

# Millennium Development Authority (MiDA)

## RE: PROCUREMENT OF METER MANAGEMENT SYSTEM (MMS) FOR ELECTRICITY COMPANY OF GHANA LIMITED (ECG)

**Bid Ref: 5130400/IFB/CB/04/18**

### **Clarifications on Item References in Sections IV. & VII. of the Bidding Document**

#### **Questions:**

“In reference to your detailed question below regarding missing information, please find the concerned chapters here:

Please find the page and items references. The same items have been **highlighted** in the attached document.

Pages 220 and 523 item 34: “As specified in section 11.0” è we cannot find this section 11.0

Pages 225 and 528 item 52: “As specified in section 38 (i) of the specification” è **We cannot find section 38 (i)**

Pages 225 and 528 Item 53: “As specified in section 38 (ii) of the specification” è **We cannot find section 38 (ii)**

Pages 226 and 528 Item 60: “As in section 16.0” è **We cannot find section 16.0**

Pages 242 and 542 (Item 32.0), pages 244 and 543 (Item 33.0): “As indicated in section 3.12 of specification” è **We cannot find the relevant section 3.12**

Pages 244 and 544 Item 38.0: “Complete Type Test reports as specified in section 2.10 of the specification.” è **We cannot find the relevant section 2.10.** “

#### **Clarifications:**

Find below, the same items have been **highlighted** in yellow markers in the attached document and revised references are provided in Annexes attached herewith.

#### **1) Section IV. Bidding Forms- Revised References**

Sr. No.	Description	Purchaser's Minimum Requirement	Bidder's Response
---------	-------------	---------------------------------	-------------------

		Original Reference	Revised Reference	Compliant / Non-Compliant	Remarks
	Form Tech 4.33 MMS 22 - CT/VT OPERATED METERS (Items 34, 52, 53 & 60)				
34	Material for base / terminal block, Material for Meter cover and terminal cover	As specified in section 11.0	See Annex A in the Clarification on MMS		
52	Routine test and Acceptance Tests	As specified in section 38 (i) of the specification	See Annex B in the Clarification on MMS		
53	Type tests	As specified in section 38 (ii) of the specification. Type test to be submitted with the offer.	See Annex C in the Clarification on MMS		
60	Meter Terminal Connection Arrangement	As in section 16.0	See Annex D in the Clarification on MMS		
	Form Tech 4.35 MMS 24 - WHOLE CURRENT PREPAYMENT METER (in Items 32, 33, 36 & 38)				
32	Tamper & Fraud Protection Features	Single Phase: As indicated in section 3.12 of specification  Three Phase As indicated in section 3.12 of the specification.	See Annex E in the Clarification on MMS		

Sr. No.	Description	Purchaser's Minimum Requirement		Bidder's Response	
		Original Reference	Revised Reference	Compliant / Non-Compliant	Remarks
33	Meter Display on key in of numeric codes (Mandatory Sequence)	<p>Available account balance</p> <p>Money used in current month with corresponding consumption.</p> <p>Consumption history in Ghana Cedis and kWh both for previous day.</p> <p>Consumption history in Ghana Cedis and kWh both for previous month</p> <p>Consumption history in Ghana Cedis and kWh covering the previous twelve months</p> <p>The days left based on the last seven days average consumption and the available account balance kWh and the cost in Ghana Cedis /hr.</p> <p>Tariff details such as the applicable tariff rates, fixed/standing charge, Monthly Fixed Charges and the applicable tax (Display per block)</p> <p>Last five Recharge codes entered on 5 separate displays</p> <p>Total credit added till date</p> <p>Current Month MD information along with date and time</p> <p>11. GPRS communication status: ON/OFF</p> <p>This status indication shall be as follows;</p>			

Sr. No.	Description	Purchaser's Minimum Requirement		Bidder's Response	
		Original Reference	Revised Reference	Compliant / Non-Compliant	Remarks
		<p>a) The ON status means that the signal level is strong enough for communication</p> <p>b) The OFF status low signal level</p> <p>The ON/OFF indication shall be available both on meter and split unit displays at all times.</p> <p>12. TOD Maximum Demand (kW) registers as defined at the time of ordering.</p> <p>TOD Active Energy (Cumulative kWh) Registers as defined at the time of ordering.</p> <p>All tampers described in section 3.12 of the specification.</p>	See Annex F in the Clarification on MMS		
36	Material for base / terminal block, Material for Meter and terminal cover	As per section 3.10 of the specification.	See Annex G in the Clarification on MMS		
38	Type Test	Complete Type Test reports as specified in section 2.10 of the specification.	See Annex H in the Clarification on MMS		

## Section VII. Purchaser's Requirements - Revised References

Sr. No.	Description	Purchaser's Minimum Requirement	
		Original Reference	Revised Reference
	2.8.22 MMS - CT/VT OPERATED METERS (in Items 34, 52, 53 & 60)		
34	Material for base / terminal block, Material for Meter cover and terminal cover	As specified in section 11.0	See Annex A in the Clarification on MMS
52	Routine test and Acceptance Tests	As specified in section 38 (i) of the specification	See Annex B in the Clarification on MMS
53	Type tests	As specified in section 38 (ii) of the specification. Type test to be submitted with the offer.	See Annex C in the Clarification on MMS
60	Meter Terminal Connection Arrangement	As in section 16.0	See Annex D in the Clarification on MMS
	2.8.24 MMS - WHOLE CURRENT PREPAYMENT METER (in Items 32, 33, 36 & 38)		
32	Tamper & Fraud Protection Features	Single Phase: As indicated in section 3.12 of specification  Three Phase As indicated in section 3.12 of the specification.	See Annex E in the Clarification on MMS
33	Meter Display on	Available account balance Money used in current month with corresponding consumption. Consumption history in Ghana Cedis and kWh both for previous day. Consumption history in Ghana Cedis and kWh both for previous month	

Sr. No.	Description	Purchaser's Minimum Requirement	
		Original Reference	Revised Reference
	key in of numeric codes (Mandatory Sequence)	<p>Consumption history in Ghana Cedis and kWh covering the previous twelve months The days left based on the last seven days average consumption and the available account balance kWh and the cost in Ghana Cedis /hr. Tariff details such as the applicable tariff rates, fixed/standing charge, Monthly Fixed Charges and the applicable tax (Display per block) Last five Recharge codes entered on 5 separate displays Total credit added till date Current Month MD information along with date and time 11. GPRS communication status: ON/OFF This status indication shall be as follows; a) The ON status means that the signal level is strong enough for communication b) The OFF status low signal level The ON/OFF indication shall be available both on meter and split unit displays at all times. 12. TOD Maximum Demand (kW) registers as defined at the time of ordering. TOD Active Energy (Cumulative kWh) Registers as defined at the time of ordering.</p> <p>All tampers described in section 3.12 of the specification.</p>	See Annex F in the Clarification on MMS
36	Material for base / terminal block, Material for Meter and terminal cover	As per section 3.10 of the specification.	See Annex G in the Clarification on MMS
38	Type Test	Complete Type Test reports as specified in section 2.10 of the specification.	See Annex H in the Clarification on MMS

## Annexes- Clarifications on MMS

### **MMS 22 - CT/VT OPERATED METERS (Items 34, 52, 53 & 60)**

- a) **Item 34:** Material for base / terminal block, Material for Meter cover and terminal cover
- b) **Original Reference:** As specified in section 11.0.

### **ANNEX A: GENERAL AND CONSTRUCTIONAL REQUIREMENTS:**

- i) Meters shall be designed and constructed in such a way so as to avoid causing any danger during use and under normal conditions. However the following should be ensured :-
  - a) Personnel safety against electric shock
  - b) Personnel safety against effects of excessive temperature
  - c) Protection against spread of fire
  - d) Protection against penetration of solid objects, dust and water (IP 53)
- ii) All the materials and electronic power components used in the manufacture of the meter shall be of highest quality and reputed make to ensure higher reliability, longer life and sustained accuracy. The bidder shall provide quality assurance of the meter component parts from the factory.
- iii) There shall be designed with application specific integrated circuits. The electronic components shall be mounted on the printed circuit board using latest Surface Mount Technology (SMT).
- iv) Modem for the remote reading/communication shall be integral part of the meter and it shall be connected through one RS 485 Port with 1 x RJ-45 /RJ-11 connection.
- v) All insulating materials used in the construction of meters shall be non-hygroscopic, non-aging and of tested quality. All parts that are likely to develop corrosion shall be effectively protected against corrosion by providing suitable protective coating. The bidder shall provide quality assurance test of insulating materials used in the construction.
- vi) The meter shall have an operation indication device such as a Blinking LED/LCD and direction indication of active and reactive power flow. The operation indicators shall be visible from the front Window
- vii) The meter shall conform to the degree of protection IP 53 of IEC 60529 for protection against ingress of dust, moisture and vermin.

- viii) The meter shall be supplied with an extended transparent terminal-block cover (ETBC)
  - ix) The meter-base, meter-cover, terminal block and ETBC shall be made of unbreakable, high grade, fire-resistant, reinforced, non-inflammable, high-grade and good quality engineering plastic.
  - x) The meter-cover shall have one window. The window shall be of transparent, UV stabilized polycarbonate or equivalent high grade engineering plastic for easily reading all the displayed values/parameters, name plate details and observation of operation indicator. The window shall be ultra-sonically welded with the meter cover such that it cannot be removed undamaged without breaking the meter cover seals
  - xi) The terminal block with ETBC and the meter case shall ensure reasonable safety against the spread of fire and should not be ignited by thermic overload of live parts in contact with them.
  - xii) The terminal block shall be of high grade non-hygroscopic, fire-retardant, low-tracking, fire-resistant, high grade engineering plastic (not Bakelite) which should form an extension of the meter case, meeting the requirement of Clause No.4.2.4 of IEC 1036-1996.
- a) **Item 52:** Routine test and Acceptance Tests
  - b) **Original Reference:** As specified in section 38 (i) of the specification

## **ANNEX B: TESTING OF METERS**

### **I. Routine Tests**

Non applicable



- a) **Item 53:** Type Tests
- b) **Original Reference:** As specified in section 38 (ii) of the specification. Type test to be submitted with the offer.

## ANNEX C: Type Tests

### II. Type Tests

The test reports/certificate/records for all type tests specified having been successfully performed in an independent third party laboratory on the type of the meter offered shall be submitted with the tender.

The type tests shall include all as specified below.in accordance with IEC 62053.

1. Performance requirement of meter
2. Test of insulation properties
3. Impulse voltage test of electric
4. Circuits relative to earth
5. AC Voltage test
6. Test for electromagnetic compatibility
7. Test of the effect of climatic environment
8. Mechanical tests

- a) **Item 60:** Meter Terminal Connection Arrangement
- b) **Original Reference:** As in section 16.0

## ANNEX D: TERMINAL CABLE ARRANGEMENT

Cable entry holes in the meter terminal block shall be capable of receiving cables up to 6mm<sup>2</sup> for current and 4 mm<sup>2</sup> for voltage. There shall be eight terminal holes for 4-wire connection of current and voltage arranged from left to right when facing the meter as follows:

### Terminal arrangement

Load<sub>in</sub> (from phase1 CT marked S1)—Voltage 1 (from phase1)—Load<sub>out</sub>,(from phase1 CT marked S2)— Load<sub>in</sub> (from phase 2 CT marked S1)—Voltage 2 (from phase 2)— Load<sub>out</sub>, (from phase 2 CT marked S2)— Load<sub>in</sub> (from phase 3 CT marked S1)—Voltage 3 (from phase 3)— Load<sub>out</sub>, (from phase 3 CT marked S3) Neutral- Neutral.

*The voltage cable holes shall be arranged either on the same side as the current holes or vertically above the current holes.*

MMS 24 - WHOLE CURRENT PREPAYMENT METER (in Items 32, 33, 36 & 38)

- a) **Item 32:** Tamper & Fraud Protection Features
- b) **Original Reference:** Single Phase: As indicated in section 3.12 of specification.  
Three Phase: As indicated in section 3.12 of the specification.

**ANNEX E: TAMPER AND FRAUD PROTECTION FEATURES**

The meter shall have tamper and fraud protection features which shall record all tampers with date and time stamp of occurrence and restoration. Tamper and fraud data up to 100 number of events per month shall be recorded in the meter memory which shall be downloadable using Optical Port, RF Module or via the meter management system (MMS). Tampers shall also appear on the customer interface unit (CIU) display for viewing by the customer. The tamper feature shall allow the meter to continue to register active energy correctly under the following conditions:

- a. Interchange of Main and Load: Correct energy registration even on interchange of one or more phases of main and load- the reverse indication in the form of blinking phase LED to indicate which phase is reverse.
- b. Meter should remain functional even when either of any phases or any one phase along with neutral is available to the meter and record correct energy.
- c. The meter alone shall be immune to tamper using external magnet with a permanent magnetic field of 0.27 Tesla or more. The meter shall log the event and record energy in deterrent mode i.e. start recording 150% of the maximum current rating of the meter at nominal voltage till the magnet is removed or the meter should trip.

The meter shall be provided with built in logic/ indication and sensor to detect tamper beyond meter's magnetic immunity level and display such occurrences. The meter accuracy and accuracy of display shall not be affected by permanent magnetic field up to the meter's magnetic immunity level.

- d. The meter should work accurately irrespective of phase sequence of mains supply.
- e. The meter should record energy as per voltage measured between incoming phase and neutral terminals when DC signal is injected on the neutral terminal of the meter through Diode. The test in this condition will be carried out at voltage reference applied to incoming phase and input terminal of diode.

f. The meter shall work accurately irrespective of failure of the latching relay and the GSM/GPRS modem.

g. The meter shall work accurately even if abnormally high voltage or Frequency, with reference to the normal system conditions stated in system condition, is applied to the terminals. The meter shall log this event and then trip.

Tampers are categorized in the meters as follows. For each tamper, the meter shall record energy correctly within its tolerance limit of class 1.

- a) **Item 33:** Meter Display on key in of numeric codes (Mandatory Sequence)
- b) **Original Reference:** All tampers described in section 3.12 of the specification.

**ANNEX F: See Item 32 above**

- c) **Item 36:** Material for base / terminal block, Material for Meter and terminal cover
- a) **Original Reference:** As per section 3.10 of the specification.

## **ANNEX G: CONSTRUCTIONAL REQUIREMENTS**

### **METER CASE:**

The meter shall have a completely insulated body mounted on a DIN-rail in an enclosure. The meter shall have a case made of unbreakable high grade fire resistant, reinforced polycarbonate or equivalent high grade engineering plastic which shall be sealed/welded in such a way that the internal parts of the meter are accessible only after breaking the meter case.

### **TERMINAL BLOCK:**

- a) The terminal block shall be made from best quality non-hygroscopic, fire retardant, reinforced polycarbonate or Bakelite or equivalent high grade engineering plastic which should form an extension of the meter case.

- b) The terminal holes of the single phase and three phase meters for connection shall be able to accommodate copper and aluminum cables up to 25mm<sup>2</sup>
- c) The single and three phase meters shall be provided with floating cage clamp, to connect the cables. Each clamping screw shall engage at least 3 threads in the terminals. The screws shall not have pointed edge at the end of thread. The clearance and creepage distance of terminal block and tips between the terminal and the surrounding parts of metal enclosure shall be as per IEC 62055-31.
- d) All parts of each terminal shall be such that the risk of corrosion resulting from contact with any other metal part shall be minimized.
- e) Electrical connections shall be so designed that contact pressure shall not be transmitted through insulating material.

**TERMINAL COVER:**

- i. The meter terminal block shall be provided with a transparent terminal cover with independent sealing arrangement in such a way that it covers the terminals, the conductor fixing screws, the external conductors and their insulation i.e. no part of meter or cable accessories are accessible from the front of the meter.
- ii. When the meter is mounted, no access to the terminals shall be possible without breaking the seal of the meter terminal cover.

***NB: Bidders are free to provide a hinged or unhinged terminal cover of the meter,.***

**TERMINAL ARRANGEMENT:**

A diagram of connections shall be provided inside the cover of the terminal block.

