Appendix D – Template Design and Construction Specification

The following template is to be used by companies when publishing their Design and Construction Specification in accordance with the Water Sector Guidance.
September 2020

Design and Construction Specification
For South West Water Ltd

Version: 1
Issue Date: November 2020

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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 version 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).

The Local Variations are highlighted in blue in the document.

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
SWW	South West Water Ltd
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
□	-	Kinematic viscosity of fluid, m²/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

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 Reducing 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 Requirements

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 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 a 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 (eg. 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 Contestable 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 – Annual Contestability Table

	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)				
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//PE/Barrier pipe/steel Operational pressure: up to 50m (AC not included, this remains Amber)				
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/ PE/ Barrier pipe/Steel				

Operational pressure: 50m to 75m (AC not included, this remains Red)				
Connections: **over 300mm** to: Parent Network: 18" nominal bore * & above, or high-risk parent Network: material (such as steel) Operational pressure: above 75m (AC not included, this remains Red)				
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				

* 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

The table should be read in conjunction with South West Water's Design and Construction Guidance.

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;

a) of an under-pressure type connection and/or,
b) a connection to a previously installed temporary valve-controlled washout installed in conjunction with the connection to the Existing Mains Network at the POC to supply the Site or Development, and/or
c) a connection to a previously installed valve-controlled washout, which has been installed on a Self-Laid Main for a future connection off such main.

Where references to the Final Connection of the Self-Laid Main to the Existing Main on the Network require a section to be isolated by a shut (to enable it to be cut-out to install a connection point), and/or if a new branch tee is required to be cut into a Self-Laid Main and the relevant assets are subsequently adopted by 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 sSite 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 Connections that fall within the amber category will be assessed on an individual basis to review method of connection against what if any mitigation can be put in place to reduce / remove any risk of failure and customer interruption. All such connections will need to be accompanied by a relevant Risk Assessment and Method Statement (RAMS) covering actions that will be taken to remedy any issues that could be encountered. The RAMS will need to be submitted to SWW at least two weeks prior to any connection date for review. SWW reserve the right to send a representative expert to monitor for the duration of the work. The use of approved contractors will aid the planning and approval process.

9.6 Activities Shaded in Red in 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.

Water efficiency - See website for information: www.southwestwater.co.uk/savewater

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 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 and Construction Variations

Changes to the design/construction of the Self-Lay Works (including those due to site conditions, changes to the Site made by the Developer, etc.) which require the re-issue of either the SLP Accepted Design or the 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

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

- PE80 Pipe
- PE100 Pipe
- Multi-Layer Skinned PE100 Pipe
- PE/AL/PE PE80 Type A Barrier Pipe
- PE/AL/PE PE100 Type A Barrier Pipe
- Class 40 or K9 Cement Lined Ductile Iron
- MOPVC – 80mm to 200mm PN16 rated
- Copper – high pressure service connections
- Steel – for high pressure diversions

25mm,32mm and 50mm (Services only) providing they meet the required standards
The below table specifies the Water Company's accepted size and 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	SDR	Pressure Rating
63mm	PE	11	16bar
90mm	PE	17	10bar
110mm	PE	17	10bar
160mm	PE	17	10bar
200mm	PE	17	10bar
250mm	PE	17	10bar
315mm	PE	17	10bar
355mm	PE	17	10bar
90mm	PE	11	16bar
110mm	PE	11	16bar
160mm	PE	11	16bar
200mm	PE	11	16bar
250mm	PE	11	16bar
315mm	PE	11	16bar
355mm	PE	11	16bar
63mm	PE Barrier Pipe	11	10bar
90mm	PE Barrier Pipe	17	10bar
110mm	PE Barrier Pipe	17	10bar
160mm	PE Barrier Pipe	17	10bar
200mm	PE Barrier Pipe	17	10bar
250mm	PE Barrier Pipe	17	10bar
315mm	PE Barrier Pipe	17	10bar
355mm	PE Barrier Pipe	17	10bar

90mm	PE Barrier Pipe	11	16bar
110mm	PE Barrier Pipe	11	16bar
160mm	PE Barrier Pipe	11	16bar
200mm	PE Barrier Pipe	11	16bar
250mm	PE Barrier Pipe	11	16bar
315mm	PE Barrier Pipe	11	16bar
355mm	PE Barrier Pipe	11	16bar
80mm-200mm	MOPVC	N/A	12bar
80mm – 800mm	Class 40 or K9 Cement Lined Ductile Iron PN16 fittings	N/A	16bar
80mm – 800mm	Class 40 or K9 Cement Lined Ductile Iron PN25 fittings	N/A	25bar
300-800mm	Steel	N/A	40bar

Table 10.1 Permitted pipes sizes, materials, SDR and pressure ratings to be used within the Water Company area (insert additional text under as necessary).

10.2 Pipe sizing materials

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.

