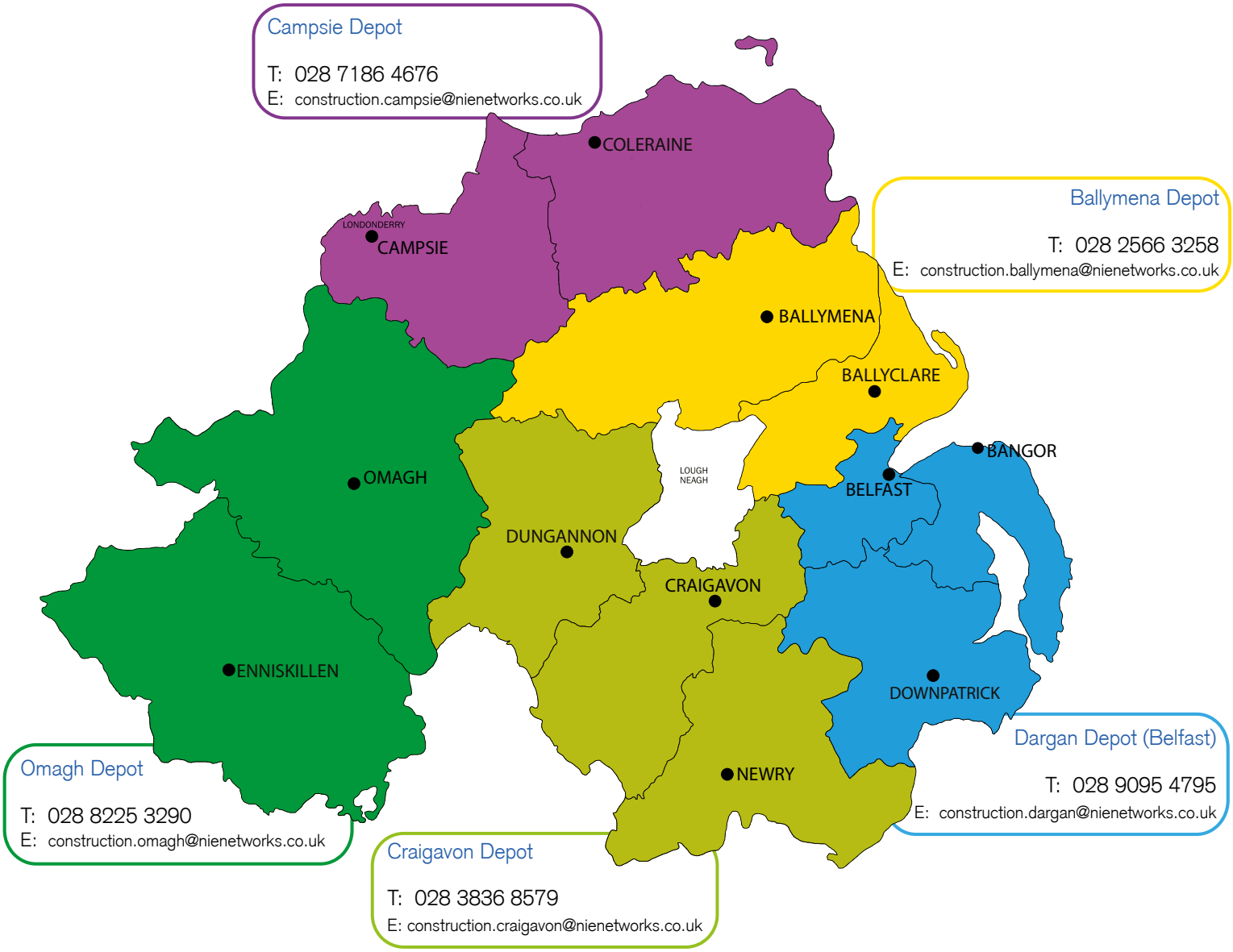
Northern Ireland Electricity Networks

ELECTRICITY CONNECTION CONSTRUCTION GUIDE

Technical Guidelines and Safety Information for Customers, House Builders and Developers

Version 2.2 June 2020

Figure 1: NIE Networks Depot Map for Construction Works



Disclaimer

Although care has been taken in the compilation and preparation of this document, NIE Networks 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.

Introduction

At Northern Ireland Electricity Networks (NIE Networks), we've been connecting customers to the electricity network for over a century. We know that today's customer, large and small, wants a simple, value for money, streamlined process and that's what we aim to deliver, every time.

We ensure we're delivering what our customers want, now and into the future. Whether you need an electricity supply for a new home or business premise, or if you are expanding your manufacturing capability, we will guide you through the process from quotation right through to getting your supply metered and energised.

This booklet will provide you with information and guidance on how to prepare your site when the job has moved to the construction stage. There is relevant information that should be passed to your civil and electrical contractors on how to prepare the site for the installation of mains and service cable. This includes the submission of a connection card(s) and registering with a supplier to enable the installation of the meter(s).

To schedule work you can call or email the relevant Construction Department listed below.

Dargan Depot (Belfast)

T: 028 9095 4795
E: construction.dargan@nienetworks.co.uk

Ballymena Depot

T: 028 2566 3258
E: construction.ballymena@nienetworks.co.uk

Craigavon Depot

T: 028 3836 8579
E: construction.craigavon@nienetworks.co.uk

Omagh Depot

T: 028 8225 3290
E: construction.omagh@nienetworks.co.uk

Campsie Depot

T: 028 7186 4676
E: construction.campsie@nienetworks.co.uk

Please note:
Every effort will be made to meet your requirements. However, we require a minimum of 10 working days notice to lay mains and service cable in private ground (statutory notice periods are required for public property).

The above timescale is a guide only and lead times may be longer during busy periods. Longer lead times may be required depending on the notice period required by Department of Infrastructure (DfI).

What are the next steps to progress my job?

After the letter of acceptance and payment (if required) are received and provided all necessary consents have been secured, our Connections Customer Liaison team will contact you to determine when you will be ready for works to commence.

Once a date has been agreed, you are responsible for the following steps including giving relevant information to your civil/electrical contractors working on your behalf.

The key steps are:

1. **Civil works and other facilitating works**
   Please prepare your site by digging your own trenches as outlined in your offer and as per the requirements outlined on page 5. The timescale for trench preparation should be agreed with NIE Networks. Ensure the meter cubicle or meter board is in position – see Page 4. Ensure any tree cutting, stream crossings and other relevant works are completed in advance of our teams starting construction as per guidance on our website.