Terminal connection arrangement shall be as follows;

- a) **Single Phase Meters:** The meters shall be top and bottom connected as shown in the design drawings in **Appendix 12**; attached herewith.  
Phase (In)-Neutral-(In) from the top and Neutral-(Out)-Phase (Out) from the bottom.

b) **Three Phase Meters:** The meters shall be top and bottom connected as shown in the design drawings in Appendix 12

Phase-R (In)- Phase-R (Out), Phase-Y (In) Phase-Y (Out), Phase-B (In) Phase-B (Out), Neutral (In)-Neutral (Out)

*i. In and Out denote input and output respectively.*

*ii. The phase and the Neutral load conductors shall be separated per customer in case there is looping to avoid duplicated measurement.*

a) **Item 38:** Type Tests

b) **Original Reference:** Complete Type Test reports as specified in section 2.10 of the specification.

**ANNEX H: TYPE TESTS**

a) The following type tests shall be carried out in accordance with the Standard specified in each case by an independent accredited laboratory as specified in below.

<b>TYPE TEST</b>	<b>STANDARD</b>
Performance requirement of Prepayment Meter	IEC 62055
Test of Insulation Properties	IEC 62053-21, 62052-11
Impulse Voltage Test of Electric Circuits relative to Earth	IEC 62053-21, 62052-11
AC Voltage Test	IEC 62053-21, 62055-31
Test for Electromagnetic Compatibility	IEC 62053-21
Test of the effect of Climatic Environment	IEC 62053
Mechanical Tests	IEC 62053

b) The Bidder shall submit the type test report of their offered meters and the report shall not be older than three (3) years.

c) The Bidder shall also submit type test report for the Inbuilt Bi-stable Latch Relay that will be used for connection and disconnection. The type test report shall not be older than three (3) years.

The Bidder shall be required to provide certificates of conformance to DLMS/COSEM and STS for the meters as part of their bid.

- d) Type tests shall be required to be performed during the Factory Acceptance Test on the consignment of meters and the cost borne by the Contractor. These tests shall be witnessed by the Employer and/or its representative and not less than two units may, at the Employer's discretion, be chosen for testing.
- e) The Type Tests during FAT shall be dispensed with if the Contractor provides evidence to the Employer's satisfaction that the relevant tests have already been performed on identical equipment (i.e. equipment meeting all the required specifications) by any of the accredited laboratories listed below)

In this case the Contractor shall provide documentary proof in the form of Certified Test Certificates that the assembled equipment and its component parts have been successfully type tested by an independent testing authority in accordance with the relevant clauses of referenced Standards.

#### Employer

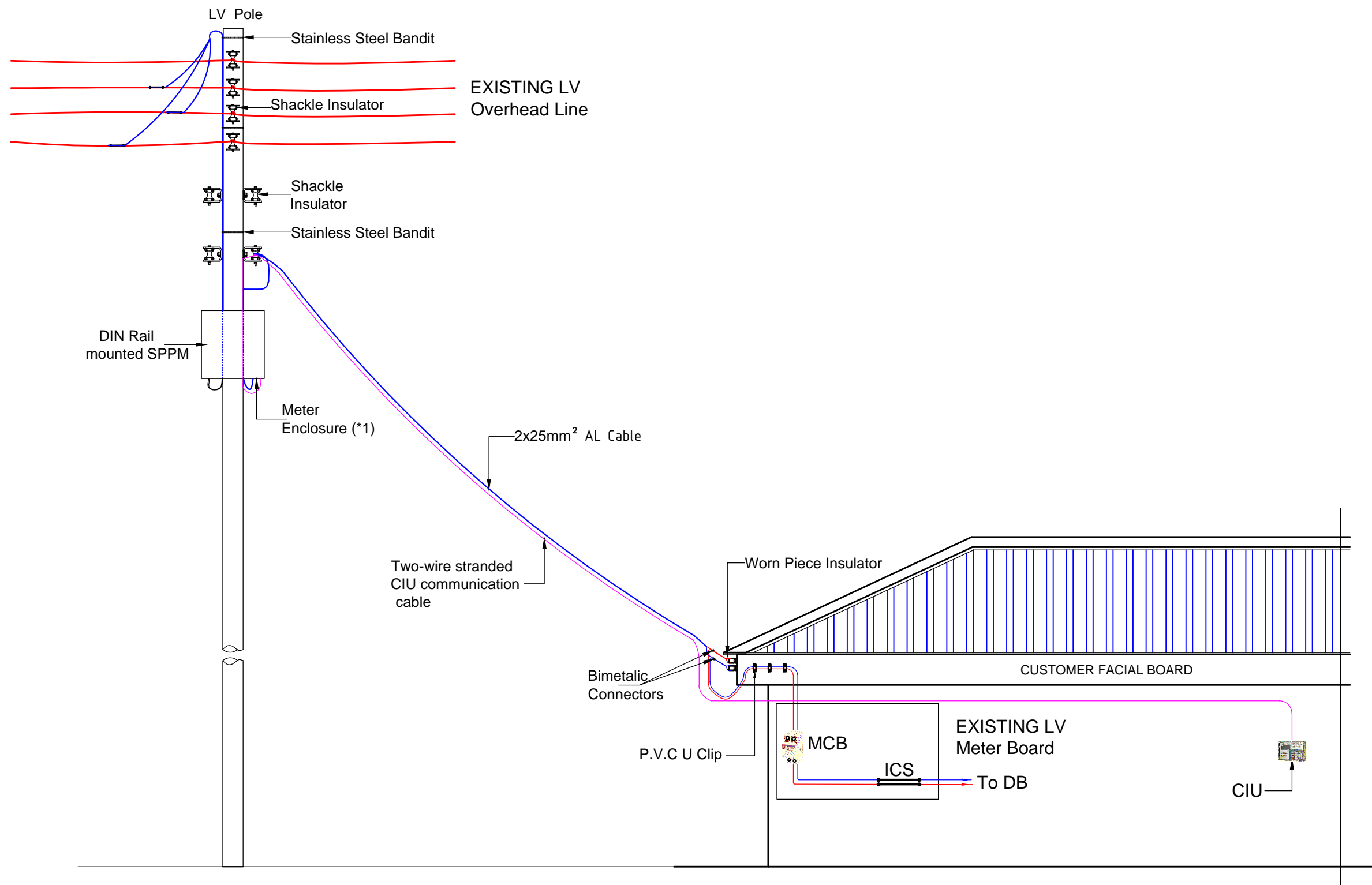
- f) Notwithstanding the fulfillment of any of the above, at any time during the currency of the contract, the Employer reserves the right to sample meters from within or across batch deliveries for routine testing. The cost of such tests shall be at the expense of the Contractor.

Should the meters fail any of the tests, the sampled batch or batches that failed the test shall be rejected by the Employer.

- g) Acceptable independent testing authorities include the following: KEMA-Holland, DNV-GL-India, CESI -Italy, EDF - France and IREQ, - Quebec, Canada CPRI-India, ERDA-India, SICEM-China, UL-USA and SABS-South Africa. Approval of type tests certificates supplied by any other authority is subject to the written acceptance of the Employer.

**SUPPLY, INSTALLATION AND COMMISSIONING OF  
PREPAYMENT METERING AND NORMALISATION OF  
ELECTRICITY CONNECTION SERVICES IN  
KANESHIE**

**APPENDIX 12  
DRAWINGS**



**LEGEND**  
 DB: Customers Distribution Board  
 MCB: Miniature circuit Breaker  
 CIU: Insulated Interface Unit  
 ICS: Insulated Inline Cable Splice

**NOTES**

1. The Meter is Mounted 1.5m Below The Neutral Wire
2. Supply Cable ( 25mm<sup>2</sup>, 4 core & P.V.C, H.D.P.E, AL) is Fastened Along the Pole at 1.5M Interval.
3. ICS Should be Insulated With Electrical Tape to Prevent Ingress of Water

Rev	Revision	Approved	Date

Client: **MILLENIUM DEVELOPMENT AUTHORITY ( MiDA ) GHANA**

OWNER: **ELECTRICITY COMPANY OF GHANA ( E.C.G )**

Consultant: **SMC**  
Member of the Surbana Jurong Group  
Website: www.smc.com

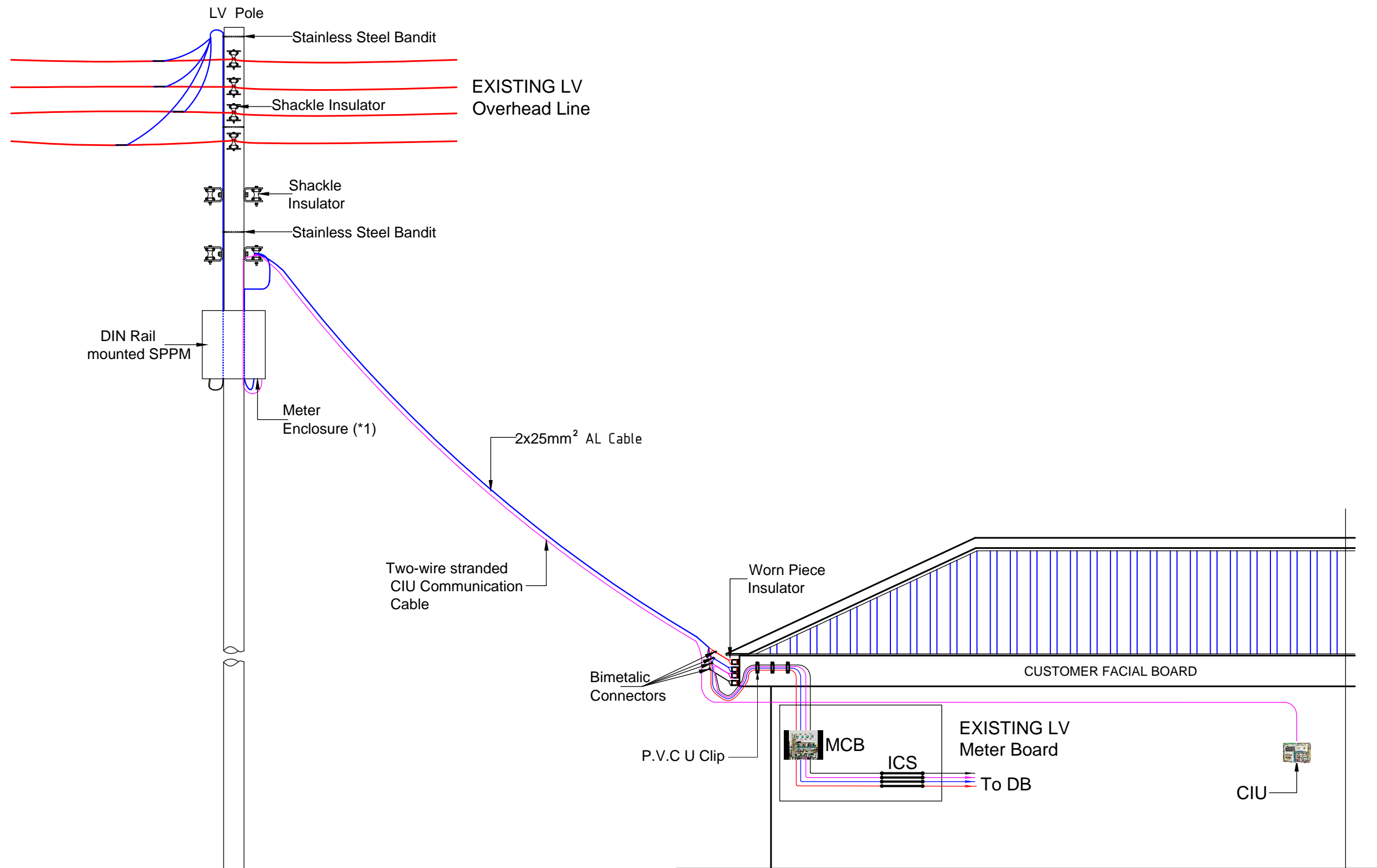
Project: **CONSULTANCY SERVICES FOR PROGRAM MANAGEMENT CONSULTANT**  
RFP: 5121100/RFP/QCBS/05/16

Title: **NORMALISATION OF SERVICE CONNECTION**  
**1-PHASE SERVICE ARRANGEMENT**

Drawn: F. ANANG	Date: AUGUST 2017
Designed: J. COLEMAN	Date: AUGUST 2017
Checked: L. MAATTSSON	Date: AUGUST 2017
Approved: M. DIZAMUHUPE	Date: AUGUST 2017

Drawing No.	Revision.
<b>PMC-5091019-004</b>	
Drawing Scale: NOT TO SCALE	Sheet Size.
	<b>A3</b>





**NOTES**

1. The meter is mounted 1.5m below the neutral wire

**LEGEND**

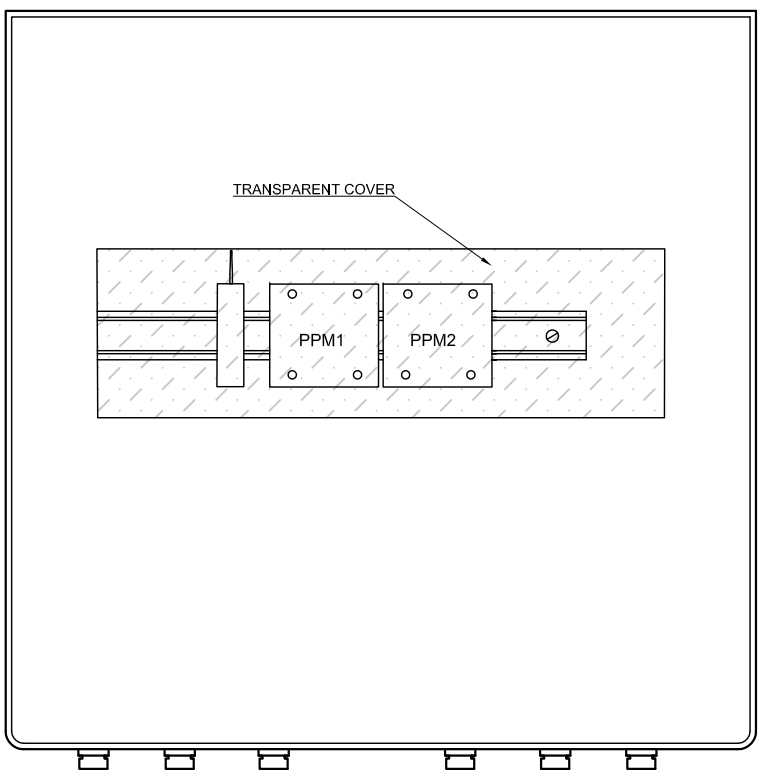
- DB: Customers Distribution Board
- MCB: Miniature circuit Breaker
- CIU: Insulated Interface Unit
- ICS: Insulated Inline Cable Splice

