

Design and Construction Specification for Clean Water Networks

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1 Scope

This document serves as a template for practitioners who are involved in planning, designing, constructing and commissioning a self-laid main and service pipes to supply domestic and industrial/commercial properties. The purpose of this document is to comply with the requirements of the Code and provide guidance for practitioners. However, it should be noted that there may be variations of the requirements for clean water networks between individual water companies, and this document indicates where there is scope for variation.

We have completed those parts of the document that are specific to our area and published a mua Water-specific version on our website, which you must apply when working in our water supply area.

In addition, practitioners should also refer to the [Water Sector Guidance on Water UK's website](#), which provides further guidance on the adoption of water assets by developers.

It is expected that over time, efforts will be made to reduce the scope of variation between each water company's specific requirements. Any changes or updates to this document will be presented to the Water Adoption Code panel, and details of these changes can be found on the Water UK website.

2 Responsibilities

Any self-laid provider, (SLP) or developer who intends to design and/or construct a self-laid main must comply with the DCS (Design and Construction Specification).

It is important to note that the words "include" and "including" in this document are to be construed without limitation.

3 Terminology

In this document, the following terms have the stated meanings:

Shall: Indicates a mandatory requirement

Should: Indicates a strong preference or best practice

May: Indicates an option which is not mandatory

References to the SLP shall include a reference to its permitted contractor where relevant.

4 Charges

The charges imposed by mua Water for any work related to the adoption of water assets are based on mua Water's published charging arrangements. Any work required to supply a site, including mua network reinforcement, will be funded by mua Water in accordance with these charging arrangements.

However, any additional work that is deemed necessary beyond the scope of what is required to supply a site, such as incumbent network reinforcement work, will be subject to Ofwat's Charging Rules. Therefore, during the design stage, any such work will be identified and appropriately funded by mua Water in accordance with Ofwat's Charging Rules.

It is important for SLPs and developers to be aware of these charging arrangements and ensure that any additional work required is identified and appropriately funded by mua Water.

5 Abbreviations

AC	Asbestos cement
AOD	Above ordnance datum
ACS	Annual contestability summary
CDM	Construction, Design and Management Regulations
CESWI	Civil Engineering Specification for the Water Industry
CI	Cast iron
COSHH	Control of Substances Hazardous to Health
DEFRA	Department for Environment, Food and Rural Affairs
DCS	Design and Construction Specification
DI	Ductile iron
DMA	District metered area
DWI	Drinking Water Inspectorate
EA	Environment Agency
EUSR	Energy and Utility Skills Register
FRS	Fire and rescue service
HAUC	Highway Authorities and Utilities Committee
HPPE	High performance polyethylene (PE100)
HSE	Health and Safety Executive
HSWA	Health and Safety at Work Act
ICE	Institution of Civil Engineers
IGN	Information & Guidance Notes
IWater	Institute of Water
LR	Lloyd's Register EMEA
MDPE	Medium density polyethylene (PE80)

NCO(W)	Water Network Construction Operations
NRSWA	New Roads and Street Works Act
NVQ	National Vocational Qualification
OFWAT	The Water Services Regulation Authority
PE/AL/PE	Polyethylene aluminium composite barrier pipe
PE	Polyethylene
PE80	Medium density polyethylene
PE100	High density polyethylene
PPE	Personal protective equipment
PPM	Parts per million
PVC	Polyvinyl chloride
SDR	Standard dimension ratio – outside diameter/ wall thickness
Competency	Safety and technical competency
TA	Technical adviser
WIA	Water Industry Act
WIRS	Water Industry Regulation Scheme
WIS	Water Industry Specifications
WRAS	Water Regulation Advisory Service

6 Nomenclature

v	Volume, in litres
A	Area, in metres squared
V	Velocity, in metres per second
Q	Flow, in litres per second
t	Time, in seconds
P	Pressure, in bar
H	Static head, in metres
hL	Head loss due to friction, in metres
L	Length, in metres
G	Gravitational acceleration, in ms ⁻²
D	Diameter, in millimetres
i	Hydraulic gradient, in metres per metre
θ	Kinematic viscosity of fluid, in m ² /s
Ks	Effective roughness value, in millimetres
Qt	Design flow, in l/s
LU	Loading units
E	Equivalent length, in metres
Ω	Soil resistivity, in ohm -cm

7 Reference documents

See Appendix 5 for a comprehensive list of reference documents.

The documents in this list are relevant to design and construction standards but may not necessarily be referred to expressly in this DCS. If there is a conflict between any of those standards and the DCS, the DCS shall take precedence unless otherwise agreed by the parties.

A list of accredited SLPs can be found at [LRQA – Water Industry Registration Scheme \(WIRS\) & WIRSAE](#).

8 Construction (Design & Management) Regulations 2015 (CDM)

8.1 Construction

The Construction (Design and Management) Regulations 2015 (CDM Regulations) apply to all design works carried out by or on behalf of mua Water. This includes both mua Water's representative (Approving Design Engineer) and the SLP's representative (SLP Designer) when the design of self-lay works is being generated and accepted for adoption. However, when carrying out work specific to a site, neither the SLP Designer nor the Approving Design Engineer would be expected to be the Principal Designer.

It is the client's (developer's) responsibility to formally appoint a competent Principal Designer and Principal Contractor for the site. The Principal Designer shall provide oversight of all design activity in accordance with the Regulations.

To comply with the CDM Regulations (2015), it is expected that the SLP designer, prior to release for construction, shall:

- Ensure that the design avoids or addresses foreseeable risks to health and safety.
- Give priority in the design to measures that will protect all people associated or affected by the project.
- Ensure that the design includes adequate information about any aspect of the project, structure, and all materials that may affect the health and safety of persons during construction and subsequent maintenance operations.
- Inform mua Water of any non-standard method of operation applicable to the self-lay works
- Record non-standard residual risks, including chemical or oil pipeline crossing and working at height which cannot be designed out, in the project file, and provide a copy to the Principal Designer and mua Water
- Cooperate with all parties concerned with planning and design for the project.

The SLP responsible for the proposed construction shall be made aware of the risks identified by the designer and the control measures required to reduce the risks to an acceptable level.

If a design is prepared or modified outside Great Britain for use in work to which CDM 2015 applies, it must comply with "Regulation 9 – Duties of Designers." The person who commissions the work is responsible for ensuring that Regulation 9 is complied with.

8.1.1 Pre-construction phase plan

A pre-construction phase plan shall be created at the design stage. This plan shall include the following:

- Description of works.
- Proposed time scales of works within the project.
- Details of risk and required control measures.
- Information required by the Principal Contractor to demonstrate competence of resources.
- Information for preparing the health and safety plan for the construction phase.

The pre-construction phase plan shall be passed to the Principal Contractor for inclusion and development of their construction phase plan before work commences on site.

The need for the plan arises from the requirements of CDM. HSE leaflet INDG411(rev1), published 04/15 states:

“Ensure a construction phase plan is in place.

The principal contractor (or contractor, if there is only one contractor) must draw up a plan explaining how health and safety risks will be managed. This should be proportionate to the scale of the work and associated risks, and you should not allow work to start on site until there is a plan”.

8.2 Collaborative design

Water companies may sometimes create indicative design drawings to estimate the cost, routing, or tendering aspects of a proposed site layout. However, it is important that these drawings are not mistaken for final construction plans. Therefore, the design drawing should be clearly labelled as "Not for construction," and an accompanying document should be produced, detailing precisely what factors were considered in producing the layout drawing.

Moreover, water companies should publish their charging arrangements, detailing any services provided and the associated rates. This ensures transparency and consistency in the pricing of services related to the design and construction of water supply systems.

8.3 Non-contestable work – installation of district meter or pressure reduction equipment

In cases where a pressure-reducing valve or district meter installation is required as part of the non-contestable work and services, mua Water will assume designer responsibility under CDM Regulations only if the installation is off-site, meaning outside of the site boundary, and not part of the contestable activity to be carried out by the SLP.

However, if the installation is required to be installed within the site boundary due to the proximity of the source of water connection, then the design responsibility will be determined by written agreement between mua Water and the SLP.

9 Design process

9.1 Minimum information required from developers

Appendix E (Minimum Information) of the WSG contains a complete statement of information requirements at all stages of the adoption process. At the design stage, the SLP may be accredited to carry out the design activity or may request mua Water carries out this activity if mua Water offers this service as a local practice under section 4.6 of the WSG.

An application form available from the mua website shall be completed which is used to identify the minimum inflow of information to begin the design process relevant to the route of delivery of the design.

9.2 Point of connection (PoC) requests

At the designated point of connection (PoC), mua Water typically uses an under-pressure connection (UPC) to minimise any disruption to existing customers. However, operational considerations may require mua Water to determine that a UPC is not suitable, and a tee piece installation will be necessary instead. This involves isolating the network and cutting out a section of the existing network to insert the tee piece. Additional valves may also need to be installed on the existing network. Such a connection will be classified as non-contestable work.

If mua Water requires the installation of additional valves on the existing network for operational reasons, even if they are not specifically required in the design for the new self-laid main (i.e. to supply a site), they shall be classified as network reinforcement work. These valves are typically installed at the same time as a connection that involves cutting into the existing network.

In situations where mua Water identifies a need for network reinforcement as part of future development or improvement/upgrade of the network, discussions shall be initiated with the SLP as soon as a point of connection (PoC) is issued, or at the earliest opportunity if a PoC has already been issued. This need may arise via the planning system, local authority development plans, or developer engagement. These requirements may be incorporated into the final SLP accepted design through mutual agreement.

If an alternative PoC is required due to technical and/or supply reasons, mua Water shall explain the reasons and identify related options and requirements to the SLP designer, particularly during the early stages of design.

If network reinforcement work is necessary to supply the site, mua Water shall identify it to the SLP/developer during the initial design stage. The SLP designer shall consider it while designing the layout of the self-lay work. The parties to the WAA shall agree upon the need for detailed design drawings and related information for design and/or construction activities, which shall be included in Schedule 1 of the WAA.

9.3 Annual Contestability Summary

- 9.3.1 This section contains information about how mua Water assesses the contestability of particular work categories.
- 9.3.2 Table 9.3 below is the summary that all water companies will publish at the date of implementation of this DCS and at least annually thereafter. This will be known as an "Annual Contestability Summary" (ACS) and is a mua Water-specific variant of the standard template appearing in table 3.2 of the WSG.
- 9.3.3 No water company's ACS will allow fewer activities to be contestable work and services than are set out on that template, as amended from time to time.
- 9.3.4 Each water company's ACS will be accompanied by indicative information about the steps that an SLP would be required to take to carry out the higher-risk tasks shaded amber in Table 9.3.

- 9.3.5 It is expected that over time, the template ACS will be modified in the light of experience and of changing accreditation requirements, to increase the scope of contestable activities available for SLPs to undertake.
- 9.3.6 The activities appearing in green in Table 9.3 shall always be contestable (ie marked green).
- 9.3.7 The works and services designated contestable by a water company under its ACS shall not, in any event, be fewer than those permitted to be carried out by SLPs in that water company's area before the date on which the guidance comes into effect.
- 9.3.8 In advance of publication, the ACS will be discussed with relevant customers in a water company's area. Each water company shall publish its ACS on its website no later than four (4) weeks before it takes effect, to allow sufficient time for SLPs to amend their processes, if required.
- 9.3.9 A water company will explain within its ACS where it has used its discretion to include an activity within the red category and ensure this is published on its website.
- 9.3.10 Where providing an adequate site supply requires network reinforcement, elements of this work should be considered as contestable, subject to the scope of works required and impact on existing end-user customers. This concerns additional work to extend from the nearest point of connection of suitable size to a more distant point of connection specified by the water company. Charges shall be by agreement between the SLP and the water company and with reference to the Water Company Charging Arrangements.