2. **Connection card**
   On completion of your electrical works, your electrician will complete and sign a connection card which must be returned to us before your supply can be energised. You will recieve a connection card with the quotation letter or you can download a copy at nienetworks.co.uk/Connections/Connection-cards

3. **Register with your chosen supplier**
   Quote the Meter Point Reference Number (MPRN) supplied on your letter of Terms & Conditions. Suppliers available in Northern Ireland can be found on the Consumer Council website consumercouncil.org.uk

   For new connections, your connection card and supplier registration do not need to be complete before construction work takes place, but these do need to be carried out before the meter will be fitted.

   For alterations or increased load, your connection card needs completed at least five working days before construction commences to facilitate the meter change.

4. **Installation of meter**
   Once we have completed on site construction and all documentation has been received, we will contact you to arrange an appointment to complete the installation of your meter. Further details can be found on Page 9. You can contact Metering by calling 028 2566 1640 or email MeteringServices.Connections@nienetworks.co.uk

If you are not sure of what is required we can arrange for a site visit to advise you or your contractor of your requirements. Please contact the relevant NIE Networks depot listed on Page 1.

After your job has been constructed and made live, you may receive a courtesy call or email from our Customer Liaison team, who will ensure you are happy with all works completed. We would welcome your feedback and may ask you to complete a survey to help us improve our service.

What will the final installation look like?

The diagram below shows the different parts of a standard domestic electricity installation.

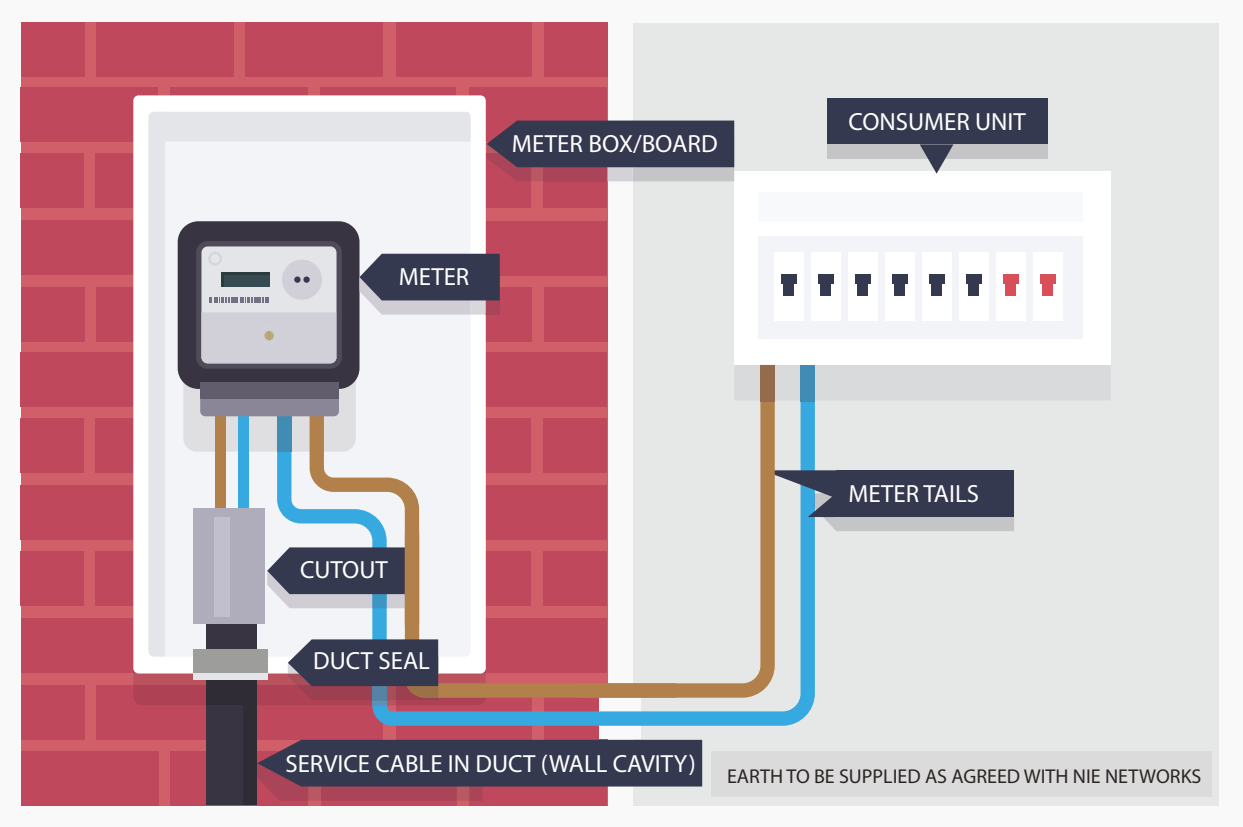


Figure 2: Standard domestic electricity installation

SERVICE CABLE - this is the cable which connects your property to the local mains. It will either go under the ground to our mains cable, or will be clipped to your house and go overhead to one of our poles. The service cable duct should extend 50mm into the meter box to allow a seal to be completed on the cable entry duct.

CUTOUT - this is NIE Networks' main fuse and needs to be below the meter on the left hand side.

METER TAILS - these are your cables and connect the meter to your installation. As the cables are yours, you need to ask your electrical contractor to include them in the scope of their works. Your meter tails should be double insulated, correctly colour coded and sized, and less than two metres long. If they are more than two metres then a fused isolator is required on the meter board. If they are more than three metres then earth fault protection is required.

CONSUMER UNIT - this contains the fuses or trip switches which control the circuits in your house, probably lights, sockets, cooker and immersion heater. This is your property and again, needs to be managed by your electrical contractor.

If you intend to install a keypad (prepayment) meter, now or at any point in the future, then it is advisable to install a data cable from the meter box to your preferred location for the freedom unit (remote keypad connected to meter).

Individual / Developer Responsibilities

Civil Works

If you are carrying out the civil works on your private land (or public land with consent), then you are responsible for the provision of all cable trenching, ducting, sandbags and blocks, including joint holes and the provision of fine compacted bedding, backfilling and reinstatement at your expense. Excavation shall not take place within 300mm of NIE Networks live cables or 1000mm from structures. More details are provided in Policy 5/009.

