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Gas Networks Ireland

Guidelines for Designers and Builders –

Industrial and Commercial (Non-Domestic) Sites

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Contact Details

Emergency	**1800 20 50 50**
Dial Before You Dig	**1800 427 747**
Business Link	**1800 411 511**
General Networks Number	**1800 464 464**
Carbon Monoxide	**1800 898 989**

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1 Introduction

1.1 Introduction

This document has been prepared for the prospective gas customer, the construction industry professional and the mechanical contractor who wishes to connect to the natural gas network.This guide outlines the permitted locations, positions, safe depths and distances of the installation of your natural gas meter and meter box when connecting to the natural gas network. It is designed to give guidelines for designers and builders on Industrial and Commercial sites with natural gas distribution systems at pressures less than 5bar.

The preferred location for Gas Networks Ireland (GNI) to locate the gas meter is externally. This is to allow for ease of meter reading, maintenance and operation assurance. However, a meter can be located internally if it is not possible to locate it externally and if the gas is being supplied at low pressure, which is 100mbar or less.

Note: For bespoke architectural solutions or for projects requiring meters located internally please contact your local Gas Networks Ireland sales representative in the early stages of design and before it is submitted to planning.

This document is to be used for guidance purposes and references the Irish installation standards for natural gas I.S 813 (Domestic) and I.S 820 (Non-Domestic), SR 12007-5: "Gas Infrastructure – Pipelines for maximum operating pressure up to and including 16 bar" or the Local Government (Multi- Storey Buildings) Act 1988. For gas mains and services the Gas Networks Ireland Operating Procedures Manual (OPM) is the document that shall be adhered to. All values for length are in millimetres unless otherwise stated. For guidance on industrial installations with a maximum operating pressure greater than 0.5 bar (500mbar) or installation requiring a supply pressure exceeding 5 bar please consult I.S. / E.N. 15001 -2. All relevant standards are listed in the Appendix *page 73.*

1.2 Large Processing Loads and Large Electricity Generation Facilities

Very large natural gas consuming processing plants require a connection directly from high pressure transmission pipelines. Gas Networks Ireland transmission pipelines provide natural gas to numerous facilities in the Republic of Ireland, as well as an electricity generating station in Northern Ireland and on the Isle of Man.
The requirements relating to the installation or maintenance of industrial process equipment, be it either an appliance or a piping system, are not included in this booklet.

1.3 Benefits of Natural Gas

Six Reasons to Switch to Natural Gas Today

- It's the cheapest form of fossil fuel energy.
- It's always available – no need to pre order or pre pay.
- No storage tank required.
- Compatible with contemporary appliances.
- Provides cooking, faster heating and hot water.
- It's the most environmentally friendly of the fossil fuels.

Why choose gas for your business?

1. Natural gas is cheaper
The abundance of natural gas has been driving the price of gas downwards. Additionally, the more gas customers there are connected to the gas network, the more cost effective for all users, as the unit price will be cheaper.

2. Natural gas is always available
Always available and never has to be stored or ordered. It does not require storage and allows a security of supply that other fuel types cannot match.

3. Natural gas gives faster cooking, faster heating and hot water.
Natural gas can be used for almost all applications, including heating and hot water, air handling units, air conditioning/ chillers, catering/cooking, and tumble drying.

4. It's the most environmentally friendly of the fossil fuels.
Made up of more than 95% pure methane, natural gas emits less carbon dioxide than other fuels. It also produces negligible levels of nitric oxide, sulphur, and particulates compared to oil or coal.

5. Natural gas can generate electricity for your business (through CHP)
Combined heat and power (CHP) also known as "Co-Generation" is the simultaneous production of electricity and heat from a primary fuel such as natural gas. Electricity is generated on site by using natural gas to drive an alternator connected to the turbine. The heat from the exhaust gases generated by the turbine is harvested to provide steam or hot water for the plant processes. Due to potential inefficiencies in electricity generation and the resulting cost of electricity from energy suppliers, significant savings can be made by generating electricity on-site to meet electrical demand.

Gas Networks Ireland

2 Combined Heat and Power

2.1 What is Combined Heat and Power?

Combined Heat and Power (CHP) also known as "Co-generation", is the simultaneous production of electricity and heat usually in the form of hot water or steam from a primary fuel such as natural gas. Electricity is generated on site by using natural gas to drive an alternator connected to the engine/turbine. The heat from the exhaust gases generated by the engine/turbine is harvested to provide heating and hot water for the building, while some of the energy within the hot water can also be used to provide cooling and air conditioning by using absorption chillers.

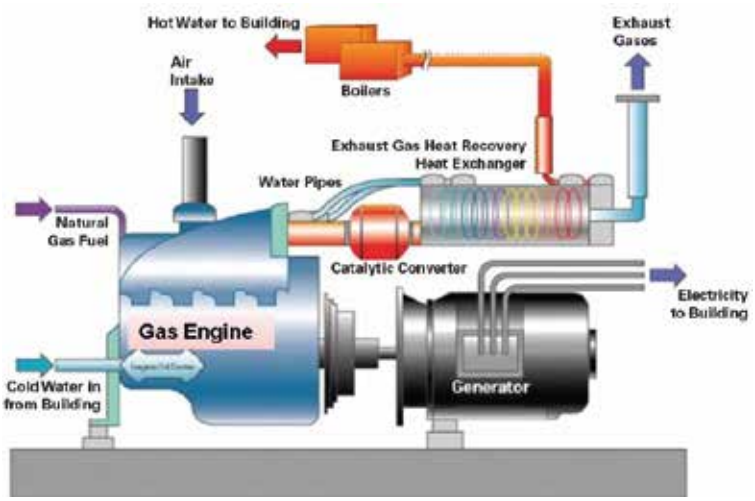

Figure 1: *Inside a Combined Heat and Power Unit*

2.2 Benefits of CHP

- Reduced energy running costs
- Avoidance of Climate Levy
- Claimable Capital Allowances
- Reduced CO^2 emission
- Conservation of valuable resources through increased efficiencies
- Reliable simultaneous generation of heat/ cooling and electricity on site (reducing dependency on grid).
- Leverage deregulation on carbon tax & electricity taxes (or climate levies)
- Increased ability to generate revenues on site through demand side management & efficiencies on procuring natural gas in larger quantities
- Typical paybacks of 3-4 years

2.3 What customers say about CHP

Kilkenny Ormonde Hotel

"Our strategy was to invest in a more appropriately sized unit, with the knowledge and experience of the savings that could be earned. We are extremely happy with this new investment which has provided a number of benefits including on-site electricity generation, greater uptime, further efficiency gains, financial savings and fewer maintainence costs."

Colin Aherne
General Manager
Kilkenny Ormonde Hotel

Bausch + Lomb Manufacturing Plant

"Bausch + Lomb are extremely satisfied with the performance of the CHP unit to date and have exceeded the initial project payback and uptime periods. This has resulted in greater than expected financial and environmental savings for the site."

Derek O'Connor
Facilities Engineering & Structural Manager
Bausch + Lomb Waterford

Boston Scientific Manufacturing Plant

- CHP unit equating to 33% of the total site electrical load, 9,125 MWh.
- 78% of the site heating load which equates to 8,100 MWh of thermal energy.
- CO2 emissions reduction of 2,760 tonnes per annum.
- Annual energy savings of more than €300,000 for Boston Scientific.

2.4 Why CHP?

Due to potential inefficiencies in electricity generation and the resulting cost of electricity from energy suppliers, significant savings can be made by generating electricity on your own site. The financial benefits of onsite electricity generation (using natural gas to power the electricity generator) are evident by comparing daytime electricity prices in Ireland of circa 11.42 cent/kWh with market natural gas prices of circa 3.67 cent/kWh (SEAI figures).

Figure 2: *CHP unit in Bausch + Lomb factory Waterford*

2.5 Plant Optimisation

CHP is a well-proven technology, recognised worldwide as a viable alternative to traditional centralised generation.

In the more conventional centralised electrical generation processes much of the energy is wasted as there is no localised uses for the heat produced, which is simply lost into the atmosphere.

With a CHP engine ,which is normally mains gas fuelled, this is linked to an alternator to produce electricity. Typically a good CHP scheme can deliver an efficiency of anything up to 25% compared to the separate energy system it replaces.

2.6 Trigeneration

Trigeneration takes cogeneration one step further. Trigeneration is the simultaneous production of electricity and heat with the additional transfer of thermal energy to provide cooling for practical use.

Heat generated from the CHP system is converted using an absorption chiller to provide cold water to cool the building. By adding the absorption chiller into a CHP system the user can increase the equipment's operational hours, maximising the utilization of the energy, which is of particular benefit in summer periods, thus reducing dependence on the more costly electrical air conditioning.

Chilled water is achieved by incorporating an absorption chiller into the process taking the heat generated from the CHP system to create chilled water to cool a building. Adding an absorption chiller into a CHP system means that the user can increase the operational hours of the equipment, maximising the utilisation of the energy, particularly in summer periods, and reducing the reliance on expensive electrical air conditioning.

2.7 Technical Details

A standard Trigeneration Combined Heat and Power installation includes:

- Prime mover
- Electrical generator / alternator
- Heat recovery system
- Absorption chillers
- Electrical safety and monitoring controls

Prime Mover: A prime mover is a gas reciprocating engine, derived from commercially proven diesel engines. Modifications are made to provide the spark ignition for the fuel and to reduce the cylinder compression ratio resulting in a strong reliable and resistant engine. In a CHP system the prime mover / engine is used to drive an electrical generator or alternator to generate electricity.

Electrical Generator/Alternator: This is an electromechanical device used to convert mechanical energy to electrical energy in the form of alternating current (AC). The generator is driven by the prime mover engine and generates the required electricity which can be used directly on site, displacing some or all of the electricity purchased from the local supply network.

Heat Recovery System: A heat recovery system is designed into the CHP Unit and takes "waste heat" from the prime mover engine, harvesting that heat for use locally in the form of hot water, steam etc. The heat from the engine comes from the exhaust fumes generated by the engine during the internal combustion process. A suitable inbuilt heat recovery system ensures that much of the energy contained in this exhaust heat is not lost. The heat is recovered by fitting an additional external heat recovery system to the CHP unit, to provide hot water from the waste exhaust.

Absorption Chillers: Absorption chillers are designed to be supplied with steam or hot water. Through a series of chemical reactions, the energy in hot water is converted to produce chilled water which is used for space cooling / air conditioning. The addition of absorption chillers into a CHP system results in the generation of cooling indirectly from natural gas and reduces the need for costly electric air conditioning.

Electrical Safety and Monitoring Controls: These systems are responsible for monitoring and controlling the energy flow to the site and the operation of the prime mover engine. It also continuously monitors in excess of 70 parameters ensuring safe operations of the equipment. The system allows immediate diagnosis of faults and ensures that the aftercare teams are alerted to any problems with the CHP unit itself, if they occur.

2.8 Combined Heat & Power Application

Small scale is particularly suitable for applications where there is a constant demand for heat throughout the year. Common applications include hotels and leisure centres. Larger scale applications include universities and industrial facilities such as chemical pharmaceutical plants.

CHP should always be considered when:

- Designing a new building
- Replacing or refurbishing existing plant
- Reviewing electricity supply
- Reviewing standby electricity generation or plant
- Considering energy efficiency in general
- Exploring options towards building regulation compliance
- Reducing CO^2 emissions and environmental impact
- Installing new boiler plant

Typical CHP users include:

- Hotels
- Hospitals
- Industrial manufacturers
- Universities
- Leisure centres
- Horticulture
- Airports
- Prisons
- Military bases
- Waste water treatment works

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3 Organising Natural Gas Connection

3.1 Checklist of Essential Information required by Design Department

The list below is to outline what is required, for a new connection the following information must be provided to the rep in order to process the project.

These items are to be checked by the Sales Rep – If No or NA please give a reason in remarks.		**Yes/ No/ NA**
Meter Locations	Must be clearly marked on site layout maps or stated clearly in project remarks	
Site Layout Plans	All New Build / Greenfield Sites require a Detailed Site Layout Plan that is compatible with Autocad **(including External References if required).**	
Elevation Drawings	These are required for all 4bar projects where the meter is to be located on, or within 3m of the building. **(PDF format will suffice)**	
Basement Plans	These are required for all builds where meters are to be located in a basement (including New Housing / Apartments site (Autocad format required).	
Ventilation	Basement works and internal meter locations require Client confirmation of adequate natural ventilation.	
Mains/Service Pipe Routing	If known.	
Outlet Supply Pressure	Has this been provided in the meter details section above?	
Builder/ Developer Specific Requirements	Please provide necessary details in the remarks / log. E.g. **Will the trench be provided on site? / What date is the gas required for, if known?**	
Wayleave Requirements	**When is a wayleave required?** • Pipelines or Services that traverse private lands to connect new customers. • Private housing estates that are not taken in charge by the Local Authority. • The requirement exists to supply gas to more than one customer. *Note: If a wayleave is required, the project designer(s) and builder must assist in supplying all relevant information (i.e. land ownership) to Gas Networks Ireland.*	

Figure 3: *Checklist of information required by Gas Networks Ireland Sales Representative*

Comments / Remarks/ Specific Requirements – Specify as much detail as possible to aid in the design process.

3.2 Connecting your Business

Gas Networks Ireland Connection Process explained

If you are interested in connecting to Ireland's gas network, please follow the steps below to see if you are eligible and what is required.

Step 1 Apply online at https://www.gasnetworks.ie/business/get-connected/commercial-enquiry/

You can check online if natural gas is available in your area. Simply enter your EirCode or your full address and you will easily find out if you can get a natural gas connection. While natural gas may be available in your county, it may or may not be available to your particular location.

What to do:

- Enter your Eircode or Address in the online mapping system
- If natural gas is available, complete and submit the online application
- Accept the terms & conditions
- Provide contact details

Step 2 Quotation process

A Gas Networks Ireland representative will contact you within 24 hours, take more details and arrange for a visit from a Gas Networks Ireland sales representative.
This visit will involve a site survey and a discussion on the potential meter location(s) and service route. It is advisable for you to have a mechanical installer or plumber available for this meeting to ensure all of the technical specifications are available for the application.
For the site visit of the Gas Networks Ireland sales representative, please gather information, including maximum hourly demand, estimated annual consumption, peak daily demand and gas pressure requirements.

What to do:

- Gather information, as listed above, in advance of the Gas Networks Ireland sales representative visit
- Please ensure that any third party involvement is highlighted to the Gas Networks Ireland sales representative, for example a landlord, or a management company, or another landowner whose land we would need to access to provide the gas connection
- Meet with Gas Networks Ireland sales representative and agree all technical requirements including meter location, service route, and gas demand information
- Provide all relevant information to Gas Networks Ireland sales representative to ensure your quotation is as accurate as possible

Step 3 Contact your installer and a gas supplier

While your quotation is being prepared by Gas Networks Ireland, you will need to contact your mechanical installer or plumber and begin the registration process with a natural gas supplier. A list of Gas Suppliers is available on the Commission for Regulation of Utilities (CRU) Website https://www.cru.ie/home/customer-care/energy/communication/Before a meter is fitted, you are required to open an account with a gas supplier and provide technical declaration of conformity of your equipment.

