



# ADDITIONAL INFORMATION FOR WORKING AROUND GAS INFRASTRUCTURE

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## GAS DIVISION

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## 1. INTRODUCTION

This document describes the requirements of ATCO for planning and conducting works near the gas distribution network (Network) which is owned and operated by ATCO within Western Australia.

The term “near” is defined in more detail throughout this document.

The most important first step is to request Dial Before You Dig (DBYD) plans which cover the area in the vicinity of the relevant work site.

ATCO will then provide you with detailed requirements for working around the gas infrastructure. This document is intended to help proponents to understand the controls expected by ATCO, for planning work, and operating safely around ATCO’s infrastructure.

**Caution:** You are solely responsible for ensuring that all safety precautions and measures on site are met, and must endeavour to ensure that no damage occurs to the gas pipeline.

This document is ‘live’ and therefore subject to change. You must always use the latest version, which is available by contacting ATCO, or visiting [www.atcogas.com.au](http://www.atcogas.com.au).

ATCO aims to continuously improve the advice it provides to help avoid delays, or rework, or additional work and associated extra costs being incurred. The Feedback Form, which is located at the end of this document, can be used to provide improvement suggestions to ATCO.

### 1.1 Glossary

**Table 1: Terms used within this document**

Term	Reference
<b>Approved Locator</b>	ATCO approved HP gas pipeline location officers.
<b>ATCO</b>	ATCO, Gas Division Australia
<b>DBYD</b>	Dial Before You Dig, call <b>1100</b> or <a href="http://1100.com.au">1100.com.au</a>
<b>Engineering Services</b>	The department of ATCO responsible for providing engineering advice relating to the safety of the Network.
<b>HP</b>	High Pressure, refer to Table 4 for where requirements apply.
<b>Network</b>	The gas distribution network which is owned and operated by ATCO. This includes high pressure gas pipelines, along with other gas mains, services and facilities.
<b>Proponent</b>	Developer, Builder, Owner, Contractor or Customer planning or conducting works near the Network.

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## 1.2 Further Information

- Refer to the **Related Documents** (section 7) for a list of standards and legislation.
- Refer to the **Feedback Form** (at the end of this document).

## 2. SAFETY INFORMATION

### 2.1 Emergency Contact Details: 13 13 52\*

In the event that you become aware of any gas leak or damage to a gas pipe, act immediately:

- Leave the area;
- Keep people clear of the area;
- Allow gas to vent into the air;
- Eliminate ignition sources (i.e., no smoking, do not light a match / lighter, extinguish any naked flames);
- Do not use any devices which may be an ignition source (this includes vehicle engines, mobile phones, power tools or appliances, electrical or light switches and torches);
- Where safe to do so, shut off all machinery, vehicles, tools and equipment in the area;
- Once clear of the area, immediately contact:

**ATCO – Faults and Emergencies on 13 13 52\* (24 hours).**

**Do not attempt to stop the flow of gas or repair the gas infrastructure.**

\* Local call fee from anywhere in the state excluding mobiles.

### 2.2 Duty of Care for Working around Gas Assets

Working near any gas pipeline, especially a High Pressure (HP) gas pipeline, can be extremely dangerous. You should always exercise due care and caution when working near any gas infrastructure.

Refer to Table 1 and Table 4 for the ATCO definition of HP.

In addition to your general duty of care, there may be other obligations under the *Occupational Safety and Health Act 1984* (and other relevant legislation) which require you to maintain safe practices.

In addition to any legal obligations that you may have under the *Occupational Safety and Health Act 1984* (and other relevant legislation), ATCO may prescribe specific requirements for working on and around its gas infrastructure. These requirements are designed to protect the Network and other infrastructure, people who may be working on and around the gas infrastructure, and the general public.

Due care must be taken at all times not to damage the gas pipelines or the protective coating covering the gas pipelines. Any damage to gas pipelines, their protective coating, or other assets must be reported to ATCO Faults and Emergencies immediately.

**Caution:** Unreported damage has the potential to endanger public safety and any wilful or negligent damage to ATCO pipelines or other infrastructure may be a prosecutable offence.

## 3. OUR NETWORK

### 3.1 About Us

ATCO is a private company delivering safe, reliable, cost-effective natural gas to West Australians. As a gas distribution company, ATCO builds, owns and maintains an underground network of pipelines that bring natural gas to approximately 750,000 West Australians. Along with building and maintaining the network, we also perform the work to connect your gas and read your meter.

ATCO's assets are located across the Perth greater metropolitan area, Albany, Brunswick Junction, Bunbury, Busselton, Capel, Geraldton, Harvey, Kalgoorlie, and Pinjarra. Throughout this document we refer to our networks of gas infrastructure within Western Australia as "the Network".

ATCO Gas Australia Pty Ltd, ACN 089 531 975 is part of the ATCO Group of Companies.

### 3.2 Gas Distribution Network Information

#### 3.2.1 Gas Distribution Network Standards

ATCO pipelines are designed, constructed, tested and operated in accordance with the following relevant Australian Standards (AS):

- AS2885 Pipelines – Gas and Liquid Petroleum
- AS/NZS 4645 Gas Distribution Networks
- AS4799 Installation of Underground Utility Services and Pipelines within Railway Boundaries
- AS/NZS 4853 Electrical Hazards on Buried Metallic Pipelines

#### 3.2.2 Gas Distribution Network Assets

The Network comprises both below ground and above ground assets including gas services, cabling, anode beds, concrete slabbing, vent poles, pits, test posts, signage and cabinets which may not be marked on the DBYD plans. Caution must be used at all times.

Gas services (and/or gas pipeline road crossings) to individual premises will often not be shown on the DYBD plan or gas asset drawings. As a matter of caution, you should assume that there are gas services present in the ground and take care to locate them prior to and during excavation and backfilling works.

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With the exception of Albany, our Network reticulates Natural Gas from transmission pipelines to customers. The Albany network reticulates Liquefied Petroleum Gas (LPG) vapour from a storage facility. While Natural Gas is lighter than air, LPG is heavier than air and can pool in low lying areas like trenches or potholes. Additional caution should be used when working around the LPG network in Albany.

### 3.2.3 Pipeline Depth of Cover

Over time the ground profile, site conditions and other aspects of a location may change. Accordingly, it should not be assumed that any works will be safe based on the typical minimum depth of cover, the actual location of gas assets must first be proven as per Section 5.2. Furthermore, fittings are often installed on the pipes which may protrude above the general elevation of, or alongside, the pipeline.