Table 9.3

	Work categories by number of properties potentially affected by work or strategic nature of existing main			
	> 49	50 - 199	200 - 499	500+ or strategic main
Selection of a proposed POC to serve a site/development from records of existing mains				
Construction of new mains and service connections				
Construction of new mains as part of the reinforcement of network extension or associated site diversion work				
Design of new water network				
Chlorination and pressure testing of self-lay works				

Meter installation in conjunction with new service connections				
Undertaking water quality samples				
Analysing water quality samples (subject to section 17.2)				
Construction of routine mains connections (CRMC) connections				
Main and/or service connection: up to 63mm PE/barrier pipe to: Parent Network: <12" nominal bore* DI/CI/SI/PE/AC/barrier pipe/steel Permanent Connections (Piece through).				
Connection: 63mm to 300mm PE/barrier pipe to parent network: <12" nominal bore* CI/SI/DI/AC/PE/Barrier pipe/steel Operational pressure: up to 50m				
Connections: 63mm to 300mm PE/barrier pipe to parent network: 12" nominal bore* to 18" nominal bore* /300mm to 450mm nominal bore* DI/CI/SI/AC/PE/barrier pipe/Steel Operational pressure: 50m to 75m				
Connections: over 300mm to parent network: 18" nominal bore* & above, or high-risk parent network: material (such as steel) Operational pressure: above 75m				
Valve operation in relation to commissioning new self-lay works*				
Self-certification of SLP for site water distribution systems designs				
Any size connection to GRP/PVC network				
Design of network reinforcement (upsizing of existing assets) and/or design of network diversion(s).				
Pipe sizing criteria, and the approval of the design by others				
Assessment of network risk and operating live network				
Commission telemetry links (meters/field equipment)				
Connection, commissioning and/or decommissioning of diverted network				

* Notes:

1. All references to PE are to all polyethylene pipe materials.
2. PE pipe sizes are identified by outside (OD) diameter and other pipe materials and sizes refer to internal (nominal bore) diameters.
3. Strategic main defined by reference to the potential impact of work on key customers such as a hospital.
4. See further section 11.7 of the DCS.

9.4 Activities shaded green in the ACS

- 9.4.1 All activities shaded green in the above table are capable of being performed by SLPs.
- 9.4.2 These green-shaded activities will apply where the SLP has the relevant WIRS or other accreditation (see section 7 of the WSG). Where further activities are accredited by WIRS, such activities shall be marked as green in the above table once approved by the Codes Panel.
- 9.4.3 mua Water will set out the procedures it has in place relating to connections to the Existing Main and the forms supporting this. These will be published on the mua website.
- 9.4.4 Changes will be brought about by the procedures set out in the Water Sector Guidance Section 11 – Governance.
- 9.4.5 References to the Final Connection of the self-laid main to the existing main on the network are:
- a. of an under-pressure type connection and/or,
 - b. a connection to a previously installed temporary valve-controlled washout installed in conjunction with the connection to the existing mains network at the POC to supply the site or development, and/or
 - c. a connection to a previously installed valve-controlled washout, which has been installed on a self-laid main for a future connection off such main.

Where references to the final connection of the self-laid main to the existing main on the network require a section to be isolated by a shut (to enable it to be cut-out to install a connection point), and/or if a new branch tee is required to be cut into a self-laid main and the relevant assets are subsequently adopted by mua Water (and therefore forms part of the network), then such connections are excluded from activities shaded green.

9.5 Activities shaded yellow in the ACS

- 9.5.1 The activities shaded yellow shall be capable of being performed by an SLP in the area of an individual water company, where the SLP complies with the requirements of the water company as set out below. Such publication shall include information about control measures required to allow the work to be performed.

The following sections set out how the publication of such information is to be approached.

- 9.5.2 mua Water may require additional evidence of competence to carry out activity and/or require the SLP to follow an operational process equivalent to one that mua Water's direct labour or term contractor would be required to follow.
- 9.5.3 mua Water's requirements will relate to the specific site and will take into account the type of connection involved; the location of the connection; the strategic importance of the main network to be connected to; the potential impact on end-user customers; risk to water quality and regulatory impact/consideration; and the resources the SLP proposes to use.
- 9.5.4 The company will set out the information it needs from the SLP regarding its accreditation and how its general and specific operations, resources, and procedures will protect the company from any risk of interruption of supply to its end-user customers and/or water quality. These requirements will be equivalent to those that mua Water's direct labour or term contractor would be required to follow.
- 9.5.5 The SLP will need to demonstrate its competence or relevant experience to undertake this activity. This may be demonstrated where mua Water has previously observed relevant self-lay works having been carried out by the SLP or by the SLP providing details of similar work that it has carried out to a satisfactory standard for other water companies.
- 9.5.6 mua Water's requirements relative to valve operation in relation to commissioning of self-lay works, a contestable activity, shall apply as set out in section 11.7.
- 9.5.7 mua Water will set out below the procedures it has in place to allow connections to the Existing Main and the forms supporting this. These will be published on the mua website.
- 9.5.8 mua Water requires all ground workers who are laying service pipes, installing meter housing, and making connections to new or existing network assets to provide proof of competence. This proof of competence can be demonstrated through a valid SPIDER registered installer (within United Utilities area), a BPEC "Service Pipe and Meter Housing Installation," or WIAPS registered installer. More information about the BPEC course can be found on their website, and training centres can be contacted to book the course.

In addition, mua Water requires all workers who operate existing or new assets such as valves and hydrants to have "Calm Network Training," which is recognised across the water industry and ensures that existing assets and customers are protected as much as possible.

mua Water expects all workers operating new or existing valves and hydrants to be "authorised by mua Water". This qualification ensures that existing assets and customers are protected as much as possible, from water quality and public health risks.

For all proposed UPT connections to the live water network under mua Water ownership, a site-specific risk assessment must be conducted by mua Water to determine if a connection can be made with minimal risk to the customers' water supply. The SLP must submit an application that includes a risk assessment, method statement and contingency plan for the planned activity. mua Water will take into account the information provided by the SLP and assess the potential operational impact on customers, considering factors such as discolouration risk, interruption to supply risk, mains condition, water contamination risk, and the quality of the RAMS and contingency plans submitted by the SLP or developer. If the risk assessment identifies the network activity as low risk, the SLP will be approved to do the work. However, if the risk assessment identifies the network activity as high risk, the quality of the SLP's RAMS will be considered, and depending on the degree of difficulty, it may either be declined or require amendment.

mua Water will conduct risk-based audits on the day of the works being undertaken. If an existing mua Water network main needs to be isolated to allow for the installation of a branch connection (not under pressure), then mua Water will be responsible for arranging the isolation. SLPs are permitted to complete 15mm and 20mm screw-in meter installations.

- 9.5.9 mua Water expects all contractors and ground workers who will be laying mains, services pipes, installing meter housing and making connections to new or existing network assets to have provided the relevant proof of competence.
- 9.5.10 If an existing mua Water network main needs to be isolated, a permit for the installation of a branch connection (not under pressure) will be required. mua Water will retain the responsibility for arranging the isolation.

9.6 Activities shaded red in the ACS

- 9.6.1 The water companies have concluded that connections shaded red in table 9.3 are of such a high risk that they are unlikely to be contestable in most conceivable circumstances.
- 9.6.2 However, if an SLP wishes to carry out this work, it shall contact mua Water directly to determine whether conditions can be agreed that enable the SLP to carry out the requested activity.

9.7 Design submissions

Design submissions shall be submitted to mua Water along with all supporting information as set out in Appendix E – Minimum Information of the WSG.

Any activity classed as non-contestable shall be confirmed in writing by mua Water following discussion between mua Water and the SLP upon the issue of a design acceptance.

9.8 Reduced water usage discount

Developers are encouraged to prioritise the construction of water-efficient properties. Qualifying developments that can demonstrate a consumption of 100 litres per person per day or less will be eligible for a reduced Water Infrastructure Charge from the incumbent

water company, as outlined in their respective charge's scheme. The incumbent water companies will use the methodologies specified in Appendix A, "Water Efficiency Calculator for New Dwellings," of The Building Regulations Approved Document G, to determine the water consumption level of new household premises.

It is important to note that if a reduced Water Infrastructure Charge is granted, the incumbent water company may conduct an audit of the actual consumption. If the expected reduction in consumption is not evident, they may choose to retroactively apply the full Water Infrastructure Charge. Therefore, mua Water reserves the right to recover any additional charges or expenses incurred from the incumbent water company or any associated with regards to a recalculation of the Asset Value Offered due to the reduction in demand from the developer/SLP.

9.9 Design proposal

When preparing a water network design proposal, the SLP designer shall:

1. Select appropriate materials for the self-laid main and service pipes.
2. Determine the legal land ownership boundary of the site.
3. Produce a drawing to an appropriate scale to show the layout and route of the self-laid mains and service pipes and proposed meter arrangements (relative to service pipe entry points) in accordance with this Design and Construction Specification.
4. Provide all related material requirements and details as required by this Design and Construction Specification.
5. Calculate demands and size all service pipes in line with this Design and Construction Specification (see also section 10.2).
6. Size the self-laid mains across the site as may be required to meet the requirements of the site and any development relative to the site, following discussion with mua Water. Any mua Water requirements will be communicated after such discussion has taken place. See further section 10.2.
7. Identify the agreed point of connection and determine by agreement with mua Water all work that is contestable and non-contestable.
8. Design the appropriate number of self-laid main fittings required to control the network and the self-lay Works.
9. Identify any sections of self-laid mains that require easements or wayleaves.
10. Identify any special engineering difficulties as appropriate.

Water companies shall share any pipe size methodology with the SLP, where this is requested by the SLP.

9.10 Drawing standards

mua Water may supply the SLP with templates to assist in the standardisation of design drawings. If this is not available, then the SLP should provide their own design template.

Design and as-laid (as constructed) drawings shall be submitted to mua Water electronically in both CAD and PDF format, by agreement with mua Water, for incorporation into mua Water's corporate geographical information system (GIS).

Design drawings shall show all asset locations, sizes and specifications in a clear format. Should enlargements or schematics be required to ensure a clear and unambiguous layout, then these shall be incorporated within the design submission.

Design drawings shall include and clearly show, as a minimum:

1. Proposed off-site self-laid mains to point of connection to the network
2. AOD at POC – the highest point of the site including site topography can be provided separately
3. Proposed self-laid mains, including the position of sluice valves, washouts, hydrants, air valves and any other fittings required
4. Any requirements for the protection and/or diversion of the existing network
5. Material and size of each self-laid main
6. Depth of each self-laid main when installation depth is not in accordance with Streetworks UK guidance (subject to agreement by mua Water)
7. The self-lay works and mua Water works (contestable/non-contestable activities)
8. Position of existing buildings or features relative to the design proposal for reference (minimum of 3 points on the drawing to enable triangulation)
9. Individually numbered plots
10. Location of service pipes, showing size if above 25mm
11. Service pipe entry points
12. Location of boundary boxes, manifold boxes and any meter chambers as applicable
13. Type of service connection for each plot, i.e. wall box, boundary box, manifold, internal
14. Hydrants adoptable by the fire and rescue service
15. Location of any ducts
16. Any special engineering difficulties
17. Areas of contamination where protective pipework is required
18. Future demand, or development, or phase adjacent to the site as identified by mua Water or the developer and its point of connection relative to the proposed self-laid main
19. North point
20. Site boundary
21. Roads/highways/service strips (adopted or proposed for adoption)
22. Change in ground level
23. Service strips, wayleaves and easements required for the construction, operation and maintenance of the self-laid main
24. Significant environmental and health and safety hazards
25. Contestable/non-contestable works annotated
26. A drawing legend/title block

The above list represents best practice and, in some cases, not all such drawings will be required by mua Water. Water companies will justify differences in documentation requirements between requisitioned and self-lay schemes.

