

Insulation Requirements

Insulation requirements depend upon where water service pipes are installed, on the pipe size, material and internal bore. It also depends on the position of the duct and if the floor is solid or suspended. Pipework must be insulated to provide at least 12 hours protection to meet the Regulator's minimum standards.

Any pipe outside of the thermal envelope requires extreme protection. Examples of pipes outside the thermal envelope include pipes above the ceiling insulation in a roof space, and pipes under suspended ground floors, pot and beam floors, or in unheated communal areas, cloakrooms, store rooms, utility rooms, garages, external locations etc.

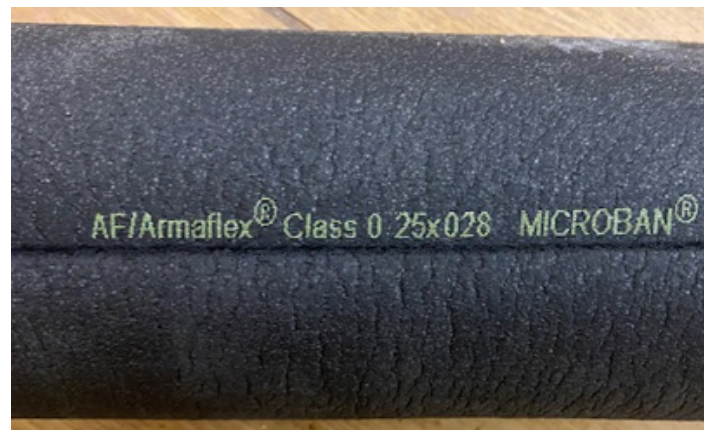
Therefore any part of the pipe in a duct that is outside the thermal envelope should be insulated to protect against extreme conditions. Insulation should be of the 'closed cell' type and be tubular to ensure an equal thickness around the pipe. The seam should also be sealed in accordance with manufacturer's instructions and the thermal conductivity should be 0.035 also known as W35 standard.

Note: Rockwool/fibre glass insulation types are not acceptable for external use.

As it is sometimes difficult to determine what is and what isn't outside the thermal envelope, the following guide should apply to both commercial and domestic water service pipe installations and we would strongly recommend exceeding the minimum requirements wherever possible.

This is the link for the pipe insulation tool:

www.waterregsuk.co.uk/information/tools/pipe_insulation_tool/



Insulation Requirements

Insulation wall thickness for domestic properties in normal conditions		
Size of supply	Material	Minimum insulation requirements
25mm	PE/Barrier Pipe	25mm wall
32mm	PE/Barrier Pipe	19mm wall
63mm	PE/Barrier Pipe	6mm wall
90mm	PE/Barrier Pipe	6mm wall
110mm	PE/Barrier Pipe	6mm wall
160mm	PE/Barrier Pipe	6mm wall

Insulation wall thickness for domestic properties in extreme conditions		
Size of supply	Material	Minimum insulation requirements
25mm	PE/Barrier Pipe	32mm wall
32mm	PE/Barrier Pipe	19mm wall
63mm	PE/Barrier Pipe	6mm wall
90mm	PE/Barrier Pipe	6mm wall
110mm	PE/Barrier Pipe	6mm wall
160mm	PE/Barrier Pipe	6mm wall

Insulation wall thickness for commercial properties in normal conditions		
Size of supply	Material	Minimum insulation requirements
25mm	PE/Barrier Pipe	32mm wall
32mm	PE/Barrier Pipe	19mm wall
63mm	PE/Barrier Pipe	6mm wall
90mm	PE/Barrier Pipe	6mm wall
110mm	PE/Barrier Pipe	6mm wall
160mm	PE/Barrier Pipe	6mm wall

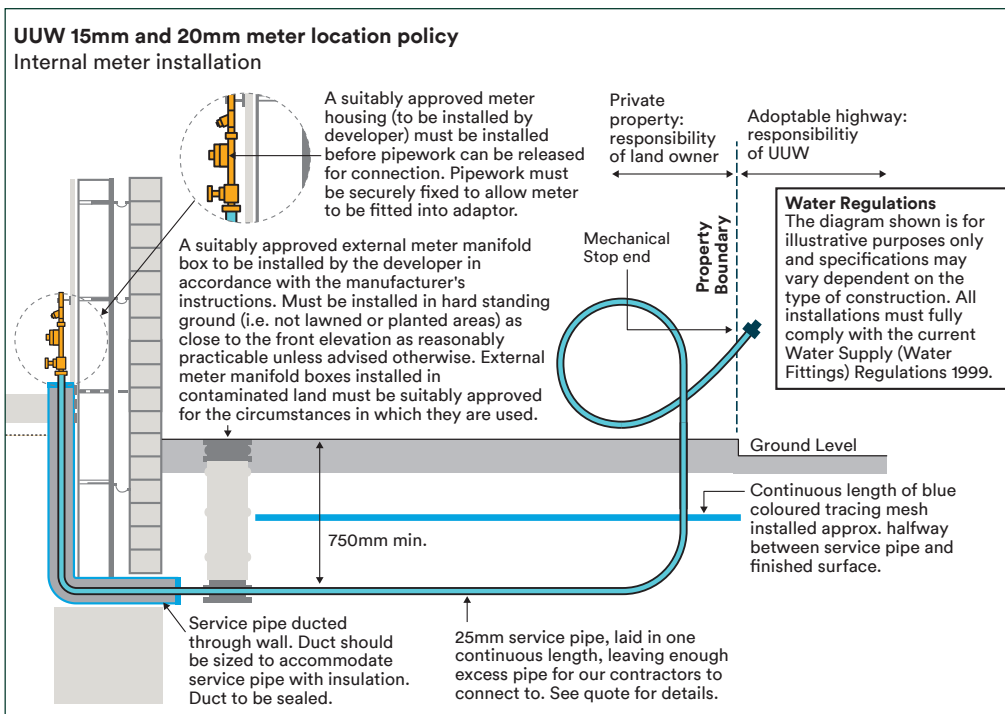
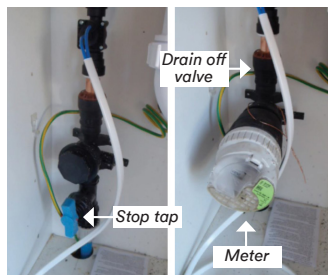
Insulation wall thickness for commercial properties in extreme conditions		
Size of supply	Material	Minimum insulation requirements
25mm	PE/Barrier Pipe	32mm wall
32mm	PE/Barrier Pipe	32mm wall
63mm	PE/Barrier Pipe	13mm wall
90mm	PE/Barrier Pipe	6mm wall
110mm	PE/Barrier Pipe	6mm wall
160mm	PE/Barrier Pipe	6mm wall

Internal domestic meter installation

The water meter should be located within the property at the point of entry.

