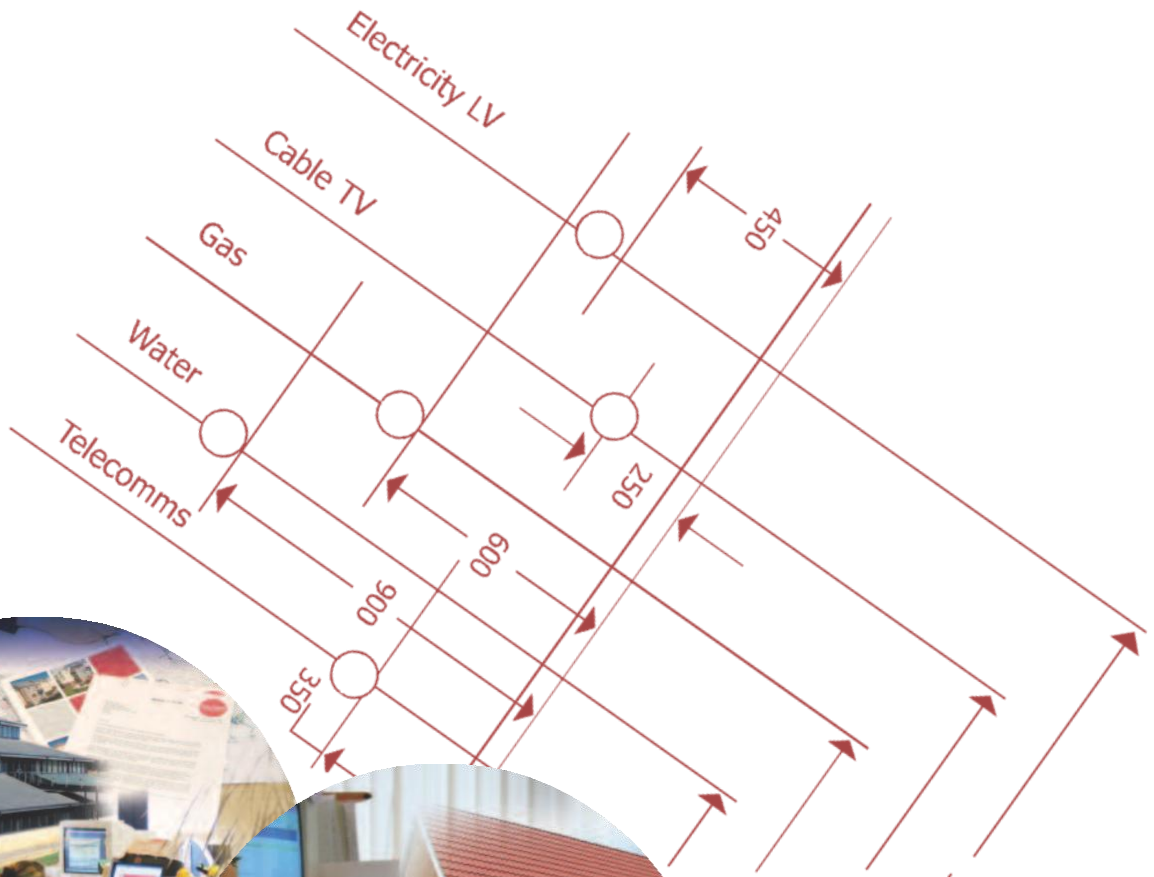


# GTC Technical Electricity Guidelines and Safety Information for Property Developers



**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. WELCOME

Welcome from GTC.

This brochure will provide you with information and guidance on the installation of electricity 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](mailto:gtcworks@gtc-uk.co.uk)**

