

SA GENERAL MAINTENANCE

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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 or Sub-Installation". Maintenance of all completed Sub-Installations shall ensure reliable functioning and optimum service life thereof. Monthly maintenance responsibilities for each Sub-installation, including all units and components as specified shall commence within Sections or portions of the Sub-installation which have achieved practical completion.

The maintenance shall be undertaken during the following stages:

- After Sectional Completion and before Certificate of Completion for a Sub-Installation or Section
- 12-Month Defects Liability Period with Maintenance
- 36-Month Fixed-term Maintenance Period

Maintenance of a Sub-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 "Sub-installations" (systems, services and/or buildings and parts of the infrastructure) in good functional condition is provided for in the Schedules 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 01.01 Maintenance during Defects Liability Period prior to Completion of the Sub-Installation

Where Sectional Completion has been granted, the Section completed shall be under Defects Liability Period prior to issuance of the Certificate of Completion commencing from the date of Sectional Completion to the date of Completion for the Installation.

The Contractor shall guarantee all works undertaken for the period between Sectional Completion and Certificate of Completion for the Sub-Installation or Section. The maintenance shall be conducted in strict compliance with the manufacturer's or Original Equipment Manufacturer (OEM) maintenance plan.

If during this period the Installation, or any part thereof, is not in working order, or not working satisfactorily owing to faulty material, design or workmanship, the Contractor will be notified and immediate steps shall be taken by the Contractor to rectify the defects and/or replace the affected parts on site at his own expense.

The Contractor shall maintain the works or Installation(s) in good working condition for the full period.

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The Contractor is obliged to rectify all defects occurring within this period prior to transitioning into the 12-Month Defects Liability and Maintenance Period.

Should breakdowns be frequent, or should the Installation otherwise prove unsatisfactory during the said period, the Contractor shall, if called upon by the Engineer or the Employer's Representative, at his own expense replace the whole installation or such parts as the Engineer or the Employer may deem necessary.

SA 01.02 12-Month Defects Liability Period with Maintenance

The Contractor shall guarantee all works undertaken for a period of twelve months after the Certificate of Completion has been issued for the Installation. The maintenance is to be conducted in strict compliance with the manufacturer's or OEM maintenance plan.

If during this period the Installation, or any part thereof, is not in working order, or not working satisfactorily owing to faulty material, design or workmanship, the Contractor will be notified and immediate steps shall be taken by the Contractor to rectify the defects and/or replace the affected parts on site at his own expense.

The Contractor shall maintain the works or Installation(s) in good working condition for the full twelve-month period.

The Contractor is obliged to fix all defects occurring within the 12-Month Defects Liability Period with Maintenance prior to transitioning into the 36-Month Fixed-term Maintenance Period.

Should the Contractor fail to transition with the installations in good working order on the expiry of the specified twelve months, the Engineer shall note all such defects in the snagging report.

All snags shall be fixed or rectified under the terms of the 12-Month Defects Liability Period with Maintenance and should be concluded within the first month of the 36-month Fixed-term Maintenance Period.

Should breakdowns be frequent, or should the Installation otherwise prove unsatisfactory during the said period the Contractor shall, if called upon by the Engineer or the Employer's Representative, at his own expense replace the whole installation or such parts as the Engineer or the Employer may deem necessary.

SA 01.03 36-Month Fixed-Term Maintenance Period

The maintenance is to be conducted in strict compliance with the manufacturer's or OEM maintenance plan.

If during this period the installation, or any part thereof, is not in working order, or not working satisfactorily the Contractor will be notified and immediate steps shall be taken by the Contractor to bring the installation to its original functional state as at Final Approval of the repair and upgrade phase.

If replacement of parts or components of the installation be involved, tendered rates shall be used in all cases.

The contractor is obliged to hand over the entire installation in good working order at the end of the 36-month Fixed-term Maintenance Period. Should the Contractor fail to hand over the works in good working order on the expiry of the specified 36 months, the Contractor shall be responsible for further monthly maintenance, at their own expense, until final delivery is taken.

SA 02 MAINTENANCE REQUIREMENTS**SA 02.01 CONTRACTOR'S RESPONSIBILITIES**

The Contractor shall maintain the complete Installation(s) for the full duration between issuance of Certificate of Sectional Completion or Certificate of Completion up to the issuance of Certificate of Final Completion, at the end of the 36-Month Fixed-Term Maintenance Period.