Methodology for the sizing of pipes shall be based on Colebrook White Equation.

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	110mm/125mm	100mm
95-300	160mm/180mm	150mm
300-700	225mm/250mm	200mm

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 (eg 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

X = Litres per person per day - 127.5
Y = Average household occupancy rate – 2.2
Z = Peaking Factor 2.3 to allow for diversity of sites.

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

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

Average daily demand per household is therefore X x Y = XY

To account for diversity in the network, Peak Flow Factors for domestic scenarios shall be taken to from the table below

Peak Demand may be calculated then by multiplying the average day demand per household by the peaking factor.

A site of 'n' Domestic units has a daily demand in litres of XY x n = nXY l

This must be multiplied by the peaking factor Z. Therefore peak demand in litres per second can be estimated at nXY x Z = Peak demand in l/s

10.5 Calculations for Multi Occupancy and Industrial and Commercial Domestic use

Where the developer/SLP provides exact flow rates for non-domestic buildings these shall be used. If these are not available, then South West Water will use a peak factor of 2.45

10.6 Process Water

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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 of 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, eg, 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 peak time velocities in all Pipes shall reach [0.4] ms^{-1}

Maximum velocity in Mains shall not exceed [1.5] ms^{-1}

Maximum velocity in Service Pipe shall not exceed [1.0} ms^{-1}

Methodology for calculating velocity shall be based on Colebrook White

10.7.4 Calculating Headloss through the Network

For newly designed and constructed Water Mains headloss per 1000m shall not exceed 10 mH, target values shall be between 0m/1000m and 2m/1000m. The target pressure at the property boundary of a standard domestic dwelling shall be 1.5 bar as a minimum, although this is different than the Guaranteed Standards.

Methodology for calculating headloss shall be based on Colebrook White

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 contaminated during Construction

If contamination is suspected during construction of the Self-lay Works the work shall be stopped and be 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.

Pipe joints in barrier pipe systems shall be made in accordance with the pipe manufacturer's guidance. Where there is a need to join barrier pipe from one manufacturer to a barrier pipe made by another manufacturer (e.g. connecting to a previously installed section of pipe), then a gunmetal transitional barrier pipe fitting shall be used and wrapped with barrier pipe system foil tape. Alternatively, a valve may be inserted to separate the two systems using flange adaptors and a suitable gasket. Standard gaskets must not be used.

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 it not meeting their specific requirements, the costs incurred will be payble by the Water Company. Any such variation will need agreement with the SLP and Developer before works proceed

Wherever possible new mains should be located in an area designated as a street. Alternatively, South West Water will accept mains to be laid in designated service strips provided there is provision for ongoing future access and maintenance. Where mains cannot be laid in a street or where future access in a service strip cannot be reasonably guaranteed then South West Water will require an easement for the main which shall be at the cost of the developer. SLP should refer to NJUG issue 8 guidelines on positioning and colour coding of underground utility apparatus.

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.

South West Water guidance on shared driveways is: -

Number of properties	**Distance to furthest property**	**Requirement**
1 – 3	< or = 50m	Private service pipes.
4+	>50m	Main with individual service pipes.

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 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
<= 150mm	6 metres – 3 metres either side of centre line
151-600mm	7 meters - 3.5 metres either side of centre line
>600mm	9 meters - 4.5 metres either side of centre line

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 for new Self-Laid Main or 900mm where there is a risk of damage eg, from agricultural activities. All DI mains should be installed at 900mm cover.

11.5 Water Quality Considerations

In accordance with the Principles of Water Supply Hygiene and related technical guidance notes listed therein (see Appendix 1-Other documents) the SLP shall ensure that the Developer and the SLP ensure demand is 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

Valves shall be installed to control the flow within the network and enable all components to be isolated, drained and recharged for maintenance purposes. The number, size and position of valves at the point of connection to the existing main will be determined by SWW.

A valve should be located at all branch locations and the maximum spacing of isolation valves on distribution mains shall be 1000m or to shut off a maximum of 50 properties.

All valves must be clockwise closing. Spindles must be installed on all valves which should end 150mm below the cover to facilitate ease of future operation.

Washout hydrants should provide where dead legs could be created during operation i.e. at isolation valves or at the end of the pipe. Dead legs created by isolation valves that can be fed from either side require an OXO arrangement (washout-valve-washout) to allow the main to be flushed out from either side of the valve. Typically, hydrants should be mounted directly on a riser from the crown of the pipe (directly on top of tee) or directly on the end of the pipe with tapers as required. For all applications water take-off by 3rd parties shall be discouraged with capped hydrants.

End washouts will be required on mains of 63mm and above and must be located to suit hydraulic and operational convenience, including consideration as to how any wash out water will be disposed of.

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 Operations

Mains isolation 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.

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

Valve operations by third parties, shall only be permitted when authorised by South West Water.

