



## **Water & Civil Division**

### **Water AMI (Advanced Metering Infrastructure) Project**

#### **GUIDELINES FOR BULK WATER METER INSTALLATION**

#### **GRE CONNECTION**

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**Dubai Electricity & Water Authority**

**GUIDELINES FOR BULK WATER METER  
INSTALLATION-GRE CONNECTION**

**Rev-4**

**20.01.2023**

## **GUIDELINES FOR BULK WATER METER INSTALLATION**

Water meters, 50mm dia. and greater sizes (GRE Connection) shall be installed horizontally inside the meter chambers as shown in standard installation drawing **PEW-STD-AMI-004.Rev4**.

### **A. BULK WATER METER INSTALLATION STANDARD**

1. Bulk meter 50mm dia. and greater sizes should not be installed in the basement, pump room, meter room, upper floors or roof of the buildings under any circumstances.
2. The location of water meter and its access should be free from obstructions such as signboards, barriers, plants, garden etc., and at least 2 metres clearance away from any Electrical resources.
3. The installation guidelines for the meter shall be strictly followed while installing the meter.
4. The water meter should not be allowed to fall or receive impact damage during installation.
5. The water meter shall be installed in accordance with the arrows displayed on the body of the meter.
6. The meter register must be arranged in such a way that it can be easily read from outside the chamber.
7. Pipes, valves and all other fittings used for meter connection shall be high quality, heavy duty, non-toxic, non-corrosive material. Flanges, nuts & bolts used shall be stainless steel 316L.
8. The meter should always be filled with water to prevent airflow through the meter. A 90 deg. bend raised upwards shall be installed after the meter to connect to the customer pipeline, as required.
9. Proper Concrete Support shall be provided for the Valves, Strainer, Pipes and fittings inside the meter chamber in order to prevent displacement of meter and associated fittings. The body of the water meter and Strainer, flanges or any other part must not be covered with concrete.
10. Do not step on the meter when installing, reading or maintaining the meter.
11. All connections shall be checked thoroughly for leaks after installation of the meter.
12. Never try to adjust the position of the meter after tightening the bolts.
13. The pipeline shall be thoroughly flushed before the meter is installed.
14. A Strainer shall be provided downstream of the meter to prevent entry of debris into customer pipelines and reservoir.
15. The consumer pipeline after the water meter shall be directly connected to a single main storage tank. Other storage tanks, including fire protection storage tank shall be interconnected from the main storage tank.
16. The size of the pipeline connected after the water meter shall be the same size as the water meter until it reaches the main storage tank to avoid Meter Overload Alarm.

17. Full-bore valves shall be provided upstream & downstream to isolate the meter for maintenance.
18. The Consumer shall install a separate valve outside the meter chamber on their pipeline to isolate the water supply to any maintenance works.
19. A Non-Return Valve (NRV) shall be installed on the customer pipeline outside the meter chamber to restrict reverse flow of water from the customer storage tank to Dewa water network/meter.
20. The NRV shall be high quality, heavy duty and made of non-toxic, non-corrosive material; preferably Stainless steel grade 316L.
21. The installation of water booster pump upstream or downstream of the meter is forbidden, any violations will be penalized in accordance with the applicable laws.
22. Consumers can install water pumps after the storage tank, if required.
23. Ensure that the construction/installation of the meter chamber, including the chamber cover is completed prior to the meter installation to avoid damage to the meter.
24. The detailed shop drawing shall be submitted to DEWA for approval prior to commencement of work.

