Design and Construction Specification
For Southern Water Services Limited

December 2020
Version 3

from Southern Water

Content

1. Scope

This document has been prepared to assist practitioners with the planning, design, construction and commissioning of a Self-Laid Main and Service Pipes to supply domestic and industrial/commercial properties.

It has been prepared to meet the requirements of the Code and is a template document. The contents of this template are mandatory but there remain a number of areas where there will be variations between individual Water Companies.

This template indicates where there is scope for variation and each Water Company will complete those parts of the document and publish a Water Company specific version on its website. That version will govern the requirements in that Water Company's area.

This document should be read in conjunction with the Water Sector Guidance which can be found on Water UK's website at https://www.water.org.uk/technical-guidance/developers-services/water-asset-adoption/

Over time, it is envisaged that work will be undertaken to reduce the scope of variation between each Water Company's versions of this document. This will be done through change requests presented to the Water Adoption Code panel (details of which can be found on the Water UK website).

2. Responsibilities

An SLP and/or Developer wishing to design and/or construct a Self-Laid Main shall comply with the DCS.

It is the responsibility of the Water Company to ensure that the relevant sections of the DCS conform to its design standards, completing the sections highlighted in yellow with their own parameters and inserting text where instructed by the square brackets. Completing these sections will create the Water Company's Design and Construction Specification document which shall be published on the company's website and which form a contractually binding part of the Water Adoption Agreement.

Within this document the words "include" and "including" 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. Charging

Water Company charges for work relating to the adoption of water assets are based on the Water Company's published charging arrangements.

Funding of any work over and above that which is required to supply a Site (including Network Reinforcement) shall be in accordance with Ofwat's Charging Rules and therefore any work of this type shall be identified during the design stage and funded appropriately by the Water Company.

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	(PE100) High Performance Polyethylene
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	(PE80) medium Density Polyethylene
NCO(W)	Water Network Construction Operations
NRSWA	New Roads and Street Works Act
NVQ	National Vocational Qualification
OFWAT	the Water Services Regulatory 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	Poly Vinyl Chloride
SDR	Standard Dimension Ration - Outside diameter / Wall Thickness
COMPETENCY	Safety and Technical Competency
TA	Technical Advisor
WIA	Water Industry Act
WIRS	Water Industry Regulation Scheme
WIS	Water Industry Specifications
WRAS	Water Regulation Advisory Service

6. Nomenclature

v	-	Volume, Litres
A	-	Area, metres squared
V	-	Velocity, metres per second
Q	-	Flow, litres per second
t	-	Time, in seconds
P	-	Pressure, in Bar
H	-	Static Head, in metres
hL	-	Head loss due to Friction, metres
L	-	Length in metres
G	-	Gravitational acceleration, ms-2
D	-	Diameter, millimetres
i	-	Hydraulic Gradient, metres per metre
θ	-	Kinematic viscosity of fluid, m^2/s
Ks	-	Effective roughness value, millimetres
Qt	-	Design Flow, l/s
LU	-	Loading Units
E	-	Equivalent length, metres
Ω	-	Soil Resistivity, Ohm -cm

7. Reference Documents

See Appendix 1 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 here:

https://www.lr.org/en/utilities/water-industry-registration-scheme-wirs-wirsae/search/

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

8.1. General

The relevant sections of the CDM Regulations (2015) apply to all design works carried out by or on behalf of the Water Company – both the Water Company's representative (Approving Design Engineer) and the SLP's representative (SLP Designer) are Designers under CDM Regulations when the design of Self-Lay Works is being generated and accepted for adoption. 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. The Client (Developer) has a 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 CDM Regulations (2015) it is expected that, prior to release for construction, the SLP Designer shall:

- Ensure that the design avoids or addresses at source foreseeable risks to health and safety
- Give priority in the design to measures which 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 which may affect the health and safety of persons during construction and during any subsequent maintenance operations
- Make the Water Company aware of any non-standard method of operation applicable to the Self-Lay Works
- Record non-standard residual risks including chemical or oil pipeline crossing, working at height which cannot be designed out, in the project file, and a copy passed to the Principal Designer and Water Company
- Co-operate 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.

A design which is prepared or modified outside Great Britain, for use in work to which CDM 2015 applies, must comply with “Regulation 9 – Duties of Designers” and the person who commissions the work is responsible for ensuring 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 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) has to 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

On occasion Water Companies may produce indicative design drawings relative to the proposed Site layout for costing, routing or tendering purposes.

Where this is the case the design drawing should be clearly marked as “Not for Construction” and/or an accompanying document produced which states precisely what has been considered when producing that layout drawing. The Water Company shall detail any services supplied and the rates chargeable in its published Charging Arrangements.

8.3. Non-Contestable Work – Installation of District Meter or Pressure Reduction Equipment

Sites may require a Source of Water Connection from a high-pressure Water Main and, in such a case, the Water Company may require a pressure reducing valve or district meter installation as part of the Non-contestable Work and Services (typically with branch connection). In this instance, the Water Company shall assume Designer responsibility under CDM Regulations for this element of the work solely where it is off Site (outside of the site boundary) and out of scope of the contestable activity to be undertaken by the SLP. If this installation is required to be installed within the Site boundary due to the proximity of the Source of Water Connection, then design responsibility will be determined between the parties by written agreement.

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 the Water Company carry out this activity if the Water Company offers this service as a Local Practice under section 4.6 of the WSG. An application form available from the Water Company 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 determined PoC the connection is typically made by an under-pressure connection (UPC) to ensure disruption to existing customers is minimised. However operational considerations may dictate that the Water Company determines that an UPC is not suitable and that the connection will require a tee piece to be installed. This involves isolating the Network and cutting a section of the existing Network out to insert same, and additional valves may also be installed in conjunction, on the existing Network. Such a connection will be considered as Non-contestable work.

Where additional valves on the existing Network, typically installed at the same time as a connection involving cutting in to the existing Network are not specifically required in the design for the new Self-Laid Main (i.e. to supply a Site) but which the Water Company requires to be installed for operational reasons; then these valves shall be considered as Network Reinforcement work.

The Water Company may identify a supply need in respect of future development that means that it requires Network Reinforcement to be incorporated within the SLP’s design (e.g. via the planning system, local authority development plans or developer engagement). In these circumstances, the Water Company shall initiate discussions with the SLP when a Point of Connection (PoC) is issued, or at the earliest opportunity if a Point of Connection (PoC) has already been issued.

Similarly, where the Water Company identifies a need for the improvement or upgrade of the Network as part of the Self-Lay Works, the Water Company shall initiate suitable discussions with the SLP when a Point of Connection (PoC) is issued, or at the earliest opportunity if a Point of Connection (PoC) has already been issued. These requirements may be incorporated by agreement into the final SLP Accepted Design.

If an alternative PoC is required and is evident particularly during the early stages of design by the Water Company to a PoC (that may have been provided also by an SLP/Developer) for technical and/or supply reasons the Water Company shall provide the SLP designer with an explanation and identify related options and requirements.

If Network Reinforcement work is deemed necessary by the Water Company relative to supplying the Site this shall be identified by the Water Company to the SLP and/or Developer during the initial design stage; and considered by the SLP designer in designing the layout of the Self-Lay Works.

The requirement for detailed design drawings and related information relative to design and/or construction activities shall be agreed between the parties to the WAA and included in Schedule1 of the WAA.

9.3. Annual Contestability Summary

9.3.1. This section contains information about how the Water Company assesses contestability of particular work categories.

9.3.2. Set out below at Table 9.3 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 it will be a Water Company specific variant of the standard template appearing at 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 on 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 on table 9.3 shall always be Contestable (i.e. 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 works 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 by agreement between the SLP and the Water Company and with reference to 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+/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 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 paragraph 17.3)				
	Work categories by number of properties potentially affected by work or strategic nature of Existing Main			
	>49	50-199	200-499	500+/Strategic main
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 071019 Water UK 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 design by others				
Assessment of network risk, & operating live network				
Commission telemetry links (meters / field equipment)				
Connection, commissioning and/or decommissioning of diverted Network				

Key:

	Work can be carried out by SLP, NAV or SWS
	Work can be carried out by SLP, NAV or SWS; SLPs and NAVs will require our authorisation, subject to caveat.
	Work can only be carried out by SWS

Additional Requirements:

An SLP or NAV will need to hold the correct accreditation to undertake the following:

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)*

When an SLP or NAV undertakes the above activity the following requirement will also need to be met:

- The connection to the Existing main is up to 32mm and forms part of a self-lay mains laying scheme.

* 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 potential impact of work on key customer such as a hospital
4 See further paragraph 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 The Water Company 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 Water Company's 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; of an under-pressure type connection and/or, 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 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 the Water Company (and therefore forms part of the Network), then such connections are excluded from activities shaded green.

9.5 Activities shaded amber in the ACS

9.5.1 The activities shaded amber 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 paragraphs set out how publication of such information is to be approached.

9.5.2 The Water Company may require additional evidence of competence to carry out activity and/or require the SLP to follow an operational process equivalent to one that the Water Company's direct labour or term contractor would be required to follow.

9.5.3 The Water Company's requirements will relate to the specific Site and will take account of 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 to water quality. These requirements will

be equivalent to those that the Water Company'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 the Water Company 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 Water Company requirements relative to valve operation in relation to commissioning of Self-Lay Works, a contestable activity shall apply as set out in in paragraph 11.7

9.5.7 The Water Company 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 Water Company's website.

9.5.8 10 days prior to any connection to any water main, the SLP shall submit a relevant risk management plan and method statements to the Assistant Project Manager (APM) via selflay@southernwater.co.uk the APM will liaise with colleagues within our Operations team to understand any network risk or customer impact from the connection being made.

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 the Water Company directly to determine whether conditions can be agreed that enable the SLP to carry out the requested activity

9.7 Design Submissions to Water Company

Design submissions shall be submitted to the Water Company 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 the Water Company following discussion between the Water Company and SLP upon the issue of a Design Acceptance.

Southern Water operates in a water stressed region and is keen to work with developers and incentivise them to build new homes that are water efficient. Our aim is to reduce the average amount of water used by our customers to 100 litres per person per day by 2039. Currently our existing customers use about 130 litres per person per day on average. When new homes are built with water efficient fixtures and fittings that will achieve average water use of 100 litres per person per day, the water Infrastructure Charge will be waived. We will measure this against the current optional Building Regulations standards, to take a consistent approach. At application stage, evidence of the property construction to the optional Building Regulations standard shall require to be provided to secure the discount.

9.8 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 paragraph 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 the Water Company. Any Water Company 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 the Water Company 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 with the SLP any pipe size methodology where this is requested by the SLP.

9.9 Drawing Standards

The Water Company 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 the Water Company electronically in both CAD and PDF format, by agreement with the Water Company, for incorporation into the Water Company's corporate geographical information system (GIS).

Design drawings shall show all asset locations, size and specification in a clear and unambiguous format. Should enlargements, blow ups or schematics be required in order 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 and highest point of the site including Site topography can be provided separately
3. Proposed Self-Laid Mains, including 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 Water Company).
7. The Self-Lay Works and Water Company 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 Site as identified by the Water Company or 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 the Water Company. Water Companies will justify differences in documentation requirements between the requisitioned and Self-Lay schemes.

9.10 Drawing Legend

The drawing legend shall contain:

1. SLP contact details
2. Developer contact details
3. Company carrying out the design (if different to 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. Water Company reference number
12. Approval status i.e.
    a. Proposed design (not for construction)
    b. Water Company approved design (not for construction)
    c. Approved for Construction)

9.11 Design & 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 Water Company Design shall be considered a Significant Variation. The Parties shall comply with the process in clause 19 of the WAA (Variations).

9.11.1 Minor Variations

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 i.e. 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 methodology of pipe size determination.