What to do:

- Contact your mechanical installer or plumber
- Contact a natural gas supplier (a list of natural gas suppliers will be provided by the Gas Networks Ireland sales representative but you can also visit the CRU website for gas supplier details)
- Begin the process to open an account with one of the gas suppliers

Step 4 Receipt of Quotation

After you have received your natural gas connection quotation from Gas Networks Ireland, you can make the payment, sign the contract and send this contract to Gas Networks Ireland. This will kick off the process to getting you connected.

What to do:
- Once the quotation has been received:
- Make payment (payment options contained in the quotation pack)
- Sign and return a copy of the signed contract
- Provide any Third Party Consents

Step 5 Gas Networks Ireland schedules work to be carried out & service pipe to be laid

Once payment and contract has been received, Gas Networks Ireland will contact you to thank you for your payment and to schedule the works to be carried out. This process will begin with the service pipe to be laid from the natural gas network to bring a service pipe into your property to the agreed meter location.

Note: Timeline for completion of the natural gas connection will be dependent on the relevant local authority's timelines for provision of a Road Opening Licence and these timelines vary across the local authority districts.

What to do:
- Ensure that you have contracted a natural gas supplier
- Open an account with this gas supplier
- Arrange for the gas supplier to request a meter fit from Gas Networks Ireland.

Step 6 Declaration of Conformance

In advance of organising to fit your natural gas meter, Gas Networks Ireland requires a Declaration of Conformance to be completed and signed by a competent mechanical installer or plumber and submitted to Gas Networks Ireland. This is evidence that the downstream pipework and equipment has been appropriately installed and tested in accordance with the required standards.

What to do:
- Your competent mechanical installer or plumber needs to test the gas equipment and pipework within your business and complete the Declaration of Conformance
- Submit the Declaration of Conformance by e-mail or fax to Gas Networks Ireland

Step 7 Fit meter & turn on gas

The following are required in order for the meter to be fitted and turned on for commercial connections.

What to do:
- Your mechanical installer or plumber needs to be onsite to meet the Gas Networks Ireland meter fitter
- He/she must have a copy of the Declaration of Conformance certificate available to be checked
- The Installer must have adequate equipment to carry out an integrity test to be witnessed by the Gas Networks Ireland meter fitter
- Installation must be completed to I.S. 820 standards found on the NSAI website

Once all of the above are all in order, the Gas Networks Ireland meter fitter will fit the meter and arrange an appointment for the meter to be turned on if this is not done on the same day as the meter fit.

Once the meter has been turned on, you can then start to enjoy the benefits of your new natural gas connection.

Readers Notes

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4 Site Work Guidelines

4.1 Gas Mains

All gas mains shall be installed by Gas Networks Ireland or a Gas Networks Ireland appointed contractor. On new–build projects, the builder normally provides a pre-excavated trench.

All trenches constructed for the purpose of accommodating a gas main shall allow for a minimum cover of 750mm. Gas mains shall not be laid with cover greater than 1200mm, unless specified by Gas Networks Ireland.

The total trench width shall amount to outside diameter of gas pipe, plus 300mm. Sand or pea gravel, 150mm minimum shall surround the gas main. The trench shall be reinstated as soon as practicable after the main is laid so to reduce the possibility of damage on site.

The typical layout of a gas main in a footpath is shown in *Figure 4 page 23.*

4.2 Gas Service

All gas services shall be installed by Gas Networks Ireland or a Gas Networks Ireland appointed contractor in a pre-excavated trench, normally provided by the builder. Any extra site works required by Gas Networks Ireland will incur additional charges.

The gas service shall be laid in a straight line to the meter location, as near perpendicular to the gas main as practicable.

Mains, services and meters transporting gas at pressures greater than 100mbar may not be positioned within the building line of premises.

For more detailed information, always refer to the Gas Networks Ireland drawings specific to the project.

All new industrial and commercial services shall incorporate an underground service isolation valve which shall remain accessible to Gas Networks Ireland and the Emergency Services.

Service Requirements

The trench for the gas service to each meter location shall be excavated to a sufficient depth to allow a minimum cover of 600mm. In the case where the service supplies a single meter module with a single meter contained within, 600mm minimum cover is required up to 1.5 metres from the meter box. Within the remaining 1.5 metre distance, cover may reduce to a minimum of 375mm to the base of the GRP sleeve (*note Figure 10 on page 28*).

1. All gas trenches shall be excavated to the width of the outside diameter of pipe, plus 300mm.

2. Sand or pea gravel, 50mm minimum shall surround the gas service.

3. Where the necessity to cross or run in close proximity to any other utility occurs, a minimum clearance of 300mm is required.

4. Marker tape (provided by the Gas Networks Ireland contractor) should be placed over all gas mains and services.

Note: To accommodate the preformed bend the minimum depth of cover required to the top of the foundation is 450mm.

4.3 General Rules

The proposed route of the service pipe must be clear when the crew arrives to carry out the work, otherwise it cannot be installed.

If the meter box is to be attached to the property wall then it must be located above the damp proof course at a minimum of 300mm above finished ground level. *Please see Figure 4 (Opposite).*

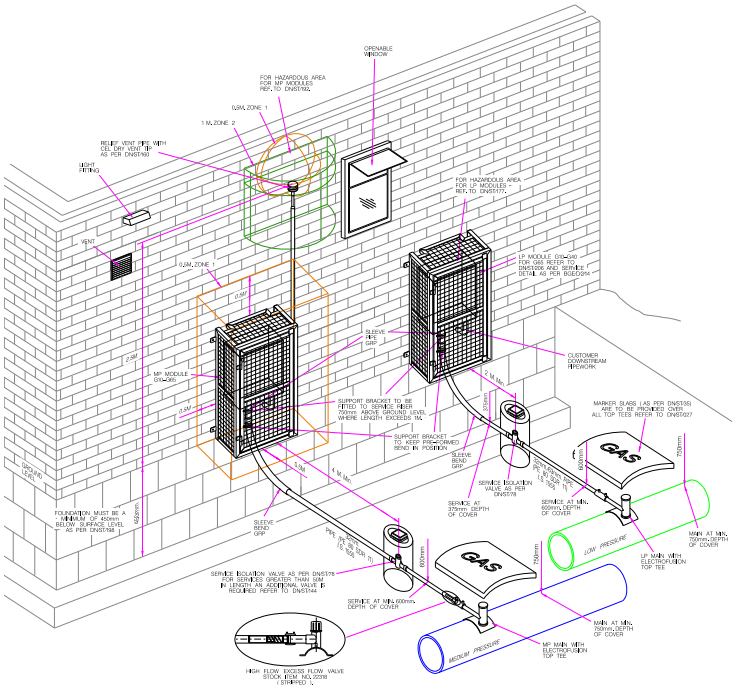


Figure 4: *The gas mains, services and meter box*

Marker tape should be placed over all gas mains and services intended for gas distribution.

4.4 Self-Trenching Information

This section illustrates how trenches should be prepared correctly before Gas Networks Ireland arrives on site. There are different excavation requirements depending on the type of pipe that is installed i.e. gas main or gas service pipe.

Gas Mains

Trenches excavated for a gas main must allow for:

Sand Bed & Surround

A 150 mm bed of sand shall be provided and installed by the customer and shall be in place before the Gas Networks Ireland contractor crew is required on site.

Depth (on day of installation)

- A minimum cover of 750mm to the crown/top of the pipe in roadways.
- 600mm minimum cover is required beneath footpaths or landscape areas, but 750mm if trafficked.
- Gas mains must not be laid deeper than 1.2 metres unless specified and agreed in advance with Gas Networks Ireland.

Width

- The total trench width must be 300mm in addition to the outside diameter of the gas pipe.
- A minimum of 150mm of sand must surround the gas main.

Gas Service Pipe

The gas service pipe will be laid in a straight line to the meter location, as perpendicular to the gas main as possible. Therefore the trench for the gas service must be excavated in a straight line. All trenches for gas service pipes must be excavated to allow for:

Sand Bed & Surround

A 50 mm bed of sand shall be provided and installed by the customer and shall be in place before the Gas Networks Ireland contractor crew is required on site.

Depth

- A minimum cover of 600mm for each service up to 1.5 metres from the meter box.
- Depth can reduce to a minimum of 375mm at the base of the GRP sleeve within the 1.5 metre distance at the meter location only.

Width

- The service pipe trench width should be a minimum of 300mm in addition to the outside pipe.
- A minimum of 50mm of sand should surround the gas service.

N.B.Contractors/Builders must provide their own sand surround and reinstatement material. The main or gas service pipe must be covered in surround before the Gas Networks Ireland contractor leaves the site. The trench must be reinstated as soon as possible after the pipe is laid to reduce the possibility of damage to the gas pipes

Marker Tape on Services

Marker tape must be laid directly above and along the line of the service, at 150mm below the proposed finished surface level.

Two layers of marker tape are to be installed on gas pipe 63mm in diameter and greater. In roads the first and second layers of marker tape shall be at a minimum of 250mm above the crown of the pipe and 250mm below the finished ground level. In footpaths the first and second layers of marker tape shall be at 200mm above the crown of the pipe and 200mm below the finished ground level.

Site Work Requirements

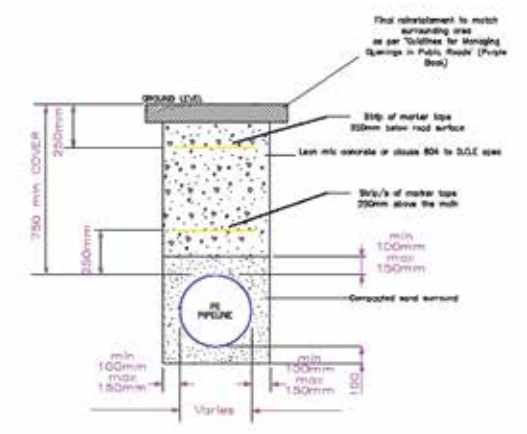


Figure 5: *Marker tape on services (<63mm diameter)*

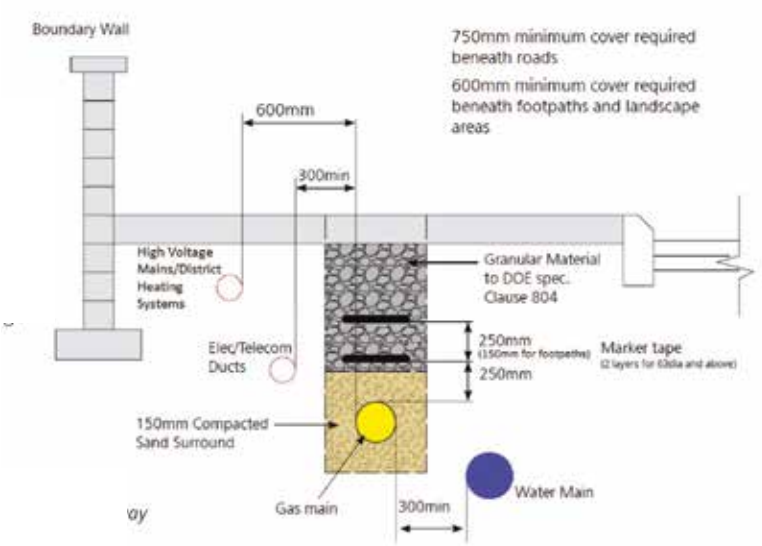


Figure 6: *Recommended gas main layout in a footpath/roadway*

4.5 On-Site Requirements

- The gas main shall never be placed in an inspection chamber with other utilities, services, drainage/sewage systems.
- A distance of 300mm shall be provided when a gas main is placed adjacent to an inspection chamber *(see Figure 7 below).*
- A minimum clearance of 300mm is required where necessary to cross or run in close proximity to any other utility service.
- No other services/utilities shall be placed over the gas main/service.
- Gas Networks Ireland will not insert the service in a sleeve or duct.

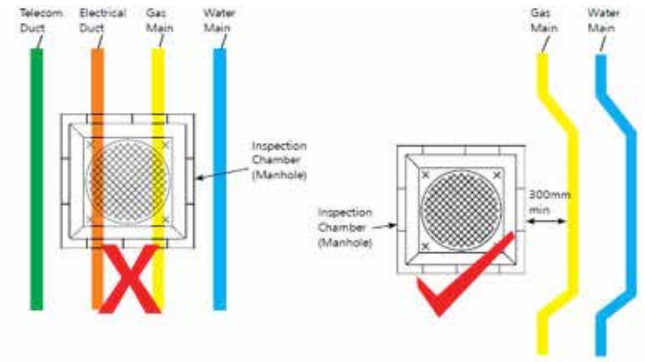


Figure 7: *Safety precautions with regards to inspection chambers*

Note:

- Polyethylene mains and services may not be positioned within the Building Line (as defined by I.S. 329 / SR 12007-5).
- For more detailed information always refer to the Gas Networks Ireland Distribution drawings specific to the project.

4.6 Excavations Parallel to Walls

When excavating trenches parallel to a wall please ensure the distance from the trench to the wall, is greater than the height of the wall. Please see the diagrams and further information relating to safely excavating parallel to walls in Section 8 Appendix A. If there are any queries relating to excavating parallel to walls please contact your local construction engineer.

4.7 Gas Safety on Building Sites

After the initial project planning stage and when a site is in progress the following safety guidelines shall be adhered to:

Do

- Ensure all excavations are carried out in accordance with the H.S.A Code of Practise: Avoiding Danger from Underground Services. i.e. use of maps/records, identification of pipe locations & safe digging practises.
- Maintain accurate on-going records of all gas mains and services laid on your site.
- Ensure all site personnel adhere to any exclusion zones while mains/services are under test on site.
- Make all operatives, including sub-contractors, aware of the presence and location of gas mains and services.
- Provide a safe and suitable location for the storage of gas pipes and materials.
- Ensure that any necessary trial holes are dug carefully by hand.
- Ensure any personnel excavating in an area containing already existing gas mains have obtained Gas Networks Ireland maps.
- If any Transmission pipelines are within or in close proximity to your site Gas Networks Ireland must be contacted on the Dial Berfore You Dig line 1800 427747 before work commences on site.
- Report any damage, no matter how slight, to the Gas Networks Ireland 24 hr Emergency Line 1800 20 50 50.

Do Not

- Interfere with stored gas pipe or materials.
- Attempt to cut or un-band coils of Polyethylene (PE) gas pipe, this can only be done by Gas Networks Ireland personnel or our nominated contractor. These coils contain a lot of stored energy and can cause serious injuries if interfered with.
- Use PE gas pipe for any other purpose, e.g. ducts, sleeves, drains.
- Use mechanical excavators within 1m of a gas main.
- Use hand held power tools, i.e. jack hammers within 0.5m of a gas main.
- Carry out piling work within 15m of a gas main without prior consultation with Gas Networks Ireland.
- Welding or hot works should not be carried out in the vicinity of an exposed gas main without prior consultation with Gas Networks Ireland.
- Attempt to repair any damage to a gas main or service.