You must install a suitably approved concentric meter housing on the supply pipe at the point of entry, directly above the stop tap. The meter housing must be able to accommodate the installation of a class D meter. **Please note:** Some housings may require a conversion insert. Check with your supplier.

The pipework must be securely fixed to allow the meter to be screwed into the meter housing. A gap of 160mm x 110mm must be left clear directly around the adaptor to accommodate the Meter housing.



External meter installation – wall-mounted box

The water meter is located within an approved meter box that is *mounted directly* to the wall.

The meter box can be installed on any elevation of the property and must comply with the specific manufacturer's installation specifications.

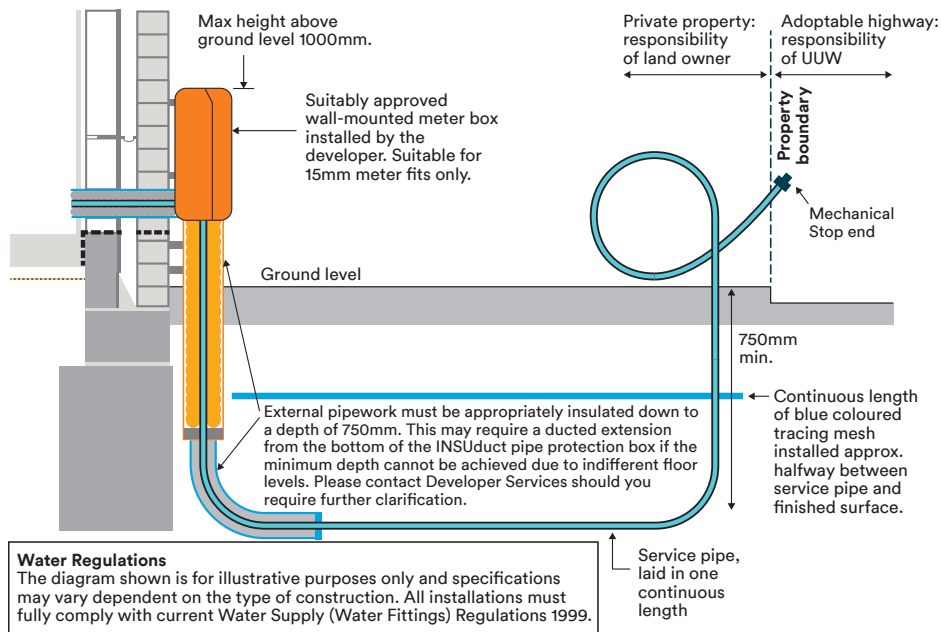
No *additional* external control is required.

Ensure **on-wall box** with insulated ducting is installed on the external elevation of the property and an insulated duct through the wall. Pipework to be ducted and appropriately insulated (32mm wall thickness) through the wall and INSUduct will need extending down to 750mm if more than 130mm above ground level.



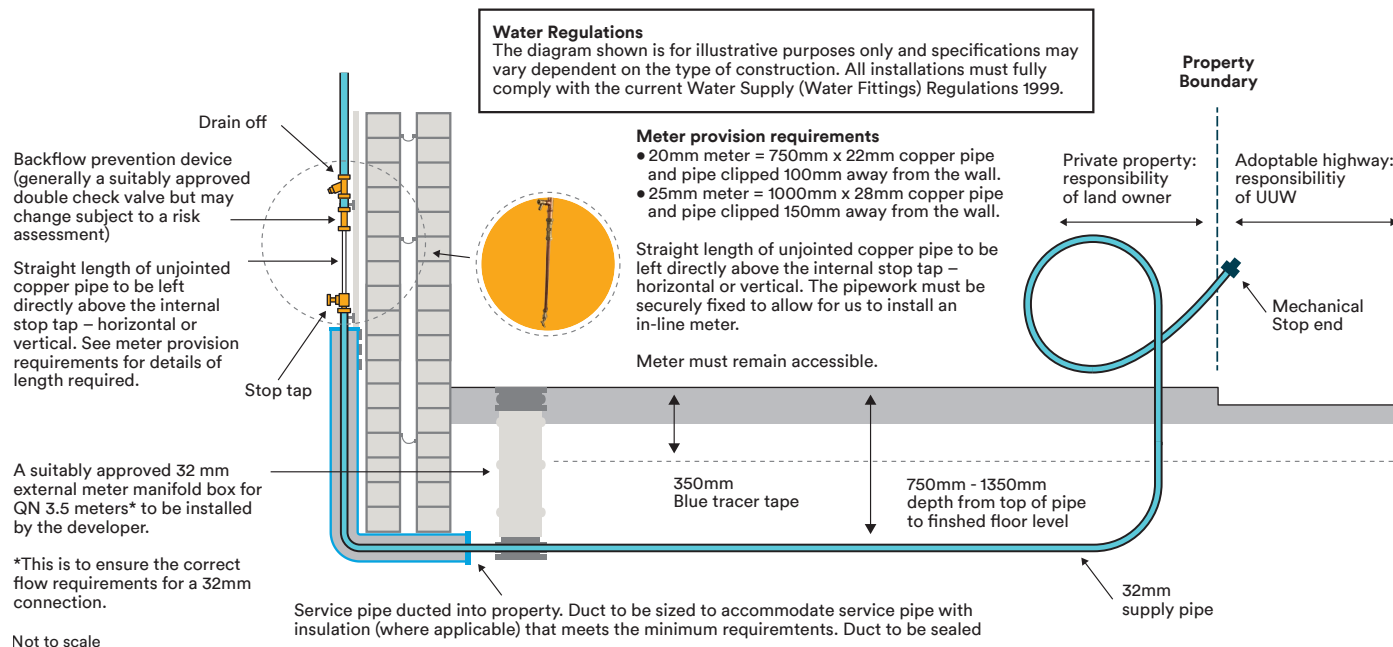
Wall mounted box together with INSUduct extension