11.8 Washout and Fire Hydrants

All washout and fire hydrants to be through bore type.

Hydrants shall be installed ensuring the outlet is no more than 300mm from the surface.

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 housed in a secure, free draining chamber which shall be vented to avoid pressurisation or depressurisation during their operation but protected against ingress of contaminants. Air valves shall be positioned at edges of fields or in footways where possible. Air valves installed on pipe bridges shall be adequately protected.

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 [500] domestic properties in size or a development size of =>200 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

Double spade valves are not normally used within South West Water's area, should you wish to use them, then you should consult with South West Water.

11.13 Rights of access

The Self-Laid Main shall, wherever possible, be routed in publicly adopted highways and maintained highways or streets as defined in NRSWA Section 48 (1) and amended under the Traffic Management Act (TMA) 2004. These shall not normally require rights of access. Examples of situations where Self-Laid Mains are to be laid in a street are:

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

The section 38 Drawing shall be used to highlight any Self-Laid Main installed in third party land, which is not a street and that may require land rights to be obtained and a legal notice to be issued. In these instances, 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.

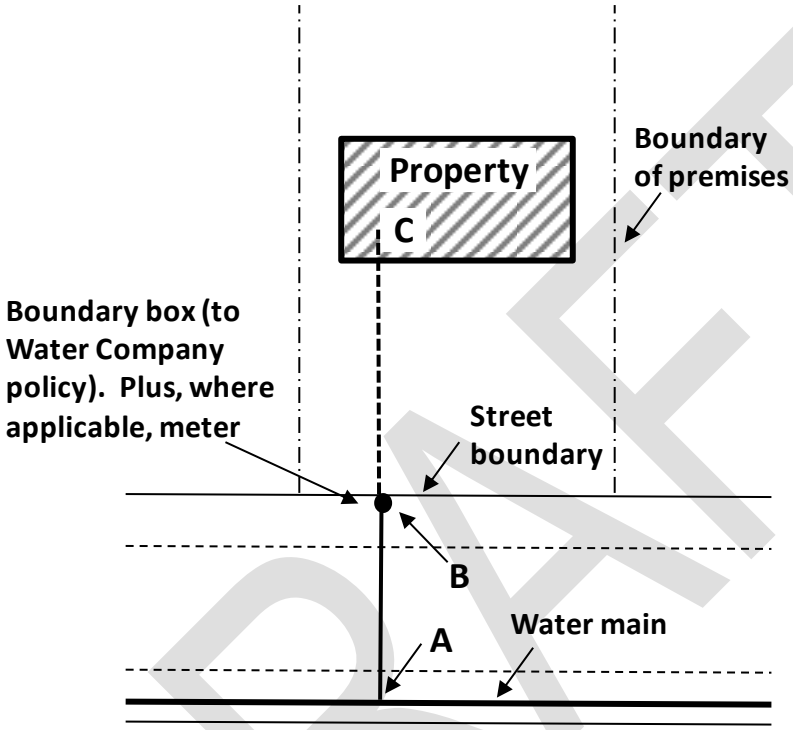
In accordance with the WAA, the Water Company shall obtain any required easements to protect its Network, or any future extension of such, and any related and/or incurred costs including third

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

The conditions for the connection of service pipes to water mains shall be as set out in section 47 of the Water Industry Act.

Service pipes stop taps and meters for any new development should be configured for optimum hydraulics, construction and maintenance.

We require the following to be undertaken: -

- Label – before the connections are requested it is important that all service pipes are clearly labelled as to which plot they serve, and the end of the pipe to be connected to the main must be sealed off with a mechanical watertight stop end (not tape or plastic bags).
- Depth – service pipes must be laid at a minimum depth of 750mm (maximum 1350mm).
- Number in single trench – a maximum of five standard service pipes in a trench (0.5m wide)
- All service pipes must be brought out to the relevant connection point.
- Barrier pipe/contamination - If the site has been deemed as potentially contaminated, you must install the service pipes using a suitable barrier pipe. If Egeplast [SLA] barrier pipe is not used, you must advise South West Water at the earliest opportunity of the barrier pipe manufacturer and size
- the household property must be secure to prevent damage or misuse of supply and a suitable stop valve installed as close as possible to where the pipe enters the building. Temporary building supplies should be installed to the required specification (typical inclusions: fixed to post or outside wall, double check valve, protection and insulation).
- Disinfection - if service pipes are greater than 50 metres in length and/or greater than 50mm in diameter, they must be disinfected and tested before connection. Further details of disinfection can be found on SWW website at:- https://www.southwestwater.co.uk/developer-services/water-services-and-connections/self-lay/

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, Position 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 Pipeipe 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). Joint communication pipes shall not be laid within private land.

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 1.0metre 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 Service Pipes

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.