Figure 8: *Coil dispenser*

4.8 Building Line

Explanation and Illustration

The building line is considered the outermost extent of the building structure (archway, balcony or basement) projected vertically on to ground level.

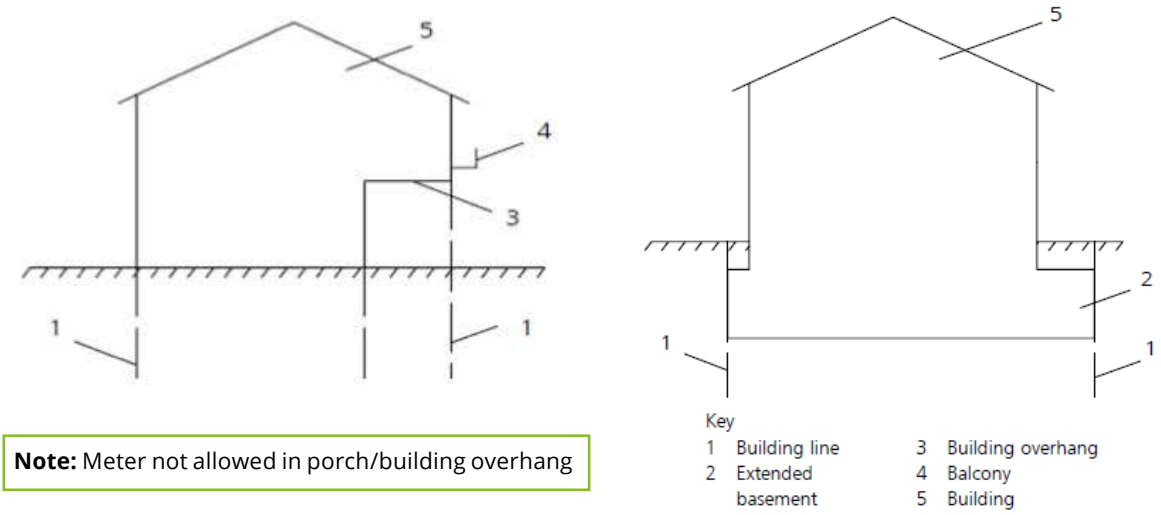
Gas mains, services and meters transporting gas at 4 bar are not permitted inside the building line of premises.

Under certain circumstances however gas meters can be positioned inside the building line:

- The gas pipework must have a pressure of 100mbar or less.
- There must be no available option of locating the meter externally.
- Polyethylene pipework may not be located within a building or in a space that may be potentially enclosed at a later stage e.g. an open porch.
- Meter location is to conform with SR 12007, I.S.821, I.S. 822 and be agreed with Gas Networks Ireland.

In figure 9 below the exclusion zone is illustrated by a dotted line:

- This exclusion zone on the left ends in line with the porch, that is no meter may be placed inside this porch or under the building overhang which is inside the dotted line.
- The exclusion zone shown on the right is further out as this extended basement is said to be attached to the building.
- For any queries relating to the building line please call your local construction engineer.



Note: Meter not allowed in porch/building overhang

Figure 9: *Building line drawing*

- Meter box is not permitted within the porch/building overhang.
- The gas meter box shall be greater than 300mm away from a flue.
- Meter box shall not be placed more than 2 metres along the gable end of the property.
- Meter box shall be greater than 150mm from ESB meter.
- Meters shall not be located in a position open to a stairway or protected shafts,lobbies or corridors, unless contained within a suitable compartment.
- Ventilation Policy document for basements and meter rooms shall be adhered to, please *see Appendix D, pages 65-66.*

Minimum Separation between Gas and other Meters

- A minimum separation of 150mm to electrical equipment or vents is required for natural gas at low pressure 100mbar or less.
- A minimum separation of 150mm to electrical equipment or vents is required for natural gas at medium pressure between 100mbar and 4bar.

4.9 Foundation Requirements for Preformed Bend below ground

There are specific requirements for a preformed bend that is placed below ground. The below figure illustrates these requirements.

The minimum depth of cover is 600mm along the entire length of the service to within 1.5m of the building line, rising (within 1.5m of the building line or, if moling, in the exit pit) to 375mm at the preformed bend. Figure 10 below shows this 375mm minimum depth of cover to the preformed bend.

Meter box shall not be placed more than two metres from the gable end of the property as shown in see *Figure 4 page 23.*

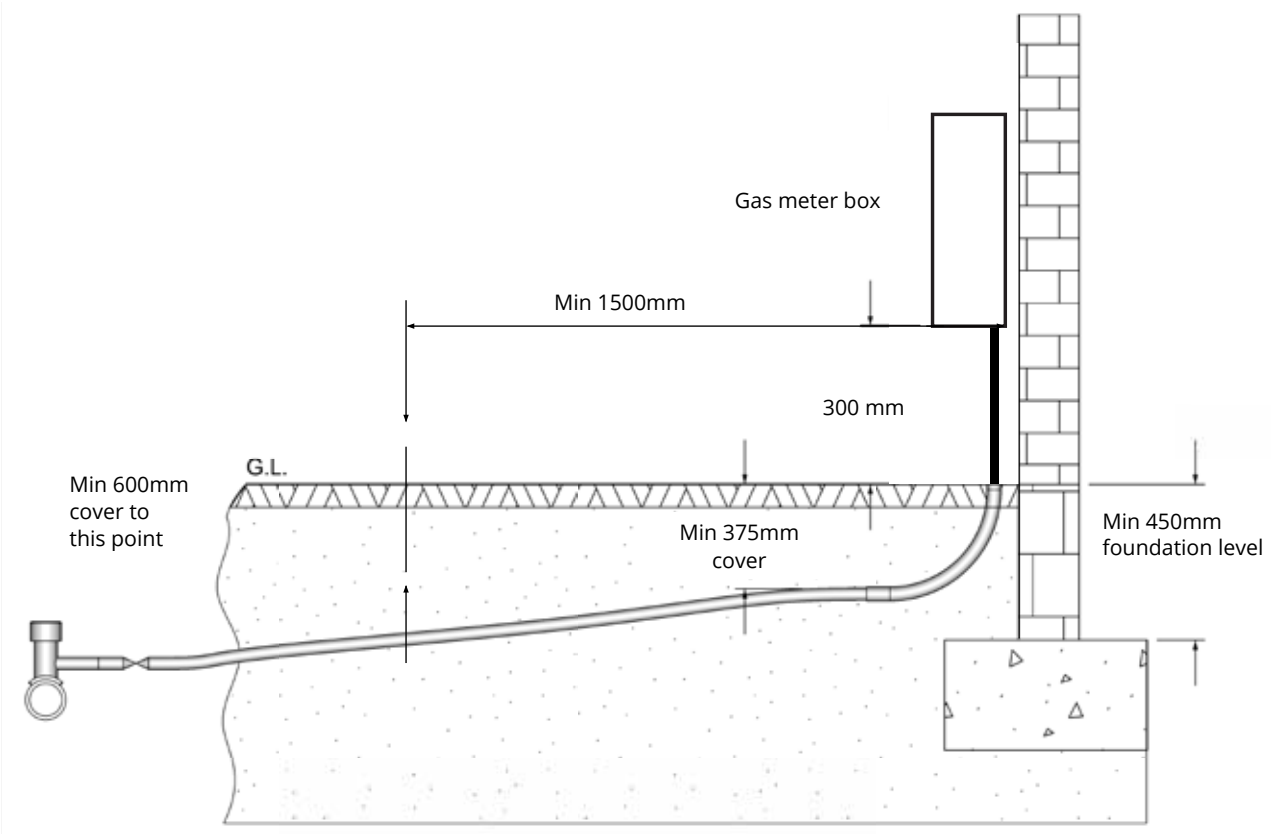


Figure 10: A minimum cover of 375mm and minimum foundation of 450mm are necessary

Readers Notes


5,8 m
5,5 m

Gas Networks Ireland

5 ATEX compliance - Explosive Atmosphere (ATEX)

For Gas Networks Ireland, a hazardous area includes:

- Areas around skids and modules where there are mechanical connections, regulator breathers or valves.
- Areas around relief valves (or vent tips where reliefs are piped out). These can release gas periodically as part of their designed function.

This does not include welded or buried pipework.

The term "ATEX" applies to atmospheres that are potentially explosive due to the possible presence of dusts, vapours or gases that are likely to ignite or explode, it is derived from the French ATmospheres EXplosibles. *See figure 11 for an example of ATEX signage.*

5.1 What is ATEX compliance?

ATEX compliance regulations apply at workplaces where flammable substances are stored or used. There are two main Directives associated with ATEX compliance;

Figure 11: *Minimum separation between gas and other meters*

1. **94/9/EC: Safety of Equipment,**
2. **1999/92/EC: Safety of the Installation**

The ATEX Directive **No. 94/9/EC** is concerned with products that may be supplied for use in potentially explosive atmospheres.

ATEX Directive **1999/92/EC** deals with the precautions to be taken in workplaces where explosive atmospheres might be present due to flammable dusts, vapours or gases (or mixtures of these).

5.2 Aim and Objectives

The aim of the ATEX directives is to avoid the three components, **1)** oxygen, **2)** fuel and **3)** ignition source, required for combustion to take place.

Taken together these factors are the starting point for hazardous area classification, and should allow for the identification of any zoned areas.

5.3 Definitions

Explosive Atmosphere – An explosive atmosphere is an accumulation of gas, mist, dust or vapour, mixed with air, which has the potential to catch fire or explode. An explosive atmosphere does not always result in an explosion, but if caught fire, the flames would quickly travel through it.

Hazardous Area – An area in which an explosive atmosphere could conceivably occur. Hazardous areas are classified into zones.

5.4 Zone Classification and Category Levels

ATEX zone classification and size depends on the likelihood of an explosive atmosphere occurring. There are three principal levels of zone classification, Zone 0, Zone 1 and Zone 2.

The following are the zone classifications associated with gases or vapours:

5.5 Zones & Categories

		Zone Classification
Zone 0	Explosive atmosphere is present continuously, or for long periods, or frequently. This zone typically occurs in enclosures with no ventilation or with inadequate ventilation and internal reliefs.	**Zone 0** Gas present continuously
Zone 1	Explosive atmosphere is likely to occur in normal operation occasionally. It typically occurs around vent tips and around enclosures with internal reliefs.	**Zone 1** Gas may be present in normal operation
Zone 2	Explosive atmosphere not likely to occur in normal operation but if it does occur will exist for a short period only. Both of these variations of Zone 2 occur outdoors or in well ventilated enclosures.	**Zone 2** Gas unlikely to be present in normal op
Zone 2 NE	Explosive atmosphere not likely to occur in normal operation but if it does occur will exist for a short period only and will be of **Negligible Extent.**	**Zone 2 NE** Gas unlikely to be present in normal op

Any sources of ignition (electrical equipment, smoking areas, etc) or openings to a building (vents, openable windows, doors) must be located outside the hazardous area for the installation. Electrical equipment may be located within the hazardous area if it is suitably rated (i.e. equipment "Ex" cert / suitable category) for the hazardous zone or suitable mitigating measures are taken (e.g. protective sleeves over cables). Please refer to the Appendix Section 8 for more information on ATEX.

Mechanical air intakes should be located an additional metre outside the hazardous area.

5.6 Common Sources of Ignition

There are two common sources of ignition; electrical appliances and non electrical with basic precautions below.

Electrical Appliances:

- Switches/Sockets
- Lights and light fittings
- Damage cables

Non-electrical

- Smoking
- Sparks from mechanical equipment
- Hot surfaces

Basic Precautions

- Reducing zone by ventilation and piping out vents.
- Physical separation between x=zone and ignition source.
- ATEX rated electrical equipment.

Please refer to the Ventilation Policy document in *Appendix D pages 65-66.*

For any queries relating to ATEX requirements please contact your local Gas Networks Ireland sales representative.


5,8 m
5,5 m

Gas Networks Ireland

6 Meter Types & Specifications

6.1 Meter locations and pressure reduction installations

Gas Networks Ireland provide and lay all gas mains and services pipework up to and including the point of delivery (normally including the meter).

Full access should be provided to the installations for Gas Networks Ireland authorised personnel at all times to facilitate construction of the meter installation and subsequent maintenance.

Service pipework provided by Gas Networks Ireland for meters or pressure reduction equipment should be positioned prior to pouring of floor slab.

Above ground gas services should only pass through naturally ventilated areas that are publicly accessible (i.e. providing access for Gas Networks Ireland maintenance at all times).

Planning permission should be obtained by the customer where necessary, i.e. for external structures designed to conceal or protect district regulator installations (DRI's) and gas meters.

6.2 General Meter Location Requirements

The meters must:

- Have clearly identified meter isolation valves and be positioned to facilitate easy access in emergency situations.
- Be positioned within the confines of the customer's/developers property and as close as practicable to the premise being supplied.
- Have the shortest possible length of service from the main adjacent to the site boundary.
- Be positioned to facilitate easy access to, reading or removal of a meter.
- Have a design and/or location that must protect the meter and its connections against the possibility of corrosion and when required the installation of crash barriers/fencing as an extra safety precaution if there is traffic operating in the vicinity.
- Be located in a well-drained area that is not liable to flooding and free from overhead high tension cables, trees, fuel storage or hazardous areas.
- Be a minimum of 300mm from electrical mains and gas equipment should not be positioned beneath overhead electrical cables or tree.
- Be earth bonded by the customer's nominated electrical contractor in accordance with the most recent revision of the ETCI (Electro Technical Council of Ireland) regulations.

Meters shall not be located:

- Adjacent to medium voltage (MV) or high voltage (HV) electricity substations (minimum direct communicating distance of 10 metres required)
- In an area adjacent to ventilation ducting or an air conditioning intake system
- Within the building line of an occupied dwelling with a 4bar inlet installation in an area adjacent to liquefied petroleum gas (L.P.G.), or a flammable material storage area where paper, timber or chemicals are stored.

  In a position open to a stairway or protected shafts, lobbies or corridors, unless contained within a suitable compartment

  - Directly beneath a ventilation grill or in a position liable to cause ingress of water, unless weather protected
  - In a space which may hinder escape in the event of an emergency in any part of a multi-occupancy building
  - Where the meter may be exposed to accidental damage. (If required, impact protection should be placed around the meter)
  - Where the meter may be exposed to extreme temperature or ignition sources (e.g. switch gear)
  - Underground or
  - In a space beneath a stairs unless placed within a minimum two hour fire resistant and sealed compartment ventilated directly to atmosphere.

When using separate buildings or enclosures for the meter/regulator units:

- The building enclosure must
  - give adequate protection against weather and vandalism.
  - be constructed so that the enclosure blends environmentally with the surroundings as far as practicable.
- Have high and low level vents installed, alternatively when this is not possible, louvered doors and vents can be installed.
- All walls should be cavity free construction and should not include windows.
- Floor/Bases are required to be of sufficient depth of concrete foundation to take the weight of the Industrial/ Commercial Meter installation and surrounding housing/fencing etc.
- All electrical lighting and switching fittings in the enclosure are to be of approved sealed flameproof construction (intrinsically safe).

