



gtc...leading utility networks

GTC Technical Guidelines - Water

GTC Technical Guidelines and Safety information for
House builders and Developers



Disclaimer

Although the greatest of care has been taken in the compilation and preparation of this document, GTC respectfully accepts no responsibility for any errors, omissions or alterations or for any consequences arising from the use, or reliance upon the information in this document.



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1. INTRODUCTION

This brochure will provide you with information and guidance on the installation of Water mains, services and meters to new developments. At the end of the brochure you will find details relevant to the safety file required under the CDM Regulations.

Our Sales Team will assist you with any enquiries you may have and will deal with technical enquiries through our Engineering Planning and Operations departments at our Head Office at Woolpit Business Park in Suffolk.

Should you wish to contact us, the telephone number is 01359 240363.

2. COMMUNICATIONS

Our opening hours are from 8.00am every weekday. In order to book in work on your development, please contact our construction team on:

Tel: 0845 602 2498

Fax: 0845 602 2499

Email: gtcworks@gtc-uk.co.uk

Every effort will be made to meet the developer's requirements but we would ask for a minimum of:

- 5 working days to deliver chamber sections and lids
- 15 working days notice to lay mains
- 10 working days notice to lay services
- 10 working days notice to lay services and fit meter
- 40 working days notice for works in the Public Highway

Please note:

- *the above timescales are a guide only and lead times may be longer during busy periods.*
- *longer lead times are needed for offsite works due to the need to co-ordinate road opening notices*



3. SAFETY

Safe Place of Work

GTC requires a safe place of work to be provided for all its staff and contractors. Initial enquiries shall be made seeking confirmation that the construction site is a safe place to work.

Upon arrival to site, staff and contractors shall report to the site manager/representative to discuss intended works. Prior to undertaking this work, a site specific risk assessment will be undertaken. If, following this assessment, the works cannot be undertaken in a safe manner, the site manager/representative will be informed. Until a safe working environment is achieved, no activities shall be undertaken.

Site Traffic Rules

All site traffic information should be made available to the team/operative when arriving on site, via a site induction or/and during the booking in on-site stage.

Equipment and Materials

The Site Manager/Representative shall ensure their equipment and materials are operated and stored in such a manner that they do not become a hazard within the working area of the team/operative. Water pipe and fittings delivered to site shall be responsibly managed with pipe sticks and coils appropriately stored (as detailed in Section 5). In particular Water fittings are delivered in clear plastic bags, these must be stored in a container and not be opened.

Scaffold

Ensure all scaffold where the team/operatives are to work is removed prior to their arrival on site.

Welfare Facilities

In the majority of cases, welfare facilities are to be made available on site from the Principle Contractor.

Competence

Any staff and/or appointed contractor working on behalf of GTC who attend site shall have the appropriate training, technical knowledge and experience to discharge the intended works in a safe manner.

Recommended Positioning of Utility Apparatus

In accordance with industry guidance and Health and Safety Executive expectations, Water mains and services must be laid at the depths specified in sections 8 and 9 of this brochure.

