Water Services and Development Department

Water Section

Specifications for the Laying of Water Mains and Drinking Water Supply

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# Specification for the Laying of Water Mains and Drinking Water Supply

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1. **GENERAL**

This specification refers to all water mains and associated apparatus including valves and meters within the administrative area of South Dublin County Council. These specifications are constantly under review and the latest edition is available on the Council’s website [www.sdcc.ie](http://www.sdcc.ie).

The South Dublin County Council website contains the following information:-

a) List of Contacts
b) Water Connection Application Form
c) Standpipe Licence Application Form
d) Specification for the Laying of Water mains & Drinking Water Supply
f) Information on Water Quality.
g) Information for private water supplies
h) Guidance on lead pipes.

2. **PLANS**

Before commencement of any work the following information shall be submitted to the Water Section for approval:

a) 3 no. site location maps to a scale of 1:1000 showing the proposed development layout of roads and proposed water mains.
b) 3 no. plans of a scale not less than 1:500 showing the layout of roads, buildings, proposed water mains, connecting point(s), water reticulation layout details and other services.
c) 2 no. dimensioned sections through the proposed roads and footpaths showing location of all services (existing and proposed) including water mains.
d) Complete set of water main drawings on CD in either .dwg, .dgn, or .dxfl format and referenced to the Irish national grid.
e) A covering letter:
   i. Stating whether the scheme is going to remain private or be taken in charge.
   ii. Quoting the Planning Permission Reference No.
   iii. Stating an indication of the date at which the connection(s) to SDCC mains are required.

3. **REGULATION/BYE-LAWS**

3.1 **General**

All works within the administrative area of South Dublin County Council shall comply with all relevant current regulations, including the Water Services Act 2007, the European Communities (Drinking Water)(No.2) Regulations 2007, South Dublin County Council’s Byelaws for the Management of Water Services and Conservation of Drinking Water 2004, and South Dublin County Council’s Specification for the Laying of Water Mains & Drinking Water Supply.

3.2 **Liability for Damage to Water mains & vice versa**

Care must be taken while carrying out any works near watermains, including laying pipes and ducts, so as not to damage any water main or fitting. Any damage must be immediately reported to South Dublin County Council Water Section, and
anybody attempting to repair such water main or fitting will be liable to prosecution, and is liable for the costs of repair and all associated costs.

The Water Services Act 2007 Section 45 states: - “A person who causes any damage to a water main, distribution system, sewer, drain, service connection or their accessories used for the purposes of providing water services belonging to or in the charge of the water services authority, an authorised provider of water services or a person providing water services jointly with or on behalf of a water services authority or a authorised provider of water services, commits an offence.”

It is necessary that watermains are accessible at all times for operational, maintenance and repair purposes. For these reasons SDCC Water Section require reasonable setbacks and clearances as set out in Section 11 of this document. SDCC Water Section will not be liable for any damage to any structure, service, or other property that does not comply with the setbacks or clearance set out in Section 11 of this document consequent to operational, maintenance or repair works on watermains.

4. APPLICATION FOR A CONNECTION

Any person requiring a new or additional water supply should first contact the Council to ascertain if a water supply is available. Applications for water main connections must be made at least 1 month in advance of commencement of works on site. Connections will be made by the Council at the expense of the applicant. The applicant shall be invoiced for the works and all payments (including any contributions due under the Planning and Development Acts) must be made in advance to the Water Section, Water Services and Development Department, South Dublin County Council, County Hall, Tallaght, Dublin 24.

5. METERED CONNECTIONS

5.1 General

Every unit, whether domestic or non-domestic, shall have a separate water service. A connection may not be taken from an existing service. All non-domestic units shall have individual valve controlled metered services, and all domestic units shall have individual valve controlled services with the facility to fit a meter. All units shall have 24 hour storage. Any proposed alternative system must be approved by the Water Section.

A meter connection shall consist of a sluice valve, pipe work at least 10 times the meter diameter in length, an approved water meter, pipe work at least 5 times the meter diameter in length and a sluice valve.

Meters shall be compatible with South Dublin County Council’s AMR system.

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

5.2 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 an integral stopcock (see section 20) which is capable of containing a meter.

Housing Developments are subject to water charges, until such time as the estate is taken in charge by the Council. A bulk revenue meter(s) will be installed on the proposed branch connection(s) at the applicants expense, by SDCC. The Developer/Management Company is required to enter into a meter agreement with SDCC prior to completion of branch connection(s). A domestic allowance will be granted on submission of conveyancing lists to the Water Charges Section of SDCC on a quarterly basis (by end of Mar-Jun-Sept-Dec). The domestic allowance is subject to annual review.