**NOTES**

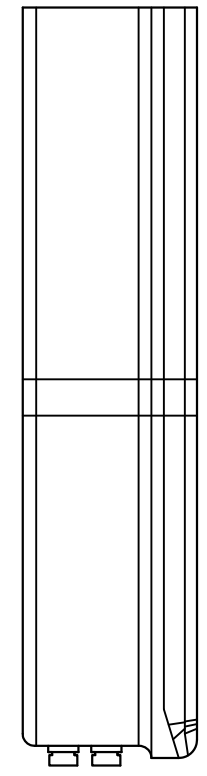
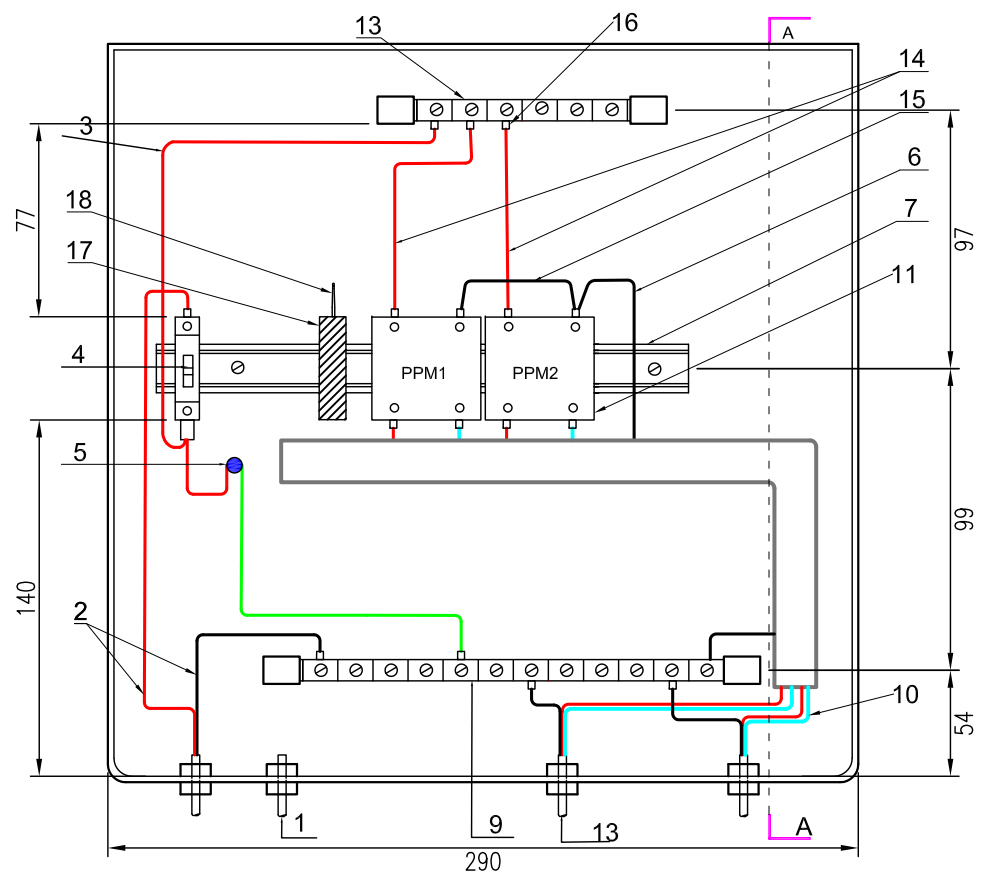
1. The Meter is Mounted 1.5m Below The Neutral Wire
2. Supply Cable ( 25mm<sup>2</sup>, 4 core & P.V.C, H.D.P.E, AL) is Fastened Along the Pole at 1.5M Interval.
3. ICS Should be Insulated With Electrical Tape to Prevent Ingress of Water

Rev	Revision	Approved	Date

Client:	 <b>MILLENIUM DEVELOPMENT AUTHORITY ( MiDA ) GHANA</b>
OWNER:	 <b>ELECTRICITY COMPANY OF GHANA ( E.C.G )</b>
Consultant:	 <b>SMC</b> <small>Member of the Surbana Jurong Group Website: www.smc.com</small>
Project:	<b>CONSULTANCY SERVICES FOR PROGRAM MANAGEMENT CONSULTANT</b> RFP: 5121100/RFP/QCBS/05/16
Title:	<b>NORMALISATION OF SERVICE CONNECTION</b> <b>3-PHASE SERVICE ARRANGEMENT</b>
Drawn:	F. ANANG Date: AUGUST 2017
Designed:	J. COLEMAN Date: AUGUST 2017
Checked:	L. MAATTSSON Date: AUGUST 2017
Approved:	M. DIZAMUHUPE Date: AUGUST 2017
Drawing No.	<b>PMC-5091019-005</b>
Revision:	
Drawing Scale:	NOT TO SCALE
Sheet Size:	<b>A3</b>
Drawing Status:	

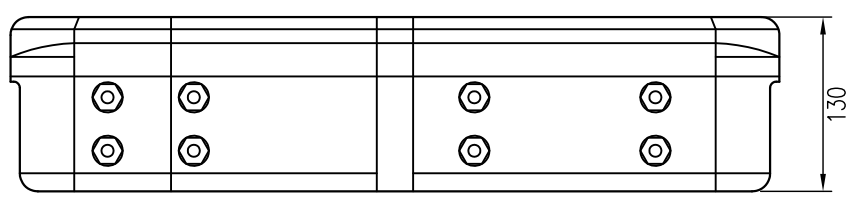


FRONT VIEW

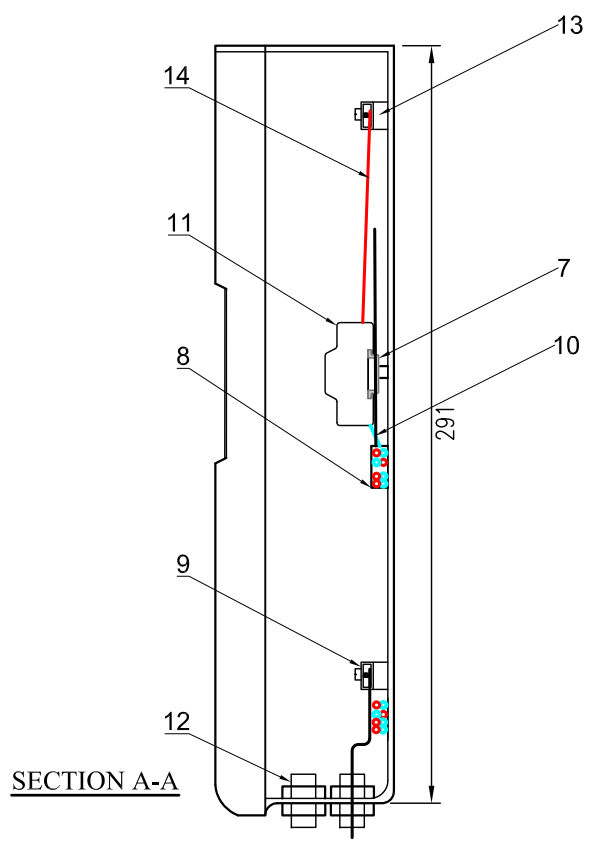


SIDE VIEW

KEYS			
No	Description	Unit	Qty
1	Cable Gland	No	8
2	Incoming 2x25sq mm Al cable from pole	m	3
3	4sq mm Cu cable from MCB to live bar	m	1
4	Single pole 100A MCB	No	1
5	Surge Arrester	No	1
6	16sq mm Cu cable from neutral bar to meter	m	1
7	Din-Rail	No	1
8	Cable Trunking (perforated type)	No	1
9	25sq mm, 12-way neutral bar	No	1
10	Communication Cable from meter to CIU	m	100
11	Prepayment Meter	No	2
12	Outgoing 2x 25sq mm Al load cable from meter to customer	m	70
13	25 sq mm, 6-way Live Bar	No	1
14	16sq mm Cu cable from live bar to meter	m	2
15	4sq mm Cu neutral cable for looping	m	2
16	Al and Cu Cable terminal lugs	No	Lot
17	GPRS Modem	No	1
18	Antenna	No	1



BASE VIEW

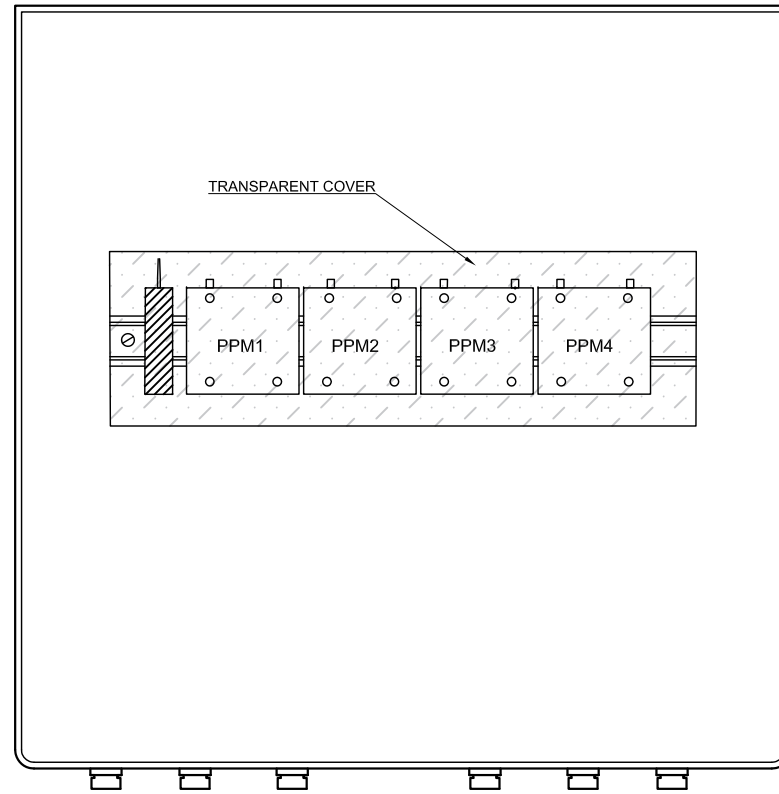


SECTION A-A

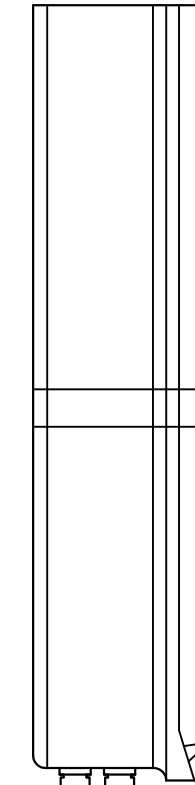
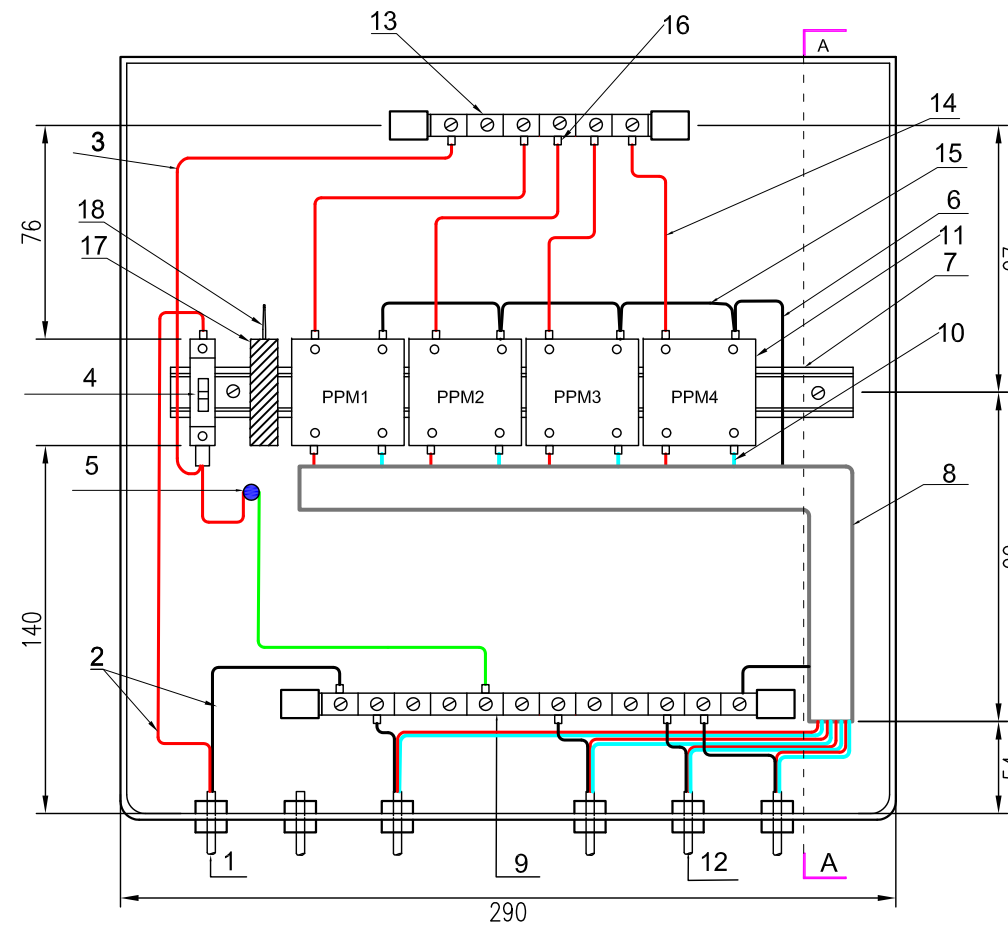
NOTES:

- 1 PPM1 and PPM2 shall be daisy chained to the modem via RS 485 port as per Drawing No PMC-5091019-C001/21
- 2 All dimensions are in mm

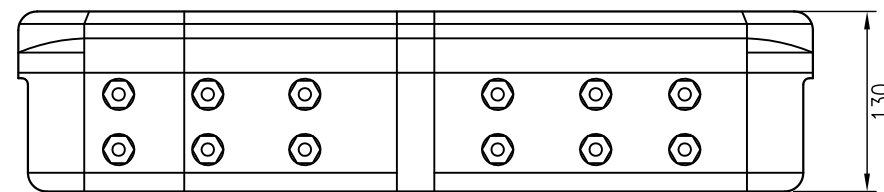
Rev	Revision	Approved	Date
Client:	MILLENNIUM DEVELOPMENT AUTHORITY ( MiDA ) GHANA		
OWNER:	ELECTRICITY COMPANY OF GHANA ( E.C.G )		
Consultant:	SMEC Member of the Surbana Jurong Group		
Project:	CONSULTANCY SERVICES FOR PROGRAM MANAGEMENT CONSULTANT RFP:5121100/RFP/QCB505/16		
Title:	2 - WAY 1 PHASE METERING ENCLOSURE INTERNAL WIRING ARRANGMENT		
Drawn:	B. YIRENKYI	Date:	AUGUST 2017
Designed:	J. COLEMAN	Date:	AUGUST 2017
Checked:	S. WURAH	Date:	AUGUST 2017
Approved:	M. DIZAMUHUPE	Date:	AUGUST 2017
Drawing No.	PMC-5091019-025	Revision:	
Drawing Scale:	NOT TO SCALE	Sheet Size:	A3
Drawing Status:			



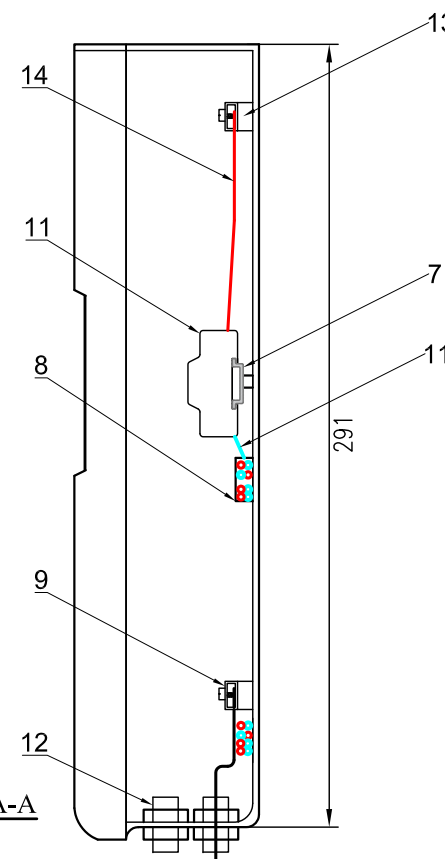
FRONT VIEW



SIDE VIEW



BASE VIEW



SECTION A-A

KEYS			
No	Description	Unit	Qty
1	Cable Gland	No	12
2	Incoming 2x25sq mm Al cable from pole	m	3
3	16sq mm Cu cable from MCB to live bar	m	2
4	Single pole 100A MCB	No	1
5	Surge Arrester	No	1
6	4sq mm Cu cable from neutral bar to meter	m	1
7	Din-Rail	No	1
8	Cable Trunking (perforated type)	No	1
9	25sq mm, 12-way neutral bar	No	1
10	Communication Cable from meter to CIU	m	200
11	Prepayment Meter	No	4
12	Outgoing 2x25sq mm Al load cable from meter to customer	m	140
13	25 sq mm, 6-way Live Bar	No	2
14	16sq mm Cu cable from live bar to meter	m	2
15	4sq mm Cu neutral cable for looping	m	3
16	Al and Cu Cable terminal lugs	No	Lot
17	GPRS Modem	No	1
18	Antenna	No	1

