



The Smart Water Meter Installation Regulation





Executive Summary

The Federal Electricity and Water Authority (hereinafter referred to as FEWA) is the regional Authority for the Generation and Distribution of Electricity and Water in the Northern Emirates of Ajman, Ras Al Khaimah, Um Al Quwain, Dhaid and Fujairah in the U.A.E.

As part of the modernization plans to provide better services and facilities to the consumers, FEWA wishes to now install Smart Water meters and thereby implement a state of art Advanced Metering Infrastructure (AMI) system.

It is envisaged that through the implementation of smart water meters FEWA would be able to acquire accurate consumption data from the meters.



Introduction

The document provides a reference for the proper installation and connection of consumer installations of smart Water Meters.

The objective of the regulation is to provide consumers, consultants, contractors, engineers & technicians with general guide for design, installations in order to meet the functional requirement of deployment of Smart water meters in FEWA.

The regulation however is not intended to substitute detailed specifications nor to serve as an instruction manual for untrained persons. It is essential that all consultants, contractors, electrical engineers & technicians study and abide by these regulations.

This of course does not absolve the concerned parties from obtaining other necessary approvals from FEWA.



General Regulation

These Regulations shall apply to all Customers, property Owners, Licensed Contractors, or any other persons involved in the installation, maintenance or operation of Smart Water Meter Installations in any Premises or other place where there is water supply provided by FEWA.

The regulations apply to the requirements of design, erection, inspection and testing of all water metering installations within premises and any additions, alterations to the existing buildings and installations therein, in the region of FEWA.

The regulations are not intended to take the place of a detailed specification, to instruct untrained persons, or to provide for every circumstance. Where a difficult or special situation arises which is not covered or allowed for in the regulations, FEWA may be sought to obtain specific advice.

Reference shall be made to the installation drawings:

- 10A-FEWA-WD-SD-GD-10A-REV-0
- 10B-FEWA-WD-SD-GD-10B-REV-0
- 10C-FEWA-WD-SD-GD-10C-REV-0
- 10D-FEWA-WD-SD-GD-10D-REV-0
- 11A-FEWA-WD-SD-GD-11A-REV-1
- 11B-FEWA-WD-SD-GD-11B-REV-1
- 11C-FEWA-WD-SD-GD-11C-REV-1
- 11D-FEWA-WD-SD-GD-11D-REV-1
- 12-FEWA-WD-SD-GD-12-REV-1
- 13-FEWA-WD-SD-GD-13-REV-1
- 14-FEWA-WD-SD-GD-14-REV-1
- 46-FEWA-WD-SD-MD-46



Reference shall also be made to the illustration in the Appendix section of this document for further clarity.

- Compliance with these regulations is compulsory. Water supply will not be made available if these regulations are not met with entirely. Any deviation from this regulation, to be notified by the contractor or consultant.
- These regulations does not provide for all types of conditions to encompass the type of installation generally encountered. Where difficult or special situations arise which are not covered or allowed for in these regulations, may be sought to obtain the best solution.
- All communication wiring diagrams shall be indicated clearly in plan, the runs of various ducts and conduits and the position of termination points.
- All wiring in communication circuits wherever applicable shall be indicated and numbered in wiring diagram.
- Junction Boxes shall also be marked to indicate the communication channels to meters distributed by them.
- The Consultant shall prepare fabrication, detailed working drawings, and obtain approval of FEWA. All works shall be carried out only on approval of drawings.
- Approval of drawings does not relieve the contractor of his responsibilities to meet the intents of specifications.
- Location of all components of the smart water metering system shall be marked at site and approval of FEWA in-charge Engineer obtained before proceeding with the installation work.
- No extension or alteration to any communication wiring Installation may be made without prior notification to FEWA or without approval,
- All extensions or alterations to an existing Installation must comply with the requirements of these Regulations.



Mbus Cables

All Mbus cables shall comply with industry standards with following requirement

- Cable Type: 2 x 2 x 0.8 mm
- Cable Resistance: 75 Ohm / km
- Cable Capacity: 100 nF / km
- Twisted Pair unshielded
- Poly propylene insulation and PVC sheathed.
- Colour coded

PVC Junction Box

The Adaptable PVC Junction Box shall be zero-halogen (halogen free) with IP56 weatherproof rating.

Minimum dimensions of the Rectangle Junction Box shall be - 150x100x70mm

The terminals for the Mbus wiring shall be isolating knife type of terminals with provision of test leads.

Shorting of the terminals shall be facilitated using suitable shorting links or combs for the set of terminals.