UUW 15mm meter location policy Wall-mounted box



If the INSUduct box is over 130mm above ground level at final fix, there will be a requirement for you to extend it by using additional ducting and insulation

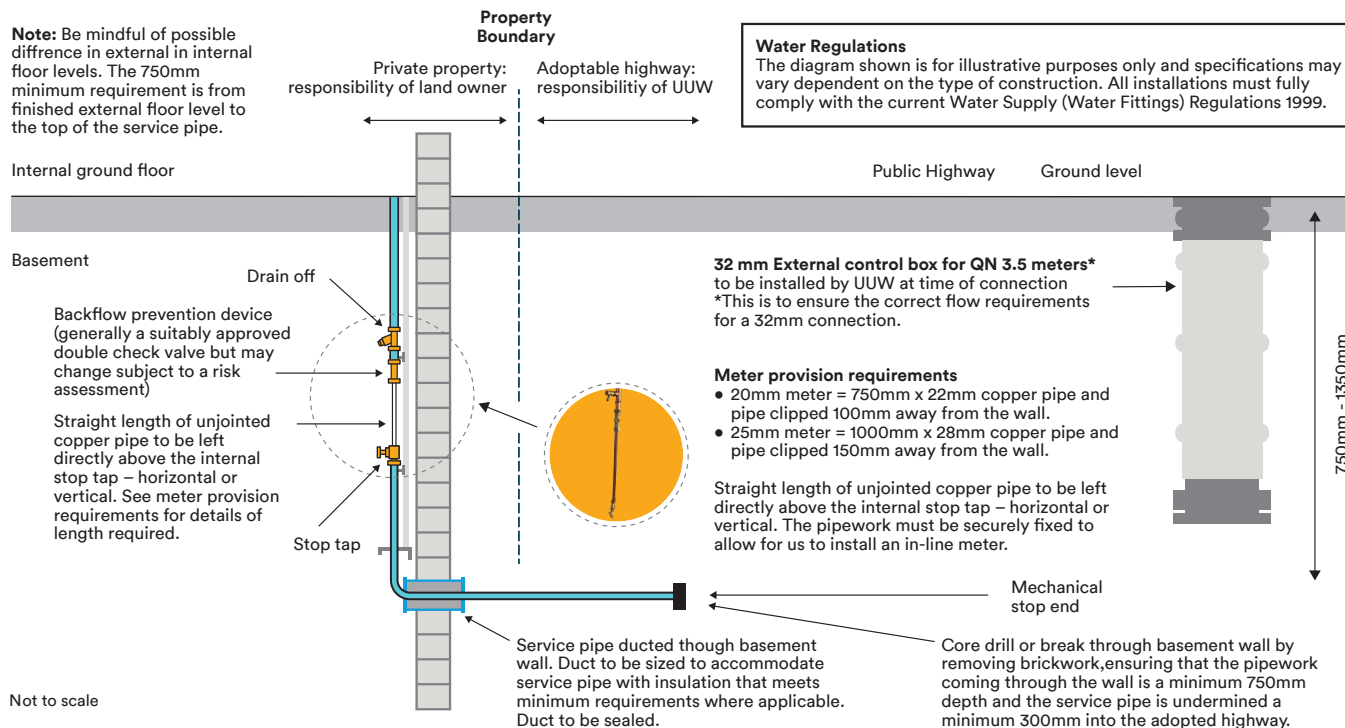
Standard 32mm commercial supply with provision for a 20mm – 25mm in-line AMR meter



Not to scale

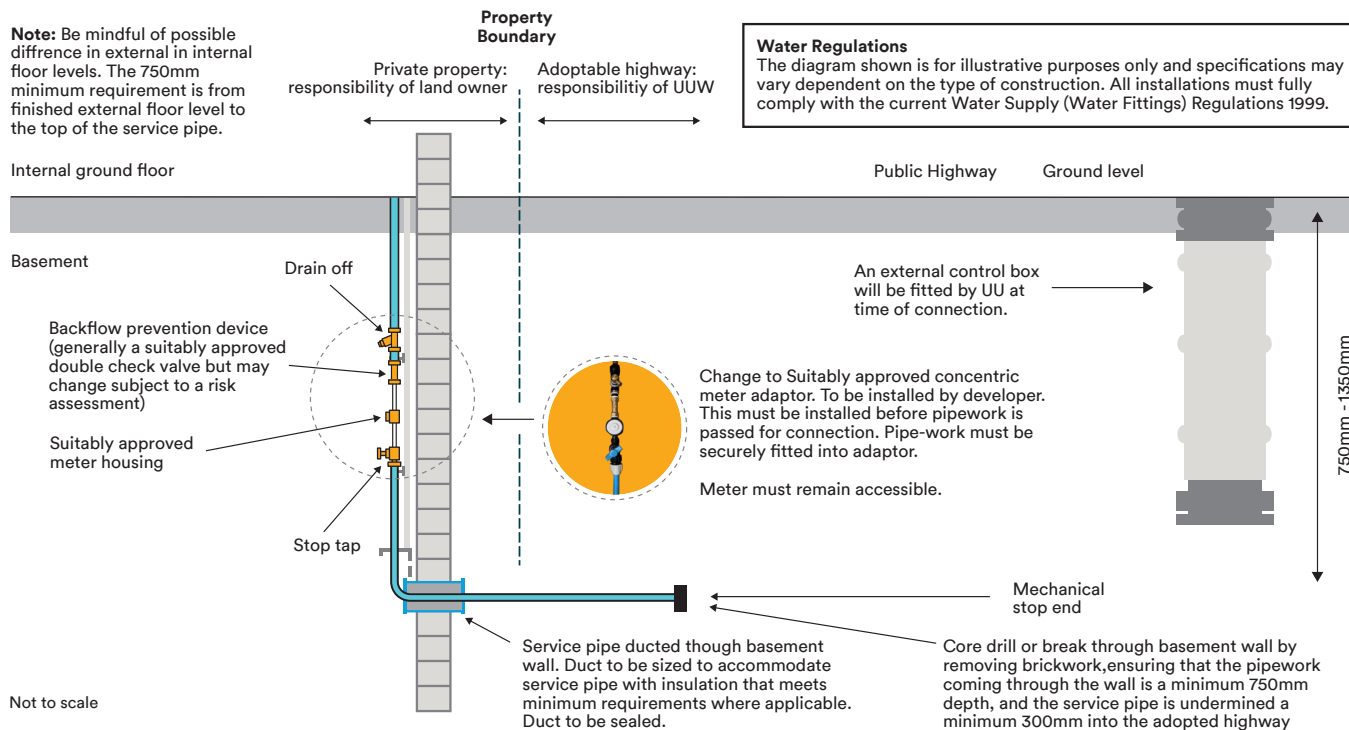
32mm commercial basement supply fronting on to the public highway with provision for a 20mm-25mm internal in-line meter