10.1 Permitted Pipe Diameters, Pressure Ratings and Permissible Materials.

PE100 Pipe
PE80 Pipe
PE/AL/PE PE80 Type A Barrier Pipe
PE/AL/PE PE100 Type A Barrier Pipe
Class 40 Cement Lined Ductile Iron (subject to hardness test)

High performance polyethylene pipe is Southern Water's preferred pipe material of choice (PE100) with medium density polyethylene (PE80) to suit on diameters of 63mm and less. PEB (barrier) pipe shall be used where contaminated land is identified in proximity to new water mains. Ductile Iron will be considered depending on Site specific criteria but the use of such shall require to be approved by Southern Water during the design stage.

The below table specifies the Water Company's accepted size and minimum pressure ratings for water pipes. Requests to use sizes and materials other than those listed below must be approved by the Water Company.

Size	Material	Pressure Rating
25mm	PE80 – light blue colour	12.5 bar
32mm	PE80 – light blue colour	12.5 bar
63mm	PE80 – light blue colour	12.5 bar
25mm	PE80 – barrier pipe	12.5 bar
32mm	PE80 – barrier pipe	12.5 bar
63mm	PE80 – barrier pipe	12.5 bar
90mm	PE100 – dark blue colour	10 bar
125mm	PE100 – dark blue colour	10 bar
180mm	PE100 – dark blue colour	10 bar
225mm	PE100 – dark blue colour	10 bar
315mm	PE100 – dark blue colour	10 bar
90mm	PE100 – barrier pipe	10 bar
125mm	PE100 – barrier pipe	10 bar
180mm	PE100 – barrier pipe	10 bar
225mm	PE100 – barrier pipe	10 bar

315mm	PE100 – barrier pipe	10 bar
80mm	Ductile Iron (class C40 – 300mm)	Site specific during design stage to manufacturer guidelines
100mm	Ductile Iron (class C40 – 300mm)	Site specific during design stage to manufacturer guidelines
150mm	Ductile Iron (class C40 – 300mm)	Site specific during design stage to manufacturer guidelines
200mm	Ductile Iron (class C40 – 300mm)	Site specific during design stage to manufacturer guidelines
250mm	Ductile Iron (class C40 – 300mm)	Site specific during design stage to manufacturer guidelines
300mm	Ductile Iron (class C40 – 300mm)	Site specific during design stage to manufacturer guidelines

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 in 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 the Water Company relevant to the design of mains and services for a Site and/or a Development.

(Water Companies' Charging Arrangements shall be referred to in relation to the provision of more than a single feed into a Site and/or a Development and/or relating to upsizing of proposed Self-Lay Works).

If the Water Company identifies a need for the betterment of Network or associated activity required on the existing network and has agreed with the SLP that they will undertake this work, or part thereof, then this proposal shall be shown as part of the detailed design of the Network and Service Pipe to supply the development.

The sizing of pipes for indicative design purposes (e.g. for cost estimates or tendering) may be done using a simple table method for number of properties. However no reliance shall be placed on this indicative assessment for the purposes of any final design as pipes shall be designed in accordance with the principles and criteria stated below.

Southern Water typically uses water network modelling to calculate frictional losses through pipes, junctions, bends, reducers etc. using the underlying Colebrook-White equation for the sizing of water mains.

Design roughness value 'k' shall be estimated according to Southern Water methodologies i.e. taking into account pipe material, lining, etc. Also, k-value for fitting/valve can be obtained from performance curve specified by a supplier.

10.3 Indicative Pipe Diameter Selection

As an indicative initial assessment of the water network pipe size requirements for a Site, Table 10.3 may be used to determine the size of pipe to supply a given number of residential dwellings. It may also be used as a method of determination of Source of Water requirements on the existing Network.

When a Water Company requires to deviate from these guidelines in determining a suitable PoC (e.g. inadequate capacity in the Network or site-specific constraints including the condition of existing assets) then such additional work would be categorised as Network Reinforcement and funded by the Water Company in accordance with 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	90mm	80mm
95-300	125mm	100mm
300-700	180mm	150mm

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

For all developments the Designer shall consider and incorporate spine mains as necessary to allow for additional development or phases of development which are to be connected ideally to at least two points on the Network. The Water Company shall make available information during this discussion and an assessment and advice shall be provided to the Designer of any Network Reinforcement to be considered in a Site design.

Note: Notwithstanding that more than one connection point into a Site may be designed (e.g. for mitigation of future supply risk) only one of these shall be designated as the Point of Connection of supply to the Site as required by the Sector Guidance). Any additional work over and above that which is required to provide the Site with a water supply shall be categorised as Network Reinforcement and funded by the Water Company in accordance with its Charging Arrangements.

10.4 Domestic Hydraulic Demand Calculations

In this section the Water Company shall specify the following constants:

X = Average demand per capita
Y = Average household occupancy rate
Z = Peak flow factor

We do not typically use alternative constants to that detailed under and/or use other related considerations for design.

Demand per capita per day shall be taken as 125 Litres unless evidence to the contrary is provided for the specific development.

Calculation for household occupancy shall be taken as 2.4 persons per household on average unless evidence to the contrary is provided for the Site.

Average daily demand (ADD) per household is therefore 125 x 2.4 = 300Litres/Property/Day.

To account for diurnal variation over 24 hours a Peak Flow Factor for domestic scenario shall be taken to be 2.27.

Peak Demand may be calculated then by multiplying the average daily demand (ADD) per household by the peaking factor.

A site of 'n' Domestic units has average daily demand in litres of 300 x n l/day.

This must be multiplied by the peaking factor of 2.27. Therefore peak demand in litres per second can be estimated at (n x 300 x 2.27) ÷ (24*60*60) = Peak demand in l/s

It should be noted that optimum design should consider average day peak week (ADPW) or critical period demand factors in order to account for the maximum demand in a critical period. The ADPW or critical period factors can vary from one zone to another; as a result should be obtained from SW prior to designing infrastructure/non-infrastructure assets.

Total number of properties/flats in multi-storey residential/domestic buildings should be calculated accurately. Once the total number of properties is established, the methodology described above applies.

10.5 Calculations for Multi-Occupancy Building and Industrial and Commercial Domestic Use

Alternative methodology or peaking factors for different build types such as flats, retail units, etc.

	Property / Use Classification	Value	Totals (calc.)	Unit / Calculation
1	**INDUSTRIAL**	-	-	-
	Area Based Demand	-	-	-
	Area Coverage (data provided)	-	-	Area (m2)
	Class B1/B2 - Businesses & General industrial use	40	-	m^2/person (area based demand). Use this to calculate the number of persons.
	Class B1 high tech	25	-	m^2/person (area based demand). Use this to calculate the number of persons.
	Total no. of people	-	-	No. (Calculated from total area (m^2) / 1 person per m^2)
	Class B1/B2 - PCC	100	-	l/person/day (apply this PCC after calculating the number of persons)
	Industrial peak factor	**2.25**	-	Factor

	Property / Use Classification	Value	Totals (calc.)	Unit / Calculation
	Industrial average demand (total)	-	-	**l/s (l/person/day x No. people) / 86400**
	Industrial peak demand	-	-	**l/s (Avg. demand x peak factor)**
	Direct Demand ***If direct demand is provided please apply a 10hr profile to derive diurnal variation. Direct demand can be given as average flow per day (l/s, m3/hr) or peak flow (l/s, m3/hr).***			
2	**SCHOOLS (if no data is provided by the developer)**	-	-	-
	Primary School (x1)	0.23	-	l/s (average demand) **Assumptions (see Ref. 5 & 6)** - Average primary school size = 260 pupils. - 25 l/day per pupil and staff for small schools; rising to 75 l/day per pupil and staff in large schools. This is calculated based on 75 l/day per pupil and staff.
	Secondary School (x1)	0.79	-	l/s (average demand) **Assumptions (see Ref. 5 & 6)** - Average secondary school size = 910 pupils. - 25 l/day per pupil and staff for small schools; rising to 75 l/day per pupil and staff in large schools. This is calculated based on 75 l/day per pupil and staff.
	*University (more detail required to estimate number of students, type of accommodation etc.)	-	-	l/s (average) In the absence of data use the estimated demand for secondary school.
	School peak factor	**2.23**	-	Factor
	School average demand (total)	-	-	***l/s (calculate total if applicable)***
	School peak demand	-	-	***l/s (Avg. demand x peak factor)***
3	**HOTELS, PUBS & CLUBS**	-	-	
	Residential Training/Conference Guest (inclusive all meals)	350	-	l/person/day
	Holiday camp chalet resident	227	-	l/person/day
	Students (Accommodation only)	100	-	l/person/day
	Total no. of people (data provided)	-	-	No.

	Property / Use Classification	Value	Totals (calc.)	Unit / Calculation
	Hotels/Pubs/Clubs Peak factor	**2.75**	-	Factor
	Hotels/Pubs/Clubs average demand	**-**	**-**	***l/s (l/person/day x No. people) / 86400***
	Hotels/Pubs/Clubs peak demand	**-**	**-**	***l/s (Avg. demand x peak factor)***
4	**LEISURE RECREATIONAL SITES**			
	Direct Demand	-	-	
	Amusements	0.03	-	l/s (Avg. demand)
	Arena / Stadium	0.87	-	l/s (Avg. demand)
	Cinema/Conference Centre/Theatre/Bingo	0.07	-	l/s (Avg. demand)
	Campsite Caravanning	0.17	-	l/s (Avg. demand)
	Peak factor (Recreation)	1.4	-	Factor
	Average demand	**-**	**-**	***l/s***
	Peak demand	**-**	**-**	***l/s (Avg. demand x peak factor)***
5	**HOSPITALS & RESIDENTIAL CARE HOMES**			
	Residential old people / nursing	350	-	l/person/day
	Small hospitals	450	-	l/person/day
	Total no. of people (data provided)	-	-	No.
	Peak factor	2.75		Factor
	Average demand	**-**	**-**	***l/s (l/person/day x No. people) / 86400***
	Peak demand	**-**	**-**	***l/s (Avg. demand x peak factor)***
6	**COMMERCIAL OFFICE, RETAIL PARK, WAREHOUSE**			
	Area Based Demand	-	-	
	Area Coverage (data provided)	-	-	Area (m^2)
	Class A1 offices or retailing	25	-	m^2/person (area based demand)
	Warehouse	120	-	m^2/person (area based demand)
	Class A1 - PCC	50	-	l/person/day
	Total no. of people	-	-	No. (Calculated from total area (m^2) / 1 person per m2)
	Peak Factor	**2.25**		
	Average Demand	**-**	**-**	***l/s (l/person/day x No. people) / 86400***
	Peak Demand	**-**	**-**	***l/s (Avg. demand x peak factor)***

10.6 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.

10.7 Pressure and Flow

10.7.1 Source Pressure

For the purposes of designing the network, the SLP shall check with the Water Company 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 the Water Company a workable solution is to be agreed between the Parties.

10.7.2 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.

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

In normal operational circumstances 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 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 the Water Company's standard pressure rating to allow standard System Test Pressures (STP) to be adjusted on site.

10.7.3 Velocity

Minimum velocities in all mains shall reach $0.3ms^{-1}$

Maximum velocity in Mains shall not exceed $0.75ms^{-1}$

10.7.4 Calculating Headloss through the Network

For newly designed and constructed Water Mains headloss per km shall not exceed 3mH.

10.7.5 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 the Water Company.

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.

10.8 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 link in Appendix 1.

10.8.1 Ground contamination during construction

When contamination is suspected during 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 the Water Company and 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 the Water Company before work recommences.

The SLP shall ensure that all employees are trained and able to undertake the appropriate actions when working in 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.

See the Schedule of Permissible Materials and construction in paragraph 21 for any additional considerations applying.

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 Water Company required approvals have been obtained and that a pre-start meeting between the Parties has occurred when one has been requested by reference to paragraph 24.

11.3 Routing and Positioning Principles

Where the Self-Laid Main is to be laid within an adopted highway, a street, or a dedicated service strip, it should be laid in accordance with the latest Streetworks UK good practice guidance (Volumes 1 to 6) unless the Water Company has indicated its preferred routing and positioning of the Self-Laid Main and Service Pipe. In this case, the Water Company's requirements shall be incorporated into the design by the SLP Designer. Any requirement for preferred routing and positioning will typically be associated with technical requirements that includes future access to assets for maintenance and/or repair. Where the Water Company requests a change to the route due to it not meeting their specific requirements, the costs incurred will be payable by the Water Company. Any such variation will need agreement with the SLP and Developer before works proceed.