Conduit and Ducts

All conduits and ducts shall be PVC based as per industry standards sized ½ “. All necessary accessories shall be provided for fixing and anchoring the conduits to the walls. Where ever necessary flexible PVC pipes shall be utilized as per the installation requirement for example on false ceilings etc.



Meter Category

- DIN 15 Ultrasonic Smart wired Mbus Protocol Meter.
- DIN 15 Ultrasonic Smart wireless Mbus Protocol Meter.
- DIN 25 Ultrasonic Smart wired Mbus Protocol Meter.
- DIN 50 and above Magnetic Smart Meter with Display units and Modbus Protocol.

Installation in Premises

Villa Areas

- For individual consumer premises, such as villas, farms, gardens, accommodation blocks, etc. the metering cabinet, metering shall be installed outside, recessed, in the compound wall.
- In case of DIN 15 meters, the wired Mbus Meters shall be installed in villa areas
- Minimum 2-meter clearance shall be maintained between electricity and water service cabinets/ points.
- 1” conduit concealed in the wall should be installed between the two cabinets for future communications.
- Reference to the Appendix shall be made for the typical installation of the smart meters in villa areas.

Buildings

- In multiple consumer premises such as residential/commercial buildings, industries, large utility complexes, schools, etc. water metering shall be installed in separate water meter rooms, in location close to which access is available at all times for operation, testing, inspection, maintenance and repair. Prior approval shall be obtained from FEWA for every such premise.



- All smart water meters will be normally provided by FEWA and restricted to one for each consumer installation, unless otherwise approved/ specified by FEWA.
- The minimum space required for installation of water meter shall be 300 mm.
- A minimum space of 1000 mm shall be provided in the front of water meter cabinet/ meters.
- The general arrangement and dimensional layout of the metering cabinets and array of meters installed in water meter room/s and enclosures along with associated wiring shall be subject to FEWA approval. The typical arrangement of water metering Appendix and associated drawings.
- Reference to the Appendix shall be made for the typical installation of the smart meters in Buildings.
- The installation of the Communication panel in case of Buildings shall be as per Appendix and located in the Electricity Meter room.

Example of Installation in Buildings (one meter room in each floor):

If there are Eight floors (Ground floor + 7) with four apartments then

1. Communication Panels is installed in the Electricity Room of the Ground floor.
2. The Main Meter if any is wired to the communication panel in the Ground Floor.
3. The sub-meters (consumer) are wired from the meters at the ground floor and from floor 1 to 7 to the communication panel (in the ground floor) as shown in the Appendix.
4. Maximum number of meters shall be 32 meters or less (in this case $8 \times 4 = 32$).

If there are 16 floors or more with example 4 meters in each floor:

1. Then the next communication Panel will be installed in the 8th floor.
2. The meters from Floor 8 to Floor 15 (total $8 \times 4 = 32$) will be connected to this communication panel.

If there are only 4 floors with 4 meters in each floor

1. The meters will be connected to one communication panel in the ground floor.
2. The total meters in this case will be $4 \times 4 = 16$



Example of Installation in Buildings (Multiple meter room in each floor):

If there are four floors (Ground floor + 3) with eight apartments with two meter rooms per floor (i.e 4 meter per meter room) then

1. Communication Panels is installed in the Electricity Room of the Ground floor.
2. The Main Meter if any is wired to the communication panel in the Ground Floor.
3. The sub-meters (consumer) are wired from the meters at the ground floor and from floor 1 to 3 to the communication panel (in the ground floor) as shown in the Appendix.
4. Maximum number of meters shall be 32 meters or less (in this case $4 \times 8 = 32$)