The following are the preferred locations of the meters in order of preference:

1. Outside – The preferred location of the meters is external to the building and in an enclosure.
2. Recessed into the Outer Leaf of the Building Structure –Meter must be completely sealed in a compartment with the exception of access and ventilation (that is subject to ventilation requirements). The service pipe entry is steel or a specialised PE to steel sleeved fitting. The specialised PE to steel fitting "cellar entry fitting" is the preference as it will eliminate the need for corrosion protection.
3. Internally in a Naturally Ventilated Area – The meters may be installed inside, if they cannot be located outside the building, subject to the following conditions:
   - Gas service is less than 100mbar
   - Ventilation must meet the requirement as specified in the building Regulations definition of a Naturally Ventilated Basement (Technical Guidance Documents, Section B 3.5.2.4).
   - Located as close as possible to the point of entry.

Ventilation Policy document for basements and meter rooms shall be adhered to, please *see Appendix D pages 65-66.*

Note: For basements to be defined as naturally ventilated each storey should be naturally ventilated by permanent openings at each level. The aggregate area must not be less than 2.5% of the floor area at that level, of which at least half should be in two opposing walls. This ventilation requirement will increase where room heights are over 4m.

The ventilation should be equally split between high and low level ventilation (or at least a 1/3 – 2/3 split).

Any area that does not meet these requirement shall not be considered as a naturally ventilated area by Gas Networks Ireland and should fall under the category "non-naturally" ventilated area.

Industrial Commercial customer gas meters can be classified into the following three categories:

Peak gas loads (gl) categories:

CATEGORY 1: Generally On-Site Fabrications

Peak gas load less than 165 kWh
(GL < 563,003 BTU's)

G4 –METERS:

(Refer to Page 39-40 further details)

Step 1: Meters fitted on-site by Gas Networks Ireland meter fitter, after receipt of Declaration of Conformance, refer to Certification of Conformance section.

CATEGORY 2: Generally Meter Modules

Peak gas load greater than 165 kWh and less than 1,035 kWh
(563,003 BTU's < GL ≤ 3,531,566 BTU's)

G10, G25, G40, G65 - METER MODULES:

(Refer to Page 44-45 for further details)

Step 1: Meter Modules manufactured off-site

Step 2: Module fitted and meter commissioned on site after receipt of Declaration of Conformance, refer to Certificate of Conformance section.

CATEGORY 3: Generally Skid Units

Peak gas load greater than 1,035 kWh
(GL > 3,531,566 BTU's)

G100, G160, G250, G400, G650, SP1, SP2 ,SP3 - SKID UNITS:

Step 1: Pressure Reduction Skid manufactured off-site (refer to pages 42-43

Step 2: Concrete Base placed in Gas Networks Ireland agreed position by client or builder (refer to Page 44-45)

Step 3: Pressure Reduction Skid placed on concrete base

Step 4: Protection is placed around the skid installation

Step 5: Meter fitted and commissioned on-site after receipt of Declaration of Conformance, refer to Certificate of Conformance section.

The meter will not be fitted unless any required meter protection has been installed.

6.3 Compartment Dimensions

Meter Type	Maximum Flow Rate m^3/h (kWh)	On-Site Fab, Module or Skid Delivery	Compartment Type/Size	Base Required?	Fitting needed for outlet pipe
G4 meter	6m^3/h (63kwh)	On-Site Fabrication On-Site Fabrication Module+ Fitter Fabrication	Meter Box Manifold Six Meter Cabinet	No No No	3/4 inch Copper
G10	16 m^3/h (166kWh)	Module (LP) Fitter Fabrication (LP) Module (MP) Fitter Fabrication (MP)	1200h x 900w x 350d 800h x 800w x 350d 1200h x 900w x 350d 800h x 800w x 400d	No No No No	1.5 " BSTP 1.5 " BSTP 1.5 " BSTP 1.5 " BSTP
G16	20 m^3/h (210 kW)	Module (LP) Module (MP)	1200h x 900w x 350d 1200h x 700w x 350d	No No	1.5 " BSTP 1.5 " BSTP
G25	32 m^3/h (340 kWh)	Module (LP) Module (MP)	1200h x 900w x 350d 1200h x 900w x 350d	No No	1.5 " BSTP 1.5 " BSTP
G40	52 m^3/h (550 kWh)	Module (LP) Skid Unit (LP) Module (MP) Skid Unit (MP)	1600h x 900w x 450d 2200h x 1500w x 1000d 1500h x 900w x 500d 2200h x 1500w x 1000d	No Yes No Yes	2 " BSTP 50mm PN16 flange 2 " BSTP 50mm PN16 flange
G65	80 m^3/h (840 kWh)	Module (LP) Skid Unit (LP) Module (MP) Skid Unit (MP)	1300h x 1100w x 500d 2200h x1500w x 1000d 1500h x 900w x 500d 2200h x1500w x 1000d	No Yes No Yes	2 " BSTP 50mm PN16 flange 2 " BSTP 50mm PN16 flange
G100	128 m^3/h (1,350 kWh)	Skid Unit (LP) Skid Unit (MP)	2800h x 2000w x 1000d 2200h x 1500w x 1000d	Yes Yes	100mm PN16 flange
G160	200 m^3/h (2,100 kWh)	Skid Unit (LP) Skid Unit (MP)	2800h x 2000w x 1000d 2200h x 1500w x 1000d	Yes Yes	100mm PN16 flange
G250*	320 m^3/h (3,400 kWh)	Skid Unit (LP) Skid Unit (MP)	2800h x 2000w x 1000d 2800h x 2000w x 1000d	Yes Yes	100mm PN16 flange
G400*	520 m^3/h (5,500 kWh)	Skid Unit (MP)	2800h x 3200w x 3200d	Yes	100mm PN16 flange
G650*	800 m^3/h (8,500 kWh)	Skid Unit (MP)	2800h x 3800w x 3400d	Yes	150mm PN16 flange
SP1*	1,920 m^3/h (21,000 kWh)	Skid Unit (MP)	2800h x 3800w x 3800d	Yes	150mm PN16 flange
SP2*	3,200 m^3/h (34,000 kWh)	Skid Unit (MP)	2800h x 5400w x 4400d	Yes	150mm PN16 flange
SP3*	3,800 m^3/h (39,710 kWh)	Skid Unit (LP)	9800l x 3000w	Yes	200mm PN16 flange

Table 1: *Full range of meters indicating type, maximum flow rate, minimum compartment sizes and outlet supply fitting required.*

Notes (in reference to page 39)

Final specification of meters by Gas Networks Ireland.

Gas Main, services and meters transporting gas at pressures greater than 100 mbar are not permitted within the building line of occupied premises. Under no circumstance is PE piping permitted inside the building.

- All Medium Pressure meter installations must be external.
- All Medium Pressure dedicated enclosures must be in accordance with Gas Networks Ireland guidelines for ventilation.
- Riser height varies from a minimum of 300mm to 500mm above finished ground height level. Components to be suitably sized to permit Gas Networks Ireland to safely install and maintain the gas meter installation.

All flange pipe connections should include a gasket.

* Meter Bypass Available, subject to evaluation. Refer to terminology for further details.

6.4 Fitter Fabrication

A fitter fabrication can be used for a select number of meters including:

- G4
- G10
- G16

The fitter fabrication is produced on site to fit specific requirements where a module is too large or unable to be sized correctly for the space available. A fitter fabrication installation is to be used in conjunction with steel plate protection as specified by Gas Networks Ireland.

It is advised that the size of the meter will be approximately the same as the equivalent meter module. For example in the case of the G16 meter it will be approximately 100 millimetres smaller overall in all directions. This type of meter is fabricated by a fitter and this is where it gets its name.

6.5 Pre-fabricated meter modules (pressure reduction & metering)

Meter modules are surface mounted and arrive on site assembled and pre-locked. When delivered they require a gas service connection carried out by Gas Networks Ireland or a Gas Networks Ireland nominated contractor. The supply pipework connection is carried out by the clients nominated gas installer.

Only after these connections are complete can the module be unlocked and the meter commissioned. The clients nominated gas installer should be on site for the co-ordination of commissioning and verification of the Declaration of Conformance.

Typical Applications:

Small to Medium sized commercial customers (note maximum kWh and maximum flow rates below).

Figure 12: *A G25 meter module with protection*

6.6 Meter Module Specifications

Modules	**Outer dimensions of module** (mm)	**Maximum flow rate** (m^3/h)/gas load (kWh)	**Supply outlet fittings**
G10 (LP)	600h x 700w x 280 d	16 m^3/h / 166 kWh	1.5" BSTP
G10 (MP)	590h x 700w x 240d	16 m^3/h / 166 kWh	1.5" BSTP
G16 (LP)	530h x 540w x 240 d	20 m^3/h / 210 kWh	1.5" BSTP
G16 (MP)	400h x 300w x 220d	20 m^3/h / 210 kWh	1.5" BSTP
G25 (LP)	800h x 600wx 300d	32 m^3/h / 340 kWh	1.5" BSTP
G25 (MP)	530h x 540w x 240d	32 m^3/h / 340 kWh	1.5" BSTP
G40 (LP)	800h x 600w x 300d	52 m^3/h / 550 kWh	2" BSTP
G40 (MP)	760h x 500w x 300d	52 m^3/h / 550 kWh	2" BSTP
G65 (LP)	1500h x 770w x 350d	80 m^3/h / 840 kWh	2" BSTP
G65 (MP)	760h x 500w x 300d	80 m^3/h / 840 kWh	2" BSTP

Table 2: *Technical details for meter modules.*

Low pressure (LP) meter modules are connected to a gas distribution network of less than 100mbar. The standard module outlet pressure is set at 20mbar.

6.7 Meter Module Position

Medium pressure (MP) meter modules are connected to the gas distribution network of pressure greater than 100mbar. Under no circumstances may the medium pressure steel or polyethylene service, including meter module, be positioned within the building line of occupied premises. Each meter module should be placed a minimum of 500mm above finished ground level.

6.8 Skid Units (presssure reduction & metering)

Figure 13: *SP1 meter*

Skid units are delivered to site assembled and pre-locked. Each unit is positioned and supported on a concrete base provided by the client/ builder (refer to pages **44-45** for further details). When delivered they require a gas service connection organised by Gas Networks Ireland or a Gas Networks nominated contractor and a supply pipework connection carried out by the clients nominated gas installer.

Figure 14*: G100 meter with protection*

Only after these connections are complete and appropriate protection provided can the skid be unlocked, the meter fitted and the completed installation commissioned. The clients nominated gas installer should be on-site for coordination of commissioning and verification of the Declaration of Conformance.

Typical Applications

Large commercial premises and industrial processing loads (note maximum kWh and maximum flow rates below).

6.9 Skid Unit Specification

Modules	Space required	Maximum flow rate (m^3/h) Maximum gas load (kWh)	Supply outlet fittings
G40 (LP)	2000h x 1350w x 800d	52 m^3/h / 550 kWh	2" BSTP
G40 (MP)	2000h x 1350w x 800d	52 m^3/h / 550 kWh	2" BSTP
G65 (LP)	2000h x 1350w x 800d	80 m^3/h / 840 kWh	2" BSTP
G65 (MP)	2000h x 1350w x 800d	80 m^3/h / 840 kWh	2" BSTP
G100 (LP)	2500h x 1800w x 800d	128 m^3/h / 1,350 kWh	100mm PN 16 flange
G100 (MP)	2000h x 1350w x 800d	128 m^3/h / 1,350 kWh	100mm PN 16 flange
G160 (LP)	2500h x 1800w x 800d	200 m^3/h / 2,100 kWh	100mm PN 16 flange
G160 (MP)	2000h x 1350w x 800d	200 m^3/h / 2,100 kWh	100mm PN 16 flange
G250 (LP)*	2500h x 1800w x 800d	320 m^3/h / 3,400 kWh	100mm PN 16 flange
G250 (MP)*	2500h x 1800w x 800d	320 m^3/h / 3,400 kWh	100mm PN 16 flange
G400 (MP)*	2500h x 3260w x 2240d	520 m^3/h / 5,500 kWh	100mm PN 16 flange
G650 (MP)*	2500h x 4400w x 2500d	800 m^3/h / 8,500 kWh	150mm PN 16 flange
SP 1 (MP)*	2500h x 4000w x 3050d	1,920 m^3/h / 21,000 kWh	150mm PN 16 flange
SP 2 (MP)*	2500h x 4800w x 3150d	3,200 m^3/h / 34,000 kWh	150mm PN 16 flange
SP 3 (MP)*	9800 l x 3000w	3,800 m^3/h / 39,710 kWh	200mm PN 16 flange

Table 3: *Technical details for skid units*

6.10 Skid Unit Information

Low Pressure (LP) skid units are connected to the gas distribution network of pressure less than 100mbar. The standard outlet pressure is set at 20mbar.

Medium pressure (MP) skid units are connected to the gas distribution network of pressure greater than 100mbar. Under no circumstances may a medium pressure steel or polyethylene service, with meter, be positioned within the building line of occupied premises.

Please find information for skid bases as follows;

- Single stream as per page 44, figure 15 and table 4.
- Twin stream as per pages 45, figure 16 and table 5.

Protection in the form of a palisade fence or cage is included in the connection cost by Gas Networks Ireland *(refer to page 47 for further details)*. The customer may provide the required protection only if the design has been pre-agreed with Gas Networks Ireland.

Note: The Meter will remain locked until protection has been installed.

6.11 Base Requirements for Skid Units

Low Pressure (LP) skid units are connected to the gas distribution network of pressure less than 100mbar. The standard outlet pressure is set at 20mbar.

Medium pressure (MP) skid units are connected to the gas distribution network of pressure greater than 100mbar. Under no circumstances may a medium pressure steel or polyethylene service, with meter, be positioned within the building line of occupied premises.