5.3 **Commercial Metered Connections**

All commercial premises (including site compounds) without exception must be separately metered. An application must be made on the official application form. The charge for commercial meters includes the ferrule and saddle band, meter and meter box with integral stopcock. In some cases it may be necessary to have more than one meter serving a commercial premises.

6. **AUTHORISED PERSONNEL**

Under no circumstances shall a connection be made to any water main by anyone other than authorised Council staff, notwithstanding the fact that the main may be laid in private property or not be in charge.

6.1 **Connections to Council water mains:**

Connections to mains which are in the charge of South Dublin County Council shall be made by authorised Council staff only.

6.2 **Connections to mains not in the charge of the Council:**

Water flowing in mains which have not been taken in charge by the Council is the property and responsibility of the Council. In order to avoid the possibility of contamination of drinking water all connections to such mains shall also be carried out by authorised Council staff only.

7. **INSPECTION**

A Council representative may inspect the work from time to time. The connection to a watermain will only be given when the Council is satisfied that:

(a) The water mains and service pipes have been laid and tested in accordance with these Specifications and approved layout drawings.
(b) All works comply with current regulations and the Byelaws for the Management and Conservation of Drinking Water 2004.
(c) Pressure, chlorination, and bacteriological tests have been carried out and approved.
(d) A copy of the bacteriological test report has been submitted and approved by the Water Section.
(e) All materials used in the construction of a water main are approved.

8. **HIGH RISE BUILDINGS**

It is necessary to use break tank and booster pumps on high rise buildings.
8.1 **Installation of Booster Pumps**
These notes are intended as a guide outlining South Dublin Co. Council’s policy on the installation of pumps for boosting pressure within a building/development. For Multiple occupancy buildings - the service manifold for each separate unit shall be located in an accessible area at a location agreed by the Water Section. In general:-
(a) Buildings of 3 storeys or more shall be equipped with balancing tanks and booster pumps on the rising main to top storey units to ensure adequate pressure to top storey units.
(b) Only indirect pressure boosting will be permitted i.e. pumping from a break cistern supplied from the public water main.

8.2 **Role of the Designer**
It is the responsibility of the designer to ascertain whether or not the Council’s water mains have sufficient capacity to meet the requirements of the proposed installation. The Council may, at the expense of the designer or client, carry out pressure and flow tests to permit the designer to calculate the hydraulic capacity of the Council’s water mains and so decide on their suitability or otherwise, for the proposed installation.

It is also the responsibility of the designer to ensure that any boosting proposal is sufficient to meet the requirements of the development, subject to any conditions the Council may impose to protect the public water supply. Although there may be sufficient flow and pressure at the boundary of the site to serve the proposed development without internal boosting the designer must include a margin for future demands on the system.

8.3 **System Maintenance**
The designer must supply to the building owner and/or management company full details of the booster system and break tank installation. These details should include a recommended maintenance schedule for the system including cleaning of the break cistern.

8.4 **Submission of Plans for Approval**
Before installing booster pump(s) full details of the proposed installation must be submitted to the Water Section for approval. The effective capacity of a break cistern should be decided after due consideration of the total water storage requirements and its’ location within the building but should not be less than 30 minutes pump output unless otherwise approved by the Water Section in writing.

Details to be submitted shall include:-
(a) Full plumbing layout of the building indicating pipe sizes, storage tank capacity, flow locations of draw off points etc.
(b) Pump details including valve arrangements, pump size and flow pump curve(s) with the operating point(s) clearly indicated.
(c) Volume, location and dimensions of break cistern(s).
(d) Maintenance schedule for the system, - pump inspection/maintenance and tank cleaning.

8.5 **Break Cisterns**
A break tank or break cistern shall:
1. be a closed vessel having a tightly fitting access cover bolted or screwed in position
2. be suitably maintained – i.e. inspected and regularly cleaned – and where necessary, suitably lined or coated to preserve the potability of the water;
3. have an air inlet and an overflow pipe or pipes all suitably screened;
4. where necessary, be insulated against heat and be supplied exclusively from a service pipe, via a ball valve.

9. **RAINWATER HARVESTING**

Rainwater harvesting systems usually require the option of top up with water from the water supply network during periods of dry weather when rainfall is not sufficient to meet the demands of the system. Any connection to a rainwater harvesting system must be provided via a secure connection where it is not possible for cross contamination and/or backflow to the public or private drinking water supply. An acceptable back up supply to the rainwater harvesting system can be provided using a connection to the high level rainwater storage tank via an unrestricted air-gap device (AA device, IS EN 1717).

All pipework connected to or from a rainwater harvesting system shall be labelled to avoid misconnection or accidental consumption of non-potable water. The label must carry the marking “RECLAIMED WATER” in black text 5mm high 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.

