Developers Guide

ENERGY assets | Networks
EVERYTHING CONNECTS

ENERGY assets | Pipelines
EVERYTHING CONNECTS

Version 2.1

ENERGY ASSETS NETWORKS

EAN is an independent distribution network operator (IDNO) and has landed numerous asset ownership contracts thanks to its partnerships with contractors, housebuilders and developers across Britain – and its flexible approach to asset adoption.

The company has built a portfolio comprising thousands of domestic connection points, but a key success factor has been its approach to other asset types, including industrial and commercial schemes, EV charging infrastructure and even a power network supporting a major data centre.

ENERGY ASSETS PIPELINES

Energy Assets Pipelines Limited (EA Pipelines) is an Independent Gas Transporter (IGT) that develops, operates and maintains local gas transportation networks.

EA Pipelines operate gas pipe networks serving domestic, commercial and industrial buildings. Our networks are usually directly connected to the major Gas Distribution Networks from where we transport gas through our network to each connected building.

We maintain high quality gas networks and ensure gas is safely provided to our customers.

We work closely with house builders, developers, major construction companies and Utility Infrastructure Providers (UIP‘s) to deliver gas networks to new residential and commercial property developments. As an IGT we are able to adopt any network operating at 7 bar and below across the UK distribution network.

Contents

Emergency numbers

Damage to live electricity cables and live gas pipes should be reported immediately on the following numbers:

Electricity

0333 800 2016

Gas

0800 111 999

SMELL GAS?

Call the National Gas Emergency Service on
0800 111 999

Introduction

This developer's guide will provide you with guidance and information on the installation of mains and services for electricity and gas.

This guide only applies to electricity and gas networks that are to be adopted by Energy Assets Networks and Energy Assets Pipelines.

Any questions or enquiries need to be raised with your chosen ICP/UIP.

Disclaimer

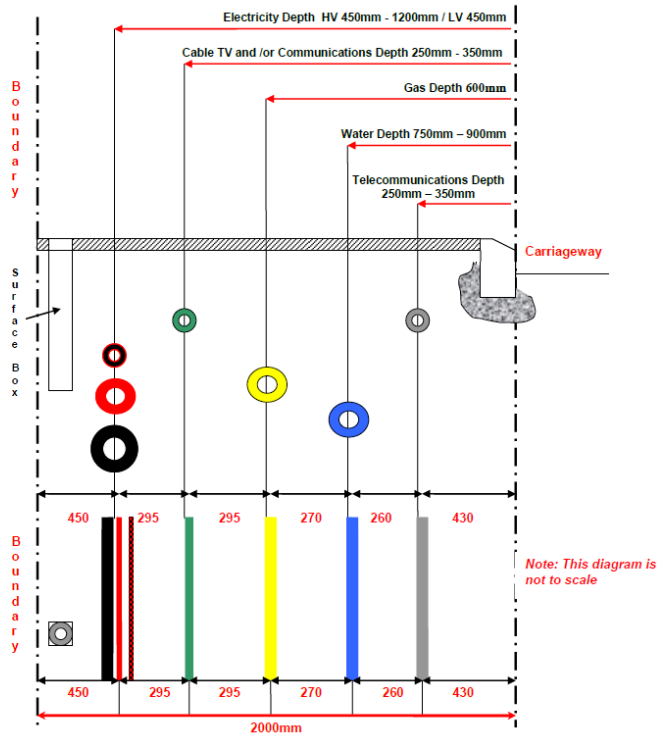
EAN and EAP respectfully accepts no responsibility for inaccuracies, errors or alterations or for any consequences arising from the use of the information in this document.

Recommended positioning of utilities

Recommended positioning of utility apparatus in a 2 metre footway

From NJUG Guidelines on the Positioning of Underground Apparatus for New Development Sites volume 2:

FIGURE 1 - Recommended Positioning of Utility Apparatus in a 2 metre Footway



Electricity mains & services installation

EAN LV mains and services cable installation

All cables should be located and installed in accordance with the National Joint Utility Group Publication NJUG Volume 2 and the EAN Installation and Records G81.

Mains cables cannot pass under buildings or cross third-party owned land and must be laid in ground to be adopted by the local authority wherever possible. Where cables cannot run in adopted highway they should follow an accessible route (i.e. private footpath), and an easement will be required.

All road crossings shall be ducted with at least one spare duct per crossing, per voltage level.