See additional information and relevant criteria in paragraph 22.

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

Designs for the installation of Self-Laid Main and/or Service Pipe(s) in shared driveways (i.e. where multiple plots are to be supplied) shall be in accordance with the Water Company's criteria.

See additional information and relevant criteria in paragraph 22.

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

Any easements required will be obtained by the Water Company (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 the Water Company and be entered into before 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-Laid Main and Service Pipe shall not restrict or compromise that Self-Laid 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, 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 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 3-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 the Water Company in the table below:

Nominal Pipe Size mm	Min Proximity required (m) from centre line of Water Main
< 250 mm	2.5m (to be agreed at design stage)
250 – 299 mm	2.5m (to be agreed at design stage)
300 – 449 mm	3m (to be agreed at design stage)
> 450 mm	3m (to be agreed at design stage)

Table: 11.1 Minimum strip width required for varying pipe diameters.

See also paragraph 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 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 the Water Company, and no Self-Laid Main or Service Pipe shall be connected to the Network until all conditions precedent within the WAA have 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.

The Water Company preferred installation depth (cover to crown of pipe) is be 900mm, unless approved by Southern Water during the design phase for new Self Laid Mains.

11.5 Water Quality Considerations

In accordance with the Principles of Water Supply Hygiene and related technical guidance the SLP shall ensure that the Developer and the SLP ensure demand sufficient to allow adequate turnover of water following commissioning of any new Self-Laid Main in order to protect water quality.

Where possible, Development spine roads shall be serviced with two-way fed ring mains to maintain water quality across the Site. The Water Company and SLP Designer shall consult on such proposals and the SLP Designer shall incorporate the Water Company 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 paragraph 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 to and for disposal of said water and whether water is required to be de-chlorinated prior to disposal.
Only standpipes that have been approved by the Water Company shall be used (details of such may be published on the Water Company website).

Operation of valves: The Water Company's specified standards in paragraph 11.7 below for 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

See also the Schedule of Permissible Materials and construction in paragraph 21.

Line valves shall be installed to restrict the number of consumers isolated by a pipe failure. As a general guide, it should be possible to limit the loss of supply to no more than circa 50 properties. Where practical, valves should be located at tee installations in preference to inline valves.

Where a dead end on a main is unavoidable it shall have a washout facility. A washout or hydrant sited as close as possible beyond the last service connection may serve this purpose. Washouts shall be installed at either side of closed boundary valve (typically as per washout-valve-washout arrangement) to enable flushing of both mains in the event that the boundary valve requires opening.

The frequency of customer connections on distribution mains usually makes it unnecessary to install air valves but typically air valves will be required in the following situations:
On long distribution mains feeding rural areas,
On local high points such as bridge crossings,
At high points on the main which are above the level of the local service connections.
In new systems most new connections are fitted with check valves at the boundary with the meter boundary box. There may however be a requirement to provide venting points when emptying or drawing down water mains for repairs.

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

Isolation of mains associated with any planned interruption requiring a shut to an Existing Main valve may be carried out by the Water Company and/or by an SLP subject to the SLP persons involved in the Site works having been authorised by the Water Company to undertake this activity. The Water Company will take into account specific Site constraints or considerations that may impact on the end user customer and/or water quality.

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

See also the Schedule of Permissible Materials and construction in paragraph 21.

For sluice valves installed on water mains typically on mains of 450mm dia. or greater the valve is to include an integral bypass (to reduce pressure differentials) – which is to be identified during the design stage.

The top of the valve spindle is to be positioned between 200mm – 300mm of the cover level of the chamber cover.

Valve closing directions within our Water Company area are left-hand closing (anti-clockwise) and all new valves to be installed by an SLP shall be left-hand closing (anti-clockwise closing.

The Water Company to insert its policy on valve operations by third parties (See under).

The SLP shall not be permitted to operate existing valves on our existing system unless the following conditions have been satisfied;
Operatives have received and passed our Safe Control of Operations (SCO) training.
SCO authorisation procedures have been complied with.
Site specific constraints or considerations have been assessed by us relative to valve operation by any party.

Note: Depending on Site specific or our operational requirements applying (being relative to the Site or to a wider area) we may not authorise valve operations notwithstanding that the above bullets have been complied with. In such circumstances we will endeavour to promptly consider and action any request for a valve operation by us that may be possible.

Care shall be exercised to locate valves in positions where they can be operated safely, allowing adequate space to rotate the tee-bar. Wherever possible, valves shall not be located in busy highways or junctions.

The location of line valves shall be during the design process to ensure that the locations are operationally acceptable.

Consideration shall be given to the use of bypasses where it is necessary to provide a ready facility for disinfection of a newly installed or modified water-main, or where larger valves are fitted.

11.8 Washout and Fire Hydrants

a. See under for Southern Water's hydrant preference and also the Schedule of Permissible Materials and construction in paragraph 21.

b. All new fire hydrants shall be of the through-bore type. Fire hydrants are to be installed on mains with and internal diameter of 80mm or greater. Washouts installed on mains of internal diameter less than 80mm are not used as fire hydrants.

c. Hydrants shall be centralised in the chamber and aligned vertically so that the operation of the spindle and installation of a standpipe by the fire authority is not compromised. All hydrants shall comply with British Standards and be of the 2.5 inch stainless steel London round thread and shall be right-hand (clockwise) closing.

d. All hydrants shall be rated at 16bar continuous operating pressure. The design flow capacity shall not be less than 2,000 litres/minute at a constant pressure of 1.7bar at the outlet.

e. All nuts and bolts incorporated into a hydrant assembly shall be of a corrosion resistant material or else coated according to WIS 4-52-03.

f. Hydrants are owned by the local fire authority once commissioned but maintained by Southern Water under an agreement with the fire authority.

g. Covers and frames: shall comply with British Standards. There shall be two prising inserts and lifting keyholes in a permanent non-rock design cover and frame with a single lid only (i.e. not split).

h. The chamber shall have a minimum clear opening of 230mm x 380mm and the sections shall be of pre-cast concrete or of an equivalent recycled composite material subject to Southern Water approval.

i. Where a main comes to a terminal point a terminal fire hydrant may be installed on mains 80/90mm and above, but any main smaller than 80/90mm shall have a washout specified for flushing purposes as fire hydrants are not typically requested by the fire authority on such sized mains.

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.

Air valves shall be installed in chambers that are able to drain or where this is not possible the air vent must be at a level higher than water could rise to in order to prevent potential contamination.

11.10 District Metered Areas and Boundary Valves

District meter locations shall be agreed with the Water Company. If no information is available, then as a rule where the design exceeds 750 domestic properties in size or a development size of 750 properties then a DMA meter is likely to be required. See also paragraph 8.3.

Shut valves will need to be installed if a Site is fed by two separate DMAs via two Source of Water Connections. In this instance their requirement and location shall be agreed at the design stage with the Water Company.

11.11 Sustainable Drainage Systems (SuDS) Considerations

SLP Designers 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 Self-Laid Mains 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 (see also paragraph 10.8).

11.12 Double Spade Valves

Southern Water does not accept the use of double spade valves and hence any proposed use of same shall only be permitted when we have provided prior approval.

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, the Water Company shall establish and confirm with the Developer/SLP the right of access and shall normally require an easement to be provided by the land owner. Examples of situations where Self-Laid Mains are not to be laid in a street are:

- Industrial and commercial Site where land is wholly owned by a singular 3rd 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 prior to commencement of works and in accordance with the Statutory Consents and Land Rights sections of the WAA.

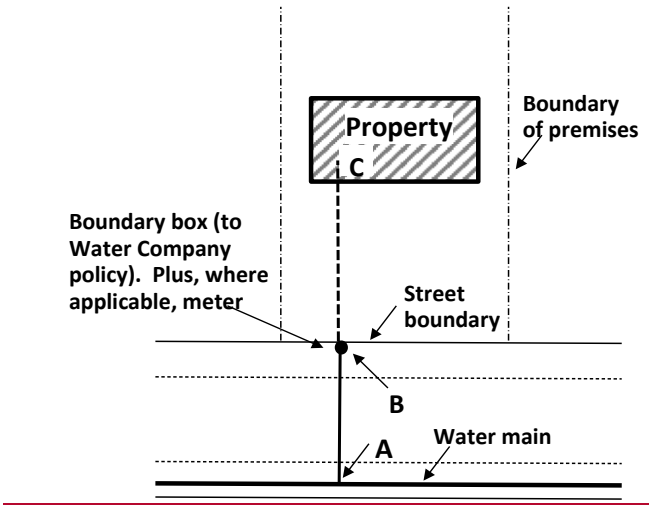
In accordance with the WAA, the Water Company shall obtain any required easements to protect its Network, or any future extension of such, and any related and/or incurred costs including third party costs shall be recovered by the Water Company in accordance with its published Charging Arrangements.

12 Service Pipe Design and Installation

Both parts of the Service Pipe shall be appropriately designed, and responsibility for design acceptance typically rests with the party responsible for its maintenance.

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	Water Company	Water Supply (Water Quality) Regulations 2016
Boundary box (plus, where applicable, meter)	SLP	Water Company	
B – C Supply pipe	Developer	Property owner	

Internal plumbing	Developer	Property owner	Water Supply (Water Fittings) Regulations 1999 and Water Supply (Water Fittings) (Amendment Regulations) 1999

Southern Water's policy, requirements 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 are detailed in the Schedule of Permissible Materials and construction in paragraph 21 and the Meter and Service Pipe Installation requirements in paragraph 22.

The supply pipe shall be the property owner's responsibility and shall conform to the Water Regulations and requirements of the Water Company.

12.1 Routing, Positioning and Location

The Water Company 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).

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 in accordance with 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 1.0 metre on each side of the boundary box.

Service Pipes being designed outside this range shall have special protective measures vetted and agreed by the 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 in accordance with industry standards.

Services to standard domestic properties shall be minimum 25mm internal diameter and capable of supplying required flow and pressure based on required demand.

Southern Water's required standard is to use high-performance polyethylene ("PE") material for all services subject to suitable ground conditions and the Water Regulations applying

Typically such have a pipe OD dia. range of 25mm – 63mm inclusive and our required standard is for PE80, which is light blue in colour.

It is important not to over-size service pipes as this may affect water quality.

When service pipes are proposed in areas of low water pressure but are longer than 30m from the point of connection with the supply main, or are support sprinklers (domestic), or to be used to assist fire-fighting (non-domestic), consideration should be given to the proposed service diameter.

When installing water services to flatted property the following table represents a guide, but is not be substituted for a full hydraulic assessment.

Number of Individual Dwellings	1	2	3 – 4	5 – 8
typical od – PE (mm)	25	32	63	63

Approved standard for service pipe connections:

a. Tapping saddles shall be of gun-metal.
b. A minimum distance of 300mm shall be maintained between service tapping's and there shall be no obstruction to future access to the tapping/connection with the main.
c. All tapping saddles shall be to BS2789 grade 500/7 and capable of withstanding pressures of up to 16bar.
d. Meter carriers and other integral fittings in a boundary box (domestic meter chamber) shall be WRAS approved i.e. gunmetal or brass.
e. All service pipe fittings shall be WRAS approved and in all ground conditions be protected against contamination, i.e. brass, copper, and/or gunmetal.
f. PE Electro-fusion top tees for service connections not exceeding 63mm outside dia. or internal dia. equivalent shall not be accepted without prior written approval from Southern Water.
g. Such approval shall typically only be considered relative to a service connection required to be made to a non-standard diameter main or to a PE 315mm main when it is not a trunk main; as typically service connections to trunk mains shall not be accepted.

12.4 Location of Boundary Boxes

Further policy and requirements on external boundary boxes and their location is detailed in the Schedule of Permissible Materials and construction in paragraph 21

In non-contaminated ground:-

Single, double, and/or multiple port manifolds boundary boxes can be used in conjunction with screw in meters. The boundary box (sealed type) must be able to incorporate a manifold meter with 1.5 inch tread, stop tap and non-return valve.