It should be noted that harvested rainwater will not be of potable standard unless it is treated. Treatment requirements will vary dependent on what is the intended use for the water.

10. **MATERIALS**

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

Pipes and fittings shall be stored off the ground in a clean environment and capped at ends until they are used in order to prevent contamination. Pipes shall be examined before use for flaws and particular attention shall be kept for signs of impact damage and scoring. Polyethylene pipes shall not be used with scores or cuts of more than 10% of the wall section and, if after installation scores or cuts of more than 10% are found the affected lengths of pipes shall be replaced.

10.1 **Water mains**

Water pipes shall only be MoPVC, MDPE, HDPE, HPPE, Ductile Iron, or PVC-A. All plastic water pipes shall be blue in colour.

uPVC pipes shall not be used on the water network.

For ease of maintenance the preferred water main materials are indicated on the following table. Other materials may be considered but require to be approved by the Water Section before use.
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<td>&gt;600</td>
<td>DI</td>
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- **MoPVC pipes** shall conform to the UK Water Industry Specification No. 4-31–08 and manufacturers shall operate a quality system in compliance with BS 5750 Part 2 (EN29002).

- **Polyethylene pipes** should be of type PE-100 and have an SDR rating of 11. PE pipes shall conform to BS 6572 and BS 6730 and water industries specification 4.32.03 to 4.32.05 (inclusive) and 4.32.13.

- **Ductile iron pipes** shall conform to BSEN545 2010: class 40 for DN 40 to 300, and class 30 for DN 350 to 600. Ductile Iron pipes and fittings shall be cement mortar lined with a sulphate resistant cement and shall be sealed with an approved bitumen or epoxy resin seal coat.

- **PVC alloy** pressure pipe and fittings shall conform to BS PAS 27.

### 10.2 Service pipes and fittings

The Water Section must approve the diameter of the service pipe in advance. The service pipe shall be laid without mechanical joints from the boundary box to a stop valve inside the house and contained within a 50mm duct along the entire length with 450mm minimum cover to finished ground level.

PE pipe and fittings shall be of type PE-X-80 and have an SDR rating of 11. They shall 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.

Before any house service is covered in it must be inspected and tested up to the saddle band in the presence of a representative of the Council.

No service shall be laid across a road unless otherwise approved by the Water Section in writing.

### 11. PIPE DESIGN PARAMETERS

#### 11.1 General Design Criteria

Water main pipe size and layout shall be in accordance with the requirements of the Water Section. The following criteria shall apply:

- a) The minimum pipe size shall be 100mm in housing developments of up to 50 houses. Developments of 50 to 100 houses shall have a 150mm diameter spine main with 100mm loops.

- b) The minimum pipe size shall be 150mm in industrial or commercial developments.

- c) House connections shall not be taken across roads, except with the prior agreement of the Water Section.

- d) Water mains should be laid to provide the optimum circulation in the local water network. Water mains shall terminate in a dead end with Council
Specification for the Laying of Water Mains and Drinking Water Supply

approval only, in which case a duckfoot hydrant shall be provided at the dead end.

e) Body valves shall be arranged in such a manner as to ensure that no more than 40 properties lose water from a burst on the system.

f) Water mains greater than 300mm in diameter laid under roads shall be ductile iron.

g) Loop water mains shall return to the spur main downstream of a sluice valve.

h) The location of hydrants should be such that they can be accessed in an emergency. Hydrants should not be located in roads or parking areas.

i) Location of branch valves, hydrants or other apparatus shall be in agreement with the Water Section.

j) Where a water main is located in an area of restricted access such as under motorways, canals, railways, rivers etc, that water main shall be duplicated to maintain the water supply until access is available to carry out the repair, or a sleeve for such a replacement main shall be laid. The second main shall be the same as the first main in regards to material, diameter and flow capacity. Isolation valves shall be provided on both sides of the inaccessible area to allow the water supply to be redirected between either main.

k) Where a water main is to be located within a structure such as a bridge or culvert, the water main shall be duplicated and the mains placed within sleeves to facilitate easy replacement of the pipe.

l) Unless otherwise approved by the Water Section, pipes should be buried underground for safety, security and protection against vandalism, weather and fire.

11.2 Location of Water mains

The following standards shall apply to new water mains and new buildings adjacent to existing water mains unless otherwise approved by the Water Section in writing at pre-planning stage having regard to technical design safeguards.

a) Water mains shall preferably be laid under footpaths.

b) No new water main up to and including 150mm in diameter shall be laid within 3m of an existing or proposed building or structure.

c) No new water main between 200mm and 600mm in diameter shall be within 5m of an existing or proposed building or structure.

d) No new water main in excess of 600mm in diameter shall be within 8m of an existing or proposed building or structure.

e) In addition to the above, no new water main up to and including 150mm in diameter shall be located within 1m of the boundary of a private property. The location of mains of diameter greater than 150mm shall be by agreement with the Council.

f) Water mains shall not be laid under walls, or in areas designated for trees/shrubs/flowers. Trees may not be planted over or in the immediate vicinity of a water main.