Any required joints should be located beneath the footpath and not in the carriageway.

All EAN LV mains and HV cable ducts shall be a minimum of 125mm and a maximum of 150mm internal diameter with the exception of 95mm Waveform cable which can be installed in 100mm internal diameter duct. All ducts shall be to ENATS 12/24 twin wall smooth lined Black Rigiduct marked as ‘Electric Cable Duct’.

Single phase service ducts shall be polypipe 38mm outside diameter minimum 32mm ID conforming to ENATS 12/24 and shall be marked ‘Electric Cable Duct’.

Three phase service ducts shall be polypipe 60mm outside diameter and a minimum of 50mm internal diameter conforming to ENATS 12/24 and shall be marked ‘Electric Cable Duct’.

LV and HV warning tape shall be to ENATS 12/23, marked with Energy Assets Networks and placed 100mm centrally over each cable, duct and joint. For further information please refer to cable cross sections on the design drawings.

EAN cable installation example

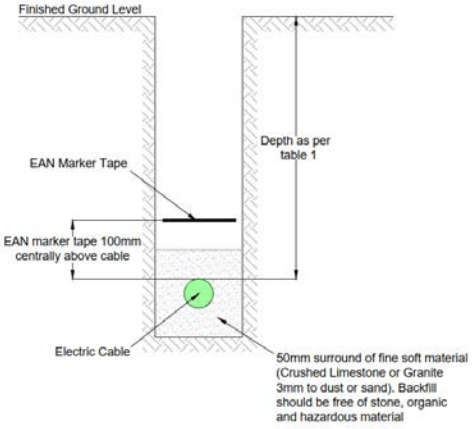


Table 1 - LV and HV Cable depths

LV Cable Depths – to top of cable or duct from finished ground level			
Verge/Footpath	Road	Agricultural	Landscaped
450mm	600mm	1000mm #	1000mm *
HV Cable Depths – to top of cable or duct from finished ground level			
Verge/Footpath	Road	Agricultural	Landscaped
600mm	750mm	1000mm #	1000mm *

Where ground is deep ploughed increase depth to 1200mm * Steel plate required above cable and joints

Electricity cable backfill

The trench bottom shall have a minimum of 50mm bedding of fine soft material (crushed limestone or granite 3mm to dust or sand). Backfill should be free of stone, organic and hazardous material. The same material shall be used as bedding above the cable to a depth of 50mm. The warning marker tape shall be installed 100mm centrally above each cable and joint. Excavated materials can be used for reinstatement above the warning tape if suitable.

Gas mains and services installation

Gas mains and services installation

All pipes should be located and installed in accordance with the National Joint Utility Group Publication NJUG Volume 2 and the IGEM Standards.

Pipes cannot pass under buildings or cross third-party owned land and must be laid in ground to be adopted by the local authority wherever possible. Where pipes cannot run in adopted highway they should follow an accessible route (i.e. private footpath), and an easement or servitude (for Scotland) will be required.

All ducting shall conform to BS4962, be yellow in colour, convoluted and perforated.

Marker tape shall be positioned 250mm above the crown of pipe.

Laying of all gas main, services and ducting can only be completed by a trained and competent person. Ground workers without a gas industry qualification cannot complete this work.

The minimum below ground service size that will be considered for adoption by EAPL working at any pressure range, will be 32mm PE.

For further information please refer to pipe cross sections on the design drawings.

EAP pipe installation example

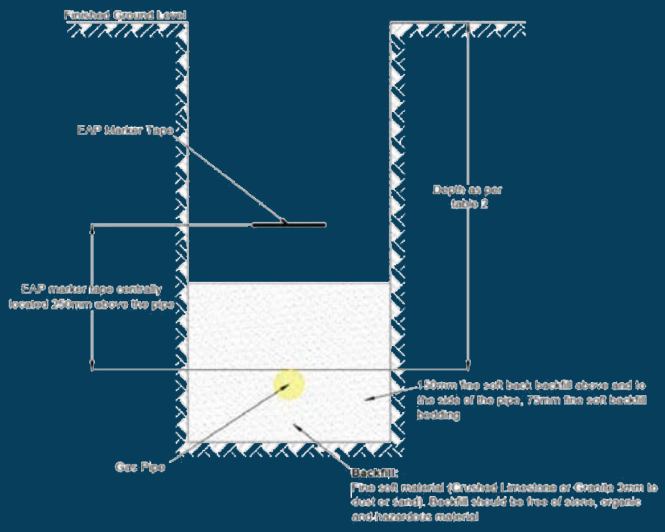


Table 2 - Pipe depths

Location	Mains	Service
Carriageways/Roads	750mm	450mm
Footways/ Footpaths	600mm	450mm
Verges	750mm	450mm
Agricultural Land	1100mm	N/A
Other Private Ground	600mm	375mm

