

YW Wholesale Policy on the installation, repair and replacement of a Non-Household Water Meter

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It's part of our
Blueprint for Yorkshire



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Introduction

From the 1st April 2017, all Non-Household Customers will be free to select a Retailer (Licensee or Undertaker of Retail Business) who will be responsible for the customer service and billing elements of their water and waste water services. Yorkshire Water (YW) Wholesale will only be responsible for the provision of water and waste water wholesale services. Under the changes, YW Wholesale will retain ownership of the Non-Household water meters.

The YW Wholesale policy allows Applicants to request the installation, replacement or repair of a meter. Relevant Applicants shall include Retailers, Non-Household Customers and Third Party Organisations. It also clearly sets out YW Wholesale's Non-Household Metering Standard and Specification.

Under this policy:

- the meter shall only be removed or installed by YW Wholesale or it's Service Partners (exceptions apply where accredited Self Lay Organisations (SLO) are employed for new developments).

This policy is intended to provide clear guidance to the Market Operator, Retailers, Third Party Organisations and Non-Household Customers.

This policy will be compliant with the Wholesale-Retail Code Part 3: Operational Terms, Part B Metering.

Any charges related to the services outlined in this document can be found on the Yorkshire Water website (<https://www.yorkshirewater.com/business/services#ls2>).

Aim

The aims of the policy are:

- to ensure a consistent approach to the installation, repair or replacement of a meter is followed within the YW Wholesale operational area;
- to provide Applicants with guidelines that shall be complied with at all times;
- to inform Applicants of the process to follow to request the installation, replacement or repair of a meter.
- to give Retailers, Non-Household Customers and Third Party Organisations visibility of YW Wholesale's meter catalogue.

If Non-Household Customers, Retailers and Third Party Organisations are found to be in breach of this standard, YW Wholesale may take enforcement action. The purpose of enforcement is to ensure that preventative or remedial action is taken to secure compliance with this standard, the market codes and associated regulation.

Exclusions from Market Codes

- Accredited Entities – we do not allow the use of accredited entities for the installation, repair or replacement of a meter;
- Process B2 – Installation of a meter performed by an Accredited Entity;
- Process B6 – Repair or replacement of a faulty meter performed by an Accredited Entity;
- Process B8 – Retailer requested change to size or location of the meter performed by an Accredited Entity;
- Process B9 – Retailer requested change of meter performed by an Accredited Entity;
- Process H2 – Application for a Contribution Offer in respect of installing a meter at an Unmeasured or Assessed Service Component. YW Wholesale does not make contribution offers or enter into contribution agreements in respect of installing a meter at an Eligible Premise.

Meter Installation, Replacement and Repair Timescales

1. YW Wholesale will comply with the permitted timescales for the installation, repair or replacement of a meter, as set out in the Market Codes.
2. YW Wholesale shall use reasonable endeavours to meet these timescales, but there may be instances where this is not possible due to factors beyond our control.

Principles

To ensure the policy is enforced fairly, the following sections contain YW Wholesale's Non-Household Meter Standards, Specifications, and application processes.

Key Requirements

3. This policy applies to a Non-Household water meter used for the purpose of billing of clean water, trade effluent and sewerage charges only.
4. This policy contains the minimum specification for the design, installation, repair or replacement of a meter. If all or part of the metering system is to be replaced or modified, it shall be replaced or modified in accordance with this policy.
5. YW Wholesale shall use the Civil Engineering Specification for the Water Industry (latest version) to address the generic details not contained within this policy.

Minimum Safety Requirements

6. YW Wholesale has a general duty under the Health and Safety (H&S) at Work Act 1974 to ensure, so far as reasonably practicable, the health, safety and welfare of employees and the public who may be affected by metering activities. The duties are legally enforceable and the Health and Safety Executive have successfully prosecuted employers.
7. There is a requirement to ensure that the meter (or any out-reading apparatus) is in a place which is safe to access to allow metering activities to take place by YW Wholesale or the Retailer.
8. YW Wholesale shall relocate the meter where it considers the current location does not meet the requirements of this policy.

Meter Ownership and Responsibility

9. A breakdown, of which element of pipework YW Wholesale owns and is responsible for, can be found in the table below.

Asset	Location	Ownership and Responsibility of Asset
Water meter including meter unions, pipework and fittings within chamber, chamber, frame and cover.	Public Highway	YW Wholesale
Water meter including meter unions, pipework and fittings within chamber, chamber, frame and cover.	Within the boundary of the Eligible Premise	YW Wholesale
Water meter including meter unions only.	Inside a building	YW Wholesale

10. If a Non-Household Customer suspects they have an issue with the meter they should contact their Retailer immediately, who in turn shall contact YW Wholesale.
11. If a Non-Household Customer requires a meter installing, replacing or repairing they should contact their Retailer.
12. The Non-Household Customer is responsible for the correct design, installation and maintenance of pipework and internal plumbing within the boundary of the Eligible Premises, which YW Wholesale's meter may be connected to.

YW Wholesale's Meter Catalogue

13. This policy contains YW Wholesale's meter catalogue which incorporates meters suitable for accurately recording a Non-Household Customer's water consumption across a range of flow rates. The meter catalogue, including technical characteristics can be found in Appendix 1.
14. YW Wholesale shall review its meter catalogue annually to ensure it is kept up to date.
15. YW Wholesale shall seek the views of Retailers from time to time, but at least once each year when creating or updating its list, in accordance with the Wholesale-Retail Codes. A Retailer may ask YW Wholesale to supply particular functionality in its meters and YW Wholesale shall consider such requests annually in reviewing its meter catalogue.

Meter Specification

16. YW Wholesale shall use three types of cold water meters, as defined within our meter catalogue:
 - Single Jet Meters;
 - Volumetric Meters;
 - Turbine Meters.
17. The actual meter or combination of meters chosen shall accurately account for the total water use of the property serviced, as defined in the Measuring Instruments (Amendment) Regulations 2010.
18. The meter shall be new. Used or reconditioned meters shall not be installed.
19. Replacement registers shall be new. Used or reconditioned registers shall not be installed.
20. The meter and register shall be compatible with common automatic meter reading (AMR/AMI) systems and data-logging equipment used by YW Wholesale in line with the meter catalogue.
21. The meter shall have a direct reading facility with a sealed encoder.

22. The meter register shall record consumption in cubic metres (m³) and shall be not be obscured.
23. The meter shall be located so it is fully accessible at all times.

Meter Selection

24. A meter shall be chosen from YW Wholesale's meter catalogue using the technical characteristics to select an appropriate meter size. The meter catalogue provides the following meter characteristics for each meter listed:
 - Nominal flow;
 - Minimum flow rate;
 - Maximum flow rate.
25. Meters not listed in YW Wholesale's meter catalogue shall not be installed.
26. YW Wholesale shall ensure that the meter selected shall accurately record consumption for the expected range of flow, and any future flow changes where known.
27. The Retailer shall provide accurate customer consumption data and future demand requirements where known to YW Wholesale to allow accurate meter sizing.
28. The Retailer shall inform YW Wholesale of any supply that is unmeasurable and YW Wholesale shall determine whether the meter installation is viable in accordance with the Retail codes.
29. Consideration shall be given to the meter manufacturer's guidelines regarding Flow Straighteners required for metering accuracy i.e. built-in Flow Straightener, minimum length of straight section of horizontal pipe required upstream and downstream of the meter.
30. Where a dedicated fire supply requires metering the design shall ensure the meter is sized correctly to supply the required amount of water for the fire system to operate satisfactorily.
31. The minimum operating upstream pressures combined with the head losses through any bypass pipe work, strainer, valves and the meter shall be taken into account at the design stage to ensure they remain within acceptable limits.

Meter Layout

32. YW Wholesale's preference is the meter shall be installed in-line to prevent it being bypassed causing loss of revenue. For larger meters YW Wholesale shall decide whether the meter should be installed on a bypass.