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

15 working days notice to lay onsite electricity main cables

10 working days notice to lay onsite electricity service cable

***Longer lead times are needed for offsite works due to the need to co-ordinate the DNO connections***

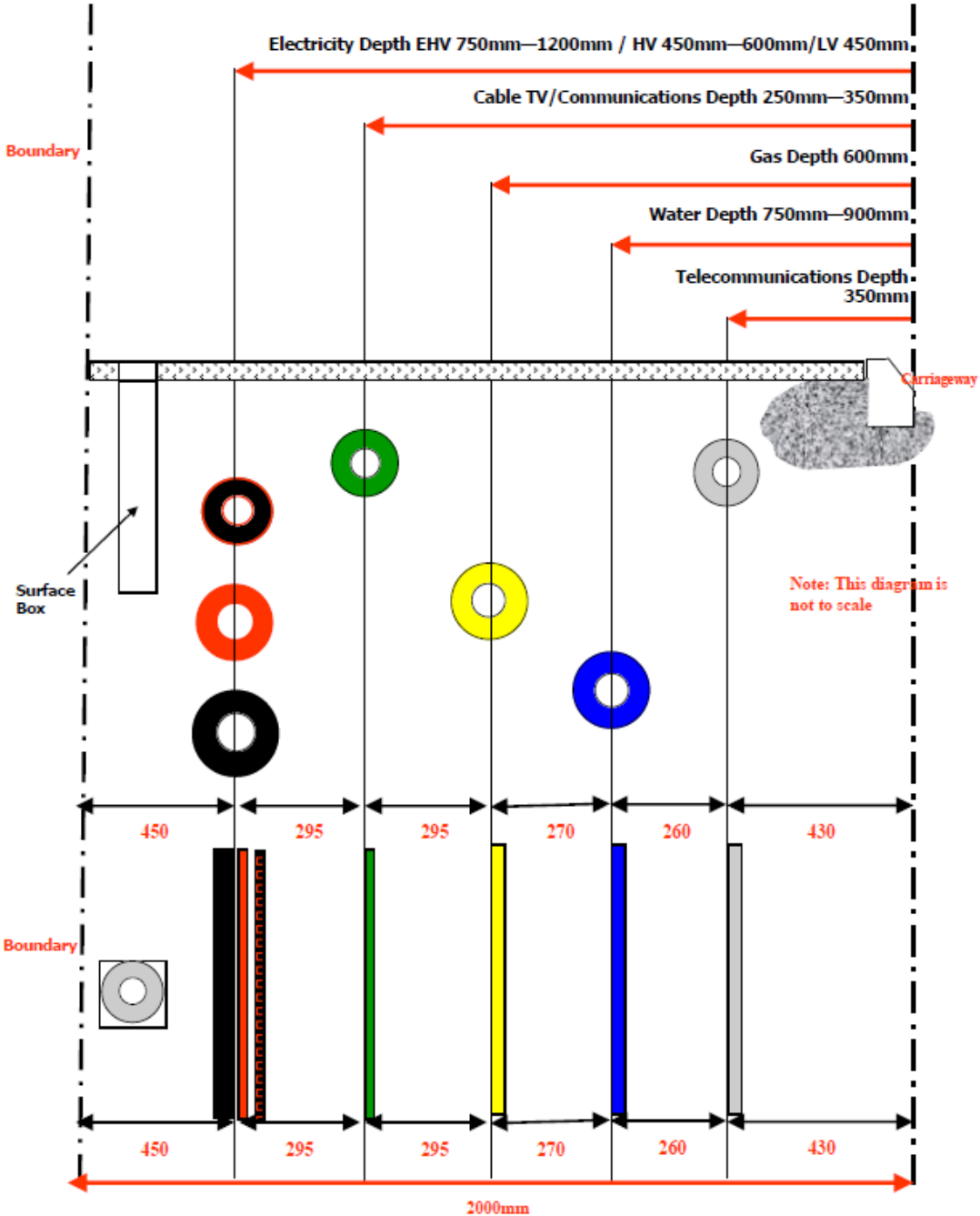
### 3. SAFETY

In accordance with GTC's and the Health and Safety Executive expectations, electricity mains and services must be laid at the depths specified in section 8 of this brochure.

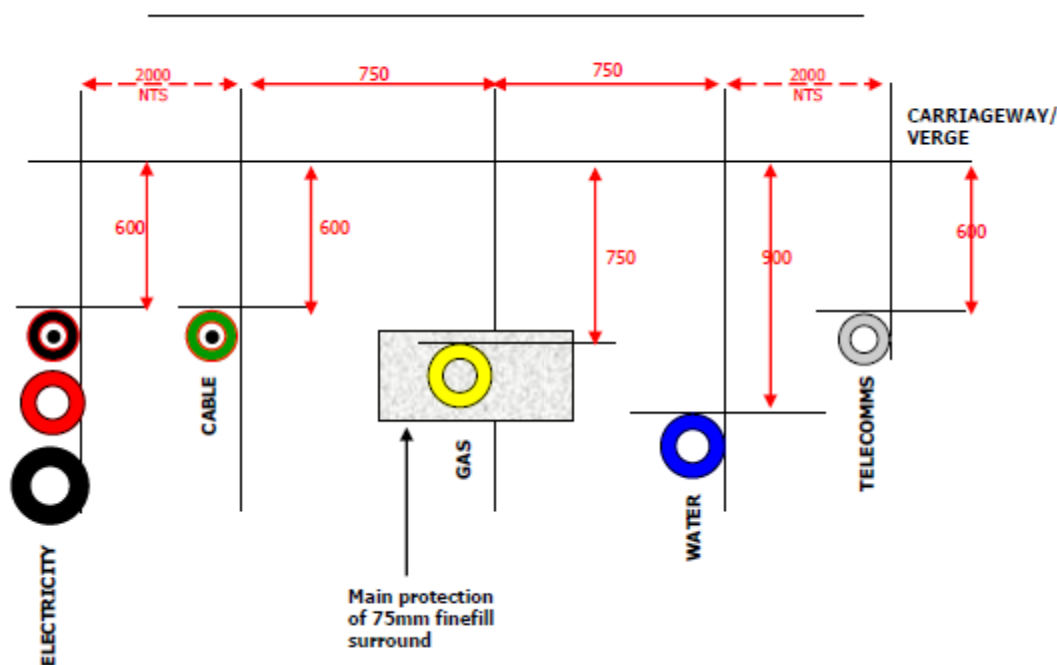
The typical position of the electricity main and other utilities apparatus in a footway is shown in the diagram below, this complies with N.J.U.G recommendations. Minimum depths of cover in mm are also shown:

**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**



**TYPICAL ROAD/VERGE SECTION TO SHOW RELATIVE POSITIONS OF UTILITY APPARATUS  
THIS DIAGRAM IS NOT TO SCALE**



It is imperative that the electricity 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 electricity mains.

The mains and services drawing should be on site at all times and updated to clearly show the installation progress. GTC will ensure that updates to the drawings are provided for your records.

Please note that other DNOs may have electricity 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 GTC's electricity mains must be reported immediately to the **GTC Electricity Emergency number 0800 0326 990** who will arrange for the Emergency Service Provider to attend site and undertake any repairs.