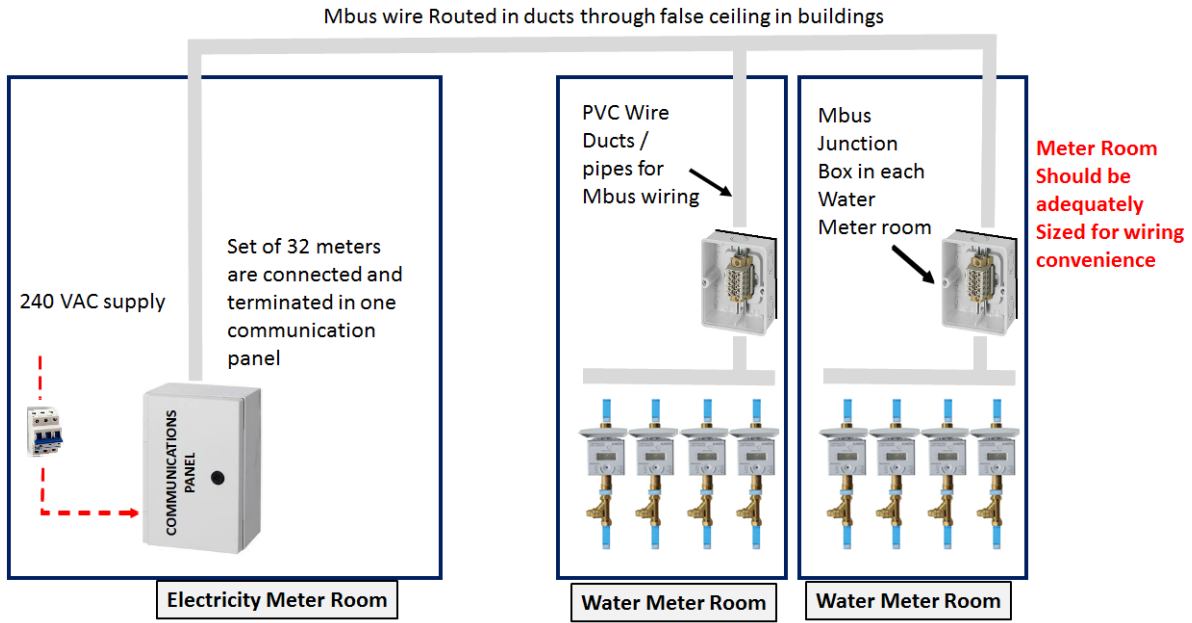
Inspection & Testing

- In order to verify compliance with these Regulations the approved Contractor shall complete and sign Meter Installation Document.

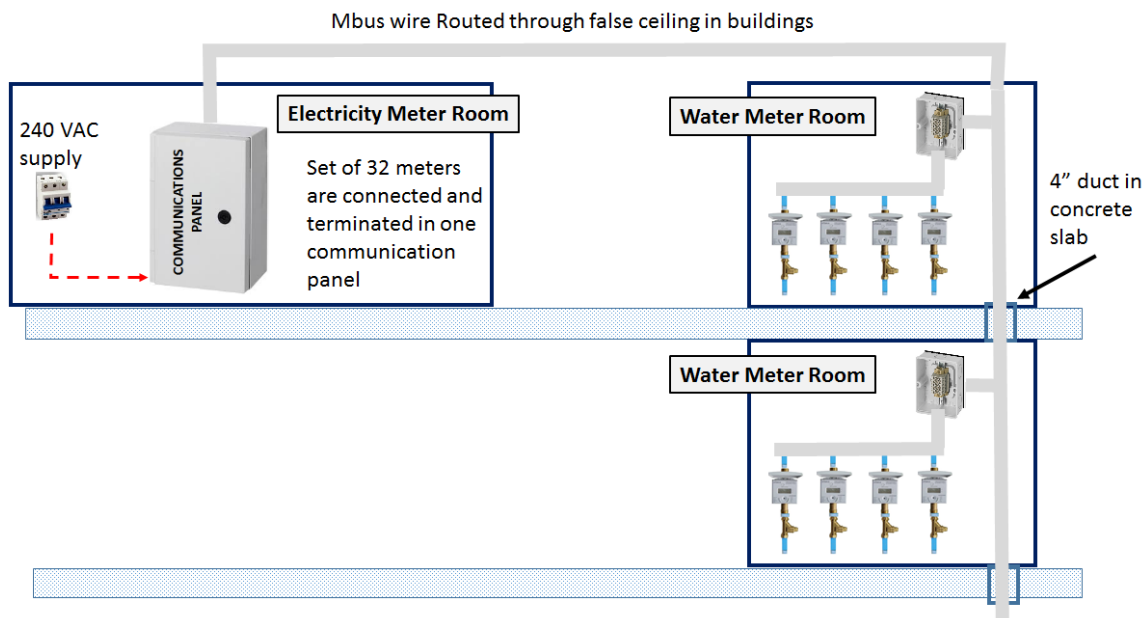


Appendices

ANNEXURE – WATER METER INSTALLATION IN MULTIPLE ROOMS ON SAME FLOOR



ANNEXURE – WATER METER INSTALLATION IN DIFFERENT FLOORS (ONE WATER METER ROOM)