**NOTES:**

- 1 PPM1, PPM2, PPM3 and PPM4 shall be daisy chained to the modem via RS 485 port as per Drawing No PMC-5091019-C001/21
2. All dimensions are in mm

Rev	Revision	Approved	Date

Client: **MILLENNIUM DEVELOPMENT AUTHORITY ( MiDA ) GHANA**

OWNER: **ELECTRICITY COMPANY OF GHANA ( E.C.G )**

Consultant: **SMEC**  
Member of the Surbana Jurong Group  
www.sj.com

Project: **CONSULTANCY SERVICES FOR PROGRAM MANAGEMENT CONSULTANT**  
RFP:5121100/RFP/QCB505/16

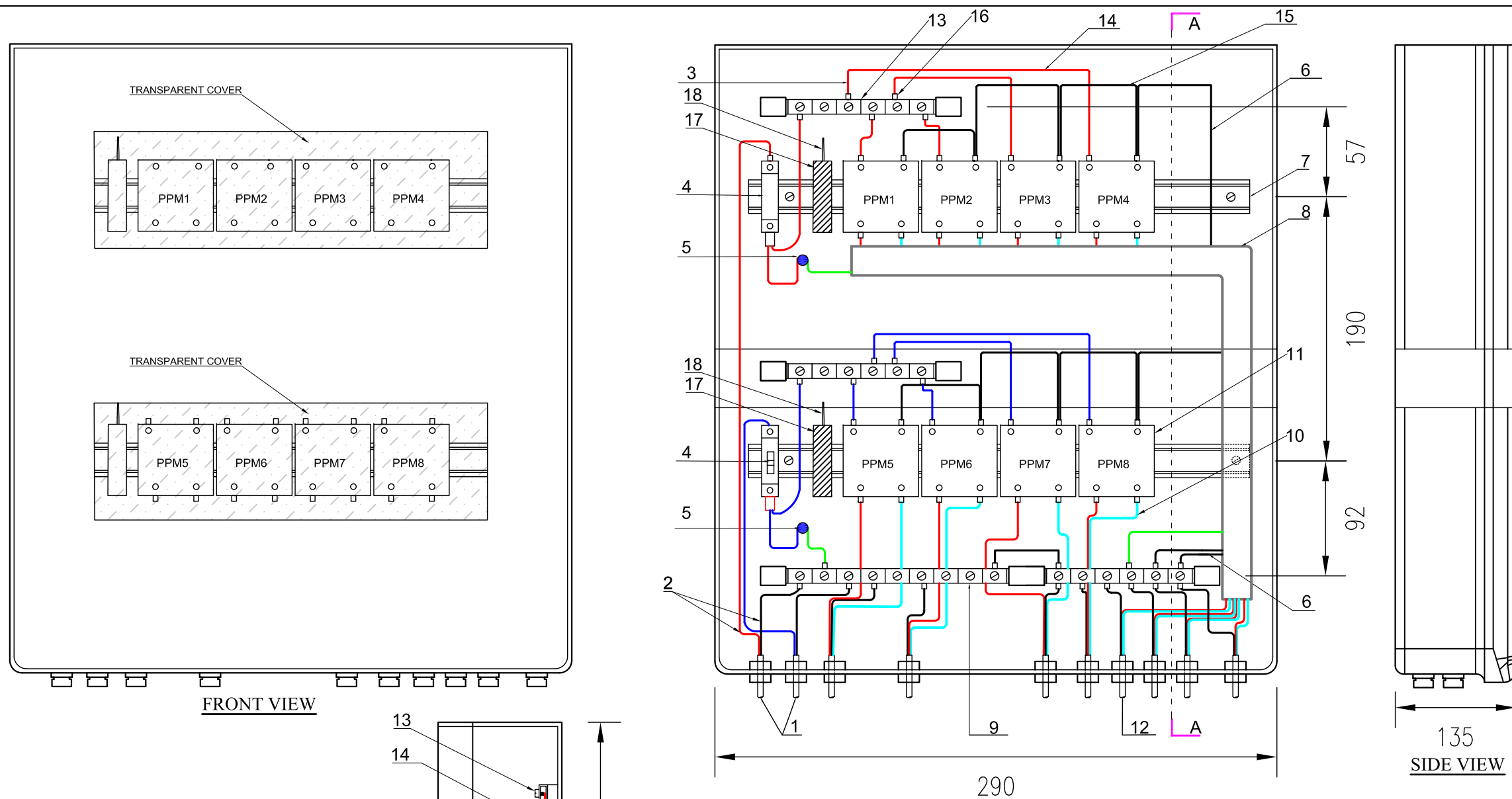
Title: **4 - WAY 1 PHASE METERING ENCLOSURE**  
**INTERNAL WIRING ARRANGMENT**

Drawn: B. YIRENKYI Date: AUGUST 2017  
Designed: J. COLEMAN Date: AUGUST 2017  
Checked: S. WURAH Date: AUGUST 2017  
Approved: M. DIZAMUHUPE Date: AUGUST 2017

Drawing No: **PMC-50091019-027** Revision:  

Drawing Scale: NOT TO SCALE Sheet Size: **A3**

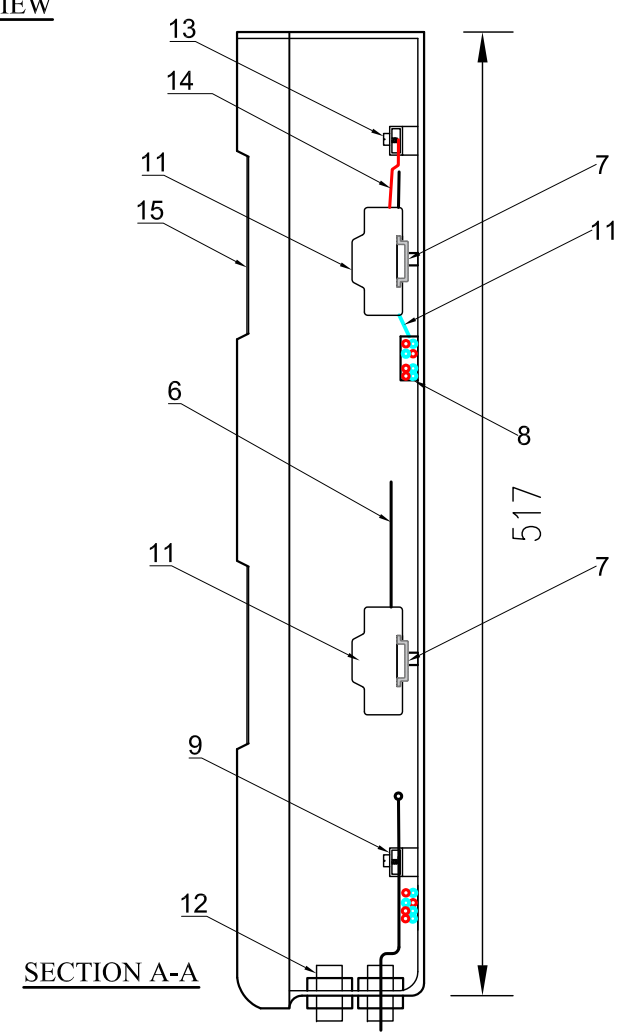
Drawing Status:



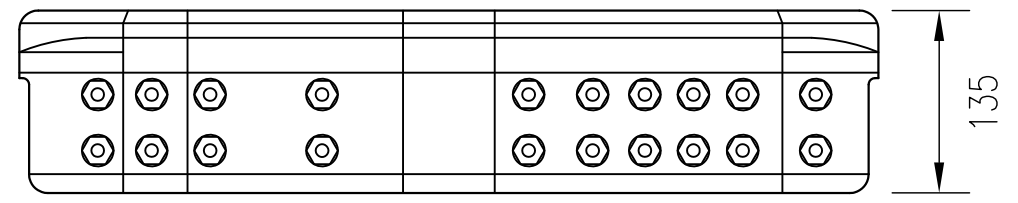
KEYS			
No	Description	Unit	Qty
1	Cable Gland	No	20
2	Incoming 2x25sq mm Al cable from pole	m	6
3	16sq mm Cu cable from MCB to live bar	m	4
4	Single pole 100A MCB	No	2
5	Surge Arrester	No	2
6	4sq mm Cu cable from neutral bar to meter	m	2
7	Din-Rail	No	2
8	Cable Trunking (perforated type)	No	1
9	25sq mm, 12-way neutral bar	No	1
10	Communication Cable from meter to CIU	No	400
11	Prepayment Meter	No	8
12	Outgoing 2x 25sq mm Al load cable from meter to customer	m	280
13	25 sq mm, 6-way Live Bar	No	2
14	16sq mm Cu cable from live bar to meter	m	2
15	4sq mm Cu neutral cable for looping	m	2
16	Al and Cu Cable terminal lugs	No	Lot
17	GPRS Modem	No	2
18	Antenna	No	2

FRONT VIEW

SIDE VIEW



SECTION A-A



BASE VIEW

NOTES:

- 1 PPM1,PPM2,PPM3 and PPM4 shall be daisy chained to the modem via RS 485 port as per Drawing No PMC-5091019-C001/21
- 2 PPM5,PPM6,PPM7 and PPM8 shall be daisy chained to the modem via RS 485 port as per Drawing No PMC-5091019-C001/21
2. All dimensions are in mm

Rev	Revision	Approved	Date

Client: MILLENNIUM DEVELOPMENT AUTHORITY ( MiDA ) GHANA

OWNER: ELECTRICITY COMPANY OF GHANA ( E.C.G )

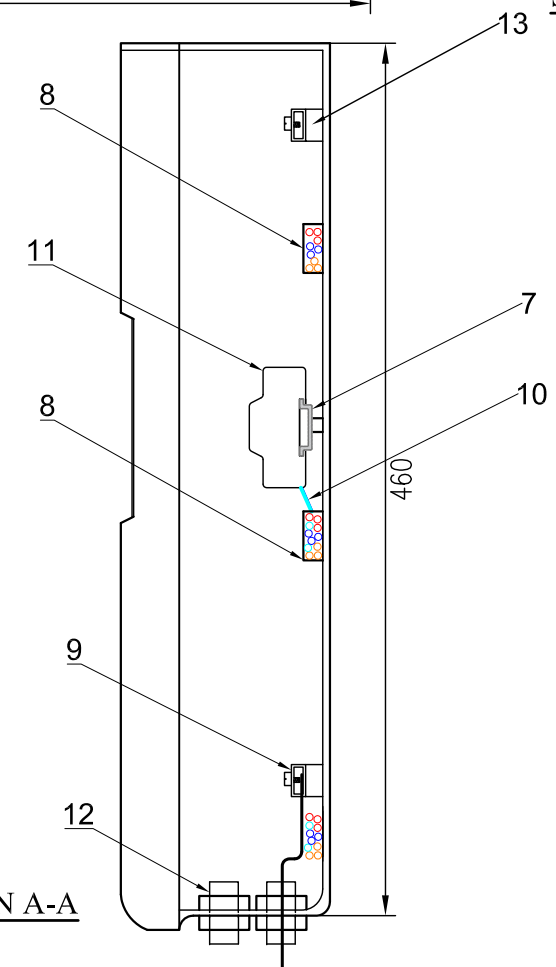
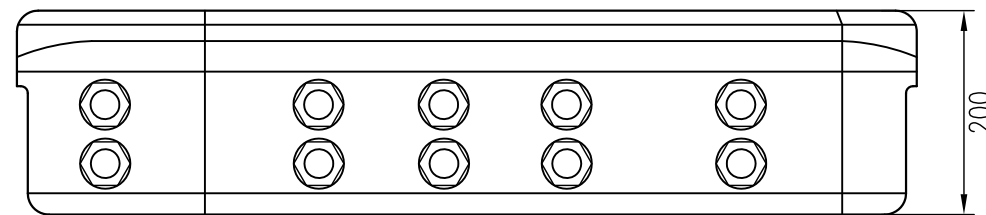
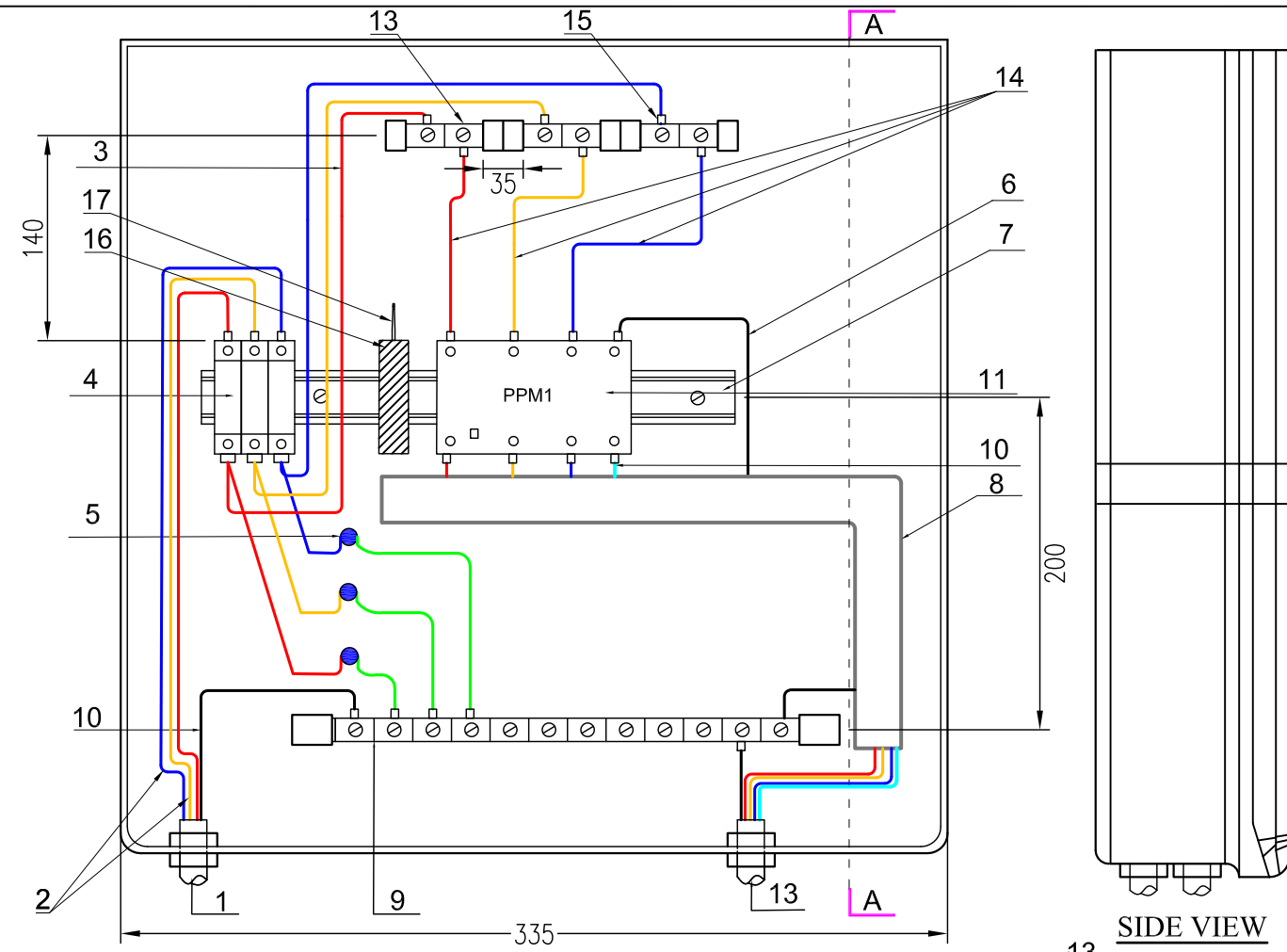
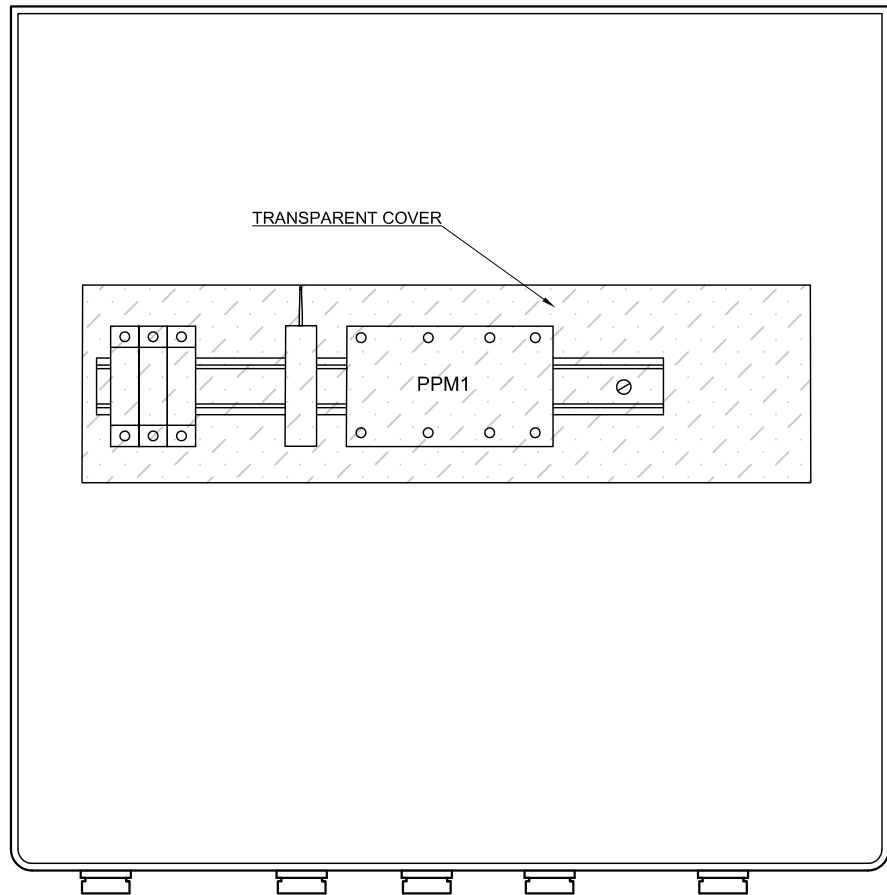
Consultant: SMC  
Member of the Surbana Jurong Group  
Website: www.smc.com