For further information refer to HSE publication HSG47 'Avoiding danger from underground services' which gives detailed guidance on avoiding damage to electricity 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](http://www.hse.gov.uk)**

## 4. DEFINITIONS

### Distribution Network

**Operator (DNO)** A company licensed by Ofgem to operate and operate an electricity network within the UK

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**Electricity Mains** Underground electricity network for distributing electricity throughout the property development

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**Electricity Service** Underground cable for conveying electricity to premises from the electricity main

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### Electricity Network

**Company (ENC)** The Electricity Network Company (ENC) is a licenced electricity distribution network owner (DNO). ENC is a wholly owned subsidiary of GTC who manages all of the ENC assets

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**High Voltage (HV)** Electricity operating at a voltage in excess of 1000 volts (normally 11000 volts)

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**Low Voltage (LV)** Electricity operating at a voltage below 1000 volts (normally 415/240 volts)

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**Substation** A substation will house electrical equipment used to transform the voltage. This is normally within a purpose built building constructed by the developer.

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**Multiway Termination** A LV mains termination cabinet allowing service cables to be installed into multi occupancy locations

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**Meter Box** A purpose build glass reinforced polyester moulding to house domestic meters.

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**Meter Compartment** A room or cupboard specifically designed to house a meter installation for apartments or multi dwelling buildings

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**N.J.U.G** National Joint Utilities Group

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## 5. 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
- Carry out all necessary excavation and backfilling work for the installation of electricity 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 'cable' marker tape, supplied by GTC, above the electricity main before backfilling the trench
- Install meter boxes and ensure doors or lids are fitted

### Easements

GTC require legal rights over all of its equipment (i.e. substations and cable) to secure future ownership and maintenance abilities which are imperative to the continued supply of electricity. Where this equipment is to remain within private land, GTC will need to obtain its rights from the developer (or landowner if different). To ensure these consents are completed efficiently and at the earliest opportunity, the developer (or landowner if different) should assist with the following:

- Ensure their legal representative is instructed to act upon acceptance of the project
- Ensure their legal representative responds to all correspondence received from GTC's legal representative without delay
- Ensure their legal representative responds to all correspondence received from the Distribution Network Operator's legal representative where applicable, without delay
- Immediately advise GTC of any changes that may affect the legal acquisitions (i.e. change in current ownership)

The timescale of consent acquisitions for a project are of great importance as they may affect required energisation dates if not completed in good time.

### Materials Delivery and Handling

- Cable, 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.
- Materials must be carefully stored in a safe and secure area on dry, firm and level ground.
- Any loss or damage occurring after delivery will be chargeable to the developer

## Ground Workers

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

## 6. METER LOCATIONS

### General Requirements

All meters should be located in meter boxes and be easily accessible to allow them to be read, maintained and isolated when necessary.

Meters must not be exposed to extreme temperatures, excessive humidity, vibration, corrosive substances or accidental damage.

It is the developer's responsibility to identify and show the required meter positions on the site plans.

### Single Domestic Properties

Ideally meters should be located in an approved built-in meter box, on the wall closest to the electricity main.

Meters can be installed in garages or inside the building. If this is a requirement for your development then GTC need to be consulted at the earliest possible time.

### Multi Occupancy Dwellings

Early consultation with GTC should take place as there are a number of different approaches which can be employed. GTC will assume all multi occupancy dwellings will have a mains cable terminated in a multiway cabinet and meters terminated in or around the main entrance at ground floor level unless otherwise stated by the developer.

