



**Fingal County Council - Water Services Department
Comhairle Chontae Fhine Gall – An Roinn Seirbhisí Uisce**

GUIDELINES FOR DRINKING WATER SUPPLY

February 2009 – Revision 1

Guidelines for Drinking Water Supply

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INTRODUCTION

This document has been produced with the assistance of the Water Operations Senior Executive Engineer, local Area Engineers, local area Supervising Inspectors, Leakage Engineer and the leakage Supervising Inspector.

This document replaces and supersedes the previous "Guidelines for the Laying of Distribution Water mains". In addition the Council's metering policy and the telemetry requirements of the Dublin Regional Telemetry System are included. The Council's metering policy has been updated to include the powers and responsibilities provided for in the Water Services Act (2007). However the Minister may make regulations under the Water Services Act. This document will be updated if such regulations are made.

These guidelines are constantly under review and are subject to change. Recommendations in these guidelines must not be construed as prohibition of use of materials/construction methods. However any deviation from these guidelines in terms of material, method of construction or operation must be agreed with the Council prior to applying for planning permission.

These guidelines take effect from February 2009.

GLOSSARY OF TERMS

DI	Ductile Iron
HDPE	High Density Polyethylene
HPPE	High Performance Polyethylene
MDPE	Medium Density Polyethylene
MOPVC	Molecular Orientated Polyvinyl Chloride
PE	Polyethylene
PVC	Polyvinyl Chloride
UK DWI	UK Drinking Water Inspectorate
UK WRAS	UK Water Regulations Advisory Scheme

GUIDELINES FOR THE LAYING OF DISTRIBUTION WATERMAINS

1 PLANS

Submission of Plans to Water Services Department for Approval

Before any contractor begins work on site, the following information must be submitted and written approval obtained thereof from the Water Services Department:

- 3 no. site location maps to a scale of 1:1000 showing the proposed development layout, layout of roads and proposed watermains.
- 3 no. plans of a scale not less than 1:500 showing the layout of roads, buildings, proposed watermains and other services.
- 2 no. sections through proposed roads and footpaths showing location of all services including watermains.
- Complete set of watermain drawings on CD. The drawings on CD must be either in *.dwg, *.dgn, or *.dxf format and referenced to the national grid.
- A covering letter:-
 - (a) *Stating whether the scheme (or part thereof) is going to remain private or be taken in charge.*
 - (b) *Quoting the Planning Permission Reference and Approval numbers.*
 - (c) *Confirming that the pipes have been correctly sized.*

Please note: No branch connections will be given unless the watermains are laid in accordance with the approved watermains layout drawings.

2 REGULATIONS / BYE-LAWS

All internal and external plumbing must comply with current standards and the Fingal County Council Water Bye-Laws, Building Regulations and FCC requirements/conditions.

3 TIME OF COMMENCEMENT

A copy of the commencement notice (which is sent to the Planning Department) must also to be sent to the local Water Area Engineer and Development Control section.

4 INSPECTION

A Fingal County Council representative may inspect the work from time to time. The connection to the County Council main will only be given when the County Council is satisfied that: -

- (a) The watermains have been laid in accordance with these Guidelines and the approved layout drawings.
- (b) All internal and external plumbing complies with FCC current standards, the Fingal County Council Water Bye-Laws and FCC requirements/conditions.
- (c) Pressure, Chlorination and Bacteriological Tests have been carried out and approved.
- (d) All conditions of connection as detailed in the approval letter are complied with.

5 WATERMAIN LAYOUT DESIGN CRITERIA

Watermain layout should be designed in consultation with Fingal County Council in accordance with these general guidelines. The following are to be complied with when designing the watermain layouts:

1. All pipes must have a minimum depth of cover of 750mm and maximum depth of 900mm measured from the top of the pipe to the finished ground surface.
2. House connections are not to be taken across roads (except where approved by Fingal County Council)
3. Watermains should be laid to provide the optimum circulation in the local water network, i.e. dead ends should be avoided. If it is impossible to prevent a dead end, a duckfoot hydrant will be required at this point.
4. The location of Body Valves should be arranged in such a manner as to ensure that no more than 40 properties (or 15 commercial units) lose water from a burst in the system.
5. All developments with more than 40 properties (or 15 commercial units) will be required to have a second branch supply to provide resilience to the local network.
6. No other service is to be located above or within 500mm of any watermains, unless it is crossing over the watermain at right angles, where there must be a minimum of 250mm vertical clearance.
7. Watermains must not be laid under walls or areas designated for trees/shrubs/flowers.
8. The watermain must be located a minimum of 1m from the boundary of private property or 5m clearance from a house or other structure. (except where approved by Fingal County Council)
9. Trunk watermains (principal main supplying the area) of up to and including 300mm diameter must have a 5m sterilised area on each side of the watermain, whereas watermains of greater than 300mm must have an 8m sterilised area on each side. Any deviations must be agreed with Fingal County Council prior to commencement of works.
10. Only DI pipes are to be used where a watermain crosses a public road, except where otherwise approved by FCC.
11. All designs must comply with the current Building Regulations, Water Byelaws, Water Services Act (2007), Fingal County Council requirements and any subsequent Acts or Regulations
12. Where a water main is to be located in an area where 24 hour access (for example under motorways, canals, rivers etc.) is not available, that water main must be duplicated to maintain the water supply until access is available to carry out the repair. The second main must be exactly the same as the first main in all regards (i.e. material, diameter and flow capacity etc.) Isolation valves should be provided on both sides of the inaccessible area to allow the water supply to be redirected from the water main in use to the second main while the first main is being repaired.
13. Where a water main is to be located within a structure (bridge decks, culverts, etc.) that water main must be duplicated and the mains must be placed within sleeves to facilitate easy replacement of the pipe.
14. Where a non-domestic supply and fire main are on the same pipe, these watermains must be metered using a magnetic flow meter (or similar approved) and the consumption must be above the minimum recordable flow of the meter. For example, for 95% accuracy on a 100mm magnetic flow

meter, the flow must be 0.4m³/hr. Please see Appendix A section 5 for further information on fire mains.