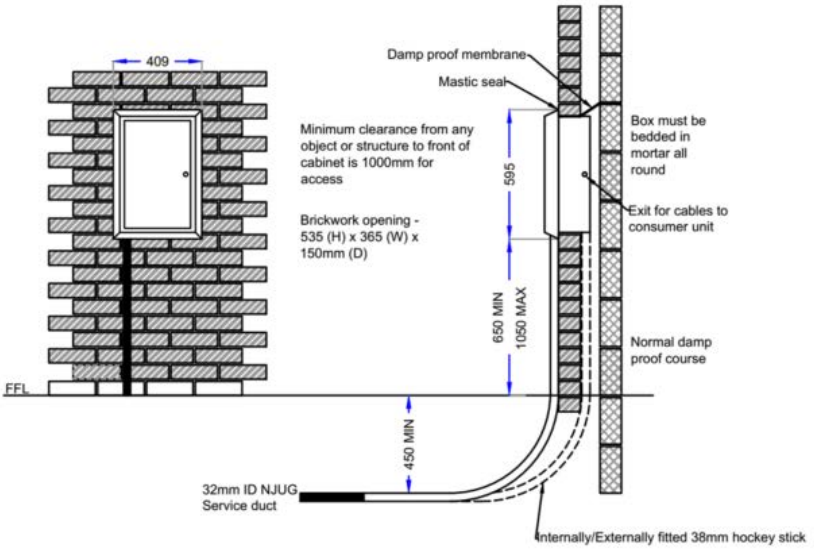
Pipe backfill

The trench bottom shall have a minimum 75mm bedding of fine soft material (crushed limestone or granite 3mm to dust or sand). Backfill should be free of stone, organic and hazardous material. The same material shall be used as bedding above the pipe to a depth of 150mm. The warning marker tape shall be installed 250mm centrally above each pipe. Excavated materials can be used for reinstatement above the warning tape if suitable.

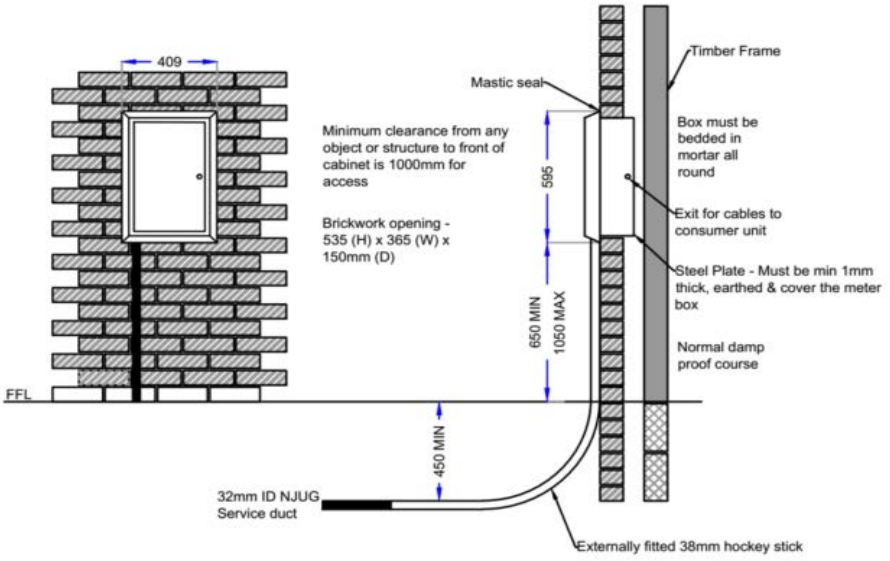
Electricity service entries and terminations

The preferred location of the service termination is in an external meter cabinet with an external hockey stick. The hockey stick and service duct shall be connected to form an unobstructed path from the main jointing position to the meter box termination point.