Any alterations to the ground conditions must comply with the following, unless otherwise approved by Engineering Services:

- HP gas pipelines, including both steel and polyethylene pipelines, require a minimum 1200mm depth of cover, particularly under roadways, traffic area or potential traffic areas. The maximum depth of cover over a HP gas pipeline must not exceed 1.8m unless otherwise approved. Refer to Section 5.2 for clarification of how ATCO defines assets as being HP.
- Other gas mains require a minimum 750mm depth of cover. Increased depth of cover may be required under roadways, traffic area or potential traffic areas. The maximum depth of cover over these gas mains must not exceed 1.5m unless otherwise approved.

Refer to Table 7 for further details.

Where the existing depth of cover does not comply with the minimum levels indicated above, there is an increased risk of damage to gas infrastructure. Reduced depth of cover can impact on the safety of a wide variety of activities, including common works near ground level and vehicle crossings. In these instances, further advice should be sought by contacting Engineering Services.

### 3.2.4 Abandoned Assets

Engineering Services must approve removal of any abandoned (AB) (or retired) assets in writing and in accordance with the following conditions:

1. Prior to the removal of any abandoned pipelines, the pipes must be tested by ATCO to confirm the absence of gas.
2. Gas testing can be arranged by Engineering Services once the request for removal has been received.
3. The requesting party will be liable for all costs involved in conducting the gas testing.

Where approval has been provided the requestor must supply an “As Removed” drawing (or gas map sketch) within 24 hours, which will enable ATCO to update the Network mapping system.



Assets annotated as ABS (Abandoned Sold) on DBYD plans are assets that have been sold to a third party. These pipes may contain third party utility assets and should be treated with care. These are indicated on the DBYD for reference only, ATCO makes no assurances about their contents, condition, removal or otherwise.

### **3.3 ATCO Contact Details**

#### **3.3.1 General Enquiries**

For more information about ATCO and all general enquiries, contact us on **13 13 56** (Monday to Friday, 7am to 6pm), or visit [www.atcogas.com.au](http://www.atcogas.com.au)

#### **3.3.2 For Faults and Emergencies**

Call ATCO Faults and Emergencies on **13 13 52\*** (24 hours).

#### **3.3.3 HP Officer**

To obtain or modify a HP Notification (see Section 6.2 below), forward all relevant details and contact the ATCO HP Officer between 8am – 4pm weekdays:

*Phone: 1300 926 755*

*E-mail: [HPenquiries@atcogas.com.au](mailto:HPenquiries@atcogas.com.au)*

#### **3.3.4 Engineering Services**

For works that may require alteration to the Network or for an Engineering Assessment of your proposed works, please send all relevant information to Engineering Services:

***ATCO – Engineering Services***

***Locked Bag 2, Bibra Lake DC, 6965***

*E-mail: [Engineering.Services@atcogas.com.au](mailto:Engineering.Services@atcogas.com.au)*

ATCO should be contacted at the above address at the earliest stage of the design, in order for assessment and (if necessary) relocation work to be planned and completed to ATCO's requirements, well in advance of your works.

## **4. WORKING NEAR GAS INFRASTRUCTURE – PLANNING WORKS**

### **4.1 Working near ATCO's Assets**

Any activities occurring near gas infrastructure require due consideration of the risks and controls to ensure they can be conducted safely. At closer proximity the risk and extent of controls will increase accordingly, as indicated throughout this document. Unless stated to relate to depth or radial distance from the infrastructure, the distances in this document relate to the horizontal distance from the pipeline alignment, not including any vertical separation.

Certain types of assets have additional risks that necessitate particular controls being imposed, such as HP gas infrastructure and metallic pipework. These controls will typically apply for works that are within **15m** of the gas infrastructure.

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Activities likely to result in high vibration levels have increased ranges of influence where they may impact the safety of the gas pipeline, particularly piling (30m) and blasting (100m). High Voltage assets may also influence the safety of metallic assets over large distances. Please refer to the relevant parts of Section 5 regarding these types of activities.

## 4.2 DBYD Plans

DBYD plans should be obtained and reviewed at the earliest stage of planning your works. These plans will help identify the presence of gas infrastructure and their approximate location. The gas pipeline annotation identified on the DBYD plans will help you to identify the type of gas pipeline and some key properties.

Some examples:

**300 ST 4.2 HP 1920kPa**  
**160 PE 1.5 HP 700kPa**  
**110 PE 1.5 PEHP 350kPa**  
**100 PVC 1.5 MP 70kPa**

Where

**300** = Nominal Diameter of the pipe in mm (i.e., DN300mm)  
**ST** = Material of pipe (Steel, Polyethylene, Polyvinyl Chloride, etc.)  
**4.2** = Approximate distance from property boundary in metres (as recorded)  
**HP** = Network descriptor (a full list is detailed in Section 6.1)  
**1920** = Maximum Allowable Operating Pressure (i.e., MAOP = 1920 kPa)

Guidance on the interpretation of the DBYD plans is provided within the DBYD cover sheet. Where the works will be in close proximity to the underground assets, a more accurate position will be required to facilitate further detailed design and construction works. In this instance, locating of the pipeline must be conducted in accordance with Section 5.2.

## 4.3 Design of Works around Gas Infrastructure

The most effective means of reducing the risks of working around gas infrastructure is to plan works in locations where the gas infrastructure is not located, or locations where the impact can be minimised. Where this is not possible, risk can be minimised through accurate locating and maximising clearances during the design phase.

Safety in design should be paramount, with due consideration of safe methods for the construction of the works and the ability to apply adequate controls for these activities. The design documents must take into account the requirements outlined within this document, along with any other controls that may be required by ATCO.

### 4.3.1 Separation Distances

Guidance on separation distances are outlined in the following sections. You must consult with Engineering Services to confirm the separation and/or parallel distance (buffer zone) from the gas pipeline where these cannot be achieved.

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You must receive approval from ATCO where new infrastructure will result in exclusion zones or other restrictions on access to ATCO's assets, including any restrictions on excavations within the vicinity of gas assets.

#### **4.3.1.1** *Underground Infrastructure*

The installation of underground assets must not restrict access to ATCO's assets, including the prevention of or restriction on excavation without shoring or other means of trench support. Infrastructure must not be installed in close proximity to gas assets where access restrictions are required unless controls are installed to maintain access as approved by Engineering Services.

The installation of any underground infrastructure must be conducted in accordance with Sections 5.3 and 5.4.

#### **4.3.1.2** *Posts and Poles*

Posts or poles (including post/sleeves for water monitoring points) must have suitable clearance to gas assets with appropriate shoring or restraints to protect and maintain access to gas assets. This generally requires a minimum clearance of 1.5m to HP Gas Pipelines, or 1m to other gas mains. For clearances less than these distances, approval from Engineering Services is required for each specific site. Exceptions may be considered for the replacement of existing poles.