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

The maintenance control plan (specified in Clause SA 04) 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).

As part of the repair, upgrade and/or new installation work of each sub-installation, the Contractor shall submit a set of Operating and Maintenance Manuals where applicable. The Contractor shall ensure thorough training to ensure 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 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 Original Equipment Manufacturer (OEM), 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 will bear part of the costs.

The Contractor shall not claim additional establishment costs where repair, upgrade and/or new installation work is to be carried out during the maintenance phase.

The Contractor shall rectify any faulty condition of which he becomes aware of, 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 tender rates are not available and where the Engineer rules that the damage caused is operational;

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- (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.

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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 R30 000,00 (transport, accommodation and travelling cost excluded), the liability of the Contractor is limited to the value of R30 000,00. The additional cost above the value of R30 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:

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- (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 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.

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COMPONENTS INCLUDED IN MAINTENANCE SCOPE

Maintenance, as specified, will be applicable to all of these Installations / Sub-Installations:

Installation A: Drakenstein Maximum

- Sub-Installation A1: CCTV Surveillance System
- Sub-Installation A2: Modular Containerised Data Centre (MCDC) and Hyper-Converged Infrastructure (HCI)
- Sub-Installation A3: Access Control System
- Sub-Installation A4: Cell phone Detection, Intercom and Public Address Systems
- Sub-Installation A5: Security Electrical Services
- Sub-Installation A6: Sally Port and Guard House
- Sub-A7: Dividing Fence System
- Sub-Installation A8: Outer and Inner Security Fencing Systems

Installation B: Drakenstein Youth

- Sub-Installation B1: CCTV Surveillance System
- Sub-Installation B2: Modular Containerised Data Centre (MCDC) and Hyper-Converged Infrastructure (HCI)
- Sub-Installation B3: Access Control System
- Sub-Installation B4: Cell phone Detection, Intercom and Public Address Systems
- Sub-Installation B5: Security Electrical Services
- Sub-Installation B6: Sally Port
- Sub-Installation B7: Dividing Fence System and Walkway

Installation C: Drakenstein Medium A

- Sub-Installation C1: CCTV Surveillance System
- Sub-Installation C2: Modular Containerised Data Centre (MCDC) and Hyper-Converged Infrastructure (HCI)
- Sub-Installation C3: Access Control System
- Sub-Installation C4: Cell phone Detection, Intercom and Public Address Systems
- Sub-Installation C5: Security Electrical Services
- Sub-Installation C6: Sally Port
- Sub-Installation C7: Dividing Fence System

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COMMENCEMENT OF MAINTENANCE PERIOD

- **Maintenance during Defects Liability Period prior to Completion of the Installation**

The period shall commence on the date indicated on the Sectional Completion Certificate up to the date of Certificate of Completion of the Installation.

- **12-Month Defects Liability Period with Maintenance**

Duration shall commence from the Completion Date of an Installation

- **36-Month Fixed Term Maintenance Work**

Duration shall commence from the end of the 12-month Defects Liability Period for an Installation.

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

NOTE:

The onus is incumbent upon the Contractor to ensure that all equipment and components of the system installed are covered by the relevant warranties and guarantees up to twelve months after the issue of a Certificate of Completion for entire repair work. The Contractor should obtain and include the necessary warranty extensions in the tender pricing.

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 minimisation 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 any time 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 / sub-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 twelve (12) 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.

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- (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 05 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 IDT, 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 Independent Development Trust (IDT), 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:

- (a) The Contractor shall establish a fixed telephone line, data services 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 email. 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

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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 DOWNTIME ALLOWED	PAYMENT REDUCTION IF EXCEEDED
Fatal breakdown	Zero (immediate response)	R3 300/hour
Emergency Breakdown - General	48 hours	R2 500/day
Emergency Breakdown - MCDC	12 hours	R5 000/day
Ordinary Breakdown	3 days	R1 000/day
Operational damage repair	3 days	R1 000/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.

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.

A difference shall be made in the monthly variable Contractor remuneration during the 12-Month Defects Liability and Maintenance Period and the 36-Months Fixed-term Maintenance.