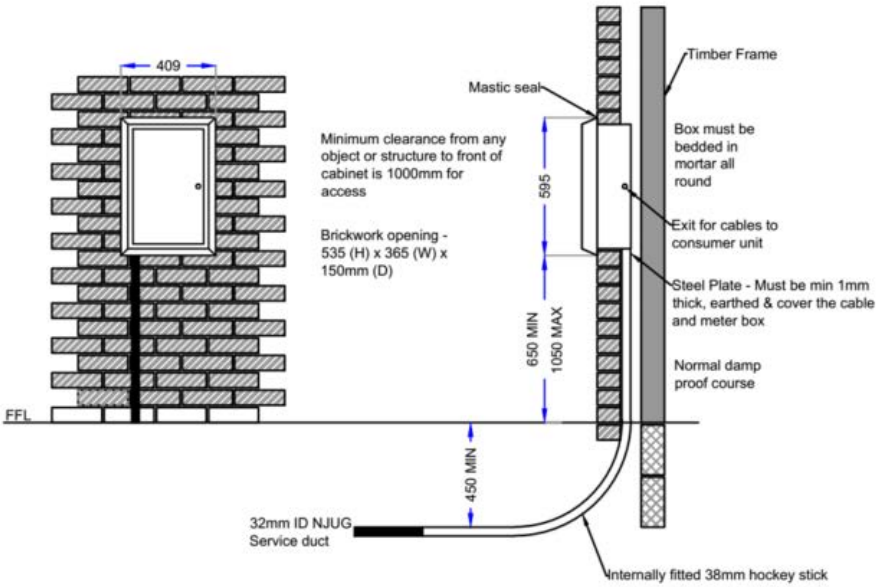
Standard meter box arrangement for brick/block construction



Standard meter box arrangement external hockey stick for timber frame



Standard meter box arrangement internal hockey stick for timber frame



Where an external meter cabinet with an external hockey stick is not possible an internal position must comply with all associated legislation within ESQCR, BS7670, building regulations and fire regulations.

A summary of the key requirements for internal services and terminations are as follows:

- Any internal cables must terminate within 3m of entry into a building onto an external brick or block wall using the shortest practical route. They cannot cross any third-party land or property (e.g. gardens), and be installed within a continuous service duct from the main joint position.
- Services not terminated onto a brick or block wall must have a steel sheet (minimum 1mm thick) installed behind to protect occupants drilling through into the service cable or cut-out. This must be bonded to the cut-out earth terminal. The steel sheet procurement, installation and bonding is the responsibility of the developer.
- Incoming cables cannot be hidden by panelling or routed behind any fixture or fitting and must be clearly identifiable.
- Services terminating on the main egress from a property (e.g. under stairs cupboards) must comply with building regulations and provide 30min fire rating either within a termination enclosure or the entire cupboard (Note: external meter boxes are not suitable for indoor use).
- In circumstances where the developer cannot provide a suitable location for an outside meter box, then EAN will accept the following:

1. **A purpose-built fire rated cupboard that is exclusively for the meter. Where this is not on an external wall, then a steel sheet (minimum 1mm thick) needs to be installed behind both the meter board and service cable to prevent someone drilling into them from behind - this must be bonded to the cut-out earth terminal.**
2. **If the cupboard is not exclusively for the meter (i.e. an under stairs cupboard) the whole cupboard needs to be fire rated, and the meter needs to be provided with additional mechanical protection. Again where the wall is not external the above steel sheet is required behind the meter board and service cable. Mechanical protection could be provided by a purpose built over box or a metal over meter box.**
3. **A standard outside recessed meter box installed inside into a brick or block work wall but on an external wall with a fire rated over box correctly fitted with fire mastic to the surround.**

All cable entries into buildings to be mastic filled to prevent smoke egress and gas ingress.

Locations unsuitable for indoor meters:

- on partition walls made of plasterboard, drywall or other similar materials;
- 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;
- inside a basement or cellar;
- inside a toilet, kitchen or bathroom;

Electricity in multi-occupancy buildings

Early consultation between the ICP and EAN should take place to agree meter locations for multi-occupancy buildings.

The service entry to the building will be installed in rigiduct to be installed into a full height service cupboard with full height doors, terminated as close to its entry point as possible. It must not cross any third-party land or property.

It must be in a communal part of the building set aside for this purpose (not a bin or store area) and be fully accessible to all parties including the flat owner to their meter.