Posts and poles located within road reserve, such as those used for signage and lighting, must have adequate clearance to gas assets to prevent damage in the event of vehicle impact. Where approval for installation with reduced clearances has been requested, the party conducting the works must demonstrate that the post or pole will not damage gas assets in event of a vehicle impact, through frangible post design or otherwise.

#### **4.3.1.3** *Structures and Footings*

Separation distances to structures / walls / footings / retaining walls / gantry or hoardings must be maintained, typically 1.5m depending on alignment. In general, no structure can be installed over any pipeline. No opening to an enclosed structure is allowable within 3m of any HP asset, or within 1m of any other gas asset. Any installation must consider safe access to the gas pipe in case of emergency access, i.e., that adequate separation be maintained so that when excavating the gas pipe or other asset, that there is no risk of the installed structure toppling / collapsing or otherwise effecting the gas asset or the personnel working on that gas asset.

#### **4.3.1.4** *Planting of Vegetation*

In general, planting of vegetation around the gas assets is acceptable provided that the roots of the plant are not capable of causing damage to the Network and free passage is maintained along the pipeline route. Separation distances should be planned, and the expected height of the fully grown plant should be taken into account so that the plant cannot fall onto any compound fence or above ground asset, nor the roots interfere with the gas pipes or below ground assets. Damage and increased fire risk are issues for above ground assets, whilst breakages, restriction of flows and damage to pipeline coating are issues for below ground assets.

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Table 2 contains guidelines for the appropriate mitigation of roots to be followed when planting trees near gas pipelines. If further guidance is required, please contact Engineering Services.

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**Table 2: Root mitigation for planting of vegetation near gas pipelines**

Distance from Gas Asset	Required Root Mitigation Methods
Greater than 3m	A minimum buffer of 3 metres is required between trees and gas mains for deep-rooted trees if root arrestors or other mitigation methods are not used.
1 – 3 metres	<p>Inside the 3-metre buffer zone, specific tree types may be accommodated after further consultation with Engineering Services and the use of special root barriers that would mitigate any damage to gas pipelines and other services in the vicinity.</p> <p>Root arrestors normally consisting of properly wrapped and secured robust polyethylene / nylon sheeting or solid concrete cylinders must be employed to a minimum depth of 1m; or 250mm deeper than the gas pipeline, whichever is greater.</p>
0.5 – 1 metres	<p>With less than a 1-metre buffer to pipeline, additional robust physical root barriers are required. These must extend 250mm deeper than the gas pipe as a minimum and allow for a minimum 300mm lateral clearance between the root barrier wall and the gas pipe wall, after consultation with Engineering Services.</p> <p>In this case, heavy preformed concrete or polyethylene pipe / liners used as root barrier are mandatory (e.g., Rocla or similar type concrete pipe or PE stormwater / sewer pipe). Concrete soakwells used as a root barrier around the tree next to a gas main are another approved option subject to blocking all holes on the full half side facing the gas main.</p>
0 – 0.5 metres	Planting directly over gas mains is not permitted in any location, as it prevents emergency and maintenance access. Local tree roots may eventually break the gas pipe and leaking Natural Gas will likely kill any vegetation in contact.

#### 4.4 Tendering for Construction

Do not issue any tenders or commence any site-works, without first contacting ATCO to assess whether any ATCO assets may be affected by proposed works. You should obtain advice in writing from ATCO regarding the separation distance required and any relevant conditions that may be imposed prior to calling for tenders.

You should specify in the tender / construction documentation that the successful site-contractor will need to comply with the requirements of this document (as a minimum). For works near High Pressure Gas Infrastructure, the requirements of Section 6 will also apply. These include the use of an Approved Locator to search for, and visually identify, the existing gas pipelines on site immediately prior to commencing any site-construction or any site-works, to confirm and visually verify the accuracy and relevance of any proving results that were obtained during the design stage.

## 4.5 Engineering Services Enquiry

Where acceptable conditions for proposed works are not detailed within this document, please enquire with Engineering Services to establish a suitable approach for proceeding with the works. Some scenarios requiring assessment by Engineering Services are listed throughout this document.

In most cases the works will be allowed to proceed with suitable controls in place. However some cases require certain limitations or restrictions to be enforced to maintain the safety of the Network. Where adequate clearances or controls **cannot** be applied, relocation of either the proposed works or the gas infrastructure may be required to facilitate the proposed works. In each case, you must make a written request regarding the proposed works to, and obtain written approval from, Engineering Services prior to proceeding.

### 4.5.1 Required Lead Times

ATCO should be contacted at the earliest stage of the design, in order for any assessment and necessary relocation work to be planned and completed to ATCO's requirements, well in advance of your works (refer to Table 3 for typical requirements). You should allow four weeks for an initial Engineering Assessment of the works, with further time required if the works are complex and/or further information is required to properly assess the works.

Where you require any works (including alterations / relocations) to be conducted on the Network to facilitate or otherwise allow your works to proceed, the minimum time frames for conducting the works should be allowed within your project from the time of the initial assessment.

**Table 3: Minimum time frames when requesting works**

Work Requested	Time Frame
Altering / relocating HP gas pipelines	12-18 months
Altering / relocating other gas mains	6 months
Gas check on abandoned assets (Section 3.2.4)	4 weeks
DCVG survey to inspect for pipeline coating damage (Section 5.10.1)	4 weeks

### 4.5.2 Making an Enquiry to Engineering Services

Please ensure that all relevant information relating to projects that may impact upon the Network are provided to:

**ATCO – Engineering Services**

**Locked Bag 2, Bibra Lake DC, 6965**

**E-mail to:** [engineering.services@atcogas.com.au](mailto:engineering.services@atcogas.com.au)

When submitting proposed works to Engineering Services for assessment, the following items may be requested depending on the nature of the work. Please have this information readily available for review by the Engineering Services team:

- scope of works, including all activities whether temporary or permanent;
- location of works / extent of site;

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- plans / drawings showing the proposed works, including:
  - location of works / extent of site;
  - changes to the surface types / surface levels;
  - location of the gas infrastructure relative to the works;
  - depth of cover of the gas infrastructure and any proposed changes;
- safe work method statements, including the type and size of equipment to be utilised and the proposed clearances for the equipment;
- risk assessments relevant to the works / gas infrastructure, including controls in place to prevent damage to the gas infrastructure;
- relevant calculations for the works, such as surface loading from heavy vehicles; and
- proposed timing of the works / requested response time.

