

Water & Civil Division

Water AMI (Advanced Metering Infrastructure) Project

GUIDELINES FOR DOMESTIC WATER METER INSTALLATION IN METER ROOM FOR BUILDINGS

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Dubai Electricity & Water Authority

**GUIDELINES FOR DOMESTIC WATER METER
INSTALLATION IN METER ROOM FOR BUILDINGS**

Rev-3

27.04.2022

GUIDELINES FOR DOMESTIC WATER METER INSTALLATION IN METER ROOM

All Domestic water meters in high-rise residential and commercial buildings shall be arranged in groups and housed inside the water meter rooms as shown in standard **drawing PEW-STD-AMI-003.Rev3**. The meter rooms shall be used solely for water meter installation to protect them against exposure to undue external interferences. No other service installations will be allowed in the water meter room. The meter should not be installed in the basement of the building, pump room or in underground meter chambers.

A. WATER METER ROOM STANDARD:

Water meter room shall comply with the following requirements:

1. Meter Room in high-rise buildings shall be located on each floor of the building and adjacent to the Electricity Meter Room and Proper water meter room shall be considered for Retail shops meters, if any.
2. The size and shape of the water meter room shall be determined based on the number of water meter to be installed and minimum size of the water meter room shall be 1500mm length x 1500mm depth x 3000mm height.
3. The meter room door shall have a minimum width of 800mm and a height of 2000mm with an appropriate handle.
4. The water meter room shall be designed to arrange the water meters into a single layer with sufficient clearance to install and maintain the meters.
5. Meter room shall be located within the common area for safe, free and uninterrupted access.
6. Install a 25mm dia. PVC conduit along a pulling spring between the water meter rooms from the highest floor to the ground floor to lay interconnecting cable for meter communication and Install junction boxes, Trunking and associated fittings in every floor as described in **Section C**.
7. An adequate drainage system shall be provided within the meter room to remove flushed water during installation and maintenance of the water meters.
8. The meter room flooring shall be clear from obstacles and shall be even, rigid and not slippery.
9. The meter room level shall be lower than (min.100mm) the passage or other floor areas such that water from the meter room should not flow into the passageway, other floor areas and elevators/lifts.
10. There shall be sufficient ventilation inside the meter room.
11. Light with IP 65 switches shall be provided inside the water meter room for sufficient illumination.
12. A waterproof 13 Amp. Power socket shall be provided in the meter room.
13. All electrical fittings in the water meter room shall be waterproof and minimum 2mtr. clearance shall be provided from all electrical services.
14. A permanent Notice/Warning plate "Landlord/Customer is not allowed to install any other devices in the water meter room 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 inside the meter room.

15. The 'DEWA Water Meter Room' name plate in Arabic and English language shall be affixed on the door, and meters shall be accessible to DEWA staff at any time.
16. Detailed shop drawing, meter room elevation plans with dimensions, including the width and height of entrance shall be submitted for DEWA approval before commencement of work.

B. METER INSTALLATION AND ASSOCIATED PLUMBING WORKS STANDARD:

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 the room 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-003.Rev3.**

The following practice shall be adopted in plumbing work for meter room: -

1. The fittings at the meter position should facilitate the installation and removal of the water meter without having work on other pipes. All-time maintenance of the meters shall be taken into account while installing new meters.
2. Pipes, Valves, PRV, NRV and other fittings used for meter connection shall be high quality, heavy duty, non-toxic, non-corrosive material approved by DEWA and these shall be located at the easily accessible places for future maintenance.
3. Pipe size for ½" meter installation shall be ½" to 1" maximum and for 1" meter installation shall be 1" to 2" maximum.
4. ½" meter can deliver up to 10,000 gallons water in 24 hours and 1" meter can deliver up to 20,000 gallons in 24 hours, approximately.
5. Consumer must have a water storage tank equivalent to 24 hours of consumption for residential premises and storage equivalent to 48 hours of consumption for labor accommodation and other high consumption premises.
6. The pipework at the meter position should be securely fixed to support the weight of the water meter and to resist any torsion, bending and tension during the installation and removal of the meter.
7. The meter shall be installed on a straight length of pipe the same diameter as the meter and equivalent in length to 3 times the meter dia. at the inlet and 2 times dia. at the outlet.
8. Isolation valves shall be installed upstream and downstream the meter to stop water flow from both directions and a stop cock shall be installed prior to the meter for locking/ disconnection of supply to the meter. An isolation valve shall be installed on the main pipeline branch in the meter room to isolate the supply in case of pipe breakages to prevent flooding.
9. The main isolation valve shall be provided for every group of five meters in order to sectionalize the group of meters during maintenance without affecting any other group of meters.
10. Both valves shall be fully open while the meter is in service and no flow control shall be conducted by adjusting the inlet and outlet valves.