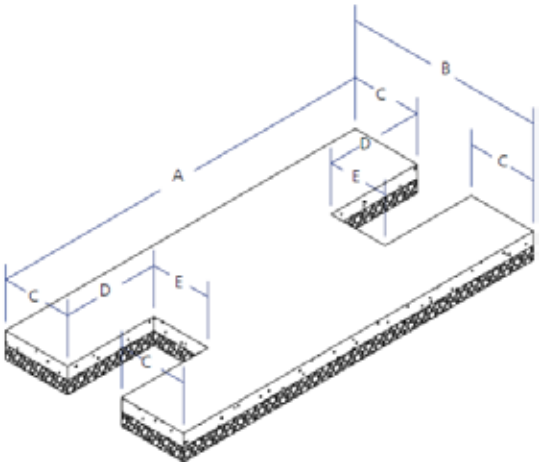


Figure 15: *Concrete base details*

SKID	DIMENSIONS				
	A	B	C	D	E
G40 LP	1,800	1,650	615	800	300
G40 to G65 (MP)	1,800	1,650	615	800	300
G65 (LP)	1,800	1,650	630	703	300
G100 (MP) to G160 (MP)	1,800	1,650	630	730	300
G100 to G160 (LP)	2,300	1,650	640	898	300
G250 (LP)	2,300	1,650	665	770	300
G250 (MP)	2,300	1,650	690	983	300

Table 4: *Dimensions for sizing the concrete base*

6.12 U shaped Base

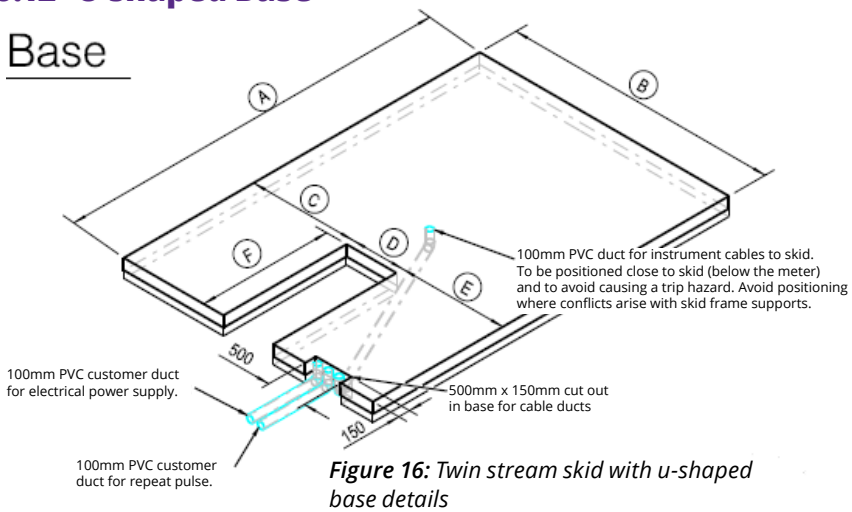


Figure 16: *Twin stream skid with u-shaped base details*

Notes:

1. Base to be constructed with 150mm concrete 30kN and A 142 road mesh top and bottom, on 100mm consolidated hardcore.
2. Base to be cast in-situ
   Refer to: DN/ST/16; DN/ST/17; DN/ST/03 sh 2 of 2.
   The location of the 500mm x 15mm cut out in base for cable ducts may vary on site to suit customer requirements / access. Exact location to be agreed with Gas Networks Ireland engineer before installation.

Skid Unit	A	B	C	D	E	F
G40 LP Twin Stream	4000	3500	1400	700	1400	1650
G65 LP Twin Stream	4000	3500	1400	700	1400	1650
G40-G65 MP Twin Stream	4000	3000	1150	700	1150	1720
G100-G160 LP Twin Stream	4500	3500	1400	700	400	1860
G100-G160 MP Twin Stream	4000	3500	1400	700	1400	1680
G250 – MP Twin Stream	5000	3500	1400	700	1400	1730
G400 – LP Twin Stream	6500	4500	1550	900	2050	1730
AFV G400	5000	3500	1400	700	1400	2100
Donkin G400	5500	3500	1400	700	1400	2200
AFV G650	5500	3500	1070	1030	1400	1700
Donkin G650	6000	3500	1070	1030	1400	1650
AFV SP1	5000	4000	1060	1290	1650	1725
Donkin SP1	5500	4000	1055	1295	1650	1930
AFV SP2	6000	4000	890	1460	1650	1960
Donkin SP2	6500	4000	890	1460	1650	2070
SP3 Base	9800	3000				

Table 5: *Table of u-shaped bases*
Note: Please contact Gas Networks Ireland to ensure you have the most up to date base drawing.

6.13 Building Energy Management Systems

Building Energy Management Systems (BEMS) are computer systems which enable the system operator to monitor and control building services including heating, air conditioning and lighting. BEMS are also capable of automatically recording gas and electricity consumption via the relevant meters and the data obtained can be used, for example, to analyse energy usage trends and to record and forecast annual energy consumptions.

Through on-line monitoring of energy usage, customers can identify and report on energy consumption data which will help to identify cost-saving opportunities and promote energy conservation between occupants and building managers.

Gas Networks Ireland is committed to promoting energy efficiency and if requested we can provide a Low Frequency (LF) Pulse Output from a Gas Networks meter. This device enables the BEMS to record the throughput of gas through the gas meter.

Electronic Daily Metering is necessary on all connections with an estimated annual consumption (EAC) greater than 3.00GWh (3,000,000 kWh). Electronic Daily Metering may be provided on skid units of lesser EAC's after request from the client and evaluation by Gas Networks Ireland.

If a twin stream skid is specified, the customer/ builder is recommended to request specific compartment and concrete base details from Gas Networks Ireland.

All skid units require a base consisting of concrete (150mm thick) placed on a consolidated hardcore (150mm thick). The builder/ customer is responsible for placing the base in the position as agreed with Gas Networks Ireland.

If a twin stream skid is specified, request specific compartment and concrete base details from Gas Networks Ireland. Dimensions may change subject to site specific requirements and should be confirmed with Gas Networks Ireland at time of construction.

6.14 Protection of Meter and Pressure Regulator Installations

Requirements

The structural containment for externally located meters may be either in the form of a pre-fabricated factory-made compartment or module provided by Gas Networks Ireland, or purpose-built compartments constructed by the builder/customer.

In the case of a steel manifold or skid unit, protection from tamper and possible impact should be provided with palisade fencing caging, or equivalent. The emergency underground isolation valve, on the gas service, should remain accessible at all times.

The enclosure should provide adequate protection against weather and the possibility of tamper.
Materials selected for construction of the enclosure should be weather resistant and durable.
Other utilities, materials or refuse, may not be placed within the same enclosure or be located within proximity to pose a safety risk. If meters are to be positioned nearby passing traffic, a protective barrier should be placed around the installation. A suitably robust crash barrier should be constructed by the builder / customer and positioned so as to prevent any accidental damage to the gas installation.

Steel cage protection

Figure 17: *G160 MP skid unit with protection*

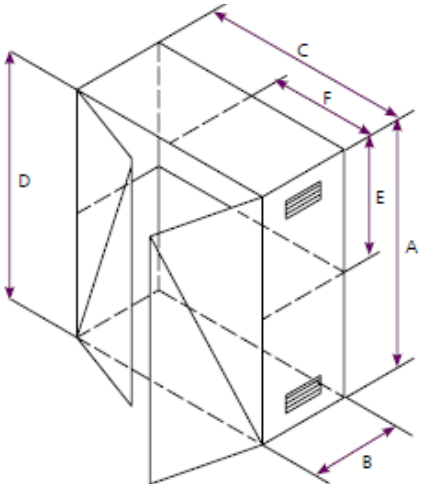


Figure 18: *Diagram of caged protection meter*

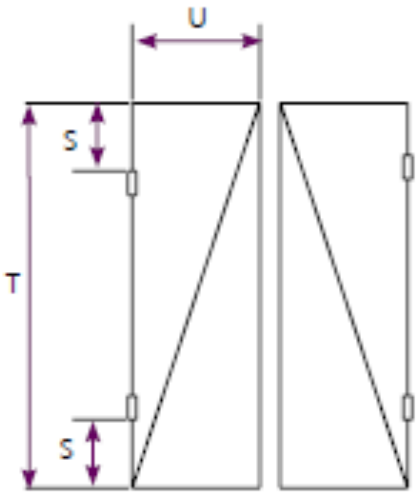


Figure 19: *Dimensions of caged protection for each arrangement*

METRE TYPES & PRESSURE	A	B	C	D	E	F	S	T	U
G40 (LP) G40 (MP) G65 (LP) G65 (MP) G100 (MP) G160 (MP)	**2000**	**1350**	**1500**	**1900**	**1000**	**750**	**450**	**1800**	**700**
G100 (LP) G160 (LP) G250 (LP) G250 (MP)	**2000**	**1350**	**2000**	**1900**	**1000**	**750**	**450**	**1800**	**850**

Table 6: *Dimensions of caged protection for each meter arrangement*

Regular Meter Unit Steel Cage

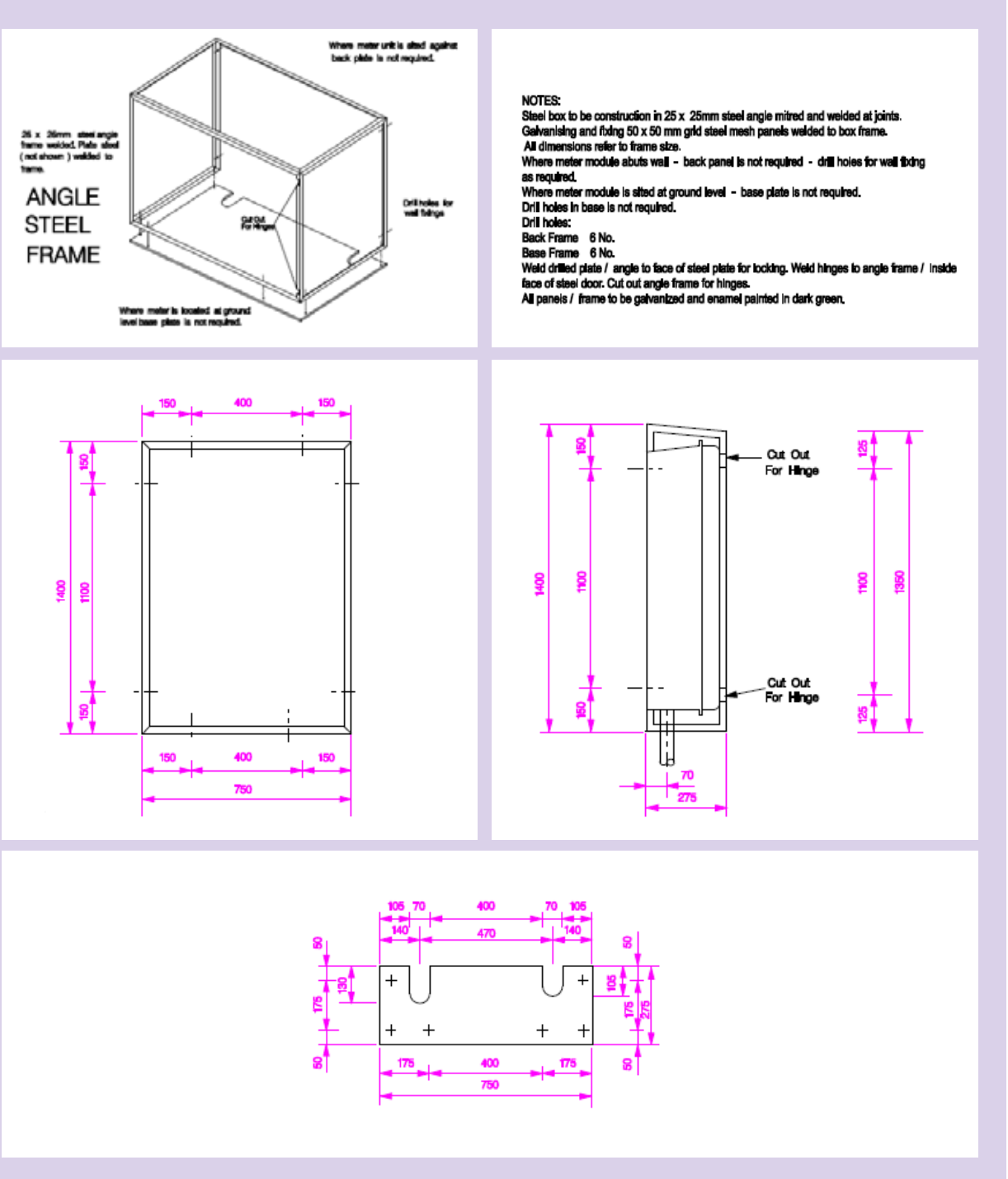


Figure 20: *Steel box detail*

6.15 Purpose Built Meter cabinets (Constructed by the customer/builder)

Figure 21: *G65 MP module with protection (provided by builder)*

To conceal equipment associated with a gas meter and pressure regulating, the client, builder or architect may opt to build a purposely constructed compartment.

Gas Networks Ireland's requirements for this compartment are as follows:

- Ventilation to atmosphere should be provided through a full height louvered door or suitably sized and constructed vents / ventilation ducts. High and low ventilation to the compartment should provide 5,000 mm^2 minimum free area each or 1% of compartment floor area each, whichever is greater.
- Ventilation ducts should be protected and constructed to resist potential fire damage.

If it is proposed that meters be located in a compartment within a basement area, Gas Networks Ireland should be consulted for ventilation requirements and construction details on **1800 411 511.**

6.16 Locating Meters inside the Building

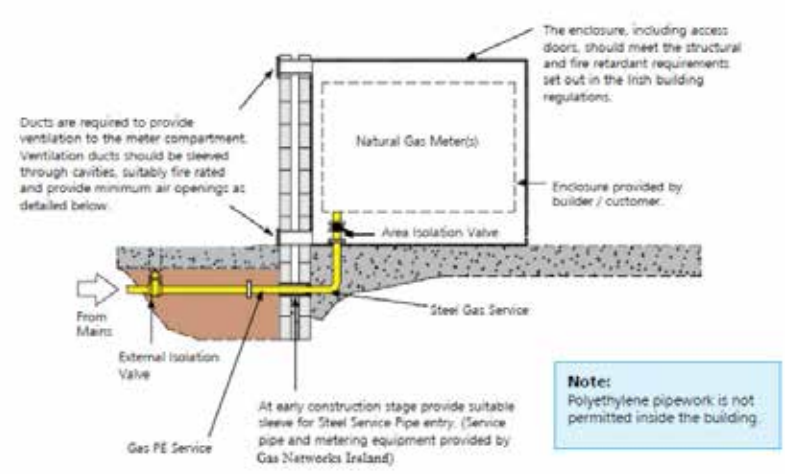


Figure 22: *Compartment details for meters placed inside the building*

Only in situations where delivered natural gas mains pressure is less than 100mbar and it is not possible to locate meters externally, may meters be placed within the building line.

In addition to the minimum requirements set out in the previous pages, the following Gas Networks Ireland specifications should be adhered to when placing meters inside the building.

- If recessed into the structure of the building or placed within the building, meters should be placed in a completely sealed compartment with the exception of access and ventilation provided by louvered doors or ventilation ducts provided direct to atmosphere.
- Meters should be positioned as near as practicable to the external wall where the gas service enters. Provision should be made for a steel service to enter into the building through a suitably robust and air-tight sleeve where traversing a cavity or void.
- On entry into the building, the gas service should only pass through a ventilated area that is publicly accessible (i.e. providing access for Gas Networks Irelands maintenance at all times). The gas service may not pass through a protected corridor, stairway, shaft, refuse area or private premise (i.e. dwelling or commercial unit).
- The enclosure, including access doors, should meet the structural and fire resistant requirements applicable to that part of the building. Solid access doors to the compartment should be self-closing and non-lockable.