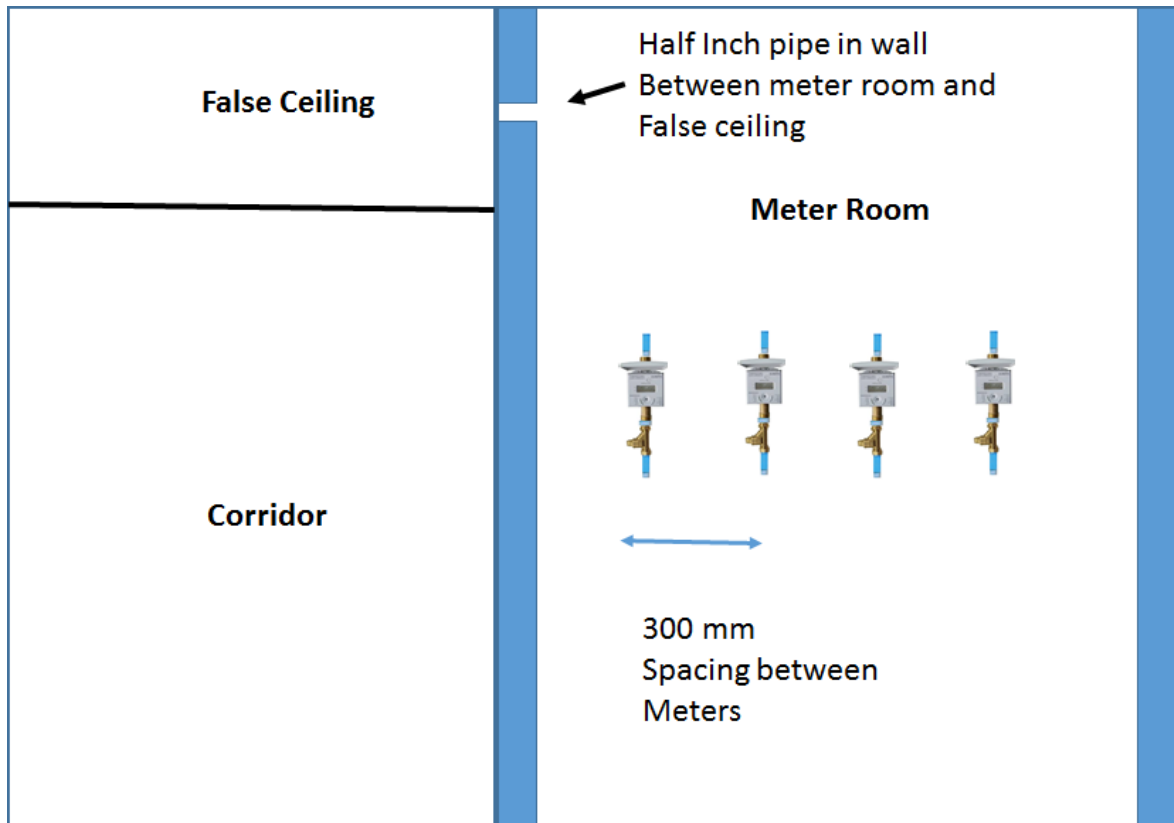
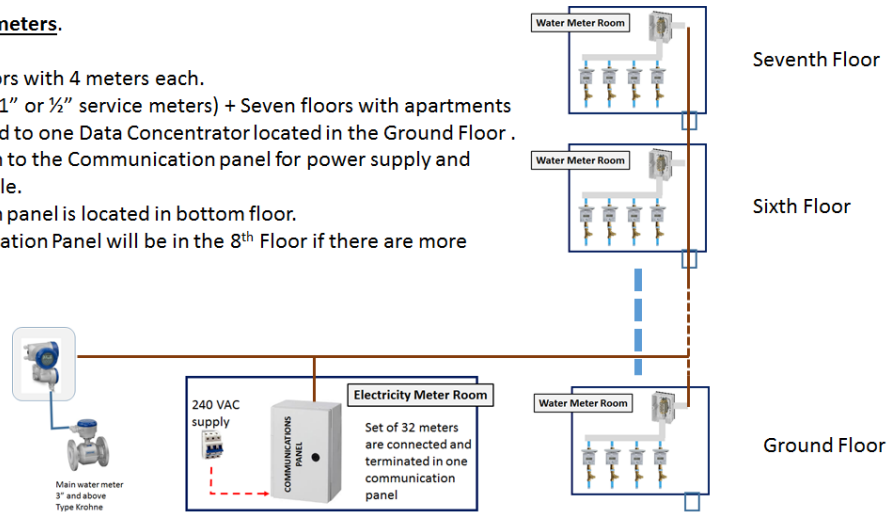


ANNEXURE – WATER METER INSTALLATION IN DIFFERENT FLOORS (ONE WATER METER ROOM)

Mbus wire Routed through false ceiling in buildings with multiple floors

Example of wiring 32 meters.