These standards also apply to the construction of structures adjacent to existing water mains.

11.3 Pipe Cover

The cover as measured from finished ground level to the top of a water main pipe shall be 750mm to 900mm in footpaths or verges, and 1000mm to 1200mm in trafficked areas.
11.4 Proximity of other services

A: Vertical Clearance
A surface water or foul sewer may not cross over a water main. The following vertical clearance where other services cross over the water mains shall apply:

- Ducts, gas mains/metal pipes
  - i. 200mm to distribution main of less than 300mm diameter
  - ii. 500mm to trunk/arterial main of 300mm or greater diameter

B: Horizontal Clearance
No service shall run directly above along the length of a water main.

The following minimum horizontal clearance shall apply to other services running along the water main:

- a) 300mm to distribution main of less than 300mm diameter
- b) 500mm to trunk main of between 300mm and 450mm diameter
- c) 3m to arterial water main of greater than 450mm diameter

Pipes, ducts, cabinets, poles, junction boxes/chambers of other utilities shall not be constructed on top of a water main. These shall be constructed at a minimum clear horizontal distance of 300mm.

Over and above the foregoing, all such intersections shall be positioned such that they are at least 500mm from any water main fitting or joint.

C: Notification
Where pipes or ducts are to be laid close to an existing water main the Water Section must be notified in writing a minimum of one week in advance of the works. In case of large diameter (300mm or greater), the water section must be notified one month in advance of the works. These notification requirements are in addition to any the formal procedures detailed above.

12. TRANSPORTATION / STORAGE

Suitable pipe supports shall be used on vehicles transporting pipes to prevent damage to both internal and external coatings by scratches etc. Timber supports are needed during transportation and stacking on site. (Do not store pipes in areas where grass is likely to grow due to the risk of grass fires that may damage the stored pipes in due course.)

Use wide fabric purpose-made slings or suitable designed machine for lifting pipes during off-loading and/or laying pipes (particularly flexible pipes with concrete or cement-mortar linings) to avoid scratches to coatings and damage to pipe ends. Damaged pipes may not be used.

13. TRENCH DETAILS

13.1 Trench Width
The trench should be kept as narrow as possible but must allow adequate room for pipe jointing and placing and compaction of backfill. The trench should be pipe diameter plus 100mm subject to a minimum of 300mm.
13.2 **Trench base**
The trench base should be free of hard objects such as stones, rock projections, and tree roots. Where the trench base is through rock or shows a recurrence of hard objects, allowance should be made for an additional thickness for under bedding of at least 25mm.

13.3 **Bedding and Backfilling**
All pipes shall be laid on a 150mm bed of rounded single sized pebble of 10mm nominal diameter or sand and haunched and covered to a depth of 150mm above the crown with similar material. The bedding directly underneath and directly over the pipe shall be lightly compacted while the sidefill shall be well compacted.

Pipes shall not be supported by stone or rock at any point. Rock shall be excavated to a depth of 150mm below the actual depth of trench required and backfilled with DOE Clause 503 prior to laying the pebble bed. All pipes shall be examined internally for dirt, stones, or any foreign matter and shall 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 shall be plugged until the next pipe is ready for insertion.

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 shall be agreed in writing with the Water Section prior to laying.

All trenches in or near roadways shall be backfilled with DOE Clause 804 or 806 and in compliance with the *Guidelines for the Opening, Backfilling and Reinstatements of Trenches in Public Road*, and the requirements of the Council’s Roads Departments.

Mechanical compactors should not be used until the total depth of backfill over the pipe exceeds 450mm.

13.4 **Pipe warning tape**
Over all water main shall be laid a 400mm wide warning mesh - Plyage HR 40D blue polyethene warning mesh or similar approved – laid over the centerline of the pipeline and tied to valves at a depth of 350mm below finished ground level. Plastic pipes shall have warning mesh as above incorporating a polypropylene reinforcing band of stainless steel tracer wire. Supply pipes/services shall have a 200mm wide laid over them at 350mm depth.

14. **THRUST BLOCKS / SUPPORT BLOCKS**
Gentle curves may be formed in the pipeline by angular deflection of the pipe joint. The angular deflection of each joint shall not exceed 2 degrees, or the manufacturers recommendation if less than 2 degrees. At the locations detailed below where the pipe needs to be restrained against movement under pressure concrete thrust blocks shall be provided.