Services shall preferably be installed in a communal part of the building and the developer shall provide and install lateral wiring to each flat which shall comply with BS7671. These laterals shall remain the property of the building owner or flat owner.

The size of the communal metering room will need to be large enough to accommodate the required MSDB, fuse carrier, metering equipment and customer's equipment. Individual installations will vary on the room required depending on the building design. Below is a table to give guidance on the minimum dimensions required for EAN equipment and metering.

Flat numbers	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

Where it is not suitable for a communal metering position a central internal rising sub-main to distribution boards on multiple floors can be installed. This must be fully accessible, retrievable and replaceable with fire stops between floors.

The termination positions for all electrical equipment must be segregated from other utilities by a minimum of 300mm.

Mechanical protection and measures to prevent damage and interference from third parties must be provided in accordance with BS7671.

The installation shall be designed to facilitate the repair, maintenance and future replacement. Cables shall not be cast directly into the building slab, be plastered into a wall or placed behind any panelling etc.

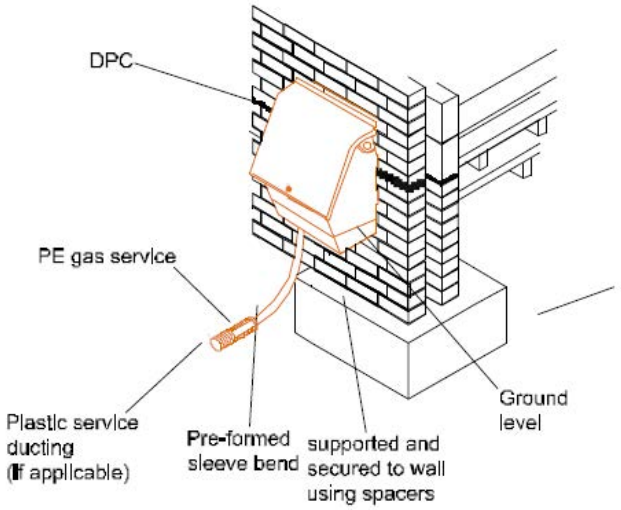
For lateral services running behind false ceilings a continuous service tube shall be installed on cable tray between the riser and each property to enable ease of replacement in the future. Any remedial/building works required as a result of a repair during the life of the installation will be organised and undertaken at the building owners expense.

Any metal conduit or trunking forming part of the riser or lateral installation shall be bonded to the main earth terminal by the developer.

Gas service entries and terminations

Meter box types and locations must be in accordance with the approved design drawing and any deviation must be agreed with an EAPL representative.

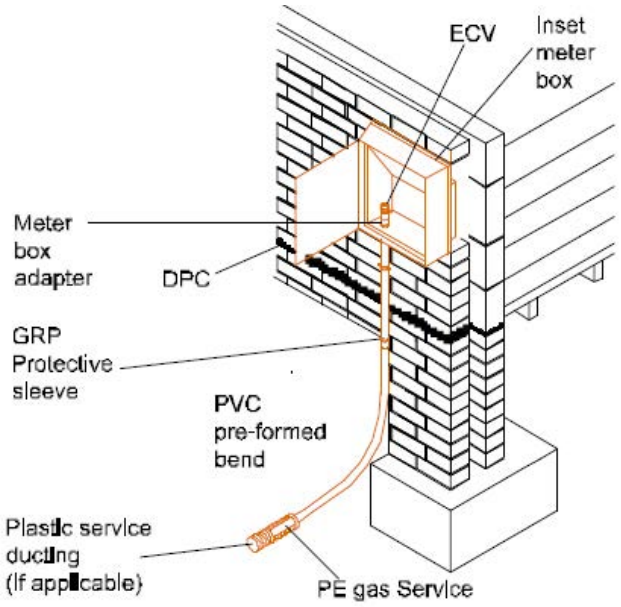
Standard meter box arrangement - Multi meter box/Universal meter box



Note: Meter boxes have to be ventilated.

PE TERMINATION IN A MULTIBOX METER BOX

Standard meter box arrangement - Inset meter box



Note: The meter box requires ventilation openings.

PE ABOVE GROUND TERMINATION IN INSET METER BOX

Semi-concealed meter boxes shall **NOT** be used. A multi box or universal box is considered as a suitable alternative. The design should be undertaken such that the boxes are not installed in positions where they may create a “trip hazard” or in locations where they are subject to vehicular or other damage.

