check and replace cover seal if required. Wash luminaire, replace neoprene seal, clean lens and re-lamp luminaires if required. Replace luminaires: Remove existing damaged luminaires, supply and install similar and approved luminaires complete with lamps and control gear, if applicable. Assess aiming angle and adjust if necessary

HE 11.03 Repair work: Measurement and payment

<u>Item</u>	<u>Unit</u>
(a) <u>Service streetlight pole</u>	No
The unit of measurement shall be the number of security light poles opened and serviced.	
The tendered rate shall include full compensation for the opening of pole cover, visual inspections, straightening of poles if necessary and securing circuit breakers and terminations.	
The contractor shall give a general report on the condition of the pole and equipment. The report should indicate if poles are rotten (wood poles), bent (steel poles), broken (wood, steel, concrete or fibreglass poles) or if the pole should be painted (steel). Strap all cable to pole.	

<u>Item</u>	<u>Unit</u>
(b) <u>Re-lamp luminaire</u>	No
The unit of measurement shall be the number of street light lamps replaced.	
The tendered rate shall include full compensation for the supply and installation of the lamp according to the manufacturer's instructions.	

<u>Item</u>	<u>Unit</u>
(c) <u>Service street Luminaire</u>	No
The unit of measure shall be the number of luminaires serviced.	
The tendered rate shall include full compensation for the service of the luminaire, including washing, corrosion protection, checking of seals and	

glands, cleaning of lenses, tightening of brackets bolts, checking of earthing continuity, checking of aiming angle and adjust if necessary

<u>Item</u>	<u>Unit</u>
(d) <u>Replace streetlight luminaire</u>	No

The unit of measurement shall be the number of streetlight luminaires replaced.

The tendered rate shall include full compensation for the supply and installation of the luminaire complete with the lamp and control gear as per manufacturer's instructions.

<u>Item</u>	<u>Unit</u>
(e) <u>Supply and install photocell bypass</u>	No

The unit of measure shall be the number of photocell bypasses installed.

The tendered rate shall include full compensation for the design supply and installation of the photocell bypass.

<u>Item</u>	<u>Unit</u>
(f) <u>Replace 125MV choke in control gear.</u>	No

The unit of measure shall be the number of chokes installed.

The tendered rate shall make full compensation for ordering, supply and installation of chokes.

<u>Item</u>	<u>Unit</u>
(g) <u>Replace connection to streetlight luminaire.</u>	No

The unit of measure shall be the number of connections replaced from the streetlight luminaire to the overhead line.

The tendered rate shall make full compensation for ordering, supply and connection of the luminaire to the overhead line with silicon cable or airtight and cable clamps on to the overhead line.

HE 12 MAINTENANCE OF THE INSTALLATION

HE 12.01 The various lighting systems shall be maintained in perfect working order following the initial repair work. The maintenance contract shall run for the balance of the 36-month contract period.

HE 12.02 The following maintenance actions will be required under this phase of the contract:

- 12.02.01 Routine preventative maintenance
- 12.02.02 Corrective maintenance
- 12.02.03 Breakdown maintenance

These actions are defined in the Additional Specification SA – General Maintenance.

HE 12.03 The maintenance schedules and frequency of maintenance activities shall be developed under the maintenance control plan which will be instituted by the Contractor. The Contractor's responsibility in this regard is specified in the Additional Specification SA – General Maintenance.

HE 12.04 **The following shall be used as guidelines to ensure effective maintenance:**

12.04.01 Scope of maintenance work on area lighting

- a) Monthly
 - i) Verify operation of switching element
 - ii) Check lamps
 - iii) Check mast door for weatherproof seal
 - iv) Check earth connection at footing, record value
- b) Annual
 - i) Service all luminaires
 - ii) Measure earth resistance of electrode
 - iii) Measure earth resistance of trench earth
 - v) Record values in record book

12.04.02 Scope of maintenance work on security lighting

- a) Monthly
 - i) Verify operation of switching element.
 - ii) Check lamps.
 - iii) Check that all pole covers are secure.
 - iv) Visually check distribution kiosk.
- b) Annual

Measure phase voltages and line currents in distribution kiosk or local distribution board. Record values in record book. Do vermin protection. Service all luminaires.

12.04.03 Scope of maintenance work on street lighting

a) Monthly

- i) Verify operation of switching element.
- ii) Check lamps.
- iii) Check that all pole covers are secure.
- iv) Visually check distribution kiosk.

b) Annual

Measure phase voltages and line currents in distribution kiosk. Record values in Record book. Do vermin protection. Service all luminaries and distribution kiosks.

HE.12.05 Maintenance shall include all repairs, replacing of components or materials, routine setting or any other actions necessary to ensure a perfect functional condition.

HE.12.06 **Maintenance work measurement and payment.**

Refer to clause SA06 of the ADDITIONAL SPECIFICATION : SA GENERAL MAINTENANCE

TECHNICAL SPECIFICATION

JC CONVENTIONAL FIRE FIGHTING EQUIPMENT

CONTENTS

JC 01	SCOPE
JC 02	STANDARD SPECIFICATIONS
JC 03	OPERATING AND MAINTENANCE MANUALS
JC 04	TRAINING OF OPERATORS FOR THE OPERATION OF THE INSTALLATION AND EQUIPMENT
JC 05	LOGGING AND RECORDING PROCEDURES
JC 06	REPAIR WORK TO INSTALLATIONS, SYSTEMS AND EQUIPMENT
JC 07	MAINTENANCE TO INSTALLATIONS, SYSTEMS AND EQUIPMENT

JC 01 SCOPE

This specification covers the general maintenance of the conventional fire fighting equipment installations, which include the following:

- (a) Fire hydrants
- (b) Fire hose reels
- (c) Fire extinguishers.

This specification shall form an integral part of the maintenance and servicing contract document and shall be read in conjunction with the additional and particular specifications compiled as part of this document.

This specification shall act as a guideline to the Particular Specification. In the event of any discrepancies between the Technical Specification and the Particular Specification, the latter shall take precedence.

JC 02 STANDARD SPECIFICATIONS

JC 02.01 GENERAL STANDARD SPECIFICATIONS, REGULATIONS AND CODES

The latest edition, including all amendments up to date of tender, of the following specifications, publications and codes of practice shall be read in conjunction with this specification and shall be deemed to form part thereof.

JC 02.01.01 SANS and other specifications and codes

- | | |
|--------------------------------|--|
| SANS 6172;
ICS 13.220.10 | - Fire extinguishers, classification system, fire ratings |
| CKS 532;
ICS 13.220.10 | - Fire extinguishers, foams |
| SANS 10105-1;
ICS 13.220.10 | - Fire extinguishers, portable, classification system, control systems |
| SANS 1322;
ICS 13.220.10 | - Fire extinguishers, portable, non-refillable |
| SANS 1567;
ICS 13.220.10 | - Fire extinguishers, portable, rechargeable, carbon dioxide |

SANS 1573; ICS 13.220.10	- Fire extinguishers, portable, rechargeable, foams
SANS 1475-1; ICS 13.220.10	- Fire extinguishers, portable, reconditioning
SANS 810; ICS 13.220.10	- Fire extinguishers, powder, portable, rechargeable
SANS 1522; ICS 13.220.10	- Fire extinguishers, powders
SANS 1571; ICS 13.220.10	- Fire extinguishers, transportable, rechargeable
SANS 889; ICS 13.220.10	- Fire extinguishers, water fire extinguishers, portable, rechargeable
SANS 10105-1; ICS 13.220.10	- Fire fighting equipment, fire extinguishers, portable
SANS 1322; ICS 13.220.10, 23.020.30	- Fire fighting equipment, fire extinguishers, portable, non-refillable
SANS 543; ICS 13.220.10	- Fire fighting equipment, fire hose reels
SANS 10105-2; ICS 13.220.10	- Fire fighting equipment, fire hose reels
SANS 1128-2; ICS 13.220.10, 23.040.60	- Fire fighting equipment, fire hose, pipe couplings, pipe connections
SANS 1128-1; ICS 13.220.10, 23.060.99	- Fire fighting equipment, fire hydrants
SANS 810; ICS 13.220.10	- Fire fighting equipment, powder fire extinguishers, portable, rechargeable
SANS 1475-1; ICS 13.220.10	- Fire fighting equipment, reconditioning, fire extinguishers, portable
SANS 889; ICS 13.220.10	- Fire fighting equipment, water fire extinguishers, portable, rechargeable
SANS 543; ICS 13.220.10	- Fire hose reels
SANS 10105-2; ICS 13.220.10	- Fire hose reels, classification systems, control systems
SANS 1475-2; ICS 13.220.10	- Fire hose reels, reconditioning
SANS 1456-5; ICS 13.220.10	- Fire hoses, collapsible, delivery pipes (fire fighting), oil resistance tests, chemical resistance tests
SANS 1456-2; ICS 13.220.10	- Fire hoses, collapsible, delivery pipes (fire fighting), percolating hoses
SANS 1456-1; ICS 13.220.10	- Fire hose, collapsible, delivery pipes (fire fighting), testing
SANS 1456-4;	- Fire hoses, collapsible, delivery pipes, coated materials,

ICS 13.220.10	non-percolating hoses
SANS 1456-3; ICS 13.220.10	- Fire hoses, collapsible, delivery pipes, uncoated materials, non-percolating hoses
SANS 1128-2; ICS 13.220.10, 23.040.60	- Fire hoses, pipe couplings, pipe connections
SANS 1128-1; ICS 13.220.10, 23.060.99	- Fire hydrants, fire-fighting equipment
SANS 1056-1; ICS 23.060.20	- Fire safety, ball valves
SANS 10400	- Application of the NBR
SANS 10287	- Automatic sprinkler installations for fire fighting purposes.
FPO/82/6E(STS 10)	- Standard technical specification for a pump installation for automatic sprinkler fire extinguishing systems.

JC 02.01.02 Department of Public Works Specifications:

- | | |
|---------------|---|
| F.P.O/G.61/3E | - Fire Security: A guide to Architects |
| PW 371 | - Specification of Materials and Methods to be used |

JC 02.01.03 Occupational Health and Safety Act of 1993: Construction Regulations, 2003 as promulgated in Government Gazette No 25207 and Regulation Gazette No 7721 of 18 July 2003.

JC 02.01.04 Manufacturers' specifications, codes of practice and installation instructions

All equipment and materials shall be installed, serviced and repaired strictly in accordance with the manufacturers' specifications, instructions and codes of practice.

In the event of a discrepancy between the statutory codes and the manufacturer's codes, the discrepancy shall be brought to the attention of the Engineer, who, in collaboration with the Employer and Local Authority, will prescribe the steps to be taken.

JC 02.01.05 Municipal regulations, laws and by-laws

All municipal regulations, laws, by-laws and special requirements of the Local Authority shall be adhered to unless otherwise specified.

JC 03 OPERATING AND MAINTENANCE MANUALS

No operating and maintenance manuals will be developed for this section.

The contractor shall use the Maintenance Control Plan (see SA Maintenance) to schedule routine preventative maintenance activities.

Over and above the afore-mentioned, the Contractor shall also be responsible for the compilation of the following:

(a) Cataloguing of the fire-fighting equipment

All the fire-fighting equipment must be catalogued under the following headings:

- (i) Location and details of equipment
- (ii) Service date
- (iii) Service frequency
- (iv) Condition of equipment
- (v) History: Usage incidents, breaking, etc.

(b) Provision of a "Fire Plan"

The Contractor shall provide a Fire Plan indicating positions, and keeping up to date any changes of the equipment position, status and operation.

JC 04 TRAINING OF OPERATORS FOR THE OPERATION OF THE INSTALLATION AND EQUIPMENT

The end user shall be trained by the supplier of the fire fighting equipment to operate the individual fire fighting equipment.

Fire fighting training shall be done by a nationally accredited training institute (Fire Protection Association of South Africa).

JC 05 LOGGING AND RECORDING PROCEDURES

The Contractor shall under this repair and maintenance contract institute a logging and recording system as part of his maintenance control plan as defined in Additional Specification SA: General Maintenance. This shall consist of a log and record book, which shall be utilised to log and record all service records, system checks, breakdowns, maintenance visits, inspections, etc.

The logbook shall be stored in a safe place as agreed with the User Client and the Engineer and shall only be utilised by the Fire Protection Officer, the Contractor and the Engineer. The Contractor shall submit copies of the monthly entries and recordings into the logbook , together with his monthly report, to the Engineer.

The logbook shall be structured to include at least the following:

- (a) Service records
- (b) Inspection and maintenance actions
- (c) Breakdown reports
- (d) Fire safety officer's comments
- (e) Inspection and test comments and reports.

The Contractor shall also institute an attendance register, which shall be kept in a safe place as agreed with the User Client and Engineer. This register shall be completed by all persons visiting the installation, including:

- (a) Fire safety officer
- (b) Contractor
- (c) Inspectors
- (d) Department personnel
- (e) Engineer.

The register shall state the date, time-in, time-out, name, company and reason for visit.

A copy of the register shall be submitted by the Contractor together with his monthly report.

JC 06 REPAIR WORK TO INSTALLATIONS, SYSTEMS AND EQUIPMENT

JC 06.01 GENERAL

During the repair and maintenance contract all the systems, installations and equipment shall be repaired as specified in the Particular Specification. This repair work shall include, but no be limited to the specified Particular Specification details.

All repair work shall be executed using approved materials and equipment suitable to the systems and/or installations they serve. The said repair work shall be executed in accordance with the relevant codes of practice, standards, regulations, municipal laws and by-laws, manufacturer's specifications and codes of practice and all applicable additional and particular specifications included in this document.

The repair work items are listed in the Particular Specification and Schedule of Quantities with all relevant details, such as capacity, size, manufacturer, model number, etc.

All repair work shall be executed within the specified durations listed in the Appendix to Tender. All new equipment, materials and systems shall be furnished with a written guarantee of a defects liability period of 12 months commencing on the date of issue of a certificate for completion of the repair work. These guarantees shall be furnished in favour of the Department of Public Works.

Repair work items for the fire fighting equipment shall be categorised under the following headings:

- (a) Fire hydrants
- (b) Fire hose reels
- (c) Fire extinguishers.

JC 06.02 REPAIR WORK TO EXISTING EQUIPMENT

The Contractor shall at the start of the repair and maintenance contract inspect, record and report on all the existing fire fighting equipment listed in this specification.

This inspection and report shall comprise the following:

- (a) Establishing the condition of all equipment;
- (b) Reporting all defects to equipment;
- (c) Compliance of equipment in respect of the governing regulations at the start of the Contract;
- (d) Recording all equipment with an identifying system;
- (e) Details of all equipment;
- (f) Suitability of equipment regarding the purpose it serves;
- (g) Water supply pressure;
- (h) Listing of latest service.

The Contractor shall report on the above in writing to the Engineer. No repair, service and/or replacement work shall commence prior to approval by or directives from the Engineer.

JC 06.03**FIRE HYDRANTS**

Repair work to the fire hydrants system is detailed in the Particular Specification and shall include, but not be limited to the following:

- (a) Replacement of damaged, broken, leaking, corroded pipe work and fittings;
- (b) Replacement of main hydrant seal;
- (c) Repair/replacement of quick coupling catches;
- (d) Replacement of damaged shaft ends (right angle wheel type);
- (e) Replacement of damaged and expired or missing 65 mm diameter hose streamers;
- (f) Replacement of damaged or missing 65 mm diameter hose nozzle;
- (g) Replacement of damaged valve stem seal;
- (h) Replacement, repair and repainting of concrete pedestals;
- (i) Replacement of fire damaged, missing or shortfall fire signage to equipment;
- (j) Hydrants shall be labelled with identifying tags and details recorded.

JC 06.04**FIRE HOSE REELS**

Repair work to the fire hose reel systems is detailed in the Particular Specification and shall include but no be limited to the following:

- (a) Replacement of the hose drum seal where leaks occur;
- (b) Replacement of the 30 m hose where perished, damaged or missing;
- (c) Repair damaged hose drums and, where directed by the Engineer, replace with new;
- (d) Replace gland packing and gaskets to hose reel shut-off valve;
- (e) Replace missing hose reel shut-off valve wheel handles;
- (f) Number and catalogue hose reel;
- (g) Where hose reels shut-off valves are damaged beyond repair, these shall be replaced with new;
- (h) All hose reel mountings shall be checked and where loose or damaged, replaced with new;
- (i) Where paintwork of equipment has deteriorated, such equipment items shall be replaced and repainted in accordance with the manufacturer's specification;
- (j) Hose reels shall be labelled with identifying tags and details recorded, including service record.

JC 06.05**FIRE EXTINGUISHERS**

Repair work to the fire extinguishers is detailed in the Particular Specification and shall include, but not be limited to the following:

- (a) Replace wall mounting boards and brackets where damaged or missing.
- (b) Dry chemical powder extinguishers shall be repaired and serviced and shall include at least the following:
 - (i) Replace discharge hose and nozzle where damaged or missing;
 - (ii) Replace gauge on bottle where reading is incorrect, damaged or missing;
 - (iii) Check, service and repair activation mechanism;
 - (iv) Replace DCP powder;
 - (v) Recharge discharge cylinder to the required capacity;
 - (vi) Reseal discharge mechanism;
 - (vii) Replace instructions on extinguishers where necessary;
 - (viii) Extinguishers shall be labelled with identifying tags and details recorded, including service record.
- (c) CO₂ extinguishers shall be repaired and serviced and shall include at least the following:
 - (i) Replace discharge nozzle and pipe where damaged or missing;
 - (ii) Replace gauge on bottle where reading is incorrect, damaged or missing;
 - (iii) Repair activation mechanism;
 - (iv) Recharge with CO₂ to required capacity;
 - (v) Reseal discharge mechanism;
 - (vi) Replace instructions on extinguishers where necessary;
 - (vii) Extinguishers shall be labelled with identifying tags and details recorded, including service record.
- (d) Water extinguishers shall be repaired and serviced and shall include at least the following:
 - (i) Check cylinder for corrosion and report to Engineer. Where directed, the complete unit shall be replaced;
 - (ii) Replace discharge hose and nozzle where damaged and missing;
 - (iii) Replace gauge on bottle where damaged, missing or where reading is incorrect;
 - (iv) Check service and repair activation mechanism;
 - (v) Replace water content;
 - (vi) Recharge discharge cylinder to the required capacity;

- (vii) Reseal discharge mechanism;
 - (viii) Replace instructions on extinguisher where damaged or missing;
 - (ix) Extinguishers shall be labelled with identifying tags and details recorded, including service record.
- (e) Foam type extinguisher shall be serviced and repaired and shall include at least the following:
- (i) Check cylinder for corrosion and report to Engineer. Where directed, the complete unit shall be replaced;
 - (ii) Replace discharge hose and nozzle where damaged or missing;
 - (iii) Replace gauge on bottle where damaged, missing or incorrect;
 - (iv) Check, service and repair activation mechanism;
 - (v) Replace foam concentrate content;
 - (vi) Recharge discharge cylinder to required capacity;
 - (vii) Reseal discharge mechanism;
 - (viii) Replace instructions on extinguisher where damaged or missing;
 - (ix) Extinguishers shall be labelled with identifying tags and details recorded, including service record.

JC 07 MAINTENANCE TO INSTALLATIONS, SYSTEMS AND EQUIPMENT

JC 07.01 GENERAL

Annual maintenance responsibilities for each installation including all units and components as specified shall commence with access to the site. A difference shall be made in payment prior to and after practical completion of the work.

Maintenance of the completed installation shall commence upon the issue of a certificate of practical completion for repair work, and shall continue for the remainder of the 36-month contract period.

This part of the Contract shall include:

- (a) Routine preventative maintenance;
- (b) Corrective maintenance, and
- (c) Breakdown maintenance,

as defined in Additional Specification SA: General Maintenance, for the specified installations described under JC 01 of this specification.

The maintenance work to be performed and executed shall be done strictly in accordance with Additional Specification SA: General Maintenance and as specified in Particular Specification PJC and this specification.

The said maintenance work shall be executed in accordance with the relevant codes of practice, statutory regulations, standards, regulations, municipal laws and by-laws and the manufacturers' specifications and codes of practice.

The maintenance schedules and frequency shall be developed under the maintenance control plan to be instituted by the Contractor, as specified in Additional Specification SA: General Maintenance.

All new equipment, components and materials supplied and installed under the maintenance contract shall be furnished with a prescribed manufacturer's guarantee. The maintenance work and items are to be categorised for each maintenance activity under the following headings:

- (a) Fire hydrants
- (b) Fire hose reels
- (c) Fire extinguishers.

The Contractor shall be remunerated monthly, based on his performance, for maintaining the complete installation in a perfect functional condition.

JC 07.02 ROUTINE PREVENTATIVE MAINTENANCE

The routine maintenance of the installations, systems and equipment shall be done in accordance with Additional Specification SA: General Maintenance, and the Particular Specification related to this work.

The routine maintenance work to be performed and executed shall include, but not be limited to the items listed below under the respective headings.

These actions and findings shall be logged and reported on the relevant approved schedules and reports.

JC 07.02.01 Fire hydrants

Maintenance work shall include at least the following actions and shall be scheduled in accordance with the relevant regulations and requirements and include monthly and six-monthly inspections and services.

- (a) Check hydrant valve seal.
- (b) Check right angle wheel for tightness.
- (c) Check valve stem and or top for damage.
- (d) Check valve stem seal and readjust.
- (e) Check operation of quick couplers.
- (f) Check operation (opening and closing movement of valve).
- (g) Check water pressure and flow.
- (h) Check stand pipe for rigidity and leaks.
- (i) Log maintenance schedule.
- (j) Report defects for processing and repair.
- (k) For fire water pipe systems see Technical Specification AA.
- (l) For fire pump see Technical Specifications FN and JA.

JC 07.02.02 Fire hose reels

Maintenance work shall include at least the following actions and shall be scheduled in accordance with the relevant regulations and requirements and include monthly and six-monthly inspections and services.

- (a) Check drain seal.
- (b) Roll down hose and check for cracks or perishing.
- (c) Check operation of PWD type nozzle.
- (d) Check operation of drain.
- (e) Check operation of fire hose reel valve.
- (f) Lubricate moving parts of drum.
- (g) Check pressure and flow of fire hose reel.
- (h) Check piping for leaks and damages.
- (i) Log maintenance schedules.
- (j) Report defects for processing and repair.
- (k) For fire water pipe systems see Technical Specification AA.
- (l) For fire pumps see Technical Specifications FN and JA.

JC 07.02.03 Fire extinguishers

Maintenance work shall include at least the following actions and shall be scheduled in accordance with the relevant regulations and requirements and include monthly and six-monthly inspections and services.

- (a) General
 - (i) Check mounting of backboard and bracket.
 - (ii) Check charge of the extinguisher.
 - (iii) Check the condition of the discharge.
 - (iv) Check the mechanism condition of the discharge hose.
 - (v) Update the log entry on the extinguisher.
 - (vi) Log maintenance schedule.
 - (vii) Report defects for processing and repair.

(b) Individual types of extinguishers

Over and above the preceding requirements, the following shall apply to individual types of extinguishers.

- (i) DCP extinguishers:
Check charge and replace powder at prescribed intervals.
- (ii) CO₂ extinguisher:
Check charge.
- (iii) Water extinguisher:
Replace water at pre-described intervals.
- (iv) Foam extinguisher:

Check foam mix and replace at predetermined intervals.

JC 07.03 **CORRECTIVE MAINTENANCE**

This corrective maintenance of the installations, systems and equipment shall be done in accordance with Additional Specification SA: General Maintenance, and the Particular Specification related to this work.

The Contractor shall inspect and check all equipment, materials, systems and installations for any pending breakdowns, maladjustments or anomalies of equipment.

The Contractor shall report and take actions to correct such shortfall.

JC 07.04 **BREAKDOWN MAINTENANCE**

Breakdown maintenance of the installations, systems and equipment shall be done in accordance with Additional Specifications SA: General Maintenance.

All breakdown problems experienced shall be acted upon within the time limitations allowed in the General Maintenance specifications.

All breakdown maintenance shall be done in accordance with the relevant specifications, standards, regulations and codes.

The Contractor shall have access to the necessary spares, equipment and tools for any possible breakdowns.

MUNICIPAL REGULATIONS. LAWS AND BY-LAWS

KA 02.04 All municipal regulations laws, by-laws and special requirements of the Local Authority shall be adhered to unless otherwise specified.

MECHANICAL PRESSURE GAUGES

- KA 02.05
- (a) Analogue mechanical or Bourdon tube pressure gauges shall be of the bottom entry type and shall have faces at least 60 mm in diameter with clear, readable markings and indicators. The screw-in fitting shall be compatible with the pipe fitting, which shall be the metric equivalent of a ½ inch BSP internal thread unless otherwise specified. Threads shall be in accordance with BS 21 for jointing threads or BS 1387 for long screw threads. The Contractor shall provide the relevant details in the operation and maintenance manuals.
 - (b) The indicated range on the gauge shall span 120 % of the operational pressure range specified for the relevant equipment. Accuracy shall be within 3 % of the full-scale deflection value. An adjustable indicator shall be set to indicate the maximum operational system pressure clearly.
 - (c) It shall be possible to isolate the pressure gauge from the pressure pipe by means of a valve or a gauge cock, which shall be supplied and installed by the Contractor and shall be included in the tendered rate for the equipment.
 - (d) A gauge protector shall be fitted where a gauge has to indicate pressures in corrosive media or liquids that could easily clog the pressure ports. It is a requirement that gauge protectors be fitted where sludge is the working medium.
 - (e) Pressure gauges fitted to hydraulic pipelines shall be glycerine-filled for damping purposes, and gauges fitted to pneumatic or gas pipelines shall be vacuum- damped.
 - (f) The circumferential positioning of pressure gauges on water and sewerage pipes shall be in accordance with BS 5316: Part 1 class C, and the static head tapping shall also comply with these standards.
 - (g) Bourdon type pressure gauges shall comply with BS 1780.

KA 02.06 DATA LOGGER SPECIFICATION

The data logger shall be a Meinecke Cosmos data logger or similar approved.

KA 02.06.01 Special features required

The following special features are required of the data logger:

- Recording of analogue values (pressure) and flow simultaneously;
- Inputs may be used for either digital or analogue sensing devices;
- Three independent memories (day, hour and events);
- Positive and negative data logging;
- LC-display;
- Alarm contact;
- Battery-powered (independent of the mains power supply);
- Appropriate software included.

KA 02.06.02 Technical data

Protection	IP68
Casing	Cast aluminium
Operating temperature	0 to 50 °C
Storage temperature	-10 to+ 70 °C
System clock	Read time
Output	V.24/RS 232-compatible data interface to connect to the PC. All socket connectors are waterproof.
Alarm contact	FET open drain - 1 max 100 mA; U max 50 V

KA 02.06.03 Pressure sensors

The sensor may be either:

- direct-connected to a 3/8" NPT thread nipple, or
- connected by an adapter to a 3/8" Whitworth female connection.

Material:

All parts which are in contact with the media and the housing must be manufactured from stainless steel.

Storage temperature	-55 to +100 °C
Operating temperature	-40 to +100 °C
Operating temperature interface	0 to +70 °C
Compensated range	0 to +70 °C
Media temperature	-40 to +125 °C
Humidity	0 to 100 % (RH)
Shock	50 g
Accuracy	± 1,0 % FS at constant temperature
Non-linearity	± 0,2 % FS
Repeatability	± 0,5 % FS
Thermal effects	0 °C to 70 °C
Response time	1,0 ms

Pressure ratings (bar):	<u>Operating pressure</u>	<u>Proof pressure²</u>	<u>Burst³</u>
	0 - 20,70	31,0	345

- (a) Sensor including interface;
- (b) Maximum pressure without causing damage to the sensing elements;
- (c) The media will be contained until this extreme pressure limit is exceeded.

Measuring range: 0,0 to 20,7 bar

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KA 03.05.03 Meter management

All metered consumers must be incorporated into a billing system for the accurate compilation of monthly accounts for water consumed.

The billing system shall be user-friendly and cover at least the following aspects:

- (a) Meter serial number;
- (b) Consumer name;
- (c) Postal and residential address;
- (d) Meter reading at start and end of period;
- (e) Dates of meter reading;
- (f) Volume of water consumed;
- (g) Tariff applicable for payment;
- (h) Estimated interim accounts;
- (i) Accounts in arrears;
- U) Unreadable accounts with associated reasons;
- (k) Incorporation of prepayment meters and associated consumption.

KA 03.05.04 Provision of software

Software packages shall be provided to enable the following:

- (a) Establishment of a meter database;
- (b) Establishment of a user-friendly database;
- (c) Water audit (WAR);
- (d) Night-flow evaluation (SANFLOW).

KA 03.05.05 Training and capacity building

This clause covers the training of representative staff of the User Client to acquire a level of competency so that they will be able to manage the water control plan.

The training programme shall include the following aspects:

- (a) Software application for water balance, water audit and billing system;
- (b) Meter reading;
- (c) Use of data loggers.

SANS 10306 will be used as a basis for the training.

KA04 MAINTENANCE

This specification must be read in conjunction with Additional Specification SA: General Maintenance.

All components of the water control plan including the associated water meters, as well as software and hardware for the computers, shall be maintained during the

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maintenance phase of the Contract. Maintenance of the system shall ensure reliable functioning and optimum service life thereof. Commencement of maintenance of the system shall mean that the system has been repaired to its original level of serviceability and shall leave the Contractor with an as-new system to maintain for the remaining period of the 36 month contract.

Remuneration for maintaining the system, services and parts of the infrastructure in perfect functional condition is provided for in the Schedule of Quantities by means of monthly payment items.

Maintenance implies and shall include monthly routine preventative maintenance and corrective maintenance, as well as breakdown maintenance on all components of the specified installation. Maintenance shall include all repair work, replacing of components, fixing defects or any other actions or rectifying measures necessary for complete operation of the water control plan.

KA 04.01 SCOPE OF MAINTENANCE

Maintenance work for the water control plan shall comprise the following:

KA 04.01.01 Monthly maintenance

- (a) Check operation of water meters;
- (b) Read all water meters;
- (c) Verify sample meter readings;
- (d) Update database;
- (e) Issue consumer accounts;
- (f) Repair visible leaks;
- (g) Compile monthly water balance on volume and costs.

KA 04.01.02 Regular maintenance

- (a) Check sewer night flows three-monthly;
- (b) Install data loggers to measure night flows at bulk and zone meters three-monthly;
- (c) Analyse data from data loggers;
- (d) Implement leak detection in areas indicated as problematic through data logger analysis.

KA 04.01.03 Annual maintenance

- (a) Clean strainer units at water meters;
- (b) Confirm settings and operation of pressure-reducing valves.

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KA05 MEASUREMENT AND PAYMENT

KA.01 C_OMPILATION OF DATABASEUnit: sum

The tendered sum shall include for the provision of the software and the input of all the initial data.

KA.02 MEASUREMENT OF NIGHT FLOWS Unit: number

The unit of measurement shall be the number of periods during which a night flow is measured per water meter installation, irrespective of the duration of the measuring period.

The tendered rate shall include for the installation of data loggers, downloading of data, presentation and analysis of results and all associated incidental charges.

KA.03 METER MANAGEMENT SYSTEM Unit: sum

The unit of measurement shall be a sum for the complete compilation of a meter management system sufficient for management of the installation.

The tendered rate shall include for the input of all related data.

KA.04 PROVISION OF SOFTWAREUnit: number

The unit of measurement shall be the number of software packages provided.

The tendered rate shall include for the supply, delivery and installation of the relevant software. All associated labour costs shall be included but, the associated computer hardware costs are to be excluded.

Separate pay items will be listed in the Schedule of Quantities for different software packages.

KA.05 TRAINING AND CAPACITY BUILDING Unit: sum

The unit of measurement shall be a sum to cover the respective training and capacity building offered.

The tendered rate shall include for the labour, transport, materials and all other related costs.

Separate items will be listed in the Schedule of Quantities for different courses required.

KA.06 SUPPLY AND INSTALLATION OF PRESSURE GAUGES Unit: number

The unit of measurement shall be the number of pressure gauges supplied and installed.

The tendered rate shall include full compensation for the supply and installation of the pressure gauges, including site handling, correct positioning, testing and all material and labour required to obtain a fully functional pressure gauge.

KA.07 SUPPLY AND DELIVERY OF DATA LOGGERS Unit: number

The unit of measurement shall be the number of data loggers supplied and delivered. There will be different items for different data loggers.

The tendered rate shall include full compensation for the corrosion protection, patent rights, royalties, transport and all other costs and actions required for the supply and delivery of data loggers as specified.

**KA.OS INSTALLATION, TESTING AND COMMISSIONING
OF DATA LOGGERS AS SPECIFIED Unit: number**

The unit of measurement shall be the number of data loggers installed, tested and commissioned as specified.

The tendered rates shall include full compensation for the site handling, positioning, installation, testing and commissioning of the data loggers as specified, including all other costs and actions required to obtain a fully functional system for flow measurement.

All actions required as part of the software installation shall be included.

BF PEST CONTROL**CONTENTS**

BF 01	SCOPE
BF 02	STANDARDS
BF 03	SAFETY REQUIREMENTS
BF 04	INITIAL PEST CONTROL PROCEDURE
BF 05	MONITORING AND REPORTING OF PEST CONTROL STATUS
BF 06	PREVENTATIVE PEST CONTROL
BF 07	TRAINING OF EMPLOYER'S PERSONNEL
BF 08	LOGGING AND RECORDING
BF 09	NOTIFICATION OF INTENTION TO ADMINISTER PEST CONTROL
BF10	PREPARATION OF THE AREA AFFECTED BY PEST CONTROL
BF 11	CLEARANCE AFTER PEST CONTROL
BF12	PERFORMANCE MEASUREMENT
BF13	MEASUREMENT AND PAYMENT

BF 01 SCOPE

This Specification covers the application of pesticides and herbicides in the facility(ies) set out in the Project Specification for the purpose of pest control. Pest control, in this instance, shall imply the eradication of pests which cause structural and other damage to buildings and installations at the facility in question.