33. An inline meter shall be fitted with isolation valve(s) to allow for maintenance. Where a bypass is used, this shall include an isolation valve.
34. All isolating valves shall be located in such a position as to ensure ease of access for both operation and maintenance.
35. All isolating valves and fittings shall be equal to the diameter of the pipework and a distance of at least 3 pipe diameters upstream and downstream of the meter.
36. The fittings shall be installed in such a way as to allow the meter to be easily removed to provide flexibility for maintenance.
37. Where a strainer is required, it shall be installed upstream of the meter and shall be the same size as the pipework so the strainer cannot adversely affect the accuracy of the meter. Additional isolation valves shall be installed to allow removal of the strainer.
38. The design of the meter, location and chamber size shall take into account the requirement to undertake maintenance and repair work in a safe manner at any time of the day or night, and where feasible that operational tasks requiring access to the meter can be carried out safely by one person with minimal lifting and traffic management.
39. All external meters 15mm in diameter shall be installed in a boundary box.
40. All external meters 20mm to 39mm in diameter shall be installed in chambers that have a clear opening with minimum dimensions of 600mm x 450mm and a maximum depth from ground level to the top of a meter of 900mm.
41. All external meters 40mm in diameter or larger shall be installed in chambers that have a clear opening with minimum dimensions of 900mm x 600mm and a maximum depth from ground level to the top of a meter of 900mm.
42. YW Wholesale shall decide when to install an outreader remote from the meter in a separate chamber or above ground kiosk. The design of the separate chamber or kiosk must be such that it provides for electrical connection between the meter and outreader.
43. Where there is no alternative but to site a meter within a carriageway, a chamber with a clear opening of 230mm x 380mm and a maximum/ minimum depth of 500mm/ 400mm deep shall be provided for the housing of an outreader. This chamber shall be located within an adjacent footpath or verge. A duct with an internal diameter of at least 50mm shall be installed between the outreader chamber and meter chamber.
44. The chamber cover shall be selected based on the loading it will be subjected to as defined in BS EN124. Where feasible the type of cover chosen shall be suitable for removal by one person i.e. Class A & B rating or slide out cover.
45. The meter, fittings and pipework shall be designed in accordance with YW Wholesale's meter catalogue and standard layouts shown in Appendix 1 and Appendix 2.

Meter Location

46. An external meter shall be installed as close to the boundary of the Eligible Premises as possible (within 0.5 metres to the Eligible Premises).
47. An internal meter shall be installed as close as possible to the internal face of the building as the supply pipe enters the property.
48. Where feasible all below ground meters installations shall be sited in either a grass verge or footway at a location that offers the greatest protection and minimum risk to personnel.
49. The meter shall be installed upstream of any branch off connections.
50. An internal meter or meter register shall not be installed at a height greater than 1.5 metres above floor level.
51. Adequate insulation for the meter and pipework shall be fitted where there is a possibility of the meter or pipework freezing.

Meter Installation

52. The meter shall be stored and installed according to manufacturer's guidelines.
53. YW Wholesale shall disinfect the meter, fittings and pipework prior to installation.
54. YW Wholesale is responsible for undertaking the isolation and re-commissioning of the water supply at the boundary of the property.
55. YW Wholesale is responsible for the removal of its own data logging equipment in advance of any metering work. Where a third party logger is fitted, YW Wholesale will give the Retailer or Non-Household Customer the option to remove their data logging equipment prior to any meter work.
56. All internal meters shall be installed in a lockable meter box where feasible and comply with the Water Supply (Water Fitting) Regulations 1999.
57. All meters shall be installed centrally within the chamber, meter box or kiosk.
58. Examples of acceptable meter layout arrangements can be found the Appendix 2.
59. The Defects Liability Period (DLP) will apply to the water meter and associated fittings. The DLP applies for 12 months after commissioning of the meter. Under the New Roads and Street Works legislation, the liability on highway reinstatement for meters laid to a depth of up to 1.5m is 2 years (3 years for pipes laid to a greater depth).

Commissioning the Meter

60. YW Wholesale is responsible for the commissioning and testing of the meter, which should include, but is not limited to, the following:
- re-commissioning of the water supply;
 - recharge of the pipework which will involve bleeding air from the Non-Household Customer's system slowly to avoid damage;
 - a visual check of the pipework and meter for signs of leakage, once the pipework is fully recharged;
 - checks to ensure the meter is recording.

Private Meters

61. A Non-Household Customer can install an additional private meter at their own expense; this must be a minimum of 10 pipe diameters downstream of YW Wholesale's meter.

Data Logging of the Meter

62. YW Wholesale may choose to install data logging equipment on a meter for leakage monitoring purposes. YW Wholesale owns and is responsible for this data logging equipment and its replacement.
63. Retailers, Non-Household Customers and Third Party Organisations must not fit their own data logging equipment or a hardwired connection, i.e. for building management software, to the meter without written permission from YW Wholesale, following the procedures outlined in YW Wholesale's Data Logging Policy.
64. Logging devices fitted in waterlogged chambers or under heavy meter lids are less likely to transmit data and an above ground housing may be required in such instances. Alternatively a manually downloadable logger may be installed.

Meter Accuracy Testing

65. Testing the accuracy of an existing meter is the responsibility of YW Wholesale in line with the Market Codes.
66. A request to test the accuracy of a meter can come from:
- YW Wholesale, any other Wholesaler;
 - the Retailer, any other Retailer;
 - a request to settle an arbitration tribunal or Trading Dispute;

67. The Retailer shall verify the data accuracy before submitting a request to YW Wholesale to undertake a formal meter accuracy test. These checks should include;
- Checking for meter reading / data handling errors;
 - Contacting the Non-Household Customer to understand if there have been any significant changes in their water usage, which may be outside the accuracy range of the meter;
 - Comparing the cumulative consumption recorded over a specific period using meter readings and logged data where available;
 - Checking for leaks and other anomalies.
68. A request for a meter accuracy test should follow the procedures outlined in YW Wholesale Meter Accuracy Testing Policy.
69. YW Wholesale will not be held responsible either at the time of installation or at any time in the future for metering inaccuracies due to:
- Unidentified deterioration in meter performance;
 - Use of meters not on the metering list within this Standard;
 - Changes in a Non-Household Customer's water usage.
70. The meter shall not be tampered with in any way by the Non-Household Customer.

Meter Repair

71. YW Wholesale and its Service Partners shall maintain, repair and where faulty, replace the meter in line with Wholesale Retail Codes.

Meter Replacement

72. YW Wholesale is responsible for replacing aging meters using its proactive meter replacement programme.

Telemetry Replacement on a Meter

73. YW Wholesale is responsible for replacing any of its automatic meter reading equipment.

Meter Data

74. When a meter or register is installed or replaced, as per the terms of the Wholesale-Retail Code, YW Wholesale shall provide the Market Operator with details of the meter installation including:
- Supply point identification (SPID);
 - Unique meter serial number;
 - Meter location;
 - Meter size and type;
 - Date and time of meter installation;
 - Opening read of the meter;
 - Date and Time of meter reading;
 - Where a meter or register is replaced YW Wholesale will provide the additional information listed below;
 - Date and time of meter removal;
 - Meter size and type;
 - Meter serial number;
 - Final meter reading.

Application Process

Standard and Non-Standard Installations

75. The Applicant shall be bound by YW Wholesale's decision regarding the most technically appropriate and cost effective meter installation, repair or replacement solution.
76. A standard installation is where:
- the meter is located in the public highway;
 - no excavation work is required on public footpaths or roads, or on land owned by third parties;
 - no work is required to gain access to the meter on the Eligible Premises, i.e. material stored on top of chamber;
 - there are no Traffic Management Act restrictions;
77. All non-standard installations are based on an individual quotation. The Applicant must confirm its acceptance of the quotation before YW Wholesale will undertake the work.