Project: CONSULTANCY SERVICES FOR PROGRAM MANAGEMENT CONSULTANT  
RFP:5121100/RFP/QCB505/16

Title: **8 - WAY 1 PHASE METERING ENCLOSURE**  
**INTERNAL WIRING ARRANGMENT**

Drawn: B. YIRENKYI	Date: AUGUST 2017
Design: J. COLEMAN	Date: AUGUST 2017
Checked: S. WURAH	Date: AUGUST 2017
Approved: M. DIZAMUHUPE	Date: AUGUST 2017

Drawing No. <b>PMC-50091019-029</b>	Revision.
Drawing Scale: NOT TO SCALE	Sheet No. <b>A3</b>
Drawing Status:	



**KEYS**

No	Description	Unit	Qty
1	Cable Gland	No	10
2	Incoming 2x25sq mm Al cable from pole	m	6
3	16sq mm Cu cable from MCB to live bar	m	6
4	3-pole 100A MCB	No	1
5	Surge Arrester	No	3
6	16sq mm Cu cable from neutral bar to meter	m	3
7	Din-Rail	No	1
8	Cable Trunking (perforated type)	No	1
9	25sq mm, 12-way neutral bar	No	1
10	Communication Cable from meter to CIU	m	50
11	Prepayment Meter	No	1
12	Outgoing 2x 25sq mm Al load cable from meter to customer	m	160
13	25 sq mm, 3-phase Live Bar (6-way each phase)	No	1
14	16sq mm Cu cable from live bar to meter	m	2
15	Al and Cu Cable terminal lugs	No	Lot
16	GPRS MODEM	No	1
17	Antenna	No	1

**NOTES:**

1. PPM1 and PPM2 shall be daisy-chained via RS 432 port.
2. One GPRS/GSM capable SIM card shall be installed in one of the meters to communicate with the MMS.
3. DIMENSION in mm

Rev	Revision	Approved	Date

Client: MILLENNIUM DEVELOPMENT AUTHORITY ( MiDA ) GHANA

OWNER: ELECTRICITY COMPANY OF GHANA ( E.C.G )

Consultant: SMEC  
Member of the Surbana Jurong Group  
Website: www.smecl.com

Project: CONSULTANCY SERVICES FOR PROGRAM MANAGEMENT CONSULTANT  
RFP:5121100/RFP/QCB505/16

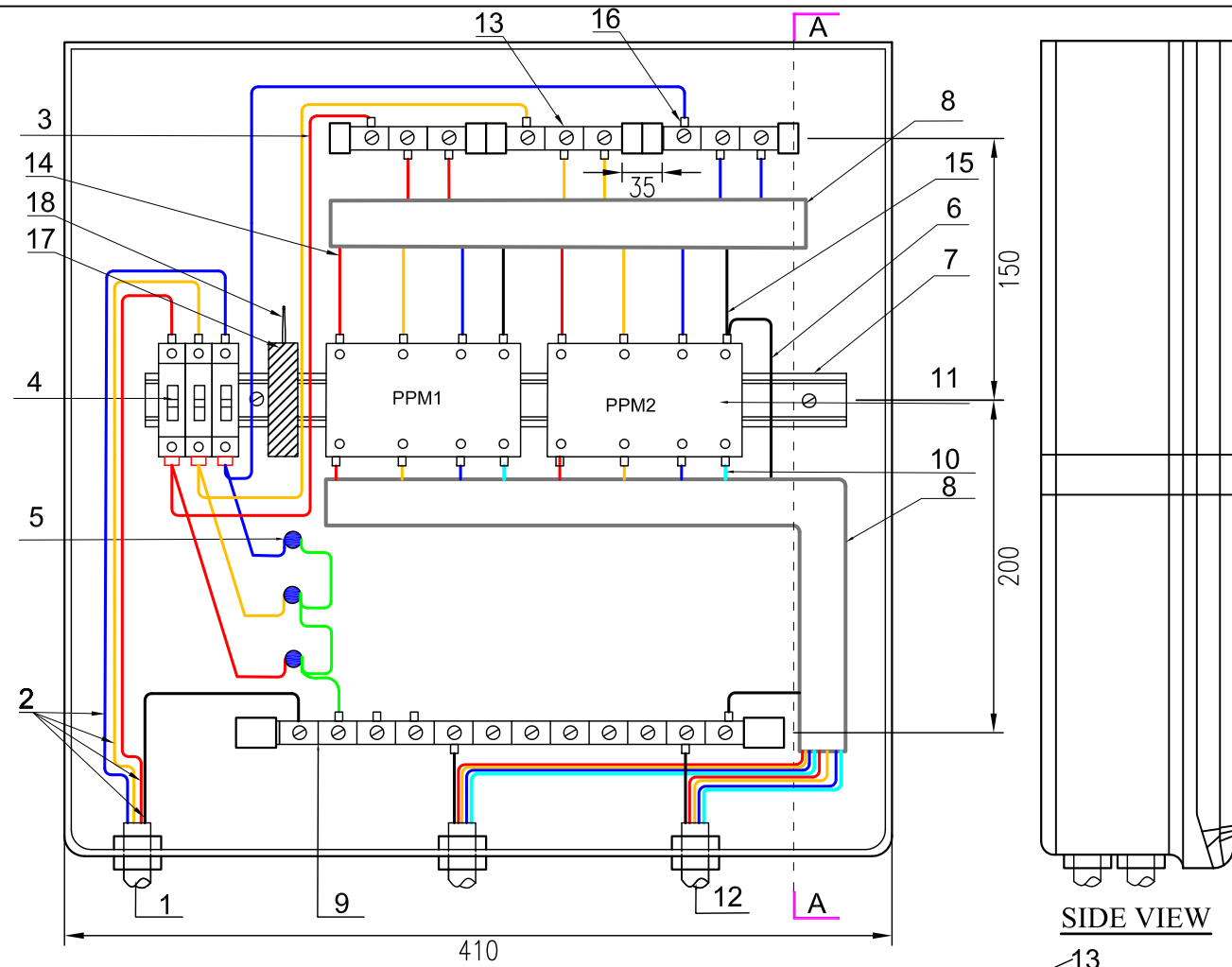
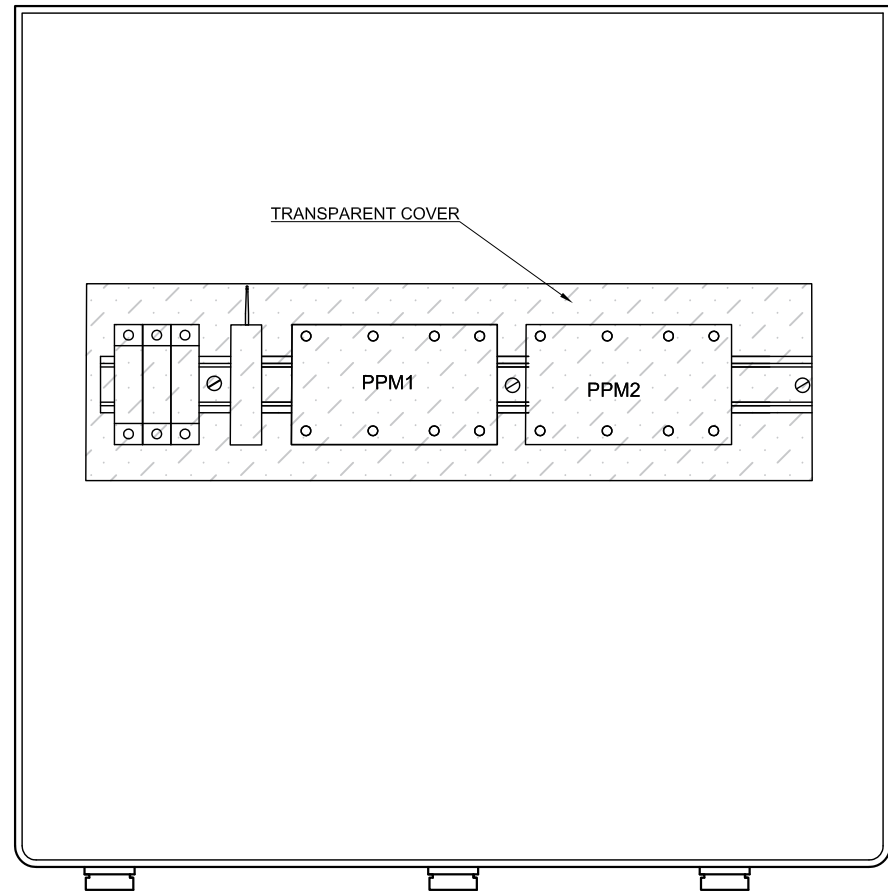
Title: 1 - WAY 3 - PHASE METERING ENCLOSURE  
INTERNAL WIRING ARRANGMENT

Drawn: B. YIRENKYI	Date: AUGUST 2017
Designed: J. COLEMAN	Date: AUGUST 2017
Checked: S. WIURAH	Date: AUGUST 2017
Approved: M. OZAMUJUPE	Date: AUGUST 2017

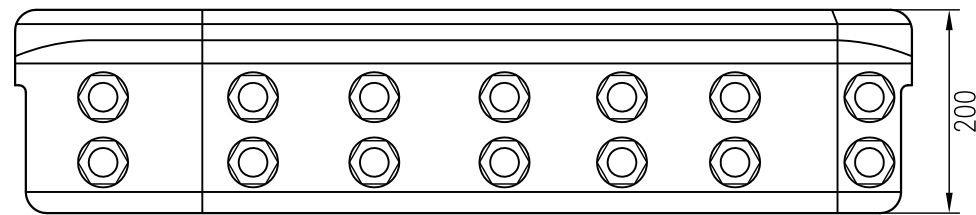
Drawing No. **PMC-50091019-024** Revision.

Drawing Scale: NOT TO SCALE Sheet Size. **A3**

Drawing Status:



SIDE VIEW

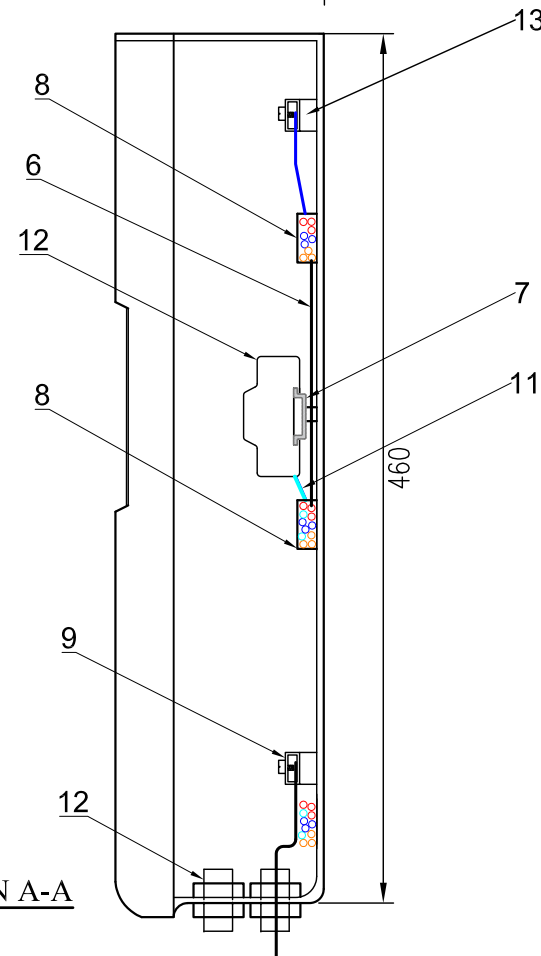


BASE VIEW

**NOTES:**

- 1 PPM1 and PPM2 shall be daisy chained to the modem via RS 485 port as per Drawing No PMC-5091019-C001/21
- 2 All dimensions are in mm

SECTION A-A



**KEYS**

No	Description	Unit	Qty
1	Cable Gland	No	16
2	Incoming 4x25sq mm Al cable from pole	m	6
3	16sq mm Cu cable from MCB to live bar	m	6
4	3-pole 100A MCB	No	1
5	Surge Arrester	No	3
6	4sq mm Cu cable from neutral bar to meter	m	4
7	Din-Rail	No	1
8	Cable Trunking (perforated type)	No	1
9	25sq mm, 12-way neutral bar	No	1
10	Communication Cable from meter to CIU	m	100
11	Prepayment Meter	No	2
12	Outgoing 25sq mm Al load cable from meter to customer	m	70
13	25 sq mm, 3-phase Live Bar (6-way each phase)	No	1
14	16sq mm Cu from live bar to meter	m	3
15	4sq mm Cu neutral cable for looping	m	2
16	Al and Cu Cable terminal lugs	No	Lot
17	GPRS Modem	No	1
18	Antenna	No	1

Rev	Revision	Approved	Date

Client: **MILLENNIUM DEVELOPMENT AUTHORITY ( MIDA ) GHANA**

OWNER: **ELECTRICITY COMPANY OF GHANA ( E.C.G )**

Consultant: **SMEC**  
Member of the Surbana Jurong Group  
Website: www.smecc.com