Structural damage shall include:

- Damage to the structural elements of buildings.
- Damage to finishes of buildings.
- Damage to building electrical installation.
- Damage to building wet services (plumbing and drainage)

BF 02 STANDARDS

The following standards and publications contain provisions, which, through reference in this text, constitute provisions of this specification. The most recent editions of the standards indicated below shall be used:

CODE	DESCRIPTION
SANS 10072	Code of practice for the safe use of household insecticides and agricultural remedies.
SANS 10124	Code of practice for the application of certain soil insecticides for the protection of buildings.
SANS 10133	Code of practice for the application of pesticides in food handling, food processing, and catering establishments.

CODE	DESCRIPTION
SANS 10080	Code of practice for the rodent proofing of buildings.
SANS 10005	Code of practice for the preservation treatment of timber.
SANS 10206	Code of practice for safety procedures for the disposal of surplus pesticides and associated toxic waste.
SANS 10204	Code of practice for the application of fumigants.
National Departments of Agriculture Publication	A guide to the control of household and industrial pests.

BF 03 SAFETY REQUIREMENTS

No pesticide shall be used for any purpose other than that recommended on the manufacturer's label of the pesticide container. All warnings and precautions set out on the manufacturer's label shall be adhered to. The manufacturer's label shall never be removed from the container.

A Pest Control Operator shall be appointed by the Contractor and the relevant certification, as specified in sub clause BE 08.03 below, shall be submitted to the Engineer before the first pesticide application.

The Pest Control Operator (PCO) will at all times ensure that pesticides are kept secure and out of reach of the general public. The PCO shall be responsible for the safe disposal of surplus pesticides as well as all empty pesticide containers.

The PCO will further ensure that no member of the general public is at any time in danger of being contaminated with the pesticide. Should a member of the general public be contaminated the PCO will immediately follow the first-aid and emergency treatment outlined in the standards.

BF 04 INITIAL PEST CONTROL PROCEDURE

BF 04.01 COMPILING OF A PEST CONTROL PROGRAMME

Before any pest control is to be administered the Contractor shall inspect the various buildings and installations at each facility and subsequently compile and submit a report, to the Engineer, detailing the comprehensive preventative pest control programme to be implemented.

The report submitted to the Engineer shall include but shall not be limited to the following:

- (a) The status of the pest infestation of the various buildings and installations at each facility.
- (b) The initial "clean up" procedure to be implemented.
- (c) The procedures of how to close off all entry points for rodents.
- (d) The routine monitoring and reporting procedures.
- (e) Estimated costs for the above.

BF 04.02 INITIAL "CLEAN UP" AND RODENT PROOFING

The Contractor shall implement the initial "clean up" procedure and the rodent proofing of the various installations, as described in the pest control programme, buildings and only after instructions from the Engineer have been obtained.

BF 05 MONITORING AND REPORTING OF PEST CONTROL STATUS

The status of pest infestation shall be monitored. The Contractor shall compile a report on the condition as well as recommendations at the intervals specified in the Particular Specifications. The report shall include but shall not be limited to the following details:

- (a) Report on the type and status of damage caused by pests.
- (b) Report on the visual observation of the presence of pests.
- (c) Report on the pest control monitoring results.
- (d) Report on the standing of the preventative pest control.
- (e) The recommended pest control procedure.

This report is to be submitted to the Engineer. Only upon instruction from the Engineer shall the recommended pest control procedures be implemented.

If, at any intermediate period, the need for pest control should arise the Contractor shall submit a report and recommendations to the Engineer and await his instructions.

BF 06 PREVENTATIVE PEST CONTROL

The Contractor shall administer preventative pest control as often as required but in accordance with the intervals specified by the manufacturer of the pesticide.

The Contractor shall report on the standing of pest activity and damage caused by the pests after each inspection as outlined in clauses PFE 02, PFE 03, PFE 04 and PFE 05 of Particular Specification PFE. The report is to be submitted to the Engineer (as in clause BF 05 above). The Contractor shall obtain the permission of the Engineer before any additional preventative pest control is to commence.

BF 07 TRAINING OF EMPLOYER'S PERSONNEL

Pests are attracted to areas where food and water are in abundance. Good housekeeping techniques can improve the likelihood of keeping an area pest free. It is therefore essential to train the Employer's relevant personnel in the essential housekeeping techniques. The objectives of the training shall be to ensure that the following be achieved:

- (a) The identification of possible attractions for pests.
- (b) The elimination of waste disposal situations which may attract pests.
- (c) Reducing the overall cost of pest control by keeping the areas as clean and pest free as achievable.

The training course shall be in accordance to the Additional Specification SD: General Training and shall furthermore include at least the following:

- (a) The effective methods of waste disposal in order not to attract pests.
- (b) The effective methods of storing foodstuffs in order not to promote the nesting and infestation of pests.
- (c) Cleaning of facilities to avoid attracting pests.

The Contractor is to develop a training syllabus in accordance with Additional Specification SD: General Training. The training syllabus shall include but shall not be limited to the following information:

- (a) The effective methods of waste disposal in order not to attract pests.
- (b) The effective methods of storing foodstuffs in order not to promote the nesting and infestation of pests.
- (c) Cleaning of facilities to avoid attracting pests.
- (d) General information about the various pests which may be found at the facility.

BF 08 LOGGING AND RECORDING

The Contractor shall institute a logging and recording system as part of his management control plan. This shall consist of a file containing the particulars as described in detail below:

BF 08.01 PESTICIDE QUALITY

A sample of each batch of each type of pesticide used shall be taken and stored in a sealed clean glass container. The container shall be clearly marked. These samples are to be kept in safe and appropriate storage by the Contractor in case of a dispute arising from insufficient control of vermin or contamination of any sort.

BF 08.02 LOGGING OF PESTICIDE APPLICATIONS

After each application of pesticides a Pesticide Application Log Sheet (Form PC-1, that forms part of this specification) is to be completed and submitted to the Engineer. The Pesticide Application Log Sheet (Form PC- 1) includes the following details:

- Name of the pest control operator
- Name and address where the pesticide application was administered
- Date of the pesticide application
- Manufacturer of the pesticide
- Pesticide name and active ingredient
- Batch identification of the pesticide
- Formulation and concentration of the pesticide
- The pest and type of control aimed at
- Type of application i.e. residual spray, fumigant, bait etc
- Area of application
- Quantity of product used

BE 08.03 RECORDS OF PEST CONTROL OPERATORS

All pest control operators shall be in possession of the National Certificate in pest control, as approved by the Department of National Education. The Pest Control Operator (PCO) shall be in possession of a Registration Certificate issued by the Department of Agriculture in accordance with Act 36 of 1947.

The Pest Control Operator's details and certifications shall be made available for inspection by the Engineer prior to the application of pesticides.

A copy of the Pest Control Operator's details and certifications shall be submitted together with the Pesticide Application Log Sheet (Form PC-1) completed for each pesticide application.

BF 09 NOTIFICATION OF INTENTION TO ADMINISTER PEST CONTROL

Before pest control procedures may commence a notification shall be submitted to the Employer's representative responsible for the facility. The Notification of Intent to Administer Pest Control (Form PC-2, that forms part of this specification) shall include the following details:

- The name and address of the person being notified
- The pest control procedure to be employed and the purpose of the pest control
- The pesticide to be employed
- The date and time of commencement

The pest control operator is to sign the notification to acknowledge responsibility for the precautions to be taken before, during and after operations.

The Employer's representative responsible for the facility is to sign the notification to acknowledge receipt of the notice.

Pest control procedures may only be implemented once the notification has been completed and signed by all relevant parties.

BF10 PREPARATION OF THE AREA AFFECTED BY PEST CONTROL

The PCO shall arrange, with the Engineer via the Contractor, a suitable time for the pest control area to be vacated and provide an approximate time for the completion of pest control.

The PCO shall provide the Employer's representative responsible for the facility with a written list of all materials and articles that must be removed from the facility before the administering of pesticides may commence.

After the PCO is satisfied that all materials, which might be damaged or contaminated during the application of pesticides, have been removed he will conduct a thorough inspection of the area before pest control application may commence.

BF 11 CLEARANCE AFTER PEST CONTROL

Upon completion of the application of pesticides the PCO shall ensure that the area is well ventilated and that the levels of harmful gases are safe for re-occupancy.

The area shall be checked for any damage or contamination caused by the application of the pesticides and all dead rodents shall be removed from the area.

The PCO shall deliver a written Clearance Notification (Form PC-3, that forms part of this technical specification), declaring the area safe for re-occupancy, to the Employer's representative responsible for the facility.

BF12 PERFORMANCE MEASUREMENT

The Contractor's performance shall be evaluated as follows:

BF12 .01 SCORE-CARD

The Engineer shall inspect each facility monthly after the commencement date of the Contract. The Engineer shall use a score-card to measure the quality of pest control service rendered by the Contractor during the preceding month. The score-card shall serve to evaluate ten performance indicators each month in the manner set out below.

BF12 .02 PERFORMANCE INDICATORS

The Contractor and the Engineer shall each have the opportunity to select five (5) performance indicators each month which shall focus on the measurement of the quality of pest control service rendered, against the relevant clauses of this specification for the month ahead. All ten (10) performance indicators are known to both the Engineer and the Contractor. The Contractor shall aim to perform satisfactorily on all ten performance indicators. All indicators shall be selected from the scope of his normal routine activities based on the pest control programme as specified in sub-clause BF 04.01. The work shall either be satisfactory or unsatisfactory and the Contractor shall score one (1) or zero (0) respectively per indicator.

BF12 .03 SATISFACTORY PERFORMANCE

The Engineer shall inspect the Site on an arbitrary day to measure the quality of the pest control against the 10 selected performance indicators. Should the Contractor score the maximum points (10) he shall receive his full payment that month under pay item BF.05 for providing a good-quality pest control service during the previous month. Should the quality of the service provided by him be unsatisfactory according to the score-card, the Contractor will not receive full payment that month due to a reduced service level. In this manner the Employer will be protected against a reduced or unsatisfactory service level.

A copy of the score-card including a guideline for the use thereof is included in this specification.

BF 13 MEASUREMENT AND PAYMENT**BF .01 Compiling Of The Pest Control Programme
For Each Location****Unit: Sum**

The unit of measurement shall be the number of comprehensive pest control programmes compiled for the different locations in each facility. Each programme shall include initial steps to be taken as well preventative pest control procedures.

The programme shall be subject to revision by the Engineer.

The tendered rate shall include full compensation for ascertaining the status of the pest infestation, for all testing; including re-testing where applicable as well as for the cost of providing all instrumentation, tools, equipment and labour that may be required.

BF .02 Initial "Clean Up" And Rodent Proofing**Unit: Sum**

The unit of measurement shall be a lump sum.

The sums tendered for the different locations in each facility shall include full compensation for the preparation of the area affected by the pest control procedure, for notifications as in clauses BE 09, BE 10 & BE 11 for the supply, preparation, delivery and the application of the pesticides, for the safe disposal of empty pesticide containers and for storage, transport and handling.

The tendered sum shall include full compensation for the cost of all materials required for the rodent proofing of the facility as well as for the supply, delivery, storage, handling, transport and installation of such materials.

The tendered sum shall also include full compensation for all testing, including re-testing where applicable for all instrumentation, tools, equipment and labour that may be required as well as for the logging and recording of all required data as described this specification.

BF .03 Monitoring And Reporting Of Pest Control Status**Unit: Number**

The unit of measurement shall be the number of reports with recommendations compiled and submitted for each location in each facility.

The tendered rate shall include full compensation for monitoring the pest control status, for the supply of all equipment used during monitoring, for delivery of relevant equipment, and for the cost of compiling the reports with recommendations.

The tendered rate shall also include full compensation for all testing, including re-testing where applicable, for all instrumentation, tools, equipment and labour that may be required as well as for the logging and recording of all required data as described in this specification.

BF .04 Preventative Pest Control **Unit: Sum**

The unit of measurement for the preventative pest control at each location in each facility for the period between inspections and for reporting as outlined in clauses PBF 02, PBF 03, PBF 04 and PBF 05, shall be a lump sum.

The tendered sum shall include full compensation for the preparation of the area affected by the pest control procedure, for notifications as in clauses BF 09, BF 10 & BF 11, for the preparation, supply, delivery, and the application of the pesticides, for the safe disposal of empty pesticide containers and for storage, transport and handling.

The tendered sum shall also include full compensation for all •testing, including re-testing where applicable, for all instrumentation, tools, equipment and labour that may be required as well as for the logging and recording of all required data as described this specification.

BF .05 Maintaining Quality Of Pest Control Service **Unit: Point**

The unit of measurement shall be a point. Each month shall represent a maximum of 10 points and a minimum of zero points, depending on the performance of the contractor in providing quality service.

Ten points per month, determined by using the rate tendered per point, shall include full compensation for executing the work as specified and for all risks, liabilities and obligations described or implied in the Conditions of Contractor, this specification, Portion 1 of the Project Specifications and in Particular Specifications SABS 1200A and 1200AB as amended in Portion 2 of the Project Specifications.

The combined tendered rate for 10 points shall also include full compensation for quality control, for all taxes, levies and insurances that may be applicable and for all other incidentals necessary to provide the service and for which no provision for payment has been made under other payment items.

The rate tendered for this item shall not be less than ten per cent (10%) of the total price tendered for the pest control service.



NATIONAL DEPARTMENT OF PUBLIC WORKS

PESTICIDE APPLICATION LOG SHEET

Name of Pest Control Company:

Name of Pest Control Operator:

Name and location of pesticide application:

Date:

Pesticide Manufacturer:

Name of applied pesticide:

Active Ingredient:

Batch identification:

Formulation and Concentration of pesticide
applied:

Type of application:

Area of pesticide application (description and
dimensions):

Quantity of products applied (verified by
Engineer):

Engineer's name and signature:

Pest and type of control aimed at:



NATIONAL DEPARTMENT OF PUBLIC WORKS
NOTIFICATION OF INTENT TO ADMINISTER PEST CONTROL

TO: _____

LOCATION OF PEST CONTROL: _____

DATE: _____

DATE OF PEST CONTROL
APPLICATION: _____

TIME: _____

PURPOSE OF PEST CONTROL: _____

TYPE OF PEST CONTROL: _____

PESTICIDE TO BE EMPLOYED: _____

The undersigned takes full responsibility for the precautions to be taken
before, during and after the pest control application.

DATE: _____

SIGNED (Pest Control Operator): _____

The undersigned acknowledges receipt of this notice.

SIGNED (Employer's Representative
responsible for facility):



NATIONAL DEPARTMENT OF PUBLIC WORKS
CLEARANCE NOTIFICATIONS

TO _____

LOCATION OF PEST
CONTROL: _____

DATE: _____

DATE OF
COMMENCEMEN
T OF PEST
CONTROL: _____

DATE OF COMPLETION OF PEST
CONTROL: _____

PURPOSE OF PEST

CONTROL: _____

TYPE OF PEST CONTROL: _____

PESTICIDE EMPLOYED: _____

The undersigned confirms that the area in which pest
control was conducted is safe for re-occupancy and that
SIGNED (Employer's Representative) responsible for facility checks and test have been conducted.

DATE: _____

SIGNED (Pest Control Operator): _____

The undersigned acknowledges receipt of this notice of clearance _____

DATE: _____

PARTICULAR SPECIFICATION

PAA PLUMBING AND DRAINAGE INSTALLATION

CONTENTS

PAA 01	SCOPE
PAA 02	GENERAL DESCRIPTION OF INSTALLATION
PAA 03	TECHNICAL DETAILS OF EXISTING INSTALLATION
PAA 04	STATUS OF EXISTING INSTALLATION
PAA 05	DETAILS OF REPAIR WORK
PAA 06	DETAILS OF MAINTENANCE WORK
PAA 07	MEASUREMENT AND PAYMENT

PAA 01 SCOPE

- (a) This specification covers the particulars of the repair and maintenance work to the plumbing and drainage installations. This particular specification shall be read in conjunction with the Technical Specification AA: Plumbing and Drainage Installation, and all additional and technical specifications compiled as part of this document, in particular the following Additional Specifications:

SA: General Maintenance
 SB: Operating and Maintenance Manuals
 SC: General Decommissioning, Testing and Commissioning Procedures
 SD: General Training
 SE: Development of Affirmable Business Enterprise.

The intended repair and maintenance work to this installation will restore the existing installation to a safe, efficiently functional system that complies with all statutory regulations and applicable standards, in the process repairing all defects and shortfalls. On completion of the repair work, the completed installation shall be maintained and serviced by the Contractor for the remainder of the allocated Contract period.

- (b) The complex consists of various areas as listed below, which form part of the repair and maintenance contract for plumbing and drainage installation, as well as the fire water piped reticulation installations.
- (i) Kitchen,
 - (ii) Stores,
 - (iii) Single cells and
 - (iv) Communal cells.

PAA 02 GENERAL DESCRIPTION OF INSTALLATION

The existing plumbing and drainage installation provides potable hot and cold water to the various areas on this site.

The potable cold water installation is provided with supply points from the reticulation network inside the buildings at very kitchen area and chased into walls to outlet points.

The potable hot-water installation is provided with supplies from various hot- water geyser units where applicable.

Central hot-water systems are not dealt with under this contract but all domestic water geysers form part of this contract.

This contract also provides for repair and maintenance of the fire water piped reticulation network, excluding the fire fighting equipment which is dealt with under Particular Specification PJC: Conventional Fire Fighting equipment.

Technical details of sanitary and brassware, as well as the plumbing and drainage installations are given in PAA 03.

PAA 03 TECHNICAL DETAILS OF EXISTING INSTALLATION

At the time of compilation of this document the existing installation consisted of the equipment and plant listed below with their relevant technical details.

PAA 03.01 SANITARY AND BRASSWARE: GENERAL

	SANITARY WARE	BRASSWARE	TRAP
WCs (cistern)	Armitage Shanks/Suda/Vaal, white, floor-mounted, vitreous china,	Brass shut-off valves	Not applicable
WCs (flush)	Armitage Shanks, white, floor-mounted, vitreous china. White, vitreous china, Vaal. Cape Stainless, stainless steel	Flush valve, concealed type wear and tear not to effect the body work	Not applicable
Cistern (WC)	Wall-mounted, white, CI. Wall-mounted, white, plastic	Brass shut-off valves	Not applicable
Urinals (cistern)	Elgin / City Metal, floor-mounted, stainless steel. Armitage Shanks, white, wall-mounted, vitreous china	Brass shut-off valves	Not applicable
Urinals (flush)	Elgin/City Metal, floor-mounted, stainless steel. Armitage Shanks, white, wall-mounted, vitreous china. Cape Stainless, stainless steel	Jnr flush valve, concealed and exposed type, shut-off valves	CP bottle trap. Flexi P-trap
WHBs	Armitage Shanks, white wall-mounted, white enamel CI, stainless steel	Pillar taps handles fixed to spindle by factory press fit pillar taps	Flexi P-trap CP bottle trap lead P-trap
Showers	Vandal proof shower heads. Channel drain type	15 mm CP undertile stop-cocks, water saver shower heads	Brass P-trap with CP grating
Wash troughs	Stainless steel, double bowl, wall-mounted	Wall type taps handles fixed to spindle by factory press fit wall type taps	Flexi P-trap
Baths	Steel enamel, white, 2 m long	Cobra 20 mm, CP star handle wall type taps	Not applicable

	SANITARY WARE	BRASSWARE	TRAP
Sinks	Stainless steel, cabinet-mounted	20 mm CP handles fixed to spindle by factory press fit, 20 mm sink mixer with overarm swivel outlet	Flexi P-trap , lead P-trap
Wash tubs	Concrete double bowl	CP wall type taps	Lead P-trap
S Hopper	Wall-mounted white porcelain	15 mm CP star handle taps	Not applicable

PAA 03.02**SANITARY DRAINAGE PIPING: GENERAL**

	PIPE	FITTINGS	EQUIPMENT
Gullies	VCP	CI grating	Not applicable
Waste pipes	GMS	Brass	Not applicable
Soil pipes	S&S CI	S&S CI	Not applicable
Cleaning eyes	CI (ABC)	Not applicable	Not applicable
Vent pipes	S&S CI	S&S CI	Not applicable

PAA 03.03**DOMESTIC WATER PIPING: GENERAL**

	PIPE	FITTINGS	EQUIPMENT
Cold-water piping	Cu GMS	Conex, soldered GMS	Brass gate shut-off valve Brass gate shut-off valve
Hot-water piping	Cu GMS	Conex, soldered GMS	Brass gate shut-off valve Brass gate shut-off valve

PAA 03.04**FIRE WATER PIPING: GENERAL**

	PIPE	FITTINGS	EQUIPMENT
Fire water piping	GMS	GMS	See specifications

PAA 03.05 PLUMBING FIXTURE QUANTITIES

At the time of completion of this document the various facilities were equipped with the number of plumbing fixtures as tabled below.

PAA 03.06 FIRE WATER INSTALLATION QUANTITIES

The following quantities of fire fighting equipment currently installed, are tabled below. The piped reticulation networks to these equipment items shall form part of this contract.

PAA 04 STATUS OF EXISTING INSTALLATION

At the time of compilation of this document the status of the equipment and installation was briefly as follows:

PAA 04.01 FACILITIES

PAA 04.01.01 Sanitary and brassware

The sanitary and brassware can be grouped into three categories:

- installations that were installed a long time ago;
- installations that have been refurbished by the maintenance department in recent years, and
- The general condition of these installations varies accordingly, and the following are common occurrences for every category.

(a) Old installations:

- (i) Recessed flush valve links and push buttons are missing.
- (ii) Flush valves in ducts are leaking.
- (iii) Cast-iron cisterns are corroded, broken and damaged.
- (iv) Shower heads are missing or broken.
- (v) Shower and tap handles are generally missing.
- (vi) WCs and WHBs are damaged, ripped out of walls, etc.
- (vii) Shower and urinal gratings are missing, resulting in excessive blockages.

(b) Refurbished installations:

- (i) Recessed flush valve links and push buttons are missing.
- (ii) Shower heads are missing or broken.
- (iii) Shower and tap handles are generally missing.
- (iv) Shower and urinal gratings are missing, resulting in excessive blockages.

PAA 04.01.02 Plumbing and drainage installation

The general condition of the plumbing and drainage installation can also be grouped into three categories:

(a) Old installations:

The installations are generally in poor condition and require extensive repairs and replacements. The following common problems were noticed:

- (i) Regular blockages on drainage pipe installation;
- (ii) Regular leaks developing on the water reticulation network above and underground;
- (iii) Missing gully gratings, IE covers and CE covers on drainage system, and broken manhole covers;
- (iv) Surface-mounted temporary hot-water pipes are prone to damage by inmates.

(b) Refurbished installations:

The installations are generally in good condition and require limited repairs:

- (i) Water pipe bracketing and hot-water pipe insulation require attention;
- (ii) Regular blockages on drainage pipe installation;
- (iii) Missing gully gratings, IE covers and CE covers on drainage system, and broken manhole covers.

(c) Problems experienced with hot-water supply to certain areas are due to the following:

- (i) Insufficient storage and heating capacity for the number of users
- (ii) Overcrowding of facilities;
- (iii) Leaks developing on piping and equipment;
- (iv) Incorrect functioning and failure of hot-water generating plants at

(d) There are problems with the floor drainage installation in the old kitchen at, currently being used as a serving kitchen and scullery. This is due to constant blockages, caused by age, insufficient straining facilities, and the absence of a grease trap that can lead to fat build-up inside drainage lines.

PAA 04.02

RESIDENTIAL BUILDINGS

These facilities are in varying conditions, corresponding to the age of the installation. The following common problems have been observed:

(a) Old houses (previously accommodation for non-white members) and old single quarters:

- (i) The sanitary and brassware, the plumbing and drainage installations, and geysers have been damaged by corrosion and vandalism to such an extent that extensive replacement is necessary.

(b) Old houses and flats:

- (i) Extensive damage to sanitary ware such as baths, WHBs and WCs.
- (ii) Old geyser installations result in frequent failures and low hot-water pressure;
- (iii) Corrosion and damage to a large proportion of domestic water and drainage installations.

(c) New houses, flats and single quarters:

- (i) Limited damage to sanitary and brassware, and plumbing and drainage installations;
- (ii) A latent problem is experienced with geyser pressure-reducing valves.

PAA 04.03 RECREATIONAL FACILITIES

These facilities are generally in a fair and functional condition. The following problems have been observed:

- (a) Sanitary and brassware are damaged in some ablutions, due to corrosion and vandalism in isolated cases.
- (b) Blockages occur in drainage pipes at rugby stadium.
- (c) There is insufficient hot water in staff kitchen due to inadequate geyser installation.
- (d) Most areas have insufficient fire protection equipment.
- (e) There are isolated leaks on underground water pipes due to corrosion.

PAA 04.04 WORKSHOPS, STORAGE, MAINTENANCE AND TRANSPORT FACILITES

- (a) Facilities are generally in a fair condition and require limited repairs to sanitary and brassware, and plumbing and drainage pipes.
- (b) Extensive repairs and replacements to inmates ablutions are necessary.
- (c) Most areas have inadequate fire protection.

PAA 04.05 OFFICE AND SUPPORT SERVICES FACILITIES

- (a) Facilities are generally in a fair condition and require limited repairs to sanitary and brassware, and plumbing and drainage pipes.
- (b) Extensive repairs and replacements to inmates' ablutions are necessary.
- (c) Most areas have inadequate fire protection.

PAA 04.06 AGRICULTURAL FACILITIES

The installations that form part of these facilities are in varying condition. The following problems were identified:

- (a) Old GMS water pipe installations in some areas are badly corroded and frequent leaks occur.
- (b) Equipment, plumbing and drainage in inmates' ablutions and some other ablutions are in a poor state and necessitate extensive replacements.
- (c) Inadequate floor/drainage at dairy leads to unhygienic conditions.
- (d) Unprotected underground GMS pipes at piggery are very corroded.

PAA 04.07 TRAINING AND EDUCATIONAL FACILITIES

These installations are generally in a fair condition and require limited repairs to and replacements of equipment and piped reticulation.

The services to primary school ablutions are in a poor condition and require complete replacement.

PAA 04.08 MAIN KITCHEN AND BAKERY, ABATTOIR AND LAUNDRY

There are various problems at these installations, in particular with regard to drainage systems. The following items were identified:

- (a) Equipment in inmates' ablution areas and kitchen are damaged, and will require repairs and replacement.
- (b) The lack of a floor drainage system and grease trap in the kitchen, a lint trap at the laundry, and blood accumulating pit and blood drying bank at the abattoir are against regulations and cause build-up in the sewer pipes and subsequently frequent leaks.

PAA 04.09 MAIN GATE HOUSE

These installations are generally in a fair condition with limited repairs and replacements required to equipment and piped reticulation.

PAA 05 DETAILS OF REPAIR WORK

The following work shall form part of the repair work to Building Services. This work shall be done in accordance with the relevant regulations, codes, specifications and Technical Specification AA: Plumbing and Drainage Installations, as set out in this document. The work to be included is set out in PAA 05.01 and PAA 05.02 below and shall be read in conjunction with the Schedule of Quantities and Technical Specifications.

The repair work shall be carried out in accordance with the requirements of Additional Specification SC: General Decommissioning, Testing and Commissioning Procedures.

PAA 05.01 GENERAL DESCRIPTION OF REPAIR WORK

PAA 05.01.01 The Contractor shall at the start of the Repair Contract inspect the items, systems, equipment, components and installations listed below. This inspection shall include the establishing of any defects, leaks, damages, shortfalls, structural soundness, repairs required, details of existing equipment, suitability of equipment for the purpose it serves, etc. The Contractor shall report back to the Engineer in writing on all the above and the following items. No repair work shall commence prior to approval by the Engineer:

- (a) Sanitary and brassware, including traps, brackets, piping, pan connectors, etc;
- (b) Sanitary drainage installation, including fittings, traps, floor drains, gullies, cleaning eyes, manholes, grease and oil separators, etc;
- (c) Domestic water piped installation, including fittings, valves, strainers, lagging and cladding, non-return valves, safety valves, etc;
- (d) Fire water piped installation, including fittings, valves, non-return valves, pressure gauges, etc;
- (e) Bracketing system;
- (f) Domestic geysers including valves, pressure reducing valves, strainers, vacuum breakers, safety valves, non-return valves, lagging and cladding, etc.

PAA 05.01.02 The general scope of work at the time of going on tender is defined as follows:

- (a) Replacing of irreparably damaged, missing and unsuitable sanitary- and brassware, including the isolation, removal and stripping of the existing equipment;
- (b) Replacing of irreparably damaged, corroded and unsuitable sanitary drainage piping, including fittings, brackets, traps, floor drains, oil and grease separators, cleaning eyes and gullies, etc;
- (c) Replacing of irreparably damaged, corroded and unsuitable domestic water piping, including fittings, brackets, valves, strainers, water meters, lagging and cladding, etc;
- (d) Replacing of irreparably damaged, corroded and unsuitable fire water piping, including fittings, brackets, valves, non-return valves, pressure gauges, etc;
- (e) Replacing of irreparably damaged and corroded domestic geysers, including valves, pressure-reducing valves, air release valves, strainers, non-return valves, vacuum breakers and safety valves;
- (f) Servicing, cleaning and repair of existing sanitary ware including removal of stains, repair of chipped-off enamel, replacing of damaged seats and lids, de-scaling and cleaning of cisterns and servicing of filling and flushing mechanisms, fixing of loose fixtures and brackets, cleaning of traps, etc;
- (g) Servicing, overhauling and cleaning of existing brassware, including dismantling, de-scaling, replacing of washers, gland packings and gaskets, replacing of missing tap handles and flushing assemblies, etc;

- (h) Servicing, cleaning and repair of existing domestic water and drainage pipe installations, including traps, floor drains, gullies, manholes, valve chambers, grease and oil separators, brackets, valves, vacuum breakers, strainers, pipe lagging and cladding, etc;
- (i) Servicing and repair of existing fire water piped reticulation, including fittings, valves, pressure gauges, brackets, etc;
- (j) Servicing, cleaning and repair of domestic geysers, including de-scaling, testing for leaks, replacing of elements, safety valves and thermostats if required, etc;
- (k) Handing over of complete systems on completion of the repair work to the satisfaction of the Engineer, when the maintenance period shall commence;
- (l) The supply and compilation of operating and maintenance manuals;
- (m) The testing, adjusting and commissioning of all systems;
- (n) The introduction of a maintenance control plan, including logging, recording and control procedures.

PAA 05.02 REPAIR WORK TO PLUMBING AND DRAINAGE INSTALLATION

The repair work to this installation shall at least include, but not be limited to the work listed below. Any items, components or installations not detailed in particular but found to be defective or inoperative during the inspection and report phase, shall be repaired or replaced as instructed by the Engineer.

PAA 05.02.01 Ablutions and communal ablutions

- (a) ablutions and communal ablutions
 - (i) Replace aboveground GMS cold-water pipe installation complete with copper pipes with capillary soldered fittings.
 - (ii) Service and repair copper hot-water installation, including insulation and bracketing, and replace pipes and fittings that are beyond repair.
 - (iii) Service and repair sanitary drainage installation, and replace items that are missing or beyond repair, including traps and inspection eyes.
 - (iv) Service and repair brassware with repair kits and replace with the following approved items, if missing or damaged beyond repair:
 - (1) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (2) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
 - (3) Cistern and concealed senior flush valves to be replaced with concealed senior flush valves;
 - (4) Rubber flexi-traps for WHBs, wash troughs and urinals;
 - (5) Vandal-proof shower gratings;
 - (6) Vandal-proof water saving shower heads;

- (7) Brace wall-mounted taps in washing areas with approved brackets.
- (v) Service and repair sanitary ware, including destaining and chip repair of enamelled or vitreous china equipment, dent removal from stainless steel equipment, replacement of missing or damaged parts such as toilet seats with vandal-proof alternatives, and replace missing or irreparably damaged equipment with the following approved items:
 - (1) Stainless steel braced WHBs and wash troughs;
 - (2) Stainless steel wall-mounted and urinals;
 - (3) Stainless steel WCs.
- (vi) Equipment such as concealed flush valve mechanisms that are installed in areas accessible to inmates, such as courtyards, are to be enclosed in a lockable cabinet constructed from an angle iron frame and expanded metal panels, fixed to wall with expansion bolts.
- (b) Visitors ablution
 - (i) Replace GMS water pipe installation with copper pipes with capillary soldered fittings.
 - (ii) Service and repair sanitary drainage installation and replace items that are missing or beyond repair, including traps and inspection eyes.
 - (iii) Service and repair brassware with repair kits and replace with the following approved items, if missing or damaged beyond repair:
 - (1) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
 - (2) Cisterns and concealed senior flush valves to be replaced with concealed senior flush valves;
 - (3) Rubber flexi-traps for WHBs, wash troughs and urinals.
 - (iv) Service and repair sanitary ware, including destaining and chip repair of enamelled or vitreous china equipment, dent removal from stainless steel equipment, replacement of missing or damaged parts such as toilet seats with vandal-proof alternatives, and replace missing or irreparably damaged equipment with the following approved items:
 - (1) Stainless steel urinals;
 - (2) Vitreous china floor-mounted WC pans.
- (c) Guard towers
 - (i) Replace GMS water pipes with copper pipe and soldered fittings, and service and repair copper pipe installation.
 - (ii) Service and repair sanitary drainage installation, and replace items that are missing or beyond repair, including traps and inspection eyes.