Pipeline alterations / relocations that are required are typically completed at the proponent's cost. ATCO will not be responsible for delays or liable for any costs associated with any potential delay due to issues with compliance to any requirements.

## 5. WORKING NEAR GAS INFRASTRUCTURE – CONDUCTING WORKS

You must not conduct any works / activities on-site within 15 m of HP gas infrastructure prior to obtaining a HP Notification relevant to the works, as detailed in Section 6.

- All construction personnel must be made aware of the presence of gas infrastructure at the daily pre-start meetings and the weekly toolbox meetings, with due consideration given to the gas infrastructure within the relevant Job Safety Assessment / Take 5.
- Gas warning signs / sign posts must not be disturbed, relocated, removed, or altered without the prior written approval of Engineering Services.
- Sources of electrical energy such as generators or other machinery must not impart any current or voltage to the gas assets.

### 5.1 Current DBYD Plans

Current DBYD plans must be obtained immediately prior to any construction commencing within a project area. Current plans must be kept on site throughout the duration of the works (current means 30 days from the date of request).

DBYD plans must be available on site in **colour** and of a clearly legible size (either in hard copy or in electronic form).

### 5.2 Locating Gas Assets

Prior to works commencing, it is the responsibility of the manager of the works, the onsite supervisor and the machine operator to arrange location of all assets that might be affected by the works to protect these assets during the work activities, and to conduct the works safely.

The presence of gas infrastructure can be readily determined by conducting a DBYD enquiry (Section 4.2). After receiving the DBYD plans, buried gas assets can be located through safe excavation methods (potholing) as detailed in the following sections.

A small percentage of the gas pipelines (approximately 10% of the Network) will require location by an Approved Locator (refer to Table 4 and Section 6.1). For the rest of the Network, it is acceptable for the proponent to hand dig to identify the location of the gas pipelines. Where the operator is not familiar or confident working around gas assets, the use of an Approved Locator is recommended.

**Table 4: Where an Approved Locator is required**

Pressure	Acronym	Network Descriptor
350kPa	PEHP	Polyethylene High Pressure, sizes DN160mm and above
	CHP	City High Pressure
500-6900kPa	HP	High Pressure

NOTE: ATCO refers to the assets identified in Table 4 as HP.

When working near or above gas pipelines or services, the location of the gas assets must always be pegged or suitably visually indicated.

#### 5.2.1 Locating Buried Assets (Potholing)

Potholing is the practice of hand digging or vacuuming a test hole to expose underground assets to ascertain their exact position and depth. Potholing must be carried out prior to any drilling or excavation that may impact these underground assets.

Potholing can be carried out with a hand shovel or by vacuum extraction. If using vacuum extraction, please note that water jetting at high pressures has the potential to damage buried assets. Care should be taken if water jetting and water pressures should be limited to 1500 psi (100bar) to avoid damage. Potholing should never be carried out with a mechanical excavator.

Prior to any potholing being carried out you must read the DBYD plans to fully understand what utilities are in the vicinity and identify any associated street furniture (access pits, test posts, etc.). You are not permitted to conduct any works (including potholing) within 15 metres of HP gas assets without a valid HP Notification being issued by ATCO, other utilities may have similar conditions for works around their assets.

It is common practice to utilise sections of PVC or other material to locate and mark the pipeline. Once the measurements have been made, the marker poles must be repositioned vertically to ensure there is a minimum of 300mm clearance from the gas pipeline to the bottom of the marker.

**Note:** An end cap must be attached to the bottom of the marking pipe to prevent damage to the underground asset.

Clean fill must be replaced around the pipe and under the post to return the soil to ground level. This will assist in preventing damage to the pipeline from vertical impacts to the marker posts, forcing the posts down onto the pipeline.

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Consideration should be given to utilise qualified locators for all asset locations. For HP gas assets, an Approved Locator must be used in all cases, after a valid HP Notification has been issued (refer to Section 6).

In addition to potholing to locate the asset, strategic slip trenching should be considered for all drilling or excavation works. Slip trenching provides a visual separation to underground assets and is useful, and may be required, when drilling near gas assets or other high risk utilities.

If unable to locate the service, contact the utility provider and your supervisor and do NOT proceed with any drilling or mechanical excavation.

### 5.2.2 Locating Assets under Slabbing

In some locations concrete (or other appropriate material) slabbing has been installed to protect the gas assets from damage. Protective slabs can often be identified through writing on the top of the slab (i.e., 'HP Gas Pipeline') or through the presence of yellow gas warning tape across the top of the slab. Where these slabs are required to be removed to positively identify the gas pipeline, an Approved Locator must always be used.

DBYD information may indicate the start and end points of the slabs. Slabs are generally 1.2m x 1.2m of concrete with lifting lugs to assist with removal, however other materials (and configurations) are becoming more commonly available. Gas pipes are generally 300mm below the bottom of the slab. Where required, excavate to allow removal of the slab ensuring that other assets are located and protected. Using an Approved Locator, remove the slab and store it in a safe location to prevent damage to the slab or from the slab falling into or causing collapse of the trench. Continue hand excavation under the slab until the pipeline is located in accordance with the requirements of sections 5.2.1 and 6.3. For any works around HP Gas Pipelines, the pipe itself must be visually sighted.

On completion of the works the protection slabs must be reinstated using an Approved Locator. A minimum of 300mm clean fill must surround the gas assets and the gap between slabs must be no greater than 200mm and no less than 25mm.

**Caution:** Concrete (or other appropriate material) slabbing is often used to protect the pipe in instances of reduced depth of cover or in areas of high consequence. Due caution should be exercised for works to proceed safely.

### 5.2.3 Locating Assets Bored within Rock

For location of bored sections of pipe within rock where the pipe cannot be visually checked, contact with Engineering Services is required to determine clearances and crossing requirements. In these situations, DBYD information may indicate the start and end points of the bores, but where drawings do not show this information please contact Engineering Services. At the bore entry or exit point the pipeline should be located and exposed utilising the location requirements of this section. The pipe within a bore should either be steel or PE, and if PE have tracer wire attached to the PE pipe. This tracer wire or the steel pipe can be used by an Approved Locator to attach a locating signal for positioning the pipe within the bore for depth and alignment. In some cases, additional bore information (bore logs) is available.