#### **B. GUIDELINES FOR BULK WATER METER CHAMBERS**

1. The meter shall be installed in a chamber (meter shall not be buried) suitable in size for installing, maintenance and removal of the meter.
2. The meter chamber, precast HDPE or Concrete, shall be waterproof, clear of obstacles, even, rigid and not slippery. There shall be a sump pit inside the chamber for draining water.
3. The meter chamber shall be located away from electrical cables, overhead lines as well as other magnetic field areas and vibrating heavy machines.
4. It shall be situated outside the boundary wall of the premise and be accessible 24/7.
5. A non-corrosive/GRE ladder shall be provided permanently in chambers deeper than 1mtr for easy access to the meter.
6. The ladder shall be installed away from the meter to provide sufficient space for the water meters to allow for the installation, reading, maintenance and removal of the meters.
7. The meter chamber shall be protected from getting buried by sand, rainwater, flooding and barricaded to prevent vehicles from parking on the chamber.
8. The flange or body of the meter, strainer and valve should not be covered with concrete during chamber construction.
9. Nut & Bolt shall be positioned in such a way that Nut on wall/concrete block side and Bolt on Meter/Valve side for easy tightening and removal of the same.
10. Wireless/radio signals for the meter communication must be able to pass through the meter chamber cover, which shall be made of GRP material.

11. Meter chamber cover shall be clearly and indelibly marked with DEWA logo and the wording 'Water Meter' on the cover in Arabic and English language.
12. A stainless steel Label engraved with 'DEWA Water Meter Chamber' and 'Legacy Account Number & Plot number' shall be affixed on the top concrete slab of the meter chamber for identification.
13. The inlet valve and pipe before the meter shall be directly buried with a 150mm dia. ductile iron cover to the inlet valve, and meter, strainer, outlet valve and associated pipes & fittings shall be inside the chamber for 200mm dia. and greater size meters.
14. The dimensions given in the table below shall be followed strictly for the construction of the meter chamber to accommodate meter and associated fittings as per typical installation drawings: (PEW-STD-AMI-004.Rev4).

### METER CHAMBER DIMENSION

WATER METER SIZE	INLET VALVE (L)	METER (L)	STRAINER (L)	OUTLET VALVE (L)	SPIGOT FLANGE ADAPTOR (L) F	CLEARANCE BETWEEN SOCKET AND CHAMBER WALLS (L) G	TOTAL LENGTH	CLEARANCE AT BOTH SIDES OF METER IN WIDTH FROM CHAMBER WALLS	METER WIDTH	TOTAL WIDTH	CHAMBER DIMENSION	CHAMBER COVER DIMENSION
A	B	C	D	E	(INLET + OUTLET SIDE)	(INLET + OUTLET SIDE)	(B+C+D+E+F+G)	(200+200)	H	I	(Minimum)	(Minimum)
50	178	200	300	178	—	250+250(500)	1356	400	110	510	1400X700	900X600
80	203	200	350	203	—	250+300(550)	1506	400	140	540	1600X700	900X600
100	229	250	350	229	260+260(520)	150+150(300)	1878	400	165	565	2000X700	900X600
150	267	300	500	267	270+270(540)	150+150(300)	2174	400	220	620	2200X700	1100X600
200	292	350	500	292	260+260(520)	150+150(300)	2254	400	280	680	2400X700	1100X600
300	330	500	500	330	260+260(520)	200+200(400)	2580	400	375	775	2600X800	1100X600

ALL UNITS ARE IN MM

15. DEWA is responsible for the supply and installation of the water meters, strainers and valves for new connections. The meters are installed either by the DEWA staff or the Contractors acting on behalf of DEWA. The customers and property developers are responsible for supply and installation of all ancillary fittings and pipe-work after the meter and connecting the supply from the meter to their pipe connections/storage tank in accordance with relevant DEWA specifications and standard drawings.
16. Meter sizes, minimum and maximum size of the pipe in accordance with size of the meter required for meter installation, quantity of water each size of meter can deliver in 24 hours and capacity of storage tank required for each type of premises are given below:

**METER SIZE, METER CAPACITY AND STORAGE TANK REQUIREMENTS**

<b>Meter Size (mm)</b>	<b>Meter Capacity/ Quantity of Water the Meter can Deliver in 24 Hours (Imperial Gallons)</b>	<b>Pipe Size to be Connected Between the Meter and Storage Tank. (mm)</b>	<b>Storage Tank Requirement for Standard Residential Premises</b>	<b>Storage Tank Requirement for Labor Accommodation and other High Consumption Premises</b>
<b>50</b>	20,001-75,000	<b>50</b>	Equivalent to 24 Hours Consumption	Equivalent to 48 Hours Consumption
<b>80</b>	75,001-200,000	<b>80</b>	Equivalent to 24 Hours Consumption	Equivalent to 48 Hours Consumption
<b>100</b>	200,001-300,000	<b>100</b>	Equivalent to 24 Hours Consumption	Equivalent to 48 Hours Consumption
<b>150</b>	300,001-650,000	<b>150</b>	Equivalent to 24 Hours Consumption	Equivalent to 48 Hours Consumption
<b>200</b>	650,001- 1,000,000	<b>200</b>	Equivalent to 24 Hours Consumption	Equivalent to 48 Hours Consumption
<b>300</b>	1,000,001- 1,500,000	<b>300</b>	Equivalent to 24 Hours Consumption	Equivalent to 48 Hours Consumption

**C. M-BUS CABLE CONTAINMENT INSTALLATION STANDARD**

1. A 25mm dia. heavy duty conduit shall be laid between Water Meter Chamber and LV room for Meter communication cable. No Conduit joints shall be used inside the meter chamber except couplings/adaptors to connect the PVC Junction box.
2. The conduit shall CPVC (with wall thickness of 2.8mm) laid underground in sand or concealed in concrete/block from chamber to retaining wall. Once entered the building, the conduit shall be GI and routed exposed along walls/ceilings leading to LV room.
3. A 75mm dia. HDPE pipe shall be laid from water meter chamber to retaining/boundary wall to protect the above conduit. In case of water meter chamber is located more than 20M away from the plot limit or having direction change (not straight to the retaining wall), a Pull Pit of dimension 300x300x300mm shall be constructed outside the boundary wall at every 25M or at every direction change. It shall be covered with suitable ductile iron cover (Standard: BS-EN124 C250) embossed with DEWA-W-AMI and sealed (water proof) with GRP Sealing plate as shown in the Reference Picture # 1, Section E.
4. A Conduit shall be GI and exposed inside building with two-way junction box provided at every 25m length and each corner (direction change) while routing on walls and ceiling up to LV room. This conduit shall not be concealed.
5. A PVC Junction box of dimension 100X100X50mm and IP 68 rating shall be provided inside Meter Chamber and connected with 25mm conduit with proper couplings/adapters. The JB shall be fitted with a PVC PG-7 gland at bottom.

6. A GI Junction box of dimension 150X150X100mm and IP 56 rating shall be installed inside the LV room on wall at a suitable position at a height of 1400mm from finished floor level and connected to GI conduit with suitable couplings/adapters.
7. A Single phase, 230V AC supply (3CX2.5 Sq.mm power cable) from a normal Power source shall be provided inside a GI JB (150X150X100mm) fitted on the wall, next to the M-bus loop with suitable Terminal connectors. The Power supply shall be provided from the Lighting/ Small power DB with separate section of Single phase 300mA ELCB and Single pole C6 MCB. The above JB should have 2 Nos of 25mm knock-out holes on each side, top, bottom and both sides. JB should be labelled with "DEWA W AMI" and feeding source label as shown in the Reference Picture # 2, Section E.