Cable type	Number of cables	Trench width (longitudinal roads/carriageways)	Trench depth (longitudinal roads/carriageways)	Trench width (in other areas eg footway)	Trench depth (in other areas eg footway)
Service	1	400mm	850mm	150mm	550mm
LV mains	1	400mm		400mm	
LV mains	2	500mm		500mm	
HV (11kV)	1	400mm		400mm	750mm
HV (11kV)	2	600mm		600mm	
HV & LV	One of each - LV staggered above HV	450mm	1000mm	450mm	HV at 750mm, dusted to lay LV at 550mm
HV & LV	Two of each - LV staggered above HV	650mm		650mm	

Where two LV mains or HV cables are located in the same trench, they must be separated by 300mm, centre to centre. LV service cables shall be separated by 100mm centre to centre.
In good agricultural land, the cable trench shall be 1100mm deep. All trenches must be provided with a minimum of 50mm fine compacted bedding/blinding material at the bottom.

In road crossings, two red ducts 150mm apart, shall be laid in a 1000mm deep trench with cement bound granular mixture surround. Cross section drawings for cable trench requirements can be provided at your request.

Ducts should be defined as detailed in the glossary. In all instances, they shall be of rigid construction and be single walled. For more information on ducting and cable well requirements – please refer to your terms and conditions.

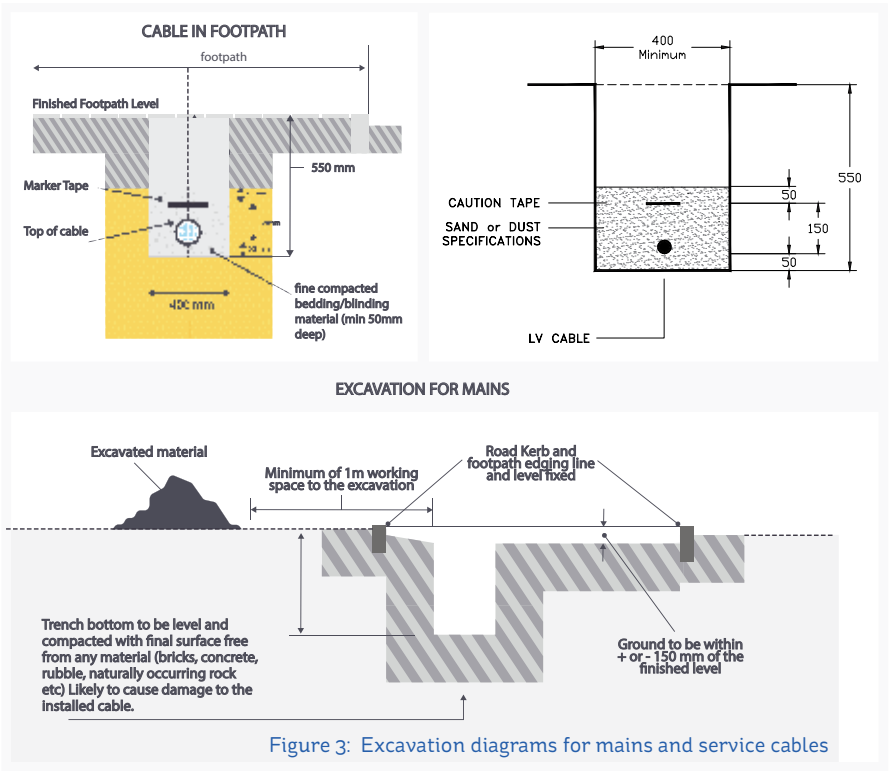


Figure 3: Excavation diagrams for mains and service cables

Cable Laying

- Carry out all necessary excavation and reinstatement work to allow cables to be laid. The trench should be kept as smooth as possible, with 50mm of fine compacted bedding/blinding material at the bottom.
- Install appropriate rigid walled ducting, as per your terms and conditions, as defined in the glossary.
- Ensure site is free of all obstacles including scaffolding and site traffic.
- Please avoid digging trenches too early to avoid tripping or trench collapsing. Agree timescales with NIE Networks.

Mains Cable

- Individual/Developer to agree a schedule of works with NIE Networks and a site visit may be arranged prior to starting works to discuss how work will proceed.
- All kerb lines must be fully formed with levels in place prior to NIE Networks commencing any work.
- Gas and water mains have to be installed prior to any cable laying by NIE Networks. It is recommended that no other utility should be installed over or within 300mm of the electricity cables
- Preferred method of cable laying is open trenching.
- When a connection is required in public property, we will schedule works in accordance with appropriate bodies and landowners.
- Red UPVC ducts 160mm/150mm, marked "Danger Electricity" and solid walled on both sides are to be used for mains cables in public property.
- A caution tape/tile must be laid on top of the dust of the cables. This will be done by NIE Networks' contractor or the ICP. It is important the marker is positioned correctly as it acts as a safety warning to anyone carrying out subsequent excavations. Therefore, it must not be moved after its positioning by NIE Networks' contractor. Bedding and surround to cables must be fine compacted quarry dust or sand.
- If you are carrying out excavation and reinstatement, trench backfilling must be undertaken immediately after cable laying has been completed. It is your responsibility (or your contractor's) to source the correct amount and type of dust. This can be obtained from a local quarry. Typically, one tonne of dust is required for every 5 metres of track. This must be left in piles along the track at 1 metre intervals.