Thrust blocks must be designed in accordance with CIRIA Report 128 ‘Guide to the design of thrust blocks for buried pressure pipelines’ and constructed from grade 35/20mm concrete in undisturbed ground having regard to both the pipeline thrusts developed during operation pipeline testing conditions and operations and surge pressures. Thrust blocks are therefore required at each:

- tee-junction,
- bend,
15. WAYLEAVES / EASEMENTS
If any water main or service is passing through private property, proof of approval for wayleave / easement rights should be obtained in advance and submitted with the planning application and water connection application.

16. FITTINGS

16.1 General
All fittings including sluice valves, butterfly valves, scour valves, hydrants, air valves, and meters shall be operable without the need to enter chambers or other confined spaces.

Chambers shall comply with the Department of Environment and Local Government’s recommendations for site development works for housing areas and requirements set out below. Details of chambers for valves on pipes of over 225mm diameter shall be agreed with the Water Section prior to construction.

16.2 Sluice Valves
SVs shall be double flanged ductile iron resilient seal gate valves for watermain purposes, and shall comply with the relevant requirements of EN1074. The number of turns (n) to open/close the valve shall be: n = 2N+1 where N is diameter in inches. All flanges shall be drilled to P.N.16. The spindle shall 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 must not exceed the max allowed in EN1074, with written test results required. All SVs are to be operable from above ground and CLOSE BY TURNING ANTICLOCKWISE.

For high unbalanced pressures, a bypass should be provided to the valve, e.g. a DN100 bypass is normally provided for a DN800 valve. To minimise difficulties the valve should be $\frac{5}{8}$ to $\frac{3}{4}$ the size of the pipeline. Long tapers should also be provided on the downstream to avoid high head loss.
SVs shall be coated with an electrostatic epoxy powder spray, or bitumen - trichloroethylene solution to UK WRAC, or an alternatively SDCC approved coating.

16.3 Butterfly Valves
1. All valves 400mm diameter or over are to be butterfly valves.
2. All butterfly valves have to be capable of being operated remotely. Actuators shall be electrically operated and shall be capable of being activated automatically via a telemetry link.
3. Butterfly Valves shall be of the double flanged bi – directional type in accordance with EN593 (formerly BS5155), drilled BS4504 PN16.
4. The valve body and disc shall be manufactured from Ductile Iron BS2789 73. Grade 420/12 or greater.
5. The valve disc shall be the double offset eccentric type and shall be fitted with a non- ageing rubber profile seal. The profile seal shall be held in place by a fully adjustable one piece clamping ring secured with stainless steel screws, mechanically locked in place.
6. The disc stub shall be manufactured from a high grade stainless steal, and securely fixed to the valve disc.
7. The valve shall be fitted with a sealed maintenance free gearbox, suitable for buried service duty.
8. The gearbox shall have a vertical input shaft and flanged facing for the easy mounting of electric actuators if required.
9. All valve areas must incorporate a flat support area on both flanges.
10. All internal and external surfaces shall be coated with a WRC approved epoxy corrosion protection.
11. The valve bore, including the seat area must be fusion bonded with enamel to prevent any formation of encrustation or support bacterial growth.
   Body: To a minimum of 17.0 BAR
   Seat: To a minimum of 17.0 BAR

16.4 Scour Valves
Scour valves shall be flanged and have the following diameters:

<table>
<thead>
<tr>
<th>Diameter of Main (mm)</th>
<th>Diameter of Scour (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not exceeding 75</td>
<td>50</td>
</tr>
<tr>
<td>100 to 200</td>
<td>75</td>
</tr>
<tr>
<td>200 to 600</td>
<td>100</td>
</tr>
<tr>
<td>600 to 800</td>
<td>150</td>
</tr>
</tbody>
</table>

16.5 Hydrants
Hydrants shall be manufactured in accordance with BS 750: 2006 Type 2 and shall incorporate a screwdown valve, underground “guide in head” type with bayonet lug outlets and false spindle cap of cast iron and iron chain. Hydrant heads should be between 50mm-200mm below finished ground level. The hydrant valve shall be ANTICLOCKWISE OPENING.

Hydrants (which are provided for emergency supply) may not be used for any other purpose without the written permission of the Council, ie a standpipe licence.

Location of Hydrants:
Hydrants shall be provided so that no building is more than 46m from a hydrant.
Provision of hydrants and locations shall comply with the requirements of the Building Regulations 2006 Technical Guidance Document B. Hydrants serving non-domestic properties shall be subject to the approval of the Chief Fire Officer.