All boundary boxes must have height and slope adjustment capabilities and be WRAS approved.

- When sited where vehicular traffic will pass over the box the specification is for a trafficable surface box (typically grade B compliant with relevant aspects of BS 5834).
- The use of a 2 port or 6 port manifold box when the number of service pipes converging at an accepted location number is in excess of two services is a preferred standard.
- For single services: the current specification for a standard boundary box is a below ground boundary box with sealed telescopic plastic raised manifold'.
- For twin-port manifolds, our current specified standard is for a raised twin 25mm In/Out meter box plus the MB601297 water surface box adjuster.
- For 6-port multi manifolds our current specified standard is a below ground boundary box with rigid plastic base.

Additionally, for when in contaminated ground:-

- Boundary boxes (sealed type) used on contaminated sites shall comply with WIS-4-37-01.
- They shall be watertight and have gunmetal connection fittings that are able to accept either barrier pipe or plastic coated copper pipes.
- All internal parts (i.e. meter carrier, ferrule) shall be made of brass.
- Both 2 and6 port manifolds shall be made up from brass and copper and, when applicable, be sited in a suitably-sized chamber comprised of pre-cast concrete sections (or approved composite alternative).
- Our current specified standard is for a sealed telescopic gunmetal base manifold.

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12.5 Supplies to Multi Occupancy Buildings

Our policy on supplies to multi-occupancy buildings and details is provided in the Schedule of Permissible Materials and construction in paragraph 22.

12.6 Services to Multi Storey Buildings

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.

Our policy and requirements relative to this paragraph 12 in the Meter and Service Pipe Installation requirements in paragraph 22.

12.7 Additional Requirements for Supplies to Buildings Other Than Domestic Dwellings

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 for 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.

Our policy and requirements relative to this paragraph 12 in the Meter and Service Pipe Installation requirements in paragraph 22.

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.

The Water Company 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 paragraph 21, 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 to be compliant with CESWI and Water Fittings Regulations.

13.3 Indicator Posts and Marker Plates

Indicator Posts and Marker Plates to be compliant with CESWI.

13.4 Chambers and Covers

Water Company to detail Permissible Materials in paragraph 21. Chambers shall be designed and installed to be of an appropriate size to allow 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.

See our general arrangement drawings detailing standard assemblies, chamber size, covers included in paragraph 23.

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 the NRSWA 1919 the Specification for the Reinstatement of Opening in Highways (3rd Edition).

13.6 Reinstatement of Highway

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 highway accordance with Applicable Law.

13.7 Ducts

SLP Designers shall consult with the Water Company at Design Acceptance stage if ducts are required to be installed by a SLP/Developer.

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.

Service pipe ducting where extending into building to form part of the service entry must facilitate the installation of insulation to Water Fitting Regulations.

Mains shall be located on the side of the highway serving the most properties to minimise the total length and to minimise the number of communication pipes, such that where a crossing beneath a public road is required (long side communication pipe) a suitable service pipe duct shall be required.

Communication pipes beneath roads shall be laid in ducts wherever possible. These allow for future maintenance and repair to be undertaken on communication pipes while minimising disruption to a public highway. A maximum of two services shall be installed in any one duct. The location of ducts shall be recorded on design and As-laid drawings.

14 Metering Requirements

14.1 Standard Domestic Metering for Individual Dwellings and Multi Occupancy buildings

Our domestic metering policy is inserted under and the Meter and Service Pipe Installation requirements in paragraph 22

Separate individual meters are a requirement for all domestic and commercial properties and our default position covering the installation of meters is that they be sited externally at the boundary of the highway with the property that they are to supply.

In accordance with the Water Sector Guidance see also paragraph 19 for our specified Local Practice relating to meter requirements.

The specification for meter type and sizes we currently accept is detailed in paragraph 21. See published standard charges for the option of procuring meters direct from Southern Water.

The current specified type of meter and current supplier is as follows.

Supplier:

Arad Metering Services, 21 Marys Lane, Burghill, Hereford, HR4 7QL

Meter Type:

Automated Meter Reading (AMR) type screw in concentric 15mm or 20mm meter (Supplier ref: F389-10) and as listed under;

- 15mm 3G inline meter (equivalent pipe diameter 0.5 inch)
- 20mm 3G inline meter (equivalent pipe diameter 0.75 inch)
- 25mm (TAGUS) inline meter (equivalent pipe diameter 1 inch)
- 40mm inline meter (equivalent pipe diameter 1.5 - 2 inch)
- 15mm 3G Gladiator concentric (screw-in type)

Note: The SLP should refer to our current published charges arrangement for the latest specified meter type and supplier as the above is subject to periodic review.

Internal Meters (supplementary information);

When approved for installation by us (typically this would be identified by the SLP at the design stage) internal meters are to be 15mm or 20mm diameter unless otherwise accepted. All meters shall be installed in accordance with the manufacturer's instructions depending on flow through the pipe etc., and in accordance with the following type, and order of precedence:
Concentric "Gladiator" meter (screw in type, with internal manifold):

1. The installation of this is subject to the installation maintaining an adequate flow of water to the customer's premises as otherwise a 15mm inline meter is to be installed.

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 this plan shall be a location plan and a covering letter.

Water Companies to provide FRS contact upon request from an SLP.

The FRS have 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: https://www.water.org.uk/guidance/national-guidance-document-on-the-provision-of-water-for-firefighting-3rd-edition-jan-2007/
(See in particular those details referenced in Appendix 5 regards flow from fire hydrants)

15.3 Dedicated Fire Mains

Dedicated fire mains shall be designed and constructed in accordance with Water Supply (Water Fittings) Regulations 2016 and fitted with backflow prevention, spiral wrapping and appropriate marker tape.

15.4 Fire Sprinkler Systems

In the absence of any information from the Water Company, 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 on the UK Government Planning Portal at http://www.planningportal.gov.uk/buildingregulations/

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 one is required) relative to the Site and/or Development.

16 As Laid (As Constructed) drawings

The Water Company's asset data is typically recorded on a geographic information (digital mapping) or CAD systems. Therefore, it is important that accurate and compliant location information is supplied to the Water

Company in a format agreed with the Water Company and which shall be specified by each Water Company 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 the Water Company as per Level of Service measure S2/1b).

The “as-laid / as-constructed” installation shall be in accordance with the approved design and with any changes to same approved by the Water Company as any deviation not agreed by the Water Company from the approved design shall be a Defect and the Water Company may require such to be corrected prior to 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, and
- corners of boundary walls

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

- building lines, and
- kerb lines

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

Scaled survey drawings should be provided. The scale shall be to 1:500 (unless otherwise agreed with the Water Company) to ensure clarity of applicable measurement 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, tapping’s, 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 the Water Company' Schedule of Permissible Materials and construction.

Where a number of assets are installed adjacent to each other, suitable asset information (increased scale extracts) are 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 (e.g. 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 the Water Company 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 the Water Company 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, the Water Company may include further guidance in its Schedule of Permissible Materials and construction in paragraph 21.1 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 a 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 the Water Company's published guidelines in this DCS.

The Water Company 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 the Water Company who reserves the right to revert to a flushing regime operated and managed by the Water Company with costs recovered.

Prior to 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 in accordance with the Water Company requirements.

The SLP is responsible for ensuring that the Developer secures all required permits and agreements for flushing, identifies where water can be flushed to and disposed of and, where the Water Company is to undertake flushing, is able to indicate whether water is required to be de-chlorinated 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.
The Water Company 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.
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
90	80	3 inches	0.00502	5
125	110	4 inches	0.00950	9.5
180	158	6 inches	0.01960	19.6
225	198	8 inches	0.03079	31
250	220	8 to 9 inches	0.03801	38
315	278	11 inches	0.06069	61
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 new main to be commissioned and connected to existing water supply distribution network.

The following table details sample testing requirements.

Table 17.2: Mains Bacteriological Sampling

Test Type	Test Name	Section (a) – Group 1 Most new mains (that don't fall under Group 2)	Section (a) – Group 2*; New mains being commissioned in or using; • Contaminated Land • Ductile iron pipe • Cement lined pipe • Epoxy lined pipe	Section (c) - Connections to existing mains
Bacteriological tests (inc. taste and odour)	Coliforms	✓	✓	✓
	E.coli	✓	✓	✓
	Faecal Streptococci	✓	✓	✓
	Clostridia	✓	✓	✓
	22°C plate counts	✓	✓	✓
	37°C plate counts	✓	✓	✓
	Turbidity	✓		
	Qualitative Odour	✓	✓	
	Free & total chlorine residual	✓	✓	✓
	Appearance	✓		
	Qualitative Taste		✓	

All taking of samples 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 the Water Company.

All activities are to be carried out in accordance with Principles of Water Supply Hygiene & Technical Guidance Notes https://www.water.org.uk/guidance/principles-of-water-supply-hygiene/

Prior to accepting a request for any Final Connection to the Network, the Water Company 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, the Water Company may (at its own cost) undertake a check sample on the Main post Final Connection, prior to permitting any further connections (mains or services).

New mains and services shall be installed in line with the requirements of Water Company these include but are not limited to the detailed requirements for filling, swabbing, flushing, pressure testing, disinfection and sampling.

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 the Water Company 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 the Water Company to provide (at reasonable cost) any such support services.

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 water.org.uk/publications/wis-ign/general 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 the Water Company within a handover commissioning suite of information.

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

17.3.2 Pressure Testing and Disinfection (supplemental) of PE Water Pipelines, Services and Installations

All testing 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 Water Company requirements specified additionally in paragraph 21 Schedule of Permissible Materials and construction.

The following also applies:

1. On-site testing operations will be clearly identified using appropriate warning notice boards.

   See also paragraph 21 "Schedule of Permissible Materials and Construction".

2. Service test: 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 prior to this test being conducted.

18 Water Company Key Contacts

Please see the links to our published key contacts:
https://www.southernwater.co.uk/regulations-services/escalation
https://www.southernwater.co.uk/developing

19 Local Practices

By reference to the Water Sector Guidance, the Water Company may insert here a permitted local practice using the terminology in the WSG.

19.2 Meter Pairing and Commissioning

Applicable: Guidance to be confirmed.

19.3 Timing of the Generation of Plot Reference Numbers

Applicable: Guidance to be confirmed.

19.4 Water Company Design Service Offerings

Not Applicable: We do not currently offer this service.

19.5 Design Self-Certification Scheme

Not Applicable: We do not currently offer this service

20 Design and Construction Specification Appendices

21 Schedule of Permissible Materials and Construction

21.1 General

Southern Water's preference is for materials that are best suited to be integrated in to the existing Network so that a consistent operational, maintenance programme and a resilient Network is maintained and developed.

With the exception of meters, where, with regards to its metering operations work we require the exact same specification of meter type and supplier specified in paragraph 14 to be used, the SLP may use any Regulation 31 approved products provided that it can demonstrate to our satisfaction that such materials are to an equivalent specification to those currently installed by Southern Water.

Whereas the SLP is required to prove to Southern Water prior to commencement of the Self-lay Works that all materials and products are referenced relative to Regulation 31 if proposed materials are to be of an alternative to those we typically and currently install but are to an equivalent specification the change shall require to be agreed by us.

21.2 Civil Engineering Consideration additional information

a) Thrust Restraint and Anchorage

All elements of a pipeline or system should be designed for the highest pressure likely to be encountered and thrust blocks are no exception.
Mains constructed with flexible, unanchored, joints require restraint at changes of direction, tees, stop ends, tapers, and possibly valves. This includes the provision of puddle flanges into a design / work construction.

Anchorage is typically provided in suitable ground conditions by mass concrete thrust blocks designed to transfer the unbalanced thrust from the main to the ground, whilst spreading the load over a sufficient area to prevent overstressing of the soil.
In the event that the ground conditions are not suitable and/or are disturbed and therefore a mass concrete block is considered not suitable for the ground conditions present the thrust block will require being designed and constructed to suit all the conditions prevailing and proposed for development, to acceptable required standards.