6.17 Meters located in the open basement areas

- Meters located in an underground car park or open basement area should only be positioned within a naturally ventilated space. Mechanical ventilation is never deemed acceptable if it serves the same basement or space as the gas service or meters.
- The meter installation should not be located directly beneath a ventilation grill or in a position liable to allow ingress of water, unless weather protected.
- If it is required that the meters or gas service be located in a dedicated room within the basement or in a basement lacking natural ventilation, Gas Networks Ireland should be consulted for specifications and ventilation requirements.

Figure 23: *G4 meters serving retail units*

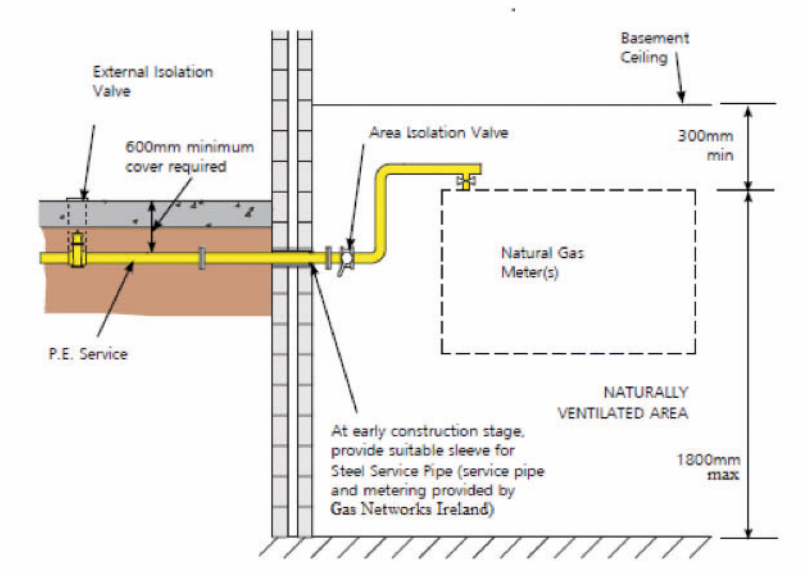


Figure 24*: Illustration highlighting requirements when placing meters in a naturally ventilated basement*

Gas Networks Ireland

7 Non - domestic premises certification

7.1 Certification of non-domestic gas installations

The non-domestic gas installations:

The authorised person responsible for the design should complete the Declaration of Conformance attesting that the installation has been designed in accordance with the requirements of I.S. 820 and in accordance with the equipment and manufacturer's instructions.

Any person who designs or carries out work on a gas installation should be a competent person.

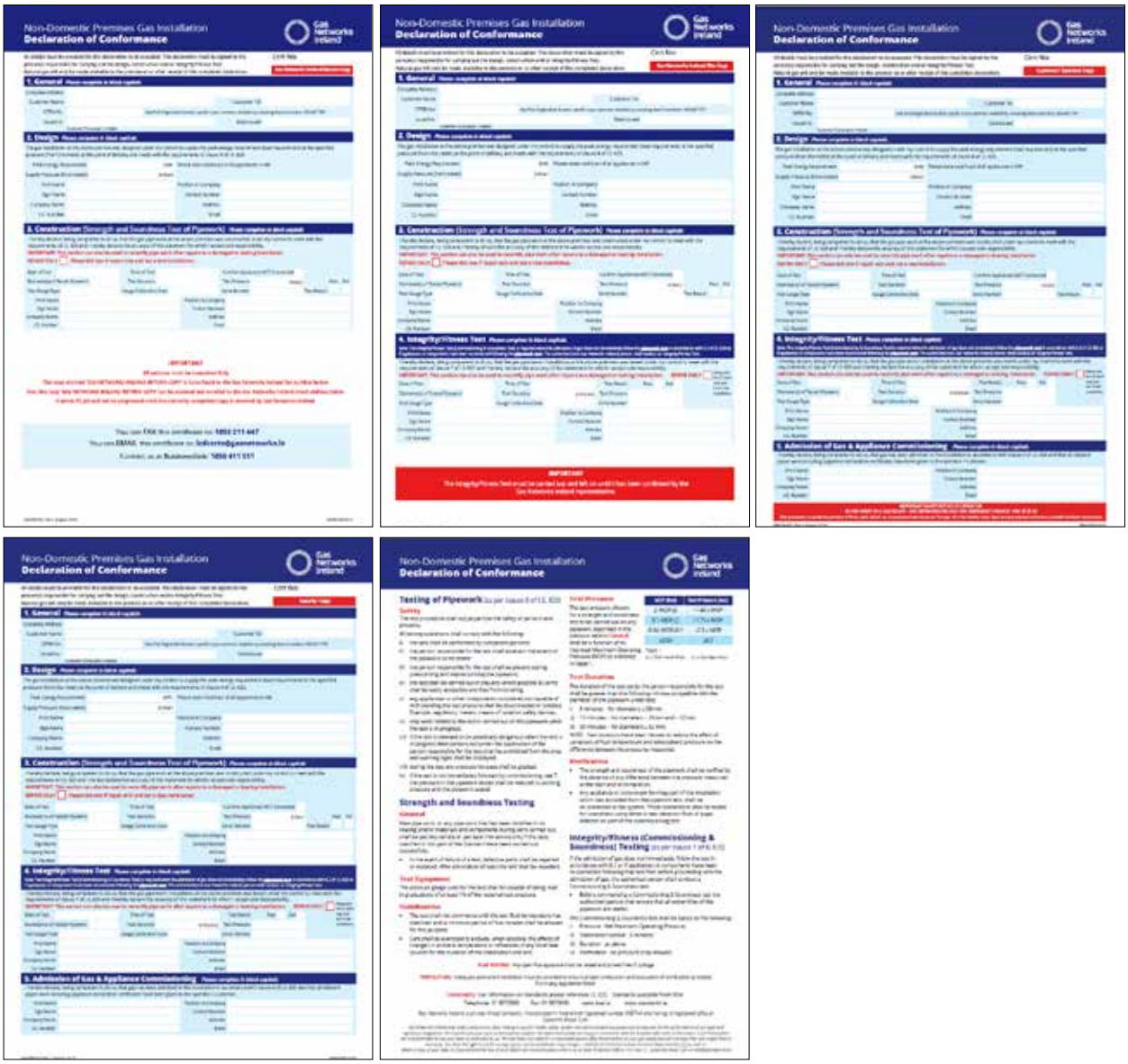


***Figure 25**: The Non-Domestic Declaration of Conformance*

Gas will not be made available unless the guidelines highlighted in section 7 are adhered to.

7.2 Steps to getting meter fitted

Step 1: Requesting the Meter:

Before your meter is fitted, you will need to contact a gas supplier to open an account. A list of gas suppliers can be found on the Commission for Regulation of Utilities. https://www.cru.ie/

Step 2: Declaration of Conformance:

Your installer must complete and return the Gas Networks Ireland Return Copy of the Non-Domestic Declaration of Conformance Cert, email **icdcerts@gasnetworks.ie** or by fax 1800 211 447

Step 3: Gas Networks Ireland

Once steps 1 and 2 are complete, Gas Networks Ireland will schedule a suitable appointment for your meter to be fitted. Please allow up to 5 working days for meter fit appointment.

Step 4: Meter Fitted

Your meter will be fitted by a Gas Networks Ireland fitter and will be locked awaiting TURN ON.

Step 5: Meter Turn On

In order for Turn On of meter to progress, your installer must connect to outlet of meter. Once this is complete, please ask your installer to ring businesslink on 1800 411 511 to request a TURN ON appointment.

7.3 Turning on your gas meter

In order for TURN ON of meter to progress the following must be adhered to:

1. Your gas Installer/RGI must be onsite to meet the Gas Networks Ireland fitter.
2. The Gas Networks Ireland Return Copy of the Non-Domestic Declaration of Conformance Cert, must be onsite. This copy must be completed and signed by your installer following the integrity test.
3. Your Installer must have adequate equipment to carry out the integrity test which is witnessed by the Gas Networks Ireland fitter.
4. The installation must be completed to the standards of I.S. 820 and manufacturers installation instructions.

****Please note that if any of the above points are not adhered to, this could result in your meter not being turned on and a new appointment will need to be scheduled.****

7.4 Completing the Declaration of Conformance

Section 1 of Certificate – General

The customer is required to contact New Connections to obtain the GPRN (Gas Point Registration Number) which is then entered onto the certificate.

Note: The certificate cannot be processed without the GPRN. The customer should quote this number to the natural gas supplier when requesting the meter to be fitted.

Section 2 of Certificate – Design

The design section should be completed by the person responsible for the design of the gas installation downstream of the point of delivery (in accordance with Irish Standard I.S. 820).

Whilst Gas Networks Ireland may supply to a number of points delivery for a single property, installation pipework may only be supplied from one point of delivery.

The pipework should be designed and constructed to enable ease of testing and purging.

As stated within I.S. 820 – Any person responsible for design should be a competent person as defined by the Irish Gas Standards.

Section 3 of Certificate – Construction:

The Construction section should be completed by the person responsible for the construction of the gas installation downstream of point of delivery and in accordance with Irish Standard I.S. 820.

During the construction of the pipework care should be taken to prevent the ingress of foreign matter (e.g. dirt, water, swarf, thread cutting oil etc.) into the pipework. Foreign matter which has entered the pipework should be removed.

Open ends of pipework and valve outlets should be sealed with an appropriate fitting.

Gas pipework should be identified in accordance with I.S. 820.

Pipework should be installed so that it does not impose excessive stress on devices or components incorporated into the pipework. E.g. meters, regulators, etc.

The gas meter, the gas regulator / governor, the gas train of the appliances should never be subjected to the contractor's pressure test. Non-compliance with the above test requirement will inevitably lead to expensive damage being incurred and resultant delays.

To carry out the test the contractor should isolate and blank their own work and only apply a test to the gas carrying pipework.

As stated within I.S. 820 – any person responsible for construction should be a competent person. All tests should be performed in accordance with the test requirements detailed in this document and the current edition of I.S. 820.

Section 4 of Certificate – integrity (commissioning) test:

The Integrity Test (Commissioning Soundness Test) is required

- in the immediate aftermath of a reported abnormal situation, or
- prior to re-supplying a premises or part thereof

Then proceeding with the admission of gas, the authorised person (not Gas Networks Ireland) should conduct an Integrity Test.

The following essentials to the safe use of gas and gas appliances shall be checked:

- Pipework: soundness of pipework and visible condition of exposed sections
- Appliances: visual evidence of appropriate location, availability of sufficient combustion air and the existence of a connected effective flue, when required.
- The Integrity section should be completed by the person responsible for the Integrity/Commissioning test of the gas installation downstream of point of delivery (in accordance with Irish Standard I.S 820). As stated within I.S. 820, any person responsible for the integrity testing should be a competent person.
- The test procedure shall not jeopardise the safety of persons and property.

All testing operations shall comply with the following:

- Under no circumstances should any equipment other than the installers piping be included in the Contactors Test.
- Any pipework not in use should be disconnected, purged and plugged, capped or sealed at each end. Where practicable, gas pipework not in use should be dismantled.
- In performing the test the contactor should isolate and blank off their own work and only apply a test to the gas carrying pipework.
- All tests should be performed in accordance with the test requirements as detailed below and within the current edition of I.S. 820.
- The installation should remain "on test" until the Gas Networks meter fitter arrives to site and commissions the meter.

Section 5 of Certificate – Admission of Gas and Turn on:

Purging and admission of natural gas should be carried out by a competent person in accordance with I.S. 820.

Natural gas is admitted to the premise by the Gas Installer nominated by the customer. The admission of gas should be supervised by the authorised person responsible for carrying out the Integrity Test.

7.5 Testing of Pipework

Safety

The test procedure shall not jeopardise the safety of persons and property.

All testing operations shall comply with the following:

i. The task shall be performed by competent persons;

ii. The person responsible for the test shall ascertain the extent of the pipework to be tested;

iii. The test shall be carried out in situ and where possible all joints shall be easily accessible and uncovered;

iv. Any appliances or other components considered not capable of withstanding the test pressure shall be disconnected or isolated, e.g. regulators, meters, means of isolation and safety devices. In this case either shall be replaced with a section of pipework, or part of the pipework situated upstream and downstream of the removed component shall be sealed and tested separately.

v. Only work related to the test is carried out on the pipework while the test is in progress.

vi. If the test is deemed to be potentially dangerous when in progress then persons not under the supervision of the person responsible for the test shall be prohibited from the area and warning signs shall be displayed;

vii. During the test any pressure increase must be gradual;

viii. If the test is not immediately followed by commissioning, the pressure in the pipework tested shall be reduced to working pressure and the pipework sealed.

7.6 Strength & Soundness testing

General

- New pipework and/or any pipework materials and components that have been modified, should only be put into service or put back into service if the tests specified in Section 6 of I.S. 820 have been carried out successfully.
- In the event of failure of a test, defective parts should be repaired or replaced. After elimination of leaks the test may be repeated.

Test Equipment

The pressure gauge used for the test should be capable of being read in graduations of at least 1% of the required test pressure.

For pressures ≤ 100mbar, a water gauge (manometer) with a millimetre scale should be used.

For pressures ≤ 300mbar, a mercury or High Specific Gravity manometer should be used.

For pressures ≥ 300mbar, a verified gauge should also be used.

Test Pressure

The test pressure chosen for a strength and soundness test to be carried out on any pipework (refer to 'General" above) should be a function of its intended Maximum Operating Pressure (MOP) as indicated in the table below.

(Maximum Operating Pressure) MOP	Test pressure
greater than **2 bar** and less than or equal to **5 bar**	1,40 x MOP
greater than **100 mbar** and less than or equal to **2 bar**	1,75 x MOP
greater than **40 mbar** and less than or equal to **100 mbar**	2,5 x MOP
less than or equal to **40 mbar**	**100 mbar**

Table 7: *Strength and soundness test pressure as a function of MOP*

Stabilisation Periods and Test Duration

Stabilisation periods and test durations have been chosen to reduce the effect of variations of fluid temperature and atmospheric pressure on measured pressure.

The test duration depends upon the diameter of the pipework and a period of time should elapse after pressurisation to allow temperature stabilization to occur.

Care should be exercised to exclude, where possible, the effects of changes in ambient temperature or influences of any local heat sources for the duration of the stabilisation of a test.

A minimum period of five minutes should be given to allow stabilisation of test fluid temperature.

The test pressure duration should comply with the following pipework diameter correlations:

- For diameters less than or equal to 28mm.....5 minutes
- For diameters greater than28mm and less than 52mm.....15 minutes
- For diameters greater than or equal to 52mm .....30 minutes

Verification

- The strength & soundness (refer to "Test Pressure" above) of the pipework should be verified by the absence of any difference between the pressure measured at the start and at completion which cannot be explained by variations in fluid temperature, atmospheric pressure and ambient temperature during the test.
- Any appliance or component forming part of the installation which was excluded from the pipework test is reconnected to the system.