- (iii) Service and repair brassware with repair kits and replace with the following approved items, if missing or damaged beyond repair:
 - (1) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (2) Replace corroded cast-iron cistern with plastic cisterns;
 - (3) Rubber flexi-traps for WHBs, wash troughs and urinals.
- (iv) Service and repair sanitary ware, including destaining and chip repair of enamelled or vitreous china equipment, dent removal from stainless steel equipment, replacement of missing or damaged parts such as toilet seats with vandal-proof alternatives, and replace missing or irreparably damaged equipment with the following approved items:
 - (1) Stainless steel braced WHBs and wash troughs;
 - (2) Vitreous china floor-mounted WC pans.
- (d) Hospital
 - (i) Service and repair of copper domestic water installation, including insulation of hot-water pipes and replacement of unsuitable brackets, and irreparable sections of pipes and fittings.
 - (ii) Service and repair sanitary and brassware with repair kits, and replace missing or irreparably damaged equipment.
- (e) Administration offices
 - (i) Replace GMS water pipe installation with copper pipes with capillary soldered fittings.
 - (ii) Service and repair sanitary drainage installation, and replace items that are missing or beyond repair, including traps and inspection eyes.
 - (iii) Service and repair brassware with repair kits and replace with the following approved items, if missing or damaged beyond repair:
 - (1) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (2) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
 - (3) Rubber flexi-traps for WHBs, wash troughs and urinals;
 - (4) Vandal-proof shower gratings;
 - (5) Vandal-proof water saving shower heads.
 - (iv) Service and repair all sanitary ware, including destaining and chip repair of vitreous or enamelled surfaces, dent removal from stainless steel equipment, replacement of missing or damaged parts such as WC seats and lids, or replacement of irreparable equipment.

(f) Facility main reticulation installations

- (i) Service and repair domestic water installations, including insulation and bracketing, pressure testing of installations, replacement of damaged, corroded or leaking sections of piping and fittings and unsuitable brackets.
- (ii) Service and repair sewer pipes, including rodding of system and visual inspection by means of a video survey if required. Replace damaged and leaking sections of sewer and fittings, damaged or broken inspection eyes, cleaning eyes and manhole covers.
- (iii) Install a dedicated fire water supply network to existing and new fire hose reels and hydrants, including a fire water booster.
- (iv) Replace underground cold-water ring supplying garden taps in cell block courtyard.
- (v) Install a strainer to domestic water supply.

PAA 05.02.02

(a) Old youth cell ablutions

- (i) Replace aboveground GMS cold-water pipe installation complete with copper pipes with capillary soldered fittings.
- (ii) Service and repair copper hot-water installation, including insulation and bracketing, and replace pipes and fittings that are beyond repair.
- (iii) Service and repair sanitary drainage installation, and replace items that are missing or beyond repair, including traps and inspection eyes.
- (iv) Service and repair brassware with repair kits and replace with the following approved items, if missing or damaged beyond repair:
 - (1) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (2) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valve;
 - (3) Cistern and concealed senior flush valves to be replaced with concealed senior flush valves;
 - (4) Rubber flexi-traps for WHBs, wash troughs and urinals;
 - (5) Vandal-proof shower gratings;
 - (6) Vandal-proof water saving shower heads;
 - (7) Brace wall-mounted taps in washing areas with approved brackets.
- (v) Service and repair sanitary ware, including destaining and chip repair of enamelled or vitreous china equipment, dent removal from stainless steel equipment, replacement of missing or damaged parts such as toilet seats with vandal-proof alternatives, and replace missing or irreparably damaged equipment with the following approved items:
 - (1) Stainless steel braced WHBs and wash troughs;
 - (2) Stainless steel wall-mounted type urinals;

(3) Stainless steel WCs.

(vi) Equipment such as concealed flush valve mechanisms that are installed in areas accessible to inmates, such as courtyards, are to be enclosed in a lockable cabinet constructed using an angle iron frame and expanded metal panels, fixed to wall with expansion bolts.

(b) Refurbished cell ablutions and single cell ablutions

(i) Service and repair copper domestic water installation, including insulation of hot-water pipes and replacement of unsuitable brackets and irreparable sections of pipes and fittings.

(ii) Service and repair sanitary drainage installation and replace items that are missing or beyond repair, including traps and inspection eyes.

(iii) Service and repair brassware with repair kits and replace with the following approved items, if missing or damaged beyond repair:

- (1) WHB, wash trough, bath and shower taps with non-removable tap handles;
- (2) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
- (3) Cistern and concealed senior flush valves to be replaced with concealed senior flush valves;
- (4) Rubber flexi-traps for WHBs, wash troughs and urinals;
- (5) Vandal-proof shower gratings;
- (6) Vandal-proof water-saving shower heads;
- (7) Brace wall-mounted taps in washing areas with approved brackets.

(iv) Service and repair sanitary ware, including destaining and chip repair of enamelled or vitreous china equipment, dent removal from stainless steel equipment, replacement of missing or damaged parts such as toilet seats with vandal-proof alternatives, and replace missing or irreparably damaged equipment with the following approved items:

- (1) Stainless steel braced WHBs and wash troughs;
- (2) Stainless steel wall-mounted type urinals;
- (3) Stainless steel WCs.

(v) Equipment such as concealed flush valve mechanisms that are installed in areas accessible to inmates, such as courtyards, are to be enclosed in a lockable cabinet constructed using an angle iron frame and expanded metal panels, fixed to wall with expansion bolts.

(vi) Disconnect and remove geysers in single cell ablutions and connect to nearby hot-water distribution lines from central hot-water plant.

(c) Non-refurbished cell ablutions

(i) Replace GMS water pipe installation with copper pipes with capillary soldered fittings.

- (ii) Service and repair sanitary drainage installation, and replace items that are missing or beyond repair, including traps and inspection eyes.
- (iii) Replace all brassware with the following approved equipment:
 - (1) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (2) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
 - (3) Cistern and concealed senior flush valves to be replaced with concealed senior flush valves;
 - (4) Rubber flexi-traps for WHBs, wash troughs and urinals;
 - (5) Vandal-proof shower gratings;
 - (6) Vandal-proof water-saving shower heads.
 - (7) Brace wall-mounted taps in washing areas with approved brackets.
- (iv) Replace all sanitary ware with the following approved equipment:
 - (1) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (2) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
 - (3) Cistern and concealed senior flush valves to be replaced with concealed senior flush valves;
 - (4) Rubber flexi-traps for WHBs, wash troughs and urinals;
 - (5) Vandal-proof shower gratings;
 - (6) Vandal-proof water-saving shower heads;
 - (7) Brace wall-mounted taps in washing areas with approved brackets.
- (v) Replace all sanitary ware with the following approved equipment:
 - (1) Stainless steel braced WHBs and wash troughs;
 - (2) Stainless steel wall-mounted and recessed urinals;
 - (3) Stainless steel WCs.
- (vi) Equipment such as concealed flush valve mechanisms that are installed in areas accessible to inmates, such as courtyards, are to be enclosed in a lockable cabinet constructed using an angle iron frame and expanded metal panels, fixed to wall with expansion bolts.

- (d) School, education and training centre, clothing store, social workers' and parole offices
- (i) Replace GMS water pipe installation with copper pipes with capillary soldered fittings.
 - (ii) Service and repair sanitary drainage installation, and replace items that are missing or beyond repair, including traps and inspection eyes.
 - (iii) Connect washhand basin at training centre that currently drains into rainwater channel to sewer system.
 - (iv) Service and repair brassware with repair kits and replace with the following approved items, if missing or damaged beyond repair:
 - (1) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (2) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
 - (3) Cistern and concealed senior flush valves to be replaced with concealed senior flush valves;
 - (4) Rubber flexi-traps for WHBs, wash troughs and urinals;
 - (5) Vandal-proof shower gratings;
 - (6) Vandal-proof water-saving shower heads;
 - (7) Brace wall-mounted taps in washing areas with approved brackets.
 - (v) Service and repair sanitary ware, including destaining and chip repair of enamelled or vitreous china equipment, dent removal from stainless steel equipment, replacement of missing or damaged parts such as toilet seats with vandal-proof alternatives, for inmates ablution, and replace missing or irreparably damaged equipment with the following approved items:
 - (1) Stainless steel WHBs and wash troughs;
 - (2) Stainless steel wall-mounted and recessed urinals;
 - (3) Stainless steel WCs.
 - (vi) Service and repair sanitary ware, including destaining and chip repair of enamelled or vitreous china equipment, dent removal from stainless steel equipment, replacement of missing or damaged parts such as toilet seats with vandal-proof alternatives, for members ablution, and replace missing or irreparably damaged equipment with the following approved items
 - (1) Stainless steel braced WHBs and wash troughs;
 - (2) Vitreous china floor-mounted WC pans;
 - (3) Stainless steel cabinet-mounted sink.
 - (vii) Equipment such as concealed flush valve mechanisms that are installed in areas accessible to inmates, such as courtyards, are to be enclosed in a lockable cabinet constructed using an angle iron frame and expanded metal panels, fixed to wall with expansion bolts.
 - (viii) Service and repair domestic geyser installation and replace geysers that are beyond repair.

(e) Hospital section

- (i) Replace GMS water pipe installation with copper pipes with capillary soldered fittings.
- (ii) Service and repair sanitary drainage installation and replace items that are missing or beyond repair, including traps and inspection eyes.
- (iii) Service and repair brassware with repair kits and replace with the following approved items, if missing or damaged beyond repair:
 - (1) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (2) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
 - (3) Cistern and concealed senior flush valves to be replaced with concealed senior flush valves;
 - (4) Rubber flexi-traps for WHBs, wash troughs and urinals;
 - (5) Vandal-proof shower gratings;
 - (6) Vandal-proof water-saving shower heads;
 - (7) Brace wall-mounted taps in washing areas with approved brackets.
- (iv) Service and repair sanitary ware, including destaining and chip repair of enamelled or vitreous china equipment, dent removal from stainless steel equipment, replacement of missing or damaged parts such as toilet seats with vandal-proof alternatives, and replace missing or irreparably damaged equipment with the following approved items:
 - (1) Stainless steel WHBs and wash trough;
 - (2) Stainless steel wall-mounted and recessed urinals;
 - (3) Stainless steel WCs.
- (v) Service and repair sanitary ware, including destaining and chip repair of enamelled or vitreous china equipment, dent removal from stainless steel equipment, replacement of missing or damaged parts such as toilet seats with vandal-proof alternatives, and replace missing or irreparably damaged equipment with the following approved items:
 - (1) Stainless steel braced WHBs and wash troughs;
 - (2) Vitreous china floor-mounted WC pans;
 - (3) Stainless steel cabinet-mounted sink.
- (vi) Equipment such as concealed flush valve mechanisms that are installed in areas accessible to inmates, such as courtyards, are to be enclosed in a lockable cabinet constructed using an angle iron frame and expanded metal panels, fixed to wall with expansion bolts.
- (vii) Disconnect and remove geysers and connect to nearby hot-water distribution lines from central hot-water plant.

(f) Kitchen and dining hall

- (i) Replace GMS water pipe installation with copper pipes with capillary soldered fittings.
- (ii) Service and repair sanitary drainage installation, and replace items that are missing or beyond repair, including traps and inspection eyes.
- (iii) Install stainless steel floor drains to kitchen and dining hall sculleries, and a 4 litre stainless steel grease trap, including drainage pipes and connection to sewer system, and disconnection of existing redundant kitchen floor drainage.
- (iv) Service and repair brassware with repair kits and replace with the following approved items, if missing or damaged beyond repair:
 - (1) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (2) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
 - (3) Cistern and concealed senior flush valves to be replaced with concealed senior flush valves;
 - (4) Rubber flexi-traps for WHBs, wash troughs and urinals;
 - (5) Vandal-proof shower gratings;
 - (6) Vandal-proof water-saving shower heads;
 - (7) Brace wall-mounted taps in washing areas with approved brackets.
- (v) Service and repair sanitary ware, including destaining and chip repair of enamelled or vitreous china equipment, dent removal from stainless steel equipment, replacement of missing or damaged parts such as toilet seats with vandal-proof alternatives, and replace missing or irreparably damaged equipment with the following approved items:
 - (1) Stainless steel braced WHBs and wash troughs;
 - (2) Vitreous china floor-mounted WC pans;
 - (3) Stainless steel cabinet-mounted sink;
 - (4) Stainless steel pot sinks.
- (vi) Equipment such as concealed flush valve mechanisms that are installed in areas accessible to inmates, such as courtyards, are to be enclosed in a lockable cabinet constructed using an angle iron frame and expanded metal panels, fixed to wall with expansion bolts.
- (vii) Service and repair domestic geyser installation and replace geysers that are beyond repair.

(g) Administration building

- (i) Replace GMS water pipe installation with copper pipes with capillary soldered fittings.
- (ii) Service and repair sanitary drainage installation, and replace items that are missing or beyond repair, including traps and inspection eyes.
- (iii) Service and repair brassware with repair kits and replace with the following approved items, if missing or damaged beyond repair:
 - (1) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (2) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
 - (3) Rubber flexi-traps for WHBs, wash troughs and urinals;
 - (4) Vandal-proof shower gratings;
 - (5) Vandal-proof water-saving shower heads;
- (iv) Service and repair all sanitary ware, including destaining and chip repair of vitreous or enamelled surfaces, dent removal from stainless steel equipment, replacement of missing or damaged parts such as WC seats and lids, or replacement of irreparable equipment.

(h) Facility main reticulation installations

- (i) Service and repair domestic water installations, including insulation and bracketing, pressure testing of installations, replacement of damaged, corroded or leaking sections of piping and fittings and unsuitable brackets.
- (ii) Service and repair sewer pipes, including rodding of system and visual inspection by means of a video survey if required. Replace damaged and leaking sections of sewer and fittings, damaged or broken inspection eyes, cleaning eyes and manhole covers.
- (iii) Install fire water supply network to existing and new fire hose reels and hydrants from the existing water network.
- (iv) Install a strainer to domestic water supply.
- (v) Install proper supports and protection to elevated hot-water circulation pipes spanning between buildings.

PAA 05.02.03 Residential facilities

(a) Houses, flats and single quarters

- (i) Service and repair domestic hot and cold-water installations, including pressure testing of existing systems, and replace items that are beyond repair. Where necessary, replace entire system with capillary soldered copper pipe system.

- (ii) Service and repair drainage system, including rodding of system, and replace damaged or leaking pipes and fittings, manhole covers, cleaning and inspection eyes and gully gratings.
- (iii) Service and repair brassware such as taps, stop-cocks and flushing mechanisms with repair kits, and replace items that are missing or beyond repair.
- (iv) Service and repair sanitary ware, including chip repair, destaining and re-coating of baths, WC bowls and washhand basins, dent removal and destaining of wash troughs and kitchen sinks and replacement of damaged or missing parts such as WC seats and lids and cistern lids. Replace missing or irreparably damaged equipment. The following replacement items shall be installed where required:
 - (1) Plastic cisterns
 - (2) Steel enamel bath tubs
 - (3) Stainless steel wash troughs.
- (v) Service and repair domestic geysers, including descaling, testing for leaks, replacement of elements if required, servicing or replacement of valves, or replace geysers that are damaged beyond repair.
- (vi) Replace interior safety valves on geysers at new houses with approved alternatives.
- (vii) Geyser overflows to be piped down to ground level from penetrations through external walls at flats.

PAA 05.02.04 Agricultural facilities

- (a) Tractor store and stables
 - (i) Replace GMS water pipe installation with copper pipes with capillary soldered fittings.
 - (ii) Service and repair sanitary drainage installation and replace items that are missing or beyond repair, including traps and inspection eyes.
 - (iii) Replace all sanitary and brassware.
 - (iv) Install piped reticulation for a fire hose reel at tractor store.
- (b) Dairy and surrounding buildings
 - (i) Replace aboveground GMS cold-water pipe installation complete with copper pipes with capillary soldered fittings.
 - (ii) Service and repair copper hot-water installation, including insulation and bracketing and replace pipes and fittings that are damaged beyond repair.
 - (iii) Service and repair sanitary drainage installation and replace items that are missing or beyond repair, including traps and inspection eyes.

- (iv) Service and repair brassware with repair kits and replace with the following approved items, if missing or damaged beyond repair:
 - (1) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (2) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
 - (3) Cistern and concealed senior flush valves to be replaced with concealed senior flush valves;
 - (4) Rubber flexi-traps for WHBs, wash troughs and urinals;
 - (5) Vandal-proof shower gratings;
 - (6) Vandal-proof water saving shower heads;
 - (7) Brace wall-mounted taps in washing areas with approved brackets.
- (v) Service and repair sanitary ware, including destaining and chip repair of enamelled or vitreous china equipment, dent removal from stainless steel equipment, replacement of missing or damaged parts such as toilet seats with a vandal-proof alternatives for inmates' ablution, and replace missing or irreparably damaged equipment with the following approved items:
 - (1) Stainless steel washhand basins;
 - (2) Stainless steel wall-mounted and recessed urinals;
 - (3) Stainless steel WCs.
- (vi) Service and repair underground domestic water installations, including insulation and bracketing, pressure testing of installations, replacement of damaged, corroded or leaking sections of piping and fittings and unsuitable brackets.
- (vii) Replace wash troughs in milk room and connect waste to drainage system.
- (viii) Install floor channels and sump to dairy and connect to drainage system.
- (c) Piggery
 - (i) Service and repair domestic hot and cold water installation, including insulation and bracketing and replace leaking sections of pipes and fittings.
 - (ii) Service and repair sanitary drainage installation and replace items that are missing or beyond repair.
 - (iii) Replace underground water pipe installation and install a strainer on the main supply to this installation.
 - (iv) Replace damaged and missing drinking nozzles.
- (d) Agriculture head office, implement store at dam, Eerstevallei store
 - (i) Replace existing GMS water pipes with capillary soldered copper pipe.
 - (ii) Repair and service copper water pipes, including bracketing, and replace leaking and damaged sections of pipes and fittings.

- (iii) Repair and service sanitary and brassware, where necessary with repair kits, in members' ablutions, replace missing parts such as WC seats and lids, and replace damaged missing or excessively corroded equipment.
- (iv) Replace sanitary and brassware in inmates' ablutions as per Prison's approved equipment.
- (v) Service and repair domestic geysers, including descaling, testing for leaks, replacement of elements if required, servicing or replacement of valves, or replace geysers that are damaged beyond repair.
- (vi) Replace majority of sanitary and brassware, as well as plumbing and drainage installations at implement store and Eerstevallei store, with the following:
 - (1) Approved sanitary and brassware;
 - (2) Copper water pipe and capillary soldered fittings;
 - (3) Plain ended cast-iron soil pipes and fittings and GMS waste pipes with brass fittings.

PAA 05.02.05 Club, entertainment and sport facilities

- (a) Staff dining room, hall bar and a la carte
 - (i) Replace aboveground GMS cold-water pipes with copper pipes and service and repair copper pipes, replacing damaged or leaking sections of pipes.
 - (ii) Service and repair copper hot-water pipe installation and replace missing or leaking sections.
 - (iii) Inspect underground water piping, service and repair and replace leaking or damaged sections.
 - (iv) Service and repair sanitary drainage installations and replace items that are missing or beyond repair, including traps and inspection eyes.
 - (v) Service and repair sewer pipes, including rodding of system and visual inspection by means of video survey if required. Replace damaged and leaking sections of sewer and fittings, damaged or broken inspection eyes, cleaning eyes and manhole covers.
 - (vi) Install a fire water supply to new fire hose reels.
 - (vii) Install a strainer to domestic water supply.
 - (viii) Service and repair brassware, such as taps, stop-cocks and flushing mechanisms with repair kits, and replace items that are missing or beyond repair.
 - (ix) Service and repair sanitary ware, including chip repair, destaining and re-coating of baths, WC bowls and washhand basins, dent removal from and destaining of wash troughs and kitchen sinks and replacement of damaged or missing parts such as WC seats and lids and cistern lids. Replace missing or irreparably damaged equipment. The following replacement items shall be installed where required:

- (1) Plastic cisterns
 - (2) Stainless steel wash troughs.
- (x) Install a properly sized stainless steel grease trap and floor drainage system to kitchen and preparation area.
- (xi) Service and repair domestic geysers including descaling, testing for leaks, replacement of elements if required, servicing or replacement of valves, or replace geysers that are damaged beyond repair.
- (b) Swimming pool and ablutions, rugby stadium, gym, dam hall, bowls clubhouse
 - (i) Service and repair GMS domestic water installation, including pressure testing, and replace damaged or leaking sections of pipes and fittings.
 - (ii) Service and repair sanitary drainage installation and replace items that are missing or beyond repair, including traps and inspection eyes.
 - (iii) Service and repair sewer pipes, including rodding of system and visual inspection by means of video survey if required. Replace damaged and leaking sections of sewer and fittings, damaged or broken inspection eyes, cleaning eyes and manhole covers.
 - (iv) Service and repair brassware, such as taps, stop-cocks and flushing mechanisms with repair kits, and replace items that are missing or beyond repair.
 - (v) Service and repair sanitary ware, including chip repair, destaining and re-coating of baths, WC bowls and washhand basins, dent removal and destaining of wash troughs and kitchen sinks and replace damaged or missing parts such as WC seats and lids and cistern lids. Replace missing or irreparably damaged equipment. The following replacement items shall be installed where required:
 - (1) Plastic cisterns
 - (2) Steel enamel bath tubs
 - (3) Stainless steel wash troughs.
 - (vi) Service and repair domestic geysers including descaling, testing for leaks, replacement of elements if required, servicing or replacement of valves, or replace geysers that are damaged beyond repair.

PAA 05.02.06 Workshops, storage, maintenance and transport facilities, boiler house

- (a) Service and repair GMS domestic water installation, including pressure testing, and replace damaged or leaking sections of pipes and fittings.
- (b) Replace GMS water pipes with copper at maintenance building where there is a mixture of GMS and copper.
- (c) Service and repair sanitary drainage installation and replace items that are missing or beyond repair, including traps and inspection eyes.
- (d) Service and repair sewer pipes, including rodding of system and visual inspection by means of video survey if required. Replace damaged and

leaking sections of sewer and fittings, damaged or broken inspection eyes, cleaning eyes and manhole covers.

- (e) Service and repair brassware, such as taps, stop-cocks and flushing mechanisms with repair kits, and replace items that are missing or beyond repair.
- (f) Service and repair sanitary ware, including chip repair, destaining and re-coating of baths, WC bowls and washhand basins, dent removal from and destaining of wash troughs and kitchen sinks and replacement of damaged or missing parts such as WC seats and lids and cistern lids. Replace missing or irreparably damaged equipment. The following replacement items shall be installed where required:
 - (i) Plastic cisterns
 - (ii) Stainless steel wash troughs.
- (g) Service and repair domestic geysers including descaling, testing for leaks, replacement of elements if required, servicing or replacement of valves, or replace geysers that are damaged beyond repair.
- (h) Install fire water piped reticulation system to areas where fire hose reels are to be installed at workshops.
- (i) Clean and service oil and sand traps at workshops and transport storage building.

PAA 05.02.07 Office and support services facilities at inmates' ablutions, head office, doctor, instructors' offices, SAPS building, instructing office

- (a) Service and repair domestic water installation, including pressure testing, and replace damaged or leaking sections of pipes and fittings.
- (b) Replace GMS water pipes with copper at SAPS building where there is a mixture of GMS and copper.
- (c) Service and repair sanitary drainage installation and replace items that are missing or beyond repair, including traps and inspection eyes.
- (d) Service and repair sewer pipes, including rodding of system and visual inspection by means of video survey if required. Replace damaged and leaking sections of sewer and fittings, damaged or broken inspection eyes, cleaning eyes and manhole covers.
- (e) Replace all brassware with the following approved equipment at inmates' ablutions:
 - (i) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (ii) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
 - (iii) Cistern and concealed senior flush valves to be replaced with concealed senior flush valves;
 - (iv) Rubber flexi-traps for WHBs, wash troughs and urinals;
 - (v) Vandal-proof shower gratings;
 - (vi) Vandal-proof water-saving shower heads;
 - (vii) Brace wall-mounted taps in washing areas with approved brackets.

- (f) Replace all sanitary ware with the following approved equipment at inmates' ablutions:
 - (i) WHB, wash trough, bath and shower taps with non-removable tap handles;
 - (ii) Shut-off valves intended as flushing mechanisms for urinals, to be replaced with concealed junior flush valves where possible or exposed junior flush valves, regardless of condition of existing valves;
 - (iii) Cistern and concealed senior flush valves to be replaced with concealed senior flush valves;
 - (iv) Rubber flexi-traps for WHBs, wash troughs and urinals;
 - (v) Vandal-proof shower gratings;
 - (vi) Vandal-proof water-saving shower heads;
 - (vii) Brace wall-mounted taps in washing areas with approved brackets.
- (g) Service and repair brassware, such as taps, stop-cocks and flushing mechanisms with repair kits, and replace items that are missing or beyond repair, at members' ablutions.
- (h) Service and repair sanitary ware, including chip repair, destaining and re-coating of baths, WC bowls and washhand basins, dent removal from and destaining of wash troughs and kitchen sinks and replacement of damaged or missing parts such as WC seats and lids and cistern lids. Replace missing or irreparably damaged equipment. The following replacement items shall be installed where required at members' ablutions:
 - (i) Plastic cisterns
 - (ii) Stainless steel wash troughs.
- (i) Service and repair domestic geysers, including descaling, testing for leaks, replacement of elements if required, servicing or replacement of valves, or replace geysers that are damaged beyond repair.

PAA 05.02.08

Training and education facilities (crèche, primary school, training centre, inmates training centre)

- (a) Service and repair domestic water installation, including pressure testing, and replace damaged or leaking sections of pipes and fittings.
- (b) Replace GMS water pipes with copper at primary school building where there is a mixture of GMS and copper.
- (c) Service and repair sanitary drainage installation and replace items that are missing or beyond repair, including traps and inspection eyes.
- (d) Service and repair sewer pipes, including rodding of system and visual inspection by means of video survey if required. Replace damaged and leaking sections of sewer and fittings, damaged or broken inspection eyes, cleaning eyes and manhole covers.
- (e) Service and repair brassware, such as taps, stop-cocks and flushing mechanisms with repair kits, and replace items that are missing or beyond repair.

- (f) Service and repair sanitary ware, including chip repair, destaining and re-coating of baths, WC bowls and washhand basins, dent removal and destaining of wash troughs and kitchen sinks and replacement of damaged or missing parts such as WC seats and lids and cistern lids. Replace missing or irreparably damaged equipment. The following replacement items shall be installed where required:
 - (i) Plastic cisterns.
 - (ii) Steel enamel bath tubs.
 - (iii) Stainless steel wash troughs.
- (g) Replace all sanitary and brassware at primary school ablutions.
- (h) Service and repair domestic geysers, including descaling, testing for leaks, replacement of elements if required, servicing or replacement of valves, or replace geysers that are damaged beyond repair.

PAA 05.02.13 Main gate house

- (a) Service and repair domestic water installation, including pressure testing, and replace damaged or leaking sections of pipe and fittings.
- (b) Service and repair sanitary drainage installation and replace items that are missing or beyond repair, including traps and inspection eyes.
- (c) Service and repair sewer pipes, including rodding of system and visual inspection by means of video survey if required. Replace damaged and leaking sections of sewer and fittings, damaged or broken inspection eyes, cleaning eyes and manhole covers.
- (d) Service and repair brassware, such as taps, stop-cocks and flushing mechanisms with repair kits, and replace items that are missing or beyond repair.
- (e) Service and repair sanitary ware, including chip repair, destaining and re-coating of baths, WC bowls and washhand basins, dent removal from and destaining of wash troughs and kitchen sinks and replacement of damaged or missing parts such as WC seats and lids and cistern lids. Replace missing or irreparably damaged equipment.
- (f) Install a strainer to domestic water supply.

PAA 06 DETAILS OF MAINTENANCE WORK

[Note: There will be no maintenance work required for this installation and equipment in this contract.]

PAA 06.01 GENERAL

The Contractor shall be responsible for the complete maintenance of all the equipment, components, installations and systems forming part of this repair and maintenance contract. The Contractor shall strictly adhere to Additional Specification SA: General Maintenance, and Technical Specification AA: Plumbing and Drainage Installations, with regard to the maintenance period, obligations, responsibilities, actions and activities, etc, which shall also include the following maintenance actions:

- (a) Preventative maintenance. A guideline to the required actions is provided in specification AA. The actions will not be limited to these guidelines, but shall include all additional actions, work, materials, etc, necessary to maintain this installation at an acceptable level.
- (b) Corrective maintenance as described and defined in Additional Specification SA: General Maintenance.
- (c) Breakdown maintenance as described and defined in Additional Specification SA: General Maintenance.

For this particular installation there shall be no fatal breakdown definition.

Emergency breakdown shall be defined as a failure of any equipment, components and systems which prevents the provision of water and the drainage of the equipment to the consumer points.

PAA 07 MEASUREMENT AND PAYMENT

All new building work and repair work to existing structures and buildings necessitated by repairs to the plumbing and drainage services as scheduled, shall be done in accordance with the structural and building section of the technical and Particular Specifications. The costs of such building and repair works shall be deemed to be included in the tendered rates for the applicable items as scheduled in this section.

PAA.01 INSPECTION AND REPORT ON EXISTING INSTALLATIONS..... Unit: number

The unit of measurement shall be the number of times inspections of and reports on the installation are carried out on the instructions of the Engineer.

The tendered rate shall include full compensation for the inspection and written report on all items, systems, components, equipment and installations, including the establishment of defects, leaks, damage, shortfalls, structural soundness, repairs required, details of existing equipment and suitability of the equipment for the purpose it serves.

PAA.02 OPERATING AND MAINTENANCE MANUALSUnit: set

The unit of measurement shall be the set of operating and maintenance manuals provided.

The tendered rate for the set shall include full compensation for obtaining, verification, compilation and submission of a full set of as-built drawings, inventory lists and operating and maintenance manuals in accordance with Additional Specification SB: Operating and Maintenance Manuals.

The tendered rate shall also include full compensation for all equipment necessary to establish the exact position and depth of underground services as well as the recording of all information on electronic drawing format.

PAA.03 ISOLATION, STRIPPING, DISMANTLING AND REMOVAL OF EXISTING BRASSWARE, SANITARYWARE AND PIPING INSTALLATIONS..... Unit: number, metre

The unit of measurement shall be the number of each item of brassware and sanitaryware and metre of piping removed, including fixtures and fittings.

The tendered rates shall include full compensation for the isolation, dismantling and removal of irreparably damaged, broken and/or unsuitable brassware (flush valves, taps, mixers, shower roses, undertile stop-cocks, demand bib taps, hose bib taps, shut-off valves, etc) and sanitary ware (water closets, cisterns, basins, urinals, baths, wash troughs, sinks, etc) including all associated pipework, brackets, traps, pan connectors, etc.

The tendered rates shall also include full compensation for the isolation, stripping, dismantling and removal of irreparably damaged, broken or unsuitable pipework installed on surface, underground, chased into walls, in ceiling voids and/or service ducts, as well as the plugging off of connections to this pipework as for the removal off site and/or to storage of all removed items as mentioned above.

PAA.04

**ISOLATION, STRIPPING, DISMANTLING AND REMOVAL
OF EXISTING GEYSER INSTALLATIONS**..... Unit: number

The unit of measurement shall be the number of each geyser installation removed, including associated pipework and fittings.

The tendered rates shall include full compensation for the isolation, stripping, dismantling and removal of irreparably damaged, broken and/or corroded domestic geysers, including shut-off valves, non-return valves, strainers, pressure-reducing valves, vacuum breakers, air release valves, safety valves, etc, and the removal thereof off site.

PAA.05

**SUPPLY AND INSTALLATION OF SANITARY-
AND BRASSWARE**..... Unit: number

The unit of measurement shall be the number of each item of sanitary and brassware supplied and installed, including all associated pipework and fittings.

The tendered rate shall include full compensation for the supply, delivery, positioning, installation, testing, cleaning, commissioning and hand-over of sanitary- and brassware including all necessary pipework, traps, brackets, fittings, bends, junctions, cleaning eyes, etc, to connect the sanitary- and brassware to the existing water supply and/or drainage installation.

The tendered rate shall also include full compensation for chasing and/or building into walls and the reinstating of existing surfaces such as floors, walls, ceilings, etc.

PAA.06

**SUPPLY AND INSTALLATION OF DRAINAGE
PIPING INSTALLATION**..... Unit: metre

The unit of measurement shall be the metre of each type of piping in the installation supplied and installed, including all fixtures and fittings.

The tendered rates shall include full compensation for the supply, delivery, installation, testing, cleaning, commissioning and handover of new drainage piping, installed on surface against walls or soffits, underground, in ceiling voids, chased and built into walls and/or service ducts, including all necessary bends, junctions, tees, cleaning eyes, covers, traps, floor drains, gratings, brackets, hangers, etc, to hand over a complete and effective installation that complies with local government regulations.