11. A threaded joint/union shall be provided after the meter to make length adjustments for meter connection in accordance with the meter length.
12. Meters shall be installed at a height of 1200mm from the finished floor/ground level. The clearance between the back plate of the meter and the wall plane shall be 200 mm and the entire meter group must be adjusted in a single layer. Multiple layers and different elevations of meters are not permitted in the water meter room.
13. Suitable size single header supply lines are to be considered in the plumbing design for each meter room, multiple or parallel header lines shall not be allowed in a single room.
14. Sufficient space (at least 200mm.) shall be provided between and around the water meters to allow for installation, reading, servicing and removal of the water meters.
15. The water meter and its associated fittings/pipes shall not be part of electrical earthing.
16. No water pump shall be installed upstream or downstream the meter and any sudden change in flow/pressure shall be avoided.
17. Maximum pressure at the meter inlet shall not exceed 2 bar, PRV and Pressure Gauge shall be installed, at least 1 mtr. before the meter, to achieve the required pressure.
18. The water meter shall be easily accessible for reading without the use of mirror, ladder etc.
19. The meter shall be installed in accordance with the arrows indicated on the body of the meter and the register shall be located in the most convenient position for reading.
20. The meter room shall be suitable for the Technician to stand upright and remove/re-install the meter easily. The instructions for the installation of the water meter must be strictly followed.
21. Prepare As-built drawings showing the pipelines to the meter and after meter to the customer pipe connection to their storage tank and the PVC Conduit from meter to the building's LV room for communication cabling and submit to DEWA.
22. A/c. No. & Flat No. plates in engraved label shall be affixed on wall immediately adjacent to the meter (not on the meter) for identification.
23. 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 the supply and installation of all ancillary fittings and pipework beyond the meter in accordance with relevant DEWA specifications and standard drawings.

C. M-BUS CABLE CONTAINMENT INSTALLATION STANDARD:

1. Install a 25mm dia. PVC conduit vertically between the water meter rooms from the highest floor to lowest floor for interconnecting communication cable for Smart water meters. Install PVC junction boxes at 25m interval (if the length exceeds 25m) and corner portions with pulling spring so as to provide ease of access to cable circuits throughout the route. The JB shall be a two way PVC JB for easiness of cable pulling.

2. In the water meter room located in each floor, install a 50X50 mm PVC trunk of sufficient length horizontally on the wall surface behind the back plate of the meter by utilizing the achieved clearance of 165mm. The trunk shall be made of a single piece securely fixed and aligned at an elevation of 1600 mm from the finished floor level and installed with proper end caps.
3. The PVC trunk shall be installed with PVC PG-7 glands equal to the number of Water Meters in the Water Meter room.
4. The PVC trunk shall be of high quality conforming to BS4607 and rectangular cross-section with a removable side.
5. All PVC conduits, trunks, glands and coupling accessories must be conforming to BS 4607 and be suitable for the ambient conditions expected. It shall be corrosion resistant.
6. 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 long lengths shall be facilitated without risk of damage to the exterior surface of the cable. The ends of the conduit, trunk and cable tray shall be provided with bushes or other finished ends such that the cables do not sustain damage during installation or throughout the life of the Installation and must be suitably sealed against the ingress of water.
7. PVC conduits installed vertically shall be clamped at every one-meter interval and installed horizontally shall be clamped every half meter using suitable and safe fixtures. The connection of conduit to JB shall be done with proper couplings/adaptors.
8. Provide an IP65, PVC Junction Box of dimension 150X150X100mm for up to 10 Water Meters and 200X150X100mm for up to 25 Water Meters in water meter room on each floor with DIN rail for fixing the water meter communication interfacing units.
9. The Junction Boxes shall be mounted on the wall planes inside the meter room at an elevation of 1800mm from the finished floor level and minimum 500mm away from the nearest water meters.
10. PVC trunk behind the meters shall be connected to the Junction Box through 25mm PVC conduit by using proper couplings/adaptors. The PVC conduit shall have soft bends and proper mounting. There shall be one connection for up to 10 water meters and two connections for up to 25 water meters.
11. A heavy duty GI conduit of 25 mm dia. shall be provided between the ground floor water meter room and LV room (or the water meter room on the floor nearest to LV room) with pulling rope for interconnecting meter communication cable with data concentrator. Install pulling junction boxes in every 25 meters interval and corner portions. The connection of GI conduit shall be done with proper GI couplings.
12. Install an IP56 GI Junction Box of dimension 150X150X50mm at suitable position on the wall inside LV room at an elevation of 1600mm from the finished floor level. This shall be connected with the GI conduit mentioned above.
13. As built drawing, continuity test and IR test reports of the communication installation and cable shall be submitted for approval. Cabling should be done through DEWA approved contractor.