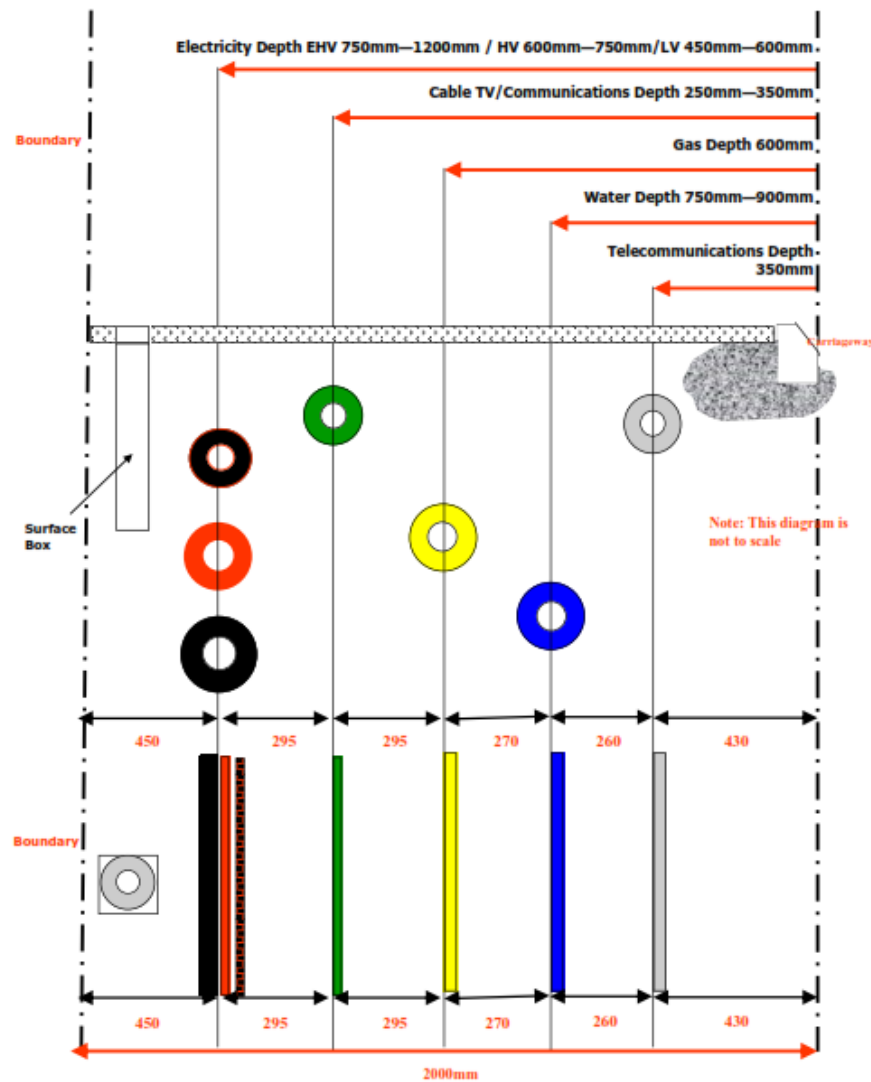
The typical position of the Water main and other utilities apparatus in a footway and road/verge is shown in the diagrams below (mm), this complies with N.J.U.G recommendations. Minimum depths of cover are also shown:



RECOMMENDED POSITIONING OF UTILITY APPARATUS IN A 2 METRE FOOTWAY (from NJUG Guidelines on the Positioning of Underground Apparatus for New Development Sites)

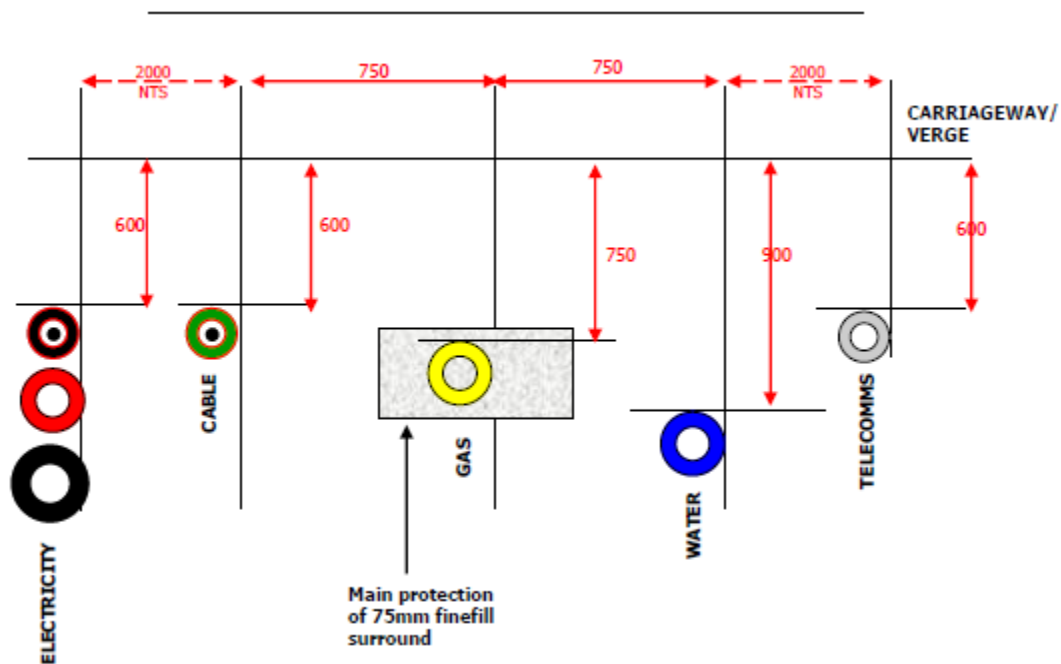
THIS DIAGRAM IS NOT TO SCALE

Note that where the footpath is less than 2 metres wide there is a principle that the Water pipe must not have other utilities within 250mm of it in all directions



TYPICAL ROAD/VERGE SECTION TO SHOW RELATIVE POSITIONS OF UTILITY APPARATUS

THIS DIAGRAM IS NOT TO SCALE



It is imperative that the Water mains are not damaged following installation and it is the responsibility of the developer to ensure that ALL contractors working on site are informed of the location of the Water mains. The mains and services drawing should be on site at all times and updated to clearly show the installation progress.