The tendered rates shall also include full compensation for the necessary underground works such as excavation, pipe bedding, fill blanket, backfilling and compaction and for the reinstatement of existing surfaces such as floors, walls, ceiling, roads, paving, etc, as well as connection to the existing drainage installation.

PAA.07 **SUPPLY AND INSTALLATION OF DOMESTIC WATER PIPING INSTALLATION**..... Unit: metre

The unit of measurement shall be the metre of each type of piping in the installation supplied and installed, indicating all fixtures and fittings.

The tendered rates shall include full compensation for the supply, delivery, installation, testing, cleaning, sterilising, commissioning and hand-over of new water piping installed on surface against walls or soffits, underground, in ceiling voids, chased and built into walls and/or in service ducts, including all necessary bends, tees, reducers, elbows, valves, strainers, adapters, brackets, hangers, etc, to hand over a complete and effective installation that complies with local government regulations.

The tendered rates shall also include full compensation for the supply and installation of hot-water pipe insulation and cladding.

The tendered rates shall also include full compensation for the necessary underground works such as excavation, pipe bedding, fill blanket, backfilling and compaction and for the reinstatement of existing surfaces such as floors, walls, ceilings, roads, paving, etc, as well as connection to the existing domestic water installation.

PAA.08 **SUPPLY AND INSTALLATION OF DOMESTIC GEYSER INSTALLATION**..... Unit: number

The unit of measurement shall be the number of each geyser installation supplied and installed, including all associated pipework and fittings.

The tendered rates shall include full compensation for the supply and installation of domestic geysers, including shut-off valves, non-return valves, strainers, pressure-reducing valves, vacuum breakers, air release valves, safety valves, etc, as well as connection to existing piping and electrical supply.

PAA.09 **SUPPLY AND INSTALLATION OF FIRE WATER RETICULATION PIPEWORK**..... Unit: metre

The unite of measurement still be the metre of each type of pipework supplied and installed in the fire water reticulation, including all fixtures and fittings.

The tendered rate shall include full compensation for the supply, delivery, installation, testing, cleaning, commissioning and hand-over of new fire water reticulation pipework installed on surface against walls or soffits and/or underground, including all necessary bends, tees, reducers, elbows, valves, adapters, brackets, hangers, pressure gauges, etc, to hand over a complete and effective installation that complies with local government regulations.

The tendered rates shall also include full compensation for the necessary underground work such as excavation, pipe bedding, fill blanket, backfilling and compaction and for the reinstatement of existing surfaces such as floors, walls, ceilings, roads, paving, etc, as well as connection to the existing fire water reticulation network.

PAA.10 **SERVICING, CLEANING AND REPAIR OF SANITARY WARE**..... Unit: number

The unit of measurement shall be the number of each item of sanitary ware serviced, cleaned and repaired, including all associated pipework and fittings.

The tendered rate shall include full compensation for the repair or replacement of all damaged or missing parts, servicing of all movable parts, cleaning of stained sanitary ware with approved cleaning agent, fixing of loose fixtures and brackets according to manufacturer's specifications, de-scaling and cleaning of cisterns and servicing of filling and flushing mechanisms, cleaning of all traps, fixing or replacing of damaged or missing shower, urinal and channel outlet gratings and any other work or action required to hand over an effective system that complies with local government regulations.

**PAA.11 SERVICING, OVERHAULING AND CLEANING
OF BRASSWARE..... Unit: number**

The unit of measurement shall be the number of each item of brassware serviced, overhauled or cleaned, including all associated pipework and fittings.

The tendered rate shall include full compensation for dismantling, cleaning and descaling, replacement of all gaskets, gland packings and seals on all valves, repair or replacement of all damaged or missing parts, replacement kits for worn or leaking flush valves, taps and mixers, repair or replacement of leaking, corroded or damaged flush pipes, readjusting of timing mechanisms on flush valves and metering taps and any other work or action required to hand over an effective system that complies with local government regulations.

**PAA.12 VIDEO SURVEYING OF UNDERGROUND
DRAINAGE PIPEWORK Unit: metre**

The unit of measurement shall be the metre of pipe surveyed irrespective the pipe material and diameter as authorised by the Engineer but not by the Engineer's Representative.

The tendered rate shall include full compensation for supplying and utilising the specialised equipment, for the operator's costs, for transport, for reporting on the findings and for all else that may be required to carry out the survey successfully.

Reporting on the findings of this video survey is over and above the reports carried out in terms of payment item PAA.01.

**PAA.13 SERVICING, CLEANING AND REPAIR OF
DOMESTIC WATER AND DRAINAGE
PIPE INSTALLATIONS Unit: metre**

The unit of measurement shall be the metre of each type of pipe installation serviced, cleaned and repaired, including all fixtures and fittings.

The tendered rates shall include full compensation for inspection, sampling testing, servicing, cleaning and repair of existing piping and equipment such as:

- (a) Initial unblocking only of all blocked drainage pipework, traps, floor drains and gullies;
- (b) Pressure testing of piping and taking of water piping samples to determine state of corrosion and scaling;
- (c) Repair work to damaged manholes, gullies, cleaning eyes, valve chambers, etc, including builders' work and benching;
- (d) Repair of existing bracketing systems including fixing and repair of existing brackets and hangers, as well as the supply and installation of additional brackets where required;

- (e) Emptying, cleaning, checking, testing and repair of oil and grease separators;
- (f) Service and repair of all valves, strainers, pressure-reducing valves, water meters, non-return valves, air release valves and vacuum breakers, including new gaskets, gland packings and seals;
- (g) Taking of water samples and bacteriological testing to determine the compliance with the relevant codes of practice;
- (h) Repairing and/or replacement of damaged hot-water pipe lagging and cladding;
- (i) Preparation, painting and repainting of pipework and equipment in accordance with Technical Specification BH: Fittings;
- (j) Any other work or action to hand over an effective installation that complies with local government regulations.

PAA.14**SERVICING, CLEANING AND REPAIR OF****DOMESTIC GEYSERS..... Unit: number**

The unit of measurement shall be the number of domestic geyser serviced, cleaned and repaired, including all fixtures and fittings.

The tendered rate shall include full compensation for the isolation, servicing, cleaning and repair of domestic geysers in accordance with the manufacturer's specifications, including descaling, testing for leaks, replacing of elements if required, checking of safety valve operation and replacement if required, testing of thermostat operation and set point and replacement if required, and any other work or action to hand over an effective system that complies with local government regulations.

PAA.15**SERVICING AND REPAIR OF FIRE WATER PIPED****RETICULATION NETWORKS Unit: metre**

The unit of measurement shall be the metre of each type of piping in the fire water network serviced and repaired, including all fixtures and fittings.

The tendered rates shall include full compensation for the inspection, testing, servicing and repair of existing piping and equipment such as:

- (a) Pressure testing of piping and taking of pipe samples to determine the extent of corrosion and scaling;
- (b) Repair or replacement of damaged, leaking, broken and corroded pipework or fittings;
- (c) Repair and service of all valves, including new gaskets, gland packings and seals;
- (d) Repair, service, adjustment and calibration of all pressure gauges;
- (e) Repair and fixing of existing brackets and hangers and the installation of additional brackets and hangers where required;
- (f) Any other work or action to hand over an effective system that complies with local government regulations

PARTICULAR SPECIFICATIONPBF PEST CONTROLCONTENTS

PBF 01	SCOPE
PBF 02	PESTS ATTACKING TIMBER
PBF 03	PESTS ATTACKING CARPETS & FABRICS
PBF04	ANTS
PBF05	RATS AND MICE

PBF 01 SCOPE

This specification covers the application of pesticides for the specific purpose of eliminating pest which may cause structural damage. This specification includes the breakdown of various buildings and installations included within the facility and the specific dimensions of each building.

PBF 02 PESTS ATTACKING TIMBER PBF**02.01** **PESTS**

Pests that caused damage to timber shall include but not be limited to the following:
mould, blue stain, powder post beetle, shot-hole borer, brown house borer, Cossonid woodborer, drywood termite, subterranean wood-destroying termites, false furniture beetle, furniture beetle, Italian beetle, decay and discolouring fungi.

PBF 02.02 **LIST OF LOCATIONS**

ITEM NO.	LOCATION	DESCRIPTION	DIMENSIONS m/m ² /m ³
02.02.01	Residential Buildings	Wooden beams and planks used in the roof. Ceiling boards. Wooden skirting and cornices. All insulations.	
02.02.02	Operational Buildings	Wooden beams and planks used in the roof. Ceiling boards. Wooden skirting and cornices. All insulations.	

PBF 02.03 **PEST CONTROL PROGRAMME AND REPORTING**

The pest control program submitted in terms of sub-clause BE 04.01 shall include but shall not be limited to:

- (a) Initial inspection of all buildings and installations to ascertain the damage caused to timber by the activity of the various pests.
- (b) If pests are found an initial "clean up" process is to be conducted.
- (c) Continuous monitoring of the activity of pests.
- (d) A comprehensive quarterly inspection of the buildings and installations.

- (e) Reporting on the damage caused by and the activity of the pests together with recommendations (To follow quarterly inspection).
- (f) Execution of the recommendations once approved by the Engineer.

PBF 03 PESTS ATTACKING CARPETS AND OTHER FABRICS

PBF 03.01 PESTS

Pests that cause damage to carpets and other fabrics shall include but not be limited to carpet beetles, clothes moths and fish moths.

PBF 03.02

LIST OF LOCATIONS

ITEM NO.	LOCATION	DESCRIPTION	mMENSIONS m/m ² /m ³
03.02.01	N/A	N/A	

PBF 03.03 PEST CONTROL PROGRAMME & REPORTING

A thorough inspection of the buildings and installations at each facility shall be conducted with specific attention to the relevance of preventative pest control. The Contractor shall compile a comprehensive pest control programme to be submitted to the Engineer for review and approval.

The preventative pest control programme may only commence upon instruction from the Engineer.

The pest control programme shall include but shall not be limited to:

- (i) Initial inspection of all buildings and installations to ascertain the damage caused to carpets and other fabrics by the activity of the various pests.
- (ii) If pests are found an initial "clean up" process is to be conducted.
- (iii) A comprehensive inspection is to be conducted at the intervals specified below:
 - Bi-annually in residential units.
 - Bi-annually in office facilities.
 - Two monthly in cell units.
 - Monthly in all food preparation areas.
- (iv) Reporting on the damage caused by the activity of the pests together with recommendations (To follow inspection as above).
- (v) Execution of the recommendations once approved by the Engineer.

PBF 04 ANTS PBF 04.01 PESTS

Ants shall include all ants irrespective of size, colour or species.

PBF 04.02 LIST OF BUILDINGS AND INSTALLATIONS

ITEM NO.	LOCATION	DESCRIPTION	DIMENSIONS m/m ² /m ³
04.02.01	N/A	N/A	N/A

PBF04.03 PEST CONTROL PROGRAMME & REPORTING

A thorough inspection of the buildings and installations at each facility shall be conducted with specific attention to the relevance of preventative pest control. The Contractor shall compile a comprehensive pest control programme to be submitted to the Engineer for review and approval.

The preventative pest control programme may only commence upon instruction from the Engineer.

The pest control programme submitted in terms of sub-clause BE 04.01 shall include but not be limited to:

- (a) Initial inspection of all the buildings and installations facilities to ascertain the damage caused by the activity of ants.
- (b) If ants are found an initial "clean up" process is to be conducted.
- (c) A comprehensive inspection is to be conducted at the intervals specified below:
 - Bi-annually in residential units.
 - Bi-annually in office facilities.
 - Two monthly in cell units.
 - Monthly in any food preparation area.
- (d) Reporting on the damage caused by the activity of the ants together with recommendations (To follow inspection as above).
- (e) Execution of the recommendations once approved by the Engineer.

PBF 05 RATS AND MICE**PBF 05.01 PESTS**

Rats and mice shall include but shall not be limited to house mice, Norway rats and roof rats.

PBF 05.02**LIST OF LOCATIONS**

ITEM NO.	LOCATION	DESCRIPTION	DIMENSIONS m/m ² /m ³
05.02.01	N/A	N/A	

PBF 05.03**PEST CONTROL PROGRAMME & REPORTING**

The pest control programme submitted in terms of sub-clause BE 04.01 shall include but not be limited to:

- (a) Initial inspection of all buildings and installations to ascertain the damage caused by the activity of rats and mice.
- (b) Closing off of all potential entry points for rats and mice.
- (c) If rats and/or mice are found an initial "clean up" process is to be conducted.
- (d) Continuous baiting to assist in control and monitoring is to be conducted.
- (e) A comprehensive inspection is to be conducted at the intervals specified below:
 - Bi-annually in residential units.
 - Bi-annually in office facilities.
 - Two monthly in cell units.
 - Monthly in any food preparation area.
- (f) Reporting on the damage caused by the activity of mice and rats together with recommendations (To follow inspection as above).
- (g) Execution of the recommendations once approved by the Engineer.

PBF 06 COCKROACHES PBF**06.01****PESTS**

Cockroaches shall include all roaches irrespective of size, colour or species.

PBF 06.02**LIST OF BUILDINGS AND INSTALLATIONS**

ITEM NO.	LOCATION	DESCRIPTION	DIMENSIONS m/m ² /m ³
06.02.01	Operational Buildings	Walls, storage areas, windows and all areas where entrance may be gained.	

PBF06.03 PEST CONTROL PROGRAMME & REPORTING

A thorough inspection of the buildings and installations at each facility shall be conducted with specific attention to the relevance of preventative pest control. The Contractor shall compile a comprehensive pest control programme to be submitted to the Engineer for review and approval.

The preventative pest control programme may only commence upon instruction from the Engineer.

The pest control programme submitted in terms of sub-clause BE 04.01 shall include but not be limited to:

- (f) Initial inspection of all the buildings and installations facilities to ascertain the damage caused by the activity of cockroaches.
- (g) If cockroaches are found an initial "clean up" process is to be conducted.
- (h) A comprehensive inspection is to be conducted at the intervals specified below:
 - Bi-annually in residential units.
 - Bi-annually in office facilities.
 - Two monthly in cell units.
 - Monthly in any food preparation area.
- (i) Reporting on the damage caused by the activity of the ants together with recommendations (To follow inspection as above).
- U) Execution of the recommendations once approved by the Engineer.

PARTICULAR SPECIFICATION

PJC CONVENTIONAL FIRE FIGHTING EQUIPMENT

CONTENTS

PJC 01	SCOPE
PJC 02	GENERAL DESCRIPTION OF INSTALLATION
PJC 03	TECHNICAL DETAILS OF EXISTING INSTALLATION
PJC 04	STATUS OF EXISTING INSTALLATION
PJC 05	DETAILS OF REPAIR AND SERVICE WORK
PJC 06	MEASUREMENT AND PAYMENT
PJC 07	DETAILS OF MAINTENANCE WORK

PJC 01 SCOPE

- (a) This specification covers the particulars of the repair and maintenance work to the conventional fire fighting equipment installation. This Particular Specification shall be read in conjunction with Technical Specification JC: Conventional Fire Fighting Equipment, and all additional and technical specifications compiled as part of this document, in particular the following Additional Specifications:

SA: General Maintenance
 SB: Operating and Maintenance Manuals
 SC: General Decommissioning, Testing and Commissioning Procedures
 SD: General Training
 SE: Development of Affirmable Business Enterprise.

The intended repair and maintenance work to this installation will restore the existing installation to a safe, efficiently functional system that complies with all statutory regulations and applicable standards, in the process repairing all defects and shortfalls. Monthly maintenance responsibilities for each installation shall commence with access to the site. A difference shall be made in payment for maintenance prior to and after practical completion of repair work. On completion of the repair work, the completed installation shall be maintained and serviced by the Contractor for the remainder of the 36-month Contract period.

- (b) The fire fighting equipment to this complete complex shall form part of this repair and maintenance contract. The piped fire water reticulation network to the equipment, such as hydrants and hose reels, are dealt with under and form part of the plumbing and drainage repair and maintenance contract.

PJC 02 GENERAL DESCRIPTION OF INSTALLATION

The various buildings on the site are generally fed by means of a project reticulation network which feeds the fire fighting equipment such as hose reels and hydrants.

The buildings are also equipped with fire extinguishers.

PJC 03 TECHNICAL DETAILS OF EXISTING INSTALLATION

At the time of compilation of this document the existing installation consisted of the equipment listed below:

PJC 03.01 FIRE FIGHTING EQUIPMENT

PJC 04 STATUS OF EXISTING INSTALLATION

At the time of compilation of this document the status of the equipment and installation was briefly as described below.

PJC 04.01 LAST SERVICE

The fire fighting equipment was last serviced between 2009 and 2011.

PJC 05 DETAILS OF REPAIR AND SERVICE WORK

The following work shall form part of the intended repair work to the fire fighting equipment. This work shall be done in accordance with the relevant regulations, codes, specifications and Technical Specification JC: Conventional Fire Fighting Equipment.

The description of the repair work included as set out below shall be read in conjunction with the Schedule of Quantities and Technical Specifications.

PJC 05.01 GENERAL DESCRIPTION OF REPAIR WORK

PJC 05.01.01 The Contractor shall at the start of the Repair and Maintenance Contract inspect the items, systems, equipment and installations listed below. This inspection shall include the establishing of any defects, leaks, conditions, damages, shortfalls, repairs required, details of existing equipment, suitability of equipment for the purpose it serves, etc. The Contractor shall report back to the Engineer in writing on all the above and the following items. No repair work shall commence prior to approval by the Engineer.

- (a) Correlation of all fire fighting equipment;
- (b) Last service record;
- (c) Inventory list of all equipment;
- (d) Compliance with present governing regulations;
- (e) Accessibility to equipment;
- (f) Dynamic water pressure under flow conditions of equipment;
- (g) As-built information.

PJC 05.01.02 The general scope of work at the time of going on tender, is defined as follows:

- (a) Replacing of irreparable damaged, missing and unsuitable fire fighting equipment;
- (b) Servicing and overhauling of all fire hose reels and fire hydrants;
- (c) Servicing and recharging of all fire extinguishers;
- (d) Replacing of missing and damaged fire extinguisher brackets;
- (e) Replacing damaged fire hose reel cabinets;
- (f) Supply and installation of additional fire hose reels, hydrants and extinguishers where necessary, in accordance with the requirements of SABS 0400;
- (g) Servicing and overhauling of fire booster connections;
- (h) Supply and/or replace missing or damaged safety signs;
- (i) Compilation of fire plan for each section of complex;
- (j) Compilation of inventory list with all relevant details and an identification system to all equipment.

PJC 05.02 REPAIR WORK TO FIRE FIGHTING EQUIPMENT

The repair work to this installation shall include, but not be limited to at least the following items. Any items, components or installations not detailed in this specification but found to be defective or inoperative during the inspection and report phase, shall be repaired or replaced as instructed by the Engineer.

PJC 05.02.01**Site reticulation network**

- (a) Service and overhaul all fire fighting equipment with respect to service schedule dates, including replacement of seals, reseating and cleaning of valve seats, replacement of missing wheel handles, etc.
- (b) Supply and install additional fire equipment, piping measured under the Repair Schedule of Quantities for plumbing and drainage.
- (c) Test the flow conditions of all equipment.

PJC 06**MEASUREMENT AND PAYMENT**

All new building work and repair work to existing structures and buildings resulting from repairs to the conventional fire fighting equipment as scheduled, shall be done in accordance with the Specifications for the structural and building section included elsewhere in this Tender Document. The costs of such building and repair works shall be deemed to be included in the tendered rates for the applicable items scheduled in this section.

PJC.01**INSPECTION AND REPORT ON EXISTING INSTALLATIONS Unit: item**

The tendered sum shall include full compensation for the inspection and written report on all items, systems, components, equipment and installations, including the establishment of any defects, leaks conditions, damages, shortfalls, structural soundness, repairs required, details of existing equipment and suitability of the equipment for the purpose it serves.

PJC.02**AS-BUILT INFORMATION AND OPERATING AND MAINTENANCE MANUALS Unit: set**

The tendered sum shall include full compensation for the compilation and submission of inventory lists and operating and maintenance manuals in accordance with Additional Specification SB: Operating and Maintenance Manuals.

The tendered sum shall also include full compensation for all equipment necessary to establish the exact position and level of underground services, as well as the recording of all information on electronic drawing format.

PJC.03 **ISOLATION, STRIPPING, DISMANTLING AND REMOVAL OF EXISTING FIRE FIGHTING EQUIPMENT** Unit: number

The tendered rates shall include full compensation for the isolation, stripping, dismantling and removal of irreparable damaged, broken or unsuitable fire hydrants, fire hose reels and fire extinguishers, including all valves, cabinets, mounting brackets, streamers, etc, as well as removal off site and/or storage of all removed items mentioned above.

PJC.04 **SUPPLY AND INSTALLATION OF FIRE HYDRANTS** Unit: set

The tendered rate shall include full compensation for the supply, delivery, positioning, installation, testing, commissioning and hand-over of fire hydrants, including all necessary pipework, cabinets, cupboards, valves, brackets, fittings, bends and the reinstating of existing surfaces such as walls, floors, ceilings, etc.

The tendered rate shall also include full compensation for the supply, delivery and positioning and fixing of all fire signage as required by regulation.

The tendered rate shall also include full compensation for the labelling with identifying tags and recording of details of all equipment.

PJC.05 **SUPPLY AND INSTALLATION OF FIRE HOSE REELS** Unit: number

The tendered rate shall include full compensation for the supply, delivery, positioning, installation, testing, commissioning and hand-over of fire hose reels, including all necessary pipework, cabinets, cupboards, valves, brackets, fittings, bends and the reinstating of existing surfaces such as walls, floors, ceilings, etc.

The tendered rate shall also include full compensation for the supply, delivery and positioning and fixing of all fire signage as required by regulation.

The tendered rate shall also include full compensation for the labelling with identifying tags and recording of details of all equipment.

PJC.06 **SUPPLY AND INSTALLATION OF FIRE EXTINGUISHERS** Unit: number

The tendered rate shall include full compensation for the supply, delivery, positioning, installation and hand-over of the fire extinguishers, including all necessary brackets, backboards, etc.

The tendered rates shall also include full compensation for the supply, delivery, positioning and fixing of all fire signage as required by regulation.

The tendered rate shall also include full compensation for the labelling with identifying tags and recording of details of all equipment.

PJC.07 **SERVICING, CLEANING AND REPAIR OF FIRE HYDRANTS** Unit: number

The tendered rate shall include full compensation for the repair or replacement of damaged, broken, leaking or corroded pipework and fittings, main hydrant seals, quick coupling catches, shaft ends for right-angle hand wheel type hydrants, streamers, hose nozzles, valve stem seals, fire cupboard doors and locks, damaged, missing or shortfall fire signage, etc.

The tendered rate shall also include full compensation for the labelling with identifying tags and recording of details of all equipment.

PJC.08 **SERVICING, CLEANING AND REPAIR OF FIRE HOSE REELS** Unit: number

The tendered rate shall include full compensation for the repair or replacement of damaged hose drums, mountings and shut-off valves, replacement of damaged or missing 30 m hoses, hose nozzles, shut-off valve wheel handles, hose drum seals where leaks occur, gland packing and gaskets of shut-off valves, repainting of deteriorated paintwork, replacement of fire cupboard doors and locks, damaged, missing or shortfall fire signage, etc.

The tendered rate shall also include full compensation for the labelling with identifying tags and recording of details of all equipment.

PJC.09 **SERVICING, CLEANING, RECHARGING AND REPAIR OF FIRE EXTINGUISHERS** Unit: number

The tendered rate shall include full compensation for the repair or replacement of all damaged, faulty or missing discharge hoses and nozzles, pressure gauges, operating instructions, the recharging of discharge cylinder to required capacity for DCP, water and foam extinguishers, and the recharging of CO₂ extinguisher to capacity, repair, resealing of CO₂ discharge mechanism, checking, servicing and repairing of activation mechanisms, replacement of water and foam extinguishers that have corroded cylinders, replacement of DCP, water or foam content of extinguishers, the replacement of fire cupboard and cabinet doors and locks, damaged, missing or shortfall fire signage, brackets and backboards, etc.

The tendered rate shall also include full compensation for the labelling with identifying tags and recording of details of all equipment.

PJC 07 **DETAILS OF MAINTENANCE WORK**

PJC 07.01 **GENERAL**

The Contractor shall be responsible for the complete maintenance of all the equipment, components, installations and systems forming part of this repair and maintenance contract for Installation. The Contractor shall strictly adhere to Additional Specification SA: General Maintenance, and Technical Specification JC: Conventional Fire Fighting Equipment, with regard to the maintenance period, obligations, responsibilities, actions and activities, etc, which shall also include the following maintenance actions:

- (a) Routine preventative maintenance. A guideline to the required actions is provided in Technical Specification JC. The actions will not be limited to these guidelines, but shall include all additional actions, work, materials, etc, necessary to maintain this installation at an acceptable level.
- (b) Corrective maintenance as described and defined in Additional Specification SA: General Maintenance.
- (c) Breakdown maintenance as described and defined in Additional Specification SA: General Maintenance.

For this particular installation a fatal breakdown shall be defined as any equipment, systems and installations prohibiting fire fighting to any area of the complex as a whole.

Emergency breakdown shall be defined as a failure of equipment, components and systems of this particular installations.

SA GENERAL MAINTENANCE

CONTENTS

SA 01	SCOPE
SA 02	MAINTENANCE REQUIREMENTS
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SA 01 SCOPE

Maintenance of the specified systems, services and/or parts of buildings and infrastructure shall all be referred to as "Maintenance of an Installation". Maintenance of all completed installations shall ensure reliable functioning and optimum service life thereof. Monthly maintenance responsibilities for each installation including all units and components as specified shall commence with access to the Site (Maintenance prior to practical completion). Commencement of maintenance after practical completion of each installation shall mean that the installation has been repaired to an acceptable level of serviceability and shall leave the Contractor with a functional installation to maintain for the remaining period of the Contract.

A difference shall be made in payment for the maintenance prior to and after practical completion of repair work.

Maintenance of an installation shall be performed in accordance with the Technical and Particular Specifications, the Operating and Maintenance Manuals (where applicable) and the Maintenance Control Plan.

Remuneration for maintaining "installations" (systems, services and/or buildings and parts of the infrastructure) in good functional condition is provided for in the Bills of Quantities by means of monthly payment items.

This Additional Specification covers maintenance requirements, development of a maintenance control plan, identification of equipment, site maintenance administration, maintenance performance measurement, as well as the items for measurement of the Contractor's service level and resulting payment.

SA 02 MAINTENANCE REQUIREMENTS

SA 02.01 CONTRACTOR'S RESPONSIBILITIES

The Contractor shall maintain the complete installations for the 36-month Contract period.

Maintenance implies and shall include monthly preventative maintenance, corrective maintenance, as well as breakdown maintenance on all components of the specified installations.

The maintenance control plan (specified in Clause SA 03) will be developed by the Contractor, to schedule the frequency of routine inspections and format of reports. The Contractor shall carry out inspections on the equipment as detailed in the Technical and Particular Specifications and the maintenance control plan. Each inspection, test or breakdown shall be recorded in an approved format and listed in a quarterly report (part of the maintenance control plan).

SA.2

As part of repair of each installation, the Contractor shall submit a set of Operating and Maintenance Manuals where applicable. The Contractor shall ensure through training that the operating and maintenance personnel are conversant with the instructions as presented in the Operating and Maintenance Manuals. Continued training shall be included in the scope of maintenance work for the duration of the 36-month Contract, in accordance with Additional Specification SD: General Training.

The Operating and Maintenance Manuals, as approved by the Engineer, shall be used as a basis of preventative maintenance. The Contractor shall perform all preventative and corrective maintenance as described in the Operating and Maintenance Manuals. This shall be in accordance with the Technical and Particular Specifications.

The Contractor shall, as part of his maintenance responsibilities repair or replace faulty equipment upon logging of a breakdown, within the down-time as defined in Clause SA 05.02 at the Contractor's cost, except in the event of replacement being labelled as exceeding liability as specified in Clause SA 02.03, in which case the Department of Public Works will bear part of the costs.

The Contractor shall not claim additional establishment costs where repair work is to be carried out during the maintenance phase.

The Contractor shall rectify any faulty condition of which he becomes aware, even if it has not been logged. Such rectification shall also be logged and listed in the quarterly report.

SA 02.02

CONDITIONS FOR EXCEEDING THE CONTRACTOR'S LIABILITY DUE TO OPERATIONAL DAMAGE BREAKDOWNS

Operational damage shall be defined for the purpose of this clause as being any damage caused on purpose, by accident or through negligence by the User Client's employees, inmates (where applicable), suppliers, subcontractors, etc for any reason whatsoever. Where repair work is necessitated during the contract as a result of operational damage caused by User Clients or their associates, the Contractor will be requested to:

- (a) perform work, using rates bid for the supply, delivery and installation of material forming part of the repair work schedule, within the maximum down-time allowed for operational damage, where the Engineer rules that the damage has been caused by incorrect operation;
- (b) submit one (1) quotation for repair and/or replacement of the damaged unit, where rates bid are not available and where the Engineer rules that the damage caused is operational;
- (c) perform the work on receipt of an order from the Engineer, within the time offered as part of the quotation,
- (d) notify the Engineer well in advance of completion of the repair work in order to enable inspection, and
- (e) refrain from claiming additional establishment costs for such work.

The responsibility of determining whether damage to the installation was caused by people other than employees or associates of the Contractor shall rest with the Engineer.

Operational damage caused by the employees, suppliers, subcontractors, etc of the Contractor, shall be repaired by the Contractor at his own cost.

CONDITIONS FOR EXCEEDING THE CONTRACTOR'S LIABILITY ABOVE MARGINAL BREAKDOWN COST

In the event where the cost for the repair or replacement of any single component/subassembly where a breakdown has occurred due to a single failure, or where the cost for replacing a single item of equipment completely, exceeds the value of R15 000,00 (transport, accommodation and travelling cost excluded), the liability of the Contractor is limited to the value of R15 000,00. The additional cost above the value of R15 000,00 will be paid for by the Employer provided that conditions 1, 2 and 3 below have been met.

1. The defective part/component/subassembly or machine must be identifiable as a single subassembly or component and not the total of a number of small defects or breakdowns on subassemblies/components on any one or more machines.

Examples of subassemblies/components are the following:

- (a) Should the wiring or bearings on an electric motor fail, the complete motor must be removed for repairs and the cost for the repairs on the complete motor will be regarded as repairs on a single subassembly/component.
 - (b) A starter motor, for example, is a subassembly, which can be removed from the machine for repairs. The repairs on the starter motor together with the repairs on the main bearings will not be regarded as a repair on a single subassembly/component. If the complete diesel engine is replaced with its associated subassemblies the replacement of the complete unit will be regarded as a single component.
 - (c) A pump as a whole is regarded as a single component. The pump and driving machine on long coupled pumps are regarded as separate subassemblies. Pumps and motors on close-coupled equipment are regarded as a single component. The pump and motor of a sump pump are therefore regarded as a single component.
 - (d) Control equipment for the control of a single item, with the sensing device, the controller itself and the final controlled variable are regarded as a single component of the system. The repairs on any one item on a controller have an influence on the rest of the control equipment and must after the replacement be commissioned again as a unit.
2. The Contractor shall submit a written report to the Engineer for approval. This report shall contain the following information:
 - (a) The make and model number of the machine serviced/inspected/ repaired/replaced;
 - (b) The identification number of the machine;
 - (c) A description or name and part number of the defective part/component or subassembly;
 - (d) A statement on whether the component could be repaired, together with a cost estimate;
 - (e) A quotation valid for a minimum period of 60 days if the component/part/subassembly has to be replaced or repaired by an outside firm. If the subassembly/machine is to be repaired or replaced by an outside company, the Contractor shall supply one (1) quotation for such parts/repairs or a quotation from any sole supplier. Only an original quotation will be accepted. The mark-up on such work shall be a

SA.4

percentage as bid and shall be applicable to the total cost (VAT excluded) of repair work by outside companies;

- (f) The expected urgency for the replacement or repairs, and
 - (g) The delivery time of a new component/subassembly/machine or delivery times on spares required to repair the defective component/ subassembly.
3. A written approval to proceed with the work must be issued by the Department. Copies of the original VAT invoices from outside companies for all repairs or spare parts supplied must be attached to the Contractor's invoice.

SA 02.04

COMPONENTS INCLUDED IN MAINTENANCE SCOPE

The main sections of a facility with their subsections are as set out in the Technical Specifications and Particular Specifications where applicable and in the Bill of Quantities and will each be deemed "an installation". Maintenance, as specified, will be applicable to all of these installations.

Maintenance in such is to cater for all work under installations till completion of the installation is approved by engineer.

Installation A: Medium A Kitchen Infrastructure

Installation B: Old Medium A Communal Cell Block

Installation C: Civil Infrastructure, External water reticulation related repair work

Installation D: Structural components

SA 02.05

COMMENCEMENT OF MAINTENANCE PERIOD

Maintenance responsibilities for an installation prior to practical completion of repair work shall include maintenance of all individual units, equipment or components thereof, for which no repair work is required (as per the contract document) or for which the repair work has not yet started, and shall commence with access to the installation.

Where access to an installation has been given but the commencement of repair work is delayed, then the maintenance responsibilities in such cases will consist of keeping the entire installation in the condition it is in by for example, fixing leaks without replacing pipework or opening a blocked pipeline without further altering or inspecting such pipes.

The Contractor shall accept full maintenance responsibilities for each completed installation upon issue of a Certificate of Practical Completion for repair work of that installation.

A difference shall be made in payment for maintenance prior to and after practical completion of repair work.