D. M-BUS CABLE INSTALLATION STANDARD:

1. Water meter communication cable shall be properly routed and secured along with the water pipe line using suitable nylon cable ties to reach the PVC trunk as shown in Picture Reference # 1, Section-E. These works shall be performed by an approved DEWA contractor.
2. M-bus cable from each meter shall be passed in to the PVC trunk through PVC PG-7 gland inside water meter room. All 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 PVC trunk. Refer Picture Reference # 2, Section-E.
3. Extend and label each M-bus cable of meter from the PVC trunk to adjacent PVC 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 PVC 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 DEWA Engineer prior to installation.
4. PVC 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 PVC 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 junction boxes located inside each water meter room of all the floors shall be looped together using M-bus cable through the conduits to build a local M-bus communication network.
9. 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.

10. In case of multiple loops inside a high-rise building, Water meters in the entire premise shall be grouped in such a way that a loop contain a maximum number of either 245, 120, 60 or 28 Nos. of water meters. For example, if the total number of meters are 245-250, then all the meters shall be grouped in one loop. Likewise, if the total number of meters are 300, then first loop will contain 240-245 Nos. of meters and second loop will contain 55-60 Nos. of meters. Moreover, if there are 490 Nos. of meters, then it will be divided in two groups of 245 Nos. connected together to maintain two loops.
11. Junction boxes shall be properly closed to maintain its water proofing capability and to be labelled with PVC engraved label. For Example, the Label for junction box on the floor No-AA shall be marked as JB WMR FAA and on the Ground floor shall be as JB WMR FG. This label shall be affixed below the one already provided on the junction box and conduits as DEWA WAMI.
12. The communication cables between the junction boxes located in the adjacent floors 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.
13. In case of multiple loops, all loop cables shall be routed together through containments in parallel up to the LV room junction box and properly labelled. For example, the cable from a junction box in Floor No-AA water meter room to junction box in LV room in Basement Floor-1 shall be marked as JB WMR FAA-JB LVR B1 using suitable size of ferrule sleeve. 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.
14. Continuity Test, IR test with reports 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. Test reports shall be submitted to DEWA for approval.
15. All the materials used for above works shall be approved by DEWA Engineer prior to installation. Preferred M-bus cable, (2x18AWG, Screened, Polypropylene, FRNC/LSZH sheath any standard brand) and Terminal Blocks/ Splicing connectors: Wago or similar standard subject to DEWA approval. Cable installation, termination and testing should be done through DEWA approved contractor.
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.
17. Exact GIS coordinates (lat. Long. WGS84) of the cable route from water Meter Chamber to the Retaining/Boundary wall, risers, concealed spaces in corridors, parkings etc. shall be mentioned in As-built drawing for DEWA Geographic Information System (GIS) update.
18. A copy of the as-built drawing shall be framed in the LV room.