15. Refer to the current version of IS EN 805 for the general requirements for water supply systems and components outside buildings.

6 MATERIALS

No materials, other than materials listed in this section, must be used without the prior approval of Fingal County Council Water Services Department. It is the responsibility of the Contractor to ensure that all materials/fittings to be used on the site have been approved for use by the Water Services Department, Fingal County Council in advance of work commencing.

6.1 Watermain Pipe Material

For ease of maintenance the preferred watermain materials are indicated on the following table. Other materials may be considered provided they have been approved by the Water Services Department.

Size of Pipe (mm)	Type Of Pipe
100 to 150	Mopvc, pvc-A, HDPE, HPPE, MDPE, DI
150 - 300	Mopvc, DI, HDPE, HPPE, MDPE
>300	DI

All plastic water pipes must be blue in colour.

- All materials used in pipes and fittings in contact with drinking water shall be suitable for purpose - such as those on the WRAS material list or similar National Approved Scheme.
- The use of UPVC pipes is no longer acceptable.
- *MOPVC pipes* must conform to UK Water Industry Specification No. 4-31-08 or equivalent specification approved by the Water Services Department
- *Ductile iron pipes* must conform to Class K9 of EN 545. Ductile iron fittings must be either Class K9 or K12. Ductile Iron pipes and fittings must be lined with a material that is approved for contact with Drinking Water.
- *PVC alloy pressure pipe* must conform to BS PAS 27. All fittings should conform to this standard also.
- PE pipes must conform to BS 6572, IS EN 12201 parts 1-3, and UK Water Industries Specification 4-32-(all parts).

6.2 Service Pipes & Fittings

PE pipe and fittings should be of type PE-X-80 and have an SDR rating of 11. They must conform to the UK Water Industry Specification No. 4-32-02 and/or BS 6572 for pipe sizes up to 63mm OD and No. 4-32-04 for fusion joints and fittings.

Copper Alloy fittings must be approved gunmetal or Dezincification Resistant Brass (Material CW602N (formerly CZ132)) and conform to IS EN 12163, 12164, 12165, 12167, 12168, 12420, as applicable to the fitting in question.

The diameter of the service pipe must be approved in advance by the Water Services Department.

Long runs of copper are to be avoided as leaching of copper can result in high copper content in drinking water.

6.3 Service pipe supplies

The service pipe must not contain any break or joint between the boundary box and the first cold water appliance/outlet/internal control valve connected to the mains supply.

All service pipes must include the installation of a boundary box with integral stopcock (*note that the use of the traditional stopcock has been discontinued*).

Where it is not appropriate to use a boundary box, the following applies:

In non-domestic units, each unit must have an individual valve-controlled metered supply and in domestic units, each unit must have an individual valve-controlled supply, including the facility to retrofit a water meter at a later stage.

NOTE: All alternative systems must be approved by Fingal County Council Water Services Department prior to construction.

Only Fingal County Council personnel are authorised to install watermain tappings.

All properties must have 24hour water storage.

6.4 Boundary Box

The boundary box comprises of a concentric meter box compatible with F.C.C. meters with telescopic body and circular plastic sealed lid complete with isolation valve, non-return valve and push-fit outlets. The minimum depth from lid to the top of the meter is 250mm. The lid and boundary box should have a loading resistance to match their location.

The boundary box may not be practical in all situations, however as a rule, the boundary box must be located in non-trafficked areas and within 225mm of the property boundary.

6.5 Sluice Valves

Unless specified or approved by FCC, all valves on water mains are to be sluice valves. Sluice valves must be double flanged ductile iron, resilient seal gate valves for watermain purposes and must comply with the relevant requirements of EN1074. The number of turns to open/close the valve must be $n=2N + 1$ where N = the equivalent diameter in inches. All flanges must be drilled to P.N. 16. The spindle must be fitted with a cast iron oval false cap (complete with grub screw). Depth from ground level to the top of the valve spindle must not be greater than 600mm. The operating torque should not exceed the maximum allowed in EN 1074, with written test results required.

Sluice Valves must be coated with an electrostatic epoxy powder spray, or bitumen – trichloroethylene solution to U.K. WRAS or an alternative Fingal County Council approved coating.

All sluice valves are to be operated from above ground with a valve key and must be **ANTI-CLOCKWISE CLOSING**. Sluice valves on pipes with diameters greater than 400mm must be installed in a chamber.

6.6 Butterfly Valves

Butterfly valves are only permitted where there is inadequate space to install a sluice valve or where the valve is to be used to modulate the flow of water.

Butterfly valves must be double flanged and must comply with the relevant requirements of EN1074. Manually operated Butterfly valves are to be operated from above ground with a Fingal County Council valve key and the operating torque should not exceed the maximum allowed in EN 1074. All flanges must be drilled to P.N. 16.

Butterfly valves must be installed with the shaft in the vertical direction to allow the gear box to be installed above ground if deemed necessary by the Council.

Where gearboxes or actuators are located below ground, they must be rated for full submergence under IP68 for 3 weeks.