Please note that other Water Companies may have water mains in the vicinity of the site. They should be contacted by the developer at an early stage in order to establish the location of any non GTC mains that may be affected.

Damage to live Water mains must be reported immediately to **IWNL operations on 02920 442 716** who will arrange for the Emergency Service provider to attend site and undertake any repairs.

Any damage to un-commissioned pipes, no matter how slight, must be reported immediately to GTC.

For further information refer to HSE publication HSG47 "Avoiding danger from underground services" which gives detailed guidance on avoiding damage to Water mains and services, including information on detecting underground services and safe digging practices. Free information is available from the **HSE Infoline on 0845 345 0055** or the **HSE website www.hse.gov.uk**.



4. DEFINITIONS

Water Main	Underground pipe network for distributing Water throughout the property development
Communication Pipe	Underground pipe for conveying Water from the Water main to the Boundary box
Service Pipe	Underground pipe for conveying Water from the Water Boundary box to the premises
NAV Water Company	A company licensed under the Water Act to operate pipes on a network and has control over them for conveying Water
Supply Pipe	The pipe work between the boundary meter box and the premises
Boundary Box	A purpose made chamber installed at the boundary of the property housing a stop valve and meter.

5. WATER MAINS AND SERVICES IN CONTAMINATED GROUND

If the site has been deemed as contaminated by GTC then specific products must be used. (Subject to GTC approval)

Water mains in contaminated ground must be barrier PE pipe or similar. The backfill requirements are the same as for non-barrier PE pipe.

Boundary boxes installed in contaminated land are to be sealed and have gunmetal fittings as described in the GTC Water Specification.

6. DEVELOPER RESPONSIBILITIES

The developer is responsible for the on-site requirements detailed below:

General Requirements

- Ensure kerb braces have been installed prior to requesting work.
- The developer is responsible for providing line and level for all mains to be installed.
- **IN EXCEPTIONAL CIRCUMSTANCES ONLY** where the above is not practical or reasonable and with the express written permission of the Water Networks Director, GTC may accept a site specific indemnity letter signed by the Developer accepting a "line and level" approach. In such circumstances the Developer will be indemnifying GTC against any and all costs relating to future relocation of cables and/or damage repairs.
- Carry out all necessary excavation and backfilling work for the installation of Water mains, services and associated equipment.



- Maintain an obstacle free route to allow installation work to be carried out in one visit wherever possible
- Ensure no work is carried out beneath scaffolding
- Ducting, supplied by the developer, can only be used for perpendicular road crossings
- Lay ducting for mains and/or services in accordance with the design drawing. Lay 'Water pipe' marker tape, supplied by GTC, 250mm above the Water pipes or ducts before backfilling the trench
- It is important to install the duct on a route exactly as shown in the design.
- The line of a Water service must be 250mm away from other utility services
- Ensure that the Water entry points into the building, have been suitably sleeved & ducted without the need for off-setting the pipe work.
- Ensure all work is undertaken by an 'Approved Plumber/Contractor'.
- Ensure all pipe and fittings are compliant with the Water Supply (Water Fittings) Regulations 1999.
- Ensure the ends of supply pipes are suitable sealed. House end has to have a stop tap fitted, main / trench end should be sealed using a dust cap or mechanical cap, tape is not sufficient.
- Supply pipes over 100 metres in length or greater than 63mm require mechanical caps due to the pressure testing and chlorination requirements.
- Ensure that there are no joints on the supply pipe. One continuous length of pipe should run from the internal stop tap through to boundary box location.
- Install valve/WO/FH chambers ensuring they are vertical, clear of debris and finished to the surrounding ground level
- Adjust the final level of Service boundary boxes to match that of the surrounding ground ensuring that the lids can be raised with ease.

Materials Delivery

- Pipe, meter boxes and associated equipment will be delivered directly to site and must be visually inspected on delivery and any damage immediately reported to GTC.
- Any loss or damage occurring after delivery will be chargeable to the developer

Handling and Storage of PE Pipe and Fittings

General

In preparation of mains and service laying, there will be a requirement to responsibly store pipe and fittings on site. The following guidelines identify best practice; however further guidance and advice can be provided by the GTC Project Manager.