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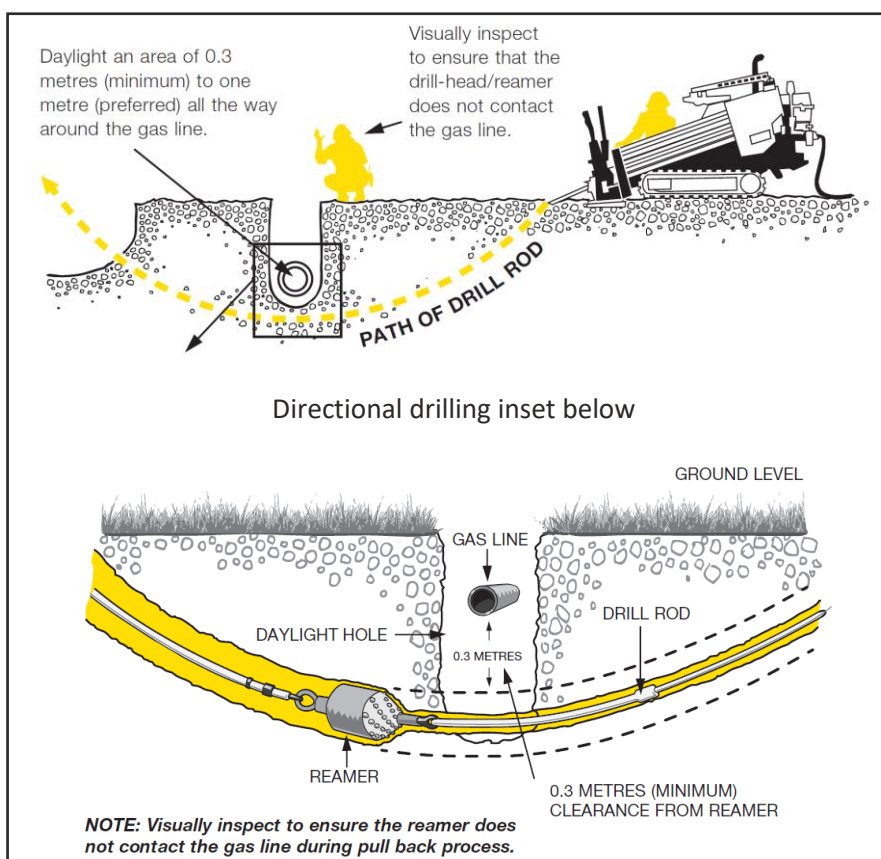
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### 5.3 Service Crossing under, or over, any Gas Pipeline

At the proposed crossing, you must locate the gas pipeline and verify its position and depth visually at the proposed crossing point. Any service crossing must be perpendicular to the gas pipeline, unless written approval from Engineering Services is obtained prior to the installation of the service.

You will need to visually sight the gas pipeline again, using a suitable non-mechanically excavated observation pit, to ensure that the drill / header / auger / jacking-pipe / crossing being used is able to be clearly seen by eye. This is to ensure that you are able to observe where the location of the gas pipeline is at all times and to prevent any possible damage to the gas pipeline from the installation of the crossing (refer Figure 1). Unseen jack / drilling / header advancing, or 'blind boring', pose high risks to the gas pipeline and should not be attempted under any circumstances.

**Caution:** No machinery is to be used within 1m of a HP main – exposure is by **non-mechanical excavation only**.



**Figure 1: Observing and maintaining safe clearances when boring**

A minimum clearance of 300mm is required between the gas pipelines and any third party pipe or service crossing. For concrete mains passing above gas pipelines a minimum clearance of 500mm is required.

Plunking is not an accepted hand excavation technique, when working in the vicinity of gas assets, and requires equivalent controls and supervision as mechanical excavation.

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## 5.4 Service Paralleling a Gas Pipeline

To determine the position of the pipe, you will need to locate the gas pipeline at 10m intervals along the parallel straight sections and physically locate all bends, junctions / laterals service offtakes and tapings / protrusions and at entry and exit locations. Some site conditions may require intervals of 5m or less for accurate location of services.

With the exception of potholing to locate the pipe, installation works must not disturb the ground 500mm all around the gas assets. This includes the collapsible area around the excavation due to the angle of repose or natural angle of the lay of the soil during the works. On completion of potholing, the ground around the pipe should be reinstated to existing ground levels as described in section 5.2.1 and section 6.3 (as relevant to the specific circumstances).

The services must not be installed such that the gas pipeline cannot be safely accessed without working in the collapsible zone of the service. For any installation less than 1-metre from a gas pipeline, pothole spacing must be no greater than every 5 metres.

**Caution:** You are solely responsible for ensuring that all safety precautions and measures on site are met, and must endeavour to ensure that no damage occurs to the gas pipeline.

## 5.5 Hot Works

All hot works conducted within 15m of any gas infrastructure must be in compliance with applicable laws and Australian Standard 1674. Typical hot works include grinding, welding, thermal cutting, concrete cutting (wet or dry) or heating, and other related heat-producing or spark-producing operations including non-mechanical cable jointing.

The presence of gas infrastructure must be specifically identified as a hazard, with the requirements of Section 3 Hazardous Areas within AS1674.1 applied accordingly. These requirements include a hot works permit authorised by a responsible officer, monitoring for flammable gases, and response procedures in the event of fire or flammable gas detection. Do not let heat sources or hot works impact on gas infrastructure and take into consideration that the ground or adjacent structures may also be capable of transmitting heat so as to circumvent protection afforded by a heat shield or barrier.

ATCO requires a review by Engineering Services prior to hot works where there is excavation resulting in less than 600mm ground cover to buried gas infrastructure, or within 5m of any gas infrastructure located above-ground (including any pits or valve covers).

## 5.6 Changes to Ground Levels or Surface Conditions

Material must not be placed on or near the pipeline, nor can ground levels be altered without written permission from ATCO. Any proposed alterations to the finished surface level, width or surfacing of any street, road reserve or crossover must be submitted to Engineering Services for assessment in-line with this document.

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If up to 100mm depth of cover is to be temporarily removed over a HP pipeline for the installation of a domestic driveway, the driveway has a width of less than 10m and a hand held compactor or bobcat of less than 1.7T is proposed, then works may proceed with a HP Notification. Driveway construction not in accordance with these parameters will require assessment by Engineering Services prior to commencement of site works, and may require a Pipeline Coating Survey to be undertaken as detailed in Section 5.10.1.

Routine road maintenance consisting of resurfacing existing road surfaces without excavation deeper than 100mm can proceed with a HP Notification. Changes to road levels, widths or maintenance with deeper excavation requirements will require assessment by Engineering Services prior to commencement of site works.

## **5.7 Operating over Gas Infrastructure with Vehicles or Heavy Equipment**

Vehicles crossing over the pipeline are limited to light vehicles (gross vehicle mass not greater than 4.5 tonnes) or heavy vehicles on established sealed crossovers (compliant general access (as of right) vehicles). Any crossings with reduced cover or exceeding the above limits must be assessed by Engineering Services.