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

E. TYPICAL PICTURE REFERENCES:



Reference # 1



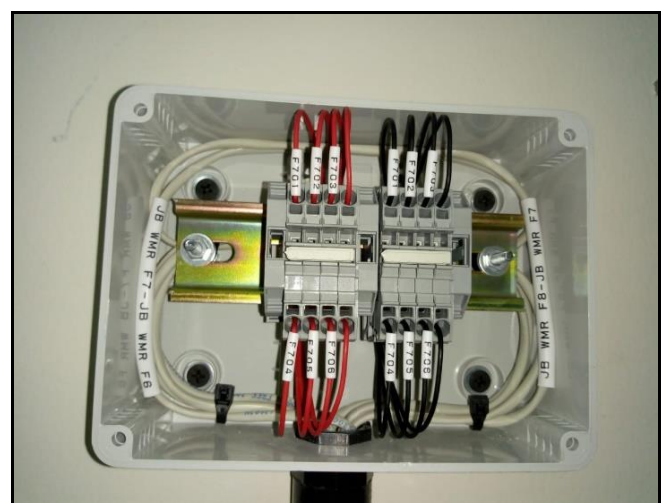
Reference # 2



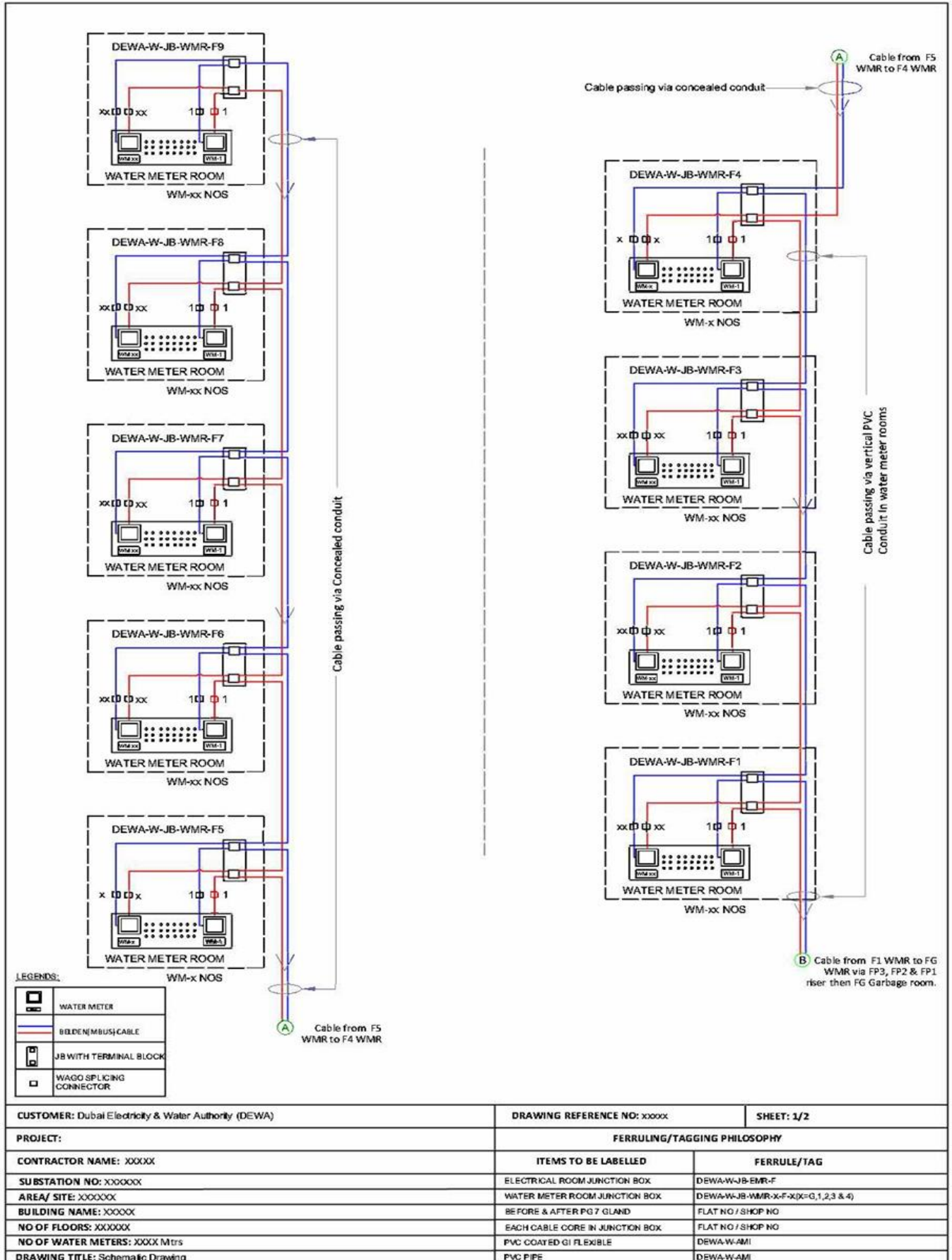