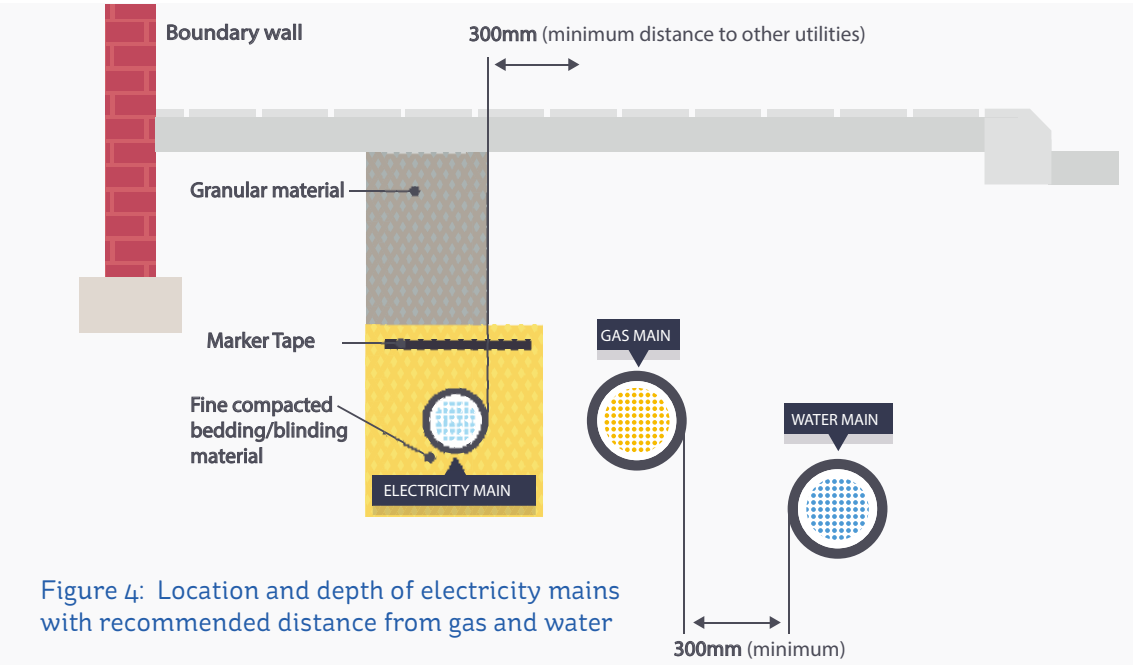
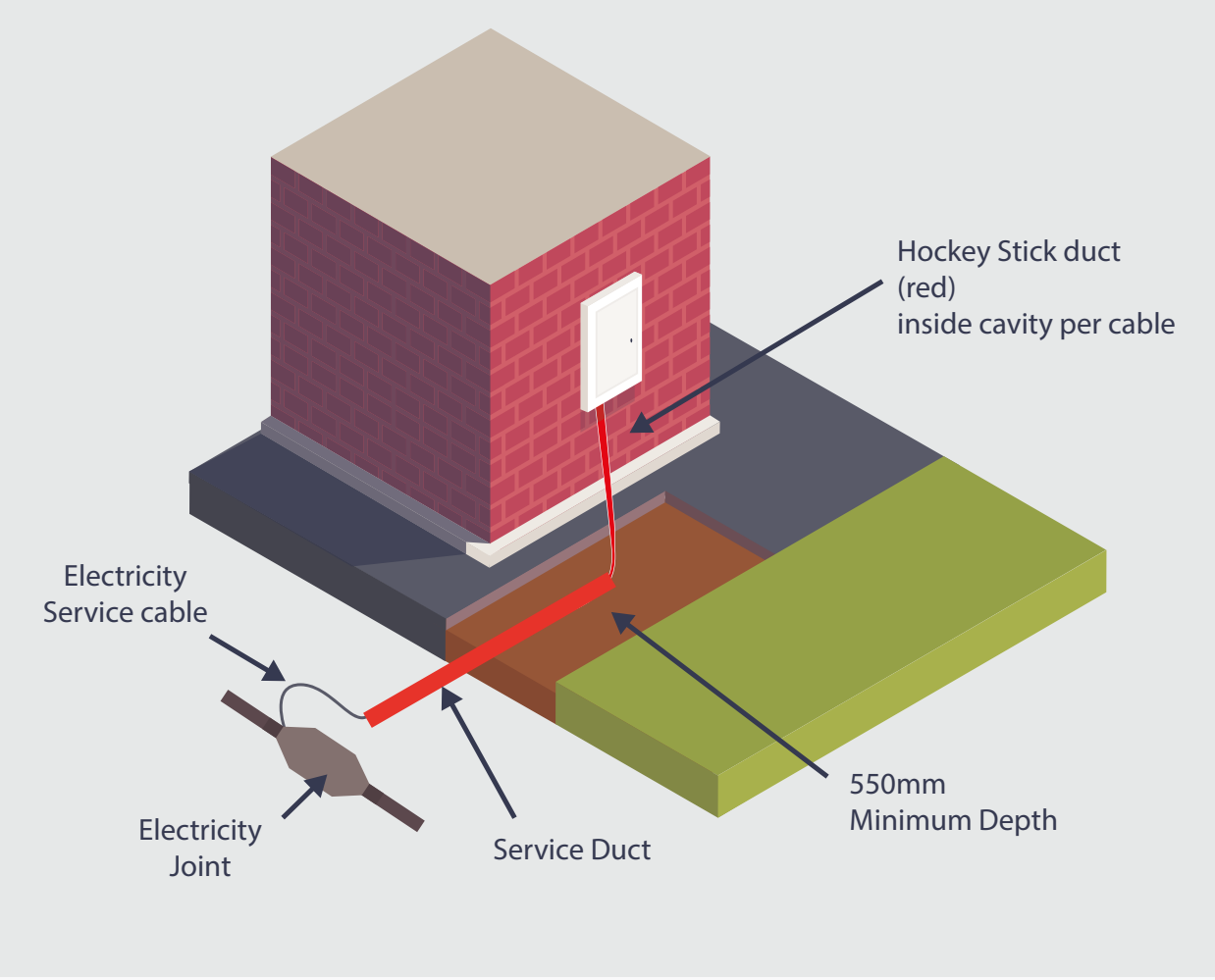


Figure 4: Location and depth of electricity mains with recommended distance from gas and water

Service Cable

- Meter box to be installed by you within fixed/permanent structure. Ensure doors are lockable and watertight – this must meet NIE Networks requirements as stated in your terms and conditions.
- Meter box location must be installed in a location approved by NIE Networks' planning department.
- Where agreed, electricity cables may be ducted from the meter position to the connection point on the mains cable in the footway. Ducting must be as specified in your terms and conditions and NIE Networks' specification 201-12.
- Cables laid direct or in ducting must be situated 300mm away from other service pipes.
- Joint holes must be 300mm deeper than the cable trench depths stated on Page 5. The width and length of joint holes for plastic sheathed cables must be: High Voltage (HV): 1000mm wide by 3000mm long. Low Voltage (LV): 1000mm wide by 2000mm long. For PILC type cables, the dimensions are 1500mm wide by 3000mm long

Figure 5: Duct and service cable arrangements to meter box



Recommended positioning of all utility apparatus

The diagram below provides general recommended positioning of all utilities in accordance with NJUG.