- There are Eight Floors with 4 meters each.
- Ground Floor (with 1" or 1/2" service meters) + Seven floors with apartments
- These are connected to one Data Concentrator located in the Ground Floor .
- Main Meter is taken to the Communication panel for power supply and communication cable.
- The communication panel is located in bottom floor.
- The next communication Panel will be in the 8th Floor if there are more floors

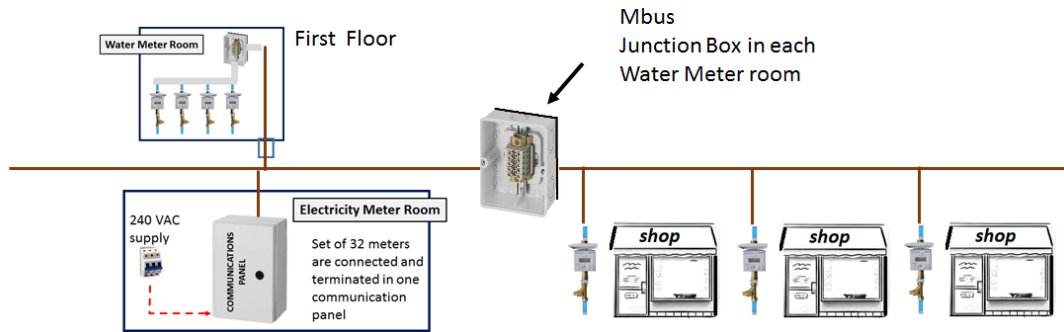




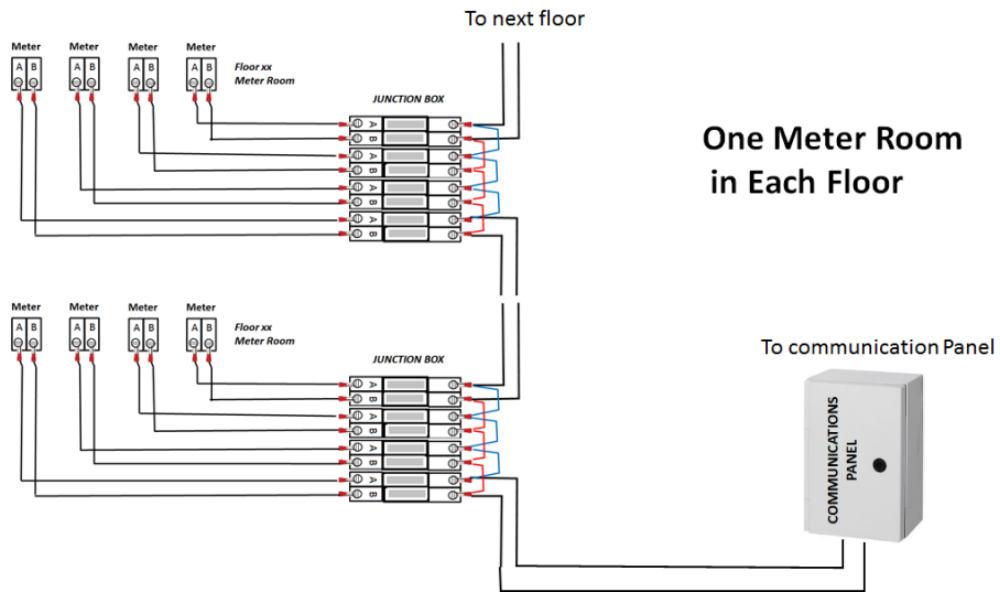
Mbus wire Routed through false ceiling in buildings with multiple floors

Example of wiring.

- Ground Floor has meters with Shops and these should be wired Mbus meters.
- First floor has meters for with apartments with meter room
- These are connected to one Data Concentrator located in the Ground Floor .
- Main Meter is taken to the Communication panel for power supply and communication cable.