Storage

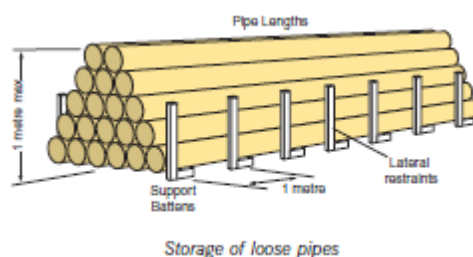
Pipes

The onsite storage facilities shall be a secure compound. Careful consideration should be given to the following aspects:

- Security of all materials and equipment from theft, vandalism, accidental damage or contamination. Precautions should be taken to prevent debris and water from entering pipe and fittings. (End caps are required on all pipes, intended to prevent ingress of contamination, and must be kept in place during storage).
- Safety of the site workers, general public, especially children and blind persons.
- The movement of traffic and construction equipment.
- All pipe store locations should be on a suitably firm hard standing, level ground, free from ground water, mud and other damaging material with adequate access for construction vehicles and/or lifting equipment.
- Badly stacked pallets, coils or bundles may slip or collapse, causing injury to personnel and/or damage to the pipe.
- Pipe and fittings are not to be stored on the ground, suitable pallets or wooden battens should be the interface between the ground and material.
- Care should be taken to prevent damage to, and distortion of, pipe ends and fittings.
- Stock should be located in such a manner as to ensure adequate stock rotation on a "first-in, first-out" basis.

Individual Pipe Lengths

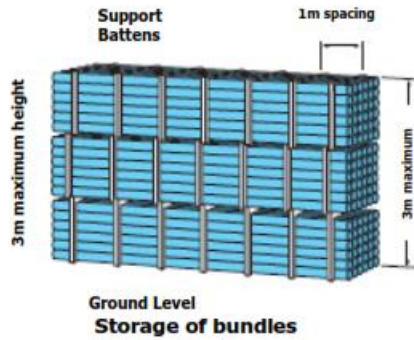
Pipe lengths stored individually should be stacked on clear level ground in a pyramid not more than one metre high, with the bottom layer fully restrained by wedges. The bottom layer of pipes should be laid on timber battens at one-metre centres.



Bundled Pipe Lengths

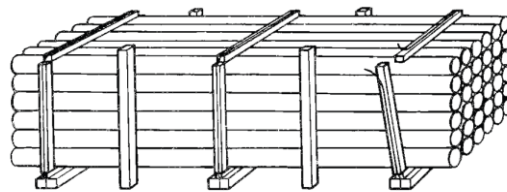
Bundled packs of pipe should be stored on clear, level ground, with the battens supported from the outside by timbers or concrete blocks. For safety, bundled packs should not be stacked more than three metres high.





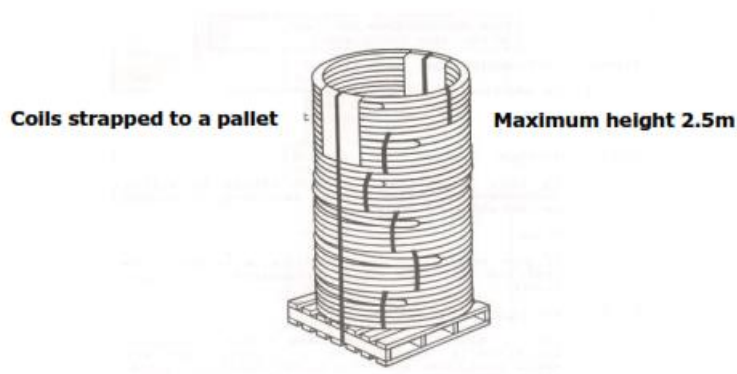
Broken bundles

Where pipe lengths are to be removed from a bundle, it should be from a single bundle with no unbroken bundles underneath; stakes should be securely fixed to retain the bundle shape whilst stock is drawn from the bundle.



Small Wrapped Coils (diameter ≤32mm)

Coils of pipe of diameter up to 32 mm are normally restrained using an outer covering of “shrink wrap” or equivalent material to enable pipe to be drawn from the centre of the coil. Only sufficient pipe for immediate use should be cut from the coil and on no account the outer wrapping be removed until the coil is almost fully unwound. The dust cap must be replaced on every occasion a cutting is taken from a coil. The coils should be placed on a hard standing.



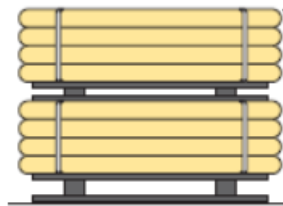
Individual coils should be stored on pallets or on firm level ground which has suitable protection for the bottom coil. The stack height shall not exceed 2.5 m. Battens or other similar provision should be provided between coils to facilitate lifting. Coils delivered by suppliers already palletised may have been secured by shrink wrap or retaining straps; such coils should remain secured to their respective pallets during storage with the stack only being broken at the time of issue.