Process B1 – Installation of a meter performed by YW Wholesale

78. The Applicant will submit Form B/01 (Metering activity carried out by the Wholesaler) to the YW Wholesale Service Desk requesting a meter installation i.e. where no meter is currently installed. If a Non-Household Customer contacts YW Wholesale direct they will be re-directed to their Retailer.
79. The initial application may be refused where:
 - the form is not completed in full, or contains insufficient or incorrect information.
80. Where YW Wholesale can determine, without a site visit that the meter installation is infeasible or impractical, it shall notify the Applicant that the request has been declined, and provide an explanation of the decision.
81. YW Wholesale shall determine the complexity of undertaking the meter installation. This may require a visit to the Eligible Premise.
82. Where a standard meter installation is feasible, YW Wholesale will contact the Applicant or Non-Household Customer (where the Retailer has given permission), and install the meter.
83. If a non-standard meter installation is required, YW Wholesale shall use the initial site visit to undertake a survey to establish how to undertake the meter installation, inform the Applicant of our findings, and provide a quotation.
84. The Applicant shall confirm their acceptance of the non-standard installation quotation.
85. YW Wholesale will visit the Eligible Premises by prior arrangement with the Retailer or Non-Household Customer (where the Retailer has given permission), and install the meter.
86. YW Wholesale shall notify the Market Operator, in accordance with the Market Terms.

Process B5 – Repair or replacement of a faulty meter performed YW Wholesale

87. The Applicant will submit Form B/01 (Metering activity carried out by the Wholesaler) to the YW Wholesale Service Desk requesting the repair or replacement of a faulty meter. If a Non-Household Customer contacts YW Wholesale direct they will be re-directed to their Retailer.
88. The initial application may be refused where:
 - the form is not completed in full, or contains insufficient or incorrect information.
89. YW Wholesale will visit the Eligible Premises by prior arrangement with the Retailer or Non-Household Customer (where the Retailer has given permission), to establish if the meter is faulty. It may be possible to replace or repair the meter as part of the initial site visit, where feasible.

90. Where YW Wholesale establishes the meter is working satisfactorily, it shall inform the Applicant of its findings.
91. Where it is not possible to repair or replace the meter as part of the initial site visit, a further survey may be carried out to establish how to undertake the work.
92. YW Wholesale will visit the Eligible Premises by prior arrangement with the Retailer or Non-Household Customer (where the Retailer has given permission), and replace or repair the meter.
93. YW Wholesale shall notify the Market Operator, in accordance with the Market Terms.

Process B7 – Retailer requested change to size, model or location of meter performed by YW Wholesale

94. The Applicant will submit Form B/01 (Metering activity carried out by the Wholesaler) to the YW Wholesale Service Desk requesting to change the size, model or location of the meter. If a Non-Household Customer contacts YW Wholesale direct they will be re-directed to their Retailer.
95. The initial application may be refused where:
 - the form is not completed in full, or contains insufficient or incorrect information.
96. Where YW Wholesale can determine, without a site visit that the meter installation is infeasible or impractical, it shall notify the Applicant that the request has been declined, and provide an explanation of its decision.
97. YW Wholesale shall determine the complexity of changing the size, model or location of the meter. This may require a visit to the Eligible Premise.
98. Where a standard meter installation is feasible, YW Wholesale will contact the Retailer or Non-Household Customer (where the Retailer has given permission), and install the meter.
99. If a non-standard meter installation is required, YW Wholesale shall use the initial site visit to undertake a survey to establish how to undertake the meter installation and provide an accurate quotation. YW Wholesale shall inform the Applicant of its findings, and provide a quotation.
100. The Applicant shall confirm their acceptance of the non-standard installation quotation.
101. YW Wholesale will visit the Eligible Premises by prior arrangement with the Retailer or Non-Household Customer (where the Retailer has given permission), and install the meter.
102. YW Wholesale shall notify the Market Operator, in accordance with the Market Terms.

Process B10 – YW Wholesale requested installation or change of meter performed by YW Wholesale (other than a replacement following a fault)

103. YW Wholesale will write to the Non-Household Customer informing them of the date of planned meter change, including the SPID, Meter Reference number, proposed model and location of the new meter, and reason for the installation or change of meter.
104. YW Wholesale will also notify the Retailer of the date of the planned installation or change of meter.
105. YW Wholesale shall decide whether to use a different model meter or install the meter in a different location based on the guidance within this policy.
106. YW Wholesale shall consider all reasonable requests from the Retailer and Non-Household Customer to change the planned meter change date, as appropriate.
107. YW Wholesale shall visit the Eligible Premises by prior arrangement with the Retailer, or the Non-Household Customer with the Retailer's consent, and install or change the meter.
108. YW Wholesale shall notify the Market Operator, in accordance with the Market Terms.

Scheme Charges

109. Where charges 'may' apply refer to YW Wholesale's Charges Scheme (<https://www.yorkshirewater.com/business/services#ls2>).
110. YW Wholesale may also charge for all additional work, on a time and materials basis, that is either requested by the Applicant, or reasonably imposed by YW Wholesale in order to allow work to be undertaken in a safe manner. This will be in addition to the standard and non-standard metering charges.
111. Charges will also apply for any aborted visit or unplanned work on a time and materials basis. A return appointment will not be made until the appropriate fee has been paid and the issue has been corrected.
112. The quotation from YW Wholesale will be valid for three months from the date of the quote. After three months a re-quotation will be required.
113. Any work considered to be outside the scope of this policy will be recharged on a time and materials basis.

Contact Details

114. For more information contact the YW Wholesale Service Desk by email at:

- wholesaleservice@yorkshirewater.co.uk.

References

115. If there is any conflict between the following, the order of precedence shall be:

- the Water Act 2014;
- the Market Codes;
- this policy.

116. This policy shall be used in conjunction with the following Regulatory, Legal and Statutory requirements provided by other key documents or bodies but not limited to:

- YW Wholesale Non Household Meter Accuracy Policy.
- YW Wholesale Data Logger Policy;
- YW Wholesale Policy for leaks on a Non-Household Customer Site.

- The Competition Act 1998;
- The Weights and Measures Act 1985;
- New Roads and Street Works Act 1991.
- The Water Act 2014;
- The Wholesale Retail Codes of Practice;
- The Water Supply (Water Fittings) Regulations 1999 (all meters, pipework and fittings shall be Water Regulations Advisory Scheme (WRAS) approved);
- The Measuring Instruments (Amendment) Regulations 2010;
- Water Regulations Advisory Scheme (WRAS);
- Civil Engineering Specification for the Water Industry (CESWI) (latest version);
- BS EN 124:2015 Gully tops and manhole tops for vehicular and pedestrian areas;
- BS EN ISO 4064:2014 Water meters for cold potable water and hot water. Metrological and technical requirements.

