



# NAIROBI CITY WATER & SEWERAGE COMPANY LTD.

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NCWSC/SCD/CONT/39/2023/VOL.III/8824/BKK

11<sup>th</sup> January, 2024

**ALL BIDDERS**

To \_\_\_\_\_

Dear Sir,

**RE: ADDENDUM NO. 1 - NCWSC/39/2023 - SUPPLY AND DELIVERY OF 15MM DOMESTIC VOLUMETRIC WATER METERS.**

Bidders are advised to take note of the changes on the prices schedule and technical specification as per annex 1.

The closing date still remains as **Friday, 9<sup>th</sup> February, 2024 at 12:00 noon.**

Benedict Kiema  
**For Managing Director**

*Board of Directors:*

*A. Karanja (Chairman), B. Okumu (Vice-Chair), N.C.C. C.E.C.M. Finance & Economic Planning, N.C.C. C.E.C.M. Green Nairobi, R. Hassan, E. Mukuhi, C. Alaro, E. Wamuiya, J. Mukabwa, Eng. N. M. Muguna (Managing Director)*

**ANNEX 1 PRICE SCHEDULE FORMS**

**PREAMBLE**

1. Attention is directed to the Form of Bid, the Instruction to Bidders, the conditions of contract and the specifications, which documents are to be read in conjunction with these Bills of Quantities.

2. General directions and descriptions of material as given in the General conditions of Contract and specifications are not necessarily repeated in the Bills of Quantities.

3. In pricing the goods the Bidder shall cover himself and shall be deemed to have covered himself for: -

(a) All services and materials which according to the true intent and meaning of the Contract may be reasonably inferred as necessary as for the completion of delivery of the materials in sound condition to the Nairobi City Water & Sewerage Company's and inclusive of all charges contingencies etc

(b) All the duties obligations, liabilities and responsibilities and incidental/services which the Contract Document places upon the Supplier, in connection with or relation to the contract.

***This document shall be completed neatly in ink or in typescript, all Correction or amendments to be initialed.***

NO	DESCRIPTION	QUANTITY	UNIT COST Ksh	TOTAL Ksh
1.	15mm Domestic Water Meters (Volumetric)	12,000		
2.	20mm Domestic Water Meters (Volumetric)	1,500		
3.	25mm Domestic Water Meters (Volumetric)	1,500		
<b>SUB-TOTAL</b>				
<b>Add 16% VAT</b>				
<b>GRAND TOTAL</b>				
<b>AMOUNT IN WORDS;</b>				

**Shortest Delivery Period after award and receipt of LPO: .....**

**Name of Bidder.....**

**Physical Address.....**

**Building.....**

**Town.....**

**Name of Authorized Representative of Bidder.....**

**Signature.....**

**Date.....**

## Technical Specifications

### Technical Specification for 15mm, 20mm and 25mm Domestic Water Meters (Volumetric)

#### **Meter Scope**

##### **1.0 Domestic water meter for house connection.**

The meter shall comply with AWWA C710-20, OIML R49 and ISO 4064 standards together with the MID 2014/32/EU. In addition, it shall comply with the EEC Council Directive No. 75/33/EEC. The meter shall have ratio  $Q_3/Q_1$  (R) of 200 or above. The meter must be new and manufactured within the year of delivery. The domestic water meter shall be supplied as a complete kit with BSP threaded inlet and outlet tail coupling kits for connection to water pipes. The meter shall be of an oscillating piston positive in action which can be installed in all positions while maintaining its metrological characteristics.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

##### **2.0 Meter Manufacturer Certification**

The meter manufacturer must have MID 2004/22/EC certification for the meters to be supplied. Certified copies of the certifications must be attached with the tender.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

##### **3.0 Meter Design:**

The domestic water meter shall be volumetric (piston) type for fully treated water. The meter should be designed for external tropical installation.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

##### **4.0 Meter Materials**

**4.1 General:** The materials used in the construction of the meter should be designed to withstand treated (potable) water in Nairobi City Water Distribution System, the climatic conditions of Nairobi City and all potable water supplied to WHO International regulations and to operate normally for a minimum of 5 years without any need for normal maintenance or repair and without the maximum error exceeding the specified limits. The domestic water meter must be constructed throughout of materials which are resistant to internal and external corrosion and if necessary be protected by some suitable surface treatment. All materials of the water meter which are in contact with the water flowing through the water meter shall be non-toxic and non-tainting. Water temperature variations within the working range shall not affect the materials used in the construction of the water meter.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**4.2 Meter Bodies:** The domestic water meter shall have a durable measuring chamber in which the piston operates. The mounting casing shall not be repaired in any manner. The inlet and outlet shall have a common axis.

