

Part 1: Design, supply, install, test and commissioning of a Smart Water & Electricity AMR system completed with billing.
King Shaka International Airport (KSIA)
Part A: Preliminaries and Generals (P&G's).

Activity Ref.	Activity description	Unit (UOM)	QTY	Rate (Rands)	Total Amount (Excl. VAT)
			(a)	(b)	(a)x(b)
A1.1	Site establishment, mobilisation, temporary facilities, temporary services, environmental controls, demobilisation and reinstatement, complete.	Sum	1		
A1.2	Project management, supervision, contract administration, reporting and stakeholder coordination, security compliance, Airport operational coordination, access control, permit-to-work systems and shutdown planning.	Month	12		
A1.3	Health, Safety, Environmental and Quality (HSEQ) management, complete.	Month	12		
A1.4	Insurances, guarantees, bonds and statutory obligations.	Sum	1		

Part A Total Amount Carried Forward to Summary

Note: Tenderers shall price the above Preliminaries and General (P&G's) based on the pricing method indicated. All obligations related to working within a live Airport environment and coordination with ACSA operations are deemed included. No additional claims shall arise from access restrictions or operational constraints.

Part B: Contractor Design for the Smart Water & Electricity AMR system.

The design of a hybrid network (wireless dominant and wired for critical points) Utility Automatic Meter Reading (AMR) Metering Solution for both Water and Electricity with billing, including detailed feasibility assessments and the development of the solution from concept through to final detailed design, in full compliance with Engineering Council of South Africa (ECSA) professional service stages. The scope includes:

- Review metering locations, confirm connectivity requirements, software platform and system integration (data acquisition, validation, data storage, reporting, and billing interfaces), and propose layouts for validation,
- Suitable sizing and design of Water and Electricity meters with a minimum useful life of 10-years,
- Electrical metering configurations including direct-connected, CT-connected and CT-VT metering,
- AMR system architecture, communication protocol design, and compliant design (e.g. earthing, power supply, surge protection etc),
- Network topology design including RF propagation and covering studies (not limited to LoRaWAN/RF/NB-IoT, etc.), the metering communication network shall be wireless-dominant at the meter level, with limited wired communication within buildings and plant rooms. Fibre optic cabling shall be used as the primary backbone
- Gateway and data concentrator placement studies,
- Provide equipment and component specifications, schedules, (all materials must meet SANS & be SABS approved) and detailed construction drawings,
- Comply with ECSA Stage – gate deliverables and technical reports,
- Execution program that is conscious of Airport and site risks, Airport operating hours, tenants, infrastructure interfaces.

Part B	Professional Fess	
Activity Ref.	Activity description	Total Amount (Excl. VAT)
B1.1	ECSA Stage 1 Services – Inception:	

	Conduct site assessments and verification for AMR system installation (metering points, CT/VT panels, breakers, water chambers and bulk meters)), including electrical infrastructure, water reticulation, meter locations, CT/VT connections, gateways, data concentrators, communication coverage studies, high level network options, Cybersecurity baseline assessment, identification of shutdown constraints, identification of required upgrades/modifications and risk register creation. Deliverables include approved inception report, high-level architecture diagrams and preliminary cost estimate.	
B1.2	ECSA Stage 2 Services - Concept and viability: Preparation of detailed design documentation for the smart water and electricity AMR system, including smart meter selection and sizing (10-year lifecycle), CT and CT-VT configuration selection, water meter type selection (bulk, zonal, tenant), communication technology evaluation, network topology modelling, gateway placement modelling, data concentrator studies, redundancy strategy design, Airport ICT integration strategy, and specifications for materials and equipment. Deliverables include concept design report, network coverage simulation report, preliminary meter schedules, single line diagrams, communication layout drawings, updated risk register, concept cost estimate.	
B1.3	ECSA Stage 3 Services - Design development: Final water and electricity AMR system design with billing, detailed electrical metering designs (direct-connected metering, CT-connected metering and CT-VT metering), detailed RF propagation modelling, gateway installation drawings, power supply schematics for AMR equipment, earthing and bonding design, software integration design (data acquisition, validation, storage, reporting and billing integration), Cybersecurity compliance design, detailed risk mitigation. Deliverables include final design report, technical specifications, equipment schedules, installation drawings and detailed BOQ.	
Part B Total Amount Carried Forward		

Part C: Procurement, Delivery, and Installations – (Remeasurement Contract)