Meters should be installed in the following positions (in order of preference):

1. cavity wall/Inset meter boxes;
2. surface mounted meter boxes;
3. Multi meter boxes/Universal meter boxes;
4. in secure garages, (suitable brackets are be used);
5. in specially constructed enclosures;
6. meter rooms as agreed with EAP; or
7. inside individual premises

Consideration needs to be given to local conditions relating to vandalism, interference damage, malicious tampering, trip hazard etc. when considering external meter positions. Surface mounted or Multi meter boxes/Universal meter boxes should not be installed on public footpaths or highways where damage from pedestrians or vehicles can occur.

The following list provides examples of locations that should be avoided:

- in close proximity to any source of heat, or where it may be subjected to extremes of temperature;
- where food is stored;
- where it might be liable to mechanical damage;
- where it might cause an obstruction;
- in bathrooms;
- where it might be affected by a corrosive atmosphere or liquid;
- where readily combustible material is stored;
- meters should not be installed into any lockable meter housing/compartment unless the consumer has been provided with a suitably labelled key providing access;

Services should be designed to be:

- the shortest length Practicable;
- follow a straight and predictable route;
- do not extend more than 2 metres along the gable wall or from the face of the building nearest to the main;

A gas service must not run parallel to the gas main. Marker tape must be installed above the service pipe.

Gas services

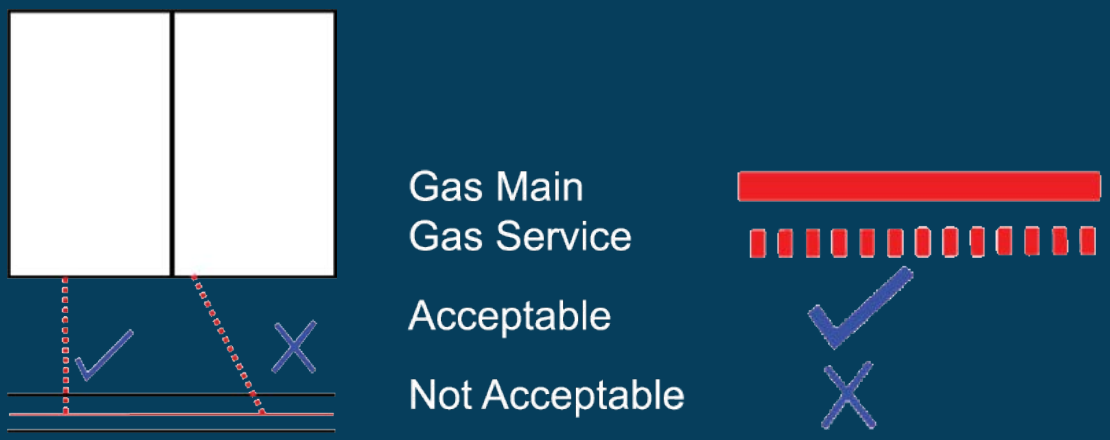
The developer will be required to undertake all excavation works on-site to allow the service to be laid, connection made to the new main and service to terminate at the property.

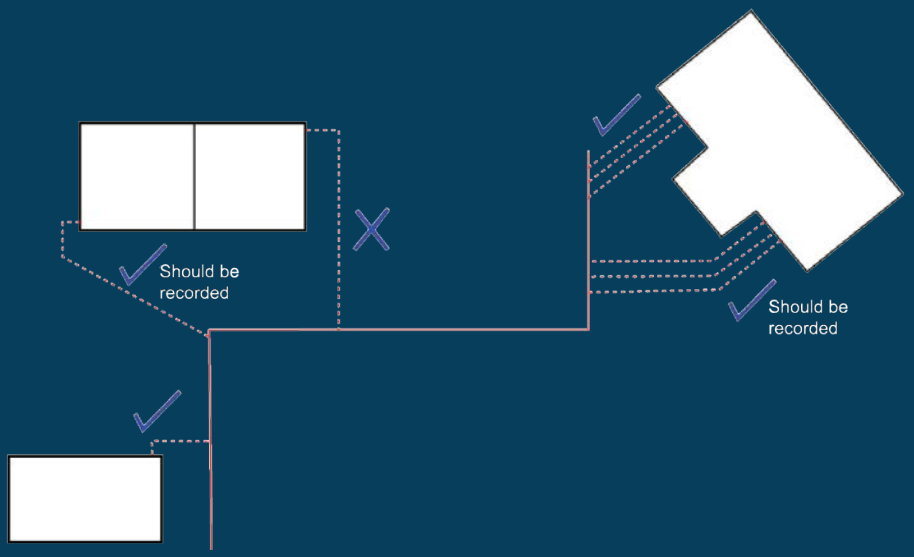
Following current industry practice is to ensure that the service pipe routes, as shown on the Approved EAP Design drawing, take a straight line along a route that is as short as possible, and at right angles to both the building and the gas main.