The outer body casing shall be of split case type with upper part fitted to the lower part by means of cap and a watertight seal inserted between the two. Alternatively, the outer casing may consist of two threaded parts, which screw together.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

## 5.0 Plastic Water Meters

The outer casing must be of highly reinforced composite material in compliance with EEC 75/33 directives and OIML R49 recommendations. The measuring element shall be of high grade polymer to ensure minimum wear and a high degree of reliability.

Alternative consideration may be given to meter body casing made from other composite materials other than the above if such materials have technical advantages and life expectancy under normal use in excess of 10 years.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**6.0 Serial Number:** On every meter body there shall be marked the nominal diameter of the meter (e.g. DN 15 mm), the meter model, an arrow indicating the direction of flow in indelible marking cast in raised characters, in very easily visible position on the outer case of the meters, **but NOT on the lid**. The letters "NCWSC" followed by the serial number (e.g. NCWSC 1512345622V) in one continuous string should be engraved on the meter body and laser marked on the upper part of the totalizer in Number and Barcode, near the index, in big letters (5mm minimum height) and not on any transparent part of the totalizer. The set of the serial numbers to be used will be issued by NCWSC to the winning bidder.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**7.0 External Case Bolts:** Where external case bolts, screws, cap bolts, nuts and washers form part of the meter design these shall be arranged for ease of removal after long service. They shall be of the same composition as the meter casing if appropriate or of stainless steel.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

## 8.0 Type of Dial / Register

The meter dial must be circular, straight reading in cubic meters (M<sup>3</sup>) of "Hermetically Sealed Dry Dial Register", IP68. No portion of the register shall be in contact with the measured water. (Meters with numbered drums in contact with the water being measured are not acceptable)

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

## 9.0 Transmission.

The transmission between the piston and the dial shall be either mechanical or magnetic type. It should have high protection against external magnetic fields.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

## 10.0 Connectors:

Meter body casing nipple shall have an external straight DN 15mm, DN 20mm and DN 25mm BSP threads respectively. Coupling nuts shall have internal BSP threads of the same nominal pitch and diameter as in each case of the meter body. They shall be of the same composition as the meter casing. The tailpiece connections shall have external BSP taper thread of the same size as the nominal diameter of the meter.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**11.0 Meter Size:** The domestic meter must correspond to OIML R-49, ISO 4064 and AWWA C710-20 standards and no deviations from this shall be accepted. The length of the water meters shall be within the following range:

Nominal Diameter	mm	15	20	25
Length	mm	110-190	165-190	178-260

The length of a meter with connectors screwed on shall be between 200 and 275mm.

**12.0 Counter:** The meter shall have a transparent window that shall be durable, impact resistant, and scratch resistant and that does not turn opaque.

The indicator shall provide for reliable and unambiguous direct reading of the volume of water measured in cubic meters (m<sup>3</sup>) and liters. The indications of volume shall be by any of the two types as follows: -

Type 1 By a row of inline consecutive digits in one or more apertures  
(Drum counters);

or

Type 2 A combination of drum counters for whole units of cubic meters and pointers on circular scales for fractions of cubic meters.

Drum counters shall be black for indication of a cubic meter and its multiples shall be red for indication of fractions of a cubic meter. Visible movements of the digits shall be upwards and the actual height of the digits on the drums shall not be less than 4 mm. The advance of a digital unit shall be completed while the next lower valued digit is within the last tenth of its travel. The drums showing digits of lowest value shall move continuously in Type 1, and may move continuously in Type 2. Indicators with pointers (Type 2) shall rotate in a clockwise direction. The value of each division on the scales shall be expressed in multiples or sub-multiples of ten.

Each scale shall be graduated in cubic meters or accompanied by a multiplying factor (x0.0001, x0.001, x0.01, x0.1) according to the value of the scale. The symbol (m<sup>3</sup>) shall appear on the dial.

**The gear unit and the counter shall be combined and completely hermetically sealed. Unsealed counters shall not be accepted.**

The numbered drums shall be contained in a transparent hermetically sealed capsule, IP68. The counter shall be placed in a window of adequate thickness in the meter body and be placed so as to allow for ease of meter reading. Black numbers on white shall denote cubic meters and white numbers on red shall denote litres.

The meter shall be pre-equipped for retrofitting with new generation bi-directional pulse emitter.

The meter, pre-equipment and the proposed communication equipment should be insensitive to magnets of up to 3850 gauss.