C1.1	Procurement, Delivery and Installation of Smart Electricity or Energy Metering (SABS/SANS approved).				
Supply, delivery, installation, testing, and commissioning of smart electricity meters suitable for single-phase and three-phase applications, fully compatible with the specified AMR/AMI system. Works include all electrical, mechanical, and functional requirements necessary to ensure accurate energy measurement, secure data transmission, and seamless integration into the AMR system. All installations shall comply with manufacturer specifications, SANS electrical standards, IEC standards and ACSA technical requirements.					
Activity Ref.	Activity description	Unit (UOM)	QTY	Rate (Rands)	Total Amount (Excl. VAT)
			(a)	(b)	(a)x(b)
C1.1.1	Single Phase Direct Connected Smart Electricity Meter, Class 0.5S/Class 1, up to 100A, complete.	Each	100		
C1.1.2	Single Phase CT Connected Smart Meter, Class 0.5S/Class 1, complete.	Each	100		
C1.1.3	Three Phase Direct Connected Smart Meter, Class 0.5S/Class 1, complete.	Each	100		
C1.1.4	Three Phase CT Connected Smart Meter, Class 0.5S/Class 1, complete.	Each	100		
C1.1.5	Bulk Revenue Smart Meter, Class 0.2S/0.5S, CT/VT compatible, complete.	Each	8		
Part C1.1 Total Amount Carried Forward					

C1.2	Procurement, Delivery and Installation of Communication Units and Cabling (SABS/SANS approved).				
Communication units shall support wireless AMR technologies including, but not limited to, LoRaWAN, RF and NB-IoT. Data cabling and fibre optic cabling shall only be provided where required for AMR gateways, data concentrators, servers, or integration with ACSA ICT infrastructure (data cabling/ fibre only applies to gateways, servers, and approved integration points). Supply, delivery, installation, configuration, and testing of AMR gateways and/or data concentrators, complete with power supply units, surge protection devices, and battery backup (where required), including network configuration, integration with the AMR software platform, and end-to-end data verification. Including network coverage validation, signal strength mapping, and redundancy checks shall be performed for all smart meters within site perimeter (as per Part B). All materials should meet SANS&SABS approved.					
Activity Ref.	Activity description	Unit (UOM)	QTY	Rate (Rands)	Total Amount (Excl. VAT)
			(a)	(b)	(a)x(b)
C1.2.1	Industrial Communication Gateway, complete.	Each	8		
C1.2.2	Data Concentrator Unit (DCU), complete.	Each	15		
C1.2.3	RS485 Communication Cable including terminations and testing.	m	450		
C1.2.4	M-Bus Communication Cable including terminations and testing.	m	338		
C1.2.5	Category 6 (CAT6) Structured Cabling including certification.	m	2800		
C1.2.6	12-Core Single Mode Fibre Optic Cable (OS2), complete.	m	3000		
Part C1.2 Total Amount Carried Forward					
Part C Total Amount Carried Forward to Summary					
Part D: Electrical Works					
Execution of all electrical works required to support the AMR system installation, including analysis of existing infrastructure, circuit modifications, supply segregation, protection, earthing, and reticulation upgrades. All electrical works shall comply with SANS standards, the Occupational Health and Safety Act, and ACSA technical requirements.					
D1.1	Instrument Transformers (CTs and VTs)				
Supply, delivery, installation, testing, and commissioning of electrical measurement sensors required for accurate metering, including current and voltage transformers. All sensors shall be correctly rated, installed, and calibrated to ensure accurate data capture and system reliability. All materials should meet SANS & SABS approved.					
Activity Ref.	Activity description	Unit (UOM)	QTY	Rate (Rands)	Total Amount (Excl. VAT)
			(a)	(b)	(a)x(b)
D1.1.1	Current Transformer (CT), Class 0.2S or 0.5S, complete.	Each	640		
D1.1.2	Voltage Transformer (VT), Class 0.2 or 0.5, complete.	Each	40		
D1.1.3	Three Phase VT Set, Class 0.2, complete.	Each	14		
Part D1.1.1 Total Amount Carried Forward					
D1.1.2	Distribution Boards (BD's) modifications, breakers (MCB's, SPD's, Isolators and RCD's), (SABS/SANS approved).				
Conduct assessment, verification, and tracing of existing electrical circuits and supply points to confirm capacity, unbundling of shared power points and rewiring to provide dedicated supply, labelled power supplies for the AMR gateways, data concentrators, servers, include upgrading, modification, or replacement of Distribution Boards (DBs), breakers, strictly limited to AMR-related electrical circuits, including circuit segregation, testing, and certification as per SANS 10142-1. All materials should be SANS/SABS approved. Supply, install, support, secure, and label Cable Trays, Trunking, and Conduits for the routing and mechanical protection of cabling associated with the Airport smart metering (AMR) communication network. Sizes shall be					

selected to ensure a maximum 50% cable fill and a minimum of 30% spare capacity for future expansion as per SANS 10142-1, IEC 60364-5-52 & IEC 61537. Materials, corrosion protection, ingress protection and installation methods shall be selected to suit the environmental conditions of the installation location, while maintaining the specified cable capacity and spare allowance. All necessary accessories include but not limited to bends, couplers, tees, supports, bolts, anchors, brackets, and hangers etc.

