Water & Civil Division

Water AMI (Advanced Metering Infrastructure) Project

GUIDELINES FOR DOMESTIC WATER METER INSTALLATION ON ROOF IN MULTISTORIED BUILDING UP TO FIVE FLOORS

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GUIDELINES FOR DOMESTIC WATER METER INSTALLATION ON ROOF

IN MULTISTORIED BUILDING UP TO FIVE FLOORS

For multistoried buildings up to five floors, water meter shall be located on the roof at a suitable location as shown in standard installation drawing **PEW-STD-AMI-002.Rev1.**

A. FIELD REQUIREMENTS FOR DOMESTIC WATER METER ON ROOF

1. The meters shall be installed vertically on the wall plane available on the roof of the building and connected after the water storage tank.

2. Water meter should not be installed in the basement of building, pump room or in underground meter chambers and minimum 2mtr. clearance shall be provided from any electrical services.

3. The meters shall be installed without any obstruction; away from air conditioning units, solar panels, dish antennas, radio masts, transceivers and any other devices/equipment installed on the roof, with sufficient clearance for installation, maintenance and reading of meters.

4. A header pipeline from the roof water storage tank shall be laid to sufficient length and connected to the branch pipelines to install meters for individual flats/rooms using suitable pipes & fittings.

5. Install a 25mm dia. GI conduit with pulling spring between the Roof floor and LV room to lay interconnecting Mbus cable communication for meters. Junction boxes, Trunking and associated fittings shall be provided in every floors as described in **Section C**.

6. All-time maintenance of the meters shall be taken into account while installing new meters.

7. Meter shall not be installed inside the cabinet or boxes that will prevent communication signals from the meter.

8. Meter shall be protected from the risk of damage by shock or vibration induced by the surroundings.

9. Water meter and its associated fittings/pipes shall not be part of electrical earthing.

10. Power socket (13 Amp, waterproof) shall be provided in a secured location on the roof.

11. A/c. No. & Flat No. plates shall be affixed on the block work immediately adjacent to the meter (not on the meter) for identification.

12. There shall be provision of adequate drainage to remove flushed water.

13. Detailed shop drawing with dimensions shall be submitted for DEWA approval before commencement of work.

B. METER INSTALLATION AND ASSOCIATED PLUMBING WORKS STANDARDS:

All plumbing work shall be performed in accordance with all local codes, ordinances, laws and regulations; and as recommended by BS EN 12056-2:2000 and BS 8000, Part 13, 14 and 15. Piping shall be installed not to obstruct entrance or passageways and rigidly anchored to walls with suitable wall brackets. Meter and associated piping works shall be in line with the dimension mentioned in the typical installation **Drawing PEW-STD-AMI-002.Rev1**

1. A header pipeline from the roof water storage tank shall be laid to sufficient length and connected to the branch pipelines to install meters for individual flats/rooms using suitable pipes & fittings.

2. The header pipeline size shall be 80mm internal dia. (ID) as minimum and branch pipelines to install the meters shall not exceed the size 25mm ID with maximum 6 water meters in a group, and the header pipeline size shall be increased according to the number of meters.

3. If booster pump is to be installed after the storage tank to achieve the required pressure in the flats/rooms, the pump shall be installed on the header pipeline with sufficient distance (Min.10 mtr.) away from the branch connections to the meter to avoid sudden variation of flow/pressure that may affect proper functioning of the meter.

4. Maximum pressure at the meter inlet shall not exceed 2bar, PRVs with pressure gauge shall be installed, at least 1mtr. before the meter, to achieve the required pressure.

5. Meters shall be installed at a height of 1200mm from the finished floor level. The clearance between the back plate of meter and the wall plane shall be 200mm and the entire meter group must be adjusted as a single layer.

6. Sufficient space (at least 200mm.) shall be provided between and around water meters to permit installation, reading, servicing and removal of the meters.

7. The pipework at the meter position should be securely fixed on the wall to support the weight of the water meter and to resist any torsion, bending and tension during the installation and removal of the water meter.