Reference # 4

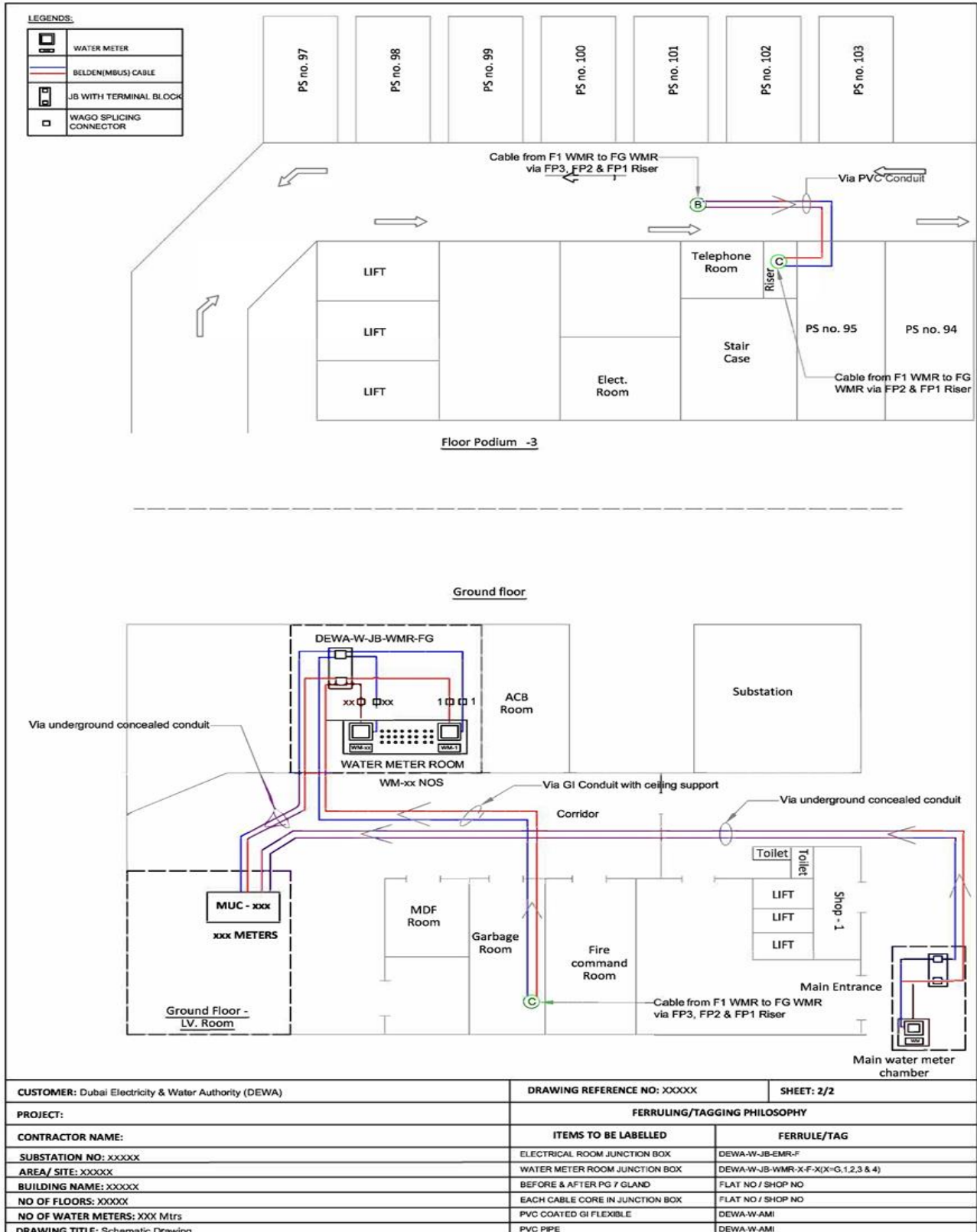


Reference # 3



F. TYPICAL M-BUS CABLE SCHEMATIC DRAWING:





Reference Drawing: PEW-STD-AMI-003.Rev3

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