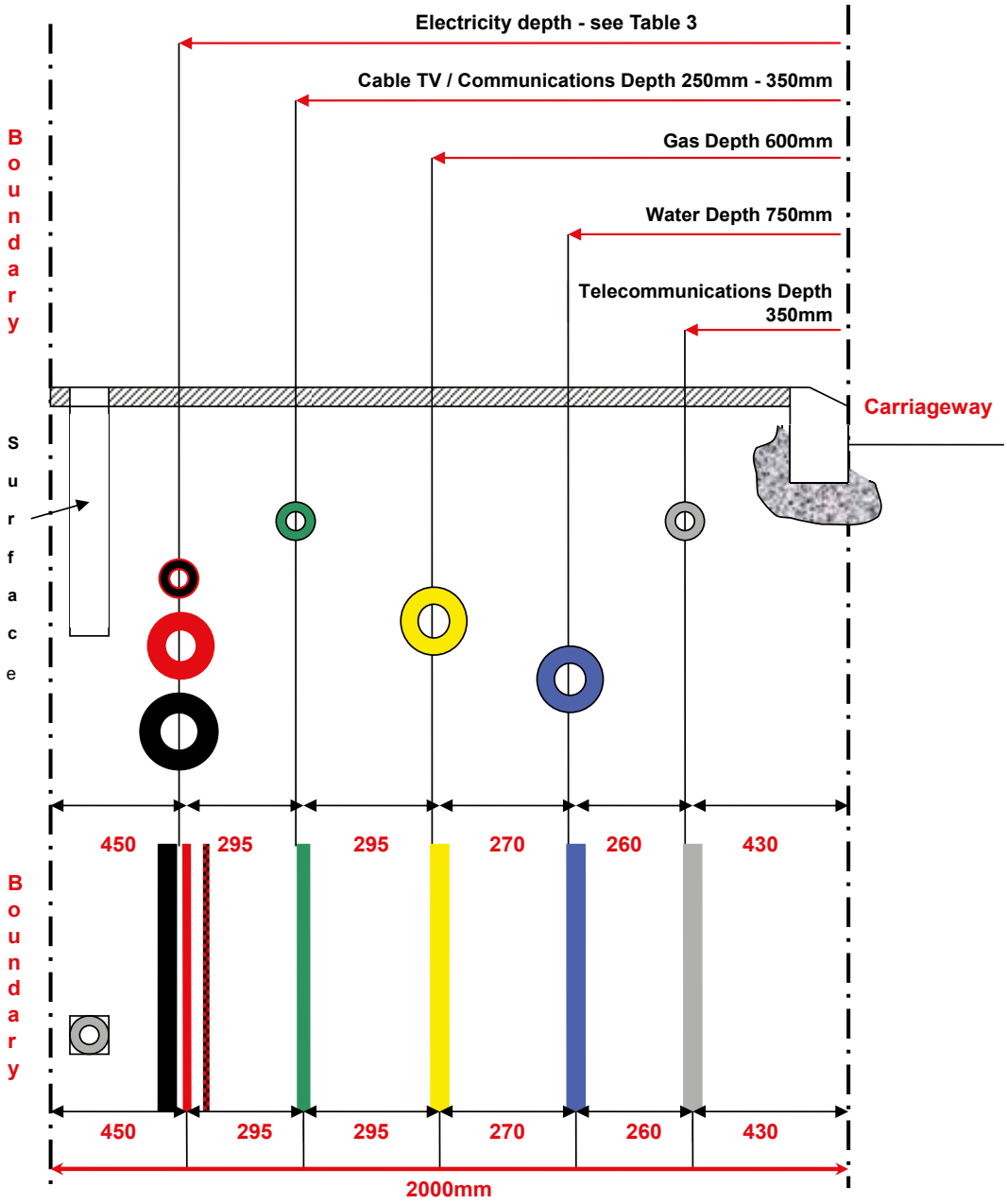


Figure 6: NJUG (Streetworks UK) diagram of recommended postitioning of utility apparatus in a two meter footway

For clarity, NIE Networks' specific depths are detailed in the following table. In particular HV cables should be buried at a minimum of 750mm. In good agricultural land that is likely to be ploughed, the cable trench should be 1100mm deep. In road crossings, two red cable ducts should be laid in a 1000mm deep trench.

Cable Type	Trench depth in Footway	Trench depth in Carriageway (longitudinal)
Service cable	550mm	850mm
LV Mains cable	550mm	850mm
HV cable	750mm	850mm

Location and Installation of Metering Cabinet

The location of the metering position must be agreed with NIE Networks. We will not be able to connect unacceptable metering positions. External meter cabinets should be used to house NIE Networks metering equipment in domestic premises unless alternative arrangements have been agreed.

Properly positioned meter cabinets facilitate regular meter readings, minimise inconvenience to customers and allow for the electricity supply to the property to be disconnected in the event of a house fire or other emergency situation.

- Your meter box should be fitted on the external side of a wall where it is accessible from the front of the property and is unlikely to be damaged.
- Cabinets are available from builders' suppliers and must be secured in position and door catches should be self locking.
- A PVC cable entry duct should be installed for each service cable. This is normally of hockey stick construction. The duct should be 32mm or 38mm diameter, red, it must enter the cubicle on the bottom left hand side and extend into the cubicle a minimum of 50mm to allow for sealing.
- The bottom edge of the cubicle should be installed to be within 900mm to 1050mm from finished ground level.
- Your sub mains cable must exit via the bottom right hand side of the meter cubicle.

Where an outdoor metering arrangement cannot be facilitated, please put your request in writing. We will then consider an alternative position to site the mains fuse and install metering equipment indoors.