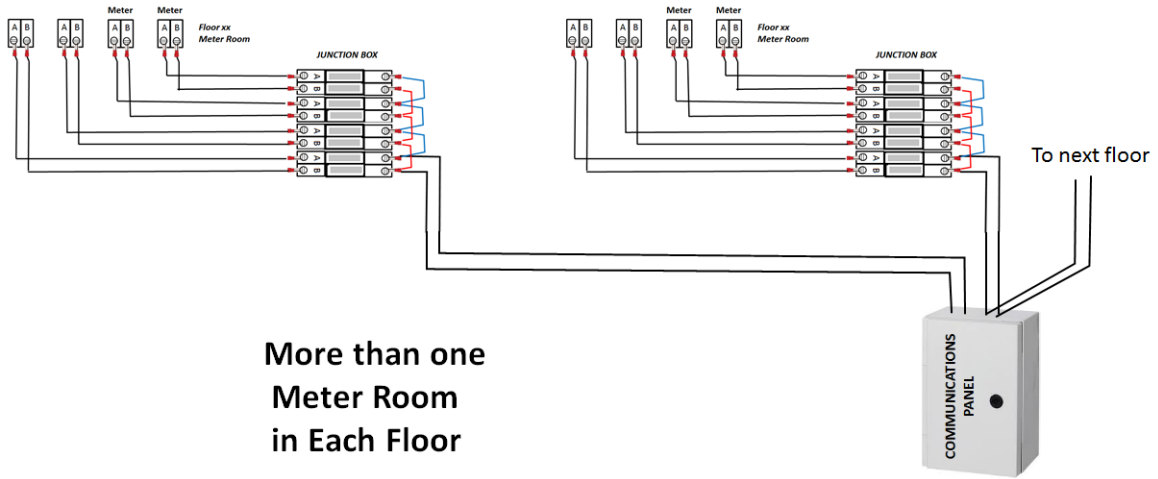


ANNEXURE – MBUS CIRCUIT WIRING SCHEME

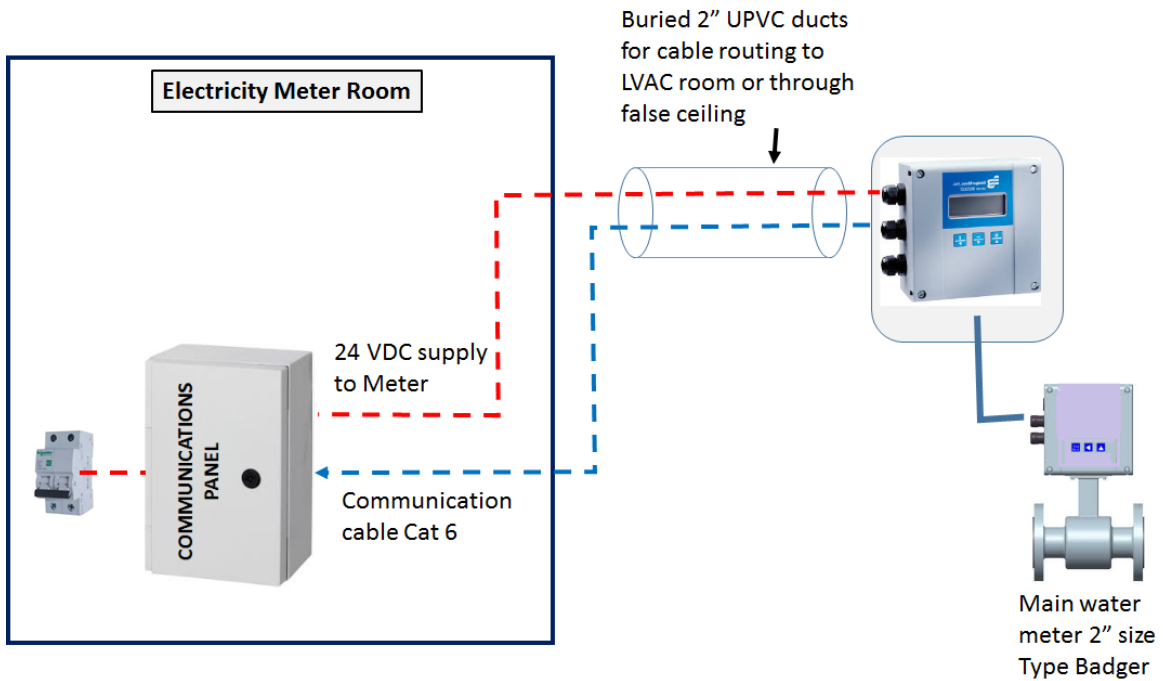




ANNEXURE – MBUS CIRCUIT WIRING SCHEME



ANNEXURE – MAIN WATER METER INSTALLATION 2"





ANNEXURE – MAIN WATER METER INSTALLATION 3" and Above