The passive resistance of the ground is mobilised to resist movement of the thrust block and conventional analysis must be employed, taking into account the area of contact between concrete and soil dimensions, soil density, shear strength parameters, level of ground water, embedment depth, and surcharge.

The SLP shall provide Southern Water with detailed design proposals relative to thrust blocks, anchor restraints, and supports relative to the design and construction of the works, and is responsible for their design and construction to all applicable standards and specifications. This information shall be issued to us prior to commencement of work with sufficient time for it to be assessed, however we shall not approve the design or construction of thrust, anchor blocks, or anchor restraints as the SLP is responsible for such.

b) Self-Anchoring Joints

In the event that there is a potential for the stability of thrust blocks to be compromised then either anchored joints or more complex reinforced concrete stepped structures may be required to be designed and constructed, where the latter would transfer thrust to a lower, more secure and sustainable, ground level.

Where there is limited working space, anchor joints should be the preferred method of anchoring a pipeline, however designers shall demonstrate that a suitable constructability assessment has been undertaken. In all cases the designer must obtain confirmation from the manufacturer of the self-anchoring pipework system as to the lengths of self-anchored joints required either side of the bend or fitting being restrained.

Where a vertically orientated bend is required and where there is insufficient cover to provide the necessary mass of concrete above larger diameter mains, then the designer shall specify anchored joints or anchorage in the form of straps or rods tied down to reinforced concrete.
The designer should note fully rigid flanged pipework should not be installed below ground with the exception of some fittings.

When flanged pipework is installed below ground it should not be thrust restrained (ensuring that any flexible joints connected to the flanged pipework are adequately restrained).

c) DI Pipe Jointing

Pipelines constructed from ductile iron can be joined by push-fit, mechanically anchored flexible systems or, by flanges (when space is limited such that a thrust blocks may be eliminated, ground conditions are unsuitable, or the presence of existing services or there is a risk of disturbance of services) such that thrust blocks are unsuitable.

Flanges shall not routinely be used for below ground jointing applications due to lack of flexibility and propensity to allow leakage from pulled joints or breaks in the pipeline. The use of flanges as a joint shall therefore only be when the above paragraph applies and hence we have approved such prior to works commencing.

d) Jointing of PE pipe with butt-fused Joints (approved method)

All PE joints shall be butt-fused (up to and including 225mm outside diameter for straight lengths (sticks); and up to and including 180mm outside diameter for coils), including bends, tees, flanged spigot or all spigot and the like.

Pipes shall be externally de-beaded but there is no routine requirement for internal de-beading and the beads are to be safely stored by the SLP and provided to us relative to any audit checks, on request.

Note: Electro-fusion joints and/or mechanical joints shall not be accepted by us between pipes, pipes and bends, bends, tees, flanged spigots, and the like; except in exceptional site specific circumstances (i.e. to circumvent an obstruction or a constraint prevents butt-fusion) or when a specialised anchor joint is required.

Any exception to butt-fusion jointing shall be only when it has been agreed by us prior to installation work commencing.

Example: if two PE pipe coils to be joined the resistance may preclude butt fusion of the two coils such that electrofusion may be the most appropriate jointing method.

However, best construction and our required preference is to ensure during construction in such an event is that jointing corresponds with the installation of a valve, a tee, or another fittings; where flanged pipework will be inevitably be present, so precluding the use of an electro-fusion joint at the point of connection between the two coils. The use of coiled pipe does not therefore provide an automatic or routine entitlement for the use of electro-fusion joints as such shall be assessed on a case by case basis in line with the above paragraph; as in most instances proper planning can prevent electro-fusion jointing.

Note: Electrofusion jointing is not permitted in any instance on PE coiled pipes above 180mm outside diameter or exceeding 225mm outside diameter on straight lengths (sticks).

e) Electro fused joints (when approved)

Data from calibrated proprietary equipment shall be required to record each weld's location and all relevant attributes related to the quality of each weld shall be recorded and provided on request by means of a printed report provided for each electro-fusion joint and its location pin-pointed on an as-laid drawing of the installation completed.

Electro-fusion couplers are to be blue coloured when the use of these couplers is approved.

21.3 Ground contamination – additional information

a) Pipe Protection (joints)

The SLP shall use an approved pipe material in all cases of contaminated land and also ensure that all joints and bolts are also protected by an approved shrink wrap or a high density bitumen tape (not petroleum based).

Such pipework is typically referred to as barrier pipe, but also, depending on circumstances, services pipework may be copper to BSEN 1057 / 1996.

Note: As a minimum requirement the Manufacturers recommendations shall be followed at all times in respect of ensuring a fully integrated pipe protection system (including all joints) and resistivity surveys should be undertaken to determine corrosion potential and the external protection required.

21.4 Civil Engineering Specification for the Water Industry (CESWI)

When we have approved an alternative to high in ductile iron pipe it shall be lined and coated in accordance with the requirements of the Civil Engineering Specification for the Water Industry (CESWI) covering requirements for internal lining and external protection and any additional relevant clauses published on our website.

- When installed in contaminated ground additional protection to the pipe shall be required, to include; factory-applied wrapping. DI pipe shall be protected in aggressive ground conditions and particularly when resistivity is >750ohm.cm.
- All pipe Materials joints shall be wrapped in an approved shrink wrap or high density bitumen tape (not petroleum based).
- All pipe systems shall be designed and installed as a minimum in accordance with manufacturer instructions and recommendations

Southern Water's CESWI supplementary clauses relative to this DCS are published on our website.

21.5 Main(s) control valves

Isolating valves shall comply with the Water Industry Mechanical and Electrical Specification 8.09, Issue 1, January 2014 and the following supplementary specification for wedge gate valves;
Be:-

- A 1.1 Cast Iron Wedge Gate Valves (DN > 50)
- A 1.1.1 Performance and Design Requirements
- Endurance for manual valves shall be 2500 cycles.
- Valves < 600mm shall be resilient seated; valve >= 600mm shall be metal seated.
- Stem seals shall be O-ring.

Isolation valves placed in the pipeline shall be positioned at intervals so that sections of the pipeline can be isolated and emptied within a reasonable time and without too great a loss of water. The interval between valves may be extended where their primary purpose is to isolate sections of main for repair purposes.
Typically on long runs of pipe isolation valves shall be placed at intervals not exceeding 500m.
In critical locations, special crossings of major roads, watercourses and railways, consideration shall be given to the location of valves to isolate the section concerned.

On distribution systems, there is a need to optimise valve locations to minimise the number of customers affected by shutdowns and requirements for disinfection and after mains cut out for new tee connections or repairs.

21.6 Gate Valves

Large diameter gate valves are difficult to open against a large unbalanced pressure. In order to ease the initial opening or final closing of a large sluice valve (450mm diameter or larger), a small diameter bypass of 100 or 150mm diameter is typically provided. The bypass valves are operated to reduce the pressure differential whenever the mainline valve is being opened or closed.

21.7 Pressure Reduction and Pressure Sustaining Valves

Pressures in the existing distribution system are typically minimised while ensuring that levels of service are maintained. This may require the use of pressure reducing valves (PRVs). For simple network configurations it should be possible to supply areas through a single PRV. For more complex networks, multiple PRV systems may be required.

21.8 Flow Control Valves

The majority of flow control valves fitted are hydraulically controlled units fitted to maintain a specific flow or pressure according to system requirements, however, if there is a need for control from a remote control station, an actuated valve may be required.
Flow control can be achieved using various types of inline valves, however, such valves shall be placed in positions which allow easy access and minimise interference with the use of the land.
On larger pipelines, inline valves shall be fitted with devices to indicate the degree of opening.

21.9 Concentric tapers

Where concentric tapers are fitted, consideration should be given to the release of air, especially at meters etc.

21.10 Boundary boxes:

See paragraph 23.2 for drawing showing alternative acceptable location positions relative to Site constraints on acceptable locations.

21.11As-laid drawings (clarification of requirements)

Further to paragraph 16; as-laid drawings are required for all commissioned mains relative to the Site with Service Pipe and meter locations being detailed there-in.

The as-built drawings are to be issued to us in an electronic format that is compatible with our current systems and records as follows and we may also require a hard copy of all documents.

The following also applies:

- Drawings are to be produced on Auto CAD 2004 (or later) compatible DWG files (including all supporting layers and backgrounds).
- A PDF copy of CAD Drawing is to be provided.

- GIS data: the location of all new adoptable assets must be accurately captured on site by GPS with a suitable survey.
- The drawings must comply with current drawing semiology and be appropriately scaled, accurately show the location of the apparatus, detail all fittings, the material types used and pipe diameters.
- The drawings must clearly show the location of all installed mains, services and meter chamber positions, diameter of pipe, locations of Sustainable Underground Drainage Systems ("SUDS") and material (including any distinction between protected or otherwise due to contaminated ground) of pipe.
- Drawings are to be accurate to within 0.1m.
- Electro-fusion and/or mechanical joints (when the usage has been approved by us) shall be accurately described and shown on the drawing.

21.12 Main Commissioning: Disinfection of Pre-coiled Pipe

Where we have agreed to off-site pre-disinfection of coils then the following additional procedures shall be applied:-

- Factory sealed coiled pipe shall be installed within six months of the disinfection/sterilisation date. If more than six months has passed, the pipe shall be re-chlorinated.
- Factory sealed coiled pipework shall be charged with mains water then left to stand for 24 hours prior to sampling following which the SLP shall take representative water samples from the coiled pipe.
- Once satisfactory sample results have been provided pipework ends are to be marked with the sample tag number and use by date.
- Where a factory sealed coiled pipe has been cut or there's any doubt about the disinfection status of the pipe (or it's suspected that contamination has occurred) the coil shall be re-chlorinated.
- Bacteriological sample results and actions shall be recorded against the coil's unique tag number.

21.13 Permeable Paving

It has currently been determined that the risk from hydrocarbons to PE water main pipes is low and therefore notwithstanding compliance with contaminated land assessment guidance, use of standard PE pipes in permeable paving access roads within residential developments is acceptable.

22 Meter and Service Pipe Policy and Installation

22.1 Meter and service pipe policy and Installation

All new build properties shall be metered and this paragraph sets out the criteria relating to the design and installation of water service pipes and related meter locations for domestic properties in order to achieve a standard which is compliant with Southern Water's preferred options to achieve a resilient network installed to a consistent specification.

Our current policy is that all meters shall be located externally to ensure ease of access for reading and maintenance, and for reducing unnecessary disturbance to customers in the future and accordingly such our preferred scenarios in order of precedence are detailed under in a) to c).

Our current requirement is that meters are generally to be installed at the back edge of the highway boundary in a footpath or service strip but alternative locations may be permitted to suit development layout

constraints. See also the preferred scenarios relative to installation of meters that are in our required order of precedence.

Consideration is to be taken in the design of any new main to ensure that the boundary box (meter chamber) is suitable for passage of vehicular traffic when such is sited where vehicular traffic over the chamber could occur post installation.

See paragraph 23 for drawing showing alternative positions for the location of meters/boundary boxes when the design of a Site layout does not adequately provide suitable proposed adoptable footpaths and/or service strips.

The SLP and/or Developer is responsible for the installation of all necessary pipework and the boundary box (and meter) unless under unless otherwise agreed with us; and the installation of the meter after, which, and thereafter we assume responsibility for the chamber and meter.

a) Scenario One: External meter in chamber

See paragraph 23.1 Diagram 1 which shows how the boundary box (meter chamber) is to be located at the back edge of the footway and/or adoptable service strip.

See paragraph 23.2 Diagram 4 and 4a which details pipework entry into a building and the relative position of external pipework in trench, and

See paragraph 23.3 Diagram 4b which details the Installation of service pipe, meter chamber, and required installation depth(s).

In the event that the meter chamber is to be located in a service strip with a soft surface (i.e. verge) the cover is to be set within a suitable concrete surround set flush with the final permanent surface in which the chamber is to be located in. Note: in the event that the SLP does not set the cover to a final finished level as construction work is still on-going by a Developer the SLP the Developer may have to retrospectively insert the concrete surround protection when the final surfaces are constructed (but this is to be discussed and agreed between all parties relevant to the Agreement between Southern Water, the SLP and the Developer).