8. The pipes shall be adequately anchored on the wall to avoid displacement of pipes while installing / removing the meter.

9. Pipes, Valves, PRVs, NRVs and all other fittings shall be high quality, heavy duty, non-toxic, non-corrosive material approved by DEWA.

10. Pipe size for ½" meter installation shall be ½" to 1" maximum and for 1" meter installation shall be 1" to 2" maximum.

11. ½" meter can deliver up to 10,000 gallons of water in 24 hours and 1" meter can deliver up to 20,000 gallons in 24 hours, approximately.

12. Consumer must have water storage tank equivalent to 24 hours' consumption for residential premise and storage equivalent to 48 hours' consumption for labour accommodation and other high consumption premise.

13. Gate valves shall be installed upstream and downstream the meter to isolate water flow from both directions.

14. Both valves shall be fully open while the meter is in service and no control of flow shall be made by regulating the inlet and outlet valve.

15. In addition to this a main isolation valve shall be installed on the header pipeline from the storage tank to isolate the supply in case of pipe breakages/maintenance works.

16. A Stopcock shall be installed prior to the meter for locking/disconnection of supply to meter.

17. A threaded joint/union shall be provided after the meter to make length adjustments for meter connection in accordance with the meter length.

18. Meter shall be installed in accordance with the arrows shown on the body and register shall be arranged in the most convenient position for reading.

19. All connections shall be checked thoroughly for leak after installation of the meter.

20. Meter installation guidelines shall strictly be followed while installing the meter.

21. Detailed shop drawing shall be submitted for DEWA approval before commencement of work.

22. A permanent Notice/Warning plate "Landlord/Customer is not allowed to install any other devices near the meter and also not allowed to do any modification to meter connection, pipes and fittings without written permission from DEWA" in Arabic and English language shall be affixed near the water meter.

23. Prepare As-built drawings showing the pipelines to the meter and after meter to the customer pipe connection to their storage tank and the conduit from meter to the building's LV room for communication cabling and submit to DEWA.

24. DEWA is responsible for the supply and installation of water meters for new connections. Meters are installed either by DEWA staff or Contractors acting on behalf of DEWA. Customers and property developers are responsible for supply and installation of all ancillary fittings and pipe-work beyond the meter in accordance with relevant DEWA specifications and standard drawings.

C. M-BUS CABLE CONTAINMENT INSTALLATION STANDARDS :

1. A GRP Junction Box of dimension 150X150X80mm and IP68 rating (for up to 8 Water meters) shall be installed on the wall and fitted with a DIN rail inside as shown in the standard installation drawing PEW-STD-AMI-002.Rev1.

2. A GI trunk of dimension 50X50 of sufficient length and IP56 rating with metallic PG-7 glands (equal to the number of Water Meters near it) shall be installed under the Junction box and connected to it through a heavy duty 25mm dia. GI conduit and couplings.

3. In case of multiple Water meter groups located away from each other, their respective Junction Boxes shall be connected with each other through similar GI conduit and couplings as described above.

4. A heavy duty 25mm dia. GI conduit shall be laid between the Junction box installed on the wall and LV room for Meter communication cable as shown the drawing.

5. A two way GI junction box shall be provided at every 25m interval and each corner (direction change) of the conduit with metallic pulling spring for cable pulling purpose. The connection of conduit to Junction box shall be done with proper couplings/adaptors.

6. The conduit shall be GI if routed along walls/roof or CPVC (with wall thickness of 2.8mm) if laid concealed in concrete/block walls. In any case, while entering the LV room, the conduit shall be transformed to GI at a minimum of 2m distance before entering LV room.

7. A GI Junction Box of dimension 150X150X50mm and IP 56 rating shall be installed inside the LV room on wall at a suitable position at a height of 1600mm from finished floor level.

8. Clamping of the conduit shall be done at every 1m span with appropriate clamps/saddles. Connection of conduit to JB shall be through appropriate couplings/adaptors.