The preliminary construction programme shall differentiate between commencements of maintenance on various installations.

DEFINITIONS**(a) Routine preventative maintenance**

This entails the rendering of services and servicing of equipment according to a predetermined maintenance control plan to:

- (i) replace and service components of equipment, units or parts thereof for each installation at prescheduled moments regardless of condition;
- (ii) readjust, reset, clean, corrosion protect all components of equipment, units or parts thereof for each installation, and
- (iii) carry out all implied actions to maintain installations in their present functional condition.

Preventative maintenance shall be aimed at minimization of breakdowns.

(b) Corrective maintenance

This entails regular observation of the equipment, identifying pending breakdowns, maladjustment or anomalies of equipment, units or parts of installations and subsequent action to restore installations to the functional condition as before the breakdown.

(c) Breakdown maintenance

This entails repair and/or replacement of defective equipment, units or parts of installations following a breakdown that leaves the installation inoperable or unsafe, and subsequent action to restore installations to their normal functional condition, within the maximum down-time allowed.

(d) Immediate response repairs

These repairs are defined as repair work required where no breakdowns are allowed at anytime in terms of the Technical Specifications.

(e) Emergency maintenance repairs

These repairs are defined as any work required to rectify an emergency breakdown that disables a complete installation and prevents it from functioning to its designed service level.

(f) Ordinary maintenance repairs

These repairs are defined as all maintenance work required other than emergency maintenance repairs.

(g) **Fatal breakdown**

Fatal breakdown is defined as an occurrence when an installation or a specified part thereof fails to operate for any period of time other than during the execution of routine preventative and corrective maintenance activities.

SA 02.07 **SITE MAINTENANCE RECORD KEEPING**

The Contractor shall provide and maintain hard-cover A4 maintenance files for each installation for the duration of the Contract. All schedules, checklists, breakdown reports, preventative maintenance records, component replacement records and quarterly reports shall be filed, together with information regarding repairs exceeding the Contractor's liability, as set out in SA 02.02 and SA 02.03.

Site maintenance records shall be submitted at each monthly meeting.

SA 02.08 **SUPPLY OF LABOUR, EQUIPMENT AND MATERIAL**

(a) **Labour**

Competent personnel that have been trained by the Contractor, in accordance with Additional Specification SD: General Training shall execute all maintenance work.

(b) **Equipment**

All tools and equipment and consumables required for maintenance work shall be supplied by the Contractor at his cost (except where otherwise provided).

(c) **Material**

All material, spare parts, components, equipment and appurtenances necessary for the complete maintenance of each installation shall be supplied and installed by the Contractor at his cost, to a maximum value per part/subassembly as specified in Subclause SA 02.03 for exceeding Contractor's Liability.

Materials as provided for in the Bill of Quantities, shall be supplied and delivered by the Contractor at the rates bid upon order of the Engineer only, and shall be free-issued to the User Client for own use. The Contractor shall inform the Engineer of all scheduled deliveries to arrange official hand-over with the User Client.

The Contractor shall cede any supplier's or factory guarantee of repaired or replaced components to the Employer to ensure that such guarantees are not jeopardised in any way. All workmanship, materials and components used for breakdown repair shall be guaranteed for three (3) months.

SA 02.09 **IDENTIFICATION OF EQUIPMENT**

A unique identification number will be allocated only to each mechanical equipment item forming part of the installation. This identification number will be allocated and administered in collaboration with the User Client and must be described in the maintenance control plan.

Reference shall be made to identification numbers in the maintenance control plan, operating and maintenance manuals and during all maintenance activities, including the logging of breakdowns and other correspondence. Identification numbers shall also be indicated on as-built drawings.

SA 03 MAINTENANCE CONTROL

SA 03.01 SCOPE

Maintenance quality control shall be the responsibility of the Contractor who shall introduce a maintenance control plan to assist him in ensuring that preventative, corrective and breakdown maintenance are performed as described in the operating and maintenance manuals and Technical and Particular Specifications.

SA 03.02 PRELIMINARY MAINTENANCE CONTROL PLAN

A preliminary version of the maintenance control plan shall be submitted with the programme and the framework of the preliminary version shall be as close as possible to that of the final maintenance control plan as specified in SA 03.03 below. Detail contained in this preliminary maintenance control plan shall include:

- (a) Actual time that a representative of the Contractor will be present on Site for the duration of the maintenance period;
- (b) the scope and frequency of routine inspections
- (c) repair methodology
- (d) details of training plan to be implemented in accordance with Additional Specification SD

SA 03.03 MAINTENANCE CONTROL PLAN

- (a) The maintenance control plan shall be based on the Contractor's preliminary maintenance control plan, and shall be bound in a neat, A4-sized, ring-bound document with a cover page and back cover. The contents of the document shall be indexed.

In drawing up the document, the Contractor may reproduce relevant paragraphs and clauses from any of the specifications forming part of the Contract documents, but should there be any discrepancies between such clauses and paragraphs in the maintenance control plan and those in the Contract documents, those in the Contract documents shall be regarded as being correct and shall apply.

- (b) To ensure that the Engineer is satisfied that the Contractor understands the purpose and advantage of carrying out maintenance work according to a maintenance control plan he shall, as an introduction to the control plan document, set out his views as to what he believes the implementation of a maintenance control plan will achieve.
- (c) The maintenance control plan shall also contain the following:
 - (i) A summary of the repair and maintenance work to be carried out under the Contract giving details of the conditions of the various installations at the facility(ies) affected by the activities under the Contract. The Contractor shall bear in mind that maintenance work may have to be carried out before the repair phase of the installation has been entirely completed and the summary mentioned above shall therefore differentiate between maintenance work before and after the repair phase has been completed.

SA.8

- (ii) Details of how the Contractor intends to carry out the various types of maintenance work especially breakdown maintenance should breakdowns occur.
 - (iii) Details of how the call centre works, as specified in clause SA 04 as well as all statistics of breakdowns, leakages, blockages, etc. available from the call centre for the installation and the age of the installation that has been taken into account in compiling the contents of the maintenance control plan.
 - (iv) A list of organisations and persons directly involved with the Contract or whose requirements have to be taken into account during the entire Contract Period such as the Department of Public Works, the User Client, the Consulting Engineer, the Contractor, the Local Authority, etc. Each person's position within his organisation as well as the applicable phone numbers shall be given.
 - (v) Details of monthly meetings to be held with the Department of Public Works, the User Client, Contractor and Engineer;
 - (vi) Reports to be submitted after every routine inspection (all reports, checklists, breakdown records, score card results, etc. for each system of an installation shall be kept on the site in a hard cover file);
 - (vii) Procedures to address complaints and logged breakdowns;
 - (viii) Details of quarterly reports, summarising all inspections, together with inspection data such as nature of test, names of persons carrying out tests and inspection results. Detail of repairs and replacements, together with testing of repaired equipment shall also be reflected in this report, and
 - (ix) Assistance to be given by the Engineer with decisions regarding material, equipment and other recommendations.
- d) The codes of practice as set out in ISO 10006 and ISO 9004 for quality systems and management shall be used as a guideline for compiling a maintenance control plan. ISO accreditation is not a requirement in terms of this Contract.
- (e) The maintenance control plan shall be upgraded when its contents are no longer representative of actual conditions.
- (f) The Contractor shall check the contents of existing Operating and Maintenance Manuals (if available) and shall update or modify them and then incorporate applicable data into his own manuals. Where no manuals exist, the Contractor shall draw up his own Operating and Maintenance Manuals.

Pertinent data contained in the Operating and Maintenance Manual may be transferred to the Maintenance control plan to make it a document which can be used as an independent handbook for maintenance work.

The Contractor is referred to the contents of paragraph (a) above regarding the reproduction of data, as this shall also be applicable to data reproduced from Operating and Maintenance Manuals.

SA 04 **COMMUNICATION**

The maintenance control plan (Clause SA 03) will provide, after agreement between the Contractor and the Engineer, for the following communication and complaint logging procedure:

SA.9

- (a) The Contractor shall establish a telephone and fax line and a cellular telephone connection to ensure that he can be reached at any time.
- (b) The Contractor shall primarily be responsible for determining the items requiring preventative, corrective and breakdown maintenance, and shall communicate this information directly to his maintenance workforce.
- (c) Should the Engineer or operating personnel of the User Client determine or suspect that preventative, corrective or breakdown maintenance is required, a call shall be logged through the call centre to reach the Contractor as soon as possible.
- (d) Reaction times will be as described in Clause SA 05.02.
- (e) All complaints of the User Client shall be reported to the Engineer via the call centre, as set out in the maintenance control plan, and the Engineer shall issue instructions to the Contractor. The breakdown registration form will be completed and faxed to the Contractor. After the Contractor has attended to the complaint, the Engineer will provide feedback to the call centre both telephonically and via fax. The breakdown close out form shall be completed by the Contractor and faxed to the Engineer as soon as the breakdown is repair by the Contractor.

The call centre logs the details of the Engineer's call and provides feedback to the complainant.

Reference shall also be made to Clause PS 7.12 of Portion 1 of the Project Specifications as well as to Additional Specifications SG regarding the Call Centre.

SA 05 PERFORMANCE MEASUREMENT

The Contractor's performance shall be measured against the following parameters:

SA 05.01 SPECIAL TESTING OF AN INSTALLATION

The Engineer may at any time inspect any part of the entire installation. During Maintenance work, the Engineer shall at his discretion order special tests to be carried out on complete installations at intervals of not less than four months, to verify the satisfactory functional condition of the installation.

The Engineer reserves the right to select at random component equipment and trade practices to be tested by independent authorities for compliance with specifications as specified in this Contract document.

The Contractor shall provide all equipment, tools and instruments required for testing.

SA 05.02 MAXIMUM MAINTENANCE DOWN-TIME

After a complaint has been logged and forwarded to the Contractor, the Contractor shall be expected to minimise the maintenance down-time until the system component is fully operational to the satisfaction of the Engineer. Should the Contractor not respond within the maximum down-time, the Engineer may arrange, at the cost of the Contractor, for the necessary repair work to be done by others.

The Contractor shall respond to a breakdown registration by travelling to Site to evaluate the breakdown (scope of repair work), estimate the realistic downtime and provide feedback to the Engineer.

Should the Contractor not be able to complete the required repair work within the maximum down-time period allowed, it shall be his responsibility to obtain extension of down-time from the Engineer. The written report shall clearly state the reasons for the extension, as well as the actual extension required.

Extension of down-time will only be granted by the Engineer if:

- (a) the maximum down-time is unreasonable in relation to the scope of the repair work required;
- (b) the delivery time of a new component/subassembly/machine or spares required for the repair of the defective component/subassembly does not enable the Contractor to successfully complete the repair work within the maximum breakdown down-time allowed.

Should the actual down-time exceed the maximum down-time the Contractor shall be liable to a payment reduction for the difference between actual down-time and maximum down-time. This is reflected in the table below:

REQUIRED MAINTENANCE	MAXIMUM DOWN-TIME ALLOWED	PAYMENT REDUCTION IF EXCEEDED
Fatal breakdown (where specified)	Zero (immediate response)	R2 500/hour
Emergency Breakdown	24 hours	R2 500/day
Ordinary Breakdown	7 days	R500/day
Operational damage repair	7 days	R500/day

"Maximum down-time" shall mean the period of time allowed to repair a breakdown, and "actual down-time" shall mean the measured period from the instant when the breakdown was logged with the Contractor until the installation has been repaired to its functional specification.

SA 05.03

PERFORMANCE-BASED PAYMENT

Remuneration for all value-related as well as all time-related preliminary and general charges shall be deemed included in the monthly maintenance payments for the various installations.

SA 05.03.01 Score-card

The Engineer will inspect each installation monthly after Practical Completion of the repair phase of the installation. The Engineer will use a score-card to measure the quality of preventative and corrective maintenance rendered by the Contractor during the preceding month, on all components that form part of the installation, in accordance with the maintenance specifications. The Engineer will record his inspection directly onto the score-card. The score-card shall serve to evaluate ten performance indicators each month in the manner set out below.

The Contractor shall always have the opportunity to score the maximum points, provided that his preventative and corrective maintenance work comply with the Specifications. The Employer will therefore be protected against a reduced or unsatisfactory service level and may refuse payment on such points.

SA 05.03.02 Performance indicators

Performance indicators shall be selected to measure the Contractor's service level of preventative and corrective maintenance.

The Contractor and the Engineer shall each have the opportunity to select five (5) performance indicators each month, which shall focus on the measurement of maintenance quality against the relevant specifications for the ensuing month. All ten (10) performance indicators are known to both the Engineer and the Contractor.

The Contractor shall aim to perform satisfactorily on all ten performance indicators. All indicators shall be selected from the scope of his normal preventative and corrective maintenance work and shall be based on the maintenance control plan and operating and maintenance manuals. The work shall either be satisfactory, or unsatisfactory, and the Contractor shall score one (1) or zero (0) respectively per indicator.

Performance indicators shall be used to focus on certain key aspects of the work and shall in no way limit the Contractor's responsibility to do all the required work.

SA 05.03.03 Satisfactory performance

The Engineer shall inspect the site on an arbitrary day to measure the quality of maintenance against the ten selected performance indicators. Should the Contractor score the maximum points (10) he shall receive his full maintenance payment for the installation. Should the quality of preventative maintenance, or components requiring persistent corrective maintenance be unsatisfactory according to the score-card, the Contractor may fail to achieve full payment due to a reduced service level. Each monthly payment for maintenance shall be subject to evaluation based on the score-card.

A copy of the score-card including a guideline for the use thereof is included in this Specification.

SA 06 MEASUREMENT AND PAYMENT**SA.01 MAINTENANCE OF A COMPLETED INSTALLATION Unit: point**

The unit of measurement shall be a point. Each month shall represent a maximum of ten points and a minimum of zero points, depending on the performance and quality of maintenance. Ten points per month, determined by using the rate bid per point, shall include full compensation for all liabilities and obligations described or implied in the Contract document and deemed by the Contractor to be applicable to the maintenance phase of the Contract, for the complete monthly maintenance of an entire installation after practical completion of repair work, and all appurtenant works deemed to form part thereof, as defined in the relevant Technical or Particular Specifications.

The combined rate bid for ten points (which shall not be less than 10% of the total Bid Sum) shall also include full compensation for complete preventative, corrective and breakdown maintenance (as defined in this General Maintenance Specification), including full compensation for all costs related to resetting, repair, procurement, supply, delivery, replacement, protecting, furnishing, installing, testing and commissioning of all items and material required to maintain the complete installation in a perfect functional condition. The only items not to be included in the rate for monthly maintenance points are:

1. Supply, delivery, installation and testing of special equipment/materials that will be measured elsewhere, and
2. Special testing of an installation.

Different installations have been listed in the Bill of Quantities, in accordance with the definition of each installation.

Although ten points per month shall include full compensation for preventative, corrective and breakdown maintenance, the Contractor might fail to achieve all points applicable in the event of unsatisfactory performance, in which case he shall still perform all maintenance requirements according to specification, but at his own cost where a reduction in points awarded is insufficient to cover his cost.

Remuneration for all value-related as well as all time-related preliminary and general charges shall be deemed included in the monthly maintenance payments for the various installations.

SA.02 MAINTENANCE OF AN INSTALLATION PRIOR TO PRACTICAL COMPLETION Unit: point

The unit of measurement shall be a point. Each month shall represent a maximum of ten points and a minimum of zero points, depending on the quality of maintenance. Ten points per month determined by using the rate bid per point, shall include full compensation for the monthly maintenance of an incomplete installation until practical completion of the repair work thereof.

The combined rate bid for ten points (which shall not be less than 10% of the total Bid Sum) shall include full compensation for preventative, corrective and breakdown maintenance (as defined in this General Maintenance Specification) of all units, equipment and/or components thereof that require no initial repair work in terms of the complete installation. As repair work progresses, maintenance responsibilities shall be extended to include those units, equipment or parts thereof that have been serviced, repaired or reconditioned.

Different installations have been listed in the Bill of Quantities, immediately below maintenance of a completed installation. The total number of points for maintenance of a completed installation plus maintenance of the same installation prior to practical

completion shall be 360.

Although ten points per month shall include full compensation for preventative corrective and breakdown maintenance, the Contractor might in the event of unsatisfactory performance fail to achieve all points applicable, in which case he shall still perform all maintenance requirements according to specification, but at his own cost where a reduction in points awarded is insufficient to cover his cost.

SA.03 ADDITIONAL TESTS:

SA.03.01 Where ordered by the EngineerUnit: rand (R)

SA.03.02 Charge required by the Contractor on subitem SA.03.01 above Unit: %

An amount has been allowed in the Bills of Quantities to cover the cost of additional tests required by the Engineer. The Engineer will have the sole authority to spend the amount or part thereof under subitem SA.03.01.

The percentage bid under subitem SA.03.02 will be paid to the Contractor on the value of each payment made to the approved testing authority.

SA.04 PAYMENT REDUCTION DUE TO EXCEEDING OF MAXIMUM ALLOWABLE DOWN-TIME DURING FATAL BREAKDOWN..... Unit: hours

The unit of measurement shall be the number of hours during which a component of an installation was in a disfunctional condition and required immediate response repairs.

The negative fixed rate shall include full compensation for the User Client's loss in productivity and, multiplied by the number of hours measured, shall be deducted from the certified amount due to the Contractor.

SA.05 PAYMENT REDUCTION DUE TO EXCEEDING OF MAXIMUM ALLOWABLE DOWN-TIME DURING EMERGENCY BREAKDOWN Unit: days

The unit of measurement shall be the number of days, in excess of 24 hours, during which a component of an installation was in a disfunctional condition that required emergency repairs.

The negative fixed rate shall include full compensation for the User Client's loss in productivity and, multiplied by the number of days measured, shall be deducted from the certified amount due to the Contractor.

SA.06 PAYMENT REDUCTION DUE TO EXCEEDING OF MAXIMUM ALLOWABLE DOWN-TIME DURING ORDINARY BREAKDOWN Unit: days

The unit of measurement shall be the number of days, in excess of 7 days, during which a component of an installation was in a disfunctional condition that required ordinary repairs.

The negative fixed rate shall include full compensation for the User Client's loss in productivity and, multiplied by the number of days measured, shall be deducted from the certified amount due to the Contractor.

SA.07 PAYMENT REDUCTION DUE TO EXCEEDING OF MAXIMUM ALLOWABLE DOWN-TIME DURING OPERATIONAL DAMAGE

BREAKDOWN..... Unit: days

The unit of measurement shall be the number of days, in excess of 7 days, during which a component of an installation was in a disfunctional condition that required ordinary repairs.

The negative fixed rate shall include full compensation for the Client's loss in productivity and, multiplied by the number of days measured, shall be deducted from the certified amount due to the Contractor.

A.08**UPDATING EXISTING OPERATING AND MAINTENANCE MANUALS:**

SA.08.01 **Description of installation** Unit: sum

SA.08.02 **etc. for other installations**

The unit of measurement shall be the sum of money needed to update the manuals for each installation. The rate bid shall include full compensation for checking the information in the manuals of each installation, for the necessary research, for drawings and diagrams, for all instructions or procedures that have to be drawn up and editing that has to be performed and for all else necessary to provide seven copies (one set) of the updated manuals all in accordance with additional specification SB.

DEPARTMENT OF PUBLIC WORKS MAINTENANCE SCORE-CARD



CONTRACT NUMBER: WCS

CONTRACT:

CONTRACTOR:

ENGINEER:

INSTALLATION:

MONTH: OF 36

The following components of the installation were selected by the contractor at the Monthly Maintenance Meeting nr. as performance indicators to be tested according to specification:

1. CONTRACTOR'S SELECTION

- 1.1
1.2
1.3
1.4
1.5

SUBTOTAL:

0	1

The following components of the installation were selected by the Engineer as performance indicators to be tested According to specification:

2. ENGINEER'S SELECTION

- 2.1
2.2
2.3
2.4
2.5

SUBTOTAL:

TOTAL SCORE:

--	--

Engineer's Representative

Signature

Date

D	D	/	M	M	/	Y	Y
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GUIDELINE FOR THE USE OF THE MAINTENANCE SCORE-CARD

The score-card and performance indicators must be used as a maintenance management tool. The aim with each score-card is to ensure that:

- (a) the project focuses on key aspects of maintenance per month;
- (b) the Contractor receives payment for his work, and
- (c) the Employer receives value for money and a sustained high level of service.

Performance indicators must be selected to measure the Contractor's service level of preventative and corrective maintenance that will be based on the Maintenance Control Plan and the Operating and Maintenance Manuals (containing information specified in the Contract documentation).

For each specific installation, different performance indicators must be defined each month based on the content of the maintenance in relation to the scope of maintenance work per installation and must be based on the Contractor's service level record on preventative and corrective maintenance.

Breakdowns must be dealt with if and when necessary by logging of the breakdown and monitoring the downtime.

The Contractor and the Engineer must agree on all performance indicators at an occasion prior to the month during which the Contractor's performance (service level of maintenance) will be measured.

ADDITIONAL SPECIFICATION**SB OPERATING AND MAINTENANCE MANUALS****CONTENTS**

SB 01	SCOPE
SB 02	PROCEDURE FOR SUBMISSION OF MANUALS
SB 03	FORMAT OF OPERATING AND MAINTENANCE MANUALS
SB 04	CONTENTS
SB 05	MEASUREMENT AND PAYMENT

SB 01 SCOPE

The Contractor shall be responsible for the compilation of complete sets of Operating and Maintenance Manuals. A separate Operating and Maintenance Manual shall be supplied for each installation where required and as defined in the Additional Specification SA: General Maintenance.

SB 02 PROCEDURE FOR SUBMISSION OF MANUALS**SB 02.01 SUBMISSION OF DRAFT MANUALS**

A draft copy of each Operating and Maintenance Manual shall be submitted to the Engineer prior to safety inspection of the installation. Approval of the draft Operating and Maintenance Manuals shall be a prerequisite for commencement of the safety inspection in terms of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)

Where an installation has an existing Operating and Maintenance Manual, the Contractor shall check whether its contents are still applicable and accurate. When drawing up his own Operating and Maintenance Manual for the installation, the Contractor shall incorporate there in all such existing applicable data. The existing Operating and Maintenance Manual shall then be disposed of provided written permission to do so has been obtained from the Engineer.

The manuals will be reviewed and checked by the Engineer and returned to the Contractor with comments, where necessary. The Contractor shall make the necessary changes and amendments to the manuals to incorporate the Engineer's comments.

SB 02.02 DEVELOPMENT OF FINAL MANUALS

A final draft copy of each Operating and Maintenance Manual shall be submitted to the Engineer at least one week prior to commencement of Day 1 tests on commissioning. This set of manuals will not be accepted without the Contractor's verification of the information contained in the manuals and the professional language

editing thereof. The Engineer shall return the manuals to the Contractor, who shall make the final corrections. The Engineer will, however, not be responsible for the quality control on manuals. Approval of final Operating and Maintenance Manuals shall be a prerequisite for issuing of a Certificate of Practical Completion for repair of the installation.

After the Engineer has approved the final Operating and Maintenance Manuals, the Contractor shall provide the Engineer with seven (7) sets of the manuals. Approval of the final Operating and Maintenance Manuals shall be a prerequisite for issuing of a Certificate of Completion.

SB 03 FORMAT OF OPERATING AND MAINTENANCE MANUALS

- (a) Manuals shall be bound in hardcover lever-arch files with plastic coatings. The files shall be clearly labelled on the front cover, as well as on the back band, with the following information:
 - (i) The title "Operating and Maintenance Manuals"
 - (ii) Name of the installation (as defined in Additional Specification SA: General Maintenance)
 - (iii) Name of the contract and contract number
 - (iv) The Contractor's name, address and contact telephone number and fax (logo optional)
 - (v) Month and year in which the manuals are finally handed over to the Employer
 - (vi) Name of the User Client
- (b) Pamphlets and bound leaflets/booklets from suppliers or manufacturers shall be placed in plastic pockets.
- (c) Drawings and diagrams larger than A3 shall be folded and placed in plastic pockets to be easily removed or stored.
- (d) The sections of the manuals specified below shall be clearly partitioned.
- (e) Cross-referencing between drawings/diagrams and text shall be in a clear and consequent format.
- (f) The Operating and Maintenance Manuals shall be supplied in English.
- (g) An electronic copy of the final manual shall be handed to the engineer upon approval of the operation and maintenance manual.

SB 04 **CONTENTS****SB 04.01** **TABLE OF CONTENTS**

The table of contents shall appear on the second page and shall consist of the headings of the various sections in the manual and the relevant page numbers.

The table of contents shall essentially contain at least the following:

1. Introduction
 - 1.1 Scope of the manual
 - 1.2 General arrangement of the manual
 - 1.3 Description of installation
 - 1.4 Specifications
2. List of drawings and diagrams
3. Parts and components
4. Operating procedures
5. Maintenance
 - 5.1 Purpose of maintenance
 - 5.2 Preventative maintenance
 - 5.3 Trouble-shooting
6. Breakdown maintenance and repair
7. List of Appendices.

SB 04.02 **INTRODUCTION**

The introduction shall contain at least the following:

SB 04.02.01 **Scope of the manual**

A summary shall explain the scope of the contents.

SB 04.02.02 **General arrangement of the manual**

A brief description shall explain the way in which the manual is arranged.

SB 04.02.03 **Description of installation**

This section shall give a functional description of the complete installation covered by the manual, including all systems and/or functional units deemed to form part thereof, as defined in Additional Specification SA: General Maintenance.

SB 04.02.04 Specifications

A summary shall be given of the specifications applicable to the particular part of the Contract.

SB 04.03 DRAWINGS AND DIAGRAMS**SB 04.03.01 Mechanical flow diagrams (MFDs) and single line diagrams**

Mechanical flow diagrams (for mechanical systems) or single line diagrams (for electrical systems) of the system and/or functional unit shall be included in the Operating and Maintenance Manuals for easy reference by the operators of the installation. Diagrams shall be drawn not only for parts of an installation that have been repaired, but also for the complete installation, including all the components.

SB 04.04 PARTS AND COMPONENTS**SB 04.04.01 Equipment data sheets**

A data sheet shall be drawn up for each piece of equipment and/or machine forming part of the installation and shall contain the following information:

- (a) Equipment tag number
- (b) Equipment description
- (c) Model/make/manufacture
- (d) Supplier/Reconditioning details
- (e) Ordering details
- (f) Details of fixed components
- (g) Details of lubrication
- (h) Maintenance references (refer to supplier/reconditioning technical manual).

SB 04.04.02 Technical equipment manuals

For each piece of equipment and/or machine forming part of the installation the following information shall be included in this section of the Operating and Maintenance Manuals:

- (a) the supplier or reconditioning manual and/or standards of operating and maintenance instructions;
- (b) illustrated parts breakdown and/or group assembly drawings as agreed with the Engineer;
- (c) parts lists and data sheets, including all characteristic curves for machines indicating operation point, efficiency, power consumption, etc;
- (d) calibration charts, and
- (e) test certificates for hydraulic pressure tests, flame-proof grading, materials, non-destructive examinations, coating and lining details, etc.

Each detailed description shall be accompanied by a set of engineering drawings. From the drawings the functionality of each part or component used, as well as the special characteristics associated with the part or component shall be very clear.

SB 04.04.03 Parts and components list

A detailed description shall specify all the parts and components used for the duration of the Contract. This description shall include new parts and components, as well as existing parts and components that have either been reconditioned or used as specified in the Contract.

The description shall state at least the part or component number, part or component name, the size of the part or component, an explanatory description, the quantity used, the material of which the part or component is made, the coating (if any), date of purchase, as well as any relevant remarks as to the application thereof.

Details of the manufacturer of the part or component shall also be listed. This shall at least state the name, address, telephone number, fax number and name of a contact person.

The supplier of the part or component shall also be stated and shall include at least the name, address, telephone number, fax number, name of a contact person and an alternative supplier (if available).

SB 04.04.04 Drawings

Drawings shall contain a descriptive heading, an explanatory key and relevant comments. Drawings shall be done on a computer-aided design package approved by the Engineer.

A compound drawing for all subassemblies shall clearly indicate how and where the various parts fit in the subassembly. The compound drawing shall be linked to the equipment data sheets and parts and components list and shall clearly specify the parts or components used, their model numbers, their sizes and the quantities used. The compound drawings shall also be accompanied by a short description explaining the workings of the subassembly, as well as the assembly of the parts or components to complete the subassembly.

SB 04.05 OPERATING PROCEDURES

The operating instructions shall be a step by step description of the manual start-up and shut-down procedure for every piece of equipment and/or process reconditioned, repaired or supplied with references to the MFDs. For automatic operation the operators shall be referred to the automatic control manual (if applicable).

The functioning of the installation shall be clearly described, using a flow diagram depicting the interrelationships among the various subassemblies. The subassemblies shall be described by descriptive drawings.

Each mechanical or process flow diagram shall contain at least a heading, relevant comments and a key.

Every subassembly shall also have its own flow diagram explaining the operation of the subassembly, as well as the application of each part and component. The application of the subassembly shall also be very clear. The flow diagram shall consist of at least a heading, relevant comments and an explanatory key.

A detailed description shall be given of all operational systems forming part of the installation, explaining the operation and functioning of the system and the number of operations personnel required for performing the operation successfully.

The preparations, which are required before the system can be operational, shall be clearly stated and explained.

The operation tasks shall be clearly explained with reference to dangerous situations that might occur. Hazardous operations shall be explained in great detail and cover all the applicable safety precautions.

SB 04.06 MAINTENANCE

SB 04.06.01 Purpose of maintenance

The maintenance process shall be explained and the main responsibilities described.

SB 04.06.02 Preventative maintenance

A preventative maintenance and lubrication schedule shall be included in this section. This schedule shall be in table format and shall include a summary of all the maintenance actions required for each different system and/or functional unit covered by this manual, in order to give a single summary of all routine preventative maintenance actions required for the complete installation.

The schedule shall indicate daily, weekly, fortnightly, monthly and yearly maintenance actions. A lubrication schedule summary shall also be included under this section.

The frequency of routine preventative maintenance actions shall be indicated very clearly.

The Contractor shall provide the maintenance requirements as prescribed by the manufacturer. The type of maintenance shall be clearly indicated. The description of the maintenance to be performed shall include at least the part name, location of the part in either the assembly or subassembly, the model number, the quantity of the particular part or component to be maintained, the type of maintenance, and notes on the maintenance procedure.

A brief description shall accompany the maintenance schedule, indicating special tools to be used, maintenance and test equipment required for the test procedures. Any special tools necessary for maintenance shall be specified in terms of name, model, size, manufacturer, supplier (name, telephone number, fax number, contact person), coating (if any) and notes on the use of the equipment.

Remarks on the system readiness checks of each subassembly shall be explained in detail. Routine inspection and maintenance processes shall be described. It shall be

very clear what needs to be done, how to perform the necessary task and any dangers that are present.

SB 04.06.03 Trouble-shooting

An explanation shall be given to assist the maintenance personnel in analysing and resolving malfunctions that might occur. Various scenarios with possible causes and rectification procedures shall be explained.

The scenarios shall be accompanied by drawings indicating the position of the part that is faulty. Each of these drawings shall have a heading, comments and an explanatory key.

SB 04.07 BREAKDOWN MAINTENANCE AND REPAIR

The Contractor shall describe the complete procedure to be followed in the event of a breakdown. It shall be very clear what the operating personnel should look for, how to eliminate any dangers due to the breakdown (eg electricity must be shut off in the event of problems with the wiring) and who should be contacted. The Contractor shall supply the names and telephone numbers of at least two contact persons who may be contacted in the event of a breakdown.

The Contractor shall refer to Additional Specification SA: General Maintenance, to determine the reaction time for the repair to the breakdown.

Repair instructions shall provide the maintenance personnel with detailed instructions for the removal and/or replacement of any item requiring replacement due to malfunctioning. Contact numbers shall also be given to assist maintenance personnel, should a breakdown occur.

The Contractor shall specify the actions expected of maintenance personnel in the event of a breakdown.

The Contractor shall also specify the testing procedures to be followed before the system can be put into operation again. Every procedure shall be described clearly and all the potential dangers pointed out, as well as the precautions that have to be taken.

The testing procedures shall be accompanied by drawings illustrating the process to be performed. Every drawing shall have a heading, comments and an explanatory key.

SB 05 MEASUREMENT AND PAYMENT

SB.01 COMPILE AND SUPPLY A COMPLETE SET OF OPERATING AND MAINTENANCE MANUALSUnit : sum

The unit of measurement shall be a sum for each complete set (seven copies) of Operating and Maintenance Manuals. Operating and Maintenance Manuals for different installations shall be measured separately in the Schedule of Quantities.

The tendered sum shall include full compensation for all technical research, gathering of information, compilation of manufacturer's instructions, compilation of drawings and diagrams, and for writing of all the descriptions, instructions and functional procedures, as well as language editing, in order to provide a clear and correct set of Operating and Maintenance Manuals.

The tendered sum shall also include full compensation for all expenses such as paper, copy work, binding and printing necessary for the completion of the manuals.

The tendered sum shall also include full compensation for the compilation of draft sets of operating and maintenance manuals in accordance with the specification, and for incorporation of all comments and corrective requirements.

SB.02 COMPILE AND SUPPLY A COMPLETE KEY PLANUnit : sum

The unit of measurement shall be a sum for each complete set (three A0-size copies) of the key plan(s).

The tendered sum shall include full compensation for all expenses such as paper, copy work and printing required for the completion of the key plan.