The indicator shall, as minimum requirement, record the following values:

Size of Meter (DN)	Minimum Registration (m <sup>3</sup> )	Registration before Self Re-Set (m <sup>3</sup> )
15mm, 20mm, 25mm	0.0001	99,999

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**13.0 Tightness, Pressure and Temperature Resistance:** The water meter shall permanently sustain (without leakage, malfunctioning or permanent deformation) a minimum working pressure of 10 bar, a test pressure of 2.5 times the working pressure and be suitable for water temperatures up to 50 degrees Celsius.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**14.0 Measuring Chamber:** The measuring chamber shall be self-contained unit, smoothly finished, firmly seated, and easily removed from the main casing and shall not be produced as part of the main casing. The chamber shall be secured in the main casing so that the accuracy of the meter will not be affected by any distortion of the main case that may occur with operating pressure less than 16 bars.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**15.0 Rotary Piston:** Piston shall be smoothly finished and equipped with thrust rollers. The piston spindles shall be fastened securely. It should have sufficient dimensional stability to retain operating clearance at working temperatures up to 50°C. A designed life expectancy in excess of 10 years is expected.

The meters shall operate at PH 6.5 – 8.5

Tenderer shall specify the optimum pH and the water quality for which the meters have been designed.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

#### **16.0 Meter Protection**

**16.1 Strainers:** The meter shall have strainer screen that is rigid, fit snugly, be easy to remove and have an effective straining area at least double the main casing inlet.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

#### **16.2 Reverse Flow Restrictor / Non-return Valves:**

All meters must be fitted with an in-built non removable maintenance free non return valve that shall prevent meter reversal.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**16.3 Sealing:** Water meters shall be provided with a means of sealing so that there shall be no possibility of dismantling or altering the water meter without visibly damaging the seal. The meters shall be sealed subsequent to manufacture and before delivery to the purchaser. The meter shall be provided with tamper resistant features such as but not limited to a rotating tamper proof cap connecting the counter to the measuring chamber.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**17.0 Registration Accuracy:**

*Normal Flow Rates or upper flow rate zone (Q<sub>2</sub>-Q<sub>4</sub>):* The meter shall register not less than 98.5% and not more than 101.5% of the water that passes through it at any rate of flow within the normal test flow limits as tabulated below.

*Minimum Flow Rate (Q<sub>1</sub>):* The meter shall register not less than 95% and not more than 105% of the water that passes through it at the minimum test flow rate to the lowest normal test flow rate as tabulated below.

ITEM	UNITS	DN 15mm	DN 20mm	DN 25mm	Permissible error In accordance to OIML R49 & ISO 4064	Permissible error
					Temp (0-30°C)	Temp (>30°C≤50°C)
Overload Flow (Q <sub>4</sub> )	m <sup>3</sup> /h	3.125	5	7.875	±2%	±3%
Permanent Flow (Q <sub>3</sub> )	m <sup>3</sup> /h	2.5	4	6.3	±2%	±3%
Transition Flow (Q <sub>2</sub> )	m <sup>3</sup> /h	0.02	0.032	0.0504	±2%	±3%
Minimum Flow (Q <sub>1</sub> )	m <sup>3</sup> /h	0.0125	0.02	0.0315	±5%	±5%
Maximum Admissible Pressure (MAP)	bar	16	16	16		
Test Pressure [1.6MAP]	bar	25	25	25		
Indicating Range (Minimum Values)	m <sup>3</sup>	99,999	999999	999999		
Maximum Working Temperature	°C	50	50	50		

All flow measurements quoted are to be supported by a test certificate from the National Standards Institute (or a similar body) of the country of origin and Kenya Bureau of Standards.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**18.0 Headloss:** Characteristic curves of head losses plotted against the rate of flow from the minimum flow rate shall be provided by the Tenderer. The meters shall show a loss of head not exceeding 0.63 bars between Q<sub>1</sub> and Q<sub>3</sub> in accordance with the standards.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**19.0 Factory Visit:**

There shall be a factory visit by the procuring entity to the actual manufacturing plant of the meters to be supplied. This shall be to ascertain capacity and compliance to the contract specifications as per the submitted bidder's information. The visit shall be after notice of intent to award the contract and prior to signing of the contract agreement. The factory visit will be at the cost of the procuring entity.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**20.0 Testing of Meters:** Testing of the meters shall be done in accordance to OIML 49: 2013 and ISO 4064.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**20.1 Tendering Sample Meters:** The tenderer shall provide three (3) sample meters of either size required two days prior to bid opening date. Upon receipt of the samples, the supply chain manager shall register the samples and issue an acknowledgement receipt. During evaluation two sample meters shall be tested for accuracy and pressure at NCWSC meter testing bench. One of the tested meters shall then be stripped to ascertain compliance of the physical components to the specifications. A detailed report shall be prepared. In case of any dispute on the test results, the remaining meter will be tested and checked at KEBS in the presence of the bidder and NCWSC representative at the bidders cost. The KEBS results shall be final.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**20.2 Testing on Delivery of Meters:** A systematic random sampling of ten percent (10%) of the delivered meters in sequentially serialized batches of one hundred (100) meters shall be tested at the NCWSC's meter test bench.