Project: **CONSULTANCY SERVICES FOR PROGRAM MANAGEMENT CONSULTANT RFP-5121100/RFP/QCB505/16**

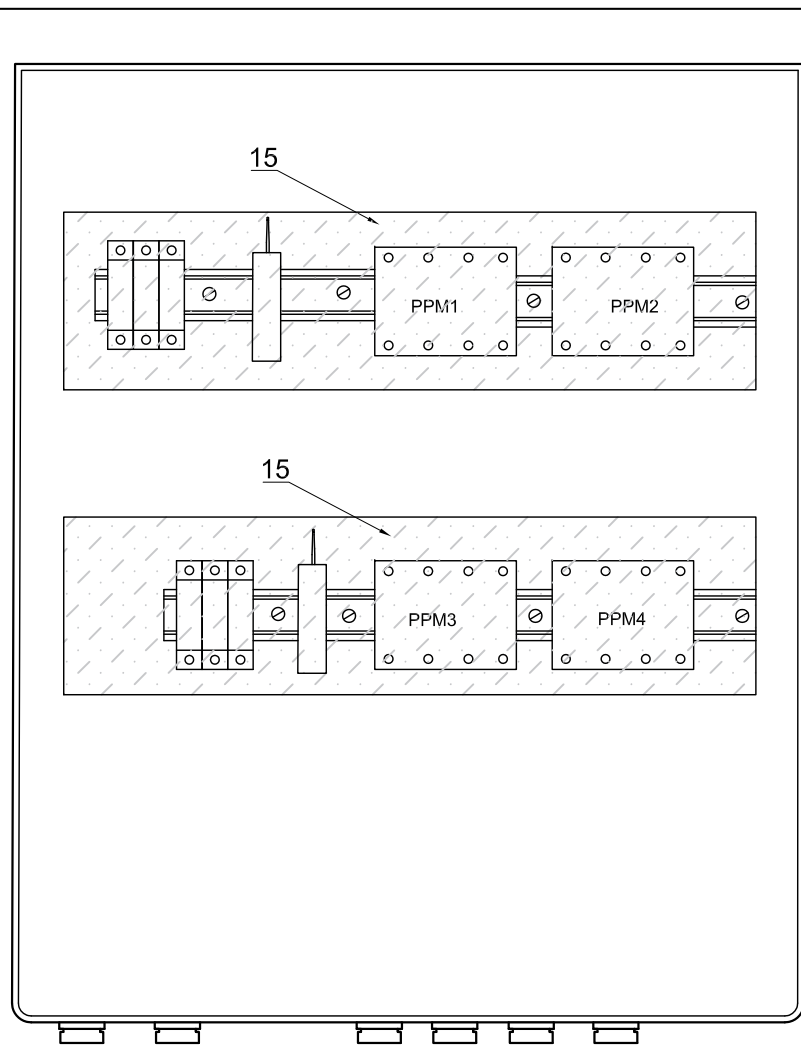
Title: **2 - WAY 3 - PHASE METERING ENCLOSURE INTERNAL WIRING ARRANGMENT**

Drawn: B. YIRENKYI Date: AUGUST 2017  
 Designed: J. COLEMAN Date: AUGUST 2017  
 Checked: S. WURAH Date: AUGUST 2017  
 Approved: M. DZAMUHUPE Date: AUGUST 2017

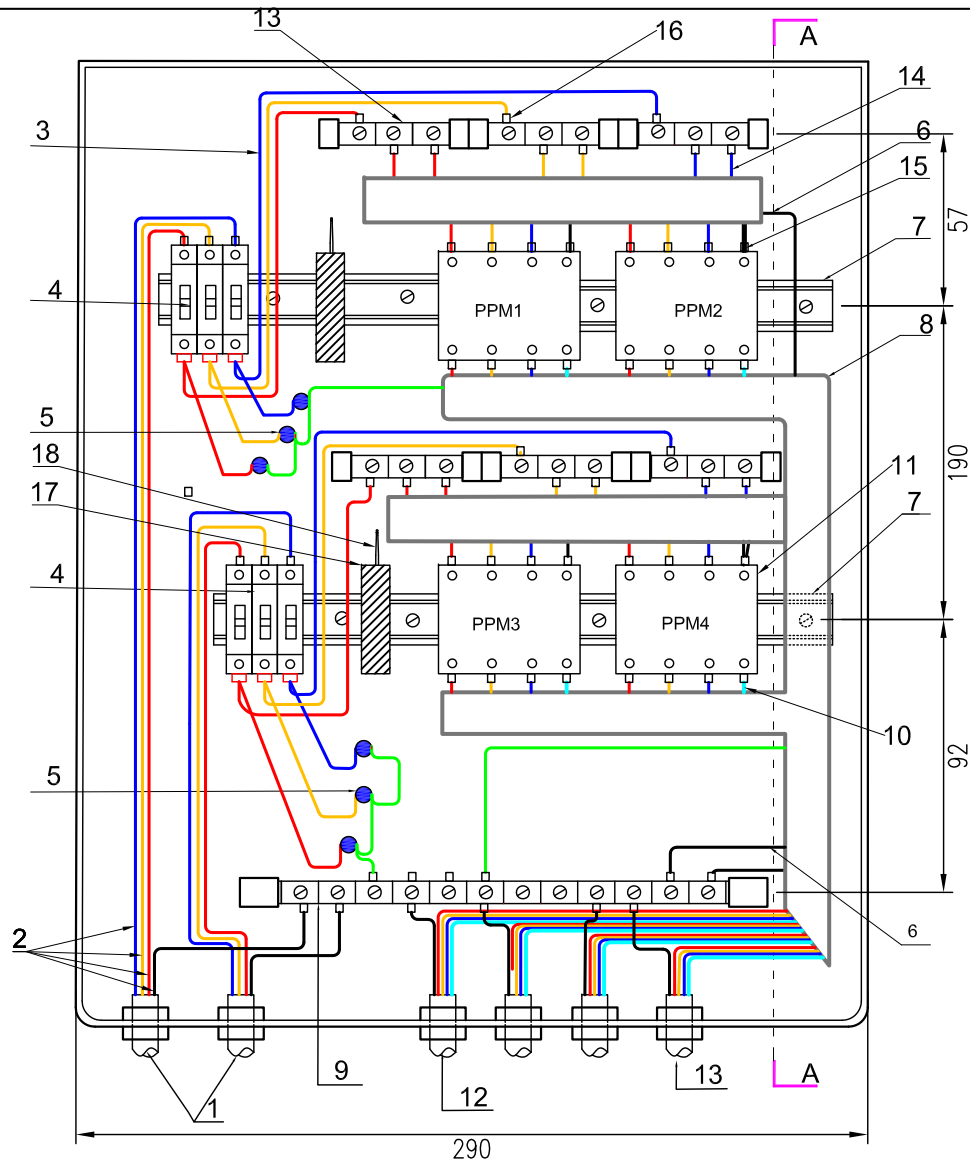
Drawing No. **PMC-5091019-026** Revision.

Drawing Scale: NOT TO SCALE Sheet Size: **A3**

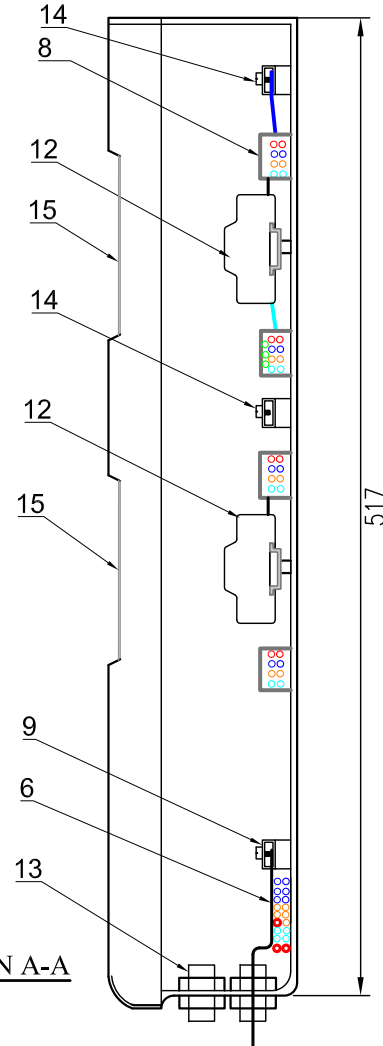
Drawing Status:



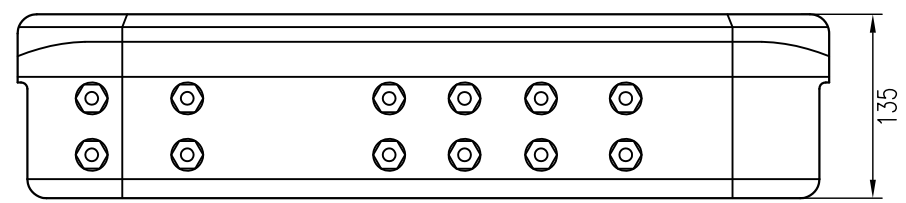
FRONT VIEW



SIDE VIEW



SECTION A-A



BASE VIEW

KEYS			
No	Description	Unit	Qty
1	Cable Gland	No	25
2	Incoming 4x25sq mm Al cable from pole	m	12
3	16sq mm Cu cable from MCB to live bar	m	12
4	3-pole 100A MCB	No	2
5	Surge Arrester	No	6
6	4sq mm Cu cable from neutral bar to meter	m	12
7	Din-Rail	No	2
8	Cable Trunking (perforated type)	No	2
9	25sq mm, 12-way neutral bar	No	1
10	Communication Cable from meter to CIU	m	200
11	Prepayment Meter	No	1
12	Outgoing 25sq mm Al load cable from meter to customer	m	140
13	25 sq mm, 3-phase Live Bar (6-way each phase)	No	2
14	16sq mm Cu cable from live bar to meter	m	2
15	4sq mm Cu neutral cable for looping	m	2
16	Al and Cu Cable terminal lugs	No	Lot
17	GPRS Modem	No	2
18	Antenna	No	2

**NOTES:**

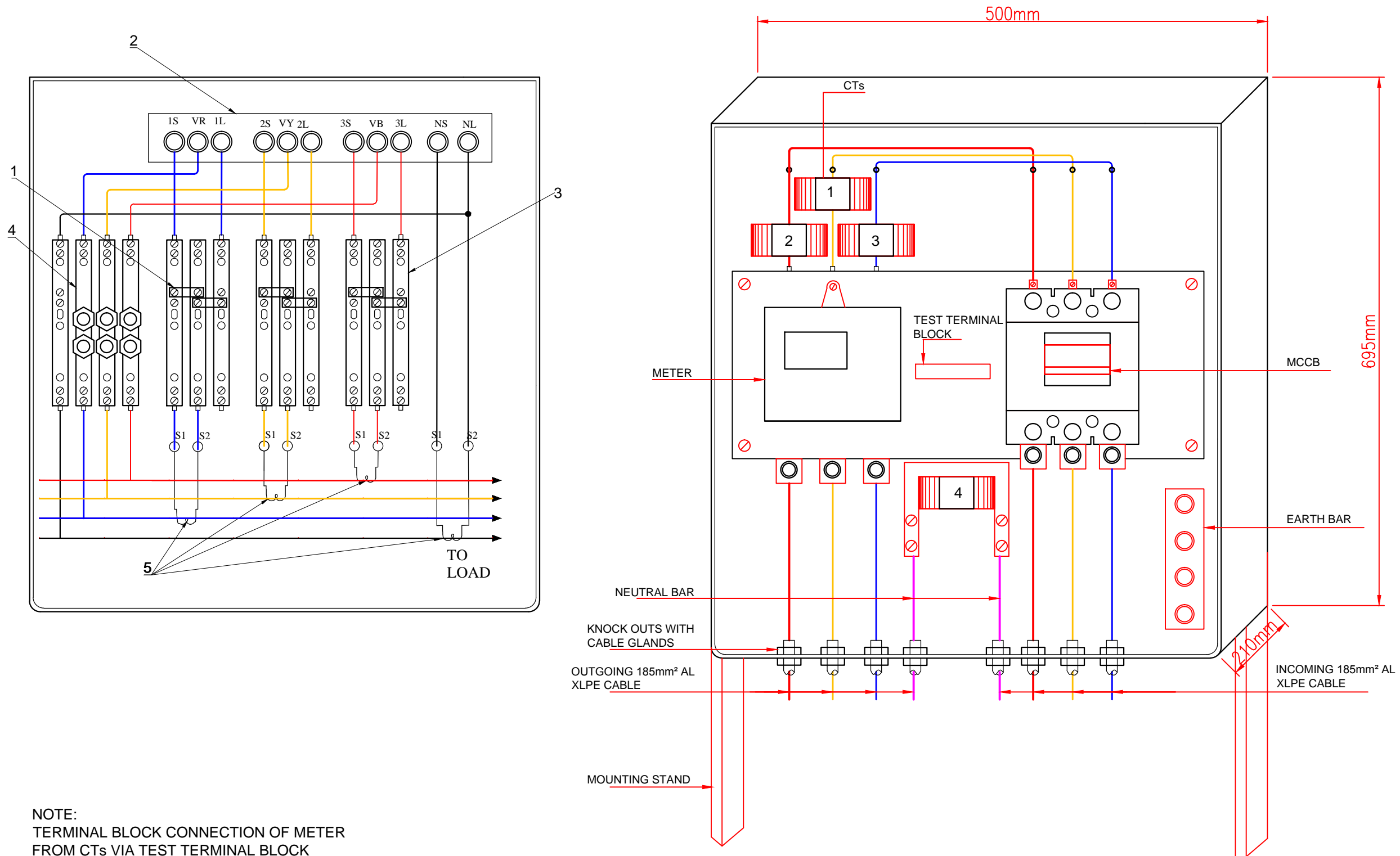
- 1 PPM1, PPM2, PPM3 and PPM4 shall be daisy chained to the modem via RS 485 port as per Drawing No PMC-5001019-C001/21
- 2 All dimensions are in mm

Rev	Revision	Approved	Date
Client:  MILLENNIUM DEVELOPMENT AUTHORITY ( MIDA ) GHANA			
OWNER:  ELECTRICITY COMPANY OF GHANA ( E.C.G )			
Consultant:  SMEC <small>Member of the Sarbana Jarong Group Website: www.smecc.com</small>			
Project: CONSULTANCY SERVICES FOR PROGRAM MANAGEMENT CONSULTANT RFP:5121100/RFP/QCB505/16			
Title: 4 - WAY 3 - PHASE METERING ENCLOSURE INTERNAL WIRING ARRANGMENT			
Drawn:	B. YIRENKYI	Date:	AUGUST 2017
Designed:	J. COLEMAN	Date:	AUGUST 2017
Checked:	S. WURAH	Date:	AUGUST 2017
Approved:	M. DIZAMUHUPE	Date:	AUGUST 2017
Drawing No:	PMC-50091019-028		Revision:
Drawing Scale:	NOT TO SCALE		Sheet Size:
Drawing Status:			A3



KEYS

No	Description	Unit	Qty
1.0000	Links for CT shorting	No	6.0000
2.0000	Meter Terminal Connection	No	1.0000
3.0000	Current Link	No	9.0000
4.0000	Voltage Link	No	4.0000
5.0000	Current transformer (CT)	No	4.0000