## **5.8 Vibration and Compaction Operations**

### **5.8.1 Vibration**

To avoid pipeline damage, vibrations from any site-works or activities must not exceed 5 mm/sec Peak Particle Velocity (PPV) as measured at the gas pipeline, by an ISO 9000 quality-accredited vibration monitoring company. If requested, you must provide ATCO with the results of the vibration readings by the next working day.

### 5.8.2 Compaction

Methods of compaction within the proximity of gas pipelines must be restricted to prevent damage to gas pipelines and their coatings. Compaction requirements are subject to site review, with Table 5 providing a guide to acceptable compaction methods around gas infrastructure, including to pipelines with reduced depth of cover. Any compaction not in compliance with these guidelines must have written agreement from Engineering Services prior to conducting any works.

**Table 5: Allowable compaction near gas pipelines**

Horizontal distance to gas pipeline	Minimum undisturbed depth-of-cover provided		Size of Compacter / Roller	Vibration mode
0 – 5 metres	300mm		Small hand-held plate compacter only	Any vibration setting
	500mm		Hand-held larger plate compacter	Any vibration setting
			Maximum (total) 8-tonne tandem-drum	Static roller only (no vibration)
	900mm All HP	750mm PVC & PE	Maximum (total) 8-tonne tandem-drum	<b>low-amplitude</b> vibration setting only
			Maximum (total) 10-tonne vibratory roller	Static roller only (no vibration)
5 – 10 metres	N/A		Maximum (total) 8-tonne tandem-drum	Any vibration setting
			Maximum (total) 10-tonne vibratory roller	<b>low-amplitude</b> vibration setting only
10 – 15 metres	N/A		Maximum (total) 10-tonne vibratory roller	Any vibration setting
> 15 metres	N/A		No restrictions	

Any compaction in rocky areas must be submitted to Engineering Services for assessment prior to works commencing. Consideration should be given to using oscillating rollers rather than vibrating rollers.

### 5.8.3 Piling

No pile-driving, sheet-piling, vibro-piling, hammer-piling is permitted within 30m of a gas main, except with specific prior written consent from Engineering Services. It should be noted that contiguous piling is a preferred method of retaining, subject to assessment by Engineering Services.

### 5.8.4 Blasting / Seismic Survey / Explosives

No blasting, seismic survey or any use of explosives is permitted within 100m of a gas main, except with specific prior written consent from Engineering Services. Calculations demonstrating the predicted maximum particle velocity will be required for assessment by Engineering Services.

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## 5.9 Dewatering

The site contractor must make sure that any dewatering on-site does not result in gas pipeline subsidence. You are responsible for engaging specialist dewatering firms to submit relevant dewatering calculations and figures to ATCO for acceptance, showing that your dewatering operations will have no detrimental impact to our pipeline. We will review your submission and, depending on the proposed impact, you may be required to install a monitoring bore(s).

## 5.10 Additional Requirements near Metallic Pipelines

### 5.10.1 Pipeline Coating Surveys

Prior to any road works or ground surface treatments occurring, Pipeline Coating Surveys may be required in order to check the condition of the gas pipeline's protective coating. You will be responsible for the costs of any testing required.

Generally, if 10m or more of steel HP gas pipeline will subsequently be located within 500mm measured horizontally, or under, the finished surface of the road / driveway or shoulder you must first pre-organise with Engineering Services to perform a Direct Current Voltage Gradient (DCVG) Survey to determine the condition of the pipeline coating.

If the survey indicates that additional coating protection or coating repairs will be required, please ensure that you allow for additional time in your project in order to arrange these works. You should not call for tenders or commence site-works, before a DCVG Survey and/or pipeline coating repair is completed.

If any coatings are found to have been damaged by your works or activities, or by the lack of preventative actions, then you will be charged for the costs associated with the damage and repair of the coating, including any indirect damage that has occurred during your works such as coating damage from excessive vibration.

### 5.10.2 Electrical Equipment

Sources of electrical current (such as above and below ground electrical cables, earth rods, substations, transformers, or impressed current systems of non- ATCO pipelines) must not interfere with the corrosion protection and induced voltage mitigation equipment of existing ATCO assets.

ATCO requires any new electrical infrastructure near gas assets to comply with AS/NZS 4853 *"Electrical Hazards on Metallic Pipelines"*. Approval by ATCO of any proposed mitigation requirements must be obtained prior to installation of the infrastructure. During the design stage the proponent must verify the location of metallic pipelines, including any appurtenance affected by the Earth Potential contour hazard. Please note that DYBD plans may not show all gas assets nor may it distinguish from above or below ground assets.

Earthing rods, substations, transformers, earthing-stakes, non- ATCO pipeline impressed current systems, cables operating above 22kV, or banks of cables operating at 22kV, will often adversely affect the safety of the gas pipelines unless mitigation is employed in accordance with AS/NZS 4853. Engineering Services must be pre-notified in all cases, and where mitigation controls are required an Earth Potential report may be required.

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## 5.11 Exposure of Gas Assets

Where gas pipelines are required to be temporarily exposed, measures must be put in place to protect the pipelines from damage. Measures must be taken to protect the pipe from accidental (construction or vehicle impact) and deliberate damage (vandalism). Where any exposed gas pipe will be left unattended for any period of time, prior approval must be obtained from Engineering Services.

Damage by sagging must also be prevented, with safe working procedures developed for exposing any gas pipelines. For any unsupported span of pipe, Engineering Services can be contacted for advice on safe working procedures.

Table 6 can be used as a guide for maximum lengths of pipe that can be left unsupported for any period of time, subject to on-site review of the pipeline condition and safe working methods being utilised.

**Table 6: Maximum unsupported length for gas pipelines**

Pipe Size (Diameter, mm)	Pipe Material (Maximum Unsupported Length, m)		
	Steel (ST)	Polyethylene (PE)	Polyvinyl Chloride (PVC)
20	2.0	1.5	1.5
32 – 40	2.5	2.0	1.5
50 – 63	3.0	2.0	1.5
75 – 90	3.6	3.0	1.5
100 – 110	4.1	3.0	1.5
150 – 160	5.0	3.0	1.5
195 – 225	5.7	3.0	1.5
250 – 280	6.4	3.0	1.5
300 +	7.0	3.0	1.5

Prior to backfilling, a minimum of 150mm all around the pipe must be filled and packed with suitable backfilling material. The padding must be fine, loose material, equivalent to washed beach or river sand. The sand must be clean, free from all sharp objects, clay material, vegetable matter, building debris and disused road paving material.