Service Pipes shall be sized to ensure velocity is ≤1.0ms^{-1} and that total headloss is ≤2mH

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

The sizing or service pipes to new developments is governed by the requirement that there should be an adequate supply to meet customer demands, at the point of delivery, at all times while ensuring that water quality is not compromised through the use of oversized pipes.

As a guide the typical size of pipe for a given number of properties is shown in the table below. The values given should not be a substitute for conducting an adequate hydraulic assessment taking into account all pertinent factors.

Number of individual dwellings	Typical PE pipe outside diameter
1	25mm
2	32mm
3-5	50mm*
5-20	63mm
21-40	90mm

*not a preferred SWW size, however it may be installed for a customer supply pipe where appropriate.

12.4 Location of Boundary Boxes

Boundary boxes shall be located in the pavement as close as is practicable to the back edge of the boundary of the street in which the water main is laid. Boundary boxes are not to be located in parking bays or areas where parking is likely to occur

12.5 Supplies to Multi Occupancy Buildings

Premises that consist of a number of separate occupancy units, which may be household and non-household, must be individually metered. Additionally, there may be a need to fit separate meters to record water consumption for communal facilities such as communal hot water or laundry facilities. Where meters are installed in a communal area, each meter should be clearly identified using a tag with permanent lettering, so that customers may easily identify which meter serves their property. Where meters are located in a secure area, customers should be provided with access both for meter reading and to enable the water to their premises to be individually controlled. Meters should not be located in any area that could present access difficulties or other safety related issues.

For low-rise buildings, in multiple occupancy, the number of separate service pipes to the building should be minimised. Ideally, 2 or more occupancy units should have a suitably sized shared service pipe, with separate meters inside the building, preferably accessible from a common area. The developer should be encouraged to provide a ground floor services cupboard, where individual stop taps and supply pipes may be taken from a common manifold arrangement. Meters for each dwelling may be located either at the intake position manifold or within the individual dwelling.

For buildings in multiple occupancy, the meters should be clearly tagged to identify the unit served, and they should be arranged in an orderly sequence. Underground meters do not necessarily need to be placed in the street, although they should be placed in a hard-standing area. A sensible location should be agreed between the SLP and South West Water.

For high-rise buildings, characterised by the requirement for pumping to upper floors, a shared service pipe from the tank/pump to each floor is acceptable. Meters may be installed in service cupboards where individual stop taps and supply pipes are fitted to a common manifold arrangement or within each individual dwelling.

The water service pipe work within the building must be arranged such that individual metering to each dwelling or to any shared water provision can be installed without the need to carry out any modification.

Refer to paragraph 14, 21 and 22 for the acceptable arrangements for the metering of multi-occupancy buildings.

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.

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.

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.

General arrangements of valves and hydrants and their chambers can be found at:-

https://www.southwestwater.co.uk/developer-services/water-services-and-connections/self-lay/

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 the 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.

14. Metering Requirements

14.1 Standard Domestic Metering for Individual Dwellings and Multi Occupancy buildings

SWW policy is to install a remote reading facility, known as Automated Meter Reading (AMR) to all new 15mm or 20mm meters which are fitted to all standard service connections. The only exception is where a new supply is dedicated to fire fighting.

It is South West Water's policy to minimise the use of bulk meters and bulk meter agreements and to maximise the use of individual metered supplies to all properties.

It is also South West Water's policy to individually meter all properties that are separately occupied and have no shared facilities such as kitchens and bathrooms. Automated Meter Reading (AMR) meters shall be installed on new connections.

Bulk Metering Agreement

Where a bulk metered supply is permitted by South West Water, a bulk metering agreement must be entered into by the owner of the property prior to the connection being made.

The table below is a guide to where South West Water will allow bulk metered supplies.

	Separate supplies	Bulk meter
New build flats/apartments	√	X
Converted property to flats/apartments	√	X
Barn conversions and farm buildings	√	X
Residential caravan park	√	X
Holiday chalets/holiday caravan park - individually owned	√	X
Holiday chalets/holiday caravan park - owned by one individual/company	X	√
Care homes/sheltered housing - individually owned	√	X
Care homes/sheltered housing - owned by one individual/company	X	√
Student accommodation - purpose built campus student accommodation owned by college/university or management company	X	√
Other student accommodation	√	X
Commercial units of any type	√	X
Conversion of outbuildings to self contained unit of any type	√	X

Internal meters

South West Water's metering policy is to have external meters installed, but in some cases for flats and apartments, South West Water preference is an unmeasured bulk supply and internal meters to supply the individual flats.