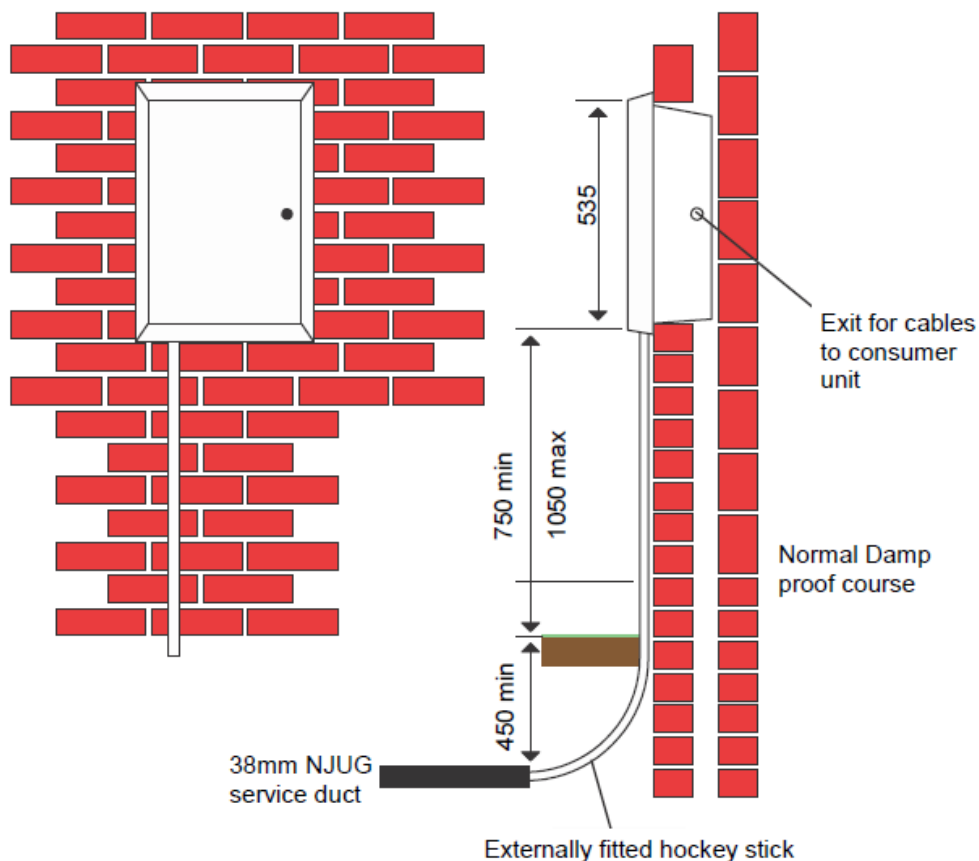
## 7. METER HOUSINGS

### External Meter Boxes – Domestic Single Phase Connections

#### General Requirements

The fitting of meter boxes and the installation of externally fitted hockey sticks is the responsibility of the developer and must comply with the manufacturer's specifications and comply with GTC's requirements.

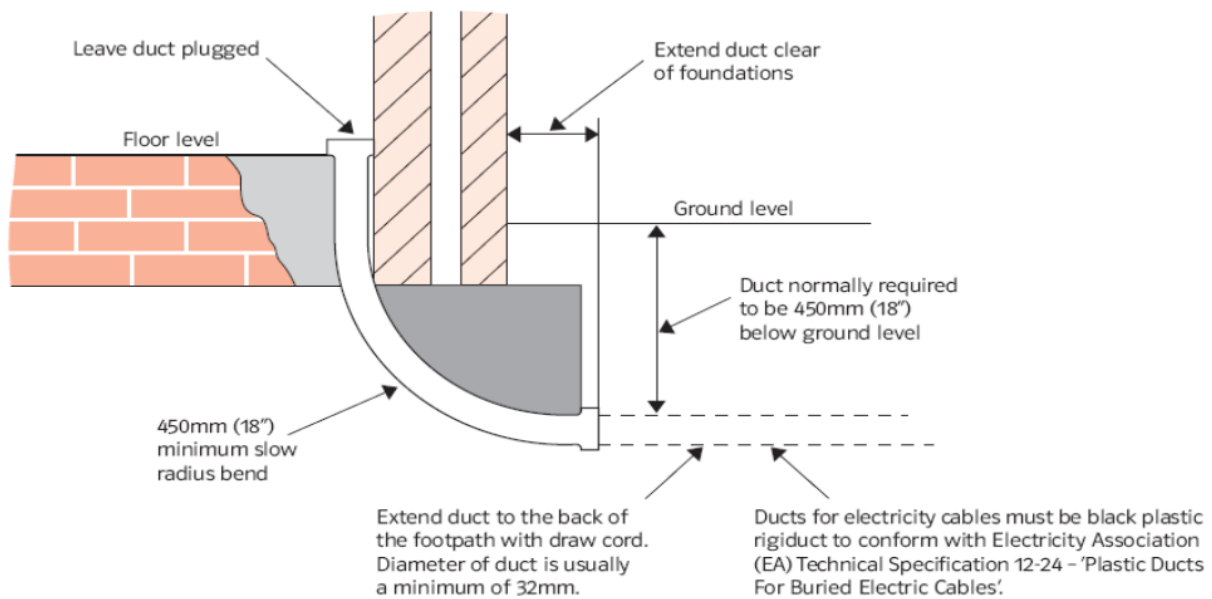
A typical example is shown below:



### Internally Situated Meter Positions – Single Phase Connections

In premises where it is not possible to install external meter boxes i.e. listed buildings, properties situated in conservation areas, where the Local planning Authority will not allow an external meter box to be installed and other agreed installations. Then, subject to satisfying all of the following conditions and at no cost to GTC, an internal meter installation will be permitted:-

- The service cable shall be installed in a continuous black plastic duct of 38mm OD minimum 32mm ID, which terminates at the level at which it enters the building. It shall be routed inside the building by the shortest and most direct route possible to allow installation and/or future removal of service cable as may be required. The internal end of the duct shall be sealed immediately after the service cable has been installed.



- The incoming service cable must not be hidden by panelling of any type, or be routed behind any fixture or fitting.
- GTC's service equipment should be installed on a brick or block-work wall and where possible, this should be an external wall.
- In timber-framed buildings and/or where a suitable brick or block-work wall is not available, then the developer shall pre-install a steel sheet of at least 1mm thickness to the wall behind the service cable, cut-out and meter and this should be connected to the main earth terminal by the electrical contractor. This is to protect persons from electric shock, if they should drill through the wall behind ENC's service equipment.
- The developer will be required to enclose the cable, cut-out and meter into an enclosure extending from ground level and covering all the service equipment. The enclosure should afford a minimum of 30 minutes of fire protection.

**NB** – Standard fibre-glass outdoor meter boxes are not suitable for use indoors as they do not comply with the appropriate British Standards for Fire Resistance and Fume Emissions. It is the developer's responsibility to ensure that any internal enclosures comply fully with fire regulations and any local planning requirements.