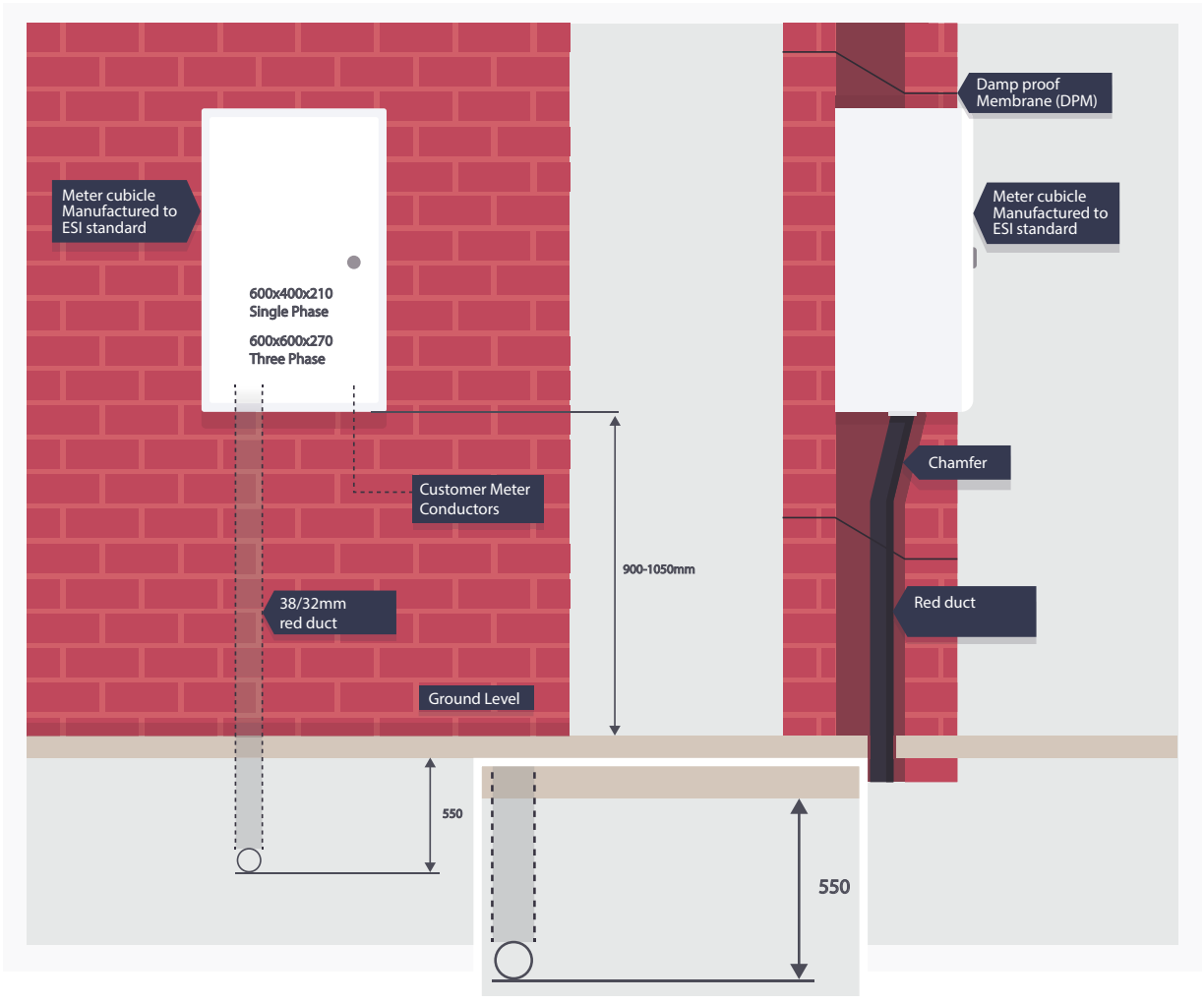


Figure 7: Meter box arrangements for recessed meter cabinet

Location and Installation of Metering Cabinet

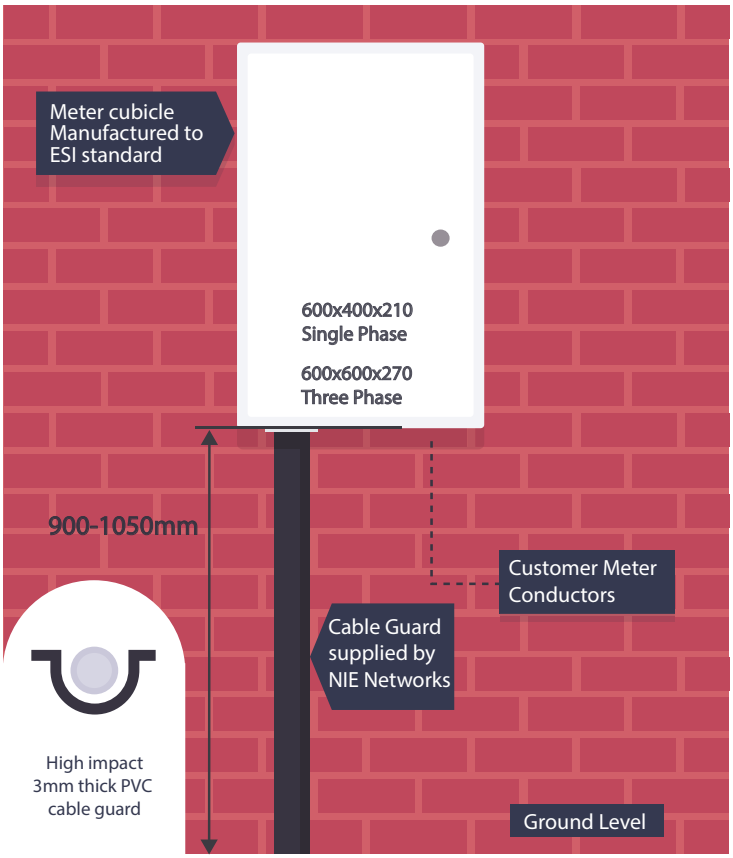


Figure 8: Meter arrangements for surface mounted meter cabinet if recessed is not available

Box Dimensions (mm)	Single Phase	Three Phase
Width	400	600
Depth	210	270
Height	600	600

All NIE Networks ducts and cables should enter the left hand side of the meter cubicle. Internal meter board positions may be agreed at the planning stage.