Note: Be mindful of possible difference in external in internal floor levels. The 750mm minimum requirement is from finished external floor level to the top of the service pipe.

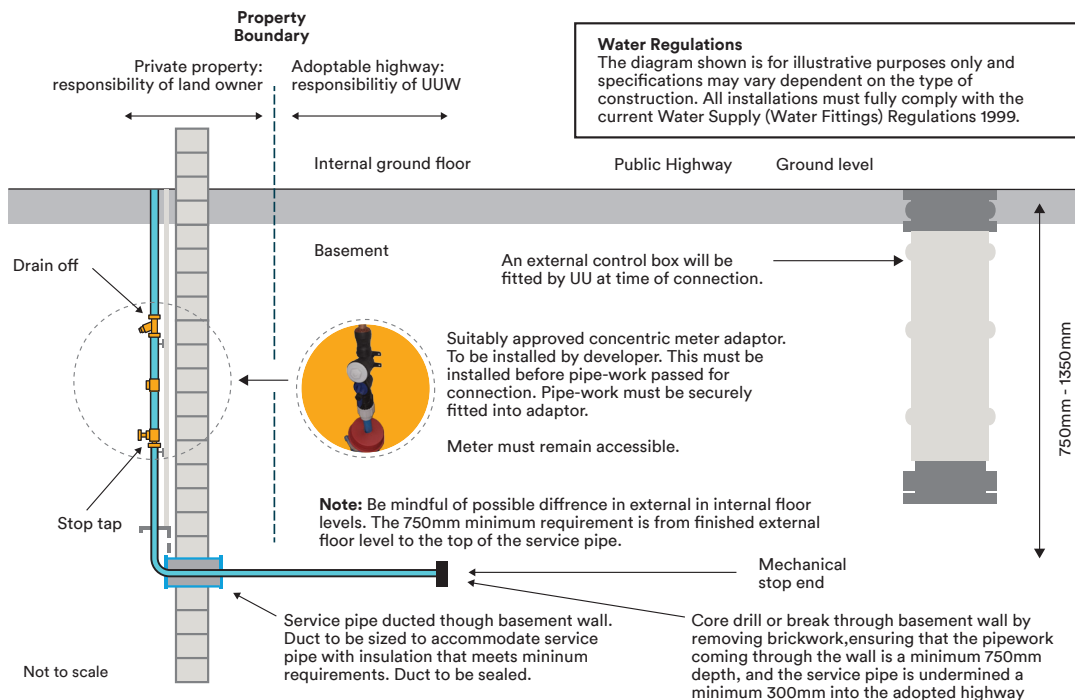


25mm commercial basement supply fronting on to the public highway with provision for a 15mm screw-in AMR meter

Note: Be mindful of possible difference in external in internal floor levels. The 750mm minimum requirement is from finished external floor level to the top of the service pipe.



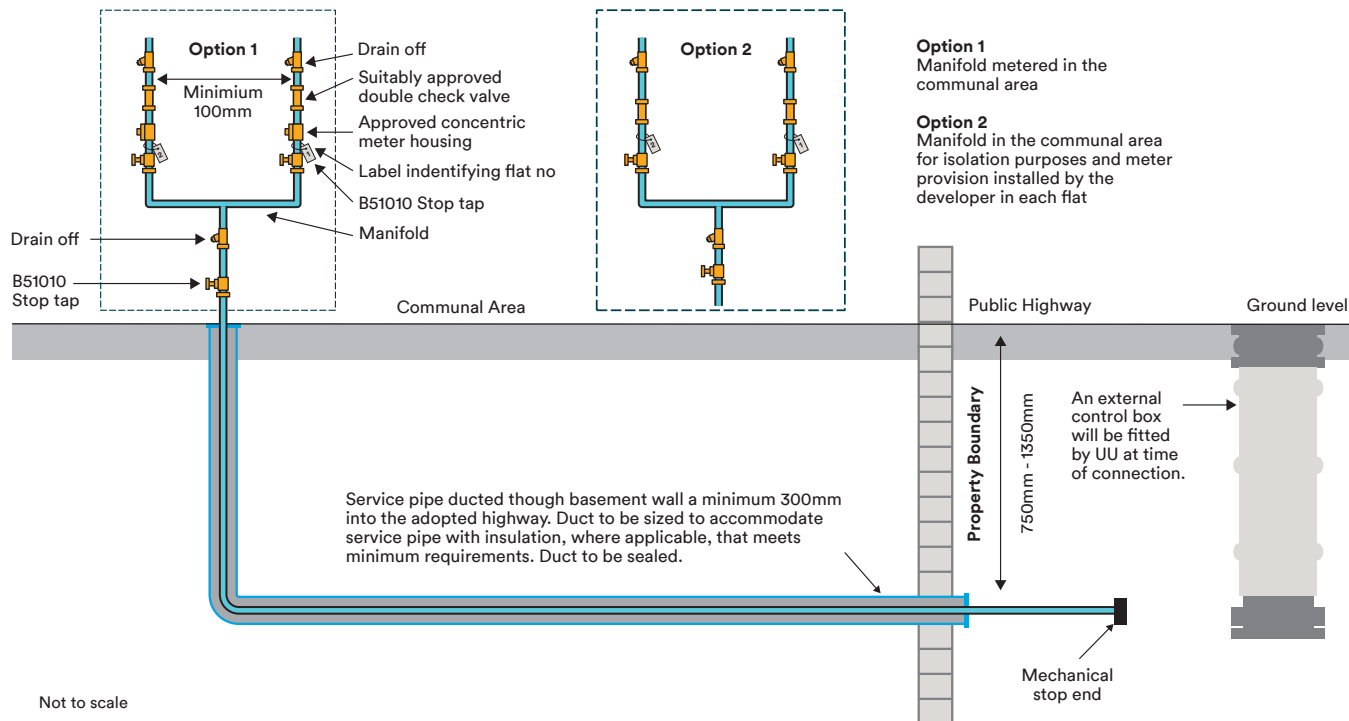
25mm domestic supply fronting onto the public highway with provision for a 15mm screw in AMR meter