The crown (top), of the asset must be covered with a minimum of 300mm of clean backfill material prior to mechanical compaction. The remainder of the excavation must be backfilled at 300mm increments and compacted to the density level in the surrounding sub-grade material and compaction requirements of the relevant road authority. All mechanical compaction must comply with Section 0.

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## 6. HIGH PRESSURE GAS INFRASTRUCTURE – MANDATORY REQUIREMENTS

### 6.1 Assets Subject to these Mandatory Requirements

Additional requirements are imposed on any activities occurring in close proximity to HP gas infrastructure. These requirements are in addition to the obligations set out in the planning and conducting work sections in this document. These mandatory requirements apply to all works within 15m of HP gas infrastructure, as shown in Table 7.

**Table 7: Application of Mandatory Requirements to various types of the Network**

Pressure	Acronym	Network Descriptor	Mandatory Requirements
20kPa	AMP	Albany Medium Pressure	No – LPG Network
7kPa	MLP	Medium-Low Pressure	No
70kPa	MP	Medium Pressure	No
350kPa	PEHP	Polyethylene High Pressure	No, sizes DN110mm & below
			Yes, sizes DN160mm & above
	CHP	City High Pressure	Yes
500-6900kPa	HP	High Pressure	Yes

The mandatory conditions around this infrastructure apply to all works including service location and all above ground activities that could impact on the infrastructure. The mandatory requirements are shown schematically in Figure 2 and detailed in this section, summarised as follows:

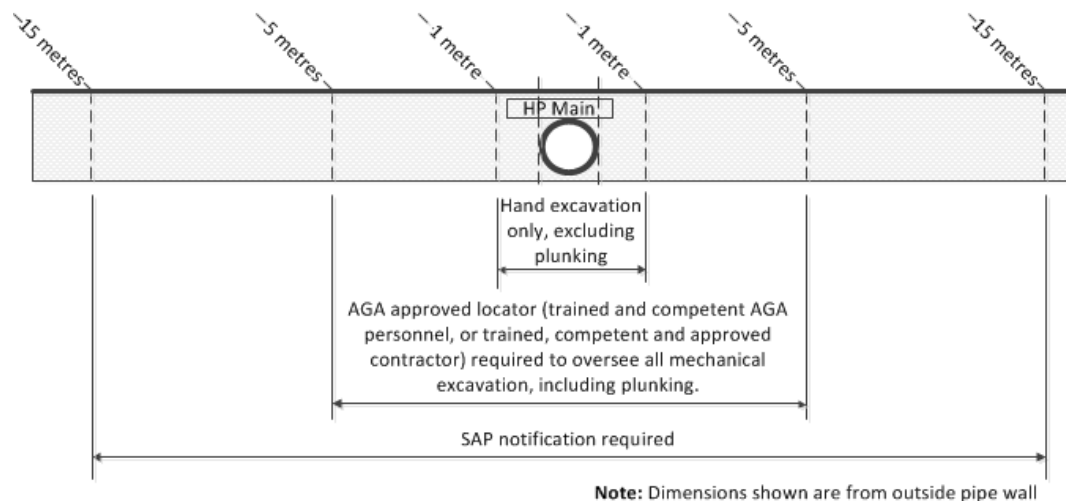
#### Works within 15m of HP Gas Infrastructure:

- All works must have a current ATCO HP Notification (Section 6.2.1).

#### Works within 5m of HP Gas Infrastructure:

- All works must have a current ATCO HP Notification (Section 6.2.1).
- Attendance is required by an Approved Locator for all activities / works (Section 6.3.1).
- The location of gas assets must be proven immediately prior to work (Section 6.3.2).





**Figure 2 Mandatory Location Requirements**

Limitations on activities and use of mechanical equipment apply (Section 6.3.2).

## 6.2 Works within 15 Metres of HP Gas Infrastructure

Due to the risk associated with working around HP gas pipelines, all works that are proposed within 15m of HP gas infrastructure must be evaluated by ATCO. Once consent is provided by ATCO as the asset owner, a HP Notification will be provided that will list the permitted activities and any conditions that must be followed. A copy of the current HP Notification must always be on site and presented to any authorised officer of ATCO upon request.

Relevant works are any action or activity or the omission of any act or activity that could affect the gas pipeline including, but not limited to:

- Weight loading onto the pipeline – heavy vehicle crossings, crane positioning, equipment storage, compaction, additional ground cover.
- Vibration loading – compaction, drilling, piling, vibratory rolling.
- Impact – digging, drilling, tie-back bars, pole installation, fencing, boring, new service installation, ground anchors, tree removal or stump grinding, etc.
- Alteration of ground conditions – road works, land developments, footpaths, crossovers, cycle paths, water courses (including swales or open drains), planting of vegetation, etc., including any activities that may limit access or cause the ground to shift or subside.
- Hot works – grinding, welding, thermal cutting or heating, and other related heat-producing or spark-producing operations per Section 5.5.

The location / position and obvert level (i.e., 'top') of all gas pipelines should be proven using direct visual identification during the planning / design stage of the project. In some instances, proving of the gas pipeline is necessary to obtain a HP Notification for subsequent activities.

### 6.2.1 HP Notification

The HP Notification is provided by the ATCO HP Officer once all requested information has been provided, and ATCO is satisfied that the works can proceed without damaging the Network. Where deemed necessary, the works may have to be reviewed by Engineering Services.

The ATCO HP Officer at their sole discretion will decide whether to issue a site specific HP Notification with accompanying conditions / requirements imposed and the proponent must comply with such conditions / requirements.

You must not conduct any works / activities on site, prior to obtaining the relevant HP Notification from the ATCO HP Officer.

**Caution:** The HP Notification must be kept on site with the works supervisor. All of the activities within 15m of HP Gas Infrastructure must be covered under the HP Notification.

ATCO regularly patrols its gas pipelines, and this HP Notification must be presented upon request by an officer of ATCO. Failure to provide the HP Notification or failure to demonstrate the works are in compliance with the approved activities may result in halting of the job until compliance with ATCO requirements is proven by the operator.

***ATCO reserves the right to notify WorkSafe and EnergySafety in cases of non-compliance and initiate prosecution as necessary.***

### 6.2.2 Required Lead Times

The minimum times that should be allowed for requesting and receiving a HP Notification to allow works within 15m of HP Gas Assets are as shown in Table 8.

**Table 8: Minimum time frames for requesting HP Notifications**

Type of Request	Time Frame
HP Notification without Engineering Assessment	2 business days
HP Notification with Engineering Assessment	4 weeks

Where the proposed works are altered or added to, additional time should be allowed for re-assessment. Where works may require alterations to the Network, additional time will be required per Section 4.5.1.