16.6 **Air Valves**
Air valves shall be Double Air Valve type with isolating valve. Double air valves shall have bodies and covers of cast iron to BS EN 1561 with flanged inlets of the size specified below. Valves shall be flanged and drilled to BS 4504-3.1. Each valve shall have a large and a small air escape orifice with an isolating valve. The isolating valve shall be a resilient seated gate valve to BS 5163 Type B (BS EN 1074) and shall be of the boltless bonnet design. The inlet diameter shall be in accordance with the following table:

<table>
<thead>
<tr>
<th>Diameter of Main</th>
<th>Up to 200mm</th>
<th>225mm to 350mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of Branch</td>
<td>50mm</td>
<td>75mm</td>
</tr>
<tr>
<td>Bore of Valve Inlet</td>
<td>50mm</td>
<td>75mm</td>
</tr>
<tr>
<td>Min clear opening of surface box</td>
<td>450mmx300mm</td>
<td>580mmx300mm</td>
</tr>
</tbody>
</table>

**Location of Air Valves:**
Air valves shall be provided at all summits on pipelines of 100mm or greater, unless a service connection exists within 2m of the summit.

16.7 **Meters**

**Meters: Up to 25mm (1”)**
Meters shall be compatible with SDCC AMR system, Bonyto type or equivalent to be agreed with the Water Section before installation. Meters are supplied and installed by SDCC at the expense of the customer.

**Meters: 25mm to 80mm (1” to 3”)**
Meters shall be compatible with SDCC AMR system, Woltman meter (WS-MFD Model 233) or equivalent to be agreed with the Water Section before installation. Mechanical meters such as Woltman above are only suitable where fire flow is not required. Meters are supplied and installed by SDCC at the expense of the customer.

**Meters: Greater than 80mm (>3”) or where fire flow required**
Magnetic free flow meter required, Aquamaster or equivalent. Magnetic flow meters can be battery powered or mains powered, and where batteries are used they must have a minimum battery life of 5 years. AMR equipment, batteries and displays are to be located in a kiosk for ease of access. Details of kiosk, plinth and ducting to be agreed with SDCC Water Section. Meters are supplied and installed by SDCC at the expense of the customer. The meter must be sealed to IP 68 and installed to the manufacturer’s instructions.

**Meters: Fire supplies**
All fire mains require a magnetic or non-mechanical flow meter to monitor for leakage and unauthorised water usage. Magnetic flow meter sizing may result in meters with bores less than the pipe they are metering and this should be taken into consideration during the watermain layout design.

Fire supplies for hydrants, fire hose reels, sprinklers etc must be fed off a fire main. Where a fire main is installed in addition to a water supply, the systems must be kept separate. Where a fire main is installed that also supplies for normal water...
usage there must be adequate normal consumption to ensure that the water within the fire main is sufficiently circulated so that water quality is not compromised.

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

17. BOUNDARY BOXES, CHAMBERS, AND COVERS & FRAMES

17.1 Boundary Boxes (for meters on services up to 25mm)
All service pipes (both domestic and non-domestic) up to 25mm shall include the installation of a boundary box with ductile iron lockable cover to IS EN 124 or IS 261 and integral stopcock into which devices can be placed to control or measure the water supply entering a property (screw-down meter type). Applicants for metered or unmetered connections shall consult with SDCC Water Section in relation to approved types of boxes.

VALVE CLOSING SHALL BE CLOCKWISE. Where possible the boundary box shall be located in the footpath fronting the property being served, and 225mm from the outside of the boundary.

17.2 Meter chambers (for meters on services greater than 25mm)
Precast concrete, in-situ concrete, blockwork, brickwork or preformed chambers on a Grade C25 100mm concrete base below the level of the pipe may be used subject to approval. The internal dimensions of the chamber shall be sufficient to contain the meter and any associated pipework with joints and bolts visible and accessible in order to allow for the future replacement of the meter without the need for any excavation.

17.3 Chambers – Sluice Valve
Precast concrete, in-situ concrete, blockwork, brickwork or preformed chambers on a Grade C25 100mm concrete base may be used subject to approval. Minimum internal dimensions 300mm X 300mm X depth of pipe for pipe size <150mm, and 375mm X 450mm X depth of pipe for pipe sizes 150mm-225mm. For pipe diameter over 225mm details of chamber to be submitted for approval. Sluice Valve Surface Boxes shall be to IS: 261 cast iron 100mm diameter clear opening 200mm deep.

17.4 Chambers - Hydrant and Air Valves
Chamber floors shall be Grade C25 concrete with 215 thick solid block walls, minimum internal dimension 450mm X 300mm. Alternatively, Polypit modular chambers or similar approved may be used. Hydrant and Air Valve Surface Boxes shall be to IS: 261 cast iron with appropriate identification mark on cover. Covers on air valves shall be perforated.