Review Date

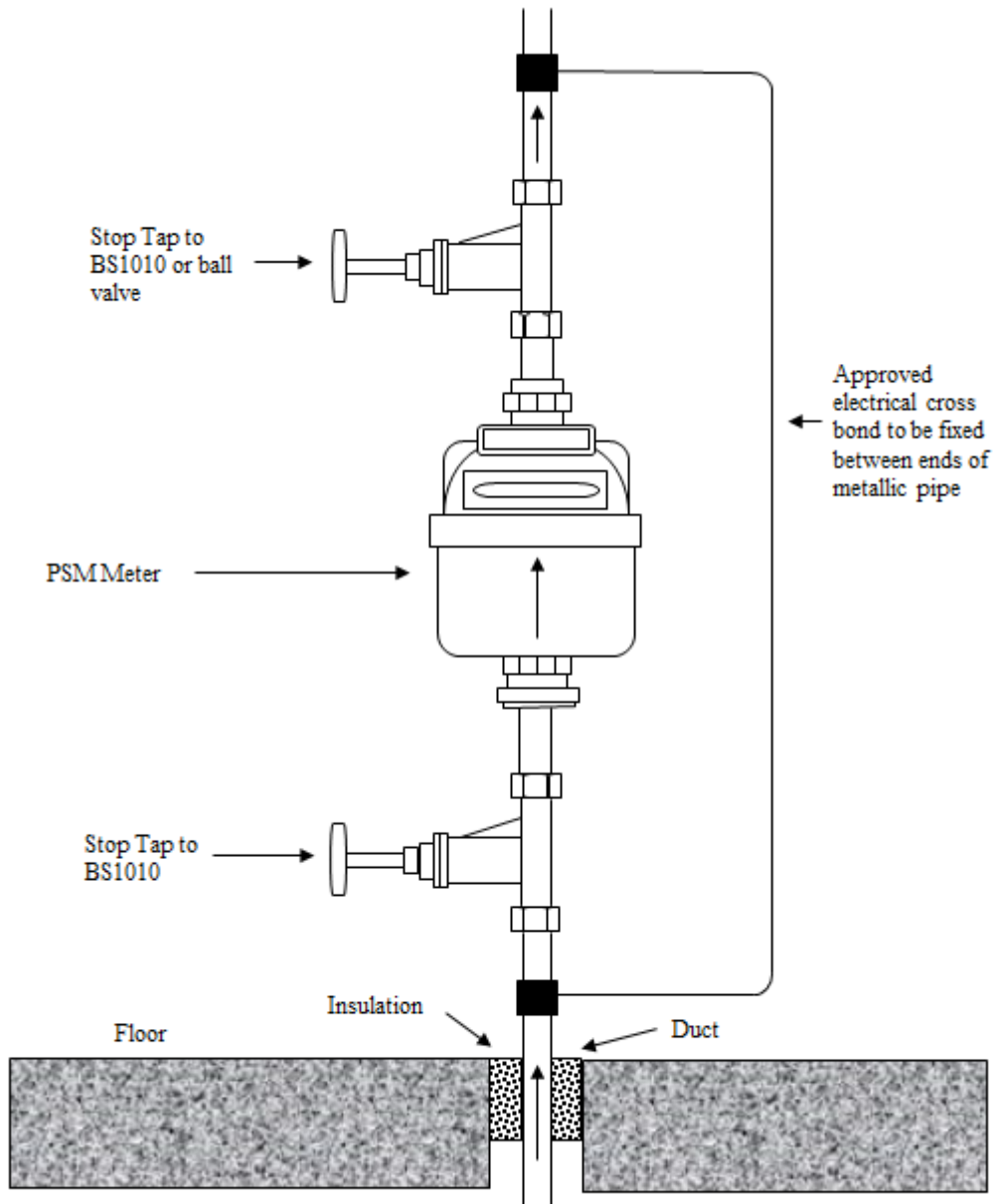
117. This policy will be reviewed annually or when necessary as a result of changes in Market Codes or centrally issued guidance. Date of last review March 2017.

Appendix 1 – Meter Catalogue

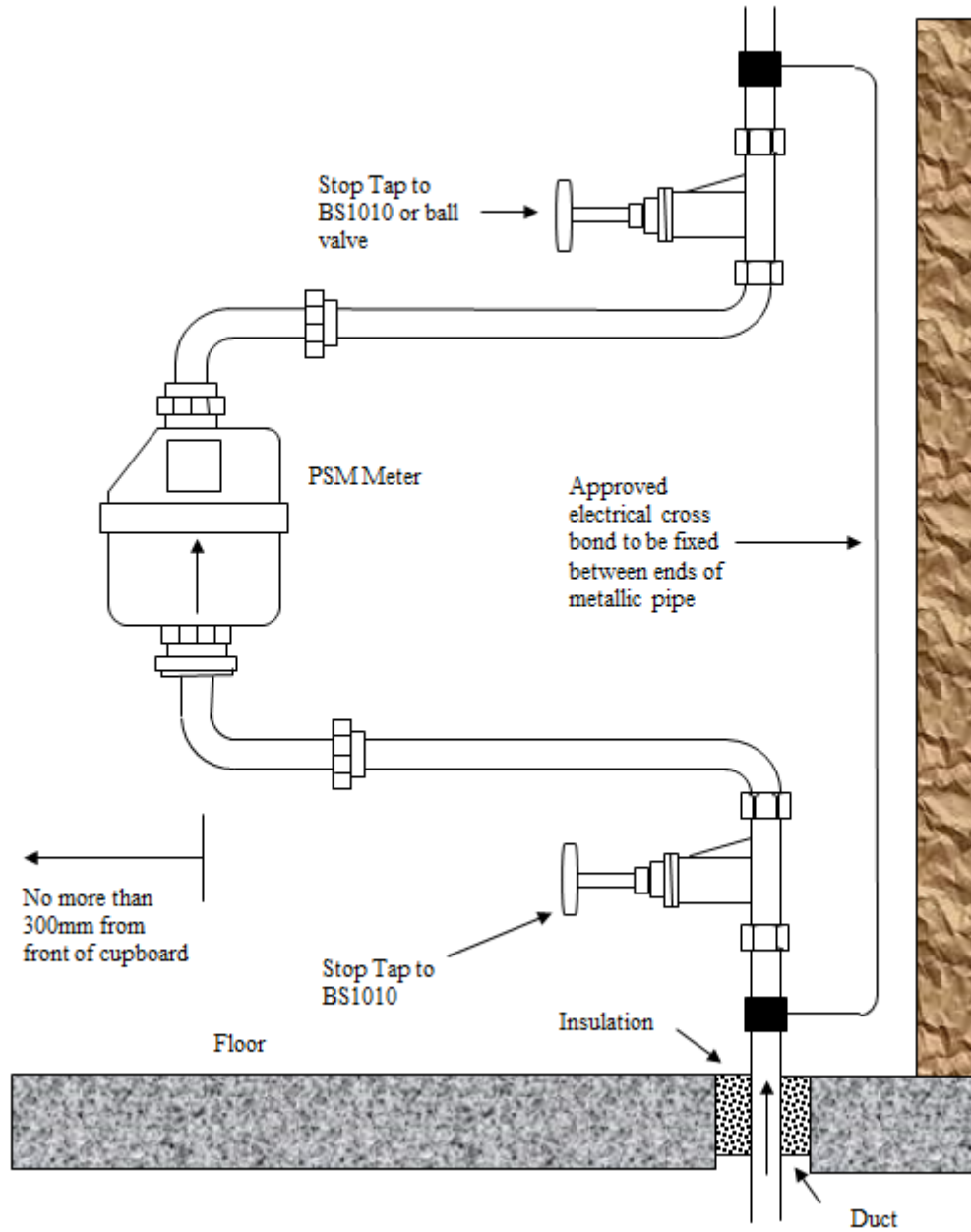
		Iron Water Meter Selection Tool														
Meter Make	Meter Model	Size	Flanged/ Threaded	Flow In Litres/ sec				Flow In Cubic Meters/ hr (m ³)				MMD Ratio	Size	Pulse Weight	Leakage Threshold Value (litres/ hr)	
				Min Flow (Q1)	Transitional Flow (Q2)	Nom Flow (Q3)	Max Flow (Q4)	Min Flow (Q1)	Transitional Flow (Q2)	Nom Flow (Q3)	Max Flow (Q4)					Headloss at Q3
Iron	Aquadis- Manifold Composite	15mm	Manifold	0.002	0.004	0.694	0.698	0.008	0.013	2.5	3.125	<0.63	315	15mm	1 tbrp (0.001 m ³)	8
Iron	Aquadis- In Line Composite	15mm	Threaded	0.002	0.004	0.694	0.698	0.008	0.013	2.5	3.125	<0.63	315	15mm	1 tbrp (0.001 m ³)	8
Iron	Aquadis- 20mm Manifold	15mm	Manifold	0.007	0.011	1.111	1.389	0.025	0.040	4	5	<0.63	160	20mm	1 tbrp (0.001 m ³)	25
Iron	Aquadis In-line (PSM)	20mm	Threaded	0.007	0.011	1.111	1.389	0.025	0.040	4	5	<0.63	160	20mm	1 tbrp (0.001 m ³)	25
Iron	Aquadis In-line (PSM)	25mm	Threaded	0.011	0.018	1.750	2.188	0.039	0.063	6.3	7.9	<0.63	160	25mm	1 tbrp (0.001 m ³)	39
Iron	Aquadis In-line (PSM)	30mm	Threaded	0.011	0.018	1.750	2.188	0.039	0.063	6.3	7.9	<0.63	160	30mm	1 tbrp (0.001 m ³)	39
Iron	Aquadis In-line (PSM)	40mm	Threaded	0.028	0.044	4.444	5.556	0.100	0.160	16	20	<0.63	160	40mm	1 tbrp (0.001 m ³)	100
Iron	Frostar M	40mm	Flanged/ Threaded	0.022	0.036	4.444	5.556	0.080	0.128	16	20	<0.6	200	40mm	10 tbrp (0.010 m ³)	80
Iron	Frostar M	50mm	Flanged/ Threaded	0.028	0.044	6.944	8.681	0.100	0.160	25	31	<0.6	250	50mm	10 tbrp (0.010 m ³)	100
Iron	Frostar M	80mm	Flanged	0.056	0.089	17.500	21.675	0.200	0.320	63	79	<0.6	315	80mm	10 tbrp (0.010 m ³)	200
Iron	Frostar M	100mm	Flanged	0.088	0.141	27.778	34.722	0.317	0.508	100	125	<0.6	315	100mm	10 tbrp (0.010 m ³)	317
Iron	Frostar M	150mm	Flanged	0.141	0.226	44.444	55.556	0.508	0.813	160	200	<0.6	315	150mm	100 tbrp (0.1 m ³)	508
Iron	Woltek M	50mm	Flanged	0.176	0.282	11.111	13.889	0.635	1.02	40	50	0.12	63	50mm	10 tbrp (0.010 m ³)	635
Iron	Woltek M	80mm	Flanged	0.438	0.700	17.500	21.675	1.6	2.5	63	79	0.15	40	80mm	10 tbrp (0.010 m ³)	1575
Iron	Woltek M	100mm	Flanged	0.444	0.711	44.444	55.556	1.6	2.6	160	200	0.15	100	100mm	10 tbrp (0.010 m ³)	1600
Iron	Woltek M	150mm	Flanged	1.111	1.778	111.111	138.889	4.0	6.4	400	500	0.14	100	150mm	100 tbrp (0.1 m ³)	4000
Iron	Woltek G	200mm	Flanged	4.375	7	175	218.750	15.75	25.20	630	788	0.12	40	200mm	100 tbrp (0.1 m ³)	15750