The height of stacked individual coils not secured to a pallet shall be such that the stack is stable and the uppermost coil can be safely handled. Individual coils of pipe of diameter not exceeding 32 mm should be hand stacked flat.

Large Coils (diameter $\geq 63\text{mm}$)

Coiled pipe should be stored flat, especially during periods of warm weather, and on firm level ground which has suitable protection for the bottom coil. Where space is limited and coils are to be stacked, the height of stacked coils should be such that the stack is stable and the uppermost coil can be safely handled. Under no circumstances should the stack exceed 2.0 metres in height. Wooden battens placed below the bottom coil and used as spacers between each layer will facilitate easy access for slinging. When the need for transportation is required, it should only be carried out by trained operatives. Batches of coils delivered on pallets must remain secured to the pallet and only be broken at the time of use. Vertical storage of PE coils shall only be with the agreement of the GTC Project Manager in suitable racks.

WARNING: Under no circumstances shall a person not competently Water trained cut the bands on coiled PE pipe. Should they do so, the uncontrolled release of the stored energy may be fatal.



The maximum height of coils stored horizontally shall be 2 metres.

Fittings

Electrofusion fittings should be stored under cover in dry conditions, preferably on racking in a lockable container. They should be kept in their boxes/packages until ready for use. Fabricated fittings may be stored outdoors, as long as they are protected against damage and prolonged direct sunlight, similar to pipe.







Ground Workers

Ensure ground workers have sufficient knowledge about safe working practices on site and that work is carried out safely

- Ground workers are only permitted to lay Service Pipes and ducting for mains.
- Ensure ground workers are aware of the large amount of stored energy in coils of pipe. Coils of pipe should be carefully restrained and unwound slowly. If they are not unwound slowly they can cause injury by suddenly uncoiling.



- Where connections are to be made to an existing Water main, the GTC Project Manager shall advise the developer/ground worker of the type of connection to be undertaken and the dimensions of the excavation necessary to facilitate the connection.

Minimum excavation requirements to support connections. Excavation base to be 150mm below pipe				
Connection type	Applicable mains diameters	Excavation size	Additional bell hole in middle in direction of offtake	Excavation shape
End on connection (Note: the excavation dimension is for the live main to be exposed)	≤180mm mains diameter	2070 x 680	n/a	
	250/315mm diameter	3285 x 815	n/a	
Insert Tee	≤180mm mains diameter	7220 x 680	1000 x 680	
	250/315mm diameter	10560 x 815	1000 x 815	
Branched offtake	≤180mm mains diameter	1500 x 680	1000 x 680	
	250/315mm diameter	1500 x 815	1000 x 815	



7. METER LOCATIONS

General Requirements

Early consultation with GTC should take place to agree meter locations.

All Boundary boxes are to be located in the footway at a position 150mm within the property boundary. Boundary boxes **must not** be installed in driveways, cross overs or areas where vehicles are likely to drive over them. It is the developer's responsibility to provide all lines and levels to allow the boundary box to be installed correctly.

If the boundary box cannot be located in the pavement position then it should be fitted in an unmade area, on the property, as close to the boundary as possible but not in an individual private driveway.

In the case of 600mm service strips where it can be shown there is no space for a boundary box then it should be positioned in an unmade area on private property.

Manifold Connections

If any of the service connections on site are to be made using 2, 4 or 6 way manifolds meter boxes they will be identified on the design drawing. Service connections for all of the properties served by each manifold must be requested at the same time and they must all be ready to be connected in one visit.

Temporary Building Supplies

Temporary building supplies fall into two categories:

1. Building operations ONLY: For activities that extend beyond 30 days a fully network connected arrangement is required. For shorter durations these can be served by the use of a metered standpipe that needs to be requested. The standpipes will be issued after the Hire Agreement has been entered into. Non GTC standpipes will not be allowed to be used on the GTC network.
2. Building operations AND Welfare Facilities: Welfare facilities cannot be served via any form of standpipe. A request for a Temporary Builder's Supply needs to be made to GTC. The supply will then take the form of a dedicated metered connection to the network for your purposes.

8. INSTALLING WATER MAINS

It is essential that the developer agrees a programme of construction which will enable GTC to co-ordinate main laying activities, within our set timescales.

A site visit will be arranged at the start of your development. At any stage of construction you can contact a GTC Project Manager for advice and guidance.