#### **D. M-BUS CABLE INSTALLATION STANDARD**

1. The M-bus cable, (2x18AWG, Screened, Polypropylene, FRNC/LSZH sheath any standard brand) shall be pulled from main water meter chamber to junction box located in the LV room without any cable joint. This looping cable shall be terminated inside Junction boxes located at both ends using splicing connectors. These works shall be performed by an approved DEWA contractor.
2. The Water meter communication cable (M-bus cable) shall be secured along with the water pipeline using suitable nylon cable ties to the PVC junction box installed inside the meter chamber.
3. The M-bus cable shall be properly glanded to the PVC Junction Box using PVC PG-7 gland and connected to loop cable using standard splicing connectors inside the junction box.
4. The cables in both side junction boxes should be neatly dressed in such a way that all the ferrules are easily visible.
5. At both ends of the loop cable, a suitable size of PVC ferrule sleeve shall be provided inside the junction boxes. For example, if the LV room is located on ground floor, the label shall read as **JB Main Meter – JB LV Room FG**
6. The loop cable shall be routed through pulling junction boxes (if any) and properly labelled as mentioned above on all the way up to the LV room junction box. Each loop cable extended up to the LV room should be left with a minimum 3 meters of extra cable length and properly coiled for further extension. LV room junction box shall be label with PVC engraved label as DEWA W AMI.
7. The junction box inside the chamber shall be properly closed to maintain its water proofing capability and to be labelled with PVC engraved label as **DEWA W AMI**.
8. Continuity test, IR test shall be conducted on each loop cable before terminating to water meter and other devices.
9. 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). Terminal Blocks/Splicing connectors: Wago or similar standard shall be used subject to the DEWA approval. Cable installation, termination and testing should be done through DEWA approved contractor
10. As-built schematic 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-E, M-Bus Cable Schematic Sample Drawings.

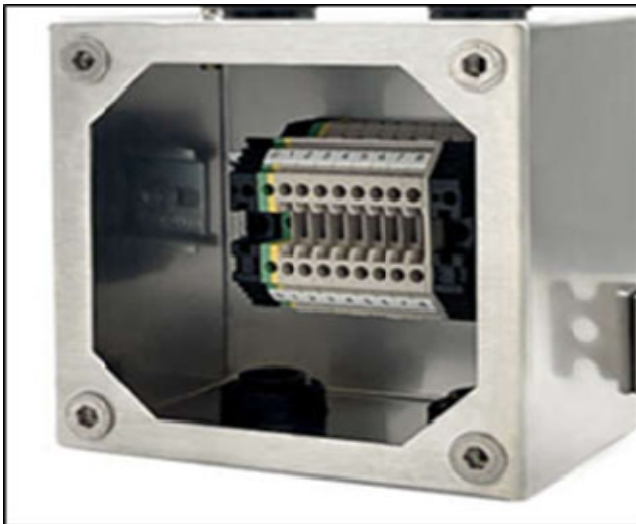
11. As-built Containment drawing shall be prepared with exact GIS coordinates of the cable route from the Main Meter Chamber to the Retaining/Boundary wall, risers, any horizontal movement of containment for sub meters and main meter, other than typical risers for DEWA Geographic Information System (GIS) update.
12. A copy of the above As-built drawings shall be framed in the LV room.