1. All meter housing and private pipework installations must satisfy Water Regulation requirements
2. The meters will only be installed on carriers that have WRAS approval. These meter carriers can either be supplied by South West Water and recharged via the new connection quote, or purchased direct from an independent supplier.
3. The meter carrier will be of a gunmetal or similar approved material complete with integral stoptap, both the inlet and outlet must have 3/4" BSP threaded ends. The meter carrier is also to have an in built non-return valve (NRV) and stoptap. The Stoptap and NRV must also have WRAS approval.
4. All meters once fitted must have a tag to identify each property flat/unit number
5. The meter carrier must be correctly secured to a wooden backboard or suitable support
6. A drain cock and a stop tap are to be fitted immediately after (downstream of) the meter carrier.
7. Each flat/unit will have its own meter, there will be no shared supply
8. The Builder/Developer must ensure that the owner of each flat/unit is shown the location of their meter.
9. Access for meter maintenance and meter reading will be required 24 hours a day / 365 days a year.
10. South West Water will not carry any special keys to open doors to gain entry to premises or meter cupboards. Any doors that need secure access must be fitted with coded pads and the codes provided to South West Water. The meter cupboard(s) must not be lockable.
11. All future maintenance and responsibility for pipework within the grounds of the property and internal pipework within the building(s), rests with the owner(s) of the property. This includes the meter carriers, but not the meters.

12. The meters will remain the responsibility of South West Water and must not be removed or tampered with by others.
13. Water and electrical apparatus must not be installed in close proximity or within same cupboard

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 provides 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/
(in particular those details referenced in Appendix 5 regards flow from fire hydrants)

Fire and Rescue Services Requirements

The location of washouts on new developments should be designed according to the requirements of Severn Trent as per the guidance given within the Washouts section.

The local Fire and Rescue Service (FRS) should be invited, during consultation, to adopt whichever washouts they see fit as fire hydrants.

The request for additional hydrants specifically to be designated as fire hydrants is subject to negotiation between the designer and the FRS and, in this instance, the installation is chargeable to the FRS.

The key documents that the designer should make reference to are:

- Section 43 (1) of the Fire and Rescue Services Act 2004
- National Guidance Document on the Provision of Water for Fire Fighting (Edition 3 dated January 2007) - Promotes liaison between the water company and the local FRS. The document is produced jointly between Water UK, the Fire and Rescue Service, DEFRA and the Department for Communities and Local Government.

The designer should follow the requirements for firefighting as required under Section 43 (1) of the Fire and Rescue Services Act 2004. This requires the Company to give the Fire Service 6 weeks' notice in writing to allow them to determine what fire hydrant or wash out

provision they require for adoption. Detailed requirements are shown in the extract below:

Fire and Rescue Services Act 2004 (Extract):

(3)	If it is not practicable for a person to give notice as required by subsection (1) or (2), he is to be regarded as having given the notice required by that subsection if he gives notice as soon as practicable.
(4)	A person commits an offence if, without reasonable excuse, he fails to give notice as required by subsection (1) or (2).
(5)	A person guilty of an offence under subsection (4) is liable on summary conviction to a fine not exceeding level 5 on the standard scale.

43	**Notice of works affecting water supply and fire hydrants**
(1)	A person who proposes to carry out works for the purpose of supplying water to any part of the area of a fire and rescue authority must give at least 6 weeks' notice in writing to the authority.
(2)	A person who proposes to carry out works affecting a fire hydrant must give at least 7 days' notice in writing to the fire and rescue authority in whose area the hydrant is situated.

Early consultation (in excess of the statutory notice period – usually 6 weeks) and site meetings with the local fire and rescue service should take place to agree the precise locations.

Siting of Fire Hydrants

Hydrants should always:

- Be located where they can be safely operated and maintained.
- Wherever possible, be out of main carriageways. This may require a short branch off the main to place the hydrant in the footway or verge.
- A hydrant branch should be no more than 5 metres long, unless there is a service connection between the fire hydrant and the main to maintain a regular flow.

If a fire hydrant cannot be installed in the footway/verge, the relevant fire and rescue service will need to be contacted and offered alternative locations within the immediate vicinity. The fire hydrant location must be agreed before the fire hydrant is installed.

- Hydrants **shall not** be located in parking bays and other locations where they can be obstructed by parked vehicles.
- It may be preferable to install a single hydrant in a street where it cannot be obstructed rather than several in locations where they can, though this should only be done in agreement with the relevant fire and rescue service.

Flow Requirements

The availability of flow and the flow requirements for firefighting should be subject to close consultation with the fire and rescue service but it should be noted that there are specific obligations and responsibilities placed upon the various parties to the discussions.

During the consultation process with the fire service the designer should provide details of the available flow at the point where any new main connects to the existing (new point of

demand). The flow rates provided should be an honest indication of flow capability for responding to fires in single and two storey dwellings.