9. The external and internal surface of pipes shall be clean, smooth and virtually free from grooves or other indentations or projections. The smoothness of the internal surface of the pipe shall be such that the pulling through of the cables in long lengths shall be facilitated without risk of damage to the exterior surface of the cable. The ends of conduit, trunk and cable tray shall be provided with bushes or other finished ends such that cables do not sustain damage during installation or throughout the life of the Installation and must be suitably sealed against the ingress of water.

10. As built drawing of the communication installation shall be submitted for approval.

11. Sample Installation of AMI Smart Water Meter and Communication Network is displayed at DEWA Sustainable Building Al Quoz, Smart Metering Office as a guideline for the Developers, Landlords, Consultants and Contractors to finalize their design drawings and to submit for DEWA approval before commencement of construction.

D. M-BUS CABLE INSTALLATION STANDARDS :

1. Water meter communication cable (Prefab M-bus cable) shall be properly routed and secured along with the water pipe line using suitable nylon cable ties to reach the GI trunk as shown in Picture Reference # 1, Section-E.

2. M-bus cable from each meter shall be passed in to the GI trunk through metallic PG-7 gland installed on the wall adjacent to the meter. The cable shall be labelled with suitable size of PVC ferrule sleeve and affixed near to the PG-7 glands. For example, the ferrule marking for Shop No.XX shall be marked as S-XX and Flat No.XX as F-XX. Moreover, all the cables inside the trunking shall be neatly dressed and secured using cable ties throughout the GI trunk. Refer Picture Reference # 2, Section-E.

3. Extend and label each M-bus cable of meter from the GI trunk to adjacent GRP junction box for termination. In order to achieve sufficient length, approved M-bus Communication cable can be joined together using suitable Splicing connectors inside the GI trunk. Special care should be taken when connecting the cables with exact polarity/color of wires. The brand of M-bus cables and Splicing connectors shall be approved by the DEWA Engineer prior to the installation

4. GI trunk shall be properly closed and PG-7 glands securely fixed to ensure the water proofing of the cable containment. Labelling of cable inside the trunk shall be similar to the one outside the trunk as mentioned in Picture Reference # 2, Section-E.

5. Sufficient quantity of Terminal connectors, End plates and DIN Rail stoppers shall be fixed inside the GRP junction box to achieve a pair for dual polarity connection. The cables inside the junction boxes and to the terminal connectors should be neatly dressed in such way that all the ferrules are easily visible, Refer Picture Reference # 3, Section-E.

6. All Red/Positive wires from the water meter cables shall be terminated and properly labelled to one part of pair of terminals and Black/Negative to the other part of pair of terminal inside the Junction Box. Suitable size of PVC ferrule sleeve labels shall be affixed on each wire of each cable. For example, the ferrule marking for Shop No.XX shall be marked as S-XX and Flat No.XX as F-XX. Refer Picture Reference# 3, Section-E

7. Each pair terminals inside the junction box shall be shortened by using terminal short links to make a star connection. Refer sample picture # 3, Section-E, White colored strip in middle of the terminals.

8. The total length of a loop cable should not exceed more than 800 meters in one run between the junction boxes. Suitable size of PVC ferrule sleeve labels shall be marked on loop cable. For example junction box in the second floor to the junction box in the first floor water meter room shall be marked as JB WMR F2 – JB WMR F1.

9. Junction box shall be properly closed to maintain its water proofing capability and to be labelled with PVC engraved label as JB WMR RF. This label shall be affixed below the label already provided on the junction box and conduits as DEWA-W-AMI.

10. Interconnecting communication cables between the junction boxes located on the Roof floor and from there to LV rooms shall be properly labelled with origin and destination names at both ends. The ferrule label for the cables shall be in similar fashion as mentioned earlier.

11. The total length of a loop cable should not exceed more than 800 meters in one run between the junction boxes. Suitable size of PVC ferrule sleeve labels shall be marked on loop cable. For example, the cable from a junction box on Roof floor to junction box in LV room in Basement Floor-1 shall be marked as JB WMR RF–JB LVR B1 using suitable size of ferrule sleeve.