Timescales are particularly important when off site mains have to be laid and connected to another upstream Water Companies network and approval is required from the Street Authority to work in the public highway.



The developer is responsible for all excavations, duct laying, line, level and backfill work on site, unless otherwise requested at the quotation stage.

On request, GTC will normally arrange for the on-site mains to be laid in trenches and/or ducts provided by the developer.

Where mains are to be laid in footways the outside kerb or kerb foundation must be in position prior to main laying in order to correctly locate the line and level of the main. GTC shall not be responsible for any costs relating to the relocation of, or damage to installed networks due to roadways or footways being incorrectly defined or changes from the original plan.

If there are any alterations to the agreed site layout, which may affect the route of the Water main, then GTC must be advised immediately.

Excavations

The minimum depth of cover for mains and ducts should be 750mm in footways and 900mm in roadways/verges from the finished ground level.

The trench should be approximately the pipe diameter plus 300mm wide and minimum cover plus the pipe diameter deep.

The bottom of the trench should be trimmed to enable the main to be bedded evenly and consistently throughout the trench at the correct cover. The bedding and surround must comply with WIS 4-08-02 (Specification for Bedding and Side fill Materials for Buried Pipelines). No other utility should be installed over, below, or within 250mm to the side of the Water main.

Road Crossing Ducts

The laying of mains across roads can be in an open trench provided by the Developer, but normally they are laid in rigid plastic ducting (Rigiduct, twin-walled, smooth internal surface, colour Blue) supplied and installed by the Developer. The developer is responsible for the supply and installations of ducting. A suitable standard for plastic ducting is BS 4692.

Corrugated ducting must not be used for road crossings.

The diameter of duct required for each size of main is shown below:

Diameter of main	Internal diameter of duct
63mm	100mm
90mm	150mm
125mm	200mm
160mm, 180mm and 250mm	300mm
315mm	400mm



Backfill Materials

The developer must arrange for their ground workers to be on site at the time when mains are being laid to ensure that the mains are surrounded by suitable bedding and surround material to a depth of 150mm above the main as soon as possible to avoid damage. Mains will not be tested and commissioned until this partial backfilling is complete.

Backfill and sub-base materials must be free from any organic, perishable or hazardous material.

A 'Water pipe' marker tape, supplied by GTC, must be incorporated within the backfill for all mains and road crossing ducts and be positioned 250mm above the main or duct.

Fire Hydrants

Unauthorised use of a fire hydrant is an offence under section 174 of the Water Industry Act 1991. In order to avoid the risk of legal proceedings please contact GTC to get authorisation to use a fire hydrant and to hire a metered standpipe. Interference with fire hydrants can result in:

- contamination of the water network.
- damage to fire hydrants.
- discolouration of the water network.
- burst mains due to pressure surges.
- reduction in pressure of the water network.
- interruption of supply to surrounding properties.

Fire hydrants should not be used for temporary building water supplies.

When designing new water mains GTC will liaise with the Fire Authorities regarding the provision of fire hydrants, and will install new fire hydrants where requested by the Fire Authority.

Fire hydrants are life saving devices; it is therefore important that once the new water main is commissioned you ensure that:

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



9. INSTALLING WATER SERVICES

The developer is required to undertake all excavation works on-site necessary to allow the lay of the Communication and Supply pipes including the installation of ducts where necessary allowing the connection to the main and the installation and connection of the boundary box to the Communication pipe and supply pipe.

The Water service pipes must be laid in straight lines along a route as shown on the agreed network drawings, any deviations must be agreed with GTC, prior to laying the service pipe. The route should be perpendicular to the property and take the shortest route possible to the Water main.