17.5 Surface Covers
Valve and hydrant chambers when installed shall be covered with approved heavy-duty metal surface covers to IS EN 124: 1994 to a rating of D400. The classification denotes the test load expressed in kN. Class D400 denotes a product that complies with a test load of 400kN. Surface boxes shall be bedded in mortar on the chamber walls and, where the chamber is located other than on a footpath, driveway or carriageway shall be surrounded by a 200mm grade C30 concrete plinth and 100mm deep.

Covers shall be level with the finished ground level after permanent reinstatement.
18. **INDICATOR PLATES AND MARKER POSTS**

Indicator plates shall clearly identify hydrant, air valve and sluice valve locations and baseboards located to the approval of the Council and shall comply with B.S.3251. They shall be mounted at the back of footpath or in the boundary wall of the public thoroughfare nearest to the hydrant or valve.

18.1 **Hydrant indicator plates**

Hydrant indicator plates shall have fixed black letters complying with BS 3251 except that the plates shall conform to colour reference n. 309 (canary yellow) in B.S. 381C. The plate shall show the diameter of the main and the distance of the marker from the hydrant.

18.2 **Air valve and sluice valve indicator plates:**

AV and SV indicator plates shall comply with the specification for single hydrant indicator plates with fixed letters in BS 3251 except that they shall be coloured white and, instead of the letter H, shall bear the letters AV and SV respectively as approved.

18.3 **Marker posts**

Marker posts shall be of concrete construction, conform to IS 162 and set 450mm into 0.06m³ of 20N/40mm concrete.

19. **PIPE TESTING**

19.1 **Pressure Test**

Mains shall be subjected to 5-bar test pressure for 24 hours and shall be increased to 10 bar and sustained for a period of 1 hour in the presence of a representative of the Council. Testing shall be carried out between suitably supported blank end pieces. Testing between “live” shut valves will not be accepted. After the pipes have been laid and jointed, the main shall be tested. During testing, backfilling shall only be 300mm above the pipe and all joints and fittings shall be exposed. The main shall be filled with water and allowed to stand and stabilise under working pressure for 24 hrs. The pressure shall then be slowly applied by pumping to about 50% in excess of working pressure. The pump is then disconnected and the amount of fall of pressure in a given time (usually 1 hr) is measured. After this time has elapsed, water is again pumped into the line to bring back the pressure to its initial value and the amount of water (volume) pumped is measured. Water is then bled to reduce the pressure at the end of the standing period and this quantity is checked against the quantity pumped in and the difference is recorded as a loss.

BS 8010 gives the standard for field loss with no-porous linings as a loss not exceeding 2l/m of nominal diameter per km of pipeline/m head of applied water pressure/24 hrs.

All the exposed parts of the pipeline including chambers should be visually checked and any leakages rectified.

A loss of 3.3l/m diameter/m pressure/km length/24 hr is permitted for new steel pipes with concrete or cement mortar linings, provided that 4 tests or preferably 6 tests are done and a plot of leakages indicate a reducing loss such that a 2l value is likely to be reached.

Polyethylene pipes shall be tested in accordance with the manufacturer’s recommendations.
**Air must not be used for testing water mains**

**Guidance:**
1. To avoid airlocks there must be suitable air valves on the pipeline.
2. Filling must proceed slowly, preferably from the lower side.
3. Test must be hydrostatic and should take place between blank flanges; bolted or welded to pipe ends or end caps fully supported by anchor blocks.
4. Pipeline should be left without backfill under pressure for a day or two after the test so that wet patches on the surface of the ground will indicate the whereabouts of any failure.

**19.2 Chlorination Test**
1. All mains shall be swabbed and disinfected before being put to supply.
2. After the pipeline has been pressure tested, cleaned and flushed, it is then filled with a chlorine solution having a strength of 20mg/l as a concentrated solution at a rate proportional to the inflow of water filling the main, which is to be measured accurately to ensure uniform and correct solution strength.
3. Sources of hypochlorite are Sodium Hypochlorite, Eirchlor, Chemchlor, and Chlorous. These contain 10-14 % of available chlorine.

The recommended dosage of Sodium Hypochlorite solution is as follows:

<table>
<thead>
<tr>
<th>Mains dia (mm)</th>
<th>Volume of Cl required/100m @10%</th>
<th>Volume of Cl required/100m @14%</th>
</tr>
</thead>
<tbody>
<tr>
<td>100mm</td>
<td>150ml</td>
<td>110ml</td>
</tr>
<tr>
<td>150mm</td>
<td>350ml</td>
<td>250ml</td>
</tr>
</tbody>
</table>

*Other dosage figures can be interpolated from the above figures*

- The solution with a concentration not less than 10mg/l shall remain in the mains for 24hrs for checking for residual Chlorine. Chlorine residual tests shall be taken at the end of the main furthest from the point of injection.
- If less than the permissible residual then the pipe work shall remain charged for a further 72 hrs after which the potability of water is to be checked at every point along the main at which a sample is drawn.
- These tests shall be carried out by an approved Government laboratory or other laboratory approved by the Council.
- The chlorinated water shall be discharged into a foul sewer (never into a surface water sewer or water-course) and such discharge shall be subject to the prior approval of the Council.