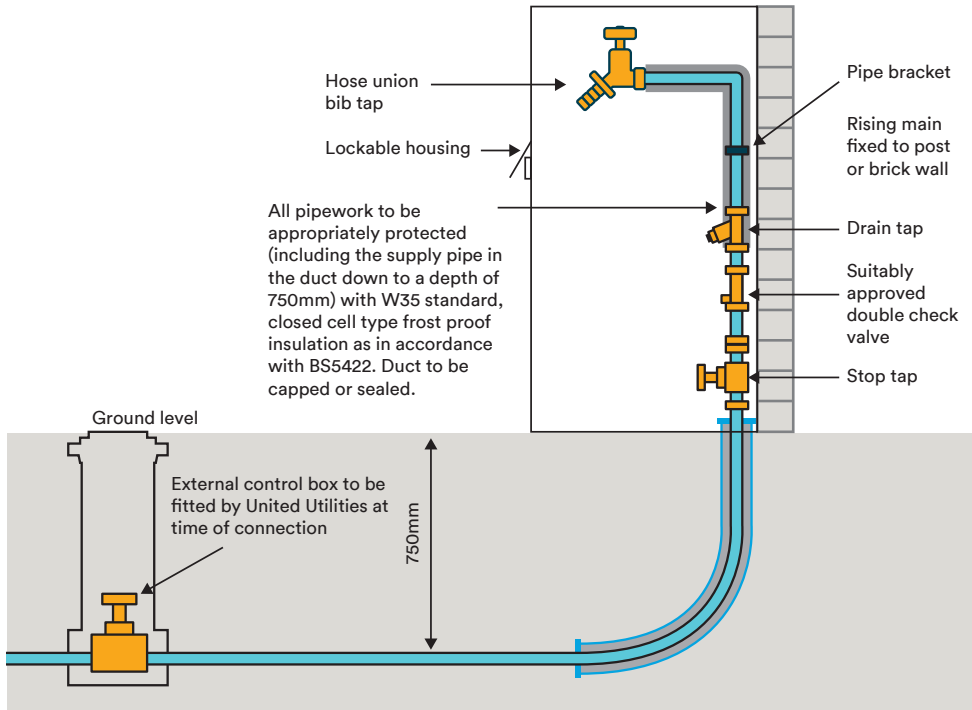
Example of a service pipe being ducted and insulated through a basement wall



Multi occupancy premises – 32mm connection fronting on to the public highway



Temporary building supplies and standpipes



Temporary building supplies must be suitably insulated and housed in a lockable box and the supply pipe should incorporate all the fittings detailed in the diagram on the left.

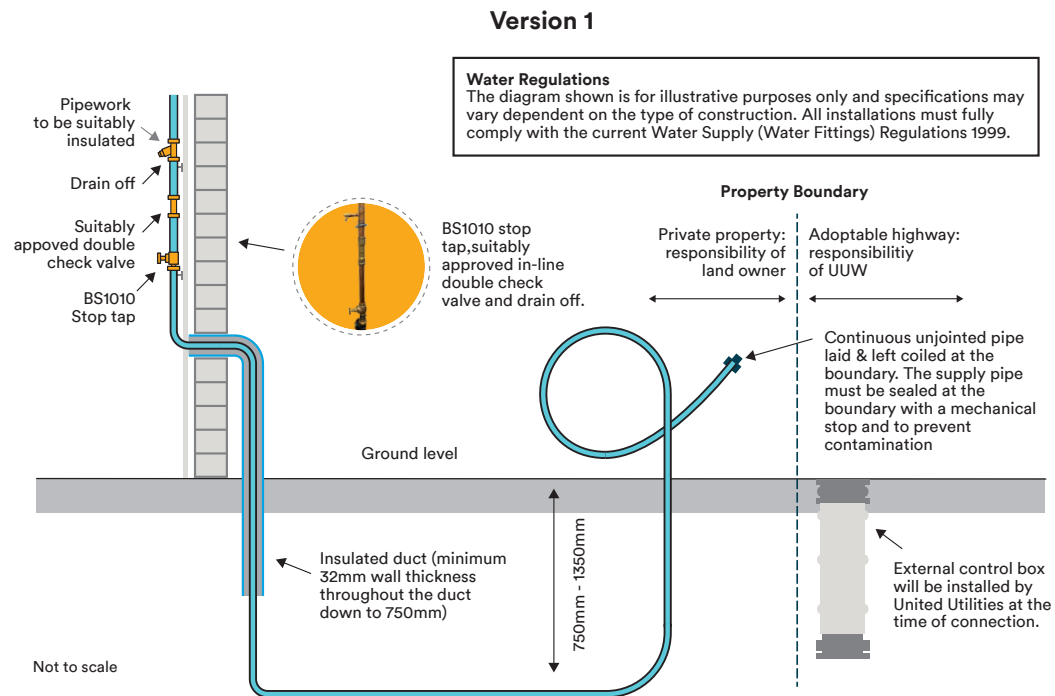


This is an example of a lockable box referenced in the spec drawing on the left.