9.11 Drawing legend

The drawing legend shall contain:

1. SLP contact details
2. Developer contact details
3. Company carrying out the design (if different to the above)
4. SLP designer name
5. CAD operator name
6. Site name
7. Site address
8. Ordnance Survey coordinates
9. Industry recognised scale of the drawing
10. Drawing/revision reference number
11. North point
12. mua Water reference number
13. Approval status ie
 - a. Proposed design (not for construction)
 - b. mua Water-approved design (not for construction)
 - c. Approved for construction

9.12 Design and construction variations

Changes to the design/construction of the self-lay works (including those due to site conditions, changes to the site made by the developer, etc) which require the re-issue of either the SLP-accepted design or the mua Water design shall be considered a significant variation. The parties shall comply with the process in clause 19 of the WAA (Variations).

9.12.1 Minor variations shall be agreed in writing between the parties. Minor variations shall be classed as changes to the proposed self-laid mains and/or service pipe design with no significant impact on the maximum scope of work measured by the number of plots on the site ie if there is no change in the number of plots or the financial transaction, the change is classed as minor.

10 Pipe sizing methodology

This section covers permitted pipe sizes and the methodology of pipe size determination.

10.1 Permitted pipe materials

The following is a compilation of pipe material types that are deemed appropriate for use in constructing sites to be adopted by mua Water:

- PE80 (MDPE) pipe
- PE100 (HDPE) pipe
- PE/AL PE80 type A barrier pipe
- PE/AL PE100 type A barrier pipe

The use of ductile iron (DI) is limited to circumstances where polyethylene (PE) is not a suitable option, and it can only be allowed after prior authorisation by mua Water.

Nonetheless, tee branches and riser pipework specifically intended for air valves or hydrants are exempt from this limitation.

The following table presents the accepted size and pressure ratings for water pipes as determined by mua Water. While this list is not exhaustive, mua Water, which is a NAV operating across the UK, will strive to review the incumbent water company’s DCS and permissible materials list to provide flexibility and options to SLPs (subject to compliance with the relevant design and construction standards). Any requests to use sizes and materials not included in the table below must be approved by the incumbent water company and/or mua Water.

Table 10.1 Permitted pipes sizes, materials, SDR and pressure ratings to be used on an mua Water adopted network.

Size	Material	SDR	Pressure rating
25mm	MDPE	11	12 bar
32mm	MDPE	11	12 bar
63mm	MDPE	11	12 bar
63mm	HPPE	17/11	10/16 bar
90mm	HPPE	17/11	10/16 bar
110mm	HPPE	17/11	10/16 bar
125mm	HPPE	17/11	10/16 bar
160mm	HPPE	17/11	10/16 bar
180mm	HPPE	17/11	10/16 bar
225mm	HPPE	17/11	10/16 bar
250mm	HPPE	17/11	10/16 bar
315mm	HPPE	17/11	10/16 bar

10.2 Principles of sizing of water mains

The self-laid main shall be sized to meet peak hydraulic demands and shall be not oversized such that they fail to satisfy all requirements or conditions to maintain water quality.

The self-laid main shall be sized to take into account the entire development that the developer and SLP are aware of to avoid unnecessary upsizing at a later date, taking into account:

- the results of any network modelling by the water company relative to an area of development by reference to information in the public domain and/or by reference to related development enquiries it has received.
- information from mua Water relevant to the design of mains and services for a site and/or a development.

In the case of providing more than a single feed into a site and/or a development or regarding the upsizing of proposed self-lay works, the charging arrangements of the water companies should be referred to.

If mua Water identifies the need for improvement of the network or related activities on the existing network and agrees with the SLP to undertake the work or part thereof, this proposal should be included as part of the detailed design of the network and service pipe for supplying the development.

While indicative design purposes, such as cost estimates or tendering, may use a simple table method for determining pipe sizes based on the number of properties, no reliance should be placed on this assessment for any final design. Pipes must be designed following the principles and criteria outlined below.

The pipes must be sized for the detailed final design by performing a hydraulic calculation that considers the calculated peak demand and the Hazen-Williams Equation. The calculation should also include allowances for headloss through fittings and valves using standard allowance tables.

To ensure adequate sizing of pipes, a comprehensive hydraulic calculation is required. This calculation must analyse the headloss throughout the proposed network during peak flow rate, including at all terminus washouts and the highest property elevation. It must also specify the minimum pressure at the highest elevation and the farthest hydraulic location. The maximum allowable headloss for the site is 0.2 mH/100 m length (2 mH/1000m) up to a maximum of 1.0 mH.

10.3 Indicative pipe diameter selection

Table 10.3 may be used as an initial indicative assessment to determine the required pipe size for a site's water network to supply a specific number of residential dwellings. It can also aid in determining the source of water requirements for the existing network. However, if mua Water needs to deviate from these guidelines to determine a suitable point of connection due to network capacity inadequacy or site-specific constraints, including the condition of existing assets, such work would be classified as network reinforcement and funded by mua Water based on its charging arrangements.

Number of individual residential dwellings	Typical pipe outside diameter (PE pipes)	Nominal bore (Other pipe materials)
0-20	63mm	50mm
20-40	90mm	80mm
40-95	110mm/125mm	100mm
95-300	160mm/180mm	150mm
300-700	225mm/250mm	200mm

Table 10.3 Derived from section A.12 of BS 805:2000

To allow for future development or phases of development, the designer must consider and incorporate spine mains as needed, ideally connecting them to at least two points on the network. During this process, mua Water will provide information and assess and advise the designer on any necessary network reinforcement to be included in the site design.

It should be noted that while multiple connection points into a site may be designed for risk mitigation purposes, only one of these points should be designated as the point of connection for water supply to the site, as required by sector guidance. Any additional work required beyond providing the site with a water supply shall be categorised as network reinforcement and funded by mua Water in accordance with its charging arrangements.

To facilitate adoption by mua Water, the designer must incorporate as much connectivity between mains as the road/highway layout allows in the network design. This approach enables a more flexible network that minimises the impact on customers during planned maintenance work and reduces the number of dead-ends, which is beneficial for water quality.

10.4 Hydraulic demand calculations for domestic, multi-occupancy buildings, industrial and commercial use

The SLP shall calculate hydraulic demand by utilising the Design and Construction Specification (DCS) documents of the respective incumbent water company. This is crucial as these factors vary regionally. Thus, all SLP design submissions must conform to the DCS of the incumbent water network in the development site's location.

10.5 Process water

It is expected that the client should provide peak demands given their individual knowledge of the development. The connection and self-laid mains that are to be installed should then be selected based on their peak demand.

10.6 Pressure and flow

10.6.1 Source pressure

For the purposes of designing the network, the SLP shall check with mua Water to confirm pressure at the source. During the design stage, if any constraints, e.g. effect on headloss due to an increased AOD relative to a site and/or development, are identified by the SLP or mua Water, a workable solution is to be agreed between the parties.

10.6.2 Pressure and flow

Reference levels of service shall be used to ensure that networks can supply all properties with a minimum pressure and flow at the customer's communication pipe.

The minimum pressure in the communication pipe at the boundary of the property to be serviced is 7 metres head with a flow of 9 litres per minute, based on Ofwat's Guaranteed Standards Scheme (GSS).

In normal operational circumstances, the minimum pressure at a hydrant or nodal point on the system shall be 15 mH or 1.5 Bar.

Maximum design pressure (MDP), which is equal to design pressure plus an allowance for surge, shall not exceed pressure nominal (PN) which is the pressure rating of the lowest-rated component in the system.

SLP designers shall clearly state where a component has been used below mua Water's standard pressure rating to allow standard system test pressures (STP) to be adjusted on site.

10.6.3 Velocity

The SLP shall calculate the velocity by utilising the Design and Construction Specification (DCS) documents of the respective Incumbent water company. This is crucial as these factors vary regionally. Thus, all SLP design submissions must conform to the DCS of the incumbent water network in the development site's location.

10.6.4 Calculating headloss through the network

The SLP shall calculate headloss by utilising the Design and Construction Specification (DCS) documents of the respective incumbent water company. This is crucial as these factors vary regionally. Thus, all SLP design submissions must conform to the DCS of the incumbent water network in the development site's location.

10.6.5 Topography

Above Ordnance Datum (AOD) shall be the preferred scale when highlighting level changes on the design drawing.

The effect of increased altitudes on a site shall be taken into consideration by the SLP Designer when low source pressures have been identified by mua Water.

The finished floor level of the highest connection shall, for the purposes of the design, serve as the additional loss of head when ensuring the reference level of service.

10.7 Selection of materials for contaminated ground

Materials for use in contaminated ground shall be selected in accordance with the Water UK Contaminated Land Assessment Guidance. See the link in Appendix 5.

If contamination has been found, mua Water will default to using a barrier pipe. However, if only a small area of contamination has been confirmed, mua Water may not require the use of barrier pipe across the entire site. Instead, they may accept the use of barrier pipe within a 15-meter range on either side of the affected area.

To take advantage of this policy, the developer may need to conduct further soil analysis to determine the extent of the contamination, and this cost will fall on the developer. Removing the requirement for barrier pipe will only be allowed with approval from mua

Water and will depend on a satisfactory soil analysis and remediation report that provides evidence as to why barrier pipe is no longer needed.

10.7.1 Ground contamination during construction

If contamination is suspected during the construction of the self-lay works, the work shall be stopped and shall be isolated from the potential source of contamination and the incident reported to mua Water and the developer. An investigation and action plan, which may include a change of pipe material (and/or replacement of the apparatus already installed), shall be agreed with mua Water before work recommences.

The SLP shall ensure that all employees are trained and able to undertake the appropriate actions when working on potentially-contaminated land in accordance with health and safety legislation.

Consideration should be given to the effect of permeable surfaces on future contamination risk and documented in section 5 of the contaminated land risk assessment.

It is necessary to follow the pipe manufacturer's instructions when making joints in barrier pipe systems. The two water industry framework suppliers, Radius and GPS, have stated that aluminium foil wrapping of joints is not necessary for maintaining the integrity of the barrier system. To ensure the proper functioning of the barrier pipe system, only EF fittings made by the same manufacturer as the PE barrier pipe should be used. In other words, the barrier pipe and EF fittings must be made by the same manufacturer.

If there is a requirement to connect barrier pipes from different manufacturers (eg connecting to an existing section of pipe), a gunmetal transitional barrier pipe fitting should be used. This fitting must be wrapped with barrier pipe system foil tape to maintain the integrity of the barrier system. Alternatively, a valve can be inserted to separate the two systems using flange adaptors and a suitable gasket. It is important to note that standard gaskets should not be used in this process.

11 Water main design and construction principles

General principles in designing self-laid mains shall be that they:

- Minimise whole lifecycle costs and impact on the environment
- Deliver minimum standards of service to customers
- Ensure security of supply so far as reasonably practicable (see section 4 as regards funding of any such additional works)
- Ensure continuing water quality
- Allow for safe and flexible operation of control points and surface assets.

11.1 Design accreditation

The SLP shall demonstrate that it has suitable design accreditation based on WIRS.

11.2 Construction (pre-start)

Prior to the construction of any self-lay work, the SLP shall ensure that any mua Water-required approvals have been obtained and that a pre-start meeting between the parties has occurred when one has been requested by reference to Appendix 4.

11.3 Routing and positioning principles

Where the self-lay main is to be installed in a public area, such as an adopted highway, street, or dedicated service strip, it must be installed in compliance with the latest Streetworks UK guidelines (Volumes 1 to 6) unless mua Water specifies an alternative routing and positioning.