Butterfly Valves must be coated with an electrostatic epoxy powder spray, or bitumen – trichloroethylene solution to U.K. WRAS or an alternative Fingal County Council approved coating.

All Butterfly valves are to be installed in a chamber.

All Butterfly valves operated by a valve key must be **ANTI-CLOCKWISE CLOSING**.

Actuated Butterfly valves will require a manual over-ride facility and the actuator must be IP rated to suit its location.

6.7 Hydrants

Hydrants must be manufactured in accordance with BS 750: 1984, Type 2 and must incorporate a screw-down valve, underground “guide in head” type, with bayonet lug outlets and false spindle.

The hydrant valve must be **CLOCKWISE CLOSING** i.e. the opposite of a sluice valve.

Hydrants must be coated with an electrostatic epoxy powder spray, or bitumen – trichloroethylene solution to U.K. WRAS or an alternative Fingal County Council approved coating.

Hydrants (which are provided for emergency supply) may not be used for any other purpose without the written permission of Fingal County Council.

6.8 Air Valves

Air Valves must comply with the requirements of BS5159 and are to be located at summits of watermains or beside trunk watermain body valves. Fingal County Council requires that all air valves are double orifice type and include an isolator valve (to allow ease of removal without draining the watermain). Any other type of air valve is subject to the approval of Fingal County Council prior to construction commencing.

6.9 Non-Return Valves

Non-return or check valves are to be used to prevent water from draining back into the public water main only if a dedicated fire main is provided. These valves should comply with the requirements of EN 1074. For fire fighting purposes there must be no physical restriction to the flow through the valve. The non-return valve must be placed in a chamber to allow access for maintenance.

7 BREAK TANK AND BOOSTER SYSTEMS

The minimum target pressure in Council mains is 15m head. As a result it may be necessary to use a break tank and pressure booster system.

7.1 Requirements for Installation of Booster Systems

Where it is necessary to use a 'Break tank and booster system' (e.g. usually buildings of 4 storeys or more), the following conditions must be complied with:

- Full details of the system to be submitted to the Water Services Department (including plumbing layout, maintenance programme, pump and tank details) before a connection to the public water supply will be allowed.
- The relevant standards and suppliers conditions must be adhered to, particularly the following:
 - **BS EN 1508:1999 Requirements for systems and components for the Storage of Water**
 - **The European Communities (Drinking Water) Regulations 2007**
- Only indirect pressure boosting will be permitted
- Separate independent drinking water supply (1hour storage not exceeded) and 24hr storage supply is required (one break tank for drinking water and another break tank for 24hr storage).
- A connection to the public water supply will not be given until a certificate of sterilisation of the tank has been received by the Water Services Department. A sample must be taken and a bacteriological test as per section 15.3 must be carried out.

7.2 System Maintenance

The building/management company must have, readily available, full as-constructed details of the system installed including the system layout, recommended maintenance schedule and details of the appropriate maintenance required to ensure that the water quality is not compromised.

It is a requirement that ongoing regular maintenance is carried out by the building/management company, and written records of this maintenance must be kept and be available for inspection by the Water Authority.

8 RAINWATER HARVESTING

Rainwater systems require the option of top up with water from the potable water system during periods of dry weather when rainfall is not sufficient to meet the demands of the system. However this must be provided via a secure connection which is immune from accidental cross-contamination and/or backflow. This is normally provided from a connection to the high-level rainwater storage tank, via an unrestricted air-gap device (AA device, IS EN 1717). For further information on the protection of potable water installations from pollution and backflow, please refer to the current version of IS EN 1717.

All pipework is to be labelled to avoid misconnection or accidental consumption of non-potable water. Labels should be of the self-adhesive or wrap-around type. The label must carry the marking "RECLAIMED WATER" in black text 5mm in height on a green background and must be at least 100mm long. The size of the lettering and labels should be increased as the pipe diameter increases.

9 SURFACE COVERS

Valves and hydrants when installed must be covered with approved heavy-duty metal surface covers to I.S EN 124:1994.

10 HYDRANT AND VALVE INDICATOR PLATES

Hydrant indicator plates and baseboards must comply with B.S. 3251 while sluice valve indicator plates and baseboards must comply with the Fingal County Council requirements. They must be mounted at the boundary of the public thoroughfare nearest to the hydrant or valve.

11 WARNING MESH

All pipework must have a 400mm wide water warning mesh, - Plyage HR 40D blue polyethylene warning mesh or similar – laid directly over the centreline of the pipeline and tied to valves, at a depth of 350mm below the finished ground surface. Supply pipes must have a mesh 200mm wide laid at the same depth.

12 CLEANING PIPES

All pipes must be examined internally for dirt, stones, or any foreign matter and must be thoroughly cleaned before laying in final position. To prevent foreign matter or vermin entering the main as it is being laid, all open ends of laid pipes must be plugged until the next pipe is ready for insertion.

13 BEDDING MATERIAL

All pipes must be laid on a 150mm bed of rounded single-sized pebble of 10mm nominal diameter and haunched and covered to a depth of 150mm with similar material. Pipes must not be supported by stone or rock at any point. Rock must be excavated to a depth of 150mm below the actual depth of trench required and backfilled with DOE Clause 804 prior to laying the pebble bed.

In ground that contains ashes or chemicals or material that could accelerate corrosion or deterioration of the pipe, the material to be used and method of laying must be agreed in writing with the Fingal County Council Water Services Department prior to laying.