Standard temporary site cabin supply

Branches to multiple cabins and temporary building water supplies is permitted with the following conditions:

- Pipework is suitably insulated and weatherproofed
- Pipework is securely clipped and free from trip hazards and accidental damage
- Satisfactory secondary backflow requirements are fulfilled

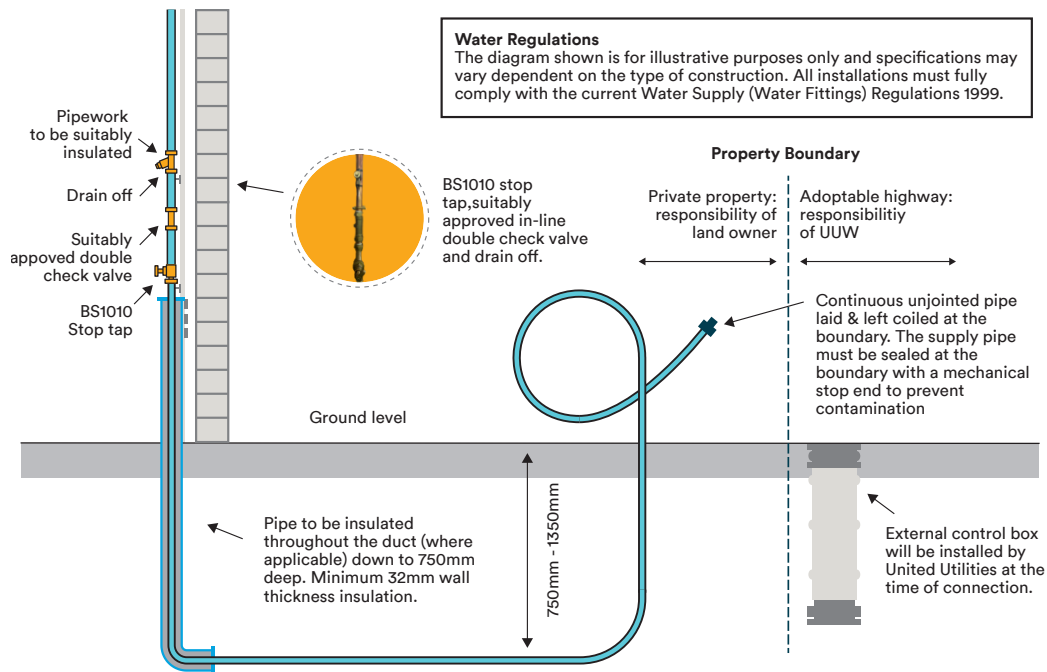


Standard temporary site cabin supply

Version 2

Water Regulations

The diagram shown is for illustrative purposes only and specifications may vary dependent on the type of construction. All installations must fully comply with the current Water Supply (Water Fittings) Regulations 1999.

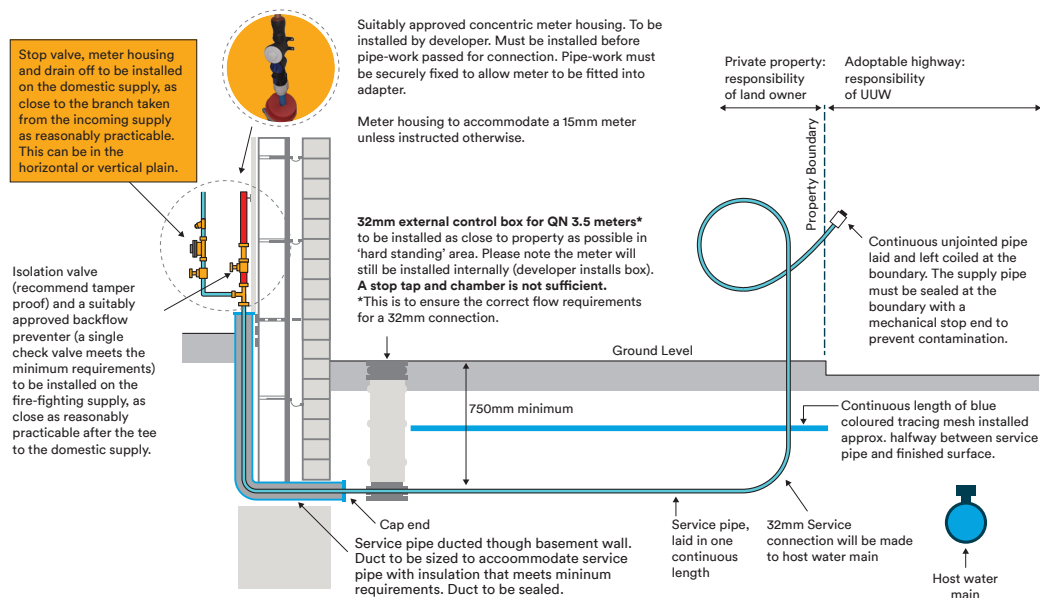


Example of a bottom entry supply prior to backfilling

Domestic Fire-Fighting Supplies

United Utilities cannot guarantee pressure or flow for any fire-fighting supplies as this is limited to the water available in the network at any time. The network pressure and flow is designed to cater for non-fire-fighting purposes.

United Utilities cannot provide specific design advice for fire-fighting systems. This should be provided by a qualified fire specialist/designer/installer in line with the relevant standards.



Water Regulations

The diagram shown is for illustrative purposes only and specifications may vary dependent on the type of construction. All installations must fully comply with the current Water Regulations.