In such cases, the SLP Designer must incorporate mua Water's requirements into the design. mua Water's preferences are typically based on technical considerations, such as ensuring future access to assets for maintenance and repair. If mua Water requests changes to the route that do not meet its specific requirements, mua Water will be responsible for any associated costs. Any variations must be agreed upon by the SLP and developer before work can proceed.

Design acceptance will consider any installation route relative to private land, land that is defined as a street and/or which is designated as a highway and any requirement for an adoptable service strip or footpath.

Designs for the installation of self-lay main and/or service pipe(s) in shared driveways (i.e. where multiple plots are to be supplied) shall be in accordance with mua Water's criteria.

If it is not possible to follow the Streetworks UK guidance, then the SLP designer should consult with mua Water to agree the preferred location.

Any easements required will be obtained by mua Water (at the expense of the SLP/developer which will include any consideration payable for the grant of easement and all legal costs and surveyors' fees incurred in relation to the documentation required). The easements must be granted direct to mua Water and be entered into before the adoption of the self-lay works can occur.

During construction, the SLP/developer shall use reasonable endeavours to ensure that other utility companies' apparatus installed after the self-lay main and service pipe shall not restrict or compromise that self-lay main and future access to it.

Self-laid mains are to be laid on the side of the road where the housing density is higher to minimise the number of service pipe crossings.

Although not a preferred configuration, the requirement for new self-laid dual main(s) (typically where road construction prohibits utility apparatus at normal depths e.g. shallow drains and permeable paving systems) may be necessary, and in these instances, such a technical consideration is to be agreed between the parties.

Security of supply may be increased at the request of the incumbent water company by linking in the self-laid main when there is a significant number of properties being serviced through a single pipe, provision for flushing in these cases must be made by designing washouts located within three-way valve arrangements or between in line valves.

To reduce the likelihood of water quality issues from the lack of turnover in the self-laid main to an end hydrant (dead leg) it shall not extend more than 2m past the last service connection.

Self-laid mains shall maintain minimum proximity to buildings and structures as specified by mua Water in the table below.

Table: 11.4 Minimum strip width required for varying pipe diameters

Nominal pipe size (mm)	Min proximity required (m) from centre line of water main
Below 300mm	2m
300-600mm	4m
Above 600mm	5m

See also section 13. Designers shall refer to Streetworks UK publication Volume 4: Guidelines for the Planning, Installation & Maintenance of Utility Apparatus in Proximity to Trees when selecting a route in proximity to existing trees and if necessary, shall highlight any Tree Protection Orders on the design drawing.

No self-laid main shall be constructed unless the design of said main has been approved by mua Water, and no self-laid main or service pipe shall be connected to the network until all conditions precedent within the WAA has been met.

11.4 Depth of self-laid main

Self-laid main(s) shall be installed at the appropriate cover depths in accordance with the minimum and maximum depth range specified in the Streetworks UK guidance relative to the surface in which the self-laid main(s) are to be installed.

mua Water’s preferred installation depth (cover to crown of pipe) is 750mm for new self-laid mains or 900mm where there is a risk of damage eg from agricultural activities. All DI mains should be installed at 900mm cover.

11.5 Water quality considerations

In accordance with the Principles of Water Supply Hygiene and related technical guidance notes listed therein (see Appendix 5 – Document reference library) the SLP shall ensure that the developer and the SLP ensure demand is sufficient to allow adequate turnover of water following the commissioning of any new self-laid main in order to protect water quality, and public health.

Where possible, development spine roads shall be serviced with two-way fed ring mains to maintain water quality across the site. mua Water and the SLP designer shall consult on such proposals and the SLP designer shall incorporate mua Water's requirements relative to this design consideration into the site design. The costs associated with this shall be dealt with under the principles set out in section 4 of this document.

Where despite the above, infrastructure is laid in advance of turnover, the self-laid main shall either have artificial load by way of cross connection into the live system or shall have a flushing programme denoted on the design, to be carried out by the SLP.

The developer or SLP shall be responsible for ensuring that all required permits and agreements are in place for identifying where water can be flushed and for disposal of said water and whether water is required to be dechlorinated before disposal.

Only standpipes that have been approved by mua Water shall be used (details of such may be published on the mua website).

Operation of valves: mua Water's specified standards in section 11.7 below for the operation of valves and hydrants shall be complied with (including satisfactory completion of any related training in line with guidance material offered by the company).

11.6 Mains fittings

In cases where sites are to be adopted by mua Water, the number, size, and position of valves at the point of connection to the existing main will be determined by the incumbent water company.

For onsite construction, mua Water requires that a valve be installed at a location that can shut off a maximum of 50 properties, ensuring effective network isolations in the event of an unplanned incident. The top of the valve spindle should be between 200-300mm below the cover level. Branch connections shall have isolation valves installed to separately control all the flows downstream of the branch.

mua Water, will base all valve specifications, including its closing direction, on the Design and Construction Specification documents of each incumbent water network, as summarised for convenience in Table 11.6:

Table: 11.6 Summary of valve closing direction

Water Company		Area	Anti-clockwise Closing (Left Hand Closing) Or Clockwise Closing (Right Hand Closing)
AFW	Affinity Water		Clockwise Closing
ALE	Albion Eco Ltd		
ALB	Albion Water Ltd		
ANH	Anglian Water Services Ltd		Clockwise Closing
BRL	Bristol Water Plc		Clockwise Closing
CAM	Cambridge Water Company Plc		Anti-clockwise Closing
DWR	DŴr Cymru Welsh Water	North West and East	Clockwise Closing
		West, East, Central and Swansea	Anti-clockwise Closing
ESP	ESP Water Limited		
HDC	Hafren Dyfrdwy		
ICW	Icosa Water Ltd		
IWN	Independent Water Networks		
ISC	Isles of Scilly		
LNW	Leep Networks Water		
NES	Northumbrian, Essex and Suffolk Water	Northumbrian Water	Anti-clockwise Closing
		Essex	Anti-clockwise Closing
		Suffolk	Clockwise Closing
PRT	Portsmouth Water Plc		Clockwise Closing
SES	SES Water		Anti-clockwise Closing
SVT	Severn Trent Water Ltd	West Shropshire and Montgomeryshire	Clockwise Closing
		East Shropshire	Anti-clockwise Closing
		Wolverhampton	Anti-clockwise Closing
		Birmingham	Anti-clockwise Closing
		Worcestershire	Anti-clockwise Closing
		Gloucestershire	Anti-clockwise Closing
		South Warwickshire	Clockwise Closing
		Coventry & North Warwickshire	Clockwise Closing
		Leicestershire	Clockwise Closing
		Nottinghamshire	Anti-clockwise Closing
		Sherwood	Anti-clockwise Closing
		North Derbyshire	Clockwise Closing
		Derby	Clockwise Closing
		Staffordshire	Anti-clockwise Closing
SEW	South East Water Plc		Anti-clockwise Closing
SST	South Staffordshire Water Plc		Clockwise Closing
SWB	South West and Bournemouth Water		Clockwise Closing
SRN	Southern Water Services Ltd		Anti-clockwise Closing
TMS	Thames Water Utilities Ltd		Clockwise Closing
UUT	United Utilities Water Plc		Anti-clockwise Closing
VWP	Veolia Water Projects		
WSX	Wessex Water Services Ltd		Anti-clockwise Closing
YKS	Yorkshire Water Services Ltd		Anti-clockwise Closing

Generally, all SLP design submissions must therefore adhere to the DCS for the incumbent water network in which the development site is situated, unless otherwise approved by mua Water.

All fittings must comply with the Water Supply (Water Fittings) Regulations 1999. Products that currently conform to these requirements and have approval are listed in Section 1 on the Water Regulations Advisory Scheme (WRAS) 'Directory of Fittings, Materials and Appliances' for use on the UK Water Supply System, published on the WRAS website. They should also comply with Reg 31 of the Water Supply (Water Quality) Regulations for England and Wales.

Valves, washouts, hydrants, etc should, as far as is practicable be located in the footpath or verge for both access and safety reasons and to mitigate the effect of traffic, surface water and silting in chambers.

Where there is no option but to design site fittings in trafficked areas, under no circumstances shall they be placed in parking bays or behind any locked access gates.

11.7 Controlling valves and valve operation

Mains isolation associated with any planned interruption requiring a shut to an existing main valve may be carried out by mua Water and/or by an SLP, subject to the SLP persons involved in the site works having been authorised by mua Water to undertake this activity. mua Water will take into account specific site constraints or considerations that may impact the end user customer and/or water quality.

Approval and authorisation by mua Water may include compliance with specific mua Water approval and authorisation procedures (and training) and completion of mua Water-provided training that includes CALM network training, valve operations, and discolouration risk assessment.

Any mains isolation on the mua Water network associated with the construction of a self-laid main will require authorisation from us directly.

Valve closing directions within the mua Water area are clockwise closing and all new valves to be installed by an SLP shall be clockwise closing.

11.8 Washout and fire hydrants

Washout hydrants must be installed at every dead end, irrespective of the main's diameter, and between any two sluice valves that isolate a section of the water main when closed.

All hydrants and washouts must be of the through-bore type. The outlet of the hydrants must be located no more than 300mm from the surface.

The installation of all hydrants must be within a chamber, with the foundation slab above the tee off the main or the duckfoot bend. The chamber should have a minimum clear opening of 430mm x 280mm. The frame and cover of the chamber must be Grade A to BS 750, with a clear opening of not less than 380mm x 230mm.

The SLP is responsible for ensuring that the hydrant is vertical and that the operating key can be utilised without being hindered by the frame or chamber walls. Fire hydrants must be compatible with the local fire authority's requirements.

For mains with a nominal diameter greater than 150mm, all new hydrant installations must include a studded sandwich.

11.9 Air valves

Air valves are required at high points and at points of significant changes of vertical direction along the network where in either case there is a risk of air locking. The location is to be agreed at design stage.

11.10 District metered areas and boundary valves

District meter locations shall be agreed with mua Water. If no information is available, then as a rule where the design exceeds 500 domestic properties then a DMA meter is likely to be required. See also section 8.3.

Shut valves will need to be installed if a site is fed by two separate DMAs via two sources of water connections. In this instance, their requirement and location shall be agreed at the design stage with the incumbent water network.

11.11 Sustainable drainage systems (SuDS) considerations

SLP designers/developers shall ensure relative to the final installation of the self-laid main and service pipe that any sustainable drainage system (SuDS) shall not be installed above, underneath, or adjacent to the final position of the self-laid main and service pipe. The location of any proposed SuDS and permeable surfaces proposed for a site are to be clearly marked on the proposed design drawing.

11.12 Double spade valves

The use of double spade valves for commissioning purposes shall only be permitted if approved by mua Water.

11.13 Rights of access

The self-laid main shall, wherever possible, be routed in publicly adopted highways and maintained highways or streets as defined in NRSWA Section 48 (1) and amended under the Traffic Management Act (TMA) 2004. These shall not normally require rights of access.

Examples of situations where self-laid mains are to be laid in a street are:

- An adopted street on land which is owned by a local authority
- A street on land which is owned by the developer and which may or may not be adopted in the future but serves more than one property
- A street on land which is in joint third-party ownership.

The section 38 drawing shall be used to highlight any self-laid main installed in third-party land, which is not a street and that may require land rights to be obtained and a legal notice to be issued. In these instances, mua Water shall establish and confirm the right of access with the developer/SLP and shall normally require an easement to be provided by

the landowner. Examples of situations where self-laid mains are not to be laid in a street are:

- Industrial and commercial sites where land is wholly owned by a singular third-party
- Site access is through a third-party's land that does not form part of the development.