- The developer will ensure that all internal enclosures are naturally ventilated.
- The following space is required: 1250mm high x 550mm wide x 300mm deep
- The position must be a maximum height of 900mm from ground floor level to the bottom of the meter board and a minimum height of 600mm
- There is 750mm clear access to the front of the enclosure surrounding the service termination and metering equipment

Indoor meters cannot be installed:

- On partition walls made of plasterboard, drywall or other similar material (unless compliant with the requirements as listed above)
- Under any stairs where headroom is less than 2m standing
- Immediately adjacent to other utility apparatus, a minimum of 300mm separation is required
- Adjacent to any localised heating source, such as an immersion tank, heating boiler, radiator etc
- Above internal or external doorways
- Inside a bin, coal or refuse store
- Basement or cellar
- Toilet, kitchen or bathroom
- In any location in breach of the current edition of BS7671 Requirements for Electrical Installations

### **Multi Occupancy Dwellings**

The developer is to provide suitable secure and fire proof enclosure for cut out and distribution board (if required) in suitable common access location on the ground floor, minimising route length to the exterior and which provides a suitable ducted cable route.

### **Non Domestic Properties – Meter Positions**

We recognise that space is always at a premium and will work with you to develop the most appropriate position that can be achieved with the least amount of space used.

Early discussions will be required to ensure that the best solution is implemented into your development.

## **8. INSTALLING ELECTRICITY MAINS (LV/HV)**

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 with GTC staff nominated to construct the network for your development.

GTC will co-ordinate all on-site works and will be the main point of contact for site operations.

GTC Field Engineers will also attend site to ensure that the work is being constructed to an acceptable standard and to meet your requirements.

The developer is responsible for all excavations; the supply of ducts, duct laying 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 within 15 working days, in trenches and/or ducts provided by the developer.

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

### **Offsite Connections**

GTC will complete the offsite connection; this will include all necessary liaisons with the DNO and highway authorities.

### **Excavations**

The depth of cover for LV mains should be 450mm in footways and 750mm in roadways/verges from the finished ground level.

The depth of cover for HV mains should be 600mm in footways and 750mm in roadways/verges from the finished ground level.

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. Sharp stones should be excluded from the base of the trench. Where the base of the trench is unsuitable e.g. rocks and stones, the trench should be excavated a further 75mm and a bed of suitable fine material laid and compacted.

No other utility should be installed over, below, or within 250mm to the side of the electricity main.

### **Road Crossing Ducts**

The main installed across the road will be in black 150mm rigid plastic ducting compliant with the EN12-24 standard.

The ducting is available at most builders' merchants. GTC can offer advice on procurement of this material if required.

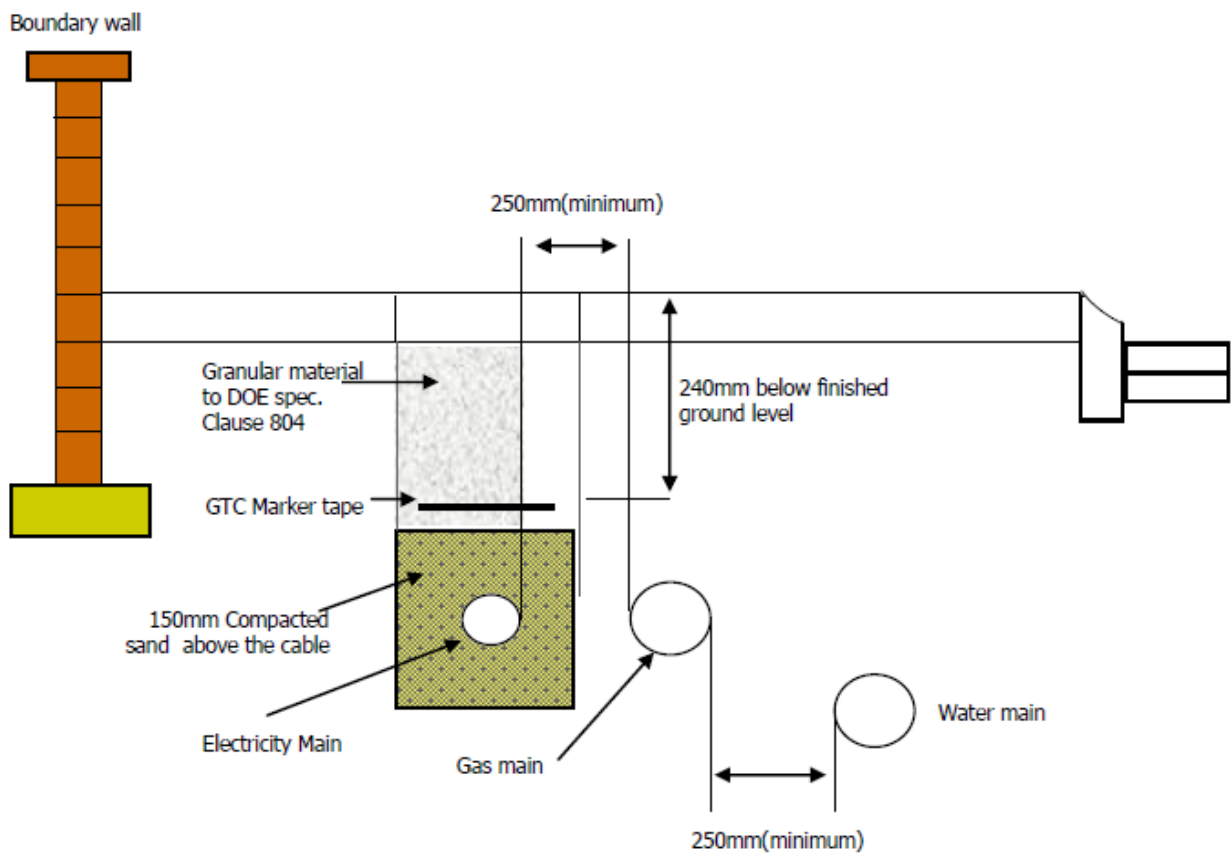
## Backfill Materials

The developer must ensure that the installed electricity main is surrounded by sand or other suitable soft material to a depth of 150mm above the main as soon as possible to avoid damage.