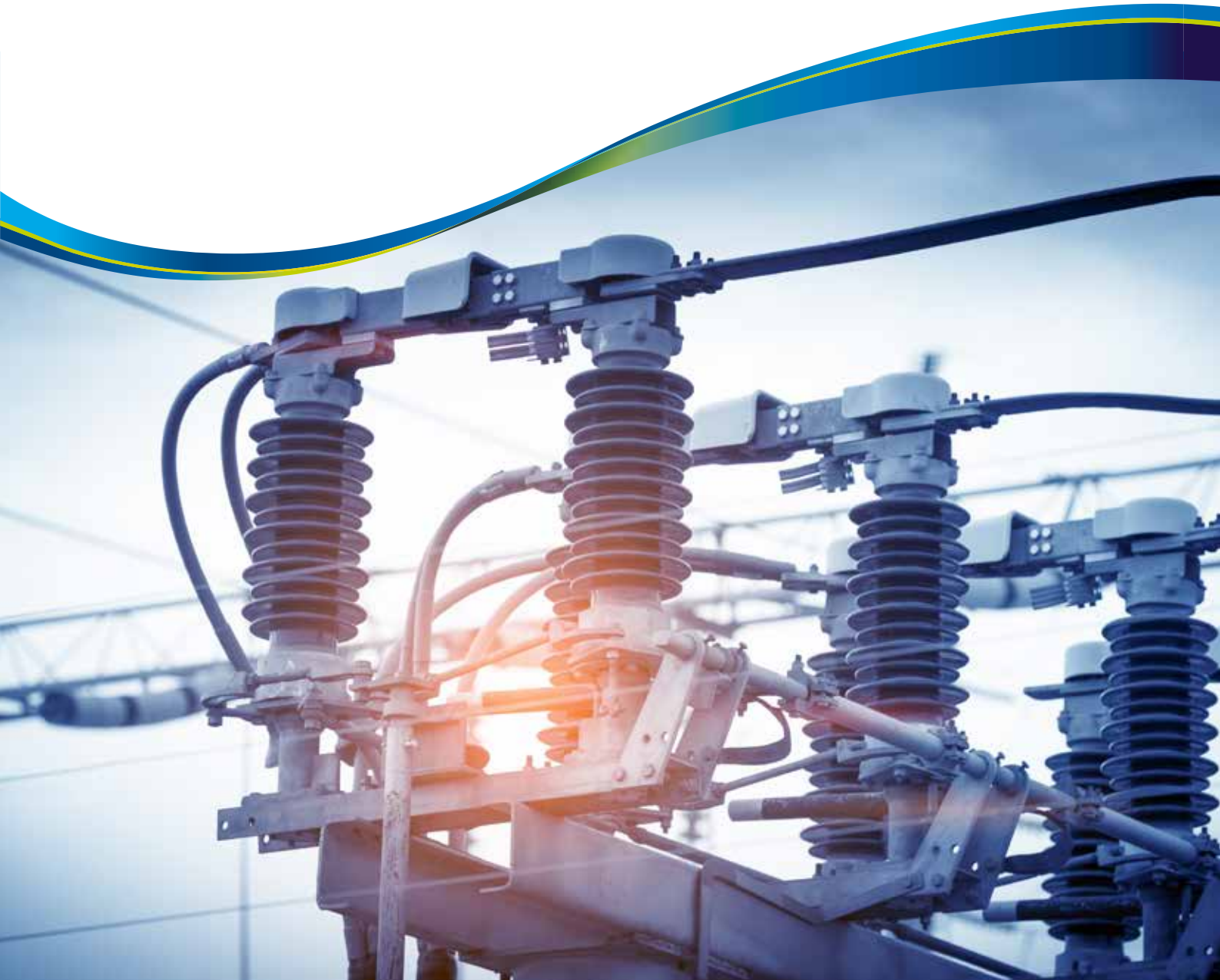
To arrange the installation of your meter, please call 028 2566 1640 or email MeteringServices.Connections@nienetworks.co.uk

CDM Regulations

NIE Networks 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, we will:

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



NIE Networks Utility Drawings

Where a site is being constructed either on or adjoining to the electricity network, the relevant drawings can be requested. Verification of cable positions must be carried out on-site so that no damage occurs to live equipment. Site Safety should be in accordance with: HSE Guidance note GS6 (Avoiding Danger from Overhead Powerlines) and HSE booklet HS(G)47 (Avoiding Danger from Underground Services). You can find more information at nienetworks.co.uk or hseni.gov.uk.

Request marked up drawings of the electricity network by emailing markups@nienetworks.co.uk or in writing to NIE Networks Drawing Office, Unit 3, Channel Wharf, Old Channel Road, Belfast.