In cases requiring the self-laid main to be laid in land not defined as a street all such permissions and rights of access shall be identified before the design is approved.

In the process of designing it may be necessary to obtain other consents for works. These consents include:

- Local highways by way of Section 50 Agreements
- Other adopting utilities where we are laying within an existing easement
- Environmental agencies and waterways authorities
- Rail and transport network operators
- Historical societies and national heritage agencies

All such servitudes, easements, wayleaves and planning permission required for the self-lay works and land for the siting of equipment shall be obtained before starting work and in accordance with the statutory consents and land rights sections of the WAA.

In accordance with the WAA, mua Water shall obtain any required easements to protect its network, or any future extension of such, and any related and/or incurred costs including third-party costs shall be recovered by mua Water in accordance with its published charging arrangements.

12 Service pipe design and installation

Water supply and communication pipes must be laid in a straight line along the route shown on the design for each plot drawing, any deviations must be agreed with mua Water, prior to laying the service pipes.

The route should be perpendicular to the property and take the shortest route possible to the water main. A water service must not run parallel to the water main.

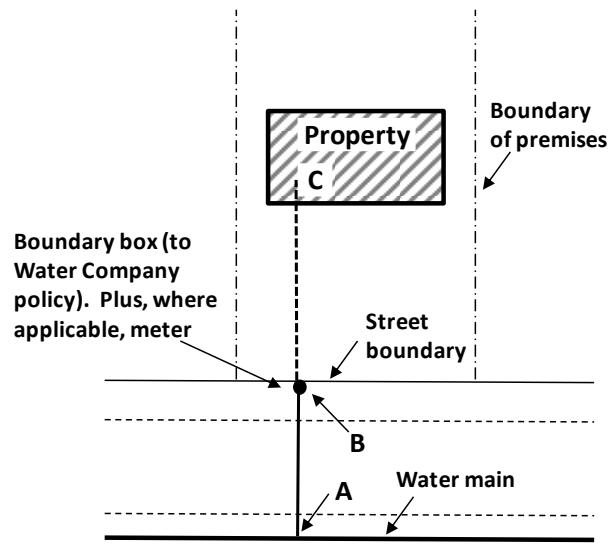
The installed supply pipe and fittings must comply with Water Supply (Water Fittings) Regulations 1999.

Supply pipes must be 750mm (+/-50mm) deep and ducted where they enter the building.

An internal stop tap must be installed as a minimum before any service connections can be made. The end of the supply pipe to be connected to the main must be sealed with a suitable end cap.

The following diagram provides guidance as to the allocation of such responsibilities.

Figure 1



Service connection pipework	Responsibility		Regulations
	Installation	Maintenance	
A – B communication pipe	SLP	mua Water	Water Supply (Water Quality) Regulations
Boundary box (plus, where applicable, meter)	SLP	mua Water	
B – C supply pipe	Developer	Property owner	Water Supply (Water Fittings) Regulations 1999 and Water Supply (Water Fittings) (Amendment Regulations) 1999
Internal plumbing	Developer	Property owner	

The supply pipe shall be the property owner’s responsibility and shall conform to the water regulations and requirements of mua Water.

12.1 Routing, positioning and location

mua Water shall specify its policy and installation requirements on the design and installation of permissible materials (service pipes, meters, chambers, ducting, etc) required routing, and location relative also to contaminated ground.

Service pipes shall only be laid through land which either form part of a street or to which the property being served has permanent rights of access.

Service pipe routes in so far as is reasonably practicable shall follow a straight route perpendicular to the self-laid main and the property to which it services.

Service pipes shall generally be designed to connect to the nearest self-laid main to the property.

Separate service pipes shall be provided to each house or building on the premises, or to those different parts of a building on the premises which are separately occupied by way of multiple supply pipes.

Joint communication pipes may be used to reduce road crossings however each property must receive an individual supply pipe and meters (if applicable).

If there is a need for several communication pipes to cross a highway, it is possible to replace them with a main pipe that runs parallel to the property curtilage for a short distance, in order to reduce the number of crossings. However, each property must still receive an individual supply pipe and meter (if applicable).

Service pipes shall be designed such that the requirements of Streetworks UK are maintained with respect to separation from other plant and utilities.

12.2 Depth of services

Service pipes shall be installed per the Water Regulations and Streetworks UK guidance.

Service pipes shall be laid with an even grade where possible, with cover between a depth of 750mm to 1350mm from the finished ground level in accordance with Water Supply (Water Fittings) Regulations 1999.

If a boundary box is to be installed on the service pipe, the pipe shall be laid with cover between 750mm and 850mm for a minimum of 1 metre on each side of the boundary box.

Service pipes being designed outside this range shall have special protective measures vetted and agreed by mua Water's approving design engineer.

12.3 Sizing of services

While service connections can only be designed to meet minimum standards at the point of delivery, every effort shall be made to ensure that all parts of the service pipe are sized to industry standards.

Service Pipes shall be sized to ensure velocity is $\leq 1\text{ms}^{-1}$ and that total headloss is $\leq 2.0\text{mH}$.

Services to standard domestic properties shall be a minimum 20mm internal diameter and capable of supplying required flow and pressure based on required demand.

Where the design includes larger dwellings, flats or where service pipes are in excess of 30m in length, the size of such pipes may be altered to achieve adequate flow and pressure.

12.4 Location of boundary boxes

mua Water's requirement is for boundary boxes to be positioned in the pavement outside of the property boundary. On a case-by-case basis, mua Water may also permit boundary boxes to be positioned inside the property boundary, on the edge of the adopted highway, when requested by the developer or local authority.

In other scenarios, mua Water's preference requires that below ground boundary meters are installed in the footpath adjacent to the property as near as is practical to the proposed highway boundary.

It is the developer's responsibility to provide all lines and levels to allow the boundary box to be fitted correctly. The boundary meter box tube should not be cut down as the tube height is designed so that the service pipe is at 750 mm depth and within no greater than 300mm of the property boundary.

Where there is no footpath, boundary boxes/stop taps should be installed in the adopted service strip or easement. Under no circumstances must boundary boxes be installed in parking bays.

Boundary meter boxes must not be positioned in driveways or drop kerb pavement crossings. Where there is a service strip, the boundary box can be positioned in an unmade area on private property.

If any of the service connections on site are to be made using 4 or 6-way manifolds, the service connections for all the properties served by each manifold must be requested at the same time and they must all be ready to be connected in one visit.

The same site preparation requirements as for single boundary boxes apply.

12.5 Supplies to multi-occupancy buildings

Individual metering is required for buildings that consist of multiple occupancy units, which may include both household and non-household units. Additionally, communal facilities such as hot water or laundry facilities must also be individually metered.

Multi-occupancy buildings are typically supplied in two ways, either individual pipes are installed to each unit or a large diameter shared service pipe is used to supply the building's demand. In both cases, mua Water allows for meters to be installed either in a plant room or outside each unit in a common area that is accessible.

If the multi-occupancy building is part of a larger housing development that is being served by a bulk meter under a NAV licence, then mua Water is responsible for the communication pipe up to the highway boundary of the building. However, all pipework beyond that point, including risers, is the responsibility of the customer or management company.

If the multi-occupancy building is a stand-alone development, such as a multi-story high-rise apartment block, then mua Water is responsible for the mains and/or supply pipe up to the point of entry into the building's plant room. All risers, tanks, and pumps beyond that point are the responsibility of the building's management company.

12.6 Services to multi-storey buildings

The Water Industry Act 1991 – Section 66 states that where the top-most storey in a building is greater than 10.5m below the draw-off point, the statutory undertaker may require the developer to fit storage equal to twenty-four hours usage and adequate pumping to reach the highest point.

During the design stage, the incumbent water company, developer, and/or SLP will identify any requirement for pumping or storage. In practical terms, any building that exceeds two storeys should be evaluated against available mains pressures.

Meters may be installed in service cupboards where individual stop taps and supply pipes are fitted to a common manifold arrangement, or within a common area outside each individual dwelling. The water service pipework within the building must be arranged in such a way that individual metering to each dwelling or any shared water provision can be installed without requiring any modification.

12.7 Additional requirements for non-domestic supplies

When the developer's flow rates are in question, the SLP designer shall check that demand was calculated in accordance with BS EN 806.

The design shall include back flow prevention; at least single check non-return valves.

Demand for process water shall be treated separately when designing the service.

The SLP designer shall investigate any seasonal demand patterns when designing the service.

13 Civil engineering considerations

13.1 General

The general specification for civil engineering components and materials shall be that of the document "Civil Engineering Specification for The Water Industry (CESWI) 7th Edition which is available from the WRc plc.

mua Water shall confirm its requirements by reference to CESWI and any additional specific requirements and/or include such in the schedule of permissible materials and construction in Appendix 1, which as a minimum shall include information and requirements relating to:

- Thrust restraint and anchorage
- Puddle flanges
- Self-anchoring joints
- Site conditions and ground-bearing capacities
- Thrust blocks
- Jointing of pipes
- Ground anchorage

13.2 Marker tape and tracer tape

Marker tape is to be compliant with CESWI and Water Fittings Regulations.

13.3 Indicator posts and marker plates

Indicator posts and marker plates are to be compliant with CESWI.

13.4 Chambers and covers

mua Water permissible materials are detailed in Appendix 1. Chambers shall be designed and installed to be of an appropriate size to allow the operation of the self-laid mains and service fittings.

Covers shall be designed to be capable of withstanding all potential loads placed upon them and shall comply with BS EN 124.

13.5 Bedding and backfill

Materials used for bedding shall conform to WIS 4-08-02 "Specification for bedding and side fill materials for buried pipelines" and material for backfill material shall be in accordance with NRSWA 1991 'Specification for the Reinstatement of Opening in Highways' (3rd Edition).

13.6 Highway reinstatement

Materials and work shall be in accordance with the NRSWA 1991 the Specification for the Reinstatement of Opening in Highways (3rd Edition).

The SLP is responsible for the classification and disposal of waste from excavations in the highway in accordance with applicable law.

13.7 Ducts

SLP designers shall consult with mua Water at the design acceptance stage if ducts are required to be installed by a SLP/developer. A single dedicated duct is to be installed for each separate individual communication pipe.

Where ducts are designed to be laid under major roads or obstructions, they shall be shown to extend beyond the road to ease installation and future inspection.

Where service pipe ducting extends into a building to form part of the service, the entry must facilitate the installation of insulation as per Water Supply (Water Fittings) Regulations 2016.

Ducts shall comply with CESWI clause 2.91 Pipes for Ducts.

14 Metering requirements

14.1 Standard domestic metering for individual dwellings and multi-occupancy buildings

All premises must have one water meter installed that complies with the Water (Meters) Regulations 1988.

Mua Water recommends 640MC (manifold) Water Meters available from:

Stream Measurement	Technical queries - key contact:
www.stream-measurement.com	Nick Price
sales@stream-measurement.com	nick@stream-measurement.com
0161 622 0777	07718 931110

Where use of the SENSUS 640MC (manifold) is not suitable, then the SENSUS 640C (inline) Water Meter can be used, subject to our approval.

Water meters must be positioned to accurately record and measure all the water supplied to the premise(s).

Each individual household premise will have only one water meter installation.

mua Water requires all meters to be installed in meter boxes located at the highway boundary of the property, unless otherwise agreed with us.

Accepted meter locations for new build properties (household)

- Internally within the structure of the premises or individual unit (house, flat, etc.)
- In a purpose-built wall mounted meter box fixed on the structure of the property (all variants)
- In a purpose built in-wall meter box built into the structure of the property
- In a purpose-built plant room or meter housing area within the curtilage of the property (multi-occupancy)

- Within a boundary box located within the footway.