Appendix 2 - Examples of Acceptable Meter Layouts

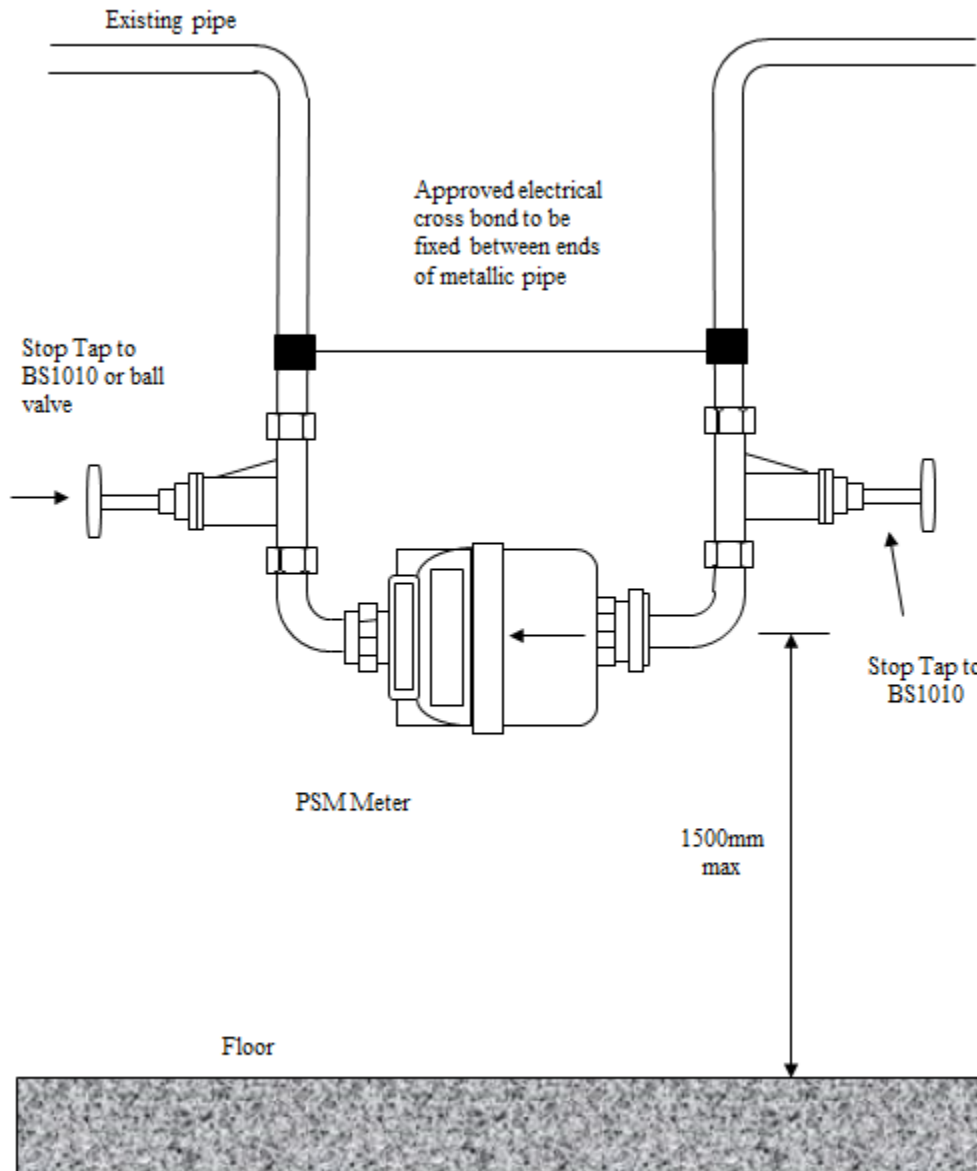
A. Internal In-Line 20mm – 39mm Meter Installation.