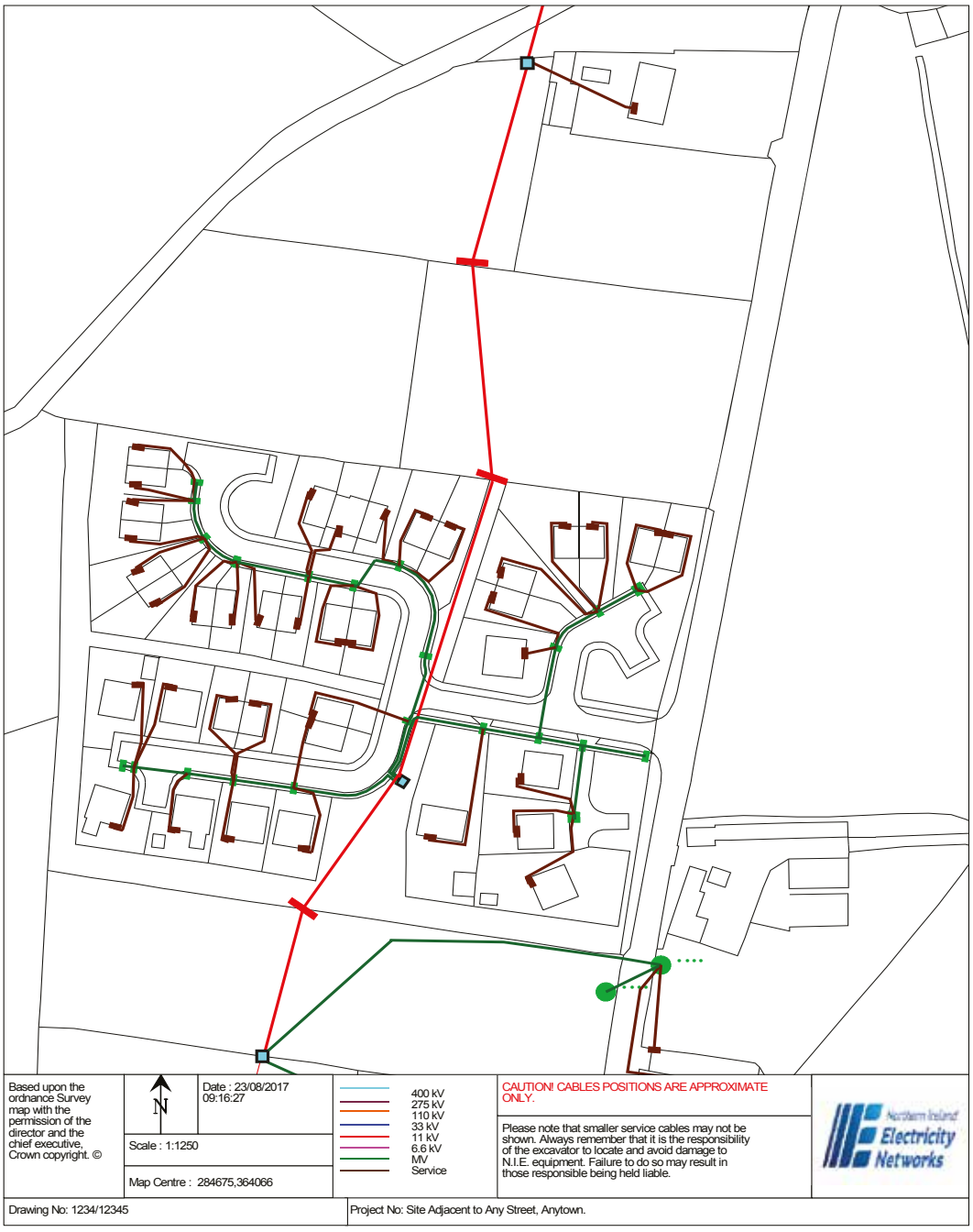


Figure 9: Sample marked up utility drawing

Safety Guidance

Customers requiring a service connection, in general and unless otherwise detailed in the connection offer, may be required to excavate cable trenches in private property to facilitate the laying of a service cable and associated earthing conductors. If customers carry out digging on private property, or arrange for someone else to do it, they must ensure that the person(s) carrying out the work understand their responsibilities under the Construction (Design & Management) Regulations (NI) 2015 and have read and understood the booklet "Avoiding danger from Underground Services" (HSG 47) published by the Health & Safety Executive. They should also discuss digging in the vicinity of other NIE Networks equipment, e.g. poles/stays with a representative from NIE Networks. You can view our short video at nienetworks.co.uk/connections.

Please remember that any preparatory works need to be completed in time for our visit. If you are not ready we may have to postpone our visit, or charge you for any additional work we do.

All electrical apparatus must be treated as live. Any injury, damage to plant, regardless of size must be reported to the site owner/manager and NIE Networks immediately. Underground services, in particular gas and electricity are extremely dangerous. Damage to electricity cables can result in electrocution, shock, severe burns or death. Gas leaks can cause fire, asphyxiation and explosion.

Damage can be a result of excavation or penetration to the ground. Underground utility services are commonly found in roads, footpaths, sites and open land.

Prior to beginning excavation works ensure you have details of all underground services in the area and they are made available to the persons carrying out the excavation. Not all service connection cables connecting street lighting pillars or buildings may be shown.

You should use appropriate equipment to locate and confirm the position of electricity cables, pipes and any other equipment within and around the area of planned excavation. Identify signs of service connection cables, e.g. gas or electricity boxes, or service connection into a house or street lamp. It is recommended that an appropriate cable avoidance tool with generator is used to do this.

Site Safety should be in accordance with: HSE Guidance note GS6 (Avoiding Danger from Overhead Powerlines) and HSE booklet HS(G)47 (Avoiding Danger from Underground Services). You can find more information at nienetworks.co.uk or hseni.gov.uk.

In an emergency contact NIE Networks on 03457 643 643.

Connections glossary

Blocks

4inch blocks (lightweight).

Sandbags

Woven white colour polypropylene sand bag

Filled sandbag contains approximately 15kg of sand

Pre filled sandbags approx. dimensions 25 x 50 x 10cm high

Cable ducts

All ducts for service, mains and HV cables shall be generally in accordance with ENA TS 12-24 and the relevant parts of BS EN 61386. Service cable ducting shall be of Class 2 construction and all other ducts Class 1.

- Class 1 ducts shall be single walled, rigidly constructed with nominal diameter dimensions of 150/160 mm (internal/external) and supplied in 6m sections.
- Class 2 ducts shall be coilable with internal bore diameter of 32 mm and supplied in 50m or 150m coils.

All ducts for electric cables shall be coloured red and display the wording “DANGER ELECTRICITY - NIE Networks.”

A copy of NIE Networks specification for ducting may be provided on request. Otherwise, NIE Networks’ Approved supplier of ducting is Emtelle. This ducting is available from:

TOTAL PIPELINE SPECIALISTS (NI) LIMITED
13A Blaris Industrial Estate
Altona Road
Lisburn BT27 5QB
Tel: 02892 660000
E: sales@total-pipeline.com
W: www.total-pipeline.com

The Pipe Crew Ltd
1 Nutfield Road
Lisnaskea
Co. Fermanagh
BT92 0LB
Tel: 028 677 21336 / 07880 796 951
W: www.thepipecrew.com
E: thepipecrew@outlook.com
E: ruairi.mcmanus@thepipecrew.com

NIE Networks reserve the right to inspect all ducting prior to the installation and jointing of cables on site.

Cable bedding and backfill

The bedding and surrounds to cables shall be either fine grade washed sand to EN 13139 (BS 1200) or fine quarry dust of similar grading. The quantity to be provided shall be enough to allow a total of 200 mm of soft bedding material to surround the cables along the entire length of the cable route. As a guide one tonne of fine quarry dust for every 5m of cable track should be supplied. This should be left in piles along the track at 1 m intervals.

Backfill material may also be selected from material excavated from the trench, provided it does not include:

- Stones or lumps of clay greater than 40 mm nominal diameter;
- Saturated material;
- Rock;
- Concrete, coated macadam, asphalt or other unnatural material.

Backfill material shall be placed in even layers and shall not be heaped in trench before being spread. Spreading and compaction shall be carried out evenly without damaging the cables or other services adjacent to the trench.

Northern Ireland Electricity Networks

www.nienetworks.co.uk

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