The key plan shall include and comply with the following:

(a) Detail ground survey

All services must be shown on a complete key plan as required by the Engineer, including roads, fences, paving, transmission and telephone lines, etc. For sewerage reticulation and stormwater drainage systems the pipe sizes, as well as invert heights must be provided. An effort must be made to trace the routes of these services.

(b) Survey of buildings

The "footprint" of all the buildings and structures must be surveyed.

(c) General

All survey data shall be captured in electronic format (DXF).

SB.03 UPDATE AND REVISE THE EXISTING SET OF OPERATING AND MAINTENANCE MANUALSUnit : sum

The unit of measurement shall be a sum for each complete set (seven copies) of Operating and Maintenance Manuals updated, revised and compiled. Operating and Maintenance Manuals for different installations shall be measured separately in the Schedule of Quantities.

The Contractor shall note that existing manuals may not be to an acceptable standard or may not be available. All manuals that exist will be available to view at the compulsory site inspection.

The Contractor shall also note that manuals may not necessarily be available in an electronic format.

The tendered sum shall include full compensation for all technical research, gathering of information, compilation of manufacturer's instructions, compilation of drawings and diagrams, and for writing of all the descriptions, instructions and functional procedures, as well as language editing, in order to provide a clear and correct set of Operating and Maintenance Manuals.

The manuals shall also include all new equipment installed under this contract.

The tendered sum shall also include full compensation for all expenses such as paper, copy work, binding and printing necessary for the completion of the manuals.

The tendered sum shall also include full compensation for the compilation of draft sets of operating and maintenance manuals in accordance with the specification, and for incorporation of all comments and corrective requirements.

ADDITIONAL SPECIFICATION

SC GENERAL DECOMMISSIONING, TESTING AND COMMISSIONING PROCEDURES

CONTENTS

SC 01	SCOPE
SC 02	PHASED REPAIRS AND UPGRADING OF THE INSTALLATION
SC 03	DETAILED COMMISSIONING PROGRAMME
SC 04	COMMISSIONING COMMUNICATION CHANNELS
SC 05	COMMISSIONING RISK CONTROL AND PENALTIES
SC 06	DELAYS TO SCHEDULED SHUTDOWNS
SC 07	MATERIAL AND EQUIPMENT PROCUREMENT AND PROTECTION
SC 08	TESTING OF EQUIPMENT PRIOR TO RECOMMISSIONING
SC 09	TESTING OF MATERIAL AND EQUIPMENT SPECIFICATIONS AND WORKMANSHIP
SC 10	DECOMMISSIONING
SC 11	RECOMMISSIONING, COMMISSIONING AND COMPLETION OF INSTALLATIONS
SC 12	MEASUREMENT AND PAYMENT

SC 01 SCOPE

This specification encompasses all aspects of the repairs of systems and services that form part of an installation, including the factory and on-site testing, decommissioning, installation and commissioning of all equipment, instrumentation and materials reconditioned, supplied and installed as part of an installation as defined in Additional Specification SA: General Maintenance.

The specified procedures are the minimum requirements to be supplemented by various technical and particular specifications in this document. These requirements shall apply to all commissioning work scheduled as part of the initial repair work on installations, as well as commissioning work that is part of the routine preventive and corrective maintenance.

SC 02 PHASED REPAIRS AND UPGRADING OF THE INSTALLATION

When an installation consists of parallel systems or components, the complete installation and all its components shall be repaired without taking the complete installation out of commission at any time, unless otherwise specified in the Technical Specifications.

In order to schedule the repairs of an installation, all work shall be done in phases as specified in the Technical Specifications and illustrated in detail on the Drawings. Repairs of each part shall terminate with the successful reconditioning of that part. Each part of the system shall be decommissioned and recommissioned in the sequence specified in the Technical Specifications and on the Drawings.

The Contractor shall install all the necessary temporary specials, spool pieces, supporting frames and brackets to provide a functional link between each repaired and upgraded part of the system and the part of the installation that has not yet been

repaired and upgraded during recommissioning. Electrical and instrumentation Contractors and subcontractors shall ensure that the system remains operational as specified, using either existing or newly installed instruments, cables and controls.

Payment is based on the successful recommissioning of a specific part of the installation.

SC 03 **DETAILED COMMISSIONING PROGRAMME**

No work of any kind on any part of the existing installation shall take place prior to the Engineer's approval of a detailed commissioning programme. This programme shall be submitted in addition to the general programme for planning and monitoring contract progress, at least two weeks prior to any programmed shutdown. The programme shall be the coordinated product of the Engineer and the User Client. Commissioning programmes shall take all process requirements into account. The detailed commissioning programme shall indicate all actions necessary for:

- (a) Decommissioning
- (b) Recommissioning of parts of the installation
- (c) Commissioning of the installation as a whole.

All work deemed necessary for practical completion of the installation shall be indicated on the commissioning programme.

The programme shall indicate the milestones to be achieved before shutdown and decommissioning as activities of zero duration, all of which shall be prerequisites linked to the "start" of decommissioning.

The following specific actions shall be included in the programme, clearly indicating the time allowed for:

- (a) Communication, including the time for confirmation of the official shutdown;
- (b) Draining parts of the installation to sumps, where available, or to other storage facilities provided by the Contractor;
- (c) Installation of temporary blanked flanges or other means of isolation where necessary;
- (d) Partial decommissioning and removal of existing material and equipment to perform work, including protection of pipework against hot work, cutting into pipework, loosening bolts, flanges and all other work necessary for recommissioning;
- (e) Installation of temporary functional links (pipe specials) between any two parts of the installation;
- (f) Each individual field weld, subject to the Engineer's approval;

SC.3

- (g) Non-destructive testing of materials, for manufacturing/construction quality and for producing test results;
- (h) Installation of all instruments and their connection to SCADA systems;
- (i) Installation and connection of all power cables;
- (j) De-aeration of all pipe sections;
- (k) Communication between the Contractor, the Engineer, the Employer and the User Client;
- (l) Start-up of the complete system, indicating start-up procedures.

Inspection of the prefabricated installation, testing of all equipment prior to final commissioning, pressure testing and non-destructive testing shall be clearly scheduled in the project progress programme.

Day 30 tests and instruction/training sessions with the User Client shall be scheduled in the project progress programme.

SC 04 COMMISSIONING COMMUNICATION CHANNELS

The Contractor shall communicate with the User Client's operating and maintenance managers via the Engineer to finalise start-up after decommissioning in accordance with the specified procedures.

The following key parties shall be involved before and during shutdown and decommissioning of any part of the system:

Contractor:	Site Agent
Engineer:	Resident Engineer
Employer:	Representative of Area Manager
User Client:	Operating and Maintenance Manager.

SC 05 COMMISSIONING RISK CONTROL AND PENALTIES

- (a) The safety instructions stipulated by the Occupational Health and Safety Act, 1993 (Act 85 of 1993) shall be adhered to at all times.
- (b) The Contractor shall not be allowed to work on any part of the installation without obtaining a commissioning check permit on the day of shutdown. A typical example of a commissioning check permit is included in this document, referring to the minimum required milestones to be achieved prior to decommissioning.
- (c) Payment reductions for exceeding the maximum permissible down-time during maintenance shall apply as stipulated in the General Conditions of Contract and

the Contract Data. This stipulation does not include shutdowns during programmed routine preventive maintenance work.

SC 06 DELAYS OF SCHEDULED SHUTDOWNS

Specific dates on which an installation shall be shut down for decommissioning shall be finalised during coordination meetings of all the parties involved, including the Engineer, the Employer, the User Client and the Contractor.

Although a date for each shutdown will be scheduled at the coordination meetings, the actual date of the shutdown shall be determined by the process requirements and user demands, allowing for a window of seven (7) calendar days from the date of the planned shutdown.

Prospective bidders shall make allowances in their bid rates for the shutdown to occur at any time during this seven-day period. No additional payment shall be due if the shutdown occurs within this seven-day period.

If the Contractor fails to commence with the shutdown and decommissioning of the installation within the scheduled period, all additional costs arising from the shutdown at a later stage shall be for the Contractor's account.

SC 07 MATERIAL AND EQUIPMENT PROCUREMENT AND PROTECTION

It is the responsibility of the Contractor to ensure the functionality of all units of new equipment prior to decommissioning, before installation of any specific part of the system. If the equipment, whether free-issued or not, does not conform to the functionality specifications during pre-installation testing, the Contractor shall notify the Engineer in writing without delay.

SC 08 TESTING OF EQUIPMENT PRIOR TO RECOMMISSIONING

The equipment shall be tested for functionality after pre-installation of equipment in parts of the installation.

- (a) The Contractor shall inform the Engineer well in advance of his intention to perform the first tests and start-up of equipment in order to allow a representative of the Engineer to witness the tests. The extent of all precommissioning tests and checks shall be agreed with the Engineer prior to commencement.
- (b) The Contractor shall first conduct his own tests of the equipment. When he is satisfied that the equipment complies with the specifications, he shall notify the Engineer that he is ready for the official tests on completion. The Contractor shall not conduct an official test without the Engineer's presence or approval. All equipment shall conform to the specified requirements.
- (c) Before starting up any part of the installation or filling the tanks and sumps with liquid, the Contractor shall clean out the tanks, pipes, fittings, equipment or structures and, if necessary, make arrangements with other Contractors to remove their building rubble from the structures, check that all safety devices and

alarms have been set and activated, all nuts have been tightened correctly, that all the equipment is complete and ready for start-up, that the plant has been installed correctly, and that copies of the operating manuals have been handed to the Engineer.

- (d) The Contractor shall start up each section of equipment after ensuring that oil fillings, lubrication, vibration monitoring, cable termination and so on have been correctly completed. He is also responsible for the first refilling of all lubricating oils and for adjusting the plant to operate according to the specifications. Before any equipment is started or energised, the Contractor shall ensure that it is safe in terms of the personnel and equipment on the site to do so. The Contractor's tendered rates and sums shall allow for these costs.

All equipment shall be tested according to the relevant specifications that form part of this document.

No shutdown or decommissioning of any part of the system shall take place unless all the equipment to be installed have been tested by the Contractor and approved by the Engineer.

SC 09 TESTING OF MATERIAL AND EQUIPMENT SPECIFICATIONS AND WORKMANSHIP

All results of the required non-destructive, precommissioning and manufacturing testing shall be submitted to the Engineer well in advance of testing the equipment on recommissioning. All such test results shall be submitted before Day 1 commissioning tests and no certificate of practical completion shall be issued prior to receipt of the required test results.

SC 10 DECOMMISSIONING

The decommissioning period shall commence on the instant of the entire system shutdown. The recommissioning period shall start in parallel with decommissioning.

Shutdown and decommissioning shall not proceed without compliance with all the milestones in the detailed commissioning programme. The list of milestones in this document is not complete but indicates the minimum requirements. Milestones to be achieved prior to shutdown and decommissioning may be added to the programme at the Engineer's discretion.

The Contractor is responsible for the safe decommissioning of all material, equipment, components and instrumentation to avoid damage to parts or components of the installation.

SC 11 RECOMMISSIONING, COMMISSIONING AND COMPLETION OF INSTALLATIONS

SC 11.01 RECOMMISSIONING

Recommissioning means the commissioning of all sections or systems that form part of the installation to meet the required functional specifications for the individual section or system prior to commissioning of the repaired and upgraded installation.

The Contractor is responsible for the recommissioning of all parts of the system and he shall perform the tasks listed below.

- (a) Prior notice shall be given to and proper arrangements shall be made for recommissioning with the Employer, the Engineer, the User Client and the suppliers of equipment that is affected by recommissioning and testing.
- (b) If plant and equipment supplied by others are to be commissioned, the supplier's specific permission together with all requirements related to commissioning shall be obtained prior to recommissioning without in any way altering the General Conditions of Contract and the Contract Data with reference to the Contractor's liability in terms of defects.
- (c) The new and reconditioned parts of the installation shall be thoroughly inspected by a responsible representative of the Contractor to ensure that manufacture/construction and installation work have been completed according to the specifications.

SC 11.02 COMMISSIONING AND COMPLETION OF REPAIRS AND UPGRADING WORK

Commissioning means commissioning of the repaired and upgraded installation as a whole to perform in perfect working order.

- (a) The commissioning period for each installation as a whole:
 - (i) Commences with the Day 1 tests of the complete repaired and upgraded installation;
 - (ii) Includes commissioning of all sections and systems that have been recommissioned prior to the Day 1 tests;
 - (iii) Includes training of the User Client's operating personnel and the maintenance teams;
 - (iv) Terminates with a Day 30 test in compliance with the commissioning report.

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- (b) The purpose of the Day 1 tests is to ensure that:
 - (i) The electronic, electrical and mechanical equipment and materials are functional and in perfect working order with respect to each other and the installation as a whole;
 - (ii) The commissioning period, including training, commences on successful completion of the Day 1 tests;
 - (iii) The Contractor is entitled to a certificate of practical completion for the repairs and upgrading of the installation on successful completion of the Day 1 tests;
 - (iv) The Contractor becomes responsible for maintenance of the installation and is entitled to performance-based payments in compliance with Additional Specification SA: General Maintenance.
- (c) Commissioning shall be undertaken over a trouble-free period up to Day 30. During this period the Contractor shall train the User Client's operators and his maintenance team for operating and maintaining the installation. This training shall allow for all possible operational conditions, including emergency conditions, the correct servicing of every part, the type of oil or grease to be used, and similar tasks. The training shall take place by means of demonstrations, and the operating and maintenance manuals shall be referred to for this purpose.
- (d) Day 30 commissioning tests shall be performed thirty calendar days after the successful completion of the Day 1 tests. The commissioning period of the installation terminates upon the successful completion of the Day 30 tests.
- (e) The Contractor shall conduct all the tests required to satisfy the Engineer that the installation is performing according to specification, and shall make allowance for these tests in his bid rates and prices. These tests shall be conducted to certify that the installation, as repaired, upgraded and installed, is in perfect working order in terms of the specified functional requirements. The Contractor shall note that all equipment is to be tested as part of an installation, where appropriate, and will not be passed if all protection devices, interlocking with other equipment, etc, are not fully functional.
- (f) The Engineer shall provide commissioning sheets to the Contractor at least three weeks before the commissioning period commences, for all the equipment supplied, reconditioned and installed by the Contractor. The Contractor shall complete the commissioning sheets during the commissioning period and all items listed shall be entered. No completion certificate will be issued for an installation of which the equipment has incomplete commissioning reports. Information that is not available or applicable, or instances where certain tests have not been carried out, are subject to the Engineer's decision.
- (g) Commissioning of the plant (which includes the thirty days between the Day 1 and Day 30 tests) includes operating under conditions that adequately prove that all the specifications have been met. All safety devices, standby plant, automatic controls and protection devices shall be adequately tested for reliability and correct functioning. The Contractor may be called upon to repeat testing during

SC.8

the maintenance period if the performance of the equipment is suspected to be substandard. Costs related to such tests shall be for the Contractor's account and shall comply with the specified requirements. Copies of updated commissioning reports shall be provided to the Engineer within two days after a test has been performed.

- (h) The Contractor is responsible for providing all labour and materials (including testing equipment) during the commissioning period and shall carry out all the servicing and adjustments to ensure that the installation operates as specified. Valid calibration certificates shall be available for all testing equipment on the site during the commissioning period.
- (i) Programmes for the Day 1 tests, Day 30 tests and instruction/training sessions with the User Client's operators and maintenance team shall be prepared by the Contractor and submitted to the Engineer at least two weeks before the commissioning period commences. The Contractor shall provide weekly updates of these schedules for the duration of the commissioning period.
- (j) The Contractor shall note that if any equipment fails during the commissioning period, the equipment shall be repaired or replaced by the Contractor, and testing and commissioning shall commence from scratch.
- (k) Successful commissioning of an installation entitles the Contractor to a certificate of completion for the installation.

SC 12 MEASUREMENT AND PAYMENT

SC.01 DECOMMISSIONING AND REMOVING PARTS OF THE INSTALLATION Unit: sum

The unit of measurement shall be a sum.

The sum bid shall include full compensation for all actions and labour required for shutdown and decommissioning of the entire installation as specified to enable decommissioning and removal of parts of the installation as listed in the Bill of Quantities.

The sum bid shall include full compensation for the decommissioning and removal of the parts and components of an installation as listed individually in the Bill of Quantities, including actions and/or costs resulting from such work, to enable the recommissioning of parts of the repaired and/or upgraded installation.

The sum bid shall include full compensation for final dismantling of decommissioned materials and equipment and the removal of all such items to stores on site, as directed by the Engineer.

SC.02 COMMISSIONING AND TESTING OF PARTS OF THE INSTALLATION Unit: sum

The unit of measurement shall be a sum.

The sum bid shall include full compensation for commissioning and testing parts of the installation to be operational while still incomplete in relation to the entire repaired and/or upgraded system or installation.

Separate payment items shall be billed for separate parts of the system.

SC.03 COMMISSIONING AND TESTING OF THE INSTALLATION Unit: sum

The unit of measurement shall be a sum.

The sum bid shall include full compensation for commissioning the upgraded installation as a whole and for all costs and expenses related to labour, removal, repair, reinstallation and testing of material and equipment during the commissioning period for each part of the installation. The sum bid shall include full compensation for the final commissioning and testing, including Day 1 and Day 30 tests, of all parts and components of the installation to the specified functional condition.

Payment shall be based on successful completion of the Day 30 tests.

SC.04 PROVISION FOR SAFETY AND HOT WORK REQUIREMENTS DURING SHUTDOWN Unit: number

The unit of measurement shall be the number of shutdowns during which all the required safety and hot work requirements are provided.

The bid rates shall include full compensation for all the required safety and hot work requirements and arrangements in accordance with the specifications during a shutdown period, including all labour, personnel, equipment, materials and consumables required.

ADDITIONAL SPECIFICATION

SD GENERAL TRAINING

CONTENTS

SD 01	SCOPE
SD 02	BASIC METHOD REQUIREMENT
SD 03	TRAINING OF USER CLIENT PERSONNEL
SD 04	TRAINING OF MAINTENANCE PERSONNEL
SD 05	MEASUREMENT AND PAYMENT

SD 01 SCOPE

The Contractor shall be responsible for providing diverse training to various groups, including operating and maintenance personnel. The Contractor shall develop and facilitate initial training sessions for all parties, as well as training sessions at specified intervals to revive and supplement the initial training. An accredited trainer shall present all training sessions.

This specification includes all requirements for methods to be employed, the syllabus required by the User Client, the syllabus required for maintenance managers and workers and the method of measurement and payment.

SD 02 BASIC METHOD REQUIREMENT

The Contractor shall be responsible for conducting a complete investigation of the groups that have to be trained in order to compile a proper training plan.

The investigation shall cover at least the following aspects:

- (a) Assess likelihood of conformance to task-specific requirements (*status quo*) of capabilities.
- (b) Identify minimum pre-qualification criteria in terms of existing knowledge and skill levels in relation to reaching target requirements.
- (c) Evaluate personnel in terms of pre-qualification criteria and tasks to be performed (skills profile).
- (d) Identify training needs.
- (e) Develop appropriate and accredited training courses and material in terms of task-specific activities and identified training needs, and compile the training syllabus per installation.

The Contractor shall identify an accredited trainer to assist in the above investigation and finalise the compilation of a training plan and syllabus. Approval of the syllabus shall be a condition for issue of a Certificate of Practical Completion for repair of an installation. Once the training plan and syllabus have been approved the Contractor shall liaise with the Engineer to establish a date and appropriate training venue that would be conducive to learning to perform training.

The training shall be revived within one month after initial training to determine its effectiveness. Further regular training sessions shall be scheduled according to the effectiveness of initial maintenance and operating activities.

The Engineer will be responsible for recording all training sessions and shall keep an attendance register. The Engineer will also examine the trainees officially with each training session and issue certificates of trainees' acquired skills on satisfactory completion of the training.

SD 03 TRAINING OF USER CLIENT PERSONNEL

The Contractor's training shall include training of the User Client's operators on biannual basis to acquaint them with operating of installations (especially electrical and mechanical systems). The training sessions shall comprise lectures and on-site (hands-on) demonstrations, and shall be conducted over two-day periods. The Contractor shall liaise with the Engineer to prepare for the correct number of trainee operators.

The content of training courses for operators shall include the essential features of operating the installation, as also described in the Operating and Maintenance Manuals.

Completion of an installation shall, in terms of the Contract Data, be subject to successful completion of training. The training course shall also be based on the Operating and Maintenance Manuals. No training shall commence without the Engineer's approval of the final draft Operating and Maintenance Manual for the particular installation.

SD 04 TRAINING OF MAINTENANCE PERSONNEL

The Contractor shall train either his own employees, or local labourers, with regard to maintenance of the installation.

The training of maintenance managers shall include the following aspects:

- (a) Awareness of safety, health and personal hygiene in terms of the requirements of the Occupational Health and Safety Act, 1993 (Act 85 of 1993);
- (b) functioning of the installation, including all its systems, services, parts of buildings and infrastructure;
- (c) all specific tasks related to routine preventative maintenance;
- (d) interpretation and understanding of Operating and Maintenance Manuals with specific reference to requirements in cases of corrective and breakdown maintenance, and
- (e) repair/reconditioning and installation/construction of equipment and materials forming part of an installation.

SD 05 MEASUREMENT AND PAYMENT

SD.01 DEVELOPMENT OF A SYLLABUS FOR TRAINING OF OPERATORSUnit: sum

The unit of measurement shall be the sum for the compilation of a training syllabus for each installation that shall be measured separately in the Bill of Quantities.

The sum bid shall include full compensation for identification of pre-qualification criteria and training needs, staff assessment and evaluation prior to training, all technical research, development and compilation of an accredited training course and course material, and all other actions necessary for commencement of official training sessions in accordance with the specification.

SD.3

The sum bid shall also include full compensation for the compilation of a draft syllabus and for incorporation of all the Engineer's comments and corrective requirements.

SD.02 PRESENTING A TRAINING COURSE FOR OPERATORS Unit: number

The unit of measurement shall be the number of training courses presented based on the approved syllabus.

The bid rate shall include full compensation for presenting a two-day training course, including lectures, demonstrations, on-site training and hands-on development and improvement of operators' skills to enable the operators to operate installations safely and efficiently.

The bid rate shall include full compensation for the Contractor's time, appointment of the accredited trainer for the course, and for all material expenses such as paper hand-outs and slides for the whole group of trainees, the number of which shall be determined during development of the training course.

SD.03 PRESENTING A TRAINING COURSE FOR MAINTENANCE PERSONNEL Unit: number

The unit of measurement shall be the number of training courses presented.

The bid rate shall include full compensation for presenting a two-day training course, including lectures, demonstrations, on-site training and hands-on development, and improvement of maintenance personnel's skills to enable them to maintain and repair installations safely and efficiently at the satisfactory functional condition specified.

The bid rate shall include full compensation for the Contractor's time, appointment of the accredited trainer for the course, and for all material expenses such as paper hand-outs and slides for the whole group of trainees, the number of which shall be determined during development of the training course.

ADDITIONAL SPECIFICATION

SH HIV/AIDS REQUIREMENTS

CONTENTS

SH 01	SCOPE
SH 02	MAINTENANCE REQUIREMENTS
SH 03	MAINTENANCE CONTROL
SH 04	COMMUNICATION
SH 05	PERFORMANCE MEASUREMENT
SH 06	MEASUREMENT AND PAYMENT

SH 01 SCOPE

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

- Raising awareness about HIV/AIDS through education and information on the nature of the disease, how it is transmitted, safe sexual behaviour, attitudes towards people affected and people living with HIV/AIDS, how to live a healthy lifestyle with HIV/AIDS, the importance of voluntary testing and counselling, the diagnosis and treatment of Sexually Transmitted Infections and the closest health Service Providers
- Informing Workers of their rights with regard to HIV/AIDS in the workplace
- Providing Workers with access to condoms and other awareness material that will enable them to make informed decisions about sexual practices

SH 02 DEFINITIONS AND ABBREVIATIONS

SH 02.01 DEFINITIONS

Service Provider: The natural or juristic person recognised and approved by the National Department of Health as a specialist in conducting HIV/AIDS awareness programmes.

Service Provider Workshop Plan: A plan outlining the content, process and schedule of the training and education workshops, presented by a Service Provider which has been approved by the Representative/Agent.

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

SH 02.02 ABBREVIATIONS

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

SH 03 BASIC METHOD REQUIREMENT

The Contractor shall, through a Service Provider, conduct onsite workshops with the Workers

The Service Provider shall develop and compile a Service Provider Workshop Plan to be presented at the workshops and which will be best suited for this project to achieve the specified objectives with regard to HIV/AIDS awareness.

The Service Provider Workshop Plan shall be based on the following information provided by the Contractor:

- Number of Workers and Sub-contractors on site
- When new Workers or Sub-contractors will join the construction project
- Duration of Workers and Sub-contractors on site
- How the maximum number of Workers can be targeted with workshops
- How the Contractor prefers workshops to be scheduled, e.g. three hourly sessions per Worker, or one 2.5 hour workshop per Worker
- Profile of Workers, including educational level, age and gender (if available)
- Preferred time of day or month to conduct workshops
- A Gantt chart reflecting the construction programme, for scheduling of workshops
- Suitable venues for workshops

The Contractor shall submit the Service Provider Workshop Plan for approval within 21 days after the tender acceptance date. After approval by the Representative/Agent, the Contractor shall make available a suitable venue that will be conducive to education and training.

The Service Provider Workshop Plan shall address, but will not be limited to the following:

- The nature of the disease;
- How it is transmitted;
- Safe sexual behaviour;
- Post exposure services such as voluntary counselling and testing (VCT) and nutritional plans for people living with HIV/AIDS;
- Attitudes towards other people with HIV/AIDS;
- Rights of the Worker in the workplace;
- How the Awareness Champion will be equipped prior to commencement of the HIV/AIDS awareness programme with basic HIV/AIDS information and the necessary skills to handle questions regarding the HIV/AIDS awareness programme on site sensitively and confidentially;
- How the Service Provider will support the Awareness Champion;
- Location and contact numbers of the closest clinics, VCT facilities, counselling services and referral systems;
- How the workshops will be presented, including frequency and duration;
- How the workshops will fit in with the construction programme;
- How the Service Provider will assess the knowledge and attitude levels of attendees to structure workshops accordingly;
- How the video will be used;
- How the Service Provider will elicit maximum participation from the Workers;
- A questions and answers slot (interactive session)
- The Service Provider Workshop Plan shall encompass the Specific Learning Outcomes (SLO) as stipulated

SH 04 HIV/ AIDS AWARENESS EDUCATION AND TRAINING**SH 04.01 WORKSHOPS**

The Contractor shall ensure that all Workers attend the workshops.

The workshops shall adequately deal with all the aspects contained in the Service Provider Workshop Plan. A video of HIV/AIDS in the construction industry, which can be obtained from all Regional Offices of the National Department of Health, is to be screened to Workers at workshops. In order to enhance the learning experience, groups of not exceeding 25 people shall attend the interactive sessions of the workshops.

SH 04.02 RECOMMENDED PRACTICE**SH 04.02.01 WORKSHOP SCHEDULE**

Presenting information contained in the Service Provider Workshop Plan can be divided in as many workshop sessions as deemed practicable by the Contractor, provided that all Workers are exposed to all aspects of the workshops as outlined in the Service Provider Workshop Plan.

Breaking down the content of information to be presented to Workers into more than one workshop session however, has the added advantage that messages are reinforced over time while providing opportunity between workshop sessions for Workers to reflect and test information. Workers will also have an opportunity to ask questions at a following session.

SH 04.02.02 SERVICE PROVIDERS

A database of recommended Service Providers is available from all Regional Offices of the National Department of Health

SH 04.02.03 HIV/AIDS SPECIFIC LEARNING OUTCOMES AND ASSESSMENT CRITERIA

Workers shall be exposed to workshops for a minimum duration of two-and-a-half hours. In order to set a minimum standard requirement, the following specific learning outcomes and assessment criteria shall be met.

04.02.03.01 UNIT 1: The nature of HIV/AIDS

After studying and understanding this unit, the Worker will be able to differentiate between HIV and AIDS and comprehend whether or not it is curable. The Worker will also be able to explain how the HI virus operates once a person is infected and identify the symptoms associated with the progression of HIV/AIDS.

Assessment Criteria:

1. Define and describe HIV and AIDS
2. List and describe the progression of HIV/AIDS

04.02.03.02 UNIT 2: Transmission of the HI virus

After studying and understanding this unit, the Worker will be able to identify bodily fluids that carry the HI virus. The Worker will be able to recognise how HIV/AIDS is transmitted and how it is not transmitted.

Assessment Criteria:

1. Record in what bodily fluids the HI virus can be found
2. Describe how HIV/AIDS can be transmitted
3. Demonstrate the ability to distinguish between how HIV/AIDS is transmitted and misconceptions around transmittance of HIV/AIDS

04.02.03.03 UNIT 3: HIV/AIDS preventative measures

After studying and understanding this unit, the Worker will comprehend how to act in a way that would minimise the risk of HIV/AIDS infection and to use measures to prevent the HI virus from entering the bloodstream.

Assessment Criteria:

1. Report on how to minimise the risk of HIV/AIDS infection
2. Report on precautions that can be taken to prevent HIV/AIDS infection
3. Explain or demonstrate how to use a male and female condom
4. List the factors that could jeopardize the safety of condoms provided against HIV/AIDS transmission

04.02.03.04 UNIT 4: Voluntary HIV/AIDS counselling and testing

After studying and understanding this unit, the Worker will be able to recognise methods of testing for HIV/AIDS infection. The Worker will be able to understand the purpose of voluntary HIV/AIDS testing and pre- and post-test counselling

Assessment Criteria:

1. Describe methods of testing for HIV/AIDS infection
2. Report on why voluntary testing is important
3. Report on why pre- and post-test counselling is important

04.02.03.05 UNIT 5: Living with HIV/AIDS

After studying and understanding this unit, the Worker will be able to recognise the importance of caring for people living with HIV/AIDS and be able to manage HIV/AIDS.

Assessment Criteria

1. List and describe ways to manage HIV/AIDS
2. Describe nutritional needs of people living with HIV/AIDS
3. Describe ways to embrace a healthy lifestyle as a person living with HIV/AIDS
4. Explain the need for counselling and support to people living with HIV/AIDS

04.02.03.06 UNIT 6: Treatment options for people with HIV/AIDS

After studying and understanding this unit, the Worker will be familiar with the various treatments available to HIV/AIDS infected or potentially HIV/AIDS infected people

Assessment Criteria

1. Discuss anti-retroviral therapy
2. List methods of treatment to prevent HIV/AIDS transmission from mother-to-child
3. Describe the need for treatment of opportunistic diseases for people living with HIV/AIDS
4. Describe post exposure prophylactics

04.02.03.07 UNIT 7: The rights and responsibilities of Workers in the workplace with regard to HIV/AIDS

After studying and understanding this unit, the Worker will be able to identify the rights and responsibilities of the Worker living with HIV/AIDS in the workplace. The Worker will recognise the importance of accepting colleagues living with HIV/AIDS and treating them in a non-discriminative way

Assessment Criteria:

1. Discuss the rights of a person living with HIV/AIDS in the workplace
2. Discuss the responsibilities of a person living with HIV/AIDS in the workplace
3. Report on why acceptance and non-discrimination of colleagues living with HIV/AIDS is important

SH 04.03 DISPLAYING OF PLASTIC LAMINATED POSTERS AND DISTRIBUTION OF INFORMATION BOOKLETS

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

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

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

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

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

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

SH 05 PROVIDING WORKERS WITH ACCESS TO CONDOMS

The Contractor shall provide and maintain condom dispensers and make both male and female condoms, complying with the requirements of SABS ISO 4074, available at all times to all Workers at readily accessible points on site, for the duration of the contract. The Contractor may obtain condom dispensers from the Department of Health and condoms may be obtained from the Local Clinic or the Department of Health.