14 BACKFILLING AND REINSTATEMENT IN OR ADJACENT TO ROADWAYS

All trenches in or near roadways must be backfilled and reinstated in accordance with the Transportation Department requirements.

15 TESTS

After the pipes have been laid and jointed, the main must be tested as outlined.

15.1 Pressure Test

The Contractor is responsible for testing the watermain. The watermain must be subjected to a pressure of 10 bar or 1.5 times its normal working pressure, whichever is the greater pressure, for 1 hour in the presence of a representative of Fingal County Council. Testing must be carried out between suitably supported blank end pieces. Watermains are to be tested prior to any service pipe tappings being installed on the watermain (other than those required for filling the watermain).

15.2 Chlorination Test

All mains must be swabbed and disinfected before being put in to supply. The pipelines must be disinfected with water having a minimum concentration of 20mg/l of free chlorine. The Water Services Department will carry this out with the assistance of the contractor.

The chlorinated water must be left in the main for a period of at least 24 hours. Chlorine residual tests must be taken at the end of the main furthest from the point of injection. The sterilisation process must be repeated if the chlorine residual is less than 10mg/l.

All chlorinated water must be disposed off in such a manner as not to pose a pollution risk.

15.3 Bacteriological Test

The main must then be refilled and the contractor will organise a sample of the water to be taken for Bacteriological Analysis. Great care must be taken when obtaining samples for testing and only sterile containers must be used. This sampling must be carried out in the presence of the Water Inspector. Samples must be tested within 6 hours of collection. Water samples may be tested in the following accredited laboratories or other accredited laboratories.

National Food Centre,
Teagasc,
Duininea,
Castleknock,
Dublin 15.
Tel: 01-8383222.

The Public Analyst Laboratory,
Sir Patrick Dun's,
Lower Grand Canal Street,
Dublin 2.
Tel: 01-6612022.

Note: The Water Services Department will not connect the new main to the existing network until a copy of a satisfactory bacteriological test report has been submitted to the Water Services Department for approval. Where a sample is tested at an accredited laboratory other than those above, a copy of the laboratory's accreditation must be submitted with the test results.

Fingal County Council reserves the right to take and test a sample and for the contractor to bear the costs.

16 CONNECTION TO FINGAL COUNTY COUNCIL MAINS

Connections to mains, which are the property of the Fingal County Council, must be made by Fingal County Council only. No other person must interfere in any way with these mains. Such connections must be made by Fingal County Council at the expense of the Applicant. The estimated cost of such connections must be lodged

with Fingal County Council before the work is undertaken. All branch conditions outlined by Water Operations must be complied with otherwise the connection will not be given.

Connections to mains not in the charge of FCC

Note: Water flowing in mains not in charge but supplied from the FCC system is the property of FCC. In order to avoid the possibility of contamination of this water and hence the public water supply, all connections to such mains must also be carried out by Fingal County Council.

Two sets of as-built drawings for the watermains layout and a copy on CD must be submitted to the Water Services Department before the connection to a FCC watermain is permitted. The drawings on CD must be either in *.dwg, *.dgn, or *.dxf format and referenced to the national grid.

Water main diversions are not allowed on Fridays due to the possibility of problems occurring over the weekend.

In order to facilitate connection to the public water main, the following must be complied with:

- The watermains are laid in accordance with this document
- Letter of approval of the connection complete with approval number
- Pressure Test passed in presence of FCC representative
- All watermains swabbed and sterilised in presence of FCC representative
- Bacteriological test passed and results submitted to Water Services Department
- All branch conditions outlined by Water Operations must be complied with
- 2 sets of as built drawings and a copy on CD to be submitted to the area Water Inspector before water connection will be given.
- Magnetic flow meter should be installed, commissioned and operational.

17 FLUSHING

When mains have been satisfactorily tested and connected to the Fingal County Council main, they must be flushed out with potable water through a standpipe placed on the end hydrant before the main is brought into use. This will be carried out by the area Water Inspector with the assistance of the contractor.

18 WATER SERVICES DEPARTMENT CONTACTS:

Water Services Department Hunt Number	8906210
Water Connections Hunt Number	8905900
Water Charges Hunt Number	8905488
Water Pollution Hunt Number	8905013
Swords Depot	8905963
Ballycoolen Depot	8694900
Metering Section	8694900

APPENDIX A

WATER SERVICES POLICY FOR THE INSTALLATION OF WATER METERS

WATER SERVICES POLICY FOR THE INSTALLATION OF WATER METERS

INTRODUCTION

The objective of this document is to set out the water metering policy within Fingal County Council and to provide clear guidelines to designers and developers on the design implications of Fingal County Council's metering requirements. It should be noted that the information contained in this document is continuously under review and is subject to change.

1 DOMESTIC CUSTOMERS

Under current legislation individual domestic customers are not metered for the purposes of charging. However all service pipes must be fitted with a boundary box with integral stopcock (see section 6.3) which is capable of containing a meter. Also the construction phase of a housing development is considered to be a Non-Domestic process and therefore all builders' supplies will be metered. This includes the installation of an AMR (Automatic Meter Reading) compatible battery-powered magnetic flow meter installed in a chamber on the distribution branch and an account opened under the developer's name which remains open until the development is taken in charge. It should be noted that all of the water supplied to the development will be invoiced to the developer minus a domestic allowance for each occupied unit. This allowance is currently 450 litres/property/day.

Leaks detected within developments that are not taken in charge must be repaired by the Developer. In accordance with the Water Services Act (2007), the Water Services Authority (Fingal County Council) will take action in the event that notified leaks are not repaired within the timescale stipulated in a notice issued under the Act.