Activity Ref.	Activity description	Unit (UOM)	QTY	Rate (Rands)	Total Amount (Excl. VAT)
			(a)	(b)	(a)x(b)
D1.1.2.1	Provisional Sum for DB modifications, MCBs, SPDs, RCDs, Cables for dedicated metering circuits, Circuit segregation, certification, including cable trays, trunking, conduits, supports and accessories.	Prov. Sum	1	R 900 000	

Part D1.1.2 Total Amount Carried Forward

Part D Total Amount Carried Forward to Summary

Part E: AMR Software and System Integration.

The scope under this section covers the supply, configuration, integration, and commissioning of the AMR software platform and associated backend systems for both water and electricity metering. Including reporting interfaces for billing department (finance) and provision for future expansion of metering points, additional water zones, and integration with other utilities or Airport Management Systems. All software and system integration works shall comply with ACSA ICT policies, cybersecurity requirements, data governance standards, and approved server hosting architectures. Software and billing related testing and acceptance shall be completed under part F, with final integration system commissioning addressed under part G. Data ownership remains with ACSA. No meter data shall be hosted offsite without written approval.

E1.1 Once-Off AMR Software and System Integration

The reporting interface shall provide automated consumption summaries, consumption profiles, tariff application, variance detection, and reconciliation checks between meter readings, AMR data, and billed values to ensure billing accuracy and support financial audits. The software shall be scalable to allow for additional new metering points, new water zones and integration with other Airport Management Systems.

Activity Ref.	Activity description	Unit (UOM)	QTY	Rate (Rands)	Total Amount (Excl. VAT)
			(a)	(b)	(a)x(b)
E1.1.1	Design, supply, installation, configuration, testing, and licensing of the complete AMR Virtual Server Infrastructure, HES, MDMS, Utility Billing System, dashboards, reporting platform, cybersecurity controls, ICT integrations and all associated accessories required for a fully functional Automatic Meter Reading (AMR) system.	Sum	1		

Part E Total Amount Carried Forward to Summary

Part F: Testing, Commissioning of a fully completed AMR system and Handover.

This section covers the testing, commissioning, certification, and handover of a fully integrated smart water and electricity AMR system, including metering hardware, communication infrastructure, electrical works, and software systems.

Activity Ref.	Activity description	Unit (UOM)	QTY	Rate (Rands)	Total Amount (Excl. VAT)
			(a)	(b)	(a)x(b)
F1.1	Factory Acceptance Testing (FAT), Site Acceptance Testing (SAT), subsystem testing, integration testing, commissioning and performance verification	Sum	1		
F1.2	Compliance records, calibration certificates, CoC's, labelling and commissioning documentation.	Sum	1		

F1.3	As-built drawings (DWG & PDF format), O&M manuals, training, asset register as per Annexure B1 , and close-out documentation.	Sum	1		
Part F Total Amount Carried Forward to Summary					

Part G: Annual Lump Sum Amount for Permits and Training (CAPEX)

Activity Ref.	Activity description (Contractor to claim against actual invoices)	Unit (UOM)	QTY	Rate (Rands)	Total Amount (Excl. VAT)
			(a)	(b)	(a)x(b)
G1.1	Provisional Sum for airport permits, security clearances, inductions, AVOP permits, personnel vetting and mandatory airport training.	Sum	1	R 40 000	R 40 000
Part G Total Amount Carried Forward to Summary					R 40 000

Part H: Decommissioning and Salvaging of the Existing Meters

This activity involves disconnecting the electricity or water meters from the supply system, safely removing or isolating the device from the installation, and ensuring the system remains safe and operational after removal. The contractor shall also provide recommendations to ACSA on the appropriate method for disposal or handling of the removed meters.

Typical steps include disconnecting the meter from the electricity or water supply, physically removing the meter from the installation, and documenting all relevant meter details such as the serial number, asset number, make, model, age, location, and final meter readings. The contractor shall also prepare supporting documentation including condition reports, removal certificates, and signed handover forms confirming the transfer of the removed meters to the Contractor. The buy-back cost or revenue generated from the disposal of the existing metering infrastructure shall be indicated as negative, since it will be considered as income to ACSA.