  The connections should be tested for soundness using either a leak detection fluid or a gas detector as part of the commissioning test.
- A declaration of the successful completion of the test shall be made by the person responsible for the test and shall include the following (see Annex D.1 section 3):
- Date and time of test;
- Description of 'Strength and Soundness Test';
- The diameter(s) of pipework tested;
- The duration of the test;
- Type and Sensitivity of Gauge used;
- Result of Test, and;
- The name and signature of the competent person.

Flue Testing

Any open flue appliance should be tested and proved free of spillage.

Ventilation

Adequate permanent ventilation should be provided to ensure proper combustion and evacuation of combustion products from any appliance / equipment fitted. In instances where permanent ventilation to a room is provided through a vent containing a filter, all open-flue appliances should be fitted with an atmospheric sensing device and gas control switch.

7.7 Project manager / gas installer responsibility

The Project Manager and Gas Installer should ensure the following:

a) That the completed Declaration of Conformance Certificate entitled, "Customer/Operator Copy" is given to the building operator and/or owner.

b) That all related paperwork is given to Operator / Customer (including Appliance Declaration Certificates and Pipework Installation Drawings).

Operator responsibility:

The safe operation and maintenance of the installation downstream at the point of delivery, from the time of commissioning, is the responsibility of the operator of the property being supplied.

At a given moment and for a given installation (or section thereof) there should be only one operator, or operator designated person in charge of the installation.

Gas Networks Ireland is responsible for the gas main and service pipe up to and including the point of delivery (normally including the primary meter). The gas user / property owner / property operator is responsible for the installation pipework, equipment and appliances after the point of delivery.

Only persons authorised or appointed by the operator may carry out work or operate the installation.

The operator of the pipework should, where the extent of the installation so dictates, have at their disposal descriptive information concerning its location, its nature and/or a plan of its layout which they should keep up to date. In the case of premises where the operator may not be present at all times or locations, this information in graphic form showing pipework and isolation valves, should be displayed in the security or operations centre of the premises.

The operator should keep the isolation valves identified and accessible at all times.

To ensure operational efficiency and continued site safety, the operator should implement annual servicing and preventative maintenance on all natural gas equipment.

Gas Networks Ireland

8 Appendix

8.1 Appendix A - Excavations Parallel to Walls

With reference to *Figures 26 and 27*, dig a trial hole to determine the depth of the foundations or base of the wall, taking care to avoid undercutting the foundation/base. Excavation work must not proceed if the wall is leaning, cracked or showing any signs of instability or distress.

Note: Please ensure:
the distance from the trench to the bottom of the foundations (W), is greater than the length from the bottom of the foundations to the pipe, (X).
the distance from the trench to the wall (S), is greater than the depth of the trench (H).

Otherwise please see conditions below:

- reduce the depth of the trench, or
- provide suitable support appropriate to the type of structure, soil characteristics and depth of trench.

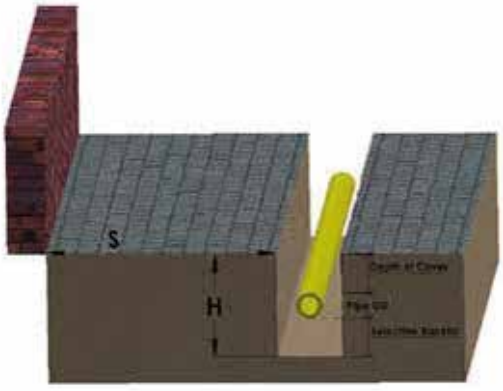


Figure 26: *Proximity of trench to walls*

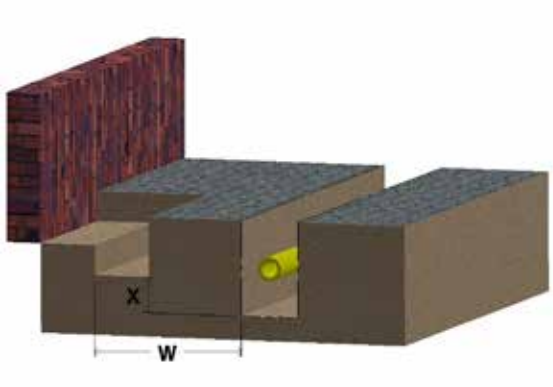


Figure 27: *Proximity of walls to foundation*

Otherwise please see conditions below:

- move the trench so that the distance from the trench to the wall is greater than the depth of the trench, or
- trial hole carried out.

8.2 Appendix B - Characteristics of Gases

Natural gas is composed primarily of methane and also contains ethane, propane and heavier hydrocarbons with small quantities of nitrogen, carbon dioxide, oxygen and sulphur compounds. Water may also be found in natural gas.

Natural gas doesn't have a standard composition and will differ depending on its source. The density of natural gas is usually in the range of 0.55 - 0.7 kg/m (at 15 °C and 101.3 kPa) making it lighter than air. The methane content of natural gas is typically 80-90%.

All flammable gases and vapours require a mix with oxygen and an ignition source to ignite. A certain percentage of gas in air is required for ignition, if there is too much or too little gas in air the mixture will not ignite. The following are the definitions and explosive limits of methane gas.

Lower Explosive Limit – LEL The concentration of flammable gas, vapour or mist in air in the presence of an ignition source below which an explosive gas atmosphere will not be formed "Too Lean".

Upper Explosive Limit – UEL The concentration of flammable gas, vapour or mist in air in the presence of an ignition source above which an explosive gas atmosphere will not be formed "Too Rich".

Methane LEL 5% and UEL 15% gas in air.
Gas detection devices typically measure in the range of 0 - 100% of LEL, where 100% LEL is %5 gas in air.

8.3 Appendix C

Example ATEX Drawing

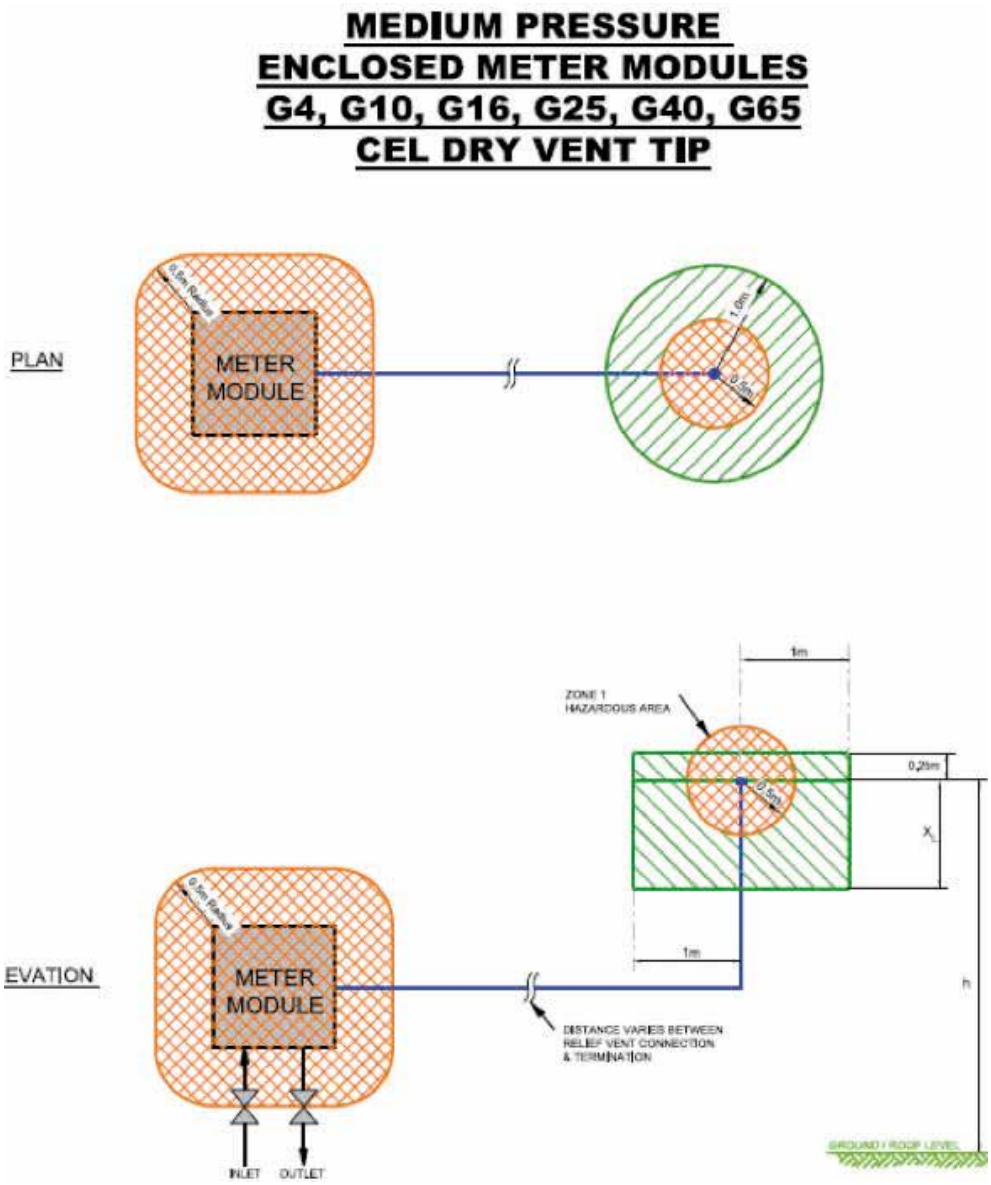


Figure 28: *Medium pressure meter modules G4-G65 cel dry vent tip*

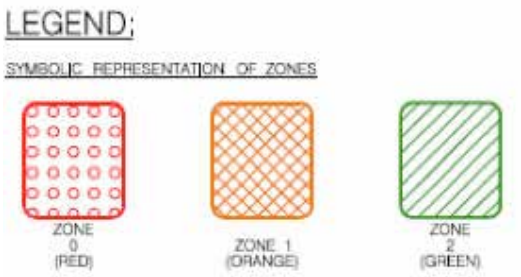


Figure 29: *Legend of ATEX zones*

Height above Ground or Roof Level h	ZONE 2 Hazardous Area Dimension X_2
h<1m	0,7m
1m<h<2m	0,8m
h>2m	1,0m

Table 8: *Zone distances based on ½ "cel dry vent tip & relief valve set pressure between 24mbar – 95mbar*

8.4 Appendix D

Ventilation Policy Document - Part 1

Ventilation Confirmation Form
DO/GE/S/MIS/001_VentForm

Gas Networks Ireland

Ventilation Requirements for Basements and Meter Rooms

1. Natural Ventilation

For basements to be defined as naturally ventilated, each storey should be naturally ventilated by permanent openings at each level. The aggregate area must not be less than 2.5% of the floor area at that level, of which at least half should be in two opposing walls. This ventilation requirement will increase where room heights are over 4m see Table 2 below.

The ventilation should be equally split between high and low level ventilation (or at least a 1/3 – 2/3 split).

Any area that does not meet these requirement shall not be considered as a naturally ventilated area by GNI and should fall under the category "non-naturally" ventilated area.

TABLE 2 – ACTUAL VENTILATION REQUIREMENTS

Room Height	Minimum Ventilation Requirement	Ventilation Requirements for a Meter Room where ventilation is provided by louvered vents or where ventilation is only provided on two walls or less.
0m<Height>4m	2.5% of the Floor Area	3.75% of the Floor Area
4m<Height>5m	3% of the Floor Area	4.25% of the Floor Area
5m<Height>6m	4% of the Floor Area	5.75% of the Floor Area
6m<Height>7m	4.5% of the Floor Area	6.50% of the Floor Area

Table 8: Actual Ventilation Requirements

2. Non-Naturally Ventilated and Protected Areas

Where there is no other option other than to install meters or mechanical connections in a "non-naturally" ventilated or protected area (as defined in building regs), then they must be enclosed in a dedicated meter room which is itself naturally ventilated directly to outside air and therefore not deemed to be within the protected area, subject to the following requirements:

- The room must be a completely fire sealed room with exception of vents directly to atmosphere. The access door must be fire rated and fire-sealed to the same specification as the room, including at points of hinges and locks. Doors must be self closing to lock. See Table 2 for meter room ventilation requirements.
- The minimum fire rating level is dependant on the location and position of the room and determined by the clients fire officer. Generally 2 hrs minimum fire rating in basement area and 90 minute in protected areas. **The fire rating requirements also applies to the ventilation ductwork inside in the room. Plastic ducts are not acceptable.**
- Separate high and low level passive ventilation ducts (fire rated) to terminate on opposing ends of the room ensuring diagonal cross flow (ATEX requirement). Termination of vents should be designed to avoid "short circuiting", i.e. 500mm minimum between each ventilation duct termination.
- Room to be sized to allow for construction, installation and maintenance of manifold/skid & associated Meters
- Room must be located in a public access area, for access for GNI construction, meter fitting and maintenance staff (arrangements may be put in place between the developer or building management company and Gas Networks Ireland).
- Door lock specification must allow for Gas Networks maintenance department access to service joints, meter and ancillaries.

8.4 Appendix D

Ventilation Policy Document - Part 2

Ventilation Confirmation Form
DO/GE/S/MIS/001_VentForm

Gas Networks Ireland

Ventilation Requirements for Basements and Meter Rooms

3. ATEX Compliance:

- Ventilated rooms as detailed above are classified as "Zone 2", per IGE/SR/25 "Hazardous Area Classification of Natural Gas Installations". A hazard exists 1000mm around all flanges, screw fittings, joints and valve glands as per this classification.
- The developer must ensure that no electrical fittings, boxes, switchgear, etc., or any potential sources of ignition are located within this 1m hazardous area unless such fittings are specifically designed for use in a "Zone 2" hazardous areas classification. Permission and approval must be sought in this instance.
- Any ignition source including light fittings and electronic equipment shall be suitable for hazardous area zone classification.
- It is accepted that petrol-engine vehicles will create an ignition source in car parks, and the layout should ensure that vehicles are kept at least 1m away from any part of the installation with screwed or flanged connections.

4. Areas of Refuse Storage:

Meters, flanges or fittings must not be located within the vicinity of a refuse storage area.

Notes:

1. Mechanical ventilation is not an acceptable form of ventilation for **meter locations** or any area where **mechanical joints** would be present. It is possible, however, to run continuous welded pipe through mechanically ventilated areas.
2. It is the developer's responsibility to ensure that the appropriate ventilation requirements will be implemented and adhered to on the site in question. This must be confirmed in advance of GNI design stage by signing of the section below or by email as described.
3. All designs, pipe runs and meter locations are subject to the approval of the Gas Networks Ireland Design Engineer. Inspections will be carried out at construction stage and Gas Networks Ireland reserve the right, if deemed necessary, to make alterations to the design to address any safety concerns arising that may not have been apparent at the design stage.

Developer / Client's Confirmation of Ventilation:

Site Name & GNI project number: _____

I confirm that the basement is **Naturally Ventilated** / **Non-Naturally Ventilated** (delete as appropriate) and that all pipe runs and meter locations will comply with the Gas Networks Ireland ventilation requirements as described above.