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

**E. TYPICAL PICTURE REFERENCES**



*Reference #1*



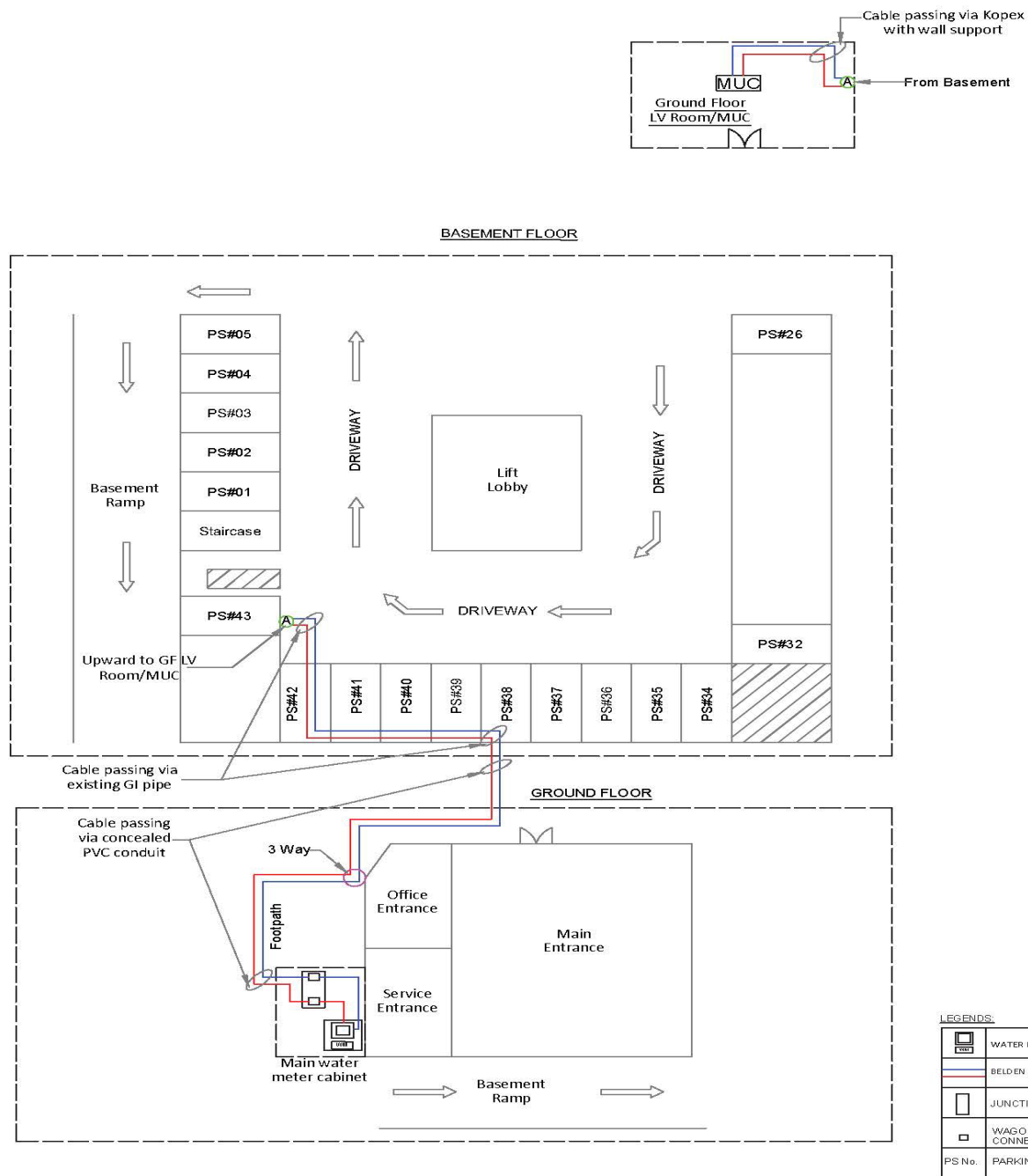
*Reference #2*



*Reference #3*



## F. TYPICAL M-BUS CABLE SCHEMATIC DRAWING



<b>CUSTOMER:</b> Dubai Electricity & Water Authority (DEWA)	<b>DRAWING REFERENCE NO:</b> FW/DEWA/BM/ 1069	<b>SHEET No. :</b> 1/1
<b>PROJECT:</b>	<b>FERRULING/TAGGING PHILOSOPHY</b>	
<b>CONTRACTOR NAME:</b>	<b>ITEMS TO BE LABELLED</b>	<b>FERRULE/TAG</b>
<b>SUBSTATION NO:</b> SS015027	MAIN WATER METER CHAMBER JUNCTION BOX	DEWA-WAMI
<b>AREA/ SITE:</b> xxx-Area    Latitude: 25.xxxxxx Longitude: 55.xxxxxx	CABLE END IN MAIN WATER METER CHAMBER JUNCTION BOX	MAIN WATER METER-LVROOM MUC1
<b>BUILDING NAME:</b> A	CABLE END IN LVROOM MUC	LVROOM MUC1-MAIN WATER METER
<b>MAIN WATER METER NO:</b>	PVC COATED GI FLEXIBLE	DEWA-WAMI
<b>DRAWING TITLE:</b> Schematic Drawing	PVC PIPE	DEWA-WAMI

Reference Drawing: PEW-STD-AMI-004.Rev4