All flow meters **must** be compatible with Fingal County Council AMR metering System and Regional Telemetry System. Refer to *"Requirements for Outstation Installation on the Dublin Region Telemetry System"* for details of telemetry requirements.

All long services (i.e. greater than 90m length) require a mechanical meter with AMR technology compatible with Fingal County Council metering system. An application for a domestic metered supply must be made.

All apartments must have a separate supply. The service must have a facility for retrofitting a meter for water consumption which is accessible to Fingal County Council staff without the need to contact the consumer or introducing any health and safety hazards.

2 COMMERCIAL CUSTOMERS

All non-domestic customers must be metered. All non-domestic premises will have an individual meter measuring the quantity of water supplied. In some cases it may be necessary to have more than one meter.

In the case of multi-occupancy units, all new/refurbished premises must design and install the plumbing of each commercial unit in such a way that each unit can be separately metered. Meter locations and shut-off valves must be easily accessible during working hours.

All flow meters **must** be compatible with Fingal County Council's AMR metering System. Refer to *"Requirements for Outstation Installation on the Dublin Region Telemetry System"* for details of telemetry requirements.

Commercial areas containing two or more commercial units require a bulk landlord meter, in addition to the non-domestic meter for each unit, which will monitor any

illegal tappings and/or water leaking within the estate. This bulk landlord meter must be a magnetic flow meter (battery-powered unless otherwise specified by FCC) to provide a supply to fire fighting apparatus. Where there is no requirement to supply water for fire fighting apparatus a mechanical meter will be accepted. The account holder of this meter will be the developer or Management Company unless the estate is taken in charge. There must be unrestricted access to all meters during normal working hours.

The type, location and size of the proposed meter must be identified on the watermains drawings submitted under section 1 of this document.

A battery-powered Magnetic flow meter must be installed on a ring main used for fire fighting purposes unless otherwise agreed with the Council. The location of this meter is to be agreed with the Water Services Department.

Note: In accordance with **Section 72(1) (a) (iv) of Part 5 of the Water Services Act 2007**, the Council may “*require any customer of water supplied by it to take such supply through a specified water supply meter*”.

3 DUTIES OF CUSTOMERS, OCCUPIERS AND BUILDING OWNERS

Part 5 of the Water Services Act (2007) deals with the provision, performance and interference with meters. Section 73 deals with meter performance while Section 74 deals with interference with meters. Sub-paragraphs 73(1),74(1) and 74(1) are reproduced below.

73.—(1) For the purpose of measurement of water usage or waste water discharge determined by a meter, the register of that meter shall be *prima facie* evidence of the volume supplied or discharged, as the case may be.

74.—(1) A person who—

- (a) removes, damages or causes the removal or damage, or otherwise impairs, or causes impairment of the proper working of a meter,
- (b) alters or causes to be altered fraudulently a meter,
- (c) prevents or causes to be prevented from being duly registered the volume of water or waste water supplied or discharged through a meter, or
- (d) fraudulently bypasses or causes or permits the bypass of a meter provided for the purposes of measuring the volume of water or waste water supplied or discharged,

commits an offence.

(4)

- (a) A consumer of water services who has reasonable grounds for believing that a meter to which this section applies is not duly registering a quantity of water being supplied to, or of waste water being discharged from, a premises by reason of the meter being unlawfully interfered with shall take all reasonable steps to ensure that such interference is discontinued.
- (b) A person who fails to comply with *paragraph (a)* commits an offence.

4 METER INSTALLATION PROCEDURE

4.1 Meters

4.1.1 Service Meter

Bonyto or equivalent, compatible with the FCC AMR system – to be agreed with FCC Water Services. Supplied and installed by FCC unless written agreement has been obtained with FCC Water Services to the contrary.

4.1.2 Bulk meter

(Only suitable where fire flow is not required)

Woltman meter (WS-MFD Model 233) or similar approved, compatible with FCC AMR system supplied and installed by Applicant under FCC supervision unless written agreement has been obtained with FCC Water Services to the contrary.

4.1.3 Magnetic Free Flow meter

Battery-Powered: Supplied and installed by the **Applicant** under FCC supervision unless written agreement has been obtained with FCC Water Services to the contrary.

In these situations the display, batteries and AMR will be located in a kiosk for ease of access.

If mains-powered magnetic flow meters are required they must be supplied and installed by the Applicant under FCC supervision unless written agreement has been obtained with FCC Water Services to the contrary. In these situations the display and AMR for the meter will be situated in a kiosk for ease of access.

All meters are to be fully operational and calibration certificates submitted to Water Services Department before a connection to the public water supply will be given.