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

An 'electricity' marker tape, supplied by GTC must be incorporated within the backfill for all mains and road crossing ducts and be positioned 240mm beneath the finished surface.

GTC will work with the developer to ensure that the soft sand surround and marker taping is carried out to our specifications as shown below:



## 9. INSTALLING ELECTRICITY SERVICES

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

A site visit will be arranged at the start of your development with GTC staff nominated to install the services for your development.

GTC will co-ordinate all service installations and will be the main point of contact for site operations.

GTC Field Engineers will also attend site to ensure that the work is being constructed to an acceptable standard and to meet your requirements.

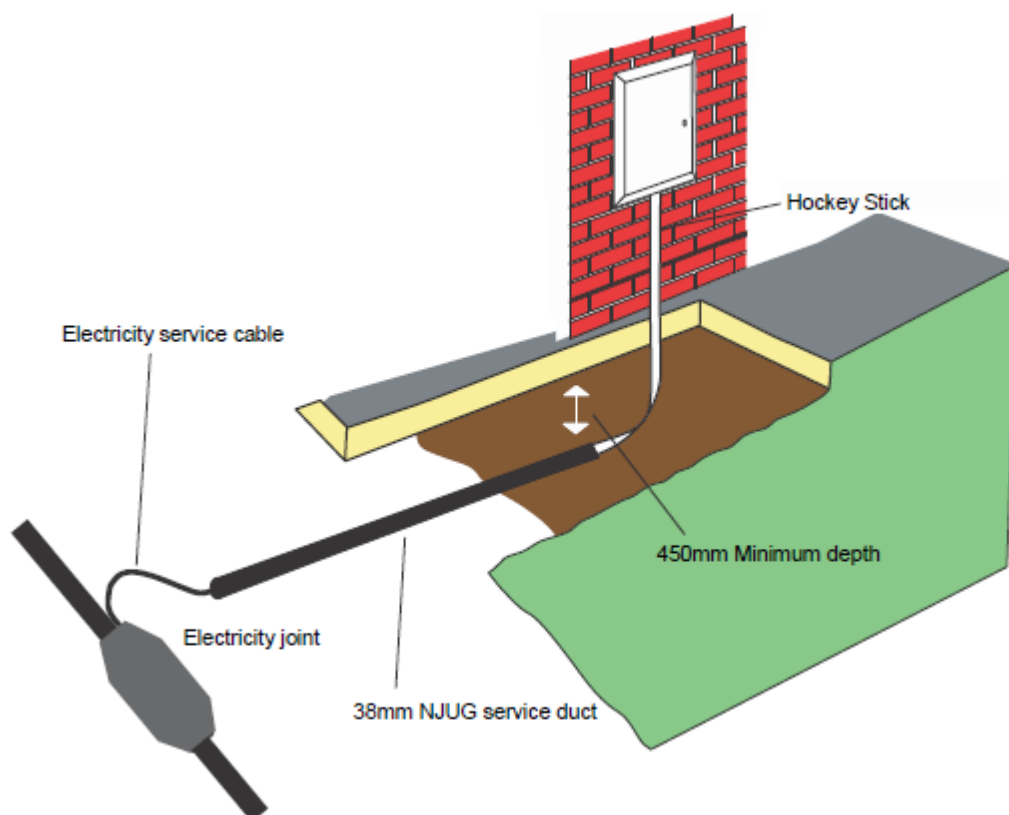
On request, GTC will normally arrange for the on-site services to be laid within 10 working days.

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

### Below Ground

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

All services must be laid to electricity LV mains depths as specified in section 8.