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

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

SH 06 ENSURING ACCESS TO HIV/AIDS TESTING AND COUNSELLING FACILITIES AND TREATMENT OF SEXUALLY TRANSMITTED INFECTIONS (STI)

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

SH 07 APPOINTMENT OF AN HIV/AIDS AWARENESS CHAMPION

Within 14 days of site handover the Contractor shall appoint an Awareness Champion from amongst the Workers, who speaks, reads and writes English, who speaks and understands all the local languages spoken by the Workers and who shall be on site during all stages of the construction period. The Contractor shall ensure that the Awareness Champion has been trained by the Service Provider on basic HIV/AIDS information, the support services available and the necessary skills to handle questions regarding the HIV/AIDS programme in a sensitive and confidential manner

The Awareness Champion shall be responsible for:

- 7.1 Liasing with the Service Provider on organising awareness workshops;
- 7.2 Filling condom dispensers and monitoring condom distribution;
- 7.3 Handing out information booklets;
- 7.4 Placing and maintaining posters

SH 08 MONITORING

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

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

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

The attached SERVICE PROVIDER REPORT (SCHEDULE B) shall be completed and submitted on a monthly basis to the Department's Project Manager, through the Representative/Agent

The attached CONTRACTOR HIV/AIDS PROGRAMME REPORT (SCHEDULE C), a close out programme report, shall be completed by the Contractor at the end of the contract

SCHEDULE A

HIV/AIDS PROGRAMME: SITE CHECKLIST

When did construction commence _____

Name of Departmental Project Manager _____

Please refer to HIV/AIDS Programme activities during the reporting period

		Tick the block if Contractor satisfactorily complied with specifications																											
		PI			PI			PI			PI			PI															
DATE		D	D	M	D	D	M	D	D	M	D	D	M	D	D	M	D	D	M	D	D	M	D	D	M	D	D	M	PI
	Programme implemented within 14 days of site handover																												
	Awareness champion on site																												
	HIV/AIDS awareness service provider report																												
	Male condom dispenser																												
	Sufficient male condoms available																												
	Male condom dispenser in a highly trafficked area																												
	Female condom dispenser																												
	Sufficient female condoms available																												
	Female condom dispenser in a highly trafficked area																												
	All four types of posters displayed																												
	Posters in a good condition																												
	Posters in a highly trafficked area																												
	Posters displayed on local support services: clinic & VCT centre																												
	Support service poster/s in highly trafficked area																												
	Support service poster/s in a good condition																												

Please indicate the applicable number for the reporting period									
Workers on payroll (at PI)									
Sub-Contractors who will be on site for longer than 30 days (at PI)									
Workshop attendees									
Number of workshops held									
Scheduled workshops according to approved workshop plan									
Booklets distributed									
Male condoms distributed									
Female condoms distributed									
_____ Representative/Agent									
_____ Contractor									

Date of progress inspection (dd/mm/yy) _____

Reporting period: (dd/mm/yy)_____ to (dd/mm/yy) _____

Deviations from HIV/AIDS awareness programme plan:

Corrective actions

Representative/Agent

Departmental Project Manager

Date

Date

SCHEDULE B

HIV/AIDS AWARENESS PROGRAMME: SERVICE PROVIDER REPORT

Reporting period: (dd/mm/yy)_____ to (dd/mm/yy) _____

Number of workshops conducted in reporting period _____

Number of scheduled workshops according to approved workshop plan _____

Deviations from workshop plan:

State reasons for deviating from workshop plan:

Corrective actions:

Service Provider

Contractor

Date

Date

HIV/AIDS AWARENESS PROGRAMME: WORKSHOP CONTENT ADDRESSED

Fill in the applicable information with regard to each workshop conducted																											
DATE	W/S			W/S			W/S			W/S			W/S			W/S			W/S			W/S			W/S		
	D	D	M	D	D	M	D	D	M	D	D	M	D	D	M	D	D	M	D	D	M	D	D	M	D	D	M
Content of workshop: (Mark the content included)																											
SLO1																											
SLO2																											
SLO3																											
SLO4																											
SLO5																											
SLO6																											
SLO7																											
HIV/AIDS in construction video																											
Indicate the duration of the workshop in hours																											
Total number of Workers																											
Indicate workshop venue																											

HIV/AIDS AWARENESS PROGRAMME: ATTENDANCE REGISTER

[illegible]

SCHEDULE C

CONTRACTOR HIV/AIDS PROGRAMME REPORT

Project name _____

Project Location _____

Contract value of project (R) _____

National Department of Health Project Manager _____

HIV/AIDS Programme duration: (dd/mm/yy) _____ to (dd/mm/yy) _____

AWARENESS MATERIAL

Describe location of posters displayed during the programme _____

Comments on posters _____

Indicate total number of booklets distributed _____

Comments on booklets _____

CONDOMS

Indicate total number of male condoms distributed _____

Indicate total number of female condoms distributed _____

Describe where male condom dispenser was placed _____

Describe where female condom dispenser was placed _____

HIV/AIDS WORKSHOPS

Indicate the total number of HIV/AIDS workshops conducted _____

Indicate the duration of workshops _____

Indicate the total number of Workers that participated in the HIV/AIDS workshops _____

Indicate the total number of Workers that were exposed to the video on HIV/AIDS in the Construction Industry _____

Comments on HIV/AIDS workshops on site _____

GENERAL

Briefly describe programme activities and satisfaction with outcome _____

Additional comments, suggestions or needs with regard to the HIV/AIDS awareness programmes on site

Please indicate if your company has a formal HIV/AIDS policy focussing on HIV/AIDS awareness raising and care and support of HIV/AIDS Workers

Yes	No	Currently developing one
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Please indicate if, to your knowledge, you have lost any workers during the duration of the project to HIV/AIDS related sicknesses. One or more of the following might indicate an HIV/AIDS related death:

Excessive weight loss
Reactive TB
Hair loss
Severe tiredness

Coughing or chest pain
Pain when swallowing
Persistent fever
Diarrhoea

Vomiting
Meningitis
Memory loss
Pneumonia

Number of HIV/AIDS-related deaths _____

Contractor

Date

Departmental Project Manager

Date

ADDITIONAL SPECIFICATION

SI OCCUPATIONAL HEALTH AND SAFETY

CONTENTS

SI 01	APPLICABLE LEGISLATION AND REGULATIONS
SI 02	SCOPE OF WORK
SI 03	THE PRINCIPLE CONTRACTOR'S GENERAL DUTIES
SI 04	THE PRINCIPLE CONTRACTOR'S SPECIFIC DUTIES
SI 05	THE PRINCIPLE CONTRACTOR'S SPECIFIC DUTIES WITH REGARD TO HAZARDOUS WORK OR ACTIVITIES

SI 01 APPLICABLE LEGISLATION AND REGULATIONS

This document was prepared to guide the Agent in the compilation of a Health and Safety Specification in terms of Sub-regulation 4(1)a of the Construction Regulation as published under Government Notice R.2003 of 18 July 2003. The content of this document or the fact it was made available for the use of the Agent will not relieve the Agent of any of his obligations in terms of the act.

The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) together with its applicable Regulations ("the Act") forms part of this Health and Safety Specification. Any word or expression to which a meaning has been assigned in the Act shall have the meaning so assigned to it unless the context otherwise indicates.

SI 02 SCOPE OF WORK

All work forming part of this Contract is divided into installations.

Installation A: Medium A Prison : Kitchen Infrastructure

During the previous contract (Contract 2), the related repairs have been done and completed, but as a result of no maintenance done on the equipment and infrastructure of the kitchen facility, some repairs are urgently needed to kitchen equipment, electrical reticulation and overall plumbing network.

Installation B: Old Medium A Prison : Cell Block

The original scope for the cells block under previous contracts (Contract 1 and 2), was to repair/replace, roof sheets, plaster to walls, civil works in bathroom areas, replacement of all electrical infrastructure and replacement of structural concrete roof slabs. Around 90% of the work in total was completed, but not all were approved due to unaccepted quality of work and building methods.

Under this contract, the unapproved work needs to be checked, removed and redone. This entails removing of roof cladding and sheets, wall tiles, geysers, urinals and plaster etc to such extent till such level where the quality can be regained to the approval of the engineer.

The work shall also include some rebuild to walls, replacement of cladding, re-plastering, re-painting and general plumbing repairs to level and seal leaks to all piping done in wall sections and on external areas of complex.

Testing of underground sewer pipes previously installed, are to be done and re-opening might be needed to ensure proper flow rates.

Installation C: Civil Infrastructure, External water reticulation related repair work

A new piping network has added to the existing fire piping reticulation at the cell block, to better pressure and reticulation of the overall network. The piping will need to be removed to give access to unapproved plaster work, which needs to be redone as well as expansion joins along the roof slabs.

Water meters have been installed during the previous contracts (Contract 1 and 2). Three new meter inspection boxes have been installed at medium C houses, which need to be finalized, marked and tested. The meters installed at Maximum prison houses, needs minor repairs and testing to complete the work.

Pressure testing and drawings of all piping to reticulation network to be completed and submitted. Information of work done during previous Contract 2 contract shall be submitted to contractor by engineer.

Installation D: Medium A Prison : Kitchen and Cell Block : Structural Components

A new floor was installed during previous contract in the kitchen and approved by engineer.

Due to operational traffic over the past year 2013, some minor areas of the Pro Struct (Stoneclad UT) floor coating has been damaged and needs to be replaced. The areas shall be identified and opened as per engineer's instructions.

The roof slabs installed at the cells needs to be checked for cracks. Thus far, no faults or concerns have been recorded.

SI 03 THE PRINCIPAL CONTRACTOR'S GENERAL DUTIES

The Principal Contractor's general duties in terms of this Health and Safety Specification are, but not limited to, the following:

1. Every Principal Contractor shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees and other contractors.
2. Without derogating from the generality of a Principal Contractor's duties under subsection (1), the matters to which those duties refer include in particular –

- a. the provision and maintenance of systems of work, plant and machinery that, as far as is reasonably practicable, are safe and without risks to health;
- b. taking such steps as may be reasonably practicable to eliminate or mitigate any hazard or potential hazard to the safety or health of employees and other contractors, before resorting to personal protective equipment;
- c. making arrangements for ensuring, as far as is reasonably practicable, the safety and absence of risks to health in connection with the production, processing, use, handling, storage or transport of articles or substances;
- d. establishing, as far as is reasonably practicable, what hazards to the health or safety of persons are attached to any work which is performed, any article or substance which is produced, processed, used, handled, stored or transported and any plant or machinery which is used in his business, and he shall, as far as is reasonably practicable, further establish what precautionary measures should be taken with respect to such work, article, substance, plant or machinery in order to protect the health and safety of persons, and he shall provide the necessary means to apply such precautionary measures;
- e. providing such information, instructions, training and supervision as may be necessary to ensure, as far as is reasonably practicable, the health and safety at work of his employees and other contractors;
- f. not permitting any employee or contractor to do any work or to produce, process, use, handle, store or transport any article or substance or to operate any plant or machinery, unless the precautionary measures contemplated in paragraphs (b) and (d), or any other precautionary measures which may be prescribed, have been taken;
- g. taking all necessary measures to ensure that the requirements of this Health and Safety Specification are complied with by every person in his employment or on premises under his control where plant or machinery is used;
- h. enforcing such measures as may be necessary in the interest of health and safety;
- i. ensuring that work is performed and that plant or machinery is used under the general supervision of a person trained to understand the hazards associated with it and who have the authority to ensure that precautionary measures taken by the employer are implemented; and
- j. causing all employees and other contractors to be informed regarding the scope of their authority as contemplated in section 37(1)(b) of the Act.

SI 04

THE PRINCIPAL CONTRACTOR'S SPECIFIC DUTIES

The Principal Contractor's specific duties in terms of this Health and Safety Specification are specified in the Construction Regulation as published under Government Notice R. 2003 of 18 July 2003. (Hereinafter referred to as "Construction Regulation, 2003").

The Principal Contractor is specifically referred to the following sub-regulations of the Construction Regulation, 2003:

Subject	Applicable sub-regulation of the Construction Regulation, 2003.
Definitions	1
Scope of application	2
Notification of construction work	3
Principal Contractor and Contractor	5
Supervision of construction work	6
Risk assessment	7
Approved inspection authorities	29
Offences and penalties	30
Withdrawal of regulations	31
Short title	32

The Principal Contractor will acquaint himself with these duties and will make provision in his Contract price for the implementation and supervision of these duties.

SI 05 THE PRINCIPAL CONTRACTOR'S SPECIFIC DUTIES WITH REGARD TO HAZARDOUS WORK OR ACTIVITIES

The following hazardous work or activities were identified in terms of the Construction Regulation, 2003, and it is the duty of the Principal Contractor to ensure that the said work and activities are performed or carried out in terms of the relevant sub regulations of the Construction Regulation, 2003 and other applicable Regulations.

Hazardous work or activity	Applicable sub-regulation of the Construction Regulation, 2003.	Other applicable Regulations
Fall protection	8	
Structures	9	
Formwork and support work	10	
Excavation	11	Precautionary measure as stipulated for confined spaces under the General Safety Regulations published under Government Notice R.1031 of 30 May 1986, as amended.
Demolition work	12	Asbestos related work will be conducted in accordance with the Asbestos Regulations published under Government Notice R. 155 of 10 February 2002 as amended.

Hazardous work or activity	Applicable sub-regulation of the Construction Regulation, 2003.	Other applicable Regulations
		Lead related work will be conducted in accordance with the Lead Regulations published under Government Notice R. 236 of 28 February 2002 as amended.
Scaffolding	14	Section 44 of the Act.
Suspended scaffolds	15	Section 44 of the Act.
Boatswains chairs	16	
Material hoists	17	
Explosive powered tools	19	
Cranes	20	Applicable provisions of the Driven Machinery Regulations as published under Government Notice R.533 of 16 March 1990, as amended.
Construction vehicles	21	
Electrical installations and machinery on construction sites.	22	Applicable provisions in the Electrical Installation Regulations published under Government notice R.2920 of 23 October 1992 and the Electrical Machinery Regulations published under Government Notice R.1953 of 12 August 1988 respectively as amended.
Use and temporary storage of flammable liquids on construction sites.	23	Applicable provisions as stipulated in the General Safety Regulations published under Government Notice R.1031 of 30 May 1986, as amended.
Water environments	24	
Housekeeping on construction sites.	25	Applicable provisions as stipulated in the Environmental Regulations for Works places

Hazardous work or activity	Applicable sub-regulation of the Construction Regulation, 2003.	Other applicable Regulations
		published under Government Notice R.2281 of 16 October 1987, as amended.
Stacking and storage on construction sites.	26	Applicable provisions as stipulated in the General Safety Regulations published under Government Notice R.1031 of 30 May 1986, as amended.
Fire precautions on construction sites.	27	Applicable provisions as stipulated in the Environmental Regulations for Works places published under Government Notice R.2281 of 16 October 1987, as amended.
Construction Welfare facilities	28	Applicable provisions as stipulated in the Facilities Regulations under Government Notice R.1593 of 12 August 1988, as amended.

SI 06 **PERFORMANCE MEASUREMENT**

The Contractors compliance to the Occupational Health and Safety Act shall be measured against pre-set parameters relating to compliance to the Act.

SI 06.01 **INSPECTIONS BY THE APPOINTED OHSA OFFICER**

The OHSA Officer shall inspect the construction site at any time during the construction and repair work period. The Officer shall complete a score card consisting of the following parameters to ensure that the Principal Contractor provide and maintain as far as reasonable a working environment that is safe and without risk to the health of his employees and other persons:

1. Safety Management
2. Appointments
3. Registers
4. Facilities
5. Incident Management
6. Signs
7. Contractors (Sub-Contractors)
8. Activity / Conditions
9. Personal Protective Equipment
10. Electrical

- 11. Housekeeping
- 12. Site Establishment
- 13. Records

SI 06.02 EVALUATION SCORE CARD

The OHSA Officer shall inspect each of the above indicated compliance criteria relating to construction and repair work for each type of installation.

The Officer will use a score card to measure compliance under the 13 Sections culminating in a total of 82 possible inspection items, depending on construction activities being executed.

The Officer will record his inspection findings directly onto the Score Card. Items that are not applicable to the site or construction work will not be relevant on the score card and each will have a maximum score of 100%. The Contractor shall always have to comply 100% to each section in order to receive payment for the point associated with that particular section.

SI 06.03 PERFORMANCE SCORE CARD

The thirteen performance indicators shall be recorded on the Performance Score Card and will be used to measure the Contractors remuneration for compliance to the Occupational Health and Safety Act.

The Contractor shall aim to perform satisfactory on all 13 indicators. Compliance shall either be satisfactory (full compliance) or unsatisfactory (less than 100% per indicator) and the Contractor shall score one (1) or zero (0) respectively per indicator.

A copy of the OHSA Evaluation Score Card and Performance Score Card is included in this specification.

SI 07 MEASUREMENT AND PAYMENT

SI. 01 COMPLAINE TO OHSA REQUIREMENTS AND CONSTRUCTION REGULATIONS 2003Points

The unit of measurement shall be a point. Each month shall represent a maximum of thirteen points and a minimum of zero points depending on the compliance to the OHSA.

Thirteen points per month shall mean full compensation for OHSA compliance for work.

DEPARTMENT OF PUBLIC WORKS OHSA PERFORMANCE SCORE CARD

CONTRACT NUMBER: WCS _____

CONTRACT: _____

CONTRACTOR: _____

ENGINEER: _____

INSTALLATION: _____

MONTH:

0	0
---	---

 OF 36

OHSA Performance Indicators

1. ITEMS	0	1
1.1 SAFETY MANAGEMENT		
1.2 APPOINTMENTS		
1.3 REGISTERS		
1.4 FACILITIES		
1.5 INCIDENT MANAGEMENT		
1.6 SIGNS		
1.7 CONTRACTORS (SUB CONTRACTORS)		
1.8 ACTIVITY / CONDITIONS		
1.9 PERSONAL PROTECTIVE EQUIPMENT		
1.10 ELECTRICAL		
1.11 HOUSEKEEPING		
1.12 SITE ESTABLISHMENT		
1.13 RECORDS		
TOTAL:		

Engineer's Representative

Signature

Date

Construction, Repair and Maintenance							
ADDITIONAL SPECIFICATION. SI OCCUPATIONAL HEALTH SAFETY EVALUATION SCORE CARD							
ITEM		DESCRIPTION		POSSIBLE POINTS	POINTS AWARDED	ACTION	
NO	ITEM	POSSIBLE POINTS	POINTS AWARDED	NO	ITEM	POSSIBLE POINTS	POINTS AWARDED
1 SAFETY MANAGEMENT				7 CONTRACTORS (SUB CONTRACTORS)			
1.1	Client SHE (SI) Specifications available on site?	1		7.1	Updated list of Sub Contractors available?	1	
1.2	Principal Contractors SHE Plan available?	1		7.2	Mandatory Agreements with all Sub Contractors on file?	1	
1.3	Adequate Risk Assessments available?	1		7.3	Safety File complete (appointments, risk assessments, safe work procedures, registers)?	1	
1.4	Safe Work Procedures available?	1		7.4	Sub Contractor's First Aider on site or alternatively	1	
1.5	Safe Work Procedures approved by Engineer?	1			First Aid Agreement in place with Contractor?		
1.6	Fall Protection Plan available?	1					
1.7	Notification of Construction Work available?	1					
2 APPOINTMENTS				8 ACTIVITY / CONDITIONS			
2.1	Contractor to confirm if there are any new appointments to be minuted	1		8.1	Correct use of Scaffolding?	1	
2.2	Are all the appointments recorded and available in the Health and Safety File ?	1		8.2	Correct use of Support Work?	1	
3 REGISTERS				8.3	Workers working safely at Elevated Positions?	1	
3.1	Fire Extinguisher (stores, site office etc.)	1		8.4	Safe Operations?	1	
3.2	Ladders	1		8.5	Barricading?	1	
3.3	Scaffolding	1		8.6	Roof work: Harnesses & Lifelines?	1	
3.4	Excavations	1		8.7	Excavation: Shoring & Batter?	1	
3.5	Form / Support Work	1		8.8	Manholes: Demarcated?	1	
3.6	Portable Electrical Tools	1		8.9	Ladders Conditions?	1	
3.7	Hand tool Inspection	1		8.10	Construction Vehicle Condition?	1	
3.8	Personal Protective Equipment & Clothing (PPE & C)	1		8.11	Haz. Chem. Substances Applications?	1	
3.9	Explosive Powered Tools	1		8.12	Hand tools properly used and in good condition?	1	
3.10	Crane	1		9 PERSONAL PROTECTIVE EQUIPMENT			
3.11	Lifting Machines	1		9.1	Correctly issued (documented in file)?	1	
3.12	Lifting Tackle	1		9.2	Used correctly?	1	
3.13	Construction Vehicles	1		10 ELECTRICAL			
3.14	Material/ Man Hoist	1		10.1	DB's & COC's?	1	
3.15	Hazardous Chemical Register	1		10.2	Good Plugs / Earth Wire?	1	
4 FACILITIES				10.3	Electrical Leads / Condition?	1	
4.1	Hygiene Inspection performed?	1		10.4	Portable Electrical Tools?	1	
4.2	Toilets adequate and clean for workers?	1		11 HOUSEKEEPING			
4.3	Change Area available?	1		11.1	Good Stacking & storage?	1	
4.4	Eating Area available for workers?	1		11.2	Cement spillage control?	1	
4.5	Washing Area available for workers?	1		11.3	Dust control?	1	
5 INCIDENT MANAGEMENT				11.4	Placing of Sand / Stone / Bricks/ materials?	1	
5.1	First Aid Box adequate and available?	1		12 SITE ESTABLISHMENT			
5.2	First Aider on site & valid First Aid Certificate in place?	1		12.1	Office	1	
5.3	Any incidents to report; (Annexure 1 report; recur/investigation; record to FEM)?	1		12.2	Stores	1	
6 SIGNS				12.3	Fencing / Hoarding	1	
6.1	"No Unauthorized Entry" Signs?	1		12.4	Access Control	1	
6.2	"Danger Construction Work" signs?	1		13 RECORDS			
6.3	"Danger Lifting Operations" sign?	1		13.1	OHS Act; OHS spec; Construction Regulations	1	
6.4	"Hard Hats" sign?	1		13.2	SANS 10085 (Scaffolding)	1	
6.5	"Dust Mask" sign?	1		13.3	Safety Rep. Inspections	1	
6.6	"Ear Protection" sign?	1		13.4	Safety Meetings (Toolbox Talks and/ or Safety Committee)	1	
6.7	"Eye Protection" sign?	1		13.5	Employees Induction	1	
6.8	"Safety Harness" sign?	1		13.6	Visitors Inductions	1	
6.9	"No Smoking" sign?	1		13.7	Job Assessments	1	
6.10	Scaffold use: "Safe" or "Unsafe" signs?	1		13.8	Medical Certificates	1	
6.11	"Emergency Assembly Point" sign?	1		13.9	Training Certificates (Crane, Lifting Machines, Vehicles, Scaffold, Safety Rep., TLB, Water Cart, Grader, Excavator, Roller, Front Loader, Mobile Crane, Bob-Cat, Bomag, Wacker and Tipper Trucks)	1	
TOTAL POINTS TO BE AWARDED						82	
TOTAL POINTS AWARDED						0	
PERCENTAGE (%)						0.00%	
The Principal Contractor's Score Achieved is:		0.00%					
Compliance with Construction Regulations 2003 is SATISFACTORY / UNSATISFACTORY (delete which is N/A)							

ADDITIONAL SPECIFICATION

SJ COVID-19 GUIDELINES FOR MANAGEMENT OF RISK ON CONSTRUCTION SITES

CONTENTS

- SJ 01 SCOPE**
- SJ 02 SPECIFICATIONS, ACTS AND REGULATIONS**
- SJ 03 GENERAL REQUIREMENTS**
- SJ 04 DEGREE OF RISK PER SITE TYPE**
- SJ 05 RISK MITIGATION PLAN**
- SJ 06 MEASUREMENT AND PAYMENT**

SJ 01 SCOPE

This specification covers guidelines and requirements to reduce the risk of a COVID-19 outbreak in the workplace and the possible impact on workers and the public.

SJ 02 SPECIFICATIONS, ACTS AND REGULATIONS

SJ 02.01 GENERAL STANDARD SPECIFICATIONS

The latest edition, including all amendments up to the date of tender, of the following specifications, publications and codes of practice shall be read in conjunction with this specification and shall be deemed to form part thereof:

CODE	DESCRIPTION
SH	HIV/AIDS Requirements
SI	OHS Act: Health and Safety
SANS 1200	Standard Specifications. A. General.

SJ 02.02 ACTS AND REGULATIONS

All regulations and statutory requirements as laid down in the latest edition of the following Acts and Regulations shall be adhered to:

ACT	DESCRIPTION
Act No. 85 of 1993	Occupational Health and Safety Act
	Construction Regulations, 2014
	Hazardous Biological Agents Regulation, 2000
Act No. 57 of 2002	Disaster Management Act
	COVID-19 Occupational Health and Safety Measures in Workplaces Covid-19 (C19 OHS), 2020
	Section 27(2) Regulations, 29 April 2020

SJ 02.03 MANUFACTURERS' SPECIFICATIONS, CODES OF PRACTICE AND INSTALLATION INSTRUCTIONS

All equipment and materials shall be installed, serviced and repaired strictly in accordance with the manufacturers' specifications, instructions and codes of practice.

SJ 02.04 MUNICIPAL REGULATIONS, LAWS AND BY-LAWS

All municipal regulations, laws, by-laws and special requirements of the Local Authority shall be adhered to unless otherwise specified.

SJ 03 GENERAL REQUIREMENTS

SJ 03.01 IMPLEMENTING WORKPLACE CONTROLS

The legislation governing workplaces in relation to COVID-19 is the Occupational Health and Safety Act (Act 85 of 1993) as amended, in conjunction with the Hazardous Biological Agents Regulation.

A COVID-19 specific risk assessment together with a written policy concerning the health and safety of all employees, clients, suppliers and sub-contractors who are associated with the Contractor, shall be drawn up and communicated to all the relevant parties, along with mitigation measures which need to be monitored and adjusted should the need arise.

SJ 03.01.01 WORKPLACE CONTROLS

- All offices (including site offices) will be sanitised before opening for business each day.
- Place posters that encourage staying home when sick, cough and sneeze- etiquette, and hand hygiene at the entrances of offices and sites.
- On-site induction with special emphasis on COVID-19 will be done with all employees upon return to work.
- Provide tissues and waste bins lined with a plastic bag so that they can be emptied without contact with the contents.
- Instruct employees to clean their hands frequently using soap and water, for at least 20 seconds or with an alcohol-based hand sanitiser that contains at least 70% alcohol.
- Continue routine environmental cleaning, which includes tools and equipment.
- Increase ventilation in offices by natural or mechanical means.
- Provide soap and water and/or alcohol-based hand sanitiser (at least 70%) in the workplace in multiple locations and in common areas to encourage hand hygiene.
- Practice social distancing (2m) as far as possible (no handshakes, hugs, kissing, horseplay or touching each other). Keep distance from each other while working on site. Supervisors will monitor this throughout the day.
- While queuing at the gate to enter the site, employees must stand in a line, with at least 2m between them.

- Desks for employees working in the office (site office) will be spaced at least 1.5m apart or where this is not possible, protective barriers will be erected between desks.
- It is compulsory to wear face masks at all times. Each employee will be issued with two cloth face masks to wear at work and while commuting, with appropriate training on the use of these masks. Arrangements will be made for the washing, drying and ironing of cloth masks.
- Temperature testing will be done on all employees every morning upon arrival to site, and also randomly during the day. All readings will be recorded, monitored and sent to the SHEQ department. The testing will be conducted by the site safety officer. On sites where a full-time safety officer is not available, the responsibility will fall onto the supervisor.
- During the temperature screening, employees will be screened for any additional symptoms such as body aches, loss of smell or taste, nausea, vomiting, diarrhoea, fatigue, weakness or tiredness. The results will be recorded in the Social Distancing Control Sheet and send to the SHEQ department. If an employee displays any of the symptoms, he will not be permitted to enter the site/offices.
- In addition to posters, brief employees and sub-contractors that anyone with a mild cough or low-grade fever (37.3 or more) needs to stay at home and take sick leave.
- Any employee who develops flu-like symptoms (i.e. cough, shortness of breath, fever) or any of the additional symptoms should inform his supervisor immediately.
- Where practical, the minimum number of employees will be allowed on site, and rotation, staggered working hours and shift work may be implemented. Promote working from home for employees who are able to do so.
- All visitors to site will undergo induction and temperature screening and must be in possession of the appropriate PPE (i.e. face mask) prior to being allowed access to site. No access will be granted to visitors not complying.
- All visitors will be required to sanitize their hands before entering the site as well as when they leave.
- Sub-contractors shall ensure that all of their employees are issued with face masks and any other necessary PPE, and that hand sanitiser and soap is available for their employees.
- Temperature testing will be done by the sub-contractor and records kept. Failure to do so will result in the sub-contractor's employee/s being put off-site until compliant.
- A copy of the Essential Service Permit must be available on site at all times. All sub-contractors to provide a copy of their Permit prior to being granted permission to work.
- All employees are obliged to comply with measures introduced in the workplace.

SJ 03.01.02 WHAT TO DO WHEN AN EMPLOYEE ON SITE BECOMES ILL WITH COVID-19

If someone becomes ill in the workplace and there is reason to suspect they may have contracted or come into contact with someone who has contracted the COVID-19 virus, the person must be isolated immediately, provided with a **FFP1 surgical mask**, and transport arranged for the employee to go home to be self-isolated or for medical examination. Ensure testing is done at an identified testing site.

The Department of Health and Department of Labour will be informed of any employees testing positive for COVID-19, whereafter an investigation will be conducted to establish the cause, including any control failures. The risk assessment will be reviewed to ensure necessary controls and PPE is in place. The risk of transmission will be assessed, the employees working area disinfected.

If an employee is confirmed to have COVID-19, his/her fellow employees will be informed of their possible exposure to COVID-19 in the workplace and referred for screening, but confidentiality must be maintained at all times, and no discrimination must be shown toward an employee who tested positive for COVID-19.

If evidence exist that the employee contracted COVID-19 as a result of Occupation Exposure, a Claim for Compensation will be lodged in terms of the Compensation of Occupational Injuries and Diseases Act 1993 (Act No. 130 of 1993) in accordance with Notice 193 published on 3 March 2020.

Once an employee was positively diagnosed with COVID-19 and isolated in accordance with the Department of Health Guidelines, the employee may only return to work after he has undergone a medical evaluation confirming the employee has tested negative for COVID-19. The employee will be required to wear a face mask, maintain social distancing and adhere to cough and sneeze-etiquette. The employee will also be monitored for symptoms upon his/her return to work.

SJ 03.01.03 TRANSPORT

- Where transport is provided, occupancy of the vehicle should be reduced in line with social distancing practice.
- All passengers must wear face masks or respirators.
- All passengers to sanitise their hands before getting into the transport, as well as when disembarking.
- Transport vehicles should be sanitised before and after each trip.
- Employees making use of public transport to ensure they wear face masks and sanitise their hands regularly (before getting into the transport and when disembarking) and attempt not to touch any surfaces unless absolutely necessary.

SJ 03.01.04 MEETINGS

Wherever possible, meetings are to be held via tele or video conference in order to maintain social distancing and prevent the possible spread of COVID-19.

Toolbox talk meetings, inductions and briefing sessions should be done in open areas with social distancing in place.

Progress meetings and technical meetings will be held in the site meeting building specified as 14 meter x 5 meter = 70m² to accommodate 12 persons. The conference table will accommodate 12 attendees, 2 meters apart. The room shall be well ventilated at a maximum temperature of 22°C.

SJ 03.01.05 TRACKING RECORD LOG

Example:

[illegible]

[illegible]

SJ 04 DEGREE OF RISK PER SITE TYPE

BUILDING AND PROJECT TYPE	SITE SET-UP AND STAFF WELFARE	CONSTRUCTION STAGE
Lower Risk	For most, but not all project construction stage risk may be as follows:	For most but not all sites, set-up risk may be as follows:
Industrial, Logistical, Roads and Bridge Construction	Lower Risk	Lower Risk
Medium Risk	<ul style="list-style-type: none"> Excavation and groundworks Foundations and Piling 	<ul style="list-style-type: none"> Large Sites
Residential Accommodation	Medium Risk	Medium Risk
High Risk	<ul style="list-style-type: none"> Basement and Substructure Structural Frame Roofing Interior First Fix Interior Second Fix 	<ul style="list-style-type: none"> Site and management offices
Healthcare facilities, Correctional Centers, Military Bases, Police Stations, Magistrates Offices	High Risk	High Risk
	<ul style="list-style-type: none"> Cladding and Glazing M+E and Lifts Interior First Fix Interior Second Fix 	<ul style="list-style-type: none"> Scaffolding Travel to and from site and access to site Horizontal walkways and vertical access Staff changing and locker rooms Showers and toilets Confined Spaces Confined Sites
	GUIDLINE	GUIDLINE
	For each construction contract there will be different levels of risk and it will be critical to evaluate the specific risks of each individual project.	For each construction site there will be different levels of risk and it will be critical to evaluate the specific risk of each individual project.