**19.3 Bacteriological Test**
Following sterilisation, the main shall then be refilled and a sample of the water shall be taken for Bacteriological Analysis. Considerable care shall be taken when obtaining samples for testing and only sterile containers shall be used. This sampling shall be carried out in the presence of a representative of the Council. Samples shall be tested within 6 hours of collection. Water samples may be tested in the following centres or in an approved and accredited laboratory, which meets the requirements of the Council.

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

The Public Health Analyst, Sir Patrick Dun’s, Lower Grand Canal Street, Dublin 2. Tel: 01-6612022.
**Note:** The Water Section will not connect a new main to the existing network until the sterilisation has been carried out and a copy of a satisfactory bacteriological test report has been submitted to the SDCC Water Maintenance Section for approval.

**19.4. Flushing the mains**
When mains have been satisfactorily tested and connected to the Council main, they shall be flushed out with potable water through a standpipe placed on the end hydrant before the main is brought into use.

**20. WATER STORAGE**
Only indirect plumbing systems shall be permitted by the Council i.e. all appliances shall be plumbed from a cold-water storage tank and supplied by gravity.

The minimum water storage requirement for industrial or manufacturing purposes shall be calculated on a 24-hour or maximum daily consumption basis.

Guidelines for domestic and non-domestic premises are shown below. Hotels with swimming pools, conference centers etc. will require more storage.

<table>
<thead>
<tr>
<th>Building or Use</th>
<th>Minimum Cold Water Storage for new developments using low flush and dual flush WCs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwelling house or Apt. (up to 3 Bed without power shower)</td>
<td>227 litres</td>
</tr>
<tr>
<td>Dwelling house or Apt. (4 Bedrooms or single power shower)</td>
<td>340 litres</td>
</tr>
<tr>
<td>Dwelling house or Apt. (having 2 full bathrooms)</td>
<td>682 litres</td>
</tr>
<tr>
<td>Additional water storage per shower en-suite in the above.</td>
<td>90 litres</td>
</tr>
<tr>
<td>Hostel’s (with communal bathrooms)</td>
<td>90 litres per head</td>
</tr>
<tr>
<td>Factory</td>
<td>45 litres per each head of staff</td>
</tr>
<tr>
<td>Hospitals, maternity</td>
<td>455 litres per bed</td>
</tr>
<tr>
<td>Hospitals, general</td>
<td>227 litres per bed</td>
</tr>
<tr>
<td>Hospital laundry</td>
<td>136 litres per bed plus staff</td>
</tr>
<tr>
<td>Hospital staff</td>
<td>45 litres per head</td>
</tr>
<tr>
<td>Hospital, nurses home &amp; medical quarters</td>
<td>136 litres per head</td>
</tr>
<tr>
<td>Hotels and Guest Houses without private bathroom</td>
<td>227 litres per head</td>
</tr>
<tr>
<td>Hotels, having bedrooms with private bathrooms</td>
<td>1045 litres per bedroom</td>
</tr>
<tr>
<td>Offices</td>
<td>45 litres per head</td>
</tr>
<tr>
<td>School, day, boys</td>
<td>23 litres per head</td>
</tr>
<tr>
<td>School, day, girls</td>
<td>36 litres per head</td>
</tr>
<tr>
<td>School, boarding</td>
<td>113 litres per head</td>
</tr>
<tr>
<td>Restaurants and canteens</td>
<td>7 litres per meal</td>
</tr>
</tbody>
</table>

**21 EEC DIRECTIVE ON MATERIALS, PIPES AND FITTINGS**
Nothing stated in this Specification is to be construed as discriminating against products and materials manufactured in any of the Member States of the European Community.

Where items to an Irish Standard Specification, a British Standard Specification, or any other Standard Specification of a Member State of the European Community are called for, this requirement shall be read as including items to a relevant international standard, or the relevant national standard of any Member State of the European Community, which provides an equivalent guarantee of safety and suitability.

Where items certified by the National Standards Authority of Ireland as complying with an Irish Standard are called for, the provisions of Circular Letter BM2/97 shall
apply, i.e. the requirement shall be read as either certified by the National Standards Authority of Ireland as complying with the Irish Standard, or shall be certified as complying with a relevant international standard, or with the relevant national standard of another Member State of the European Community, which provides an equivalent guarantee of safety and suitability.

22 CONTACTS

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