Any deviations must be agreed with EAP prior to laying the service pipe.

Service which do not follow the “predictable route” due to obstructions on site i.e. drain covers must be agreed with EAP before being laid. An as-laid drawing showing the agreed route must be submitted to EAP prior to the service being connected.

Gas service laying guidance.





Gas in multi-occupancy buildings

While the preference will always be for supplies to terminate externally in ground floor meter boxes, we recognise that in some instances and due to the nature of the development, there may be a requirement for an internal gas riser/ manifold.

A bespoke 3 stage risk assessment process is required for all multi-occupancy buildings, except for individual meter boxes. This includes;

- design Risk Assessment to be undertaken by the principle designer;
- pre-commissioning – to be undertaken by the UIP in conjunction with the developer an EAP;
- post commissioning – to be undertaken by EAP representative and findings reported to EAP.

Substations

Brick built substations are the preferred standard for standalone distribution substations.

Substations to be built to EAN specifications and drawings. Please refer to EAN-D010 Brick Substation and EAN-D-008 GRP Substation drawings. These drawings are available upon request from your nominated ICP.

A risk assessment will be completed prior to construction to determine the construction substation type and door requirements. EAN offers two substation designs, a GRP enclosure or a brick built with steel or GRP doors. EAN reserves the right to specify the type of substation and doors to be used.

Minimum clearance around the substation for maintenance access is 1m.

Substations generally sit 1.5m back from the back edge of the footway so that the doors do not impede the footway.

Other solutions offered by the developer may be considered but the final approval remains with EAN.

EAN will typically look to acquire an area of land 6m x 5m.

Unrestricted 24-hour 365-day vehicle and pedestrian access is required to the substation doors.

Pressure Regulating Installations (PRI)

Above ground PRIs (gas governors) shall be used where possible. The agreement of EAP shall be obtained based upon valid engineering justification prior to the design being approved. Below ground units shall not be installed without prior EAP authorisation. The PRI housing should comply with the current edition of IGEM/ TD/13.

It is EAPLs preference that all PRI housing should be walk in, purpose built housings, or standard GRP housings consisting of double doors complete with a 3-point locking system.

Where a GC type kiosk is proposed to be used, the agreement of EAP shall be obtained, supported by a suitable, detailed site specific risk assessment for this type of housing.

Location of the PRI needs to be agreed with EAP and clearly shown on plans, together with the specific details of the proposals for vehicular access and off road parking, accessibility for future maintenance, and proximity of dwellings and other structures.

Developers should carefully consider the likelihood of vehicular damage when choosing a PRI location and additional protective measures may be required e.g bollards, barriers, etc.

Unrestricted 24-hour 365-day vehicle and pedestrian access is required to all the PRI’s.

Legals

Substations
EAN will require as a preference freehold ownership of any substation or switch room. A 99-year lease will be acceptable as an alternative, in exceptional circumstances. Legal agreements must be in place prior to energisation.

PRI
A land transfer and access easement are required and the agreement should be in place prior to commissioning of the PRI.

Easements & servitudes
EAN/EAP typically ask for 1m either side of the pipe or cable on easements and servitudes. EAN/EAP do not require easements in any already adopted or adoptable highways. Nor do EAN/EAP require easements in shared driveways and verges which are to be maintained by management companies unless it's to run through the driveways to feed further plots on the rest of the site. DNO HV cable varies but is typically 1.5m either side for HV cable. Medium and intermediate pressure gas mains will require a wider easement/servitude strip, typically 3m and 5m either side of the pipe.

Responsibilities
Client to provide solicitor details and ensure they are engaged early and throughout the process.

Third party land rights
EAN/EAP would expect the client to make initial contact and get agreement for us to enter the land and obtain an easement. We would expect them to cover all costs for this. We can make the contact with the landowners but there would be additional charges for this service.

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