## Multi Occupancy Dwellings

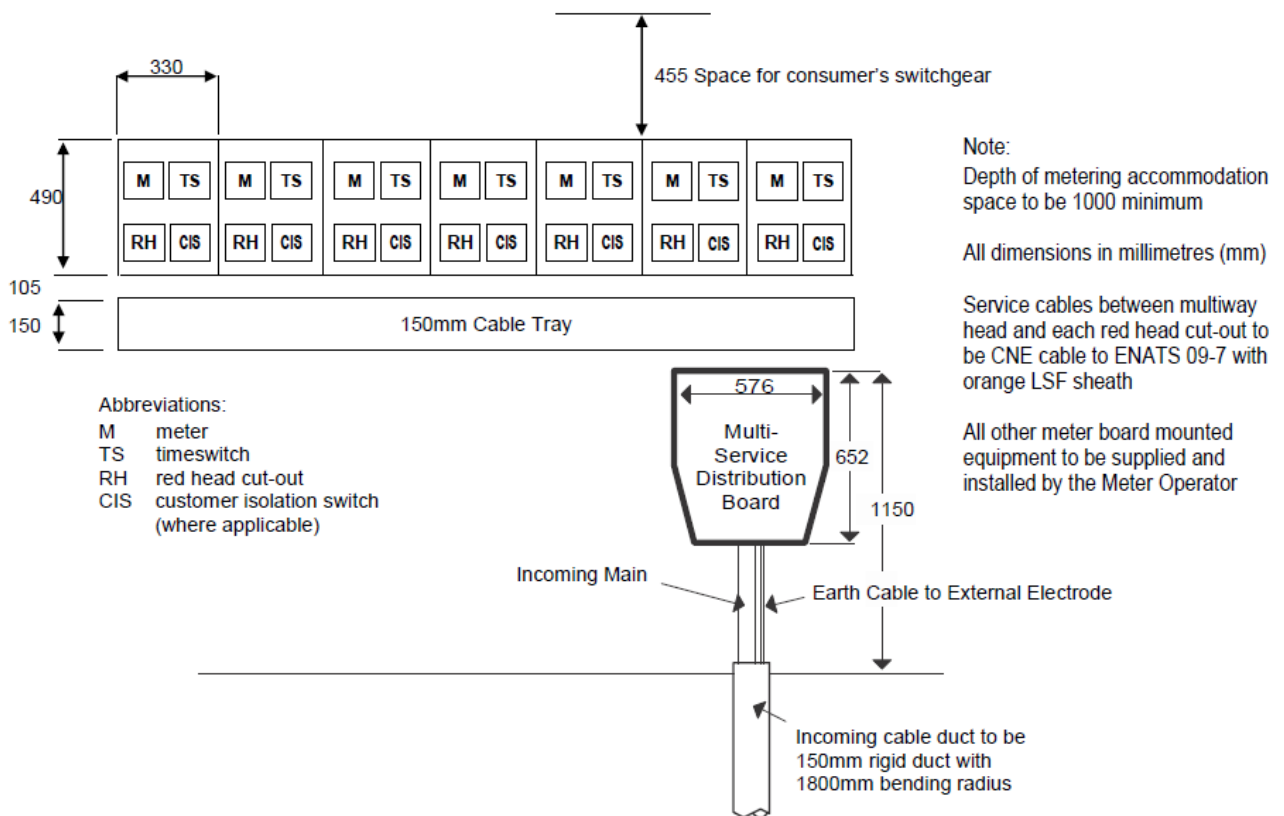
Services shall preferably be installed at group metering positions and the developer shall provide and install lateral wiring to each flat complying with the current edition of BS7671 'Requirements for Electrical Installations'. These laterals shall remain the property of the building landlord or individual flat owners as appropriate.

## Materials Provision

The position and number of service positions shall depend on the distance from each flat such that the lateral wiring can be installed within the design requirements of the current edition of BS7671 'Requirements for Electrical Installations'.

In order of preference the number/position of services shall be:

1. A single position on the ground floor
2. A single position on the ground floor plus a sub-fused rising main to some or all floors
3. Several positions on the ground floor plus a sub-fused rising main to some or all floors



## Space required for Group Metering Positions using Multi-Service Distribution Boards (MSDB)

Although individual installations will vary with each building design, the following table provides guidance on the minimum dimensions required to accommodate GTC's equipment and associated metering.

FLATS	WIDTH	HEIGHT	DEPTH
Up to 6	1100	2100	450
Up to 10	1600	2100	450
Up to 12	2500	2100	450
Up to 16	3000	2100	450
Up to 20	3500	2100	450
Up to 24	4000	2100	450
Up to 28	4500	2100	450
Up to 30	5000	2100	450

In situations where GTC has agreed to adopt riser and/or lateral cables, the developer's electrical contractor will complete the installation in accordance with the following requirements:

1. the electrical contractor will install riser and/or lateral cable forming part of GTC's distribution network in accordance with BS7671 'Requirements for Electrical Installations'.
2. and will be required to submit a completion certificate for any and all riser and/or lateral cables, prior to energisation

Failure to comply with these requirements may prevent connection of the equipment

Where the developer is to install adoptable riser and/or lateral cables on behalf of GTC, GTC will provide LSOH cabling free issue as detailed in the accepted quotation

If the developer wishes GTC to consider other options then early discussions are recommended

In all situations GTC will require 24 hour access to equipment used to provide supplies within multi occupancy dwellings. This access is for the purposes of inspection, maintenance and repair as may be required and therefore the developer will be expected to provide keys and/or access codes for all common corridors, stairwells and utility cupboards, unless secured by Fire Brigade FB1 or FB2 locks.

## **10. UTILITY DRAWINGS**

Where a site is being constructed either on or adjoining a GTC network the relevant utilities drawings can be requested. Verification of cable positions must be carried out on-site so that no damage occurs to live equipment. All requests must be made to the GTC office at the address below.

GTC  
Energy House  
Woolpit Business Park  
Woolpit  
Bury St Edmunds  
Suffolk  
IP30 9UP

## **11. SUBSTATIONS**

The developer will carry out all civil work associated with installing substations. Substations will be built to GTC's specifications and drawings and all substation sites will be subject to a lease or land purchase. The developer is required to obtain planning permission and building regulations compliance for these structures.

For most sites, a choice of GRP building or brick built substations with GRP or steel doors is offered. However, where proximity to buildings is an issue, or where the need for higher levels of security is identified, GTC reserves the right to specify the type of substation and doors to be used.

Typically, a brick built substation can be constructed with approximately 3m clearance from the nearest property. However, a GRP enclosure provides less noise attenuation and therefore requires a greater clearance from the nearest property. These clearances vary depending on location and size of transformer to be installed within the housing and will vary from 7m to 19m.



The red lines represent the extent of GTC's required access, which is typically up to 1m greater than the area subject to land transfer. This requirement covers both sides and rear of the substation. The requirement for the front of the substation will be dependent upon its specific location. However where the substation opens onto a footpath, a minimum of 1.5m from the back edge of the footpath is required, this is to enable the substation doors to open without impinging into the footpath."