The Fire Service base requirements will generally be for 8l/s but where cannot be achieved or they require a greater flow (usually due to higher risks e.g. commercial, industrial, schools, hospitals etc.) it is their responsibility to manage and plan around the shortfall in flow. It is normal practice for the above flows to be obtained from a water main of a minimum diameter of 90mm and therefore **fire** hydrants are not installed on mains below this diameter. May be smaller by agreement with the relevant fire and rescue services

Note that 63mm diameter water mains may not have sufficient capacity to allow hydrants to be fitted. If they are, they may not be adopted by the fire and rescue service. The decision rests with them and should be on a case by case basis.

For new systems South West Water is **not** required to provide additional capacity for firefighting. This is the responsibility of the appropriate fire and rescue service or person requesting the firefighting supply.

Please see Schedule of Permissible Materials and construction in paragraph 21

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.

Types of System

Direct Mains Fed System
This type of system uses the water mains to directly feed the fire sprinkler system. It can be used where the mains pressure and flow delivery is adequate to feed the fire sprinkler operating requirements directly.

Mains Fed Booster Systems
This type of system uses an in line booster pump and could be used where there may be inadequate pressure to meet the fire sprinkler system requirements. Permission is required from South West Water (SWW) to install a booster pump.

Storage System
This type of system uses a stored volume of water incorporating an air gap AA or AB (a cistern). To meet the demands of a fire sprinkler system SWW recommends that this type of system is used to ensure that a supply of water is permanently available. Any pumping plant

should be located so that it is unlikely to be affected by fire. It shall also be accessible for maintenance purposes. All such storage systems must have appropriate backflow prevention arrangements at the inlet.

Water Pressure
SWW will meet the requirements of the Water Industry Act 1991 and the Guaranteed Standards Scheme in relation to pressure. This means providing minimum pressure of 7 metres static head. SWW cannot guarantee pressures above the minimum guaranteed standard. This should always be taken into consideration by the designer/installer before proceeding with any installation. Customers and designers should be aware that network water pressures may vary depending on the season and time of day. The water supply may also be interrupted at any time for a variety of reasons including planned and unplanned/emergency maintenance or third party damage events. SWW may also alter the water pressure in the network from time to time to meet the differing demands of the network but will continue to meet the guaranteed standard. Should a customer decide to install a sprinkler system directly from the mains water supply and SWW modify the water distribution as described above, SWW will not be held liable for any failure of the fire sprinkler installation or for the consequences of not installing a storage based system.

Water Charges
SWW do not charge for water used solely used for fire fighting fires and testing fire fighting equipment. SWW reserve the right to install a water meter on fire fighting supplies to ensure compliance.

A single water connection will be taken from the water main to the property. The service pipe will then be divided into two connections, one for a domestic supply and one for the water sprinkler system. The domestic supply will be metered, the fire sprinkler supply may also be metered and no charge will be made for water used for fire fighting or testing purposes.

Water Sprinkler Designers'/ Installers' Responsibility
The designer/installer shall install a sprinkler system in accordance with the appropriate British / European standard and comply with the Water Supply (Water Fittings) Regulations 1999. There shall not be any connections from the dedicated fire fighting supply for domestic purposes. The designer/installer shall take into account that SWW will not guarantee flows and pressure above the GSS standards set out above and as already explained the supply may be interrupted due to planned activities on the network or due to a burst on the supply network.

Building Owners' Responsibilities
They shall consult with the respective water sprinkler designer/installer before requesting any new water connection. It is the building owners' responsibility to specify the required internal diameter of service pipe connection when making a request for a new water connection.

Owners shall discharge all claims made by any person in respect of any liability which arises from or is in any way connected with the operation or failure of the system. They shall indemnify SWW in full on demand for all losses and expenses incurred by it arising from or in any way connected with such liability.

It is the owner occupiers' responsibility to maintain the associated check / isolation valves and ensure that the fire system is serviced as per the manufacturers' recommendations.

Building owners shall ensure that the pipe work used for fire fighting fittings purposes is solely used for this purpose and does not have any connections to other fittings. The building

owner shall indemnify SWW against any loss of revenue associated with water usage not in connection with fire fighting or testing or fire fighting fittings.

If a water meter is not installed on a fire fighting dedicated supply and it is identified that the owner has used water from that supply for non fire fighting activities, the owner shall at their expense install a water meter for that supply and pay charges for non fire fighting usage. It is an offence to use water in this manner and legal proceedings will be instigated.

Water Regulations
Sprinkler system installations must be notified to SWW under the Water Supply (Water Fittings) Regulations 1999. SWW will maintain a register of customers who have advised them that they have installed a fire sprinkler system on a domestic property. A Regulation 5 notification must include drawings showing pipe runs and a schedule of fittings. SWW will consider an application for any in line booster pump, this type of pump can however, only be installed with the consent of SWW. Any non-compliant fittings must be rectified within an agreed timescale with SWW.

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 the Water Company.

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, tappings, tees, Service Pipe(s) and boundary boxes shall be clearly identified, together with the relevant fitting on the plan and/or in an accompanying legend. The legend should be consistent with 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 Not used

17.3 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.