Not to scale

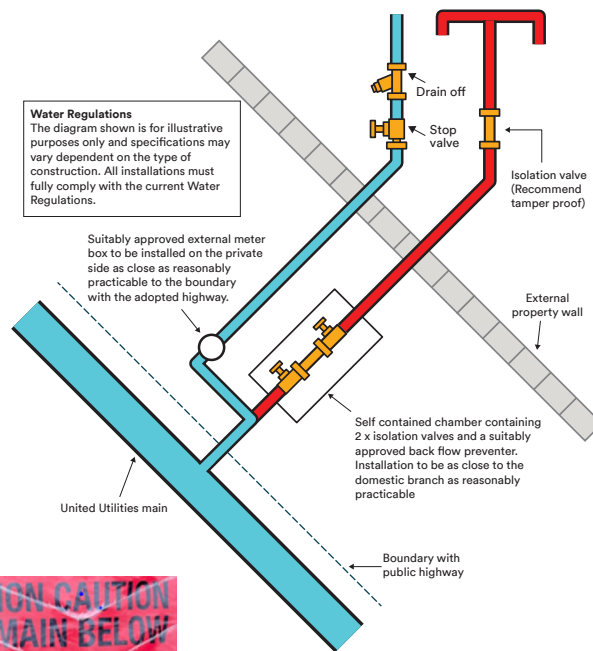
Domestic Fire-Fighting Supplies

External connection – Generally used for properties that are a minimum 50 metres from the point of connection or where the supply enters a different part of the property.

- Fire-fighting supply pipe to be installed in accordance with BS1710:2014 which provides the standards for pipe ID and includes colour coding requirements, guidance on labels and the contents of pipework
- Isolation valve and suitably approved backflow preventer, generally a single check valve, to be installed in a self-contained chamber, as close as reasonably practicable to the domestic supply pipe branch from which the fire-fighting supply was taken. Chamber to be sized to allow access for maintenance and repair
- Fire-fighting supply to be separately ducted and insulated (where required) into the property but can share the same trench as the domestic supply. Duct to be sized to accommodate the service pipe and insulation
- Depth of supply between 750mm-1350mm

BS1710:2014 Pipe ID colour banding requirements for fire-fighting supplies:

Fire-fighting system supplied direct from the mains network



Green	Auxiliary blue	Red	Auxiliary blue	Green
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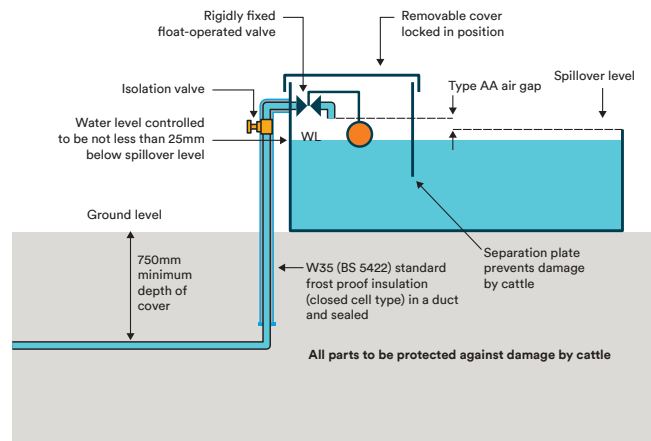
Agricultural/animal drinking water trough

Domestic/commercial

Boundary and point of entry

- The water supply pipe to be laid to the boundary, leaving two metres excess pipe for us to connect to and a mechanical stop end fitted to the end of the pipe
- From the top of the water supply pipe in the trench to the finished floor level must be between 750mm – 1350mm depth
- Trench to be free from debris and left open for inspection
- Every pipe supplying a drinking trough or bowl must be fitted with a float-operated valve or no other less effective device
- The inlet valve must be securely fixed to the trough and the water inlet point must have an AA air gap or the equivalent fluid category 5 backflow protection
- Water supply pipe to be protected from damage by cattle, horses etc; rising pipe to be ducted and insulated at the trough location, from a minimum 750mm down, up to at least floor level, ideally beyond; insulation to be continued to the inlet of the float valve
- A 100mm duct (solid or flexi but not land drainage) should be sufficient for 25mm and 32mm supplies
- 32mm wall thickness insulation with a thermal conductivity of 0.035 will meet the minimum recommended standards for 25mm and 32mm supplies
- All insulation exposed to the elements should be protected with a weatherproofed tape
- The duct to be sealed using an end cap or with a readily removable sealant (not oil based)

- An isolation valve to be installed just below the inlet to the float valve
- A risk assessment will be required to determine the need for a backflow preventer installation at the boundary with the public highway



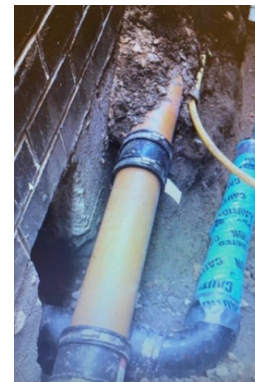
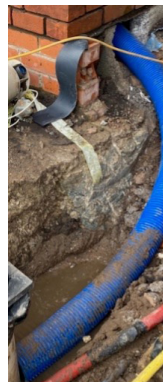
Shallow entry point Installations

The depth of your water supply pipe should be between 750mm – 1350mm from the top of the pipe to the finished ground level. Should you be prevented from achieving the minimum requirements at the point of entry to the property due to circumstances beyond your control e.g. a ring beam; you can compensate for lack of ground cover by extending your duct out from the property to a point where you can achieve a minimum 750mm ground cover and then insulate to protect against extreme conditions back through to the internal floor level. This may also require the relocation of your external meter box.

Duct to be sealed with an end cap or a readily removable sealant that isn't oil based.

Note: Insulated ducting is not an alternative to meeting the minimum requirements for depth.

Any duct that is not blue must be identified by spiral wrapping blue ID tape around the duct if it travels beyond the foundations of the building. Picture 4 and 5 taken prior to spiral wrapping.



Rainwater harvesting systems

United Utilities’ have identified rainwater harvesting systems as the single biggest threat to water quality if they are not installed correctly, and so your installer’s familiarity with the Water Supply (Water Fittings) Regulations 1999 and the British Standard for pipe identification markings (BS1710: 2014) is fundamental to a compliant installation.

BS1710:2014 provides the standards for pipe ID and includes colour coding requirements, guidance on labels and the contents of pipework. The purpose of this requirement is to prevent accidental cross-connections that could lead to contamination of wholesome water in supply pipes or distributing pipes.

The Water Supply (Water Fittings) Regulations 1999 detail the national requirements for the design, installation, composition and maintenance of water fittings. These Regulations make provision to stop the waste, misuse, undue consumption, erroneous measurement and most importantly the contamination of the drinking water supply.