### 6.2.3 What Information Will You Need to Provide the HP Officer

You must forward all relevant project details and drawings of any proposed works (including any temporary works / activities) and proposed machinery deployment, to the ATCO HP Officer. A current ATCO DBYD Sequence Number must also be provided when calling.

The HP Officer can be contacted 8am – 4pm weekdays:

*Phone: 1300 926 755*

*E-mail: [HPenquiries@atcogas.com.au](mailto:HPenquiries@atcogas.com.au)*

For any emergencies call **13 13 52\*** (24 hours), as detailed in Section 2.1.

## **6.3 Works within 5 Metres of HP Gas Infrastructure**

### **6.3.1 Attendance by an Approved Locator**

In addition to the HP Notification requirement (Section 6.2.1), an ATCO approved HP Gas Pipeline Location Officer (**Approved Locator**) must be on site to attend and assess all works and activities. Exceptions to this requirement may be granted in the case of works that involve hand digging only and this is at ATCO discretion.

**Note:** Plunking is not an acceptable hand excavation technique when working in the vicinity of gas assets and requires equivalent controls and supervision as mechanical excavation.

To obtain a list of Approved Locators and to request a HP Notification, contact the ATCO HP Officer (Section 3.3.3).

All on-site attendance by Approved Locators is at the requestor's booking and cost. You are responsible for any landscaping or road reinstatements that may be required by local regulations imposed by a local government authority or road-owner / landowner.

### **6.3.2 Work Requirements near HP Gas Infrastructure**

The location of ATCO assets must be visually proved immediately prior to commencing any site works / construction. All digging must be by hand until the gas pipeline is visually located and confirmed. When working near or over HP gas pipelines, the location of the pipeline must be pegged or suitably visually indicated at all times.

Mechanical digging and vertical boring/augering may be conducted for further excavation under the direction of an Approved Locator once the pipeline has been located, **but no closer than 1 metre radially to the pipeline**. Accordingly, for any work within 1 metre of HP Gas Pipelines you must provide suitable labourers for hand-digging or vacuum extraction under the standing supervision of the Approved Locator on site.

All mechanical digging must be limited to the use of machinery up to an equivalent of a 20-tonne excavator with general purpose buckets only (no tiger tooth or similar without specific approval). Note that your site works may be delayed or stopped at time of construction if pre-proving by an Approved Locator has not been completed and Engineering Services has not otherwise agreed to the proposed design and clearances.

## 7. RELATED DOCUMENTS

The following standards and legislation (refer Table 9) must also be referred to when conducting works around gas infrastructure:

**Table 9: Standards and legislation applicable to working around gas infrastructure**

Standards and Legislation
• AS2885.0 Pipelines – Gas and Liquid Petroleum
• AS4041 Pressure Piping
• AS4799 Installation of Underground Utility Services and Pipelines within Railway Boundaries
• AS/NZS 4130 Polyethylene (PE) Pipes for Pressure Applications
• AS/NZS 4645.1 Gas Distribution Networks
• AS/NZS 4853 Electrical Hazards on Buried Metallic Pipelines
• AS/NZS 5601.1 Gas Installations
• ATCO Policies and Procedures (including Safe Work Instructions)
• Energy Coordination Act 1994 (WA)
• Environmental Protection Act 1986 (WA)
• Gas Standards Act 1972 (WA)
• Gas Standards [Gas Fitting and Consumer Gas Installations] Regulations 1999 (WA)
• Occupational Safety and Health Act 1984 (WA)
• Occupational Safety and Health Regulations 1996 (WA)
• Utility Providers Code of Practice for Western Australia 2016
• Western Australia Excavation Code of Practice 2005

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## 8. DISCLAIMER

### **Note:**

1. To the maximum extent allowed by law, no warranty or representation is given or made concerning the information provided in this document (including as to quality, completeness, accuracy or fitness for any purpose or that it complies with any applicable laws, standards or codes).
2. You should conduct your own independent due diligence checks and verifications and obtain your own independent design and advice from relevant competent engineering experts and other professionals (including to ensure the stability, structural integrity, support, durability, performance, drainage, safety, quality, adequacy, fitness for any purpose and compliance with all relevant laws, standards and codes) for your own constructions, their location, footings, foundations, protections, materials and any equipment, fittings, wires, cabling, pipes, conduits or apparatus to be used, applied or installed in relation to those constructions; and for the maintenance, upkeep, repair, monitoring and checking on an ongoing basis of any such constructions.
3. Each site will have its own unique conditions / characteristics / difficulties / requirements and therefore it is your sole responsibility, as the project proponent to conduct independent investigations, research and engineering analysis and seek independent specialist advice regarding your specific projects / activities / works to ensure that any of your works / activities do not cause damage, or are likely to cause damage to, gas assets.
4. To the maximum extent permitted by law, ATCO, its related bodies corporate and officers, employees, agents or contractors are not liable in any way whatsoever (including for negligence, recklessness or breach of any statutory duty) for any loss, liability, cost or claim of any kind whatsoever (including any direct loss, indirect loss, consequential loss, economic loss, loss of profit, loss of opportunity, death, illness, injury or damage to reputation or goodwill) arising from or in relation to the use of or reliance on the information in this document.
5. ATCO reserves the right at any time (without giving any notice) to modify, supplement or withdraw this document, or any part of this document.
6. In this document, 'including' means 'including, but not limited to'.
7. This important notice may not be altered, omitted, hidden or removed, except by ATCO.

## 9. DOCUMENT APPROVAL

	Title	Name	Date
<b>Owner:</b>	Senior Engineer	N Butt	25/09/2018
<b>Reviewer:</b>	Supervisor Pipeline Maintenance	D Powell	24/08/2018
<b>Approver:</b>	Manager Engineering Services	S Oler	25/09/2018

## 10. DOCUMENT HISTORY

Revision	Date	Amended By	Details of Amendment
0-9	15/03/2012	Various	Previous revisions.
10	07/06/2016	J Richardson	Locating conduit separation added 5.2.1.
11	25/09/2018	D Powell and N Butt	<p>Clarified minimum separation distances for engaging a HP Approved Locator. Clarified requirements throughout, and added a few new requirements such as in Sections 4.3.1 and 5.8.3.</p> <p>Removed approved locators in glossary hyperlinks to locators list in EIM. Feedback form moved to separate document to be added as an Appendix.</p> <p>Included all comments from the legal review.</p> <p>Rebranded and renumbered from NCN WI008 RF01</p>

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