On site tests are undertaken at each sample point to determine:

- Free and total chlorine
- Taste and odour
- Visual appearance

Samples for laboratory analysis should not be taken unless the on-site results / checks are satisfactory.

Below are the sample results, that should be received to enable a new main to be connected.

Type	**Result**
Coliforms	Zero
E. coli	Zero
pH	6.5 to <9.5
Chlorine	comparable with the feed water
Conductivity	<100uS/cm difference from feed water
Turbidity	<4NTU
Taste and odour	no unusual taste or odour
Visual appearance	clear and bright

If any of the above sample results, do not meet the criteria, the main should be chlorinated, tested and sampled again.

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 (< water.org.uk/publications/reports/principles-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).

If any of the onsite tests are not satisfactory, or if there is any doubt concerning the quality of water being sampled, advice must be sought from the appropriate Water Quality Scientist via Developer Services

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

The SLP is advised to contact 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.

17.4 Pressure testing of Self-Laid Main

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. 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.
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

Water Companies to publish key contacts on its website.

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.

19.1 Meter Pairing and Commissioning

To protect our end customers, by ensuring that wholesome water is provided, we will require an appearance/chlorine and ammonia test to be completed after the new connection has been undertaken. Services cannot be connected to the new main prior to this test passing.

Should the test fail we will not be able to authorise service connections and corrective actions will need to be undertaken dependant on the type of failure.

Further information on how to undertake these tests can be found at https://www.southwestwater.co.uk/developer-services/water-services-and-connections/self-lay/

All meter details are required within 5 calendar days of connection. Upon receipt of the meter details the end user billing account will be created. Where accurate meter details have not been received within 5 calendar days of the plot connection SWW reserve the right to visit site and/or obtain the meter details, recharging all reasonable costs.

19.2 Timing of the Generation of Plot Reference Numbers

Plot reference numbers are generated at the time the quotation is issued. Following receipt of a completed application form a quotation is usually issued with 28 calendar days. Each plot reference number is made up as follows:

- the application reference number (eg WR123456)
- the individual plot number/description (eg plot 32 or block A landlord supply)

For example, WR23456-plot 32 or WR123456-block A landlord supply

19.3 Water Company Design Service Offerings

South West water offer SLP's and/or Developers a full Design Service. Applications for this offering are submitted using our infrastructure application, in the same manner as an application for a design approval.

19.4 Design Self-Certification Scheme

Not applicable. This is currently not a service South West Water offer.

20. Design and Construction Specification Appendices

Water Company may insert appendices into this document within the following paragraphs 21 to 24 only in the form of text or "object" file.

21. Schedule of Permissible Materials and Construction

Materials

Please refer to CESWI 7th Edition for permissible materials. Any deviations to those materials stated shall only be permitted if authorised by South West Water.

Pipe Jointing

South West Water 's approved method of installing PE pipe & PE barrier pipe is by butt fusion. All pipe joints shall be butt fused in accordance with WIS. 4-32-08. De-beading of each butt fused joint shall be number and tested.

PE & barrier pipe- Pipe jointing is approved in the following order up to and including 355mm:
1. Butt fusion (approved preferred standard)
2. Mechanical
3. Electrofusion shall only be approved when used in conjunction with an independent approved quality control system.
For PE jointing all EF boxes shall be blue box enabled
DI – Push fit or mechanical

Service Connections

Service connections shall be put at a minimum of 300mm spacing.

Meters for standard connections
The current technical specifications for meters installed in the SWW area are:

Type of Meter	Meter Size	AMR Meter	Capable of capturing and transmitting usage data	Capable of having an external logger (or similar devices for data capture and transmission) applied to it
Diehl Altair V4	Up to 20mm	Yes	Yes	Yes

Hygienic storage of fittings and materials

All pipe and fittings shall be stored off the ground. Wherever possible to be stored on hard-standing ground and where not possible grass/vegetation is to be maintained at a height below the off-ground storage.

All pipes shall be delivered and stored with end caps.
All fittings are to be bagged or wrapped.

22. Meter and Service Pipe Policy and Installation

All new build properties shall be metered with the pipework and fittings installation complying with Water Supply (Water Quality) Regulations 2016 and Water Supply (Water Fittings) regulations 1999. Our current policy is that meters should be located externally to enable ease of access for reading, inspection, maintenance and access to the stop tap. We appreciate however that external meters are not always possible or practical, in these situations Internal meters can be used. Further details of these arrangements can be found in the below.

South West Water offer to SLP's with the relevant accreditation the option to complete their own services connections ≤63mm and the ability to fit the meters for these. Where applicable South West Water will also consider SLP's with the relevant accreditation to undertake service connections >63mm.

South West Water also offer to both the Developer/SLP an option for SWW to install the pipework and the boundary box into the footway.