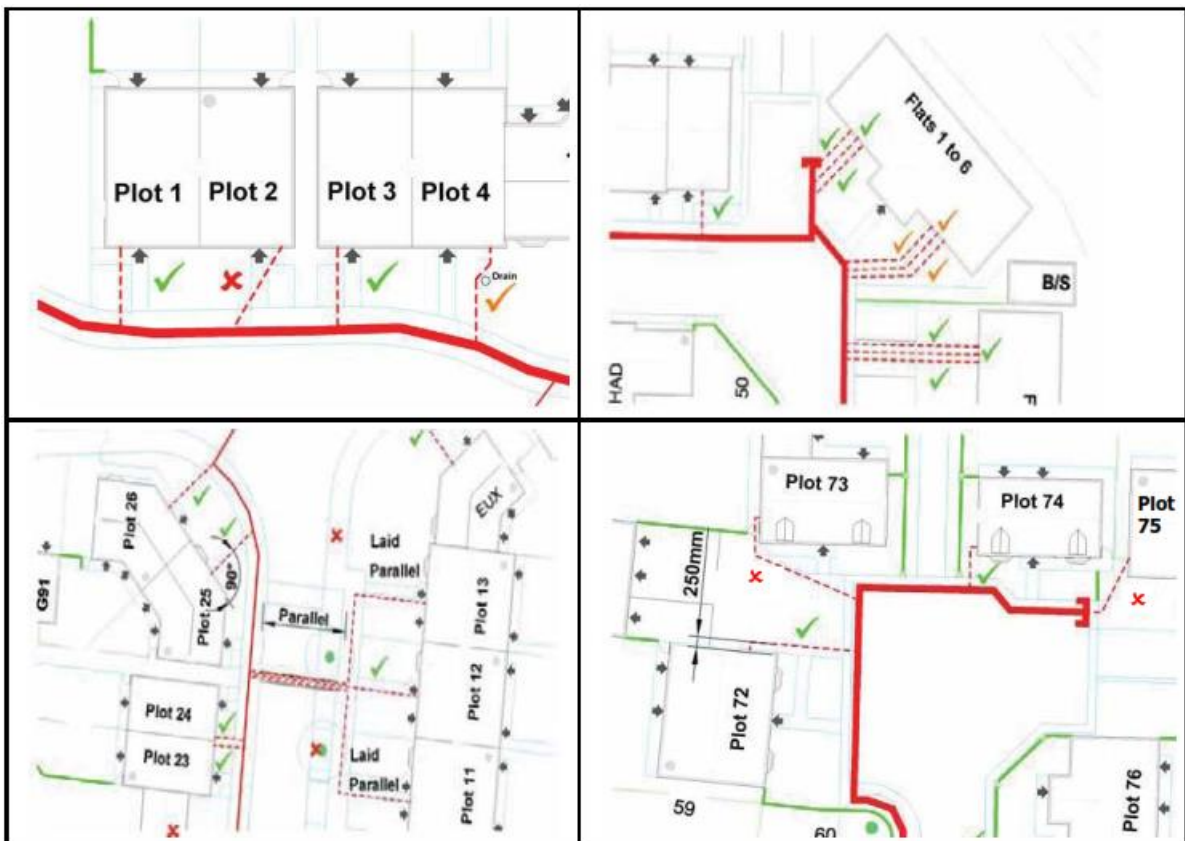
A Water service must not run parallel to the Water main. Marker tape must be installed above the service and communication pipes.

The following diagrams outline what is considered acceptable practice and what is not:

✓ - Acceptable

✓ - Acceptable but must be accurately recorded

X – Not acceptable



Below Ground

The developer is responsible for the supply and installation of ducting for Communication pipes (the pipe between the main and the boundary box) and the installation of supply pipes between the boundary meter box and the premises. Supply pipes and fittings must comply with Water Supply (Water Fittings) Regulations 1999. Supply pipes must be ducted where they enter a building.

The ends of pipes or ducts must be capped or plugged at all times to prevent ingress of water or debris.

All supply pipes must be clearly marked or labelled as to which plot they serve before the connections are requested. Failure to label the Supply pipes may lead to delays or service connections being aborted. The Supply pipe must be terminated inside the building with a stop tap fitted.

Communication pipes shall be laid by GTC, in trenches provided by the developer. Supply pipes shall be laid by the Developer.

Supply & Communication pipes must be laid with a minimum depth of cover of 750mm (+/- 50mm) from the finished ground level. The pipe must not be kinked, squashed or damaged and should be backfilled with a sand/fine fill surround of 75mm to prevent any damage occurring during final reinstatement.

If the water main is on the other side of the road, the drawing will highlight the requirement for ducting the communication pipes. A 100mm duct should be installed across the road with the ends of the ducted pipe exposed in readiness for the connection to be made. The ducting must be BLUE and laid at a depth of 750mm

No other service pipes (gas/electric) should be placed in the same duct as a water service (1 pipe per duct)

Water Regulations and Approved Plumbers/Contractors

All external Supply pipes and internal plumbing must comply with the Water Supply (Water Fittings) Regulations 1999.

The plumbers used must be an Approved Contractor. This is defined in the Regulations as:

- A person who has been approved by the water undertaker for the area where a water fitting is installed or used OR
- A person who has been certified as an approved contractor by an organisation specified in writing by the regulator

There are currently 6 Approved Contractors Schemes operating in England & Wales.