Key installation points to note

- Strictly no cross connections between mains cold water and harvested water are permitted. It is therefore essential that harvested water pipework is kept totally separate from mains water pipework. Non-return valves, check valves, RPZ valves and motorised valves are not a permitted form of separation
- All harvested rainwater pipework, below and above ground, must be identified in accordance with BS1710:2014. Signage

may also be required, clearly stating “not suitable for drinking.” This includes the internal pipework that delivers water around commercial and domestic properties, to outlets and appliances such as washing machines and external taps.

- A mains cold water top up to harvested water storage cisterns should incorporate fluid category 5 protection (type AA or type AB air gap) and the branch to the cistern should be fitted with an isolation valve and a suitably approved single check valve as close as reasonably practicable to the mains cold water pipe work from which the branch is taken

Pipe marking and label examples

Colour coding chart detailing the pipe marking requirements for rainwater harvesting pipework. Colourfast polyethylene tape to be spirally wrapped along the length of underground pipework from the rainwater harvesting tank to the property. This should include direction of flow arrows and a text box detailing the contents of the pipe.

Water quality				
Non-potable water system derived from any other	Green	Flint grey	Black	Flint grey
				Green

Rainwater harvesting systems

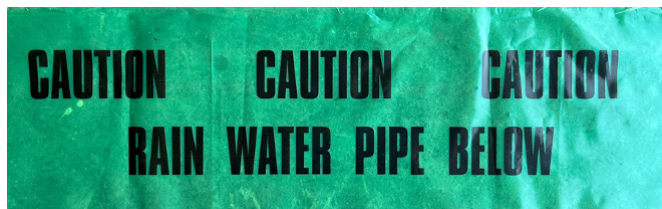
An alternative to the use of underground pipe marking tape is the installation of black/green mdpe pipe specifically manufactured for rainwater harvesting systems in accordance with IGN -9-02-05.



Note: Seek advice from your local inspector prior to laying pipework in contaminated ground.

Warning Tape

Denotes the presence of a supply pipe below. Warning tape to be laid along the whole length of the installation on top of approx. 300mm of back fill. This is in addition to pipe ID.



Internal pipework

The marker tape should still be banded green, flint grey, black, flint grey green and stencilled with whatever fluid family is relevant eg rainwater harvesting. The tape should also incorporate a direction

of flow. In concealed areas marker tape should be applied every 500mm. It should also be applied before and after valves and at a point where the pipe changes direction and either side of any wall a pipe passes through. For any long lengths of pipe we would just be looking for a representative application of marker tape that will make the contents of the pipe easily identifiable.

Signage

Signage warning that harvested water is not suitable for drinking

Typical harvested rainwater usage?

- Flushing toilets
- Laundry
- Washing the car
- Watering the garden



What can you not use harvested rainwater for?

- Drinking
- Cooking
- Washing dishes
- Bathing and personal hygiene

Water supply pipe installation for allotments with single or multiple watering points

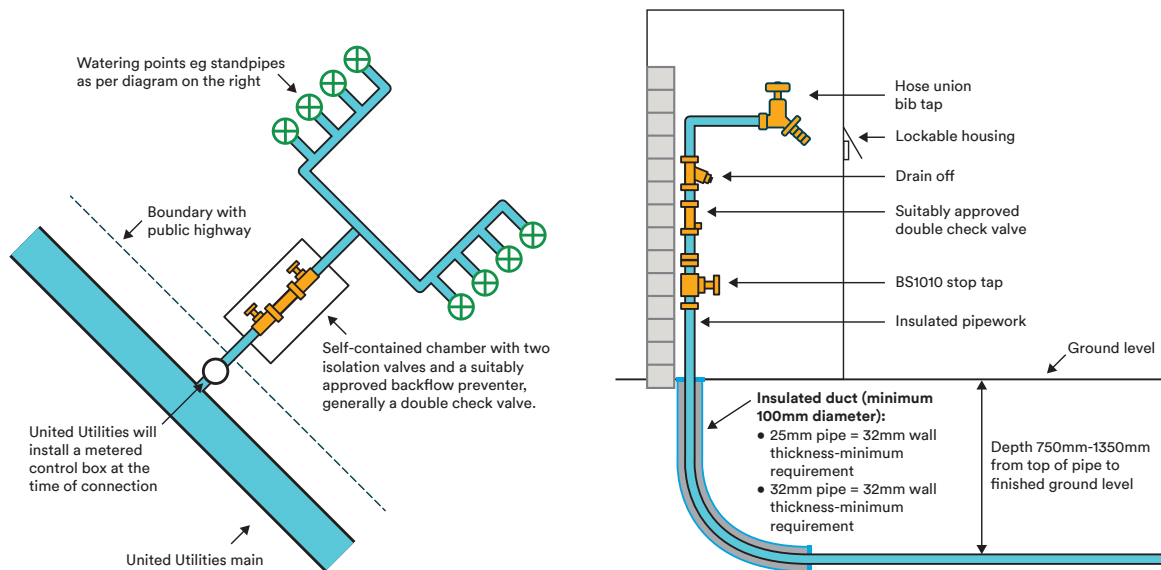


Diagram for guidance only and not to scale – Service pipe to terminate at the point of connection agreed with United Utilities, leaving a minimum of two metres of excess pipe for us to connect to and the end of the pipe to be fitted with a mechanical water tight fitting to prevent the ingress of debris and contaminants. All pipework to be laid between 750mm-1350mm and all branches taken to watering points to be ducted and insulated to protect against extreme conditions. Hose connections to be retractable with a self-closing mechanism and disconnected after use. Watering points to be confirmed for domestic use only (eg watering plants and produce) and installed using the installation details provided. Suitably approved pre-fabricated standpipes can be installed as an alternative to self-constructed ones. No fertilizer attachments allowed and the hose must not be allowed to fall below the spill over level of any vessel that is being topped up. Anything considered beyond domestic use will be subject to a risk assessment to determine the level of backflow protection required. A suitably approved backflow preventer, generally a double check valve, but the level of protection may be increased upon further risk assessment, to be installed as close as reasonably practicable to the boundary and the chamber sized to allow for maintenance and repair.