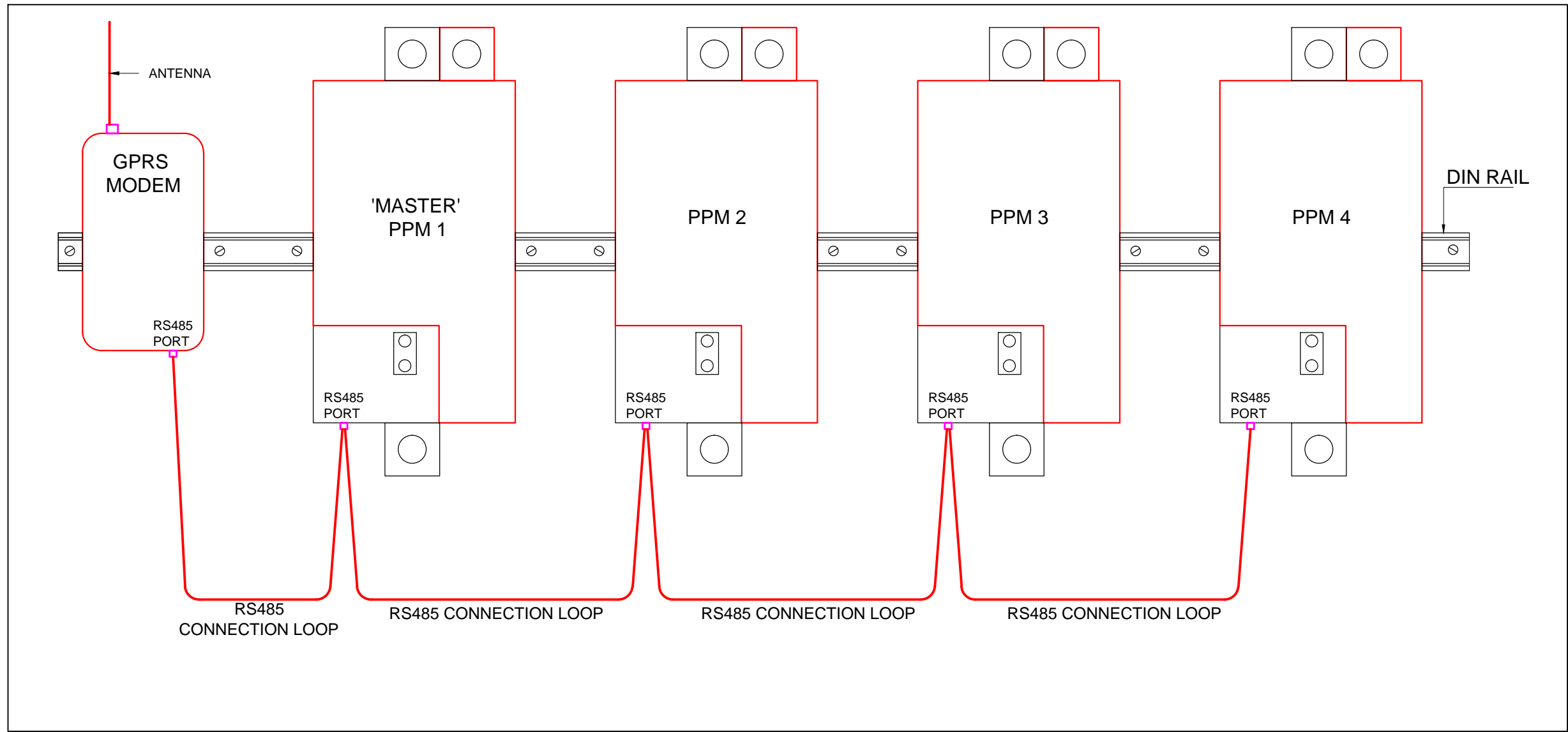


NOTE:  
TERMINAL BLOCK CONNECTION OF METER  
FROM CTs VIA TEST TERMINAL BLOCK

Rev	Revision	Approved	Date

Client:	MILLENIUM DEVELOPMENT AUTHORITY ( MiDA ) GHANA
OWNER:	ELECTRICITY COMPANY OF GHANA ( E.C.G )
Consultant:	SMEC Member of the Surbana Jurong Group Website: www.smecc.com
Project:	CONSULTANCY SERVICES FOR PROGRAM MANAGEMENT CONSULTANT RFP:5121100/RFP/QCBS05/16
Title:	CT PREPAYMENT METERING PANEL WITH ACCESSORIES
Drawn:	B. YIRENKYI Date: AUGUST 2017
Designed:	J. COLEMAN Date: AUGUST 2017
Checked:	S. WURAH Date: AUGUST 2017
Approved:	M. DIZAMUHUPE Date: AUGUST 2017
Drawing No.	PMC-50091019-030
Revision:	
Drawing Scale:	NOT TO SCALE
Sheet Size:	A3
Drawing Status:	





Rev	Revision	Approved	Date

Client:	 <b>MILLENIUM DEVELOPMENT AUTHORITY ( MiDA ) GHANA</b>
OWNER:	 <b>ELECTRICITY COMPANY OF GHANA ( E.C.G )</b>
Consultant:	 <b>SMC</b> <small>Member of the Surbana Jurong Group Website: www.smc.com</small>
Project:	<b>CONSULTANCY SERVICES FOR PROGRAM MANAGEMENT CONSULTANT RFP: 5121100/RFP/QCBS/05/16</b>
Title:	<b>DETAIL WIRING OF GPRS/GSM MODEM TO INDIVIDUAL METERS</b>
Drawn:	F. ANANG Date: AUGUST 2017
Designed:	J. COLEMAN Date: AUGUST 2017
Checked:	L. MATTSSON Date: AUGUST 2017
Approved:	M. DIZAMUHUPE Date: AUGUST 2017
Drawing No.	PMC-5091019-C001/21
Drawing Scale:	NOT TO SCALE
Drawing Status:	A3

There are many repeat queries, out of which we have tried to present only the important ones

SI	Reference			Question	Answer	Interpretation 1	Interpretation 2	Interpretation 3	Interpretation 4	Answers to Query on Clarification (Answer 2)
	Page (Bidding doc)	Section	Item							
7	428	Section VII. 2.3.1.2.4	GIS coordinates acquisition for the meter	<p>Allow for GIS coordinates acquisition for the meter (Section 2.3.1.2.4)</p> <p>Question How to implement the GIS function? Does the GIS function needed to be added in the meter? Please explain how to achieve this function. Please clarify.</p>	<p><b>Yes. The GIS acquisition function should be resident in the meter.</b></p>	Meter should have GPS Receiver to be able to Identify its GIS Location	The installer enters the GIS information on the meter at the time of meter installation			It is <i>mandatory</i> that GPS Receiver be included.
8	440	Section VII. 2.3.2.1	2.3.2.1 Meter Management	<p>The databases shall NOT be encrypted as the design of customized reports is essential. The system shall allow for the generation of engineering tokens for the following application:</p> <p>New meter installation: tokens for a limited number of units in the meter for activation and validation of the installation.</p> <p>Repair/checking of meters where customers indicate that the meter has failed - provision of small quantify energy units.</p> <p>Report facilities must include parameterization, data printing by range of dates, or other classifications based on parameters used into the Vending System (Section 2.3.2.1)</p> <p>Question: Engineering tokens: does the TOKENS need to be general-purpose for all meters?</p>	<p>The Engineering tokens shall be specific to the meter and shall comply with IEC 62055-41 - Electricity metering – Payment systems – Part 41: Standard transfer specification (STS) – Application layer protocol for one-way token carrier systems, as in section VII page 406.</p>	<p>The IEC 62055-41 is an standard for STS prepay meters and provides for only "Unit (kWh)" based transactions. Which means MIDA will coordination with PURC to change all the tariff's to Flat Rates. To facilitate implementation of system based on IEC 62055-41</p>	<p>the current tariffs in Ghana are slab/ subsidy/ calculations based. Which is not covered under IEC 62055-41. Hence the meters shall be capable of meeting the requirements of above beyond IEC 62055-41 to meet PURC tariffs. And the standard to be followed will be declared later by MIDA</p>			<p>We make reference to IEC 62055-41 edition 2 which makes provision for currency based tokens.</p> <p>The 120 meters being supplied by the MMS Bidders should comply with this requirement.</p> <p>The meter firmware should be capable of implementing the PURC step tarrif structure.</p>

10	490	Section VII. 2.8.3	MMS Communications System - USB Modem	<p>MMS Communications System – USB Modem</p> <p>The USB Modem need to do what function? Please clarify.</p>	<p><b>The USB modem shall be plugged in to the vending work station to allow web connection to the Meter Management System.</b></p>	<p>Vending station <b>should not get internet connectivity via Wireless/ ethernet</b> and should use only dial-up modems for internet connectivity</p>	<p>Incase of non availability of USB dial-up modem the vending shouldn't take place</p>	<p>Incase of Non availability of mobile network via USB modem, the vending station should not connect to MMS</p>		<p><b>The requirement is for the vending stations to be provided by the Bidder to have ethernet or modem connectivity.</b></p>

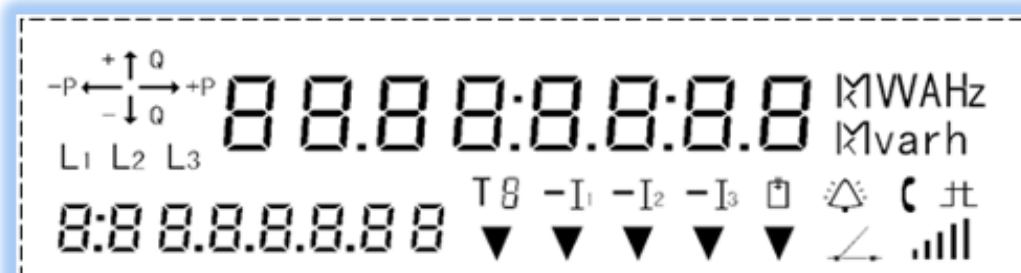
13	553 - 555	Section VII. E. Implementation Schedule	Schedule and Schedule Table	<p>There is not any explicit allocation of time/effort in Phase 1 for:  (a) Integration of MMS to existing Indra CMS and  (b) 20 AMI and 20 PPM sample meters from the separate bidding process (mentioned in "Important Note" pg 551)?  (c) Data migration from existing vending systems to MMS?</p> <p>Please can MiDA provide for this?</p>	<p>a) This is not indicated in Implementation Schedule, but the integration of MMS to the existing Indra CMS is planned to run concurrently with the Testing of AMI and Prepayment Meters on the MMS and Meters supplied by third party Bidders in separate Procurement processes for AMI and PPM on page 550. A revised schedule has been issued as Amendments 1 and 2 in an Addendum.</p> <p>b) The testing of 20 sample AMI and PPM per bidder from the separate bidding process is clearly indicated in the implementation schedule in Page 549 and 550.</p> <p>c) All STS compliant meters on existing</p>	MIDA will declare later in due course the name of suppliers of 6 PPM and 6 AMI	There is NO STS compliant meter in existing system as the PURC Tariff is Slab/ Subsidy based which is not supported by STS. Hence MIDA will provide Tariff compliant STS Meters from existing system for its migration to MMS	MIDA is flexible between Clarification No. 13 and 37. Bidder can opt for any make of meters based on any system	MIDA will do Selective Bidding (NOT ICB) between the 6 manufacturers selected by the MMS supplier, for Implementation stage of PPM and AMI Meters as described on page 550	<p>ECG confirms that there are STS compliant meters in its system and requires the Bidders to facilitate the testing of 20 meters each from existing STS Compliant meters in ECG system (max 100) as part of this scope, in addition to the 240 meters to be provided by the Bidders themselves.</p> <p>MiDA may not undertake Limited Bidding (LB) involving the six (6) PPM and six (6) AMI manufacturers proposed by the MMS Supplier.</p>
14	466	VII. Purchasers Requirements	Hardware The Supplier shall familiarize himself with the existing Vending Systems hardware utilized by ECG and take this infrastructure and systems into account in the proposed vending solution offered.	<p>What are the existing vending systems in use at ECG?</p> <p>What platform(s) (hardware/software) do the existing vending systems run on?</p> <p>How are the existing vending systems currently integrated in to Indra CMS?</p>	<p>The Integration of the ECG's existing vending systems to the MMS is indicated as options (integration to other systems) and the relevant price shall be provided as requested under Schedule 6 (see item 86)</p> <p>Software: Windows server and Linux hardware: hardware required for STS compliant meters</p> <p>Through web services and DB link.</p>	MIDA will provide details/ quantity of ECG existing vending systems by make before MMS tender opening for fair evaluation	As there is no specification for Vending hardware in STS, so MIDA will provide independent specifications before bidding	MIDA will specify the IEC standard to be complied with PURC tariff as well as ECG Specification		<p>There is no need for prior knowledge of the existing vending systems in use. The Supplier will be required to offer Support Services to integrate them only when awarded a contract.</p> <p>In this IFB, Bidders are expected to price their inputs on Daywork basis under Schedule 8 A5 of the Price Schedules.</p> <p>We make reference to IEC 62055-41 edition 2.</p> <p>Also see answer above on existing vending systems.</p> <p>See answer above.</p>

				Is there any specific roadmap for deprecating the existing vending systems and if so can ECG share those?	Awaiting outcome of procurement processd.	On successful implementation of MMS, existing/ legacy meters procured as per ECG specifications, in last 5 years, worth USD 500 million will be scrapped				There is no intention of scrapping existing legacy meters upon successful implementation of the MMS.
				Is there any need to account for data migration efforts from existing vending systems in to MMS?	This has not been quantified and is awaiting the outcome of procurement process.	For data migration from existing systems to MMS will be through a separate procurement process	MIDA will quantify the migration efforts along with all details of work to be done so that it can be mitigated bid price for fair evaluation			See answer to 466 above.
16	458	2.3.4.1 Vending Station	<input type="checkbox"/> Indra CMS Interfacing	Why does the RVS need separate Indra CMS interfacing when its vending software may be assumed to interface with the vending application server in MMS?	The fifth bullet point in section VII 2.3.4.1-Indra CMS interfacing is no more required.  RVS does not need a separate interfacing with the Indra CMS directly.	MIDA will declare the Standard to be followed for Common Vending Application Server which will meet the PURC tariff (including calculation of slabs & subsidies), which is not supported by STS standard IED 62055-41	Once the Existing PPM's are scrapped, CMS will also be decommissioned, which was recently procured at a cost of USD 11 million with loan from World Bank by ECG			There is no intention to scrap the existing PPMs and the CMS.  The relevant standard to be followed for STS is IEC 62055-41 edition 2
	/	/	<input type="checkbox"/> 99% success rate for all 'full' meter reading packets (interval and register data, and meter events)	This is in contrast with the 98% success rate within 22 hours lower on the same page, Which one?	98% success rate within 22 hours. This has been corrected in an Addendum.	A methodology for calculating the success rate along with parameters and exceptions as per the clause will be published	A bidder not complying with 98% success rate will be disqualified during evaluation	A method of penalizing a complying bidder not practically achieving the 98% success rate shall be published before bid opening		The procedures for Bid Review and Evaluation is given in Section III of the Bidding Documents, details of which are given in ITB Clause 28; and includes how this feature will be evaluated.
	/	/	<input type="checkbox"/> The system availability must be at least 99.95%	This is in contrast with the 99.995% requirement elsewhere in document (p406) . Which one?	The system availability shall be 99.95%. This has been corrected in an Addendum.	A methodology for calculating the success rate along with parameters and exceptions as per the clause will be published	A bidder not complying with 99.95% success rate will be disqualified during evaluation	A method of penalizing a complying bidder not practically achieving the 99.95% success rate shall be published before bid opening		The procedures for Bid Review and Evaluation is given in Section III of the Bidding Documents, details of which are given in ITB Clause 28; and includes how this feature will be evaluated.
	/	/	<input type="checkbox"/> 4 hours maximum recover time if a catastrophic failure is corrected	This is in contrast with the 15 min MTTR requirement elsewhere in document (p406) . Which one?	4 hours maximum recover time if a catastrophic failure is corrected. This has been clarified in an Addendum.	A methodology for calculating the success rate along with parameters and exceptions as per the clause will be published	A bidder failing to comply in the bid will be disqualified during evaluation	A method of penalizing a complying bidder not practically achieving the 4 hour recovery time shall be published before bid opening		The procedures for Bid Review and Evaluation is given in Section III of the Bidding Documents, details of which are given in ITB Clause 28; and includes how this feature will be evaluated.