Single meters shall be installed in an approved boundary box with an integral meter carrier and stop-tap; and multiple numbers of meters in an approved multi manifold chamber of typically two to six meter ports. Meter chambers, covers and frames shall be suitable for the final surface, ground conditions, and location in which they are to be installed.

We do not currently accept boxed wall mounted with external meters but if the SLP/developer wishes such to be considered we will consult with them.

b) Scenario Two: - Internal meter installed inside a property

In the event that we accept that scenario one is not possible or practicable due to Site constraints or considerations (including design) then single or multiple services into a property may be accepted and be internally metered in accordance with this scenario two.

If an SLP/developer therefore wishes to install internal meters this is to be identified at the design stage when applying for a service connection and we will assess and confirm our decision.

Internal meters, related pipework, and fittings shall be of a material that is suitable and appropriate to the location in which they are to be installed and be accessible for future reading, exchange, or maintenance. For instance, internal meters are typically installed in meter cupboards or plant rooms and as such they can easily be disturbed or exposed to extreme temperatures, so Material selection is to suit the location.

It is our preferred requirement that multiple meter manifolds are constructed of gunmetal and be suitably protected. Any alternative to this shall require our approval.

Our policy is that internal meters are fitted with radio reading devices so they can be read from outside of the property to ensure that customers aren't inconvenienced by meter reading personnel requesting future access.

See paragraph 23.2 Diagram which shows an illustration of a typical single meter installation of in-line meter internal (not on manifold).

See Diagram 3 under which shows a meter carrier for a single and/or multiple internal meter installation (which can also be used on a multiple manifold).

Only one meter shall be installed per individual property and in no circumstances shall more than one meter be installed to supply the same property unless the property is a block of flats with multiple individual units (which may have a single person or appointed organisation responsible for water supplies to said flats). In this instance a suitably sized meter may be installed once accepted and agreed by us.

Student accommodations may not be typically individually metered but could be supplied by a suitably sized single meter to supply the accommodation block. In the event said meter has a nominal diameter of 40mm or above it shall require to be sited on a bypass arrangement for ease of future maintenance or meter exchange.

Internal manifolds and meter carriers guidance

When manifolds are accepted and a pre-fabricated manifold isn't available (or suitable) the SLP/Developer is responsible for any required fabrication of the internal meter manifold.
A six-way internal manifold (typically 540mm wide x 340mm high) requires 90mm space on either side to accommodate the meter and space to fit it. It shall be fixed securely to a wall, and if located in a cupboard it will typically protrude 250mm from the wall.

A single internal manifold (meter carrier) is typically 65mm wide x 110mm long and requires 160mm between the centres to enable the meters to be screwed in, and likewise must be fixed securely to a wall. Material selection shall be designed to suit the proposed location, and unless otherwise agreed by us meter carriers shall be constructed of gunmetal and be suitably protected.

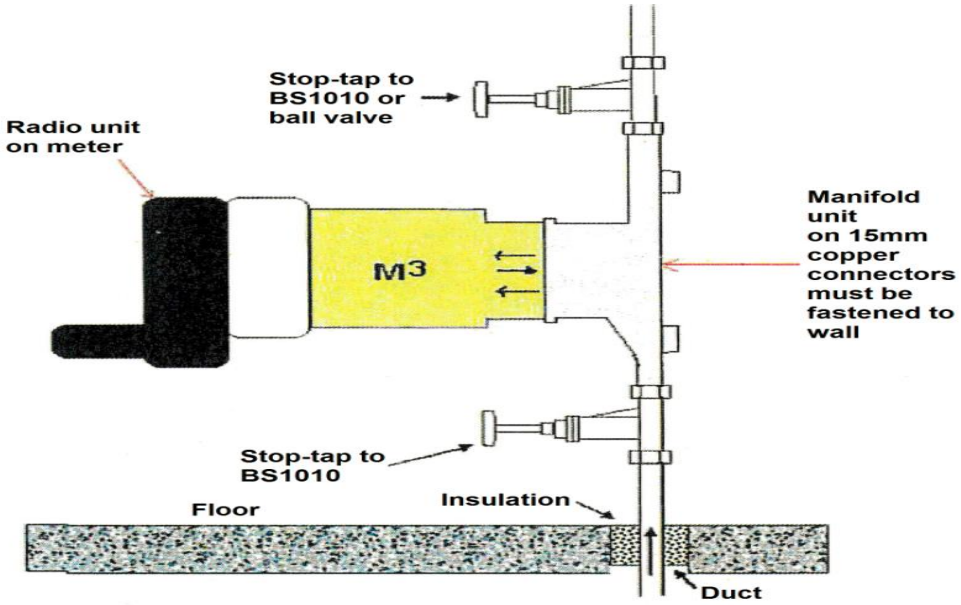
Fitting the manifolds guidance

If the pipework is incorrectly installed when a meter installer turns up it may not be possible to fit the meter(s) resulting in a delay whilst awaiting correction.

When the manifolds are installed they shall satisfy the following;

- A single stop-tap shall be installed on the inlet to a six or four-way manifold (of the same diameter as the inlet pipe) to enable the manifold to be completely isolated and exchanged.
- Safe and comfortable access to the manifold shall be provided to install or exchange meters.
- A non-return (check) valve and drain cock shall be installed immediately upstream of each meter.

- Each pipe shall be tagged to indicate the apartment/unit it supplies (i.e. a block of flats or properties with multiple units).
- A stop tap is to be fitted in each apartment or unit and left closed following installation.
- Single manifolds require 160mm between the centres to enable the meters to be screwed in and shall comply with the drawing under.



c) Additional information on service / meter installation(s)

- Meter chambers shall be of a self-contained type, with integral meter carriers and isolation valves.
- The boundary box shall be installed so that all joints are water tight.
- Excavation around the water main shall expose the point of connection to the pipe and also relative to any road crossing ducts (for service crossing of roads) for the service connection to be made.
- The supply pipe shall consist of a single length of pipe (no joints) installed from the property footings (and from the internal stop-tap) to the boundary box (meter chamber) outlet where the connection with the boundary box is to be made; leaving a sufficient length to make the connection as necessary.
- The communication pipe shall consist of a single length of pipe (no joints) installed from the inlet of the boundary box (and integral pipework) to the point of connection with the supply main; leaving a sufficient length to make the connection as necessary.
- Pipework shall be capped with a mechanical fitting until the trench and pipework have been inspected and passed as satisfactory to connect to the supply main.
- Southern Water shall not be liable for blockages in the pipework once the connection is made so installers shall ensure that all pipework is free of debris prior to fitting a cap end and has been flushed and tested in accordance with the Water Regulations.
- All pipework shall be clearly marked up to identify the plot it will be supplying.
- External meter (single boundary box/chamber and/or multiple meters in manifold chamber) are to be installed within 300mm of the back edge of the kerb within a service strip or public adopted footpath.
- When boundary boxes and/or manifold chamber(s) are to be laid fronting a communal driveway separate supply pipes shall be installed in a communal excavation in the driveway and brought out to the highway/road location for the point of connection to the main unless otherwise agreed with us at the design stage.

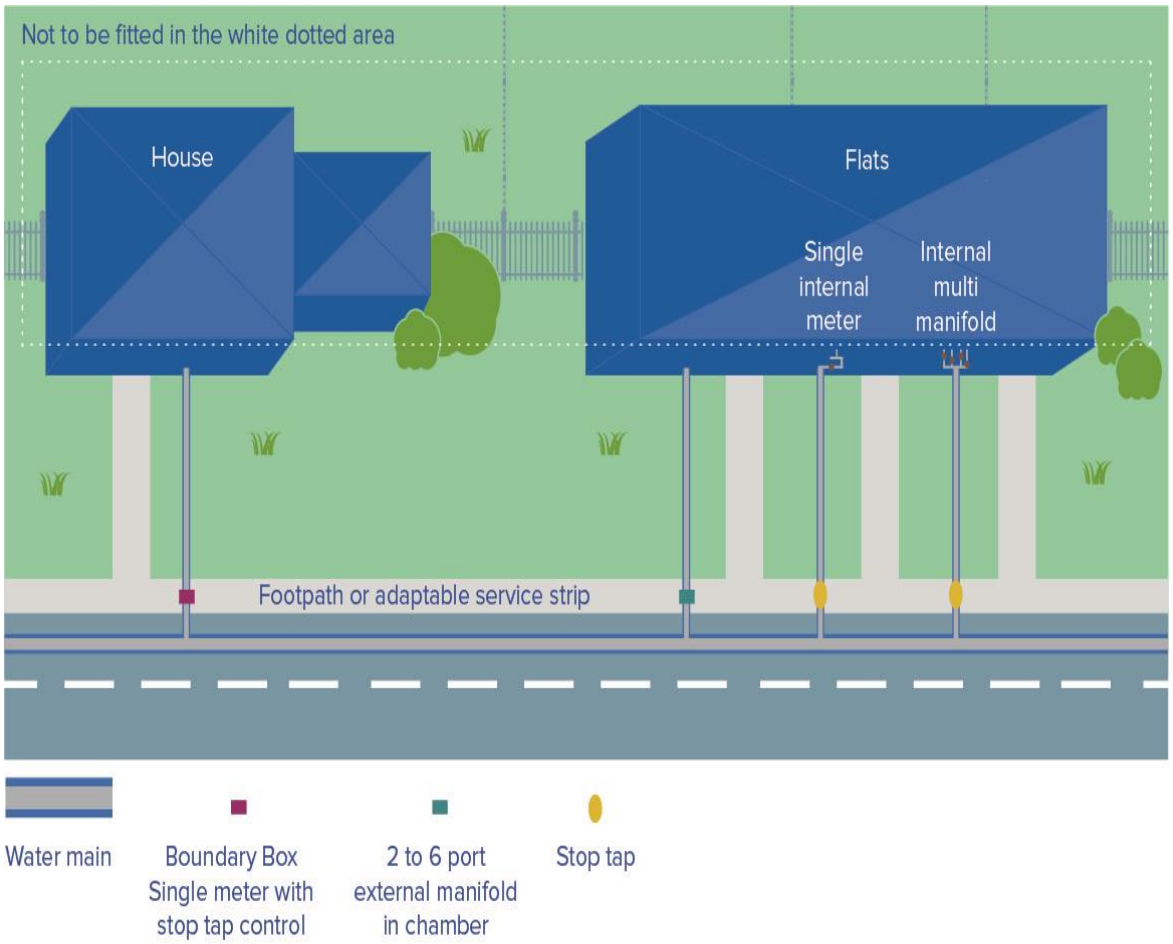
- Preferably, where possible, chambers shall be sited clear of vehicular traffic or else a suitable boundary box able to withstand vehicular traffic shall be installed.
- All excavations shall be backfilled with suitable and appropriate materials but the joints at the meter chamber shall be left exposed until all connections are satisfactorily completed.

d) Guidance notes for meter manifolds (see diagram 23.4)