The end customer must have reasonable access to read the meter and we must also have reasonable access for reading and maintenance of the meter(s).

We have no order of preference of the above locations, all are acceptable. The final location of the meter from the above list, remains the choice of the Household Developer.

For service connections greater than 25mm and classed as non-standard connections, these connections may be used to provide supply to several individually metered premises or may be used to supply single premises and fitted with a bulk meter.

The arrangements for metering and their locations are likely to be design specific and dependant on the construction of the building, the layout of the pipe work and the availability of sufficient space to facilitate the meter installation.

14.2 Temporary supplies

All temporary water supplies must be metered and reported to mua Water.

The method for establishing a temporary water supply should be by connecting a service pipe from the new mua water main terminating to a property or to a lockable box. An isolation valve must be installed on to the service pipe.

A temporary connection can be either disconnected upon completion of the construction work or utilized for a permanent domestic water supply after the property is built. If the connection is temporary, you are responsible for notifying us when it is ready to be disconnected.

Any charges associated with building water will be charged through the local temporary supply meter, any build water costs enforced by an incumbent will be passed through to the SLP.

Building water is defined as all water used for the purposes of completing the development, including that used for washing down roads, jetting and construction.

Any connection, and use of water that does not meet the requirements of a temporary supply (as set out above) shall be treated as an unauthorised connection under section 174(3) Water Industry Act

Standpipe hire is available through [our partner Aquam](#).

15 Water for firefighting

15.1 Fire and rescue service (FRS) consultation

Pursuit to Section 43 (1) of the Fire and Rescue Services Act 2004 a plan showing adoptable washouts shall be sent to the FRS for consultation purposes, along with a location plan and a covering letter.

mua Water will provide FRS contact upon request from an SLP.

The FRS has the statutory period – 42 calendar days – to respond with their requirements in respect of adopting hydrants for firefighting.

Hydrants to be adopted shall be then marked on the drawing.

15.2 Location and flow from hydrants

Ordinarily, water companies do not design distribution networks for firefighting purposes. It should be expected that flow from fire hydrants would be in line with minimum standards on the water distribution network.

See also [Water UK guidance](#), in particular those details referenced in Appendix 5 regards flow from fire hydrants.

When designing new water mains, the contractor shall liaise with the fire authorities regarding the provision of fire hydrants and will install new fire hydrants where requested by the fire authority.

It is therefore important that once the new water main is commissioned you ensure that:

- Site access is made available to fire service personnel so that the new fire hydrants can be inspected and adopted by the fire authority.
- Fire hydrants shall be kept free and not covered or made inaccessible in the event of a fire during the construction of your development.
- When constructing footpaths and other final surfaces, you ensure that the correct fire hydrant cover is installed, the fire hydrant marker post is in position, and the fire hydrant cover is to the finished surface level and not buried.
- Fire hydrant chambers are free of debris and surfacing materials, and the cover can be removed.

15.3 Dedicated fire mains

Dedicated fire mains shall be designed and constructed in accordance with Water Supply (Water Fittings) Regulations and fitted with backflow prevention, spiral wrapping and appropriate marker tape.

15.4 Fire sprinkler systems

In the absence of any information from mua Water, SLP designers shall refer developers to the polices within the building regulations when requests for sprinklers are being made. These documents, 'Document B (Fire Safety) – Volume 1: Dwellings' and 'Volume 2: Buildings other than dwelling houses', can be obtained from the [UK Government Planning Portal](#).

It is recommended that the SLP designer consults with the developer who is responsible for seeking advice from a specialist provider of sprinkler systems (where required) relative to the site and/or development.

16 As laid (as constructed) drawings

mua Water's asset data is typically recorded on a geographic information (digital mapping) or CAD system. Therefore, it is important that accurate and compliant location information is supplied to mua Water in a format agreed with mua Water and which shall be specified in the schedule of permissible materials and construction.

The approved design drawing shall be updated and amended in accordance with all changes to as constructed installation whenever there is a deviation from the approved design. (Note: all changes to an approved design shall only be made with the acceptance of mua Water as per Level of Service measure S2/1b).

The “as-laid/as-constructed” installation shall follow the approved design and any changes approved by mua Water. Any deviation from the approved design not agreed by mua Water shall be a defect and mua Water may require such to be corrected before the adoption of the installation.

The position of all installed apparatus shall be recorded to ensure locational accuracy (the position of apparatus shall be recorded relative to a minimum of two fixed (geographical or otherwise) features adjacent to the installed apparatus and the measurements shall intersect the centre of the new asset and if available is to be referenced by British National Grid Reference.

Positional accuracy is to be measured and recorded, wherever practicable, to a minimum GPS accuracy of +/- 100mm to the centre of the apparatus.

Surveys for self-lay works shall be carried out using triangulation, i.e. two measurements taken from fixed features. They should intersect at the centre of the asset in the following order of priority:

- corners of buildings
- corners of boundary walls

Surveys done using offsets, i.e. using a single measurement (usually along the length of the Self-laid main), in the following order of priority:

- building lines
- kerb lines

Temporary and natural features should only be used when no other permanent features are available, with the agreement of mua Water.

Scaled survey drawings should be provided. The scale shall be 1:500 (unless otherwise agreed with mua Water) to ensure clarity of applicable measurements and features.

Material, pipe size, external and internal corrosion protection of pipe, and the depth of cover to self-laid main (where depth differs from standard) shall be identified.

All valves, hydrants, washouts, meters, ducts, swab access points, tappings, tees, service pipe(s) and boundary boxes shall be clearly identified, together with the relevant fitting on the plan and/or in an accompanying legend. The legend should be consistent with mua Water’s schedule of permissible materials and construction.

Where a number of assets are installed adjacent to each other, suitable asset information (increased scale extracts) is to be incorporated and clearly referenced as a subset of information from the self-laid main as-laid/as-constructed drawing.

The full dimensional references for all pipes and fittings shall be indicated (eg material, diameter, SDR) at any change in details, and measurements shall be in millimetres.

Clear differentiation should be made between live and decommissioned Water Mains and associated fittings. Decommissioned network assets may be shown on a separate drawing, if required.

As-laid/as-constructed drawings shall be submitted with any request to commission any completed work. Such shall be clearly labelled with the developer's name, scheme number, scheme name, scheme type, stage, number and date of submission.

17 Self-laid main and services commissioning

To enable the commissioning of new assets to take place, mua Water shall provide its flushing, super chlorination and sampling requirements including minimum training requirements for samplers e.g. as per the Water Regulations under ISO/IEC 17025 may be deemed appropriate.

A compliant pressure test should be carried out which demonstrates the self-laid main to be free of air and leaks. Certificates shall be provided by the SLP to mua Water confirming a compliant pressure test.

Before flushing into a public combined or surface water sewer the developer shall contact and obtain approval from the local wastewater company, Environment Agency, highway authority or other, as appropriate.

In addition, mua Water may include further guidance in its schedule of permissible materials and construction in Appendix 1 setting out its requirements for the provision of testing and commissioning.

17.1 Mains flushing

In accordance with the Principles of Water Supply Hygiene and associated technical guidance notes (see in particular TGN02 and TGN03), it is a requirement that there is always a sufficient turnover of water on all potential dead legs of main or sectional lengths and regular flushing of these mains shall be undertaken to satisfy water quality requirements.

Accordingly, a suitable flushing regime is to be agreed in respect of the construction programme of the self-laid main. The responsibility for work and related costs is set out in the WAA.

Note: Operation of existing valves shall only be in accordance with mua Water's published guidelines in this DCS.

mua Water may seek to recover the cost of flushing work where a delay to the proposed delivery date occurs as a consequence of a failed pressure test and/or mains sample. This will likely delay the mains connection date and subsequent installation date of new service connections and hence an appropriate flushing regime to protect water quality will be required to be agreed with mua Water who reserves the right to revert to a flushing regime operated and managed by mua Water with costs recovered.

Before any end washout on any phase/section of main, the SLP may install a temporary or permanent sluice valve and if the washout is to be used for flushing or building water with a standpipe then it shall be an approved metered standpipe as per mua Water requirements.

The SLP is responsible for ensuring that the developer secures all required permits and agreements for flushing, and identifies where water can be flushed to and disposed of. Where mua Water is to undertake flushing, the SLP must indicate whether water is required to be dechlorinated first.

As a general rule, it is unnecessary to consider cleansing velocities, except the need to discharge a volume (twice the pipe’s volume will ensure complete turnover) from a washout at the end of the main.

mua Water has a responsibility to ensure that its customers are not affected by discoloured water which may be caused by flushing out mains so when discharging water it is important to keep velocities in the pipe under control to avoid discolouration upstream.

The suggested guideline is to limit flow velocity to no greater than 0.2 m/sec with the need to turn over mains water at least once per week, and examples are detailed in the table below.

Example guidelines

Pipe size (mm)	Internal diameter (mm for PE)	Imperial equivalent	Area m2 and volume in m3 per metre	Volume in litres per metre (rounded off)
63	50	2 inches	0.00196	2.0
90	80	3 inches	0.00502	5.0
125	110	4 inches	0.00950	9.5
180	158	6 inches	0.01960	19.6
225	198	8 inches	0.03079	31.0
250	220	8 to 9 inches	0.03801	38.0
315	278	11 inches	0.06069	61.0
355	312	12 inches	0.07645	76.5

17.2 Mains bacteriological sampling

All sampling and data relating shall be undertaken by an approved UKAS-accredited analytical laboratory that will confirm and provide all results and required reports relative to:

- Incoming main sample(s)

- New mains sample(s) – result(s) for each length of the new main to be commissioned and connected to the existing water supply distribution network.

Samples from new mains should, as a minimum be checked for residual chlorine, taste and odour, coliform bacteria, *E. coli*, together with appearance and turbidity. Enterococci and *Clostridium perfringens* should be considered where appropriate.

All sample taking shall be carried out by accredited persons. Sample point location(s) where samples were taken from must be detailed and cross-referenced with the results and shown on the construction drawing and provided to mua Water.

All activities are to be carried out in accordance with [Water UK Principles of Water Supply Hygiene & Technical Guidance Notes](#).

Prior to accepting a request for any final connection to the network, mua Water must be reasonably satisfied that the samples have been taken where indicated and have passed water quality requirements such that the self-laid main can be adopted.

As such, mua Water may (at its own cost) undertake a check sample on the main after final connection, before permitting any further connections (mains or services).

In accordance with the Principles of Water Supply Hygiene (TGN02), if the self-laid main is not brought into service within 14 calendar days of a satisfactory sample having been taken, the main should be flushed with mains water and re-sampled. If contamination is suspected, the main should be re-chlorinated and sampling carried out as in paragraphs numbered 10 & 12 of the TGN02.

The SLP is advised to contact mua Water to confirm arrangements for taking samples, sample testing, testing parameters and reporting, and laboratories they intend to use and/or to confirm any requirement for mua Water to provide (at reasonable cost) any such support services.

Chlorination of all service pipes greater than 63mm diameter require chlorinating and testing.

Service pipes greater than 50mm diameter require chlorinating. Testing is only required if they are over 100 metre in length or contamination is suspected.

If service pipes are less than 50mm diameter, then chlorination and testing is not required unless contamination is suspected.

As part of the installation process for any new main or service connection, the SLP or developer shall adopt the following good practice:

- All fittings and pipe ends must be sprayed with a chlorine solution of 1000 mg/l as they are laid, extra care must be taken to prevent water, subsoil or other material entering the pipeline during construction.
- New water mains must be flushed until visibly clear. They must be disinfected by charging with water containing sufficient free chlorine to ensure that a concentration of at least 20 mg/l has been maintained throughout the entire pipe length over a period of standing for at least 16 hours up to a maximum of 48 hours.