- Water Industry Approved Plumbers' Scheme - WIAPS (administered by WRAS on behalf of 16 water undertakers)
- A Plus (Anglian Water)
- TAPS (Thames Water)



- WaterMark Scheme (Severn Trent Water)
- Association of Plumbing and Heating Contractors (APHC)
- Chartered Institute of Plumbing and Heating Engineers (CIPHE)

Each Approved Contractor Scheme operates in different geographical areas. To join a scheme a plumber or plumbing business must reside or be located in the geographical area covered by that scheme.

Approved Contractors will issue to GTC a Water Regulations Compliance Certificate for every new property. A check on a small number of properties to ensure compliance will be carried out by IWNL. The GTC Project Manager should provide you with a supply of blank certificates, however should you require more please contact **0845 602 2498**

Non Approved Contractors will not be able to issue Compliance Certificates for their work and every property will need to be inspected by IWNL to ensure compliance. Additional costs are payable for this service. No property is able to be connected to the network without a Compliance Certificate being issued first.

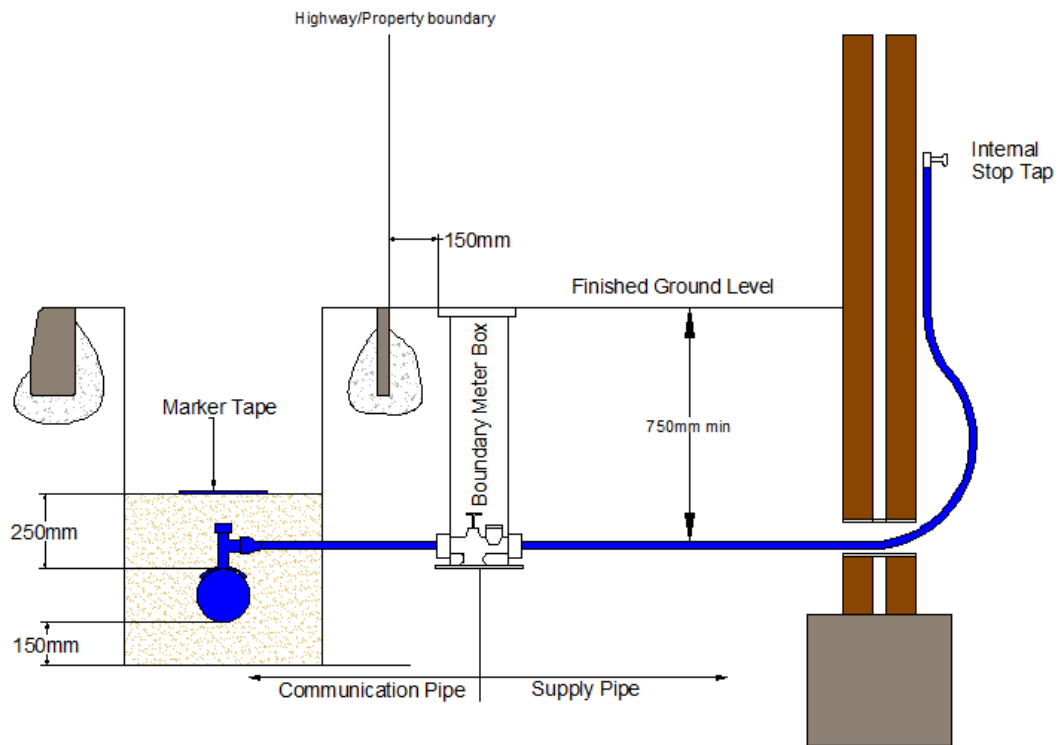
Chlorination of Service Pipes

Supply pipes over 100 metres in length or greater than 63mm in diameter must be chlorinated and tested before connection.

IF THERE IS INSUFFICIENT COVER THE SERVICE WILL NOT BE COMPLETED AND THE DEVELOPER WILL BE NOTIFIED

A 700mm square excavation is required at the Water main and below the meter box position to enable the Communication and Supply pipes to be connected to the Water main and terminated at the boundary box.





10. INSTALLING WATER METERS

Water meters can only be installed or moved by GTC or their agents. GTC will generally install the water meter with the service.

11. CDM REGULATIONS

GTC will act as the 'Designer' and 'Contractor' for the construction and commissioning of Water networks on new property developments.

The Water mains, services and meters that will be installed on the development will remain the property of the licenced Water Company named in your quotation. GTC will be responsible for the operation and maintenance of the network.

The construction team should leave a marked up copy of what is live in the site agent's office during the construction phase so that other construction workers have access to live plant information.

Should you require any further information please contact the GTC Water Networks Director.