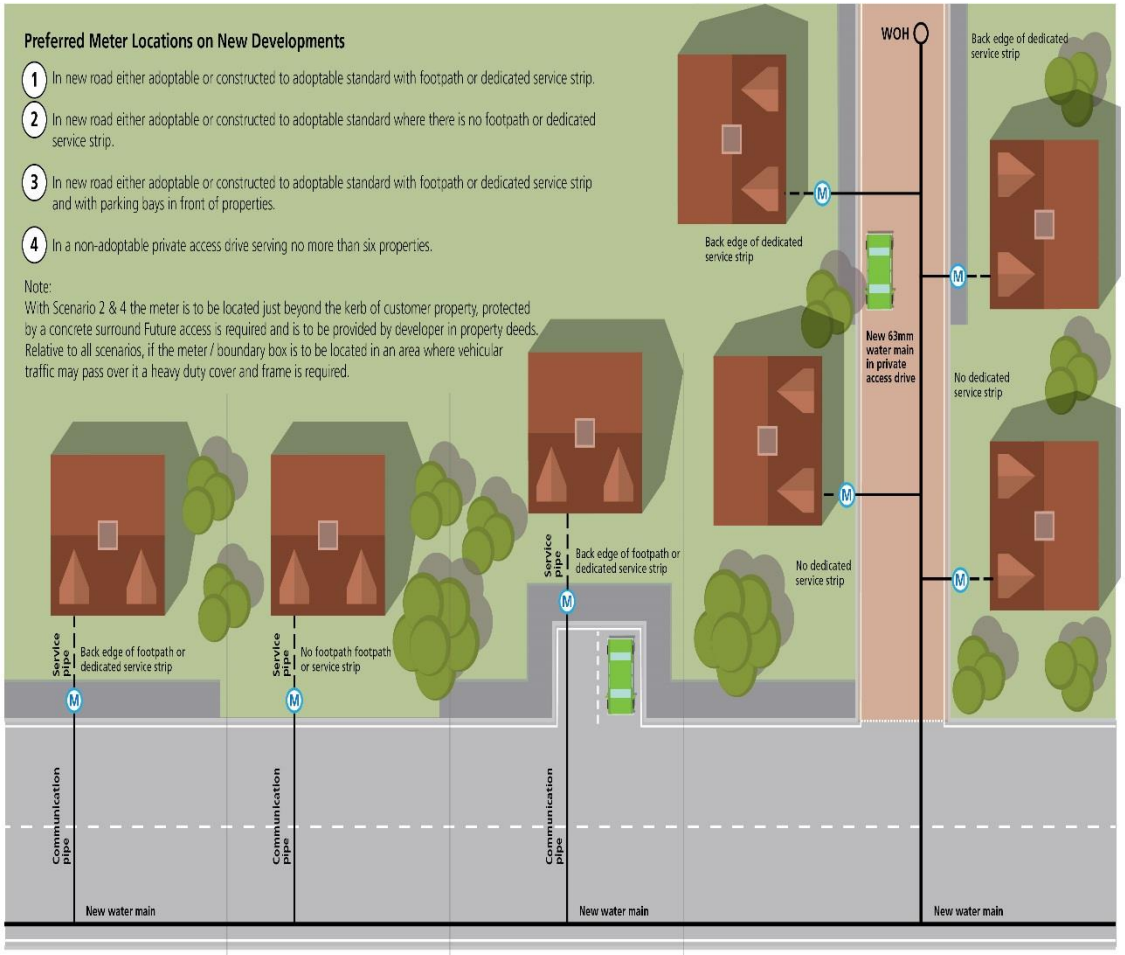
- In accordance with our preferred requirement the meter carrier shall be gunmetal or a similar approved material (plastic is not recommended in this installation) complete with integral stop-taps and non-return valve and both the inlet and outlet shall have ¾ inch BSP threaded ends.
- The meter carrier shall be fixed securely to a wooden backboard.
- Meters are be installed that provide a safe and comfortable access for maintenance or meter replacement. Meters are preferably to be located at eye level for ease of viewing.
- A stop-tap shall be installed on both the inlet and outlet pipework to a meter. Note: The stop tap with an external single meter is typically located in the boundary box as an integral part of the chamber.
- All individual flats shall have individual meters (no shared supply shall be accepted) and the location of individual meters to a flat shall be obvious and identified.
- Access for meter reading and/or maintenance shall be provided for 24 hours a day, 365 days a year. Meter readers may not have any special keys to open doors to premises, gated communities or lockable plant room. Any doors to a room that contains meters shall have a coded key pad (codes to be notified to us) and meter cupboards shall not be lockable.
- Following installation the meter is owned by us, as is any boundary box and we are responsible for maintaining and/or replacing these. Charges apply if damage is caused by a third party.
- The meter carrier and associated pipework is not our responsibility but that of individual property owners and/or managing agents (i.e. of flats) who are responsible for all future leaks, repairs and/or maintenance. This includes all pipework installed within the curtilage of a property (i.e. the supply pipe) to the property boundary with the highway.
- Water and electrical apparatus shall not be installed in close proximity or within the same cupboard) and the current Electrical and wiring Regulations shall apply.

23 Standard Arrangement Drawings

23.1 Diagram 1: Typical location of boundary boxes in a service strip or footpath.

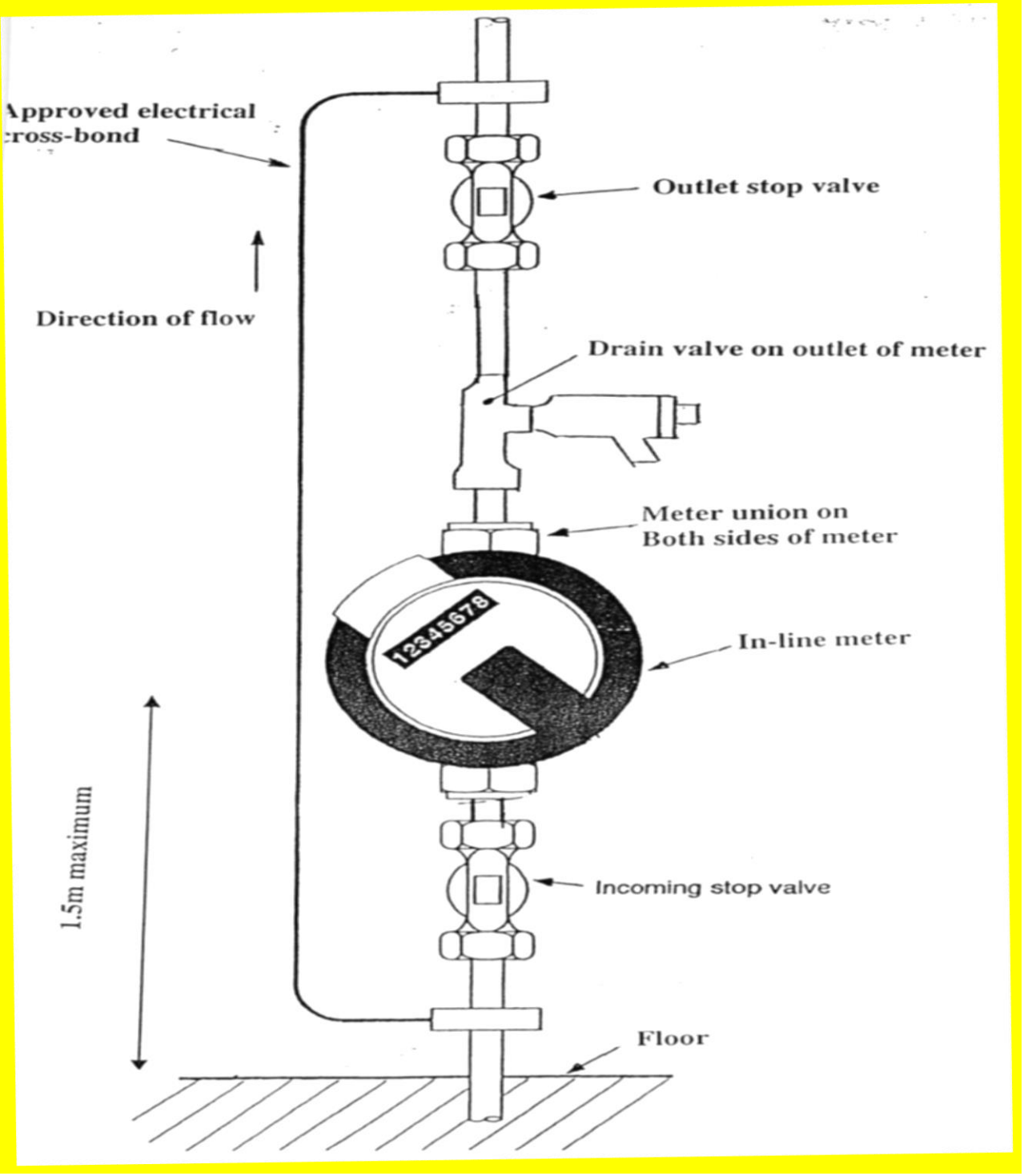


23.2 Diagram 1a: Alternative acceptable locations of boundary boxes relative to a service strip or footpath / highway.



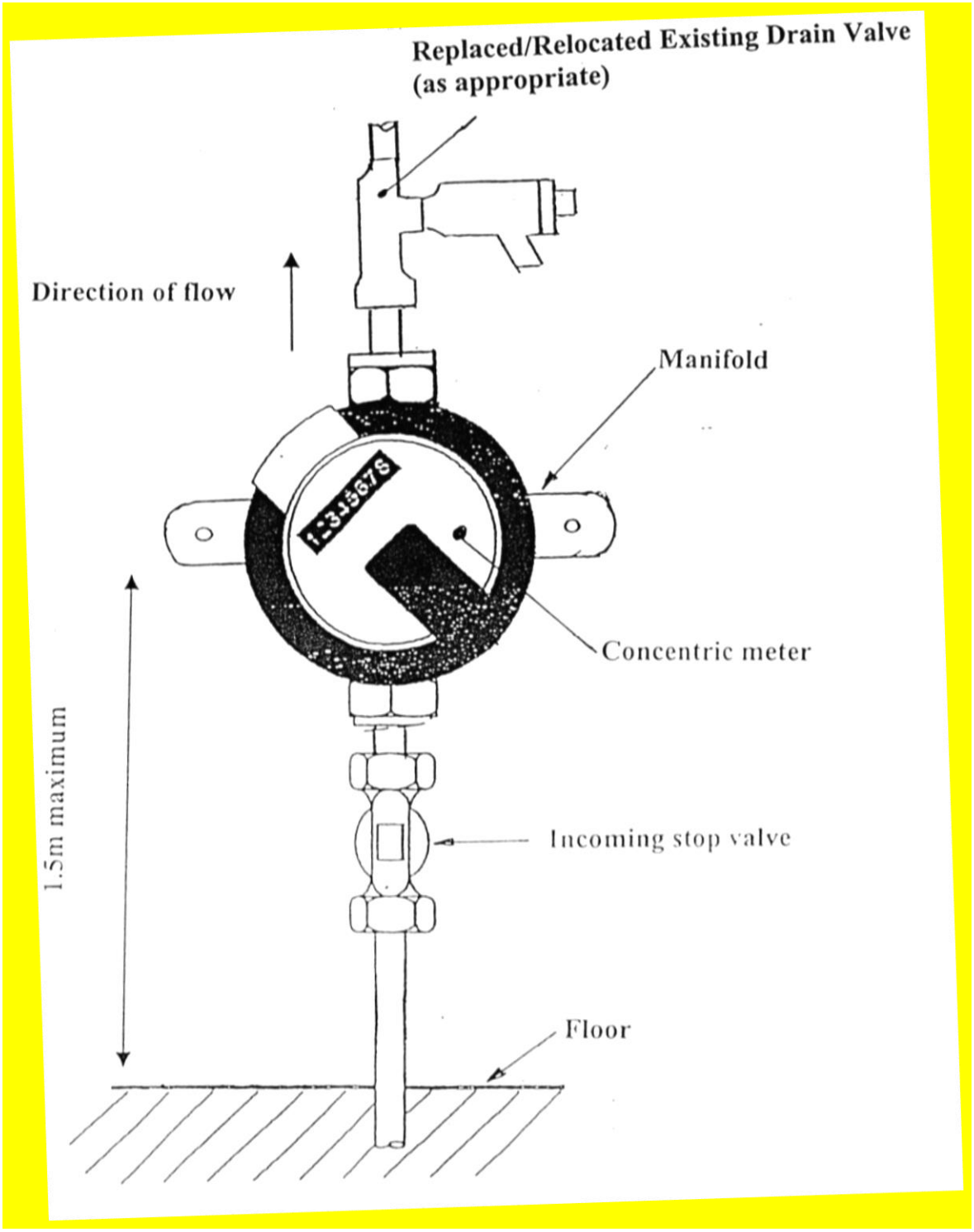
23.3 Diagram 2: Typical single meter installation with In-line meter (not on manifold)

In the below diagram a double check valve shall be inserted after the meter but before the drain-cock. An external installation does not require a drain-cock or stop tap on the outlet.