The use of sustainable energy is encouraged in relation to power supply

4.2 Meter Chamber Layout

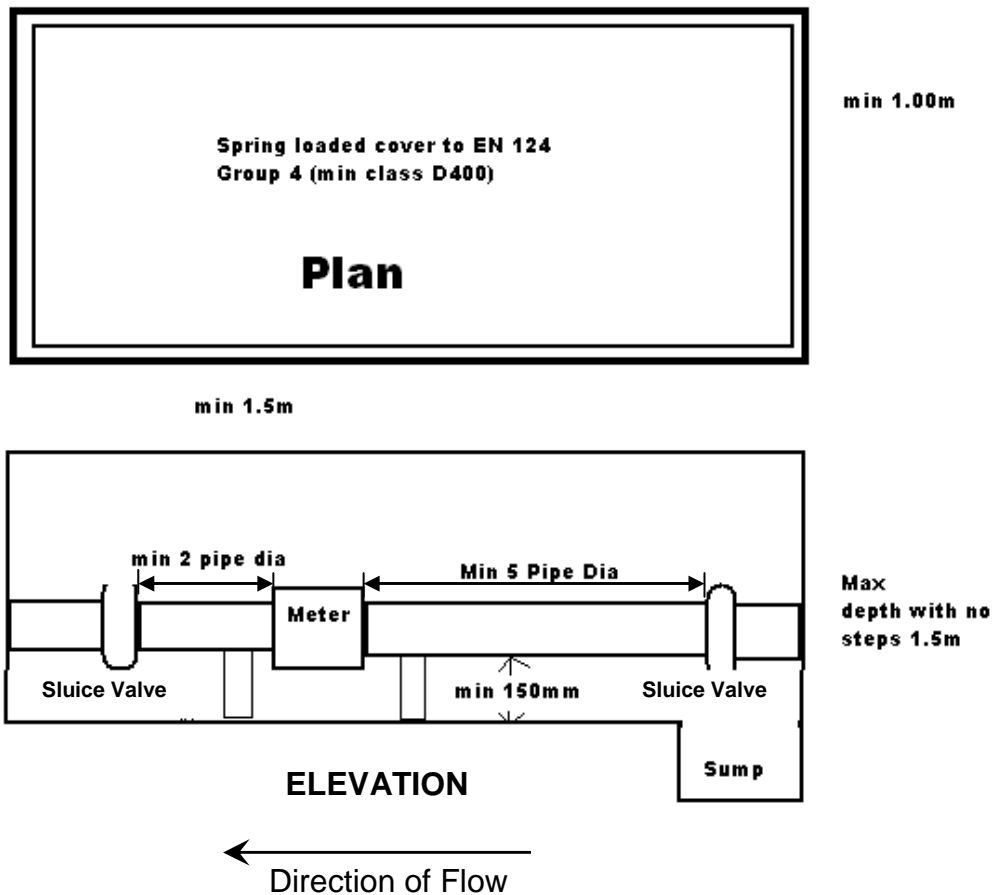
Chamber covers must meet the I.S. EN 124:1994 manhole cover specification to a rating of D400. The classification denotes the test load expressed in kN. For example Class D400 denotes a product that complies with test load of 400kN.

Group 4 (min class D400)

Carriageways of roads (including pedestrian streets), hard shoulders, and parking areas for all types of road vehicles

Figure 1 below shows a sample meter chamber layout with the minimum dimensions required.

Figure 1 - Meter Chamber Layout



4.3 Kiosk and Meter Arrangement

Meter Type

The meter must be an electromagnetic flow meter which is powered by a battery. The meter must be sealed to IP 68. The meter is to be installed according to the manufacturer's instructions. If the manufacturer's instructions contradict these guidelines, FCC must be contacted for clarification. The battery must have a minimum battery life of 3 years. The meter must be capable of monitoring and displaying the following:

- Flow Rate
- Forward, Reverse, Net Flow Totals
- Velocity
- Date & Time

The flow sensor must be intelligent such that any associated electronic display unit can be connected to it without subsequent programming.

Location

The only part of the apparatus to be located in the meter chamber is the meter itself. The power supply to the meter must be provided through a duct connecting the meter to a separate kiosk.

Kiosk

The battery pack, display and AMR must be located in the kiosk. The kiosk must be located above ground on a concrete base/plinth, must be constructed from 3mm thick coated galvanised steel and painted with 2 pak polyurethane paint to Ral no 6020. The concrete plinth should extend in front of the kiosk to provide a work area for installation/maintenance of kiosk equipment. The kiosk should have a single door; the door of the kiosk must have 2 No. heavy duty hinges and a proprietary locking mechanism.