All meters installations shall be notify to South West Water using the Meter Installation form.

SWW policy is to install a remote reading facility, known as Automated Meter Reading (AMR) to all new 15mm or 20mm meters which are fitted to all standard service connections. The only exception is where a new supply is dedicated to fire fighting.
The standard approach is one premise – one service pipe – one meter. This is not always appropriate however for high-rise or other buildings in multiple occupation, where a single shared service, and perhaps even a single meter might be sensible, depending upon ownership, layout etc. At the very least, the supply to each separately occupied property should be so arranged that it can be individually isolated from outside the property, or from an area of common access within the main building. Where one premise - one service pipe - one meter cannot be provided the layout shall be agreed with South West Water.

It is South West Water's policy to minimise the use of bulk meters and bulk meter agreements and to maximise the use of individual metered supplies to all properties.

It is also South West Water's policy to individually meter all properties that are separately occupied and have no shared facilities such as kitchens and bathrooms. Automated Meter Reading (AMR) meters shall be installed on new connections.

Bulk Metering Agreement
Where a bulk metered supply is permitted by South West Water, a bulk metering agreement must be entered into by the owner of the property prior to the connection being made.

External Meters

Single boundary boxes

Single boundary boxes should typically be located at the back edge of the footway in which the water main is laid. The boundary box shall be accessible for all occupiers – i.e. not in another properties private land or behind fencing. Shall be safe to maintain for South West Water employees, avoiding shrubbery, hedges and fences. The position of the box shall allow reading, inspection.
A key consideration here is Highway Authorities won't allow boundary boxes in driveways or drive entrances where vehicles are likely to drive over them.

Multi-port manifolds

Where it isn't possible or practical to install a single boundary box in accordance with either of the above options, a multi-port manifold can used for installation instead providing it is not located in the highway.

Internal Meters

Internal meters are permitted on new blocks of flats and by agreement on new non-household buildings providing the terms and conditions detailed below are met in addition to the s45 new connection conditions.

1. All meter housing and private pipework installations must satisfy Water Regulation requirements
2. The meters will only be installed on carriers that have WRAS approval. These meter carriers can either be supplied by South West Water and recharged via the new connection quote or purchased direct from an independent supplier.
3. The meter carrier will be of a gunmetal or similar approved material complete with integral stoptap; both the inlet and outlet must have 3/4" BSP threaded ends. The meter carrier is also to have an in-built non-return valve (NRV) and stoptap. The Stoptap and NRV must also have WRAS approval.
4. All meters once fitted must have a tag to identify each property flat/unit number
5. The meter carrier must be correctly secured to a wooden backboard or suitable support.
6. A drain cock and a stop tap are to be fitted immediately after (downstream of) the meter carrier.
7. Each flat/unit will have its own meter, there will be no shared supply.
8. The Builder/Developer must ensure that the owner of each flat/unit is shown the location of their meter.
9. Access for meter maintenance and meter reading will be required 24 hours a day / 365 days a year.
10. South West Water will not carry any special keys to open doors to gain entry to premises or meter cupboards. Any doors that need secure access must be fitted with coded pads and the codes provided to South West Water. The meter cupboard(s) must not be lockable.
11. All future maintenance and responsibility for pipework within the grounds of the property and internal pipework within the building(s), rests with the owner(s) of the property. This includes the meter carriers, but not the meters.
12. The meters will remain the responsibility of South West Water and must not be removed or tampered with by others.
13. Water and electrical apparatus must not be installed in close proximity or within same cupboard

23. Standard Arrangement Drawings

All Standard Arrangement Drawing will be provided on the South West Water's website to ensure latest practice can always be followed.

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 meeting 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	
WIS 4-08-02	Specification for bedding and sidefill materials	
IGN 4-37-02	Design against surge and fatigue conditions for thermoplastic pipes	
IGN 4-01-03	Guide to Pressure Testing of Pressure Pipes and Fittings for use by Public Water Suppliers	
IGN	4-01-03	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 7145 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/p ublications/water-industry- guidance	Water UK/HBF National Joint Committee 2014 (available free of charge at: http://www.water.org.uk/p ublications/water-industry-guidance	
Volumes 1 - 6	Streetworks UK (formally National Joint Utilities Group) Guidance Publications available at: http://streetworks.org.uk/resources/publications/	
	Principles of Water Supply Hygiene & Technical Guidance Notes (available from Water UK online at water.org.uk/publications/reports/principles-water-supply-hygiene	
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/ t. Specifications for PVC pipe and fittings:- https://bpfpipesgroup.com/support-downloads/technical-guidance/	

Report R97	Trenching Practice (2nd edition)	CIRIA, 1983 Available at: http://www.ciria.org/ItemDetail?iProductCode=R97&Category=BOOK&WebsiteKey=3f1 8c87a-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&Cat egory=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/specificati on-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