23.4 Diagram 3 (3a): Typical meter carrier installation for a single and / or multiple internal meter installation

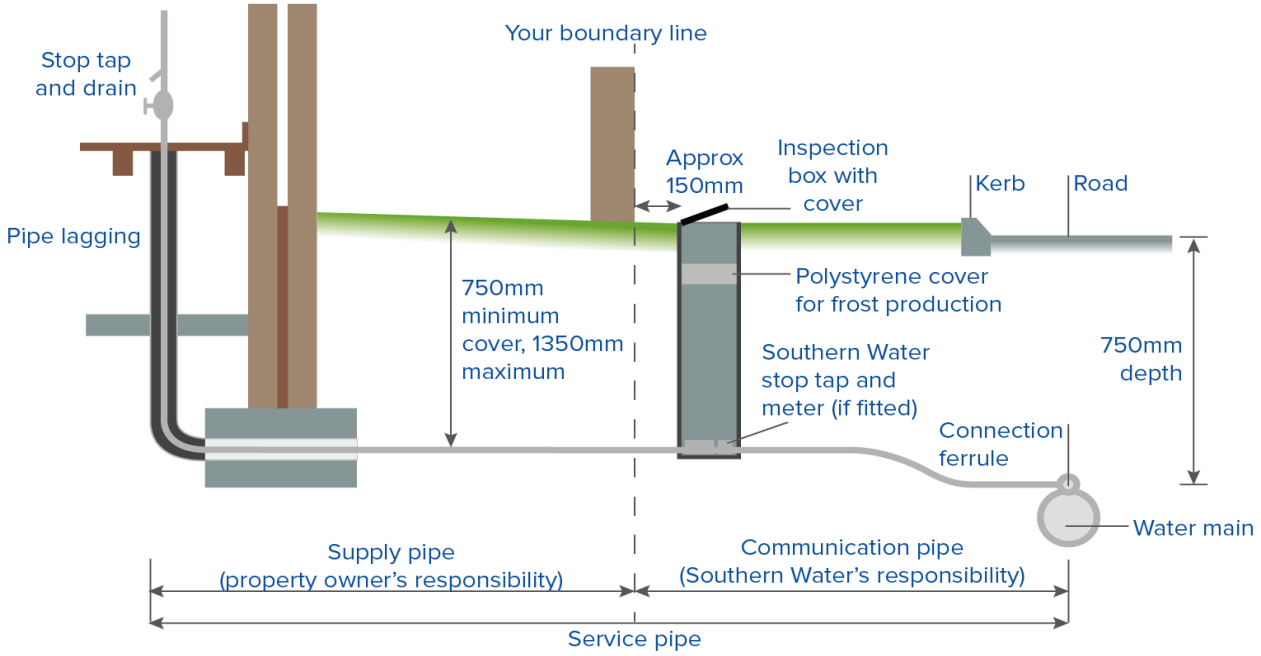
In the below diagram a double check valve shall be inserted after the meter but before the drain-cock. An external installation does not require a drain-cock or stop tap on the outlet.



23.5 Diagram 3 (3b): Typical internal meter manifold multi meter installation

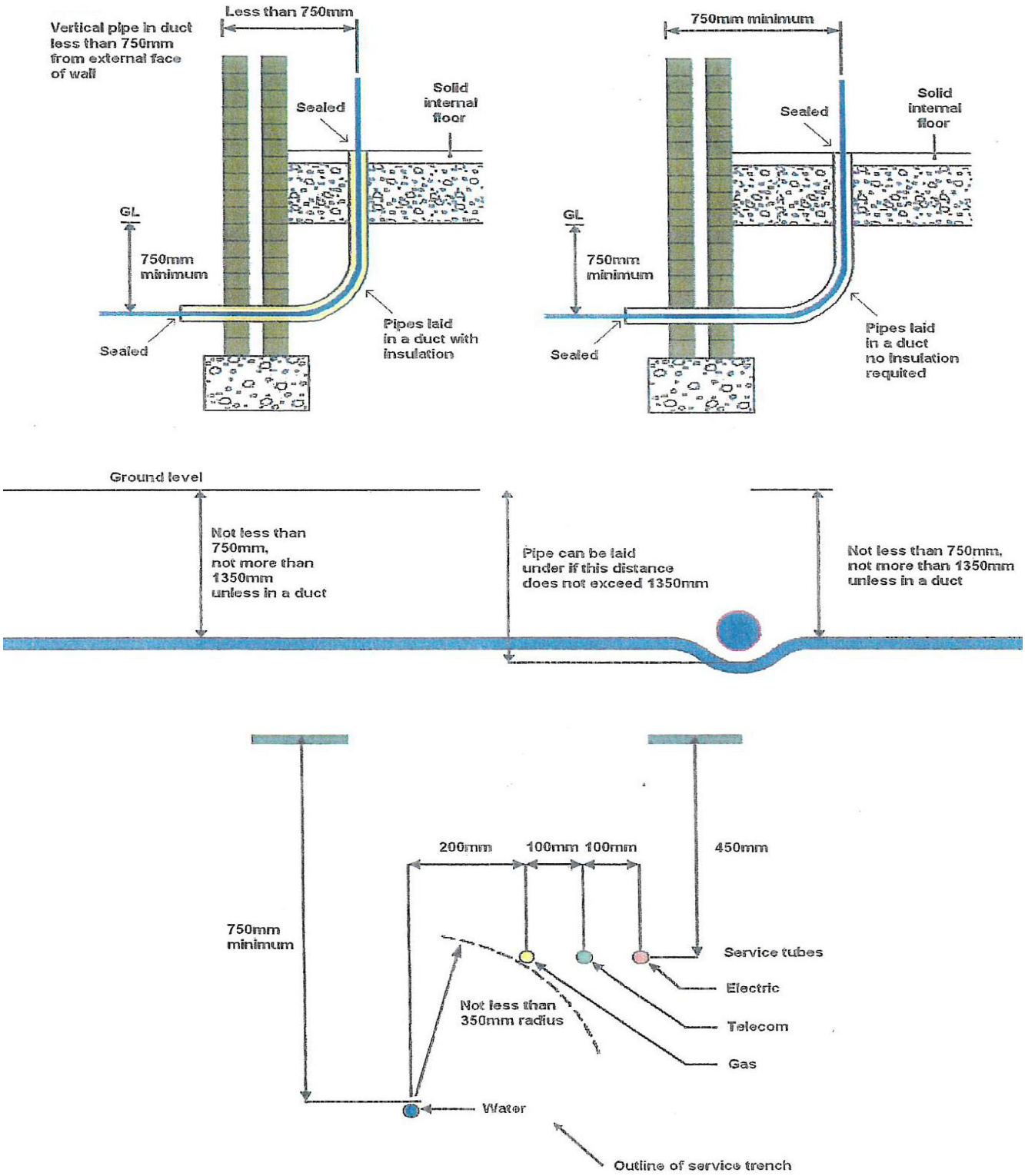
Diagram 4 (4a): Typical installation of service pipe, meter chamber box, and depths

For additional information, please refer to the WRAS Guidance on 'Water System and design installation'



and in particular Section 4, Schedule 2, paragraphs 8, 9,10,11,12 and 13, together with Schedule 2, Section 3, paragraphs 3, 4, 5, 6 and 7.

Diagram 4 (4b): Typical details of pipework entry into a building and relative position of external pipework in trench



24. 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, of securing timely, cost-effective delivery and ensuring smooth adoption and handover. For this reason, they will generally be requested by Water Companies.

In more detail, such meetings will allow the following aspects of the project to be addressed:

- Site-specific Health & Safety and site management issues
- Confirmation of the identity of the Principal Contractor under CDM Regulations
- Introduce site personnel and establish their individual roles and responsibilities
- Establish local lines of communication between Site and Water Company staff
- 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 and shall record the minutes of the meeting and circulate such within 5 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 the Water Company, prior to the commencement of the Self-Lay Works, provide the following pre-start information in any event.

'Pre-start information' includes as a minimum:

1. Confirmed arrangements for CDM 2015 Regulations and other H&S 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 (Street-Works) and local (Water Company) design requirements.
5. Overview of process for dealing with variations/ and changes to the Site layout and associated approved design drawing (revisions and impact on design, co-ordination and charges etc.).
6. Confirm and detail the Source of Water for testing and mains connection Delivery Date.
7. Confirm 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 the Water Company of all risk and method statements relative to design and/or construction activities.
15. Arrangements for co-ordination of activities.
16. Arrangements for supply of proof of WIRS Accreditation, personnel qualifications and/or certification documents (i.e. 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 Water Company 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 Water Company post commissioning check sample by the Water Company 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 the Water Company 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 2016 before commencement of any work. This confirmation may consist of the SLP providing the Regulation 31 appropriate identifier relative to the materials proposed.

Appendix 1

WIS & IGNs

Number	Title	
S 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	
R128	CIRIA Report “Guide to the Design of Thrust Blocks for Buried Pressure Pipelines”	
IGN	4-01-03	Water Industry Information and Guidance note - 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: ***http://wras.co.uk***

British Standards (BS) & BS EN Standards

Number		Title
BS EN 124		Gully tops and manhole tops for vehicular and pedestrian areas
BS		
BS5834-2		"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	1042-2.2 1983 & ISO 1745 1982	Measurement of fluid flow in closed conduits and Determination of flowrate of fluids in closed conduits of circular cross selection – 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

Number / Date	Title
10/WM/03/21	Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites
CESWI	Civil Engineering Specification for the Water Industry 7th Edition (or later version thereof) ("CESWI") together with any Water Company amendments (to be published on Water Company website with DCS).
2009/03	Guidance Note On Notification of Methods of Reinstatement using EToN available at: http://hauc-uk.org.uk/
Published January 2014	Contaminated Land Assessment Guidance: Protocols Published by Agreement Between Water UK and the Home Builders Federation https://www.water.org.uk/guidance/contaminated-land-assessment-guidance/
Water UK/HBF National Joint Committee 2014 (available free of charge at: http://www.water.org.uk/publications/water-industry- guidance	Water UK/HBF National Joint Committee 2014 (available free of charge at: http://www.water.org.uk/publications/water-industry- guidance
Volumes 1 - 6	Streetworks UK (formally National Joint Utilities Group) Guidance Publications available at: http://streetworks.org.uk/resources/publications/
R128	CIRIA Report "Guide to the Design of Thrust Blocks for Buried Pressure Pipelines"
	Principles of Water Supply Hygiene & Technical Guidance Notes (available from Water UK online at water.org.uk/publications/reports/principles-water-supply-hygiene

9.Drinking Water Safety - Guidance to health and water professionals		DWI, Available free of charge at: http://dwi.defra.gov.uk/stakeholders/information-letters/2009/09_2009Annex. pdf
Drinking Water Safety - Guidance to health and water professionals	Specifications for polyethylene pipe and fittings:-. https://bpfpipesgroup.com/support-downloads/technical-guidance/ Specifications for PVC pipe and fittings:-.	
Report R97	Trenching Practice (2nd edition)	CIRIA, 1983 Available at: http://www.ciria.org/ItemDetail?iProductCode=R97&Category=BOOK&WebsiteKey=3f18c87a-d62b-4eca-8ef4-9b09309c1c91
Report 128	Guide to the Design of Thrust Blocks for Buried Pressure Pipelines	CIRIA, 1994 Available at: http://www.ciria.org/ItemDetail?iProductCode=R128&Category=PHOTOCOPY
HSG 47	Avoiding Danger from Underground Services	HSE Books, 2014 Available free of charge at: http://www.hse.gov.uk/pUbns/priced/hsg47.pdf
	Specification for the Reinstatement of Openings in Highways (3rd Edition)	Department of Transport 2010 Available at: https://www.gov.uk/government/publications/specification-for-the-reinstatement-of-openings-in-highways

	Water supply to domestic fire sprinkler systems	Water UK June 2015 (and earlier documents Available free of charge at: http://www.water.org.uk/publications/policy-positions- and-briefings/water-supply-domestic-fire-sprinkler- systems