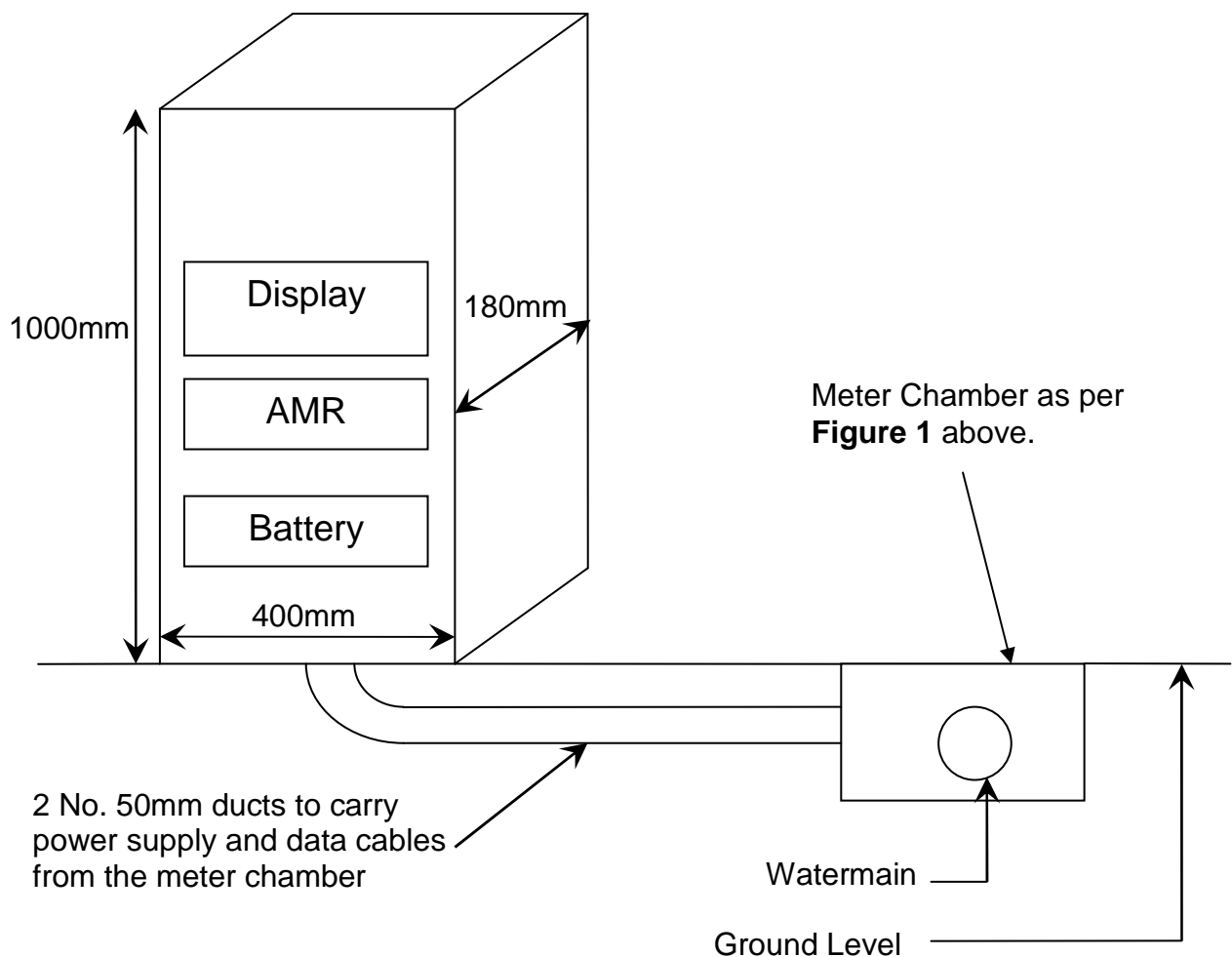
It must have the following **minimum internal** dimensions:

- internal height: 1000mm
- internal width: 400mm
- internal depth: 180mm

The ducts should be laid at least 600mm below ground level with a warning tape laid above it at a depth of 400mm.

Figure 2 below shows the generic layout that must be followed unless otherwise agreed with the Council.

Figure 2 - Kiosk and Meter Arrangement



5 EXAMPLES OF METER INSTALLATION ARRANGEMENTS

5.1 Overview of Fire Mains

All fire mains require a battery-powered magnetic flow meter to monitor unauthorised water usage or leakage.

Where a fire main is installed in addition to a water supply, the systems must be kept separate. Where it is intended to install a fire main which also supplies the non-domestic units, there must be adequate consumption within the non-domestic units to ensure that the water within the fire main is sufficiently circulated so that water quality is not compromised. Fire suppression systems and/or equipment such as fire hose reels, sprinklers, hydrants etc. must be fed off the fire main and not the mains water supply.

Non-return valves are to be used to prevent back-siphoning of stagnant/standing water in the fire main into the public water supply.

Magnetic flow meter sizing may result in meters with bores less than the pipe they are metering. This needs to be taken into consideration during the watermain layout design.

The arrangements shown in in **Figure 3**, **Figure 5** and **Figure 6** are only indicative of the types of layout acceptable. The fire main and the location of the hydrants must comply with the requirements of the Building Regulations and BS 5306-1:1976. All hydrants must comply with **section 6.7** and have indicator plates as per **section 10**.