Alternatively, an email to the Gas Networks Ireland Sales Rep for the project confirming that ventilation will be provided in accordance with this form (DO/GE/S/MIS/001_VentForm) will be taken as acceptance of the GNI ventilation requirements.

Signed:_____ Date:_____ Position:_____

8.5 Appendix E

Gas Market Terminology

Capacity – Space booked in the natural gas network for the purpose of moving gas from point to point.

CRU – Commission for Regulation of Utilities.

Commodity – The quantity of gas flowing through the network in any given period.

Eligible Gas Customer – Gas Customers who are entitled to have their natural gas supplied by any licensed supplier.

End User – A customer who has an entered into an agreement with a Shipper to purchase and/or utilise natural gas taken from the Transportation System (The Natural Gas Network).

Entry/Exit – Under an entry/exit regime Shippers can transport natural gas from any Entry Point to any Exit point and trade gas at the Irish balancing Point in accordance with the provisions of the Unified Code of Operations.

GPRN – Each gas point (entry or exit) has a unique reference number known as the Gas Point Registration Number.

GPRO – The Gas Point Registration Operator (GPRO) is the independent administrative service that has been established to support the newly competitive natural gas market and market opening process. The GPRO manages the register of all gas points (entry or exit) across the country on behalf of all shippers.

The Gas Point Registration Operator is the unit responsible for registering customers with their respective suppliers. The GPRO will notify end users of their eligibility. Consult the Gas Networks Ireland website for further details.

Nominated Consumption – The annual quantity (estimated annual consumption) of gas which the consumer indicates they require from the supplier of their premise(s).

Siteworks – Siteworks (within the context of deregulation terminology) are defined as the process required to facilitate Shippers to arrange for changes or upgrades to the connection of an existing gas point or connection of a new gas point.

Supplier – A supplier directly sells natural gas to a customer (this supply function may or may not include shipping). The CER licences suppliers only when it is satisfied as to their ability to finance their operations and provide a satisfactory level of service to the customer.

TPA – Third Party Access allows users to transport natural gas through the Gas Networks Ireland's network.

8.6 Gas Load Terminology

MHQ – Maximum Hourly Quantity (Alternatively PHQ or PHC)

MDQ – Maximum Daily Quantity (alternatively PDC or PDQ or PDV)

PDC/Q/V – Peak Day Capacity/ Quantity/ Volume

EAC – Estimated Annual Consumption (alternatively EAQ)

MDL – Maximum Design Load

SPC – Supply Point Capacity

Scmh – Standard Cubic Metres per Hour

Mscm – Million Standard Cubic Metres

1 GWh = 1,000MWh = 1,000,000 kWh

The Supply Point Capacity represents the maximum daily volume of gas expected to be off taken at the Supply Point during normal operation.

Supply Point being an exit from the gas distribution pipes system serving a single user and made up of one or more gas points.

The capacity at the Supply Point is the amount that is reserved on behalf of the customer for peak day usage (MDQ). It is used for the purpose of booking and charging capacity.

The Supply Point Capacity level is determined by Gas Networks Ireland in accordance with procedures approved by the Commission for Energy Regulation.

The **Maximum Hourly Quantity** is not always the same as the Maximum Design Load.

The Maximum Design Load can include provision for sudden gas requirements due to equipment start-up or allowances for future site expansion.

Properties of Natural Gas (at 15□ and 101.3kPa)	
Property Gross Calorific Value (GCV) of Gas	Natural Gas 36.5 TO 47.2 MJ/ml (Real Gross Dry)
Relative Density (air = 100)	0.55-0.7
Flammability Limits (% Volume in Air): Upper: Lower:	 15 5
Family	2nd Family Group H

Glossary of Terms

Authorised Person

A competent person who is appointed by the client/ customer to fulfil a given task on an installation system as defined by Irish gas standards.

bar, barg, mbar, mbarg

Measure of pressure – barg and mbarg refer to "gauge pressure", that is, the pressure relative to atmospheric pressure. 1bar = 1,000mbar.

Building Line

The outermost extent of the building structure (archway, balcony or basement) projected vertically on to ground level Gas mains, services and meters transporting gas at pressures greater than 100mbar are not permitted inside the building line of occupied premises. However, they are permitted within privately owned and managed zones without occupied space or safety risks above or below. In this instance, the property supplied should be detached and not form part of a multi-occupancy building.

Building Regulations (TGD's)

Irish Building Regulations (Technical Guidance Documents).

Coating

A factory applied light wrapping, paint or other suitable substance applied to a pipe to protect against corrosion.

Commissioning

The activities required to pressurise pipework, stations, equipment and assemblies with the fuel gas and to put them into operation.

Compartment

An enclosed space within a building specially designed or adapted to house gas equipment.

Competent Person

A person having the ability, appropriate training, knowledge and experience to supervise or carry out work in a safe and proper manner.

Daily Metering

Electronic Daily metering is placed on all industrial and commercial connections with an estimated annual consumption greater than 5.55GWh. Daily Metering Allows for accurate billing of large fuel quantities consumed.

Design Pressure (of Pipework)

The pressure for which the designer should make allowance in specifying materials and construction methods in order that the pipework will safely withstand the maximum incidental pressure, soundness and strength test as applicable.

DN

Alphanumeric designation of size for components of a pipework system, which is used for reference purposes. It comprises the letters DN followed by a dimensionless whole number, which is directly related to the physical size, in millimetres, of the bore or outside diameter of the end connections.

NOTE 1: The number following the letters DN does not represent a measurable value and should not be used for calculation purposes except where specified.

NOTE 2: Where DN designation is used, any relationship between DN and component dimensions are given, e.g. DN/OD or DN/ID. "

Domestic Appliance

An appliance designed for household use.

DRI

District Regulator Installation – A distribution network pressure reduction station that reduces gas pressure to allowable limits (normally reduces Medium Pressure to Low Pressure) so that gas mains may be positioned closer to buildings and gas services and meters may be placed within the building line.

Duct

Purpose provided space constructed of building materials for the enclosure of installation pipework or other building services.

ETCI Regulations

Electro-Technical Council of Ireland Regulations.

EVCD

Electronic Gas Volume Conversion Device (in relation to Daily Metering) used to convert volume of gas measured at a meter from local to reference conditions of Pressure, Temperature and Compressibility.

Ferrous Piping

Ferrous pipes are made of cast irons, low and medium alloyed steels and specialty steels such as tool steels and stainless steels.

Note: Ferrous piping cannot be connected to Non-Ferrous piping such as copper. The metals in contact cause a galvanic effect and corrosion.

Flue

A passage for conveying the products of combustion from the appliance to outside atmosphere.

Fitter Fabrication

Where an authorised and competent person installs a primary meter and regulator to a premise point on behalf of Gas Networks Ireland.

FFL – Finished Floor Level

The level of the floor immediately inside the building.

FGL – Finished Ground Level

The level of the ground, landscape, footpath or road immediately outside the building.

Fire Resistant Duct

A duct constructed from material(s) rated as fire resistant (Refer to Irish Building Regulations).

Fire Stopped

Building component/material designed to prevent the spread of fire through walls or ceilings for an allocated minimum period of time.

Free Ventilation

Ventilation not reliant upon mechanical activation.

Gas Main

A distribution pipeline, normally buried underground, from which multiple end users are supplied with gas.

Gas Service

A distribution pipe connecting the distribution network to a user's meter and through which that user's gas is supplied.

Installation Pipework

A pipe system downstream of the point of delivery terminating at the appliance(s) inlet(s) connection(s).This refers to any gas pipework, fittings, meters or ancillaries downstream of the point of delivery nominated by Gas Networks Ireland. This point may be either a combination of a regulator and valve or a meter.

Isolation Valve / Shut-Off Valve

A valve system which permits isolation of a part of or the complete gas installation.

Local Government (Multi-Storey Buildings) Act 1988

See "Scope/Irish Standards" in Section 1 and Section 8 "Applicable Standards for Industrial/Commercial Installations".

LP – Low Pressure

Gas supplied from THE Gas Network Ireland distribution network at a pressure less than

Multi-Occupancy Dwelling

A building which contains different, separate 100mbar Normal pressure between 17mbarg and 100mbarg.

Mechanical Joint

Compression, flange or union type joint. A type of joint in which gas tightness is achieved mechanically rather than by welding, brazing or soldering.

Meter

A device to measure the volume of gas or quantity of energy supplied.

Meter Bypass

A meter bypass is used on larger installations where there is typically 16 to 24 hours per day usage. It is incorporated so that a shutdown period is kept to an absolute minimum when meter maintenance is required. The meter bypass is available for meters of size G250 or above.

Module

Pre–Fabricated meter and pressure regulator unit within a robust plastic cabinet – supplied by Gas Networks Ireland.

MP – Medium Pressure

Gas supplied from the Gas Networks distribution network at a pressure greater than 100mbar, but not greater than 5bar. For pressures greater than 100mbar, gas mains, services and meters may not be positioned/ located within the building line.ownerships or tenancies

A building comprising of, or including, five or more storeys. A basement being regarded as a storey (see also storey).

Natural Gas

Gas largely consisting of methane, distributed through a network of pipes.

Natural Ventilation

Sufficient air movement in a space to ensure one air change per hour (minimum). See Naturally Ventilated Basement.

Naturally Ventilated Basement

A naturally ventilated basement is a space below or partially below a building with air openings of sufficient size to cause free air flow at all times. Should gas service pipework or meter installations be required in this space, the minimum air opening requirements should comply with the building Regulations definition of a Naturally Ventilated Basement (Technical Guidance Documents, Section B 3.5.2.4)

Non–Ferrous Piping

Refer to ferrous piping for excluding categories.

Open Riser

Rising pipework not enclosed as it passes through living or shared spaces in the building.

Pressure Reduction

Process needed to reduce the gas pressure from the service before passing through the gas meter and onto load requirement. Only gas services operating at a pressure less than 100mbar may enter a building. Therefore, if placing meters within a building, gas at a pressure of less than 100mbar is required.

Point of Delivery

The point immediately downstream of the control device fitted to terminate the service pipe. Natural gas service pipes terminate in a combination of a regulator and isolation valve.

Polyethylene (PE)

A plastic polymer which is widely used in fluid transportation such as natural gas. Polyethylene pipework is not permitted within the building.

Purge/Purging

A procedure for safely removing air or inert gas from pipework and replacing it with combustible gas, or the reverse procedure.

Regulator/Governor

A device which reduces the gas pressure to a set value and maintains it within prescribed limits.

Riser

Installation pipework rising vertically within or outside a building to supply one or more premises.

A space in a building lacking any air flow. Any enclosed, generally inaccessible and unventilated space.

Safety Device

Equipment designed to automatically shut off the gas supply in the event of a condition exceeding a pre-set limit.

Service Shaft

A space specifically designed and constructed for the passage of building services.

Sleeve

A length of rigid protective pipe impervious to gas, through which a gas pipe passes. The sufficiently sized annulus between the sleeve and gas pipe allows for normal expansion/contraction and acts as a conduit for gas in the event of leak.

Storey

Any of the parts into which a building is divided horizontally above or below ground level. It excludes any structure situated above the level of the roof or below the lowest floor, which is intended for the protection of a water tank or lift motor or similar use. Such structures should not be for or adapted for habitable purpose or as a workroom/store room.

Supervision System

A combination of sensing equipment and control equipment designed and installed to activate a safety device.

Supplier

A supplier directly sells natural gas to a customer (this supply function may or may not include shipping). The CRU licences suppliers only when it is satisfied as to their ability to finance their operations and provide a satisfactory level of service to the customer.

A list of Gas Suppliers is available on the CRU website https://www.cru.ie/home/customercare/energy/communication/

Supply Pipework

Refer to installation pipework.

Ventilated Space

A space where the air is permanently replaced by natural or mechanical means.

Void

A space in a building lacking any air flow. Any enclosed, generally inaccessible and unventilated.

Vent Pipe

A pipe to convey the flow of venting gas to a safe location.

Wrap

Material used to protect pipes from corrosion.

8.7 Applicable Standards for Industrial Installations

European Codes/Irish Standards:

I.S. 329 – Code of Practise for Distribution Gas Mains (Gas Networks Ireland)

SR 12007-5 - Gas Infrastructure – Pipelines for maximum operating pressure up to and including 16 bar

I.S. EN 1776 – Gas Supply Systems – Natural Gas Measuring Stations

I.S. EN 12327 – Gas Pressure Testing, Commissioning and Decommissioning Procedures

EN 15001-2 and I.S. /EN 15001-2

I.S. 820 – Non Domestic Gas Installations

www.nsai.ie www.standards.ie or (01) 8073878

Technical Guidance Documents (Buildings Regulations)

Local Government (Multi-Storey Buildings) Act 1988

Government Publications

email: publications@opw.ie

Tel: (01) 647 6879

3.1 Irish Standards

The appropriate Irish Standards are as follows:

- **SR 12007-5:** "Gas Infrastructure – Pipelines for maximum operating pressure up to and including 16 bar"
- **I.S. 329:** Code of Practice for Distribution Gas mains
- **I.S. 820:** Non domestic Gas Installations
- **I.S 821:** Gas Pressure Regulating Stations for Distribution
- **I.S. 822:** Gas Pressure Regulating Stations for Service Pipelines
- **I.S. EN 1555:** Plastic Piping Systems for Gaseous Fuels Supply
- **I.S. EN 1776:** Gas Supply Systems – Natural Gas Measuring Stations
- **I.S. EN 12007:** Gas Supply Systems – Parts1-4: 2000
- **I.S. EN 12186:** Gas Supply Systems – Gas Pressure Regulating Stations forTransmission and Distribution
- **I.S. EN 12279:** Gas Supply Systems – Gas Pressure Regulating Installations on Service Lines
- **I.S. EN 12327:** Gas Pressure testing, commissioning and decommissioning procedures

ATEX and Hazardous Area Classification Standards

- **IS.EN. 60079-10:** Electrical Apparatus for Explosive Gas Atmospheres: Classification of Hazardous Areas.
- **IGE/SR/25 part 2** Hazard Area Classification of Natural Gas Installations.
- **99/92/EC:** ATEX 137 Workplace Directive
- **94/9/EC:** ATEX 95 Equipment Directive
- **IGE/SR/24:** Risk Assessments

3.2 Gas Networks Ireland Specifications and Design Manuals

All meter installations shall comply with the latest editions of following Gas Networks Ireland specifications:

- **BGE/DBU/MRA/0:** Supply, Fabrication, Delivery of District Regulators, Low and medium Pressure Regulator/Meter Assemblies for 65 – 4000 scmh.
- **DO/DS/DM/001:** Design Manual for Industrial and Commercial Meters
- **ICMRP Design Policy Document**
- **BGE/D/2/04:** Mains/Service terminations for inlet to skids
- **BGE/D/3/05:** Isolation Valve Details up to 4bar

Readers Notes

Disclaimer

Gas Networks Ireland

The main contact details for
Gas Networks Ireland are:

General Enquiries
1800 464 464

24hr Emergency Service
1800 20 50 50

info@gasnetworks.ie
@GasNetIRL

gasnetworks.ie

41187/03/2018