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 05.03.01 Score-card

The Engineer will inspect each installation monthly after Sectional Completion and/or Completion 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 06.01 MAINTENANCE OF COMPLETED SECTION OF A SUB-INSTALLATION OR EQUIPMENT PRIOR TO CERTIFICATE OF 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 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 a Section of the Sub-Installation or equipment after Sectional Completion of Repair and Upgrade 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 a Sub-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.

The total number of points for maintenance of a completed Section or Equipment under usage shall be 60 points.

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 Sub-Installations.

SA 06.02 MAINTENANCE OF A SUB-INSTALLATION DURING THE DURING 12-MONTH DEFECTS LIABILITY PERIOD WITH MAINTENANCEUnit: 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.

The total number of points for maintenance of a completed installation during the 12-Month Defects Liability period with Maintenance shall be 120 points.

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 06.03 **MAINTENANCE OF A COMPLETED SUB-INSTALLATION DURING THE 36-MONTH FIXED-TERM MAINTENANCE PERIOD**..... 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 Sub-Installation after Certificate of Completion of the Repair and Upgrade 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 Sub-Installation in a perfect functional condition. The only items not to be included in the rate for monthly maintenance points are:

- 3. Supply, delivery, installation and testing of special equipment/materials that will be measured elsewhere, and
- 4. Special testing of a Sub-Installation.

The total number of points for maintenance of a completed installation shall be 360.

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 06.04 **DEFECTS LIABILITY PERIOD PRIOR TO COMPLETION** Unit: month

Where Sectional Completion has been achieved, the Section completed shall be under Defects Liability Period prior to Completion commencing from the date of Sectional Completion to the date of Completion for the Installation.

Remuneration for Defects Liability Period prior to Completion of an Installation per month for portions of the Installation which have achieved Sectional Completion shall be calculated as follows:

$$MDS = \frac{CWS}{TWSI} \times MDSI$$

*MDS = Monthly Defects Liability amount for the portion of Sub-Installation in the particular Section
 CWS = Certified Value of the completed works of the Sub-Installation in the Section
 TWSI = Tendered amount for completing all works for the entire Sub-Installation
 MDSI = Tendered Monthly Defects Liability amount for the entire Sub-Installation during Defects Liability Period prior to Completion of an Installation.*

SA 06.05 **WARRANTY EXTENSION** Unit: month

Where the Engineer or Employer requests early installation or usage of equipment (e.g. X-ray Machines, Walk-through Metal Detectors), the Contractor shall extend the warranty and Defects Liability Period for the equipment from the date of operational usage to the date of Completion of Certificate.

SA 06.06 **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 dysfunctional 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 06.07 **PAYMENT REDUCTION DUE TO EXCEEDING OF MAXIMUM ALLOWABLE DOWN-TIME DURING A GENERAL EMERGENCY BREAKDOWN** Unit: hours

The unit of measurement shall be the number of days, in excess of 48 hours, during which a component of an installation was in a dysfunctional 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 06.08 **PAYMENT REDUCTION DUE TO EXCEEDING OF MAXIMUM ALLOWABLE DOWN-TIME DURING EMERGENCY BREAKDOWN RELATED TO MODULAR CONTAINERISED DATA CENTRE (MCDC) AND HYPER-CONVERGED INFRASTRUCTURE (HCI) SUB-INSTALLATION** Unit: hours

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 dysfunctional 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 06.09 **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 3 days, during which a component of an installation was in a dysfunctional 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 06.10 **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 3 days, during which a component of an installation was in a dysfunctional 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.

SA.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 Sub-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.

MAINTENANCE SCORE-CARD PROFORMA

CONTRACT NUMBER: _____

CONTRACT: _____

CONTRACTOR: _____

ENGINEER: _____

SUB-INSTALLATION:

MONTH NO:

The following components of the sub-installation were selected by the contractor at the Monthly Maintenance Meeting no. as performance indicators to be tested according to specification:

1. CONTRACTOR'S SELECTION

- 1.1 _____
- 1.2 _____
- 1.3 _____
- 1.4 _____
- 1.5 _____

0	1

SUBTOTAL:

The following components of the sub-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:

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/ /

Engineer's Representative

Signature

Date

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 Sub-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 Sub-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.