- No new main, service connection or service pipe shall be brought into service until the contents of the main have been tested successfully for bacteriological, chemical, taste, odour and appearance.
- All bacteriological sample results must be approved by mua Water prior to mains being commissioned. If the new main is not brought into service within 14 days of a satisfactory sample having been taken, the main should be flushed with mains water and re-sampled. If contamination is suspected, then the main should be chlorinated and re-sampled.

17.3 Pressure testing of self-laid main

17.3.1 Pressure testing of pressure pipes and fittings for use by public water suppliers must be carried out as set out in the Water Industry ‘Information and Guidance note’ (IGN 4-01-03 October 2015: issue 2), available to view online at <https://standards-board.water.org.uk/wp-content/uploads/2022/02/IGN-4-00-02-The-development-and-amendment-of-specifications-and-guidance-note-for-the-Water-Industry-v8.1.pdf> with reference to the following guidance notes: ‘Pressure Testing and Disinfection (supplemental) of PE Water Pipelines, Services and Installations’.

Pressure data, analysis report/pass certificate and pressurisation/decay graphs are to be provided by the SLP to mua Water within a handover commissioning suite of information.

All results must be provided in both graphical (test output graph) and tabular formats.

Material	Pressure loss (bar/hour)
Ductile Iron	0.200
PE 100 SDR	11 0.030
PE 100 SDR	17 0.016
PE 100 SDR	21 0.012

17.3.2 Pressure testing and disinfection (supplemental) of PE water pipelines, services and installations shall be carried out in accordance with IGN 4-01-03. Reference should also be made to the Civil Engineering Specification for the Water Industry (CESWI) (with additional clauses) and any specific mua Water requirements specified additionally in paragraph 21 of the schedule of permissible materials and construction.

The following also applies:

- On-site testing operations will be clearly identified using appropriate warning notice boards. As a guide, it will generally take five working days to pressure test and sterilise a main before it can be commissioned. A water main must be commissioned within 10 working days of a sample being collected and only following receipt of successful water quality results. The system test pressure shall be calculated as set out in IGN 4-01-03, unless otherwise agreed with mua Water.

- All new service pipe connections must undergo a service test. The procedure is also defined in Water Industry Information & Guidance Note (IGN 4-01-03) 'Pressure Testing of Pressure Pipes and Fittings for use by Public Water Suppliers'.
 - The system test pressure shall be 18 bar.
 - The service shall not have been tapped before this test is conducted.

18 mua Water key contacts

Key contacts are outlined on our website.

19 Local practices

Not applicable

19.1 Meter Pairing and Commissioning

Not applicable

19.2 Timing of the generation of plot reference numbers

Not applicable

19.3 mua Water design service offerings

Not applicable

19.4 Design self-certification scheme

Not applicable

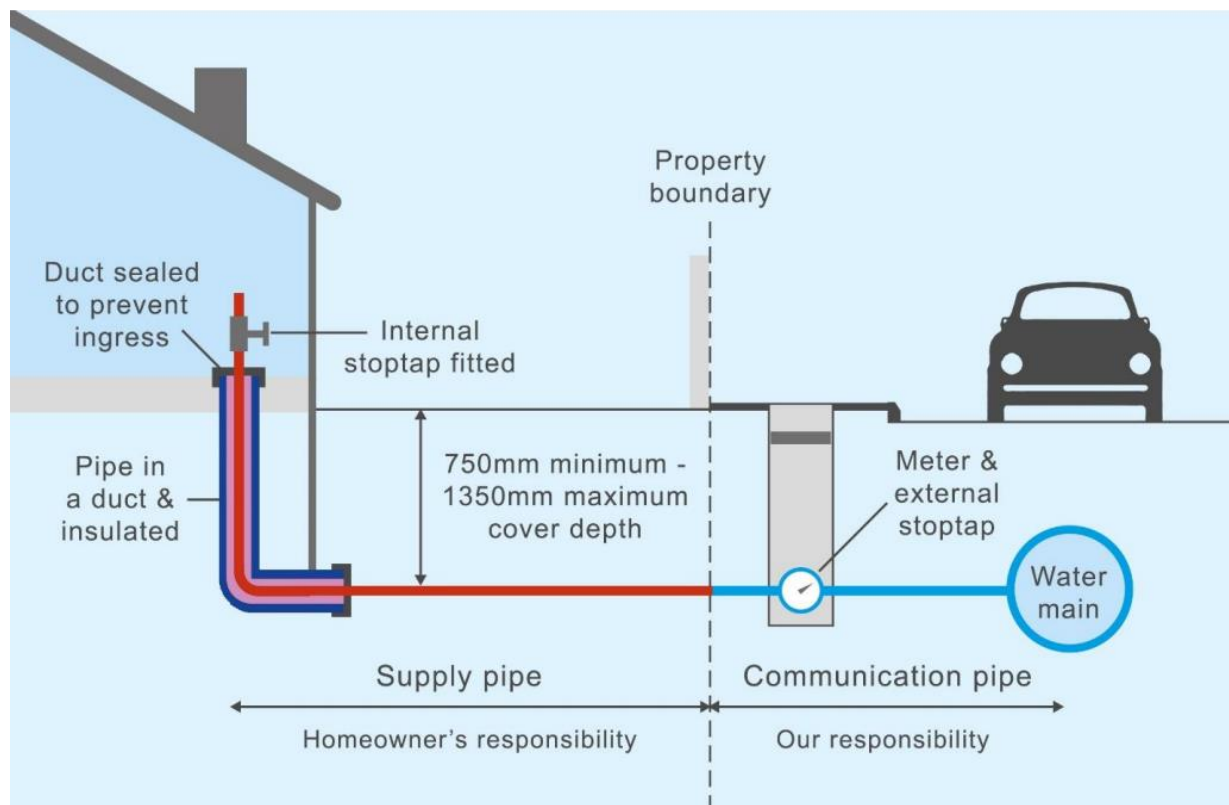
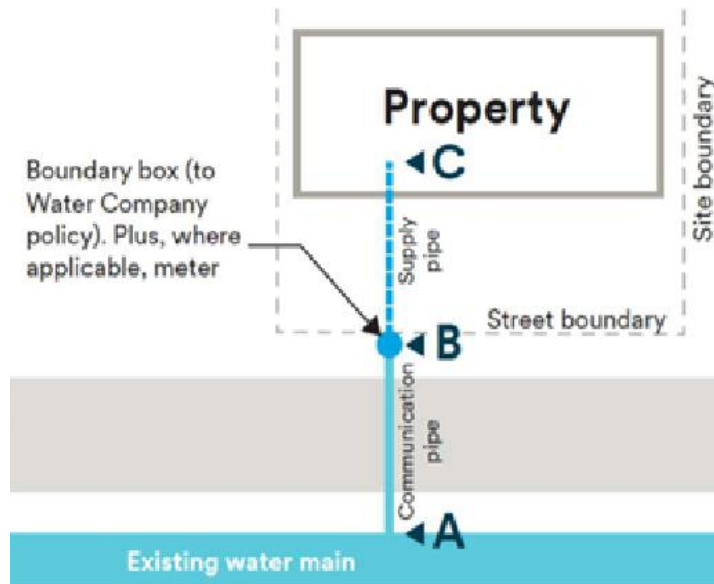
Appendices

Appendix 1: Schedule of permissible materials and construction

As a NAV service operating throughout the United Kingdom, we are committed to taking into account the Distribution Control System (DCS) and the approved list of materials for each existing water company. Our aim is to provide flexibility and options to Service Level Providers (SLPs), subject to their compliance with the appropriate design and construction standards and the regulatory requirements governing water systems.

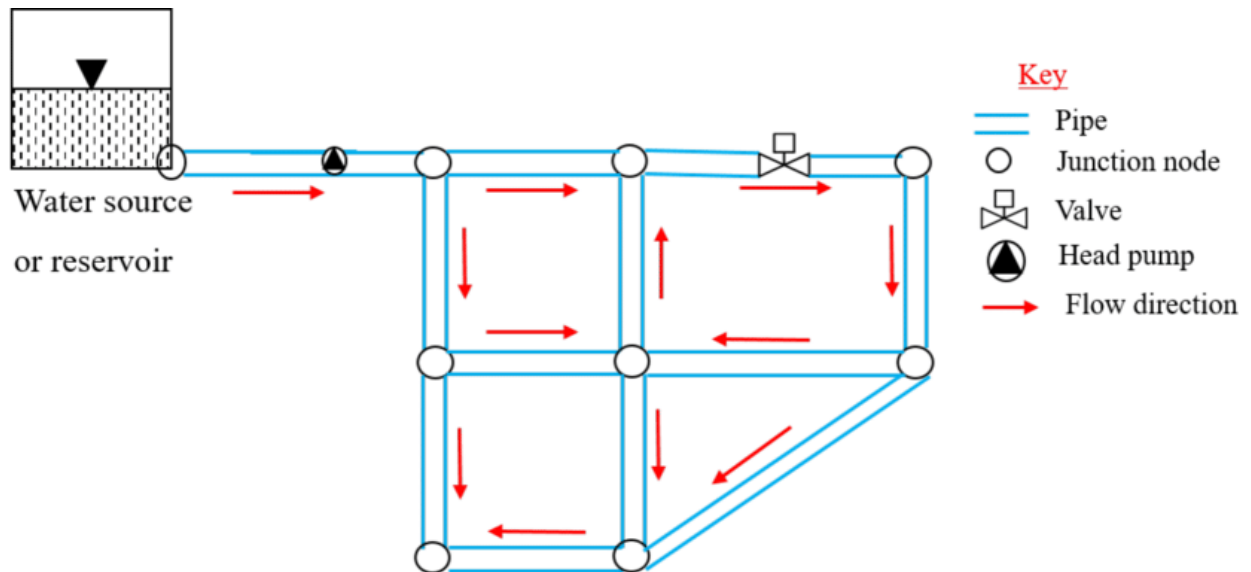
Appendix 2: Meter and service pipe policy and installation

mua Water’s metering and service pipe policy are located in sections 14 and 12 respectively.

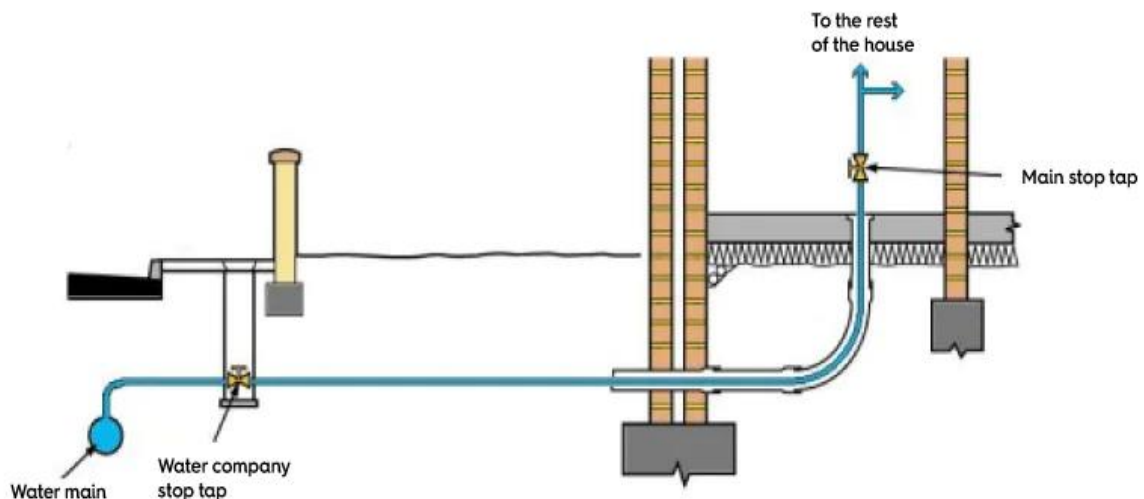


A water distribution network. There are two parts to a home water system: The first part brings in clean water, and the second part takes away wastewater. The water comes in

from the mains and goes directly to the boiler or to a cold-water tank, to be heated for hot baths and showers, as showing in the schematic below.