Bespoke solutions offered by the developer may be considered but final approval remains with GTC.

In order to maintain our substations, GTC requires suitable and unrestricted 24 hour access for HIAB crane vehicles to all sites, to enable installation and/or recovery of electrical plant.

In order to establish a substation GTC will, in most instances, look to acquire an area of land 5m x 5m.

## 12. INSTALLING METERS and MPAN ISSUE

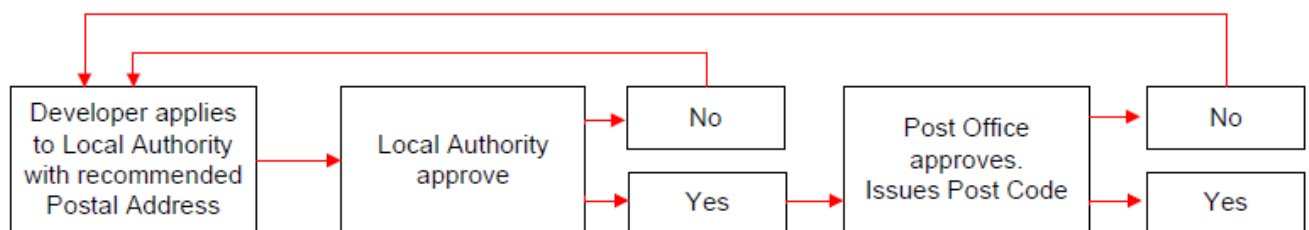
The developer must liaise with his chosen electricity supplier to install meters.

### MPAN Registration

GTC recognises the industry issues surrounding new connections and have developed the following guidance to make the new connections process as clear as possible.

### Plot to Postal Address

Plot to postal address issues have long been identified in causing confusion within the new connections arena.



As shown above, the confirmation of address data has several approval points. There are no defined timescales for approval by the local authorities. Royal Mail also retains the right to veto address applications until they issue the post code. For these reasons developers are advised to begin the address application process as soon as possible following planning approval to allow sufficient time for processing.

The guideline from local authorities and Royal Mail is approximately 12 weeks and work is going on to standardise the process however, in the interim; communication and liaison will have to be closely managed.

### MPAN Allocation

It is GTC's preference to issue MPANs upon confirmation of the postal address and post code from the developer. This is recognised standard practice in several DNO areas and is effective in minimising the data issues in changing from plot to postal address.

GTC recognise that in all cases this is not always possible and will work flexibly to help developers. On large developments, MPANs shall be allocated in a phased manner to enable better data quality as plans come to fruition.

## Installation and Crossed Meters

The potential for crossed meters (meter information allocated to the wrong postal address) is a particular problem in the industry, especially for high density developments (flats). To minimise the potential for errors the following system is recommended.

Contractors and M&E fitters should implement a tagging system when fitting out the flats. By tagging the tails to each flat with the Plot/Postal address PRIOR to pulling them through to the meter board. This will clearly identify which flat the tails are linked to.

## Tagging the Meter Board

Meter boards may be in communal positions held in basements or on each floor. Clearly labelling the meter boards with the Plot/Address/MPAN where the meter is fitted will assist the Meter Operator (MOP) in completing their job. Having the boards and tails clearly tagged will minimise the room for error during meter fit.

- The issuing of post code and postal address can take up to 12 weeks
- Ensuring that meter information is not 'crossed' will help to reduce the safety risk to customers, customer dissatisfaction, incorrect billing and the subsequent problems for suppliers and customers.
- Good communication with GTC will help provide better customer service

## Unmetered Supplies

In addition to your accepted GTC quotation GTC also require an Unmetered Supplies Agreement where there are unmetered connections (e.g. Street lighting, traffic signals) onto our electrical network.

In the majority of cases the connections will be on adoptable land where the local authority will ultimately take ownership of these connections when they adopt the highway. During the build stage the developer will be responsible for the payment of the energy consumption for these columns. Where the columns are on private land, GTC will require an Unmetered Supply Agreement between the management company and GTC.

To ensure GTC can carry out these connections we require the following documentation to be in place.

- Developer to issue a council approved drawing which enables GTC to do the following
  - Design
  - Quote
  - Calculate the annual consumption of the connections in accordance with the Elexon procedure BSCP520
- Developer's acceptance and payment of the quotation.
- Signed copies of the Unmetered Supplies Agreement and the Letter of Intent Authorisation received

## 13. C.D.M. REGULATIONS 2007

The Electricity network Company (ENC) is licensed by Ofgem to own and operate distribution networks.

ENC is a wholly owned subsidiary of GTC who manages all of the ENC Assets.

### Construction

GTC will manage the construction phase of any electricity installation project and ensure that the appropriate information is provided in respect of the electricity infrastructure and submitted to the Principal Contractor for inclusion in the site Health and Safety plan.

In relation to the project GTC will:

1. Design the electricity distribution network
2. Co-operate with the Principal Contractor so far as is necessary to enable compliance with the duties under the relevant statutory provisions
3. So far as is reasonably practicable, promptly provide the Principal Contractor with any information (including any relevant part of any risk assessment) which might affect the health or safety of any person working on the site.
4. Comply with any directions of the Principal Contractor.
5. Comply with any rules applicable to GTC in the health and safety plan.

Information will be provided to the Principal Contractor to establish GTC is competent to manage and carry out the construction work.

Should you require any further information please contact the GTC Technical Manager.