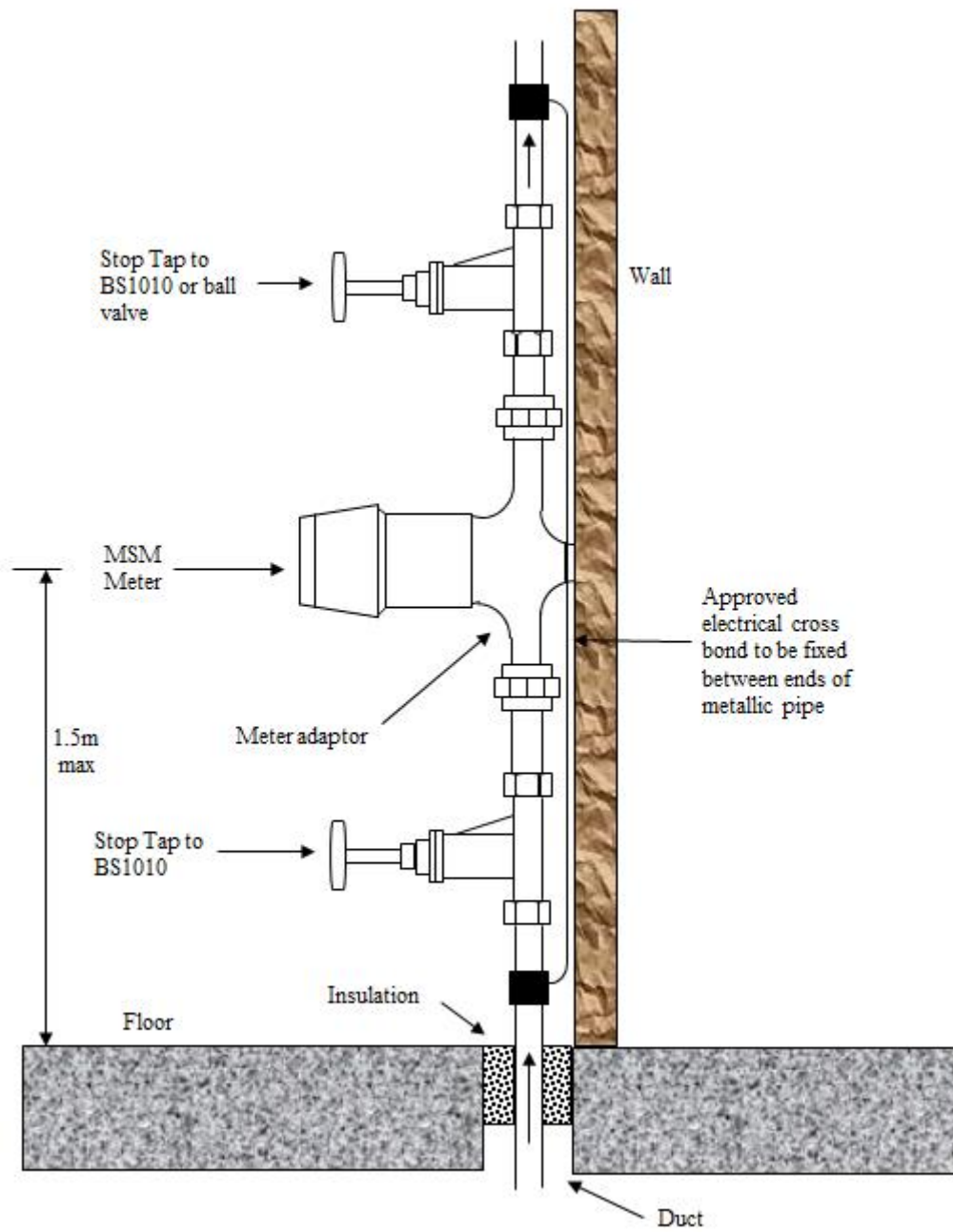
B. Internal In-Line 20mm – 39mm Meter Installation in Kiosk.



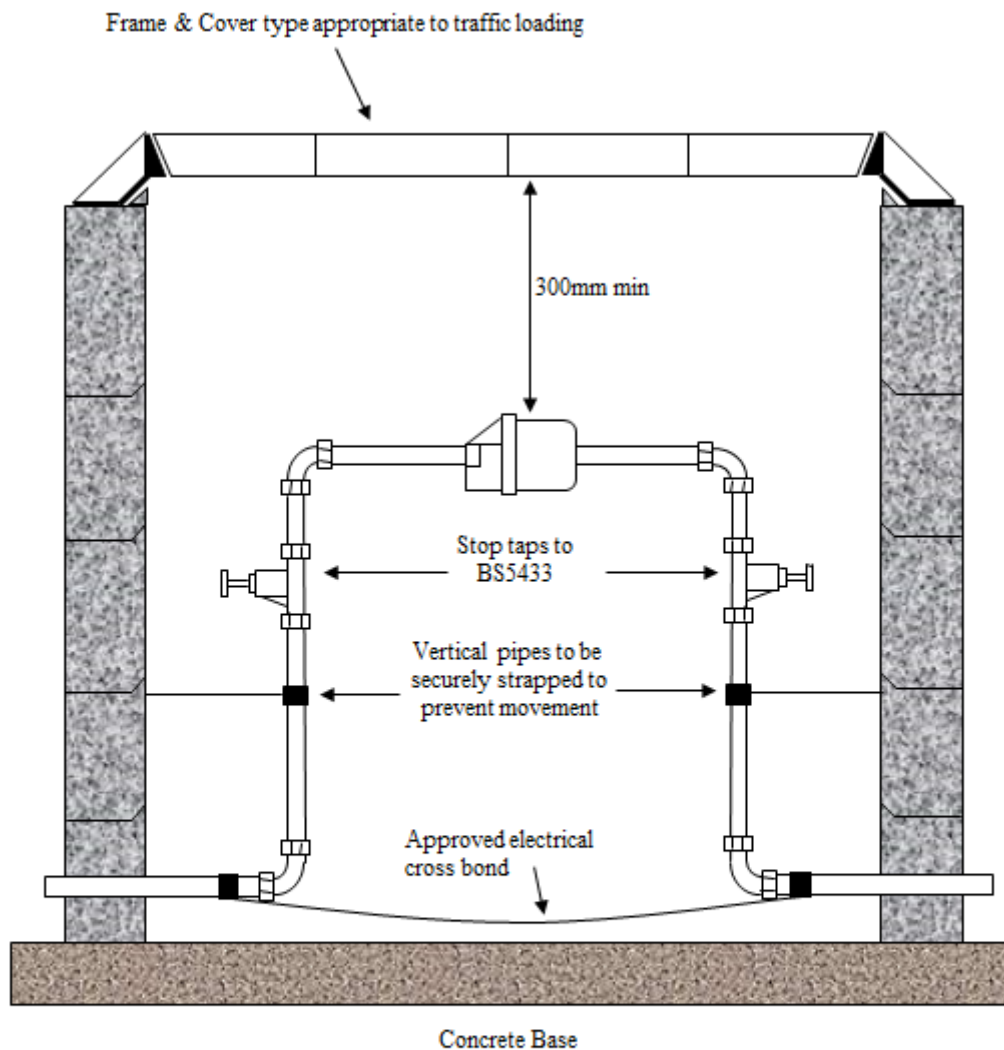
C. Internal 20mm – 39mm Meter Installation Requiring Diversion.



D. Internal in-line 20mm – 39mm Meter Installation.



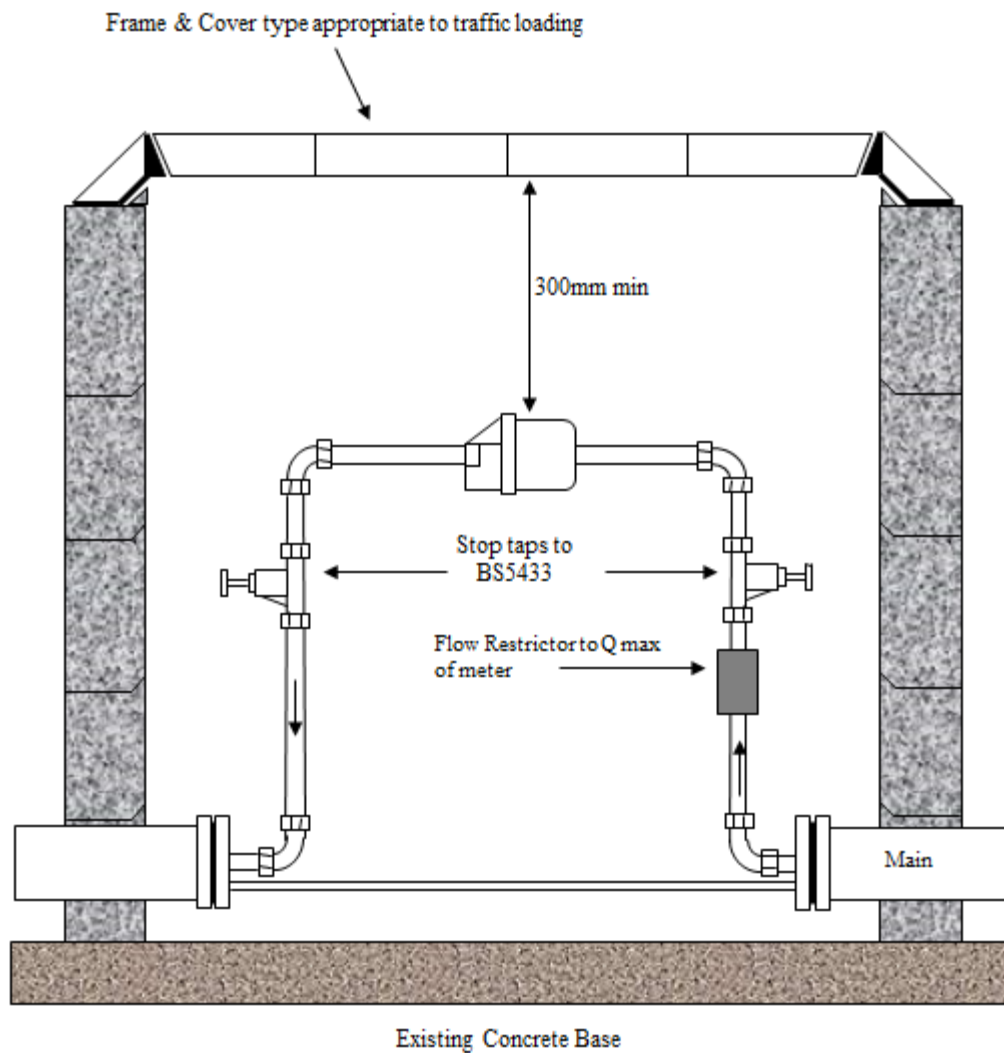
E. External Meter Installed In Precast Concrete Chambers for 20mm to 39mm Meters.