SJ 05 RISK MITIGATION PLAN

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
Demographics of Labour: <ul style="list-style-type: none"> Inadequate procedures in place to identify potential infected employees and workers Manage the exposure to COVID-19 on the project, including visitors and suppliers 	Contractor is to maintain a register of all employees and workers on the project, including Sub-Contractors (inclusive of employees and workers) and Professional Team, keeping records of the following information as a minimum (Note: the NIOH document that is currently available): <ul style="list-style-type: none"> Name Age of employee/visitor Contact Details Health status Socio-economic status/unskilled labour (work force) Accommodation arrangements (work force) 	CONTRACTOR

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
<p>Origin of labour and transportation</p> <p>Need to minimize the risk of exposure to virus whilst in transport</p>	<ul style="list-style-type: none"> • <u>On site transportation:</u> Where on site transportation is done, a policy needs to be available for how such transportation will be made safe and limit any opportunity for cross infection. If possible, the Principal Contractor should provide their own transportation of work force. (Where not possible, use of public transport can be considered to comply to transport limitations) • <u>Parking areas:</u> Private and public vehicles are required to park outside of the construction site • Support staff for professional service providers are to work from office location or from home • <u>Education and information:</u> Information boards are required at entrance of sites and within Site Offices with information on the virus and precautions to be taken during working hours and traveling. • <u>Social Distancing:</u> <ul style="list-style-type: none"> ○ <u>On site:</u> As far as possible, work activities must be so arranged that social distance is kept to a minimum of 2 metre. ○ <u>Site office:</u> seating arrangements must be of such that social distancing for roll players is kept to a minimum of 1 metre, ie; '<u>ONE CHAIR. SKIP CHAIR. ONE CHAIR. SKIP CHAIR</u>'. ○ Roll players must be limited to Professional Team and principal contractor. ○ Facial Masks must be worn at all times by all roll players. ○ Contractor work force when on site and transportation to and from site, where hand gloves can be used, they should be worn at all times to minimize touching of possible contaminated surfaces and injury. 	<p style="text-align: center;">CONTRACTOR AND PROFESSIONAL TEAM</p>

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
<p>Public transportation across borders/towns/cities</p> <p>Where a return to work will necessitate travel between Provinces and cities for employees and workers to return to the project, The Principal Contractor and Sub-Contractors are to have in place procedures for or provision of transport for the return of workers to minimize the risk of exposure to the virus whilst in transit.</p>	<p>The contractor to source/recommend a transport service provider that complies with all travel restrictions and requirements as gazetted by the government, inter alia:</p> <ul style="list-style-type: none"> • Maximum occupancy of vehicles to allow for social distancing • Vehicles sanitized before passengers board • Passengers provided with Face Masks and hand sanitizers provided within vehicles for passengers sanitization before boarding and after returning from vehicles for comfort breaks • Regular testing of body temperature • Adequate number of vehicles to be provided to comply with the maximum occupancy • Principal Contractor to put in place procedures for sanitization of personal belongings and luggage of work force on arrival at final destination • Permits to be provided per vehicle and per passenger from Authorising Authority 	<p>CONTRACTOR</p>
<p>Social Distancing:</p> <p>Construction site and facilities not set up in such a way that it will be possible as far as is practicable to maintain the required social distancing of 2 metres between persons when at work</p> <p>Risk:</p> <p>Manual labour for physical tasks and tasks that will not allow for social distancing;</p>	<p><u>Tasks that require more than 1 person to complete:</u></p> <ul style="list-style-type: none"> • Providing adequate supplies of suitable PPE such as face masks, task specific gloves, safety glasses, disposable/additional coveralls; • PPE used during multi-person activities to be exchanged immediately after the task is completed; • Sealed bins to be provided for disposable PPE such as masks, disposable coveralls, disposable gloves, etc.; • Sealable bags provided to each person for keeping PPE requiring laundering, such as gloves and coveralls, and • Sanitizing/washing facilities provided for immediate sanitizing of hard hats, safety glasses, shoes, safety harnesses etc, on completion of multi-person tasks 	<p>CONTRACTOR</p>

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
<p>Site access by non-employees/security access</p> <p>Inadequate access control measures in places</p>	<ul style="list-style-type: none"> • Stop all non-essential visitors • All employees and non-employees to be screened with non-contact thermometers (Thermal Thermometers); • Body temperature checks with thermometer upon employee's arrival and departure; • Introduce staggered start and finish times to reduce congestion and contact at all times; • Take body temperatures of anybody stepping on or off site; • Monitor site access points to enable social distancing; • Number of access points to be reduced to enable controlled monitoring; • Ensure disinfectants are in place for disinfecting of shoes on entering/leaving the site; • Provide hand sanitizer for all entering the site to sanitize hands; • Allow social distancing of 2 metres in ques for all entering the site; • Regular cleaning of common contact surfaces areas, e.g.; desks, telephones handsets, site office door handles, chairs, etc.; • Drivers of suppliers of materials and goods and services must remain with their vehicles if load will allow it, if not, drivers are to wash hands before unloading goods and materials 	<p>CONTRACTOR</p>
<p>Alcohol and Drug Testing</p> <p>Lack of safe testing procedures in place for alcohol and drug testing</p>	<ul style="list-style-type: none"> • Alcohol testing may only be done using single use test units, and must be disposed of in the appropriate contaminated waste bins provided on site; • Drug testing will only be done by an occupational health facility either using urine or blood sampling; • A protocol will be drawn up by the Principal Contractor to manage this with the occupational health service being used. 	<p>CONTRACTOR</p>

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
<p>Medical Surveillance</p> <p>No methodology in place as part of the normal requirements for pre-placement, periodic and exit medicals that includes factors related to COVID-19</p>	<ul style="list-style-type: none"> • The normal requirements of pre-placement, periodic and exit medicals will remain, with the Occupational health service providing a methodology of how they will be including factors relating to Covid-19. No lung functions or peak flows will be done until deemed safe to do so by the South African Thoracic Society. • It is preferable that occupational health service providers use a cloud-based record keeping service to ensure easy tracking and tracing. Free apps such as Square 1 is such an example. • Any person who contracts the virus may need to be reported to the Compensation Commissioner as an occupational disease where their work is to monitor and in contact with others. Such details are provided in the Compensation for Injuries and Diseases Act (COIDA). • Isolation of workers who have a temperature or any symptoms, and removal to the closest facility for testing and treatment, through the numbers provided. The PC is to ensure their policy on this includes such information. • Workers will be required to complete COVID-19 questionnaires prior to returning to site. Any worker with any symptoms is not to return to work, or notify the PC of same. 	<p>CONTRACTOR</p>
<p>Ablution Facilities on Site</p> <p>Unhygienic ablution facilities leading to poor hygiene</p>	<ul style="list-style-type: none"> • Restrict the number of people using toilet facilities at any one time. e.g. use a welfare attendant; • Hand washing facilities (soap and water, paper towel) to be available where possible, and if not, to provide hand sanitizer. Wash hands before and after using the facilities • Induction training to educate to ensure all users are hand washing correctly; • Enhance the cleaning regimes for toilet facilities particularly door handles, locks and the toilet flush handle. Flush toilets preferably 1:15 ratio unless increased cleaning regime present; • Portable toilets should be avoided wherever possible, but where in use these should be cleaned and emptied more frequently. Portable toilets to be provided at a 1:10 ratio; • Provide suitable and enough rubbish bins for hand towels with regular removal and disposal be cleaned and emptied more frequently; • Introduce staggered start and finish times to reduce congestion and contact at all times; • Consider increasing the number or size of facilities available on site if possible. 	<p>CONTRACTOR AND EMPLOYEES</p>

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
<p>Waste Management for Covid-19 Waste</p> <p>Outdated waste management arrangements in place that leads to an increased risk of the spread of Covid-19</p>	<p>Waste management arrangements to be updated to include provision for the disposal of additional waste generated due to preventative measures implemented. All waste to be managed as hazardous waste.</p> <p>a. Disposal of any gloves, masks</p> <p>The contractor shall dispose of all used gloves and masks as hazardous waste and provide sealable bags and containers for the safe disposal of this waste.</p> <p>b. Paper towels</p> <p>The contractor shall provide adequate supplies of paper towels on site. At points where these towels are provided lined waste bins to be placed in order to collect all used towels and then to be disposed of in hazardous waste.</p> <p>c. Disinfectant solution</p> <p>The contractor to provide adequate supplies of disinfectant on site where the use of water and soap for cleaning is not practical. If disinfectant dispensers are not refilled it should be disposed with other hazardous waste.</p> <p>d. Wastewater</p> <p>Wastewater at washing points, toilets, and bathrooms to be contained in a drainage system that prevent surface spills. If wastewater is contained in waste buckets it must be sealed when removed and disinfected after it is cleaned.</p>	<p>CONTRACTOR</p>
<p>Site Meetings</p> <p>Not limiting the number of employees at all activities to the minimum required to do the work in a safe manner.</p>	<p>Only necessary meeting participants should attend.</p> <ul style="list-style-type: none"> Attendees should be two metres apart from each other. Rooms should be well ventilated / windows opened to allow fresh air circulation. Consider holding meetings in open areas where possible. Technological alternatives to be exploited for meeting Attendance if possible (Zoom, Skype, MS Teams). Training and awareness to address procedures and the importance of social distancing. Toolbox talks to be conducted outdoors when possible in order for persons to maintain social distancing. Where inclement weather does not allow for this, toolbox talks to be conducted with smaller groupings of workers in a sheltered area large enough to maintain social distancing. 	<p>CONTRACTOR</p>

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
<p>Signage</p> <p>Conflicting messages/notices displayed on the site in contravention with current requirements to respond to Covid-19</p>	<p>The Principal Contractor is to review all current signs and notices displayed on site. The PC is to avoid conflicting messages/notices that have been in place prior to lockdown and review accordingly.</p> <p>a. Access rules</p> <p>The contractor shall install additional signage with site rules specific to the prevention of spreading the COVID-19 virus at the access control points of the site.</p> <p>b. Notices/Posters with protocols</p> <p>Notices and posters shall be placed and installed to raise awareness and regarding protocols to be followed on site. These notices and posters shall be placed conspicuously at various points on the site including the following places:</p> <ul style="list-style-type: none"> • Entrance • Site notice board • Site Office • Eating areas • Next to toilets and bathrooms • Hand washing stations • Storerooms 	<p>CONTRACTOR</p>
<p>Emergency Planning</p> <p>Emergency plan not completed and undated in line with current Regulations of the National Disaster Management Act</p>	<p>An updated emergency plan is to be completed that is in line with the current Regulations of the National Disaster Management Act.</p> <p>a. First aid</p> <p>Extra gloves, and disinfectants are to be available, first aiders are to be issued with at least FFP2 masks should they be required to respond</p> <p>b. Evacuation plans</p> <p>Evacuation plans should consider social distancing.</p> <p>c. Isolation of potentially infected workers</p> <p>The emergency plan is to consider how anyone who arrives on site and displays any of the symptoms, or has a raised temperature.</p>	<p>CONTRACTOR</p>

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
<p>Welfare facilities</p> <p>Lack of procedures and arrangements for the provision of welfare facilities to prevent the spread of Covid-19 between employees on site</p>	<p>The Principal Contractor shall adapt arrangements regarding the provision of welfare facilities to be in line with Government guidelines and requirements.</p> <p>a. Clean, storage for food and personal belongings</p> <p>The Principal Contractor to provide lockable storage for all employees on site, which shall be disinfected daily. Training and awareness to address procedures and the importance of good hygiene practice.</p> <p>b. No personal belongings to be kept on site</p> <p>Apart from extra clean personal clothing no other personal belongings allowed on site accept if kept in locker provided by the Principal Contractor.</p> <p>c. No communal drinking facilities (shared cups etc.)</p> <p>The Principal Contractor to provide adequate supplies of bottled water to all employees on site. Empty bottles to be disposed of as normal waste. Training and awareness to address procedures and the importance of good hygiene practice.</p> <p>d. Eating areas</p> <p>The Principal Contractor is to limit the number of employees at all activities to the minimum. Stagger lunchbreaks and resting periods for work teams. Training and awareness to address procedures and the importance of good hygiene practice and social distancing.</p> <ul style="list-style-type: none"> Workers are required to stay on site once they have entered it and not use local shops. Dedicated eating areas should be identified on site to reduce food waste and contamination. <p>Where catering is provided on site, it should provide pre-prepared and wrapped food only;</p> <ul style="list-style-type: none"> Payments should be taken by contactless card wherever possible; Crockery, eating utensils, cups etc. should be disposable if supplied; Drinking water should be provided with enhanced cleaning measures of the tap mechanism introduced; Tables should be cleaned and disinfected between each use; All rubbish should be put straight in the bin and not left for someone else to clear up; All areas used for eating must be thoroughly cleaned at the end of each break and shift, including chairs, door handles, vending machines and payment devices. 	<p>CONTRACTOR AND EMPLOYEES</p>

RISK DESCRIPTION	MITIGATION PLAN/ACTION	RESPONSIBILITY
Consequence Management Inadequate processes and procedures in place for consequence management	<ul style="list-style-type: none"> When non-compliance activities are noted, that activity will be stopped. Should the remedial actions not take place the site will be shut down till the corrective actions have been implemented. Employees that do not work according to the SSHSS and SSHSP must be disciplined according to the company's disciplinary codes and practices. Supervisory employees on site must ensure compliance, and when non conformances are noted disciplinary actions should also be followed. Principal Contractor's should note that they could be fined and even according to the Disaster Management Act, arrested. 	CONTRACTOR

SJ 06 MEASUREMENT AND PAYMENT

SJ 06.01 APPOINTMENT OF A COVID-19 AWARENESS CHAMPION.....Unit: Month

The unit of measurement shall be for the number of months the Awareness Champion is employed.

The tender rate shall include the training of the person on basic COVID-19 information and regulations and to ensure that the person has the necessary skills to handle questions and apply correct procedures regarding the COVID-19 regulations.

SJ 06.02 ARRANGING AWARENESS WORKSHOP Unit: Number

The unit of measurement shall be for the number of events arranged.

The tender rate shall include the cost of the service provider, suitable venue and all tuition material and performing assessment procedures.

SJ 06.03 PROVIDING PERSONAL PROTECTIVE EQUIPMENT (PPE)..... Unit: Month

The unit of measurement shall be for the number of months the Contractor must provide PPE to all workers on site.

The tender rate shall include for face masks, gloves, tissues, towels etc. for all workers for the full construction period of 24 months.

SJ 06.04 PROVIDING SANITIZING/WASHING FACILITIES Unit: Month

The unit of measurement shall be for the number of months the Contractor must provide sanitizing and washing facilities on site for the total 24 month contract period.

The tender rate shall include for providing sanitizing and washing facilities for all construction workers at all the different construction sites for all PPE equipment as specified.

SJ 06.05 ADDITIONAL ABLUTION FACILITIESUnit: Number

The unit of measurement shall be for the number of facilities on the different construction sites.

The tender rate shall include for the construction of sanitizing and washing facilities consisting of a concrete floor area min 3 x 3 meter with 3 hand wash basins and IBR roof covering, including 5000ℓ water tank on stand, as well as soak away for grey water. The facilities to be maintained for the duration of construction at each site.

SJ 06.06 SITE MEETING VENUE Unit: Sum

The unit of measurement shall be for the additional cost relating to the site meeting venue building as specified in SANS 1200 and PS 5.4.

The additional rate shall include for the additional m² size of the building and furniture which will consist of a separate chair and an 800mm x 600mm table desk for each of the 12 places.

SJ 06.07 PROVIDE NOTICES AND POSTERSUnit: Month

The unit of measurement shall be for the posters and information notices and booklets to raise awareness and to share information about COVID-19.

The posters and notices must be maintained at places as indicated in Item 1.10.7 at all the different construction sites for the duration of construction.

SJ 06.08 PROVIDE SCREENING FACILITY..... Unit: Month

The unit of measurement shall be for the provision of a screening facility to accommodate workers daily at the start of every working day, including provision of infrared forehead thermometers and the maintenance of the equipment for the duration of the 24 month contract period.

ADDITIONAL SPECIFICATION

SN IMPLEMENTATION OF LABOUR-INTENSIVE INFRASTRUCTURE PROJECTS UNDER THE EXPANDED PUBLIC WORKS PROGRAMME (EPWP)

CONTENTS

SN 01	SCOPE
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SN 04	EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR INTENSIVE WORKS
SN 05	TRAINING OF EPWP WORKERS
SN 06	CONTRACTUAL OBLIGATIONS IN RELATION TO LABOUR
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SN 01 SCOPE

This project is part of the Expanded Public Works Programme and aims to alleviate and reduce unemployment. EPWP will achieve this aim through the provision of work opportunities as part of the project. EPWP workers will be recruited and trained in skills relevant to the work to be done on this project. These workers will be employed by the Contractor as part of this project so that they can gain work experience on these projects. The Contractor will be required to manage, supervise and report on the EPWP workers, monthly, for a period of 36 months. Furthermore the Contractor will be required to supervise these EPWP workers to ensure that the work they perform is of the required standard.

Labour-intensive infrastructure projects under the EPWP include:

- using labour intensive construction methods to provide employment opportunities to local unemployed people;
- providing training or skills development to those locally employed workers;
- building cost-effective and quality assets.

The employment of locally employed temporary workers on all EPWP labour-intensive infrastructure projects must be in accordance with the Code of Good Practice for Employment and Conditions for Expanded Public Works Programmes issued in terms of the Basic Conditions of Employment Act, 1997 (Act N°75 of 1997)..

SN 02 TERMINOLOGY AND DEFINITIONS

SN 02.01 TERMINOLOGY

- | | | |
|----|---------|---|
| a) | BY HAND | refers to the use of tools which are manually operated and powered. |
|----|---------|---|

- b) EPWP Expanded Public Works Programme, a National Programme of the government of South Africa, approved by Cabinet.
- c) DOL Department of Labour. Labour-intensive refers to methods of construction involving a mix of machines and labour, where labour, utilising hand tools and light plant and equipment, is preferred to the use of heavy machines, where technically and economically feasible. (Note: The normal emphasis on the cost-effectiveness and quality of the asset must be retained.)
- d) Public body refers to a department, trading entity, constitutional institution, municipality, public entity or municipal entity
- e) Scope of work refers to a specification and description of the services or construction works which are to be provided and any other requirements and constraints relating to the manner in which the contract is to be performed

SN 02.02 DEFINITIONS

- (a) “employer” means the contractor or any party employing the worker under the EPWP Programme.
- (b) “client” means the Department of Public Works.
- (c) “worker” means any person working or training in an elementary occupation on an EPWP.

SN 03 APPLICABLE LABOUR LAWS

In line with the Expanded Public Works Programme (EPWP) policies, the Code of Good Practice for Employment and Conditions of Work for Expanded Public Works Programmes read in conjunction with a Ministerial Determination for Expanded Works Programmes issued by the Minister of Labour in terms of Section 50(1) of the Basic Conditions of Employment Act of 1997 of which extracts have been reproduced below in clauses SN 04, shall apply to works described in the scope of work and which are undertaken by unskilled or semi-skilled workers.

SN 04 EMPLOYMENT OF UNSKILLED AND SEMI-SKILLED WORKERS IN LABOUR INTENSIVE WORKS

SN 04.01 REQUIREMENTS FOR THE SOURCING AND ENGAGEMENT OF LABOUR

The beneficiaries of the programmes should be locally-based (as close to the project site as possible) individuals prepared to work on the specific EPWP.

In order to spread the benefits as broadly as possible in the community, a maximum of one person per household should be employed, taking local available labour into account.

Workers from other areas may be employed if they have skills that are required for a project and there are not enough persons in the local communities who have those skills or who could undergo appropriate skills training. However, workers from other communities should not exceed 20% of all persons working on a programme. A proper skills audit should be conducted, where possible, in an area where an EPWP is in operation.

Programmes should set participation targets for employment with respect to women, youth, and people with disabilities.

The proposed targets are:

- 55% women;
- 40% youth from 16 to 35 years of age; and
- 2% people with disabilities.

EPWPs should seek to achieve these targets in all occupational categories. Persons under sixteen years of age may not be employed on EPWP.

SN 04.02 **SPECIFIC PROVISIONS PERTAINING TO SANS 1914-5**

Definitions

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

Contract participation goals

- The specified contract participation goal for the contract is stated in the Scope of Works. The contract participation goal shall be measured in the performance of the contract to enable the employment provided to targeted labour to be quantified.
- The wages and allowances used to calculate the contract participation goal shall, with respect to both time-rated and task rated workers, comprise all wages paid and any training allowance paid in respect of agreed training programmes.
- Further to the provisions of clause 3.3.2 of SANS 1914-5, written contracts shall be entered into with targeted labour.

The definition for net amount shall be amended as follows:

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

SN 05 **TRAINING OF EPWP WORKERS**

The contractor shall provide all the necessary on-the-job training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the contract in a manner that does not compromise worker health and safety.

Three types of training are applicable, namely

- Life skills;
- On the job training;
- First Aid training;
- Technical Skills training.

Training will be implemented by training instructors accredited by DOL and/or CETA:

- EPWP workers shall be employed on the projects for a minimum period of 12 months.
- EPWP workers shall be deployed on projects in the vicinity of their homes. The same arrangements as for other workers regarding accommodation, subsistence and travel shall be applicable to EPWP workers.
- (a) The contractor shall provide all the necessary on-the-job training to targeted labour to enable such labour to master the basic work techniques required to undertake the work in accordance with the requirements of the contract in a manner that does not compromise worker health and safety.
- (b) The cost of the formal training of targeted labour, will be funded by the provincial office of the Department of Labour. This training should take place as close to the project site as practically possible. The contractor, must access this training by informing the relevant provincial office of the Department of Labour in writing, within 14 days of being awarded the contract, of the likely number of persons that will undergo training and when such training is required. The employer must be furnished with a copy of this request.
- (c) A copy of this training request made by the contractor to the DOL provincial office must also be faxed to the EPWP Training Director in the Department of Public Works – Cinderella Makunike, Fax Number 012 328 6820 or email cinderella.makunike@dpw.gov.za Tel: 083 677 4026
- (d) The contractor shall be responsible for scheduling the training of workers and shall take all reasonable steps to ensure that each beneficiary is provided with a minimum of six (6) days of formal training if he/she is employed for 3 months or less and a minimum of ten (10) days if he/she is employed for 4 months or more.
- (e) The contractor shall do nothing to dissuade targeted labour from participating in the above mentioned training programmes.
- (f) An allowance equal to 100% of the task rate or daily rate shall be paid by the contractor to workers who attend formal training, in terms of (d) above.
- (g) Proof of compliance with the requirements of (a) to (e) must be provided by the Contractor to the Employer prior to submission of the final payment certificate.

SN 06 CONTRACTUAL OBLIGATIONS IN RELATION TO LABOUR

The EPWP workers to be employed in the programme (EPWP) shall be directly contracted to the Contractor. Over and above the construction and project management responsibilities, the contractor will be expected to perform the tasks and responsibilities as set out in this specification.

Implementation of labour intensive practices under the Expanded Public Works Programme (EPWP) is required to a value of not less than 10% of the tendered contract amount for wages paid to local labour.

SN 07 PAYMENT OF WORKERS

Employers must pay workers at least the minimum rate as stipulated in the Ministerial Determination: Expanded Public Works Programme

Workers can be paid on the basis of the number of tasks completed. These workers are referred to as “task-rated workers”. Alternatively, workers can be paid on a daily rate.

There are jobs where it is not possible to pay workers on the basis of tasks performed. These workers must be paid on the basis of the amount of time they worked. They are referred to as “time-rated workers”.

On the task-based system, a worker is paid for each task completed or part thereof.

If workers are informed a day before that work will not take place the next day, they should not be entitled to any payment.

Workers will be paid a training allowance in case they are required to attend agreed training programmes. This should be equal to 100% of the daily task rate for task-rate workers or 100% of the daily rate of pay for time-rated workers. All the costs of training will be covered, for example, travel, trainers, material, tuition fees.

Where a worker participates in a learnership, the relevant learnership determination must be used to determine the training allowance whilst on training.

Each worker must be given written particulars of employment and verbal explanations in an appropriate language of their rate of pay and how this is to be calculated.

Where a project is completed earlier than anticipated the worker should receive the full agreed remuneration for the stipulated period of the contract if the pay for the task was to be calculated on the basis of time. Where such work was to be performed on a task-based system, the full agreed remuneration for the task should be paid for early completion.

SN 07.02 Penalty for non achievement of Local Labour Target (LLT)

The Contractor will be assessed on a quarterly basis in the event that the Contractor fails to substantiate that any failure to achieve the Local Labour Target (LLT) was due to quantitative underruns, the elimination of items, or any other reason beyond the Contractor's control which may be acceptable to the Employer, the Contractor shall pay to the Employer penalties (P) in an amount determined in accordance with the following formula:

$$P = 1 \times \frac{(0 - D_o)}{(100)} \times NA$$

Where D = tendered Local Labour Target (LLT) percentage.

D_o = the Local Labour Target (LLT) which the Employer's Representative, based on the credits passed, certifies as being achieved upon completion of the Contract.

NA = Net Amount, being Tender Sum excluding VAT and CPA

P = Rand value of penalty payable

SN 08 GENERIC LABOUR INTENSIVE SPECIFICATION

The Generic Labour-intensive specification below is the same as SANS 1921-5, Construction and management requirement for works contracts- Part 5: Earthworks activities which are to be performed by hand and should be included in the scope of works without amendment or modification as set out below.

SN 08.01 Scope

This specification establishes general requirements for activities which are to be executed by hand involving the following:

- a) Trenches having a depth of less than 1.5 metres
- b) Cleaning of storm water drainage
- c) Cleaning of roads and sidewalks
- d) Clearing of fence routes
- e) Cleaning and site keeping
- d) Cleaning of buildings

SN 08.02 Precedence

Where this specification is in conflict with any other standard or specification referred to in the Scope of Works to this Contract, the requirements of this specification shall prevail.

SN 08.03 Hand excavateable material

Hand excavateable material is material:

- a) granular materials:
 - i) whose consistency when profiled may in terms of table 1 be classified as very loose, loose, medium dense, or dense; or
 - ii) where the material is a gravel having a maximum particle size of 10mm and contains no cobbles or isolated boulders, no more than 15 blows of a dynamic cone penetrometer is required to penetrate 100mm;
- b) cohesive materials:
 - i) whose consistency when profiled may in terms of table 1 be classified as very soft, soft, firm, stiff and stiff / very stiff; or
 - ii) where the material is a gravel having a maximum particle size of 10 mm and contains no cobbles or isolated boulders, no more than 8 blows of a dynamic cone penetrometer is required to penetrate 100 mm;

Note:

- i) A boulder, a cobble and gravel is material with a particle size greater than 200 mm, between 60 and 200 mm.
- ii) A dynamic cone penetrometer is an instrument used to measure the in-situ shear resistance of a soil comprising a drop weight of approximately 10 kg which falls through a height of 400 mm and drives a cone having a maximum diameter of 20 mm (cone angle of 60° with respect to the horizontal) into the material being used.

SN 08.04 Trench excavation

All hand excavateable material in trenches having a depth of less than 1,5 metres shall be excavated by hand.

SN 08.05 Compaction of backfilling to trenches (areas not subject to traffic)

Backfilling to trenches shall be placed in layers of thickness (before compaction) not exceeding 100mm. Each layer shall be compacted using hand stampers

- a) to 90% Proctor density;
- b) such that in excess of 5 blows of a dynamic cone penetrometer (DCP) is required to penetrate 100 mm of the backfill, provided that backfill does not comprise more than 10% gravel of size less than 10mm and contains no isolated boulders, or
- c) such that the density of the compacted trench backfill is not less than that of the surrounding undisturbed soil when tested comparatively with a DCP.

SN 08.06 Excavation

All hand excavateable material including topsoil classified as hand excavateable shall be excavated by hand. Harder material may be loosened by mechanical means prior to excavation by hand.

The excavation of any material which presents the possibility of danger or injury to workers shall not be excavated by hand.

SN 08.017 Clearing and grubbing

Grass and small bushes shall be cleared by hand.

SN 08.08 Shaping

All shaping shall be undertaken by hand.

SN 08.09 Loading

All loading shall be done by hand, regardless of the method of haulage.

SN 08.10 Haul

Excavation material shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150 m.

SN 08.11 Offloading

All material, however transported, is to be off-loaded by hand, unless tipper-trucks are utilised for haulage

SN 08.12 Spreading

All material shall be spread by hand.

SN 08.13 Compaction

Small areas may be compacted by hand provided that the specified compaction is achieved.

SN 08.14 Grassing

All grassing shall be undertaken by sprigging, sodding, or seeding by hand.

SN 08.15 Stone pitching and rubble concrete masonry

All stone required for stone pitching and rubble concrete masonry, whether grouted or dry, must to be collected, loaded, off loaded and placed by hand.

Sand and stone shall be hauled to its point of placement by means of wheelbarrows where the haul distance is not greater than 150 m.

Grout shall be mixed and placed by hand.

SN 08.16 Manufactured Elements

Elements manufactured or designed by the Contractor, such as manhole rings and cover slabs, precast concrete planks and pipes, masonry units and edge beams shall not individually, have a mass of more than 320 kg. In addition the items shall be large enough so that four workers can conveniently and simultaneously acquire a proper hand hold on them.

SN 08.17 Roads

The following operations may be carried out using labour intensive methods:

1. Site clearance
2. Layer work construction including loading, hauling and spreading material.

Note: All compaction should be done using conventional compaction equipment and where necessary the use of heavy machinery may be employed to loosen material for excavation by hand. Where significant use of blasting is indicated, then the Works are probably not suitable for labour intensive methods.

3. Where higher standards of roads are to be constructed then the following operations may be included:
 - Macadam base course either dry, water bound or emulsion bound; foamed bitumen gravel; emulsion treated gravel; or slurry bound or composite macadams.
 - Application of bitumen bound surface treatment (cold) including spreading and dragging of chips.
 - Slurry treatments to existing or new road surfaces.
 - In situ concrete roads
 - Segmented block paved roads.
 - Cast in-situ block pavements (hyson-cells);
 - Road markings.
4. Fencing.
5. Erection of road signs.
6. Grass maintenance.
7. Road reserve maintenance.
8. Rubble masonry bridges, culverts and retaining walls

SN 08.18 Storm water

The following operations may be constructed using labour intensive construction methods:

1. Gabions and reno mattresses.
2. Small diameter pre-cast concrete elements (pipes and arches).
3. Grassed or lined water channels

SN 08.19 Sewers

The following operations may be constructed using labour intensive construction methods:

1. Sewer manholes either in brickwork or using specially manufactured pre-cast manhole rings (individual mass less than 320 kg).
2. Sewer manhole covers and lids using specially designed pre-cast units.
3. Maturation or flocculation ponds with least dimension not exceeding 100m.

SN 08.20 Water

The following operations may be constructed using labour intensive construction methods:

1. Laying of water pipelines, fittings and house connections in all materials (including steel) where the mass of individual pipe lengths does not exceed 320 kg.
2. Construction of ferro-cement reservoirs.
3. Excavation for membrane lined and floating roof reservoirs.
4. Construction of small masonry reservoirs.
5. Spring and well protection measures

SN 08.21 Haul of Material

Where the haul of any material exceeds 200 m, consideration should be given to the use of local resources for transporting material. This includes the use of animal drawn vehicles and small trailer combinations utilising locally sourced tractors. All loading and off loading can be done by hand.

SN 08.22 Electricity

The following operations may be constructed using labour intensive methods:

1. Excavation of trenches for reticulation of all voltages.
2. Excavation for and erection of poles for overhead lines.
3. Installation of all electricity cables (joints and terminations by qualified persons).

SN 08.23 Bill of quantities

Labour-intensive works is highlighted in the bills of quantities for the payment items relating to labour-intensive works (LI).

SN 09 REPORTING

The Consultant shall, before certifying a contractor's payment certificate, ensure that the contractor has submitted labour information in a format and timeframe specified by the employer. If the information submitted by the contractor is inadequate the consultant shall not submit the payment certificate to the employer for payment.

The Contractor's payment invoices shall be accompanied by labour information for the corresponding period in a format specified by the employer. If the contractor chooses to delay submitting payment invoices, labour returns shall still be submitted as per frequency and timeframe stipulated by the Employer. The contractor's invoices shall not be paid until all pending labour information has been submitted.

SN 10 MEASUREMENTS AND PAYMENT

The number of EPWP workers specified for this contract that will receive orientation and life skills development training is 15 and technical training is 15

SN 10.01 PAYMENT FOR EMPLOYMENT AND TRAINING OF EPWP WORKERS (TARGET: - 15 EPWP WORKERS)

- SN 10.01.01** Orientation and Life Skills development training for EPWP workers for an average of 10 days per EPWP workerUnit: PC Sum
- SN 10.01.02** Technical skills training for EPWP workers for an average of 20 days per EPWP workerUnit: PC Sum
- SN 10.01.03** First Aid Level 1 training for EPWP workers for an average of 5 days per EPWP workerUnit: PC Sum
- SN 10.01.04** Profit and attendance for administration of items 1 and 2 above..... Unit: percentage (%)

SN 10.02 PAYMENT FOR TRAVELING OF EPWP WORKERS

- SN 10.02.01** Travelling (based on return trip/EPWP worker) Unit: worker/ day

The unit of measurement shall be the number of EPWP workers transported from the nearest local community to the work place and back on a daily basis. The tendered shall allow for the cost of each worker to be able to safely reach the work place and travel back each day and shall be measured as a number for each worker per day.

SN 10.03 EMPLOYMENT OF EPWP WORKERS

- SN 10.03.01** Employment of EPWP workers Unit: PC Sum
The unit of measurement shall be the number of EPWP workers at the labour rate of comparable unskilled work in the local area alternatively a minimum R 1 734 per month as the amount indicated in the Ministerial Determination 4: EPWP, dated 01 November 2015, Clause 14.2: Minimum of R78.86 per day multiplied by the period employed in months and the rate tendered shall include full compensation for all costs associated with the employment of EPWP workers and for complying with the conditions of contract. The cost for the training shall be excluded from this item. This item is based on a 24 months appointment for EPWP workers.

SN 10.04 PROVISION OF EPWP DESIGNED OVERALLS AND HARD HATS AND SAFETY BOOTS (PPE) TO EPWP WORKERS

- SN 10.04.01** Supply 2 x EPWP branded overalls to each EPWP workerUnit: PC Sum
- SN 10.04.02** Supply 1 x EPWP branded hard hat to each EPWP worker...Unit: PC.Sum
- SN 10.04.03** Supply 1 x pair of safety boots to each EPWP worker..... Unit: PC.Sum
- SN 10.04.04** Profit and attendance for administration of items 1, 2 and 3 above.....Unit: %

EPWP worker overalls should be orange (top and bottom) as per EPWP branding specification with the exception of Correctional Services contracts where the overalls should be blue (top and bottom). **A minimum of two overalls per EPWP worker should be**

supplied. Hard hats should be orange and branded as per the EPWP branding specification.

An amount has been provided in the Schedule of Quantities under sub item SM 11.04.01 and SM 11.04.02 for the supply of EPWP designed overalls and hard hat, as per the EPWP branding specification provided by the EPWP unit. The tendered percentage under sub items SM 10.05.02 will be paid to the contractor on the value of each payment pertaining to the supply of overalls and hard hats and safety boots to cover his expenses in this regard.