12. Each loop cable extended up to the LV room should be left with minimum 10 meters of extra cable length and properly coiled for further extension. These cables can be placed on the wall of LV room where there is enough space available to install DEWA communication related devices as shown in the Picture Reference# 4, Section-E.

13. Continuity and insulation resistance test shall be conducted on each loop cable before terminating to water meters and other devices. Insulation Resistance test to be performed at 100VDC for one minute with a minimum insulation resistance value of 1MΩ as acceptable.

14. Test reports of cable continuity and insulation resistance to should be submitted for approval.

15. All the materials used for above works shall be approved by the DEWA Engineer prior to the installation. Preferred make for M-bus Cable: Belden or Similar Standards and Terminal Blocks/ Splicing connectors: Wago or Similar Standards subject to the DEWA approval.

16. As built drawing of the entire cabling and termination, specifying the physical route and locations shall be prepared and submitted for final acceptance. Sample form of As-built schematic drawing is shown in the Section-F, M-Bus Cable Schematic Sample Drawings.

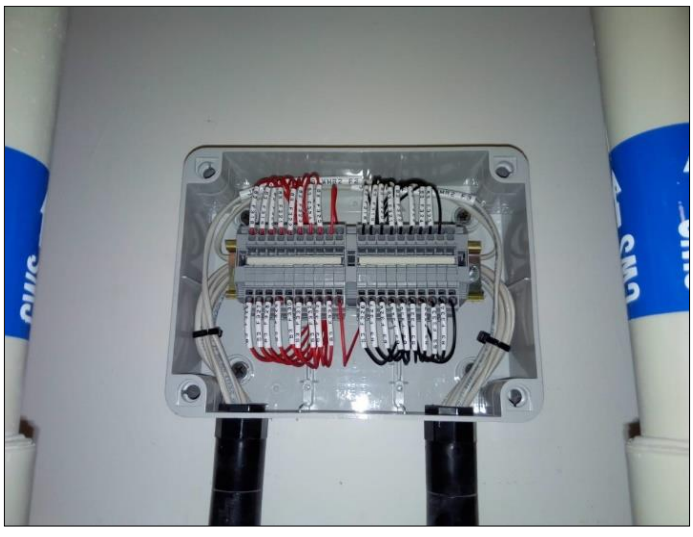
All the above requirements should be strictly complied by the Developers /Contractors before submitting application for the new connection.

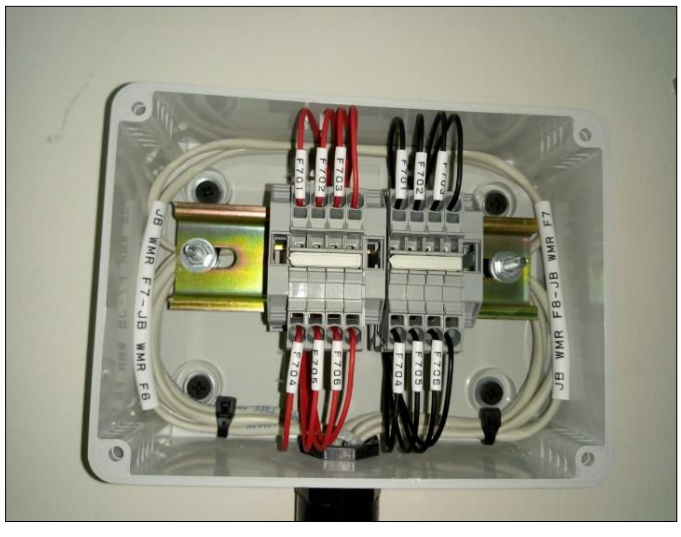
E. TYPICAL PICTURE REFERENCES:

Picture Reference# 1

Picture Reference# 2

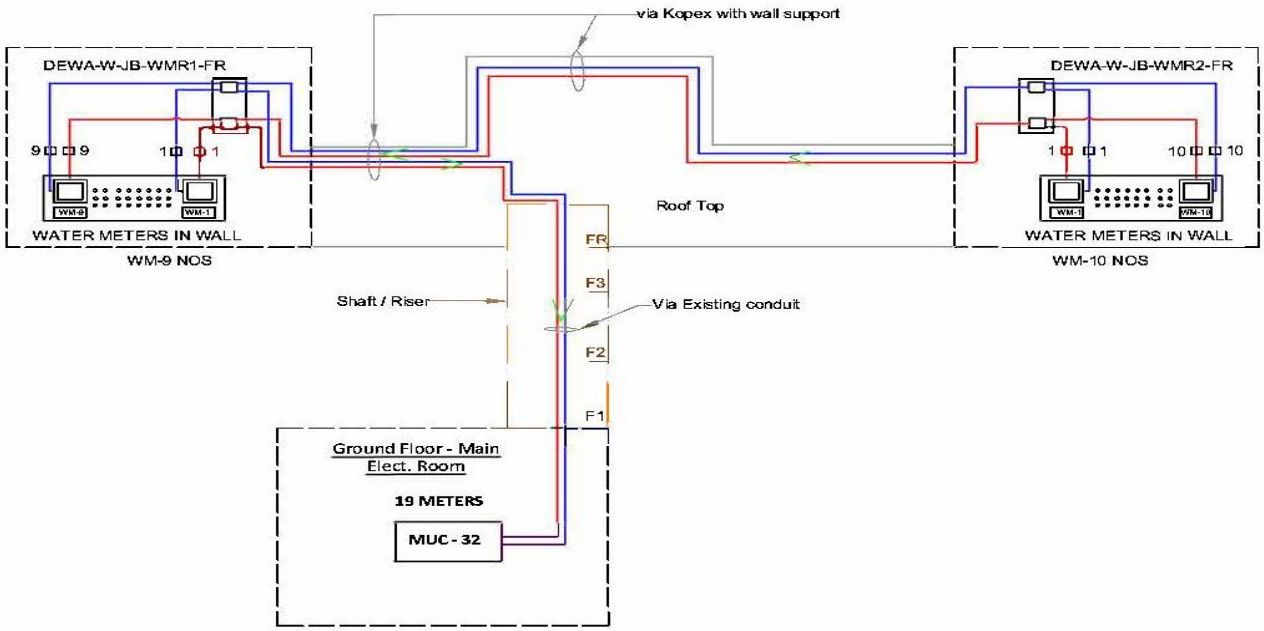
Picture Reference# 4





Picture Reference# 3

F. TYPICAL M-BUS CABLE SCHEMATIC DRAWING:



LEGENDS:

	WATER METER
	BELDEN(MBUS)CABLE
	JB WITH TERMINAL BLOCK
	WAGO SPLICING CONNECTOR

CUSTOMER: Dubai Electricity & Water Authority (DEWA)	**DRAWING REFERENCE NO:** FW/DEWA/18/981	**SHEET: 1/1**
PROJECT: Smart Water Meters (AMI) implementation, PO # 3091800094	**FERRULING/TAGGING PHILOSOPHY**	
CONTRACTOR NAME:	**ITEMS TO BE LABELLED**	**FERRULE/TAG**
SUBSTATION NO: PK009362	ELECTRICAL ROOM JUNCTION BOX	DEWA-W-JB-EMR-F
AREA/ SITE: 127-Hor Al Anz	WATER METER ROOM JUNCTION BOX	DEWA-W-JB-WMR-X-F-X(X=G,1,2,3 & 4)
BUILDING NAME: Barkha Building	BEFORE & AFTER PG 7 GLAND	FLAT NO / SHOP NO
NO OF FLOORS: Roof	EACH CABLE CORE IN JUNCTION BOX	FLAT NO / SHOP NO
NO OF WATER METERS: 19 Mtrs	PVC COATED GI FLEXIBLE	DEWA-W-AMI
DRAWING TITLE: Schematic Drawing	PVC PIPE	DEWA-W-AMI

Reference Drawing: PEW-STD-AMI-002.Rev1

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