Notes:

1. For chamber size 610 x 455mm where the chamber is subject to traffic loading a mass concrete base laid to a thickness of 100mm. Where chamber is not subject to traffic loading a precast concrete base unit shall be used.
2. For chamber size 430 x 280mm a precast concrete base shall be used in all loading conditions.
3. Chamber size of 610 x 455mm shall be used for 30 and 40mm PSM's. Chamber size 430 x 280mm for 25mm PSM meters.
4. Notes 1 to 3 on Drawing D8 also apply.

F. Installation of a 20mm – 39mm Meter in Place of a Flanged Meter in an External Precast Concrete Chamber.

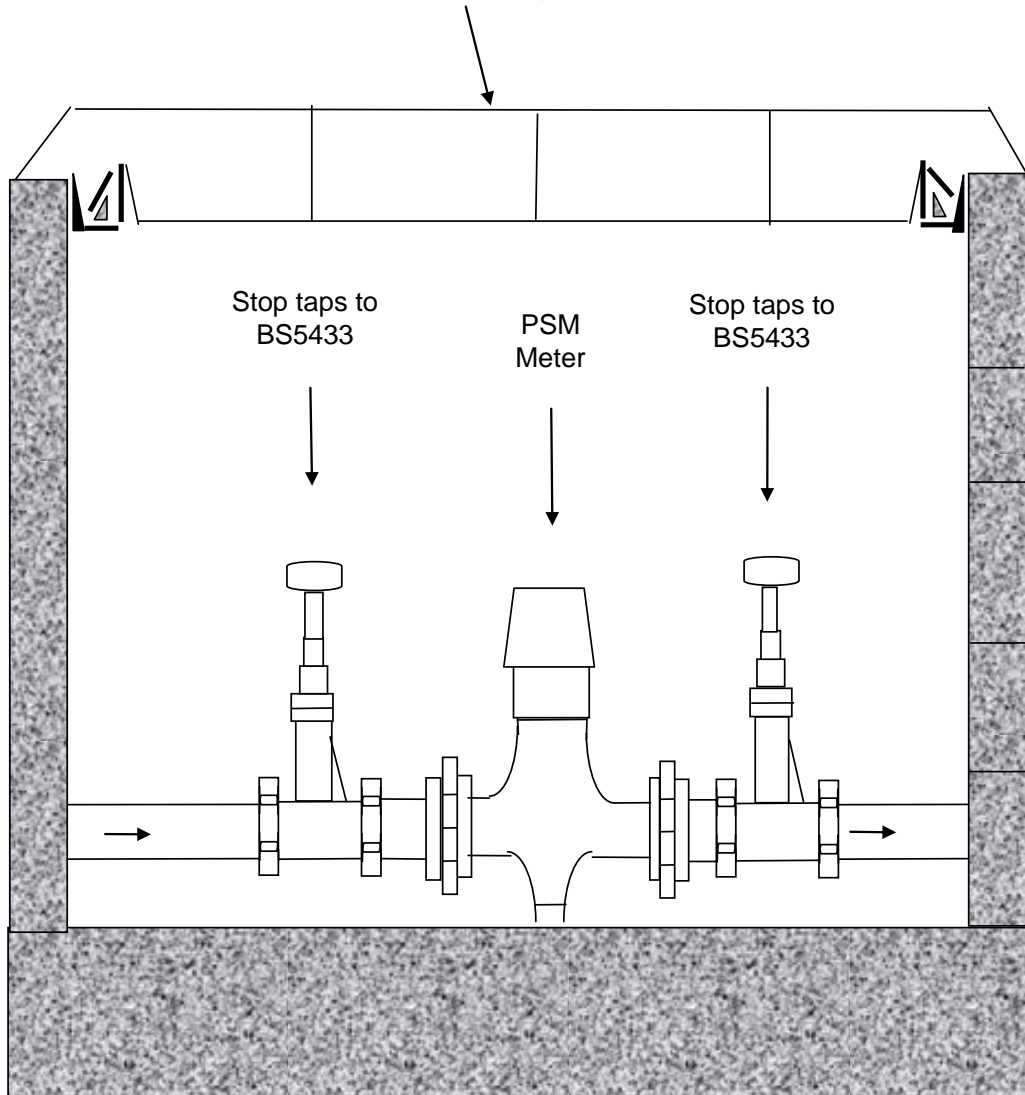


Notes:

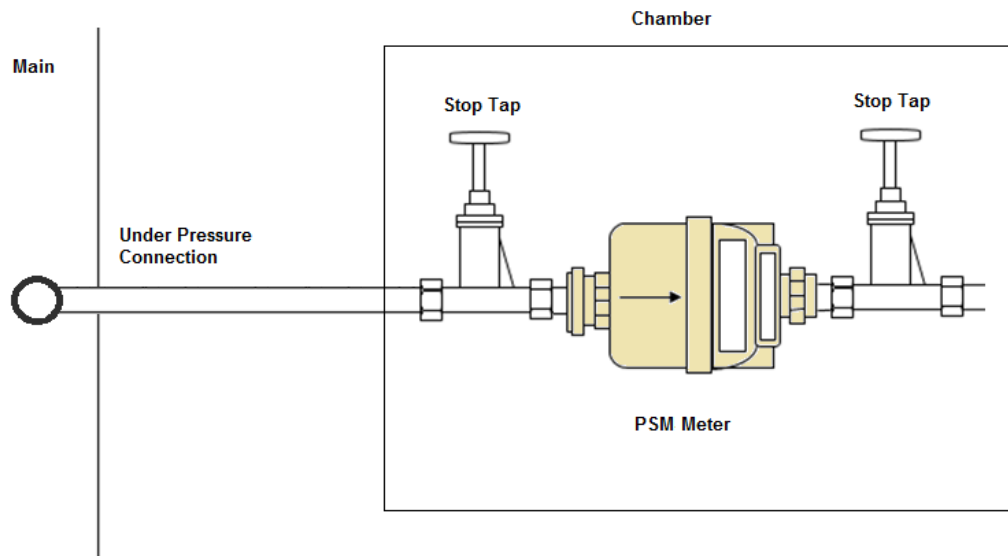
1. For chamber size 610 x 455mm where the chamber is subject to traffic loading a mass concrete base laid to a thickness of 100mm. Where chamber is not subject to traffic loading a precast concrete base unit shall be used.
2. For chamber size 430 x 280mm a precast concrete base shall be used in all loading conditions.
3. Chamber size of 610 x 455mm shall be used for 30 and 40mm PSM's. Chamber size 430 x 280mm for 25mm PSM meters.
4. Notes 1 to 3 on Drawing D8 also apply.