Bidders may indicate **R0.00** for this item (H1.2) in the Bill of Quantities. Any costs associated with the removal, handling, transportation, recycling, or disposal of the existing meters shall be deemed to be included in the Contractor's overall tender price. The Contractor shall be fully responsible for ensuring that all removed meters are handled and disposed of in accordance with applicable environmental and regulatory requirements. No additional payment will be made by the Client for this activity, and any revenue obtained from salvaging or recycling the removed meters shall accrue to ACSA. The contractor provides a performance guarantee/bond at the start as security that they will carry out the work properly.

Note that Item H1.3 will be a negative value (Income to ACSA from disposal). QTY is the total number of meters.

Activity Ref.	Activity description	Unit (UOM)	QTY	Rate (Rands)	Total Amount (Excl. VAT)
			(a)	(b)	(a)x(b)
H1.1	Decommissioning (removal, and handling) of existing energy /electricity meters , including accessories, documentation - final meter readings, serial/asset numbers in the condition report, refer to attached Annexure excel-sheet and provide safe removal certificate.	Each	280		(+) R
H1.2	Buy-back costs or revenue generated from the disposal of the existing meters (energy). Contractor to remove meters from site (Airport), dispose and provide safe disposal certificate , Performance guarantee/bond to be released pending the safe disposal certificate.	Each	280	(-) R	(-) R

Part H Total Amount Carried Forward to Summary

Total Project Value (Excl. VAT) – Sum of part A to H

Total CAPEX (Sum of part A to H), Excluding VAT,

VAT @ 15% of the Total CAPEX

TOTAL CAPEX (INCLUSIVE OF VAT)

Note:

- The project is under NEC3 Contract Agreement – Engineering & Construction Contract (ECC) Option B - Priced Contract with Activity Schedule (**Remeasurement Contract**).
- Rate is inclusive of unit or material price, all accessories, transport to site, labour, profit & risks.
- Material or equipment are inclusive of all the accessories required and must be SABS/SANS approved.
- Upon completion of the installation, testing, and commissioning of the smart metering infrastructure/solution, the Contractor shall request inspection by ACSA. If the works are found to be complete and in accordance with the contract requirements, ACSA shall issue a **Practical Completion Certificate**.
- The **Defects Liability Period of Twelve (12) months**, covers all defects in installation and workmanship, shall commence from the date of issuance of the **Practical Completion Certificate** and commissioning acceptance by ACSA. During this period, the Contractor shall promptly rectify any defects arising from faulty workmanship, complete Smart AMR metering and billing system, meters, communication equipment, software, materials, or installation at no additional cost to ACSA.
- The **Warranty Period** for the smart meters and associated equipment shall be a minimum of **Twelve (12) months** and shall run concurrently with the **Defects Liability Period**, commencing from the date of issuance **Practical Completion Certificate** and commissioning acceptance by ACSA. Repairs under the warranty shall not be considered part of the **Defects Liability Period** or **Maintenance Period**.
- The **Five (5) year Maintenance Period** and AMR system installations shall run concurrently due to the requirement for ongoing operational and monthly billing support for the smart metering system, unless otherwise specified in the Contract. Notwithstanding the concurrent operation of these periods, the Contractor shall remain fully responsible for performing all maintenance services in accordance with the Maintenance requirements of the Contract. The existence of the Defects Liability Period or Warranty Period shall not relieve the Contractor of its obligations to provide routine inspections, preventive maintenance, system support, and operational assistance during the Maintenance Period.
- Outstanding retention shall be paid after the “**Defects liability period ends/expires**” and obtained the “**Final Completion Certificate and Closed-Out report**” or similar approval from ACSA.

Summary of Contract – Specific Bills of Quantities (BoQ's) corresponding to Annexure A1 the full BoQ	
Description	Total Amount (Excl. VAT)
Part A: Preliminaries and Generals (P&G's).	R
Part B: Contractor Design for the Smart Water & Electricity AMR system.	R
Part C: Procurement, delivery, and installations.	R
Part D: Electrical works.	R
Part E: AMR software and system integration.	R
Part F: Testing and commissioning of a fully completed AMR system and handover.	R
Part G: Annual Lump Sum Amount for Permits and Training (CAPEX)	R 40 000
Part H: Decommissioning and Salvaging of the Existing Meters	R
Total CAPEX (Total Project Value – Sum of part A to H), Excluding VAT, (Less Salvage)	