Legend for Sample Arrangements

- H Fire Hydrant
- M Meter
- FHR Fire Hose Reel/Internal Sprinkler System

Figure 3 - Sample Arrangement 1 for non-domestic property with firemain

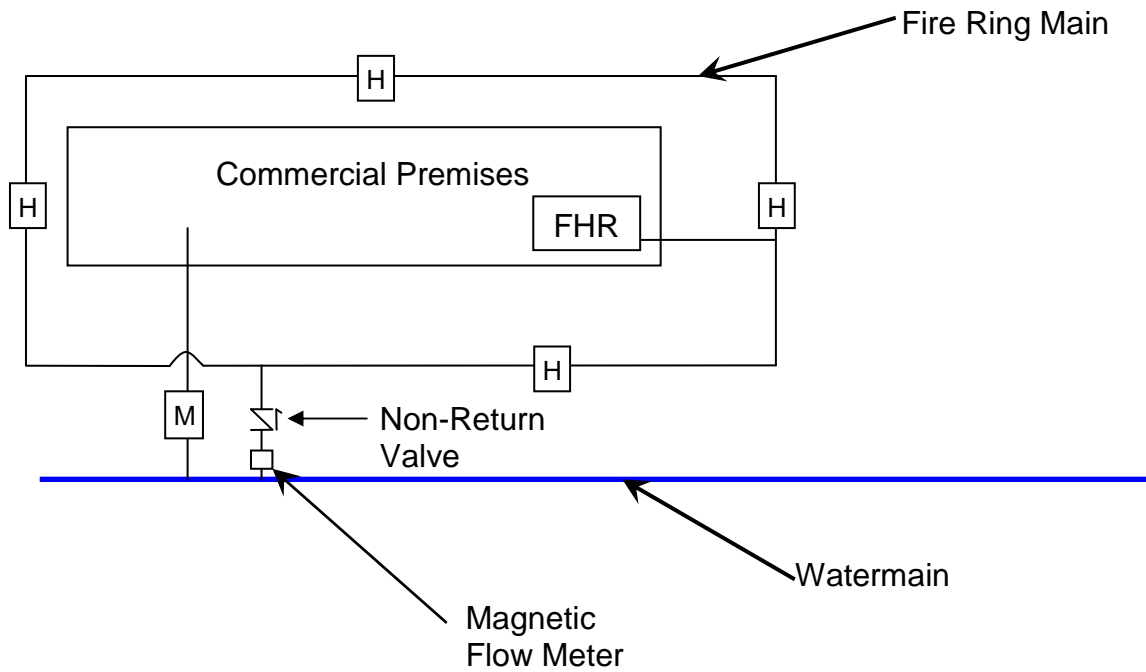


Figure 4 - Sample Arrangement 2 for non-domestic properties

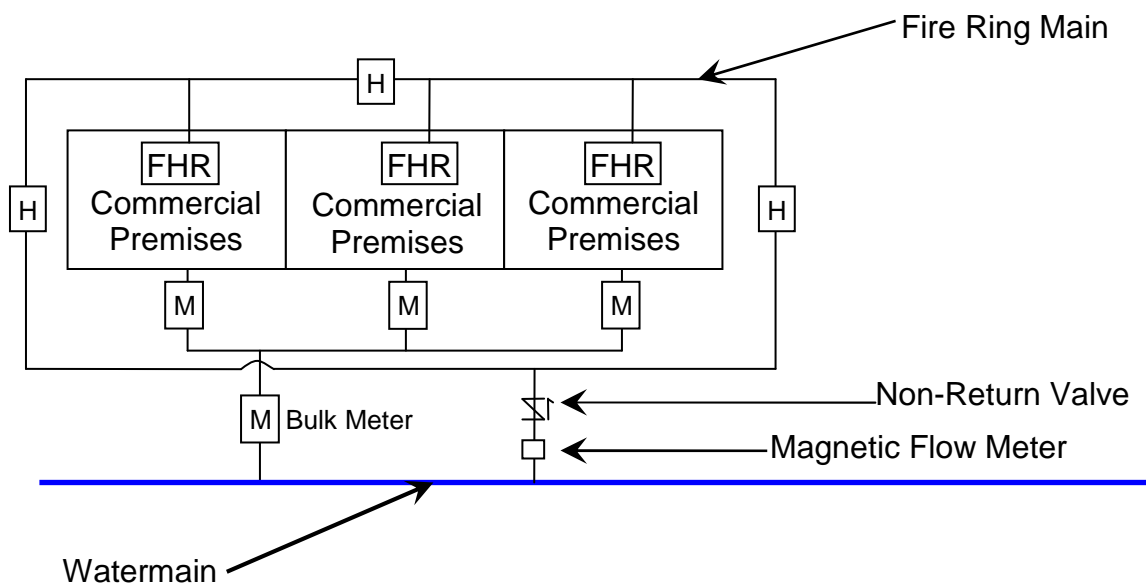


Figure 5 - Sample Arrangement 3 for non-domestic properties with fire main
 (where water usage is sufficient to allow circulation)

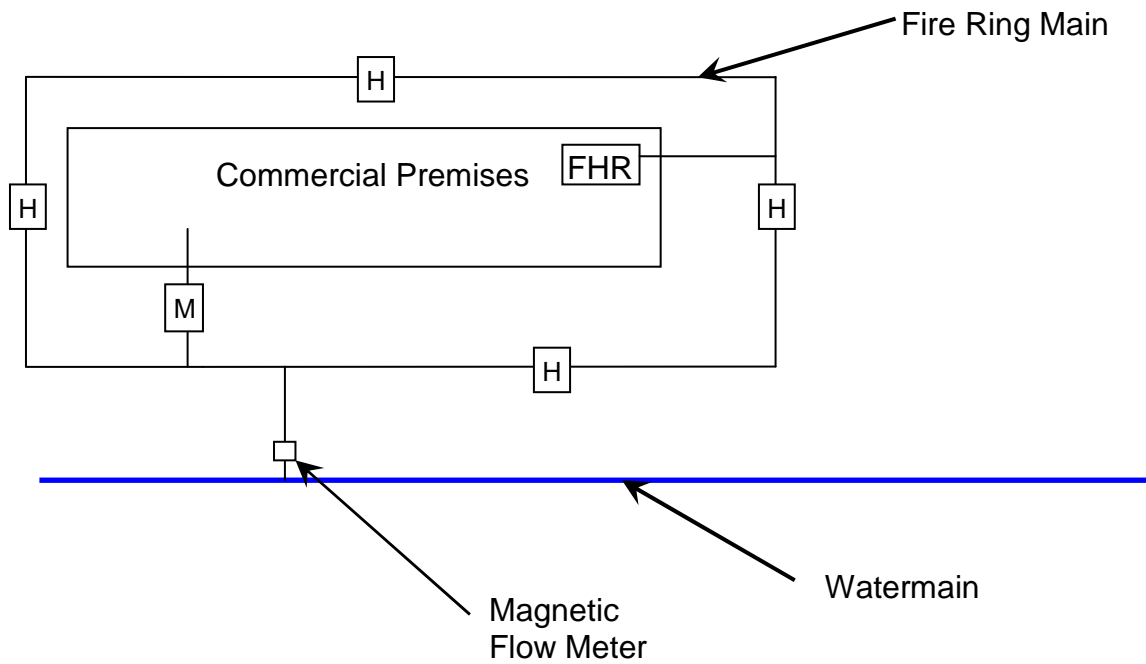


Figure 6 - Sample Arrangement 4 for non-domestic property with fire main and fire storage tank