	/	Operation life of System components.	<input type="checkbox"/> MMS Centre (hardware) – 5 years.	Elsewhere in document(p405)it is mentioned as 10 years. Which one?	<b>The Software for the MMS shall be supported for at least 10 years and the expected life for the hardware shall be at least 5 years.</b>	After 5 years MIDA will provide new hardware and port the MMS application and data to new hardware	The new hardware provided by MIDA after 5 years shall be maintained and supported by MIDA	AMC cost of 10 years for software and first 5 years for hardware should be incorporated in bid price		<b>The Hardware shall be supported by warranty (3 years) and post warranty (2 years)</b>
22	430	2.3.1	The system availability must be at least 99.5%	This is in contrast to 99.995% on page 406 and 99.95% on page 408. Which one?	<b>Please refer to answer 19 above.</b>	A methodology for calculating the success rate along with parameters and exceptions as per the clause will be published	A bidder not complying with 99.95% success rate will be disqualified during evaluation	A method of penalizing a complying bidder not practically achieving the 99.95% success rate shall be published before bid opening		<b>The procedures for Bid Review and Evaluation is given in Section III of the Bidding Documents, details of which are given in ITB Clause 28; and includes how this feature will be evaluated.</b>
	/	/	<input type="checkbox"/> 4 hours maximum recover time if a catastrophic failure is corrected	This is in contrast with the 15 min MTTR requirement elsewhere in document (p406). Which one?	<b>Please refer to answer 19 above.</b>	A methodology for calculating the success rate along with parameters and exceptions as per the clause will be published	A bidder failing to comply in the bid will be disqualified during evaluation	A method of penalizing a complying bidder not practically achieving the 4 hour recovery time shall be published before bid opening		<b>The procedures for Bid Review and Evaluation is given in Section III of the Bidding Documents, details of which are given in ITB Clause 28; and includes how this feature will be evaluated.</b>
28	403	Section VII. B 1.1.1. e)	One hundred and twenty (120) STS prepayment Meters based on open protocol system, (Twenty (20) meters each from six (6) different manufacturers). One hundred and twenty (120) AMI meters based on open protocol system (Twenty (20) meters each from six (6) different manufacturers)	1) What is the quantity list of meter on different types going to be delivered in the Proof of Concept (PoC)? 2) We have found five types of meters mentioned in the tender, but no specific quantities. We attach a draft table to highlight these different meters. Please can you provide the number of meters per type? 3) Since the number of meters for the PoC is only 240 and thus very small, do we as the MMS bidder need to provide the different meters and fully comply with the meter requirements? In other words can we provided meters with a deviation for the 240 only? The reason for the question is cost based and in order to provide meters that fully comply means that there may be a cost to mitigate any deviations! 4) Is MiDA expecting the 6 meter vendors to supply their own HES (Head End System), or is the Ghana MMS Tender expecting the bidder to supply only one "universal" HES?	<b>1) 20 meters from six different manufacturers.</b> <b>2) The twenty (20) prepayment meters to be supplied from six different manufacturers shall consist of:</b> <b>a. Ten (10) Single phase prepaid meters for residential applications, with basic current and maximum continuous current rating of 5 and 60A/phase respectively.</b> <b>b. Eight (8) Three phase prepaid meters for medium commercial applications, with a basic current and maximum continuous current rating of 10 and 100A/phase respectively.</b> <b>c. Two (2) Three phase CT-connected meters for large commercial applications, with a rated current and maximum continuous current rating</b>	Only companies globally who are manufacturers for all three types of meters i.e. Single Phase/ Three Phase/ LTCT Prepayment are permitted to be selected by MMS supplier	MIDA will coordinate with PURC to modify the tariffs for LTCT prepay consumers so as to do away with Maximum Demand and Power Factor Penalty which is part of current tariff but has no mention in IEC 62055-41 (STS)	Maximum primary current will be published by MIDA before bid opening so as to get meter prices from vendors for fair evaluation	MIDA to confirm the supply of in home display with meters before bid opening to facilitate fair evaluation	<b>MMS supplier can select meters from any manufacturer provided the meters can interface with the MMS seamlessly and meets the specifications.</b>  <b>The procedures for Bid Review and Evaluation is given in Section III of the Bidding Documents, details of which are given in ITB Clause 28; and includes how this feature will be evaluated. Kindly check Section VII Purchaser's Requirements to comply with requirements.</b>

37	403	B 1.1.1. e) f)	One hundred and twenty (120) STS prepayment Meters based on open protocol system, (Twenty (20) meters each from six (6) different manufacturers). One hundred and twenty (120) AMI meters based on open protocol system (Twenty (20) meters each from six (6) different manufacturers)	Do the supply of meters need to conform to any Ghana localization requirements? Who is to install the total of 220 meters? Bidder or ECG?	There is no special preference for meters from any country. All meters that meet the requirements are acceptable.  Supplier will be required to install a total of 240 meters.	MIDA will publish the locations of 240 meters installation so that the cost of installation can be considered in bid price for a fair evaluation	MIDA shall publish bill of quantities for installation material for each of 240 sites for incorporation of its value in Bid Price for a fair evaluation			The 240 meters for testing the open architecture of the MMS shall all be installed in the Kaneshie District of ECG.  Supplier shall be responsible for installation of these meters.
38	405	B. BUSINESS FUNCTIONS AND PERFORMANCE REQUIREMENTS	The Centralized Meter Management System shall have enough capacity and capability for scalability to cover the entire ECG operations for now and for the next ten (10) years. The MMS shall support an initial capacity of 3,000,000 metering end points with capability of anticipated 10% growth rate (ECG internal data) every year for the next ten (10) years (expandable to 6,500,000).	Please clarify if the system is to be ready from day one of operations for 3,000,000 meter points, or is the initial value 200,000 meter points as per the following: "The RCC shall support an initial capacity of 200,000 metering end points"? What is the initial phase for system readiness and if so what rollout plan to 3,000,000 meters points and effective 6,500,000 over ten years? Please provide detailed meter rollout plan for system readiness?	a) Yes, RCC shall support an initial 200,000 metering end points whilst centralised MMS shall support an initial 3,000,000 metering end points. b) The initial system readiness shall be 3,000,000 metering end points. c) The roll out plan is not part of this scope	MIDA will manage further expansion of the system be undertaken to 6,500,000 meters. The expansion would need further computing hardware, lease lines, OS / Data base licences etc.			The MMS shall have the capability to fully support 3,000,000 meters. The expansion to 6,500,000 will definitely require further hardware and software and is outside this scope.	
39	120	SCHEDULE-6 – SYSTEM INTEGRATION	SYSTEM INTEGRATION A1 Integration of central MMS and RCCs to CMS A2 Integration to SCADA A3 Integration to OMS A4 Integration to ERP A5 Integration to CIS A6 Integration to GIS A7 Integration to Any Other System	Please can a full clarification including detailed information be provided how the MMS system needs to integrate the the 3rd party applications A1 to A7? Are these systems are already up and running? if so, could you please provide their types, versions, vendors and technical information required for their intergration into MMS? What API functionality shall be provided for full integration requirement? For those with no detail, what can be assumed? If the initial phase in not important for MMS integration to these systems, please can they be excluded in the list for costing purposes?	a) Integration of the MMS shall be the RCCs and the Indra CMS. b.) Integration of the MMS to other Systems is indicated as options and the relevant prices shall be provided as requested under Schedule 6 of the Price Schedules. c) Detailed documentation on the Indra CMS prepayment interface shall be provided to Bidders in an Addendum. d) Bidders are expected to provide prices for all items in the Price schedule.	MIDA shall publish interface details of all future integration, so as all bidders have same reference to arrive at the optimum pricing for the purpose of fair evaluation			Integration between this system and other enterprise applications as listed shall be as per IEC 61970/68 standards -Common Information Model (CIM).  Bidders to note that A7 herewith does not include integration to existing vending systems. See answer to 466 above.	

40	124   427	SCHEDULE-8 – RECURRENT COST   2.2.2.2 Telecommunications Services:	Telecommunication Services	Who is to provide for and supply the "Telecommunication Services" i.e. the physical communication cloud such as GPRS   Fiber etc.? Is this for the bidders account? If so, can a full details description be provided on this service?	<p>a.) Fibre Optic Cable between centres shall be provided by ECG</p> <p>b.) Communication between Meters and MMS shall be via 3rd party communication channels and the relevant GPRS SIMs for the sample meters shall be provided by the bidder.</p> <p>c.) The following links are to be provided (cost to be included in bid) by the Bidder through the Telecom Service Providers - New Leased Fibre Links:</p> <ol style="list-style-type: none"> <li>1. Primary Site to RCC (Avenor)</li> <li>2. Recovery Site to RCC (Avenor)</li> <li>3. Primary site to RCC (Makola)</li> <li>4. Recovery Site to RCC (Makola)</li> </ol> <p>d) The duration of the</p>	Bidder should not consider the cost of links in their final bid	Bidder should consider the indicative cost of links which will not be in its scope. So the same cost will not be considered for all bidder during commercial evaluation for the purpose of fair evaluation		ECG has already laid fibre links to these centers. Bidders shall not be responsible for fibre links.
42		General	General	<p>The tender documentation is requesting for a central MMS system with 2 x regional systems:</p> <ol style="list-style-type: none"> <li>1) Does the regional systems conform to the same "high availability" of the central system e.g. 99.995% including a DR site?</li> <li>2) Where are the Primary sites and DR sites for the two regional centres?</li> </ol>	<p>a) "High Availability" of the central system shall be 99.95% inclusive of the DR site The regional Systems should have 99.95%.</p> <p>b) The two regional centres shall use the Primary Site (Central MMS) and Disaster Recovery site( Legon) as back up 1 and 2 respectively. This is well explained in Figure 1, issued with the Bidding Document.</p>	A methodology for calculating the success rate along with parameters and exceptions as per the clause will be published	A bidder not complying with 99.95% success rate will be disqualified during evaluation	A method of penalizing a complying bidder not practically achieving the 99.95% success rate shall be published before bid opening	The procedures for Bid Review and Evaluation is given in Section III of the Bidding Documents, details of which are given in ITB Clause 28; and includes how this feature will be evaluated.
46	526	2.18.22 Form MMS - CT/VT OPERATED METERS	27		Hardware for meter reading instruments for all meters will be provided MiDA	Bidder should not consider cost of any meter reading instrument for the pilot batch of 240 meters		MiDA is not providing Hardware. Bidder is responsible for the Hardware.	
55	93   101   107	SCHEDULE-2 – SUPPLY SCHEDULE-3 – DELIVERY TO SITE SCHEDULE-4: SERVICES – SYSTEM DESIGN, INSTALLATION AND COMMISSIONING	Table Quantities - Price Schedules	<p>There are numerous items listed with a "ZERO" inserted in the Qty column. Please advise:</p> <ol style="list-style-type: none"> <li>1) Does the Bidder price these items?</li> <li>2) Please can a detailed description and specification be presented so that the Bidder can ascertain if this item listed as Zero will indeed be adequate enough for the operational running of the system and respective applications?</li> <li>3) In terms of the "High Availability (HA) - 99.995% or 99.95% (TBA)" required from the system as per the tender, there could be a conflict of interest with the Bidders system and those that ECG will supply in terms of maintaining the HA standard. How will ECG separate these issues?</li> </ol>	<ol style="list-style-type: none"> <li>1) Yes. The quantities are zero so it will not add to the total price.</li> <li>2) Yes. This is provided at Forms MMS except F5 Load Balancer which is has been provided in an Addendum.</li> <li>3) "High Availability" is 99.95%. ECG is committed to providing support for these items. There is a commitment letter MiDA signs to this effect.</li> </ol>	A methodology for calculating the success rate along with parameters and exceptions as per the clause will be published	A bidder not complying with 99.95% success rate will be disqualified during evaluation	A method of penalizing a complying bidder not practically achieving the 99.95% success rate shall be published before bid opening	The procedures for Bid Review and Evaluation is given in Section III of the Bidding Documents, details of which are given in ITB Clause 28; and includes how this feature will be evaluated.



57		In MMS Functional Requirements No. 10	The headend system shall support energized status checks (i.e., Pings) of one or more meters.	<p>1. Normally only GPRS meter has IP address.</p> <p>2. If the head end system is going to Ping the meter, the IP address should be static IP address but it is impossible to get static IP address for all of the GPRS meters.</p> <p>3. The meter can be found online or offline by responding to the master requests and the head end system can be set to execute scheduled reading every 15 minutes if it is necessary. Meter will be shown online if it responds to the master question otherwise it will be shown offline.</p> <p>4. Therefore, we suggest to modify it by stating "The head end system shall support energized status checks (i.e., sending reading request) of one or more meters."</p>	<p><b>5, 15 (default), 30 or 60 minute of interval data (page 429) hence every 15 minutes is OK.</b></p> <p><b>Yes. Modified to include "The head end system shall support energized status checks (i.e.,pings) of one or more meters. It shall also send reading request."</b></p>	Bidder should consider the cost of all computing hardware (Data Center/ Disaster Recovery/ RCC Equipment) to meet the demand of reading 3 million customer data every 15 minutes, with the efficiency of 98% over 22 hours	A methodology for calculating the success rate along with parameters and exceptions as per the clause will be published	A bidder not complying with said efficiency will be disqualified during evaluation	A method of penalizing a complying bidder not practically achieving the reading efficiency of 98% over 22 hours for 3 million meters every 15 minutes shall be published before bid opening	<b>The procedures for Bid Review and Evaluation is given in Section III of the Bidding Documents, details of which are given in ITB Clause 28; and includes how this feature will be evaluated.</b>
58	161	Section VII. Network Security Functional Requirements No.1	If selected, Purchaser reserves the right to commission a third-party security review or penetration test of all components of the Bidder's solution prior to production implementation. Security issues or vulnerabilities discovered must be remediated by the Bidder prior to production implementation, at the Bidder's expense	<p>Could you clarify as below:</p> <p>1. Can the bidder select the third-party to do security review and test of all components of the bidder's solution?</p> <p>2. Which software will be used for the third-party test?</p>	<p><b>1) MiDA will select the third party to do the security review or penetration test of all components of the Bidder's solution prior to production implementation.</b></p> <p><b>2) Software can not be pre-determined.</b></p>	MiDA will publish the test plan for security review before bid opening for consideration of cost by all bidders for the purpose of fair evaluation	Bidder is not necessarily required to obtain ISO 27001, which is an international standard to verify security of the IT systems			<p><b>MiDA reserves the right to commission a third-party security review.</b></p> <p><b>MiDA will not publish the test plan before bid opening.</b></p>
86		Section VII. Purchaser's Requirements – 2.3.4.2.	Vending Software Specifications. Vending Operations	<p>The R of: Vendi (propr</p>  <p>Please confirm that the vending should also generate tokens for proprietary non STS protocols meters</p>	<p><b>(proprietary and STS).</b></p> <p><b>Token generation for STS meters only. see item 14</b></p>	MiDA will publish the details of proprietary systems to be integrated to MMS before the bid opening so as to ensure fair evaluation				<p><b>On-line payments by vendors should be possible for all prepayment meters (proprietary and STS).</b></p> <p><b>Token generation for STS meters only. see item 14</b></p>

94				<p>The different types of meters to be tested and supplied with the system: 1. is this the responsibility of the contractor?</p> <p>2. Which manufacturers are to be chosen</p> <p>3. Who will approach the manufacturers regarding these meters</p> <p>4. What's the proportion in percentage between single and threephase meters</p> <p>5. Are these prepayment or credit meters?</p> <p>6. Are these meters to follow the same communication platform as indicated on the architecture?</p> <p>7. We believe that the two RCCs of the nine are not ready yet, when will they be ready?</p>	<p>1. Yes. It is the responsibility of the Supplier (contractor).</p> <p>2. It is up to the Bidder's choice.</p> <p>3. The Bidder.</p> <p>4. The twenty (20) prepayment meters to be supplied from each manufacturer shall consist of:</p> <p>a. Ten (10) Single phase prepaid meters for residential applications, with basic current and maximum continuous current rating of 5 and 60A/phase respectively.</p> <p>b. Eight (8) Three phase prepaid meters for medium commercial applications, with a basic current and maximum continuous current rating of 10 and 100A/phase respectively.</p> <p>c. Two (2) Three phase CT-connected meters for large commercial</p>	<p>Bidder should consider the STS Meters offered with MMS, which will receive credit information from the MMS and will inturn do real time tariff application and take decision on disconnection with in the meter itself, ensuring the PURC tariff compliance The meter shall not get into debt/ negative credit</p>	<p>Bidder should consider the STS Meters offered with MMS, wherein MMS shall retain credit information and will inturn do real time tariff calculation and take decision on disconnection at the MMS sesvrer then communicate to the meter for disconnection/ connection, ensuring the PURC tariff compliance The meter shall not get into debt/ negative credit</p>			<p>Bidder should consider the STS Meters offered with MMS, which will receive credit information from the MMS and will inturn do real time tariff calculation and take decision on disconnection with in the meter itself, ensuring the PURC tariff compliance Emergency and friendly credit should be configurable.</p>
97			<p>Comfirm if the communication platform between the RCC + meters will be the responsibility of MiDA</p>	<p>The communication platform between the RCC + meters <u>shall be the responsibility of the Bidder</u>. See Page 466 and also Schedule 2, 3 and 4.</p>	<p>Bidder should not consider the cost of links in their final bid</p>		<p>Bidder should consider the indicative cost of links which will not be in its scope. So the same cost will not be considered for all bidder during commercial evaluation for the purpose of fair evaluation</p>			<p>All Communications with the meters shall be through the head-end systems which is the responsibility of the Bidder to provide.</p>