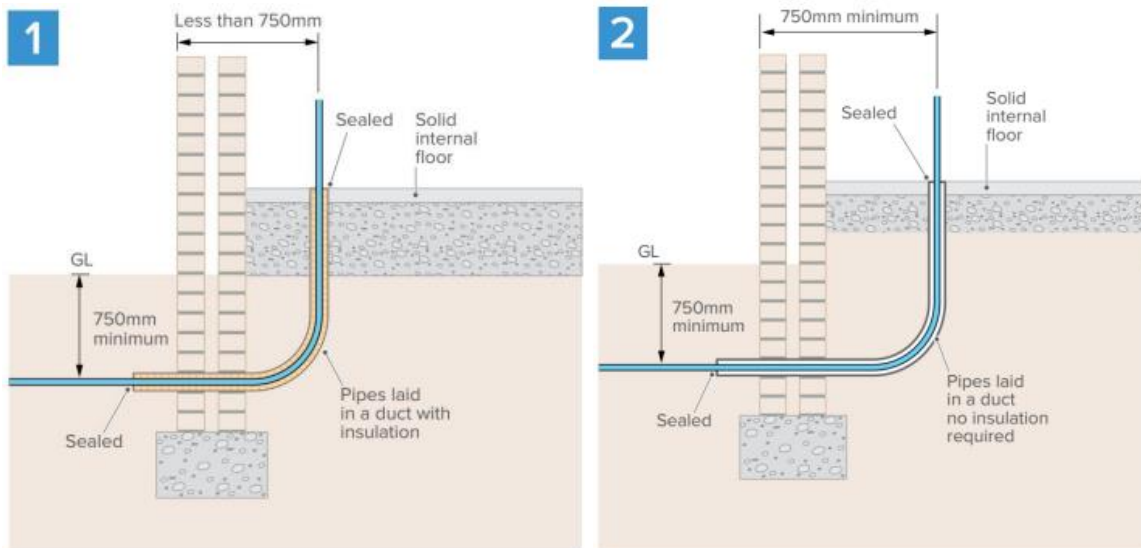


Where domestic water supply boundary stop tap and main isolation point lines. There will be a supply line "a lead pipe" bringing water into the property.



How a water metre works; A water metre works on the principle of water enters a precision-machined chamber containing a disc which nutates (wobbles). The position of the disc divides the chamber into compartments containing an exact volume.

Manifolds are an option for sites which need multiple connections at one location. They allow to bring the communication pipe to one location from which it can then separate into individual supply pipes through a 2 or 6-way manifold. For 2-way manifolds the pipes should be no further than 300mm apart and for 6-way no further than 700mm apart (measured from pipe 1 to pipe 6).



Appendix 3: Construction pre-start meeting agenda

A pre-start meeting shall only be required if one party to the WAA submits a written request to the remaining parties notifying them that it requires a pre-start meeting.

However, such meetings are viewed by water companies as a key means of helping to achieve good health and safety outcomes, securing timely, cost-effective delivery and ensuring smooth adoption and handover. For this reason, they will generally be requested by water companies.

Such meetings will allow the following aspects of the project to be addressed:

- Site-specific health and safety, and site management issues
- Confirmation of the identity of the Principal Contractor under CDM Regulations
- Introduce site personnel and establish their roles and responsibilities
- Establish local lines of communication between the site and mua Water teams
- Assess any associated construction activity that may need accommodating in the SLP construction programme
- Discuss issues relating to the distribution that have the potential to affect the project.

The parties shall agree the date of the pre-start meeting and shall record the minutes of the meeting and circulate such within five calendar days. The pre-start meeting shall include the 'pre-start information' listed below.

Where no pre-start meeting is required by a party, the SLP and/or developer shall, if requested by mua Water, provide the following pre-start information before the self-lay works begin.

As a minimum, pre-start information includes:

1. Confirmed arrangements for CDM 2015 Regulations and other health and safety requirements.
2. Future contact arrangements and authorised parties for giving instructions, agreeing "right day" for SLAs, making variations, and exchanging information regarding progress with all parties' works.
3. Confirmation of line and level of Self-lay Works.
4. Confirmation of national (Streetworks) and local (mua Water) design requirements.
5. Overview of the process for dealing with variations/and changes to the site layout and associated approved design drawing (revisions and impact on design, coordination and charges etc).
6. Confirm and detail the source of water for testing and the mains connection delivery date.

7. Confirm the latest design approved drawing, and any revision, and drawing for construction.
8. Process for submitting as-laid drawings.
9. Identify any potential site hazards or constraints (such as existing network considerations, including protection, diversion or renewal).
10. Confirm that access is approved relative to any land rights, statute and third-party consents.
11. Contact details.
12. An indication of when any new service connections are required by and if any new property is to be fed from the network.
13. Confirmation that the agreement has been signed by all parties.
14. Completion and issue by the SLP and/or developer and/or mua Water of all risk and method statements relative to design and/or construction activities.
15. Arrangements for coordination of activities.
16. Arrangements for supply of proof of WIRS Accreditation, personnel qualifications and/or certification documents (ie Hygiene Code of Practice).
17. Arrangements for water sampling and requirements for certification and accreditation of results, pressure testing and disposal of water.
18. Arrangements for mua Water approved standpipe supply if required.
19. Confirmation of all required regulatory requirements, arrangements, permits and consents relative to the construction, flushing (and any future arrangements to maintain water quality), and commissioning of the self-lay works.
20. Confirmation of any requirement for a mua Water post-commissioning check sample by mua Water in accordance with the code procedures.
21. Arrangements and contact details for future management of defects and/or damage following adoption.
22. Confirmation of how the SLP proposes to demonstrate to mua Water that the materials and products intending to be used (and on completion of work all actual materials used in case of divergence from the intended list) in the installation of self-lay works complies with Regulation 31 of The Water Supply (Water Quality) Regulations before any work begins. This confirmation may consist of the SLP providing the Regulation 31 appropriate identifier relative to the materials proposed.

Appendix 4: Document reference library

WISs and IGNs

Number		Title
WIS	4-08-02	Specification for bedding and sidefill materials
IGN	4-37-02	Design against surge and fatigue conditions for thermoplastic pipes
IGN	4-01-03	Guide to Pressure Testing of Pressure Pipes and Fittings for use by Public Water Suppliers
IGN	4-08-01	Bedding and sidefill materials for buried pipelines
WIS	4-08-02	Specification for bedding and sidefill materials
WIS	4-21-02	Mechanical couplings and repair clamps for iron pipes for the conveyance of cold potable water (underground use) for the size range 40 to 1600mm
WIS	4-22-02	Specification for ferrules (tapping tees) and ferrule straps for underground use
WIS	4-23-04	Specification for underground stop valves, including spherical valves, for potable water services for nominal sizes up to and including 63 and nominal pressures of 10 bar minimum and made principally of metal or thermoplastics.
WIS	4-52-03 & 4-52-03A	Specification for Anti-Corrosion Coatings on Threaded Fasteners. See also amendment 4-52-03A
WIS	4-32-08	Specification for the fusion jointing of polyethylene pressure pipeline systems using PE80 and PE100 materials.
WIS	4-32-11	Specification for thermoplastic end load resistant mechanical fittings for polyethylene pipes of nominal size < 63mm. Note with outside diameters to BS 5556 (metric)
WIS	4-37-01	Specification for boundary boxes for the metering and control of domestic and small industrial water services.
WIS	4-32-16	Specification for butt fusion jointing machines.
WIS	4-37-01	Specification for boundary boxes for the metering and control of domestic and small industrial water services (see also British Standards).
IGN	4-37-02	Design against surge and fatigue conditions for thermoplastic pipes.

IGN	4-50-03	Operating guidelines for the use of site-applied, factory-applied, and reinforced factory-applied polyethylene sleeving on ductile iron pipeline systems.
IGN	4-51-01	External zinc coating of ductile iron pipe.
WIS	4-52-01	Specification for polymeric anti-corrosion (barrier) coatings.
IGN	4-52-02	The use of polymeric anti-corrosion (barrier) coatings.
IGN	9-04-05	Report of the expert group on the risks of contamination of the public water supply by backflow at wras.co.uk

British Standards (BS) and BS EN Standards

Number	Title
BS EN 124	Gully tops and manhole tops for vehicular and pedestrian areas
BS 5834-2	“Meter chamber” - Boundary box - (and when for use in areas subject to occasional vehicular access relevant aspects of this BS apply) with anti-slip lid design to BS 7976 Part 2 Internal fitted NRV in accordance with WIS 5-11-01 (BS EN 13959 and shut off device rising-spindle with WIS 4.23.04.
BS EN 805	Water Supply – Requirements for systems and components outside buildings
BS 8588	Polyethylene pressure pipe with an aluminium barrier layer and associated fittings for potable water supply in contaminated land. Size 20 mm to 630 mm
BS 8561	Specification for mechanical fittings for use in the repair, connection and renovation of pressurized water supply pipelines. Requirements and test methods
BS EN 545	Ductile iron pipes, fittings, accessories and their joints for water pipelines. Requirements and test methods.
BS 750	Specification for underground fire hydrants and surface box frames and covers.
BS EN 805	Water supply. Requirements for systems and components outside buildings.
BS EN 806	Specifications for installations inside buildings conveying water for human consumption. Operation and maintenance.

BS 042-2.2 1983 & ISO 7145 1982	Measurement of fluid flow in closed conduits and determination of flow rate of fluids in closed conduits of circular cross section – Method of velocity measurement at one point of cross-section.
BS EN 1295	Structural design of buried pipelines under various conditions of loading. General requirements.
BS 3251	Indicator plates for fire hydrants and emergency water supplies. Part 1: Hose Reels and Foam Inlets.
BS 9295	Guide to the structural design of buried pipelines.
BS EN 12201	Plastics piping systems for water supply, and for drainage and sewerage under pressure. Polyethylene (PE). General. Part 2: Pipes. Part 3: Fittings.
BS PD 855468	Guide to the flushing and disinfection of services supplying water for domestic use within buildings and their curtilages.

Other documents

Title	Version
Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites	10/WM/03/21
Civil Engineering Specification for the Water Industry (CESWI) together with any mua Water amendments, published on the mua website with DCS	7 th Edition or later
Guidance note on notification of methods of reinstatement using EToN available at hauc-uk.org.uk	2009/03
Contaminated Land Assessment Guidance: Protocols published by agreement between Water UK and the Home Builders Federation, available from Water UK	January 2014
Water UK/HBF National Joint Committee 2014, available from Water UK	2014
Streetworks UK (formally National Joint Utilities Group) Guidance Publications, available from streetworks.org.uk	Volumes 1 – 6
Principles of Water Supply Hygiene & Technical Guidance Notes, available from Water UK	
Drinking Water Safety - Guidance to health and water professionals, available from Defra	2009

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Polyethylene and PVC pipe and fittings specifications, available from the British Pipes Federation	
CIRIA Trenching Practice, available from ciria.org	Second edition, 1983
Guide to the design of thrust blocks for buried pressure pipelines, available from ciria.org	Report 128, 1994
Avoiding danger from underground services, available from the HSE	HSG 47
Specification for the reinstatement of openings in highways, available from the Department for Transport	Third edition, 2010
Water supply to domestic fire sprinkler systems, available from Water UK	June 2015