G. External Inline 20mm – 39mm Meter Installation in a Precast Concrete Chamber.

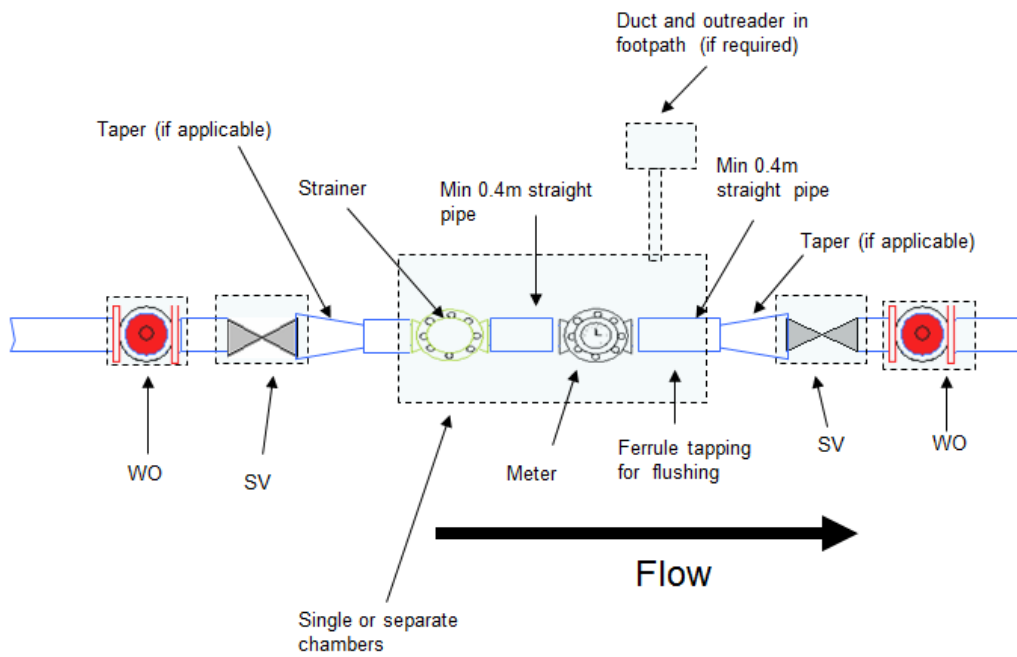
Frame & Cover type appropriate to traffic loading. Grade B125 for pavement & verges.
Grade D400 for all trafficked surfaces



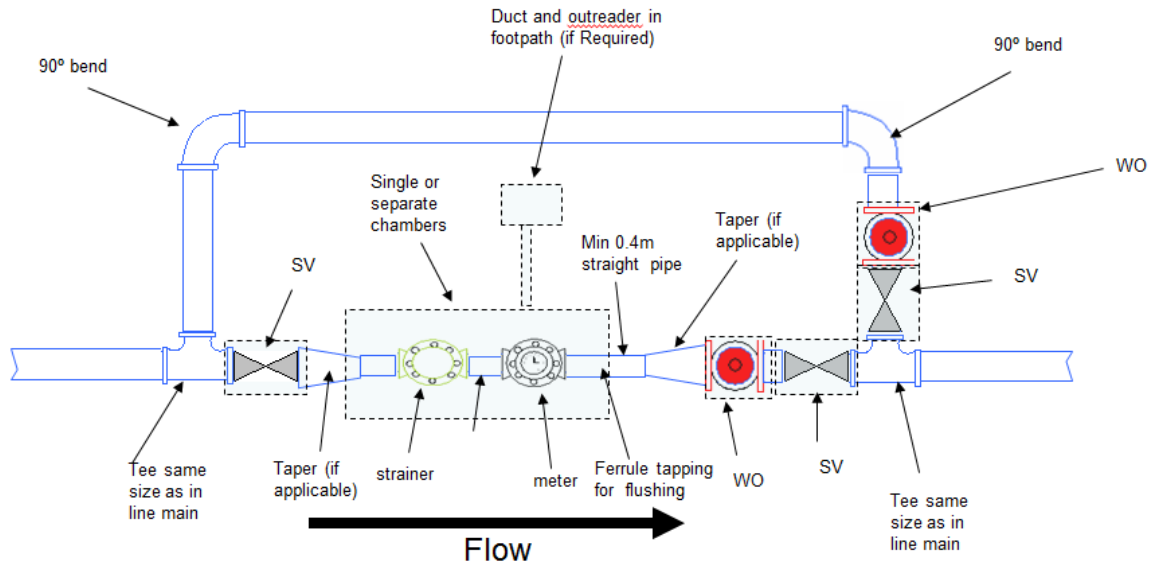
H. Standard Installation Drawing for External 20mm to 39mm Meter Installation.



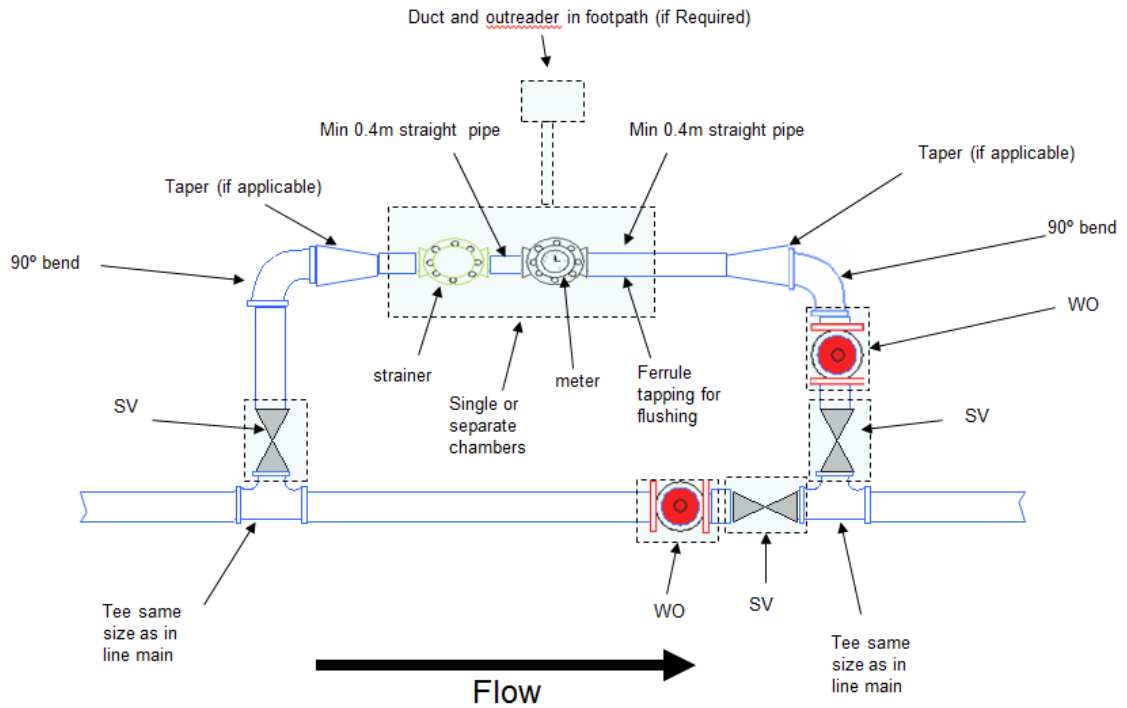
I. Flanged Meter (40mm or greater) and Strainer Installation.



J. Standard Installation Drawing for Double Flanged Meter (40mm or greater) and Strainer with a Bypass.



K. Standard Meter (40mm or greater) Installation on a Bypass.



Note – Under certain circumstances an inline meter may be requested. This may depend on highway conditions, location, hydraulics, lack of space, health and safety etc.

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