If 2 or more out of the sampled 10 meters in a batch fails, then the batch shall be subjected to requirements of clause 20.3 upon acceptance by the supplier.

In case of a dispute the failed meters shall be re-tested by the Kenya Bureau of Standards (KEBS) to verify the results at the Bidder's cost.

The results from KEBS shall be final. If NCWSC results are upheld and the supplier disagrees with requirements of clause 20.3, then the batch shall be rejected.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**20.3 Non-conformance in accuracy test:** A batch shall be considered as having failed if more than ten percent (>10%) of the tested meters fail the test.

Under these circumstances the whole batch shall be subjected to 100% testing and only the meters that pass shall be accepted and the failed meters shall be rejected and returned to the supplier. The cost of testing shall be charged to the contract at a rate of Kes.400 per meter.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

### **21.0 Manufacturing defects**

These shall include but not limited to leakage, cracked body, faulty dials, stopped meter.

Detection of any of the above on any meter shall be considered as a manufacturing defect then: -

I. The entire consignment shall be tested 100% on the identified manufacturing defects and only the meters that pass shall be accepted and the failed meters shall be rejected. The rejected meters shall be collected by the supplier at their cost. The cost of testing shall be charged to the contract at a rate of Kes.400 per meter.

II. The supplier shall be instructed to deliver another consignment within 60days. If this consignment is also found to have manufacturing defects, contract termination shall commence immediately in accordance to clause 35 of GCC and concluded after finalization of testing defined in item (I) above. No further delivery shall be accepted.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_



**22.0 Design Workmanship and Materials:** The meters shall be guaranteed against defects in materials and workmanship for a minimum period of two years from date of delivery subject to their being used only for the measurement of portable water under the normal conditions of flow, pressure and temperature recommended by the manufacturers for the size and type of meter concerned. The supplier shall provide durability test certificates for all deliveries.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**23.0 Packaging:** Packing shall be made of strong carton box, and inside such carton box, each meter plus the associated fittings shall be packed in its own carton box. The meters shall further be packed in batches of 10 meters. The cartons shall be labelled with the meter model, meter serial number, manufacturer's logo and contacts.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**24.0 Maintenance manuals:**

A complete set of maintenance manuals in ENGLISH, spare parts lists, extruded drawings, wall charts required for maintaining the meters or in carrying out tests are to be provided with the tender.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**25.0 After sales service:**

Address of the local agents technical advisors and details of after sales-service shall be submitted together with each tender. Information on stocks of meters and meter spares, which will be held by the local agents, is also to be stated in the tender.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**26.0 Meter test certificates**

During delivery each meter shall be accompanied by the following test certificates in accordance to OIML R49 2013

1. Accuracy testing
2. Pressure testing

Each delivered consignment shall be accompanied by a durability certificate.

Compliance (YES/NO): \_\_\_\_\_

Comments: \_\_\_\_\_

**27.0 Additional information:** The tenderer is at liberty to provide additional operational information on the meter not catered for in this document like rotating of the register for almost 360° etc

**Summary of the technical data of the goods**

Tenderer must complete the attached Annex A, which summarizes the technical data of the goods being offered under this tender.

**ANNEX 'A' TO TECHNICAL SPECIFICATION**

(To be completed by all Tenderer)

A. Type/Model of meter: .....

METER SIZE	MIN. FLOW RATE Q1 M <sup>3</sup> /h	PERMANENT FLOW RATE Q3 M <sup>3</sup> /h	OVERLOAD FLOW RATE Q4 M <sup>3</sup> /h	OUTER CASING TYPE	MAX. ADMISSIBLE PRESSURE (BARS)	MAX. ADMISSIBLE TEMP. (°C)	PRE-EQUIPPED FOR REMOTE READING. ( Yes / No)
15 mm							
20mm							
25mm							

B. Copies of test certificates from manufacturer shall be attached.

C. After-sales service of the meters can be carried out by (Name of Local Agent)

.....

Located at ..... Box No. ....

Telephone .....

Contact Person .....

### 1. List of Goods and Delivery Schedule

S/No	Item Description	Unit	Delivery Time Required	Tenderers Delivery time offered
1.	15mm Domestic Water Meters (Volumetric)	20,000 pcs	After Issuance of LPO	
2.	20mm Domestic Water Meters (Volumetric)	1,500 pcs	After Issuance of LPO	
3.	25mm Domestic Water Meters (Volumetric)	1,500 pcs	After Issuance of LPO	