ADDITIONAL INFORMATION FOR SAFELY WORKING AROUND GAS INFRASTRUCTURE

GAS DIVISION

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1. NETWORK FUNDAMENTALS

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

The document is intended to help proponents to understand the controls expected by ATCO, for designing, planning and operating safely around ATCO's Critical and non-critical gas infrastructure.

The crucial first action is to request Before You Dig Australia (BYDA) plans which identify the utilities within the vicinity of the relevant work site.

The second action is for the proponent to provide ATCO with their comprehensive work scope, drawings and schedule, including plant and machinery, that will enable ATCO to assess the proponents proposed works and provide detailed requirements for the proponent to safely work around the ATCO gas infrastructure.

Caution: You are solely responsible for ensuring that all safety precautions and measures on site are met, to ensure that no damage occurs to the gas pipeline and/or gas assets. **ATCO must be notified immediately 13 13 52** should any damage occur to gas assets.

1.1 ATCO Contact Details

For all ATCO enquiries or for more information about ATCO, contact us via gas.atco.com and use the ATCO Self Service portal, or call 1300 926 755 (Monday to Friday, 7:30am to 3:30pm).

1.2 Safety Information

Emergency Contact Details: 13 13 52 ATCO Faults and Emergencies, 24 hours

In the event that you become aware of any gas leak or damage to a gas pipe, 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 13 13 52:

Never attempt to stop the flow of gas or repair gas infrastructure.

1.2.1 Critical Asset Enquiries

To obtain a Critical Asset Notification or modify a Notification for works in the vicinity of ATCO Critical Assets, refer to Section 5 - Critical Asset Infrastructure – Mandatory Requirements Contact ATCO

using the ATCO online Critical Asset Notification Request Form, include all relevant work scope, data, drawings and schedule, including plant and machinery.

NOTE: A **current ATCO BYDA Sequence Number** must be provided when contacting ATCO.

ATCO should be contacted well in advance of your works, in order for assessment and (if necessary) Network alteration work to be planned and completed to ATCO's requirements ahead of your works

1.2.2 Non-Critical Asset Enquiries

To obtain a Works Notification for any works in the vicinity of **non-critical** ATCO gas infrastructure, contact ATCO using the ATCO online Notification of Works Form, include all relevant work scope, drawings and schedule, including plant and machinery.

ATCO should be contacted well in advance of your works, in order for assessment and (if necessary) Network alteration work to be planned and completed to ATCO's requirements ahead of your works.

1.2.3 Engineering Services Enquiries

Engineering Service enquiries are required for proposed works that may require alteration to the Network, and/or are unable to comply with requirements detailed within this document. Some scenarios requiring assessment by Engineering Services are listed throughout this document

Engineering Services shall be contacted via the online webforms on the Engineering Enquiries web page at the earliest stage in your design and planning.

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.

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

- scope of works, including all activities whether temporary or permanent;
- plans / drawings showing the proposed works, including:
  - location of works / extent of site;
  - changes to the surface levels / surface types;
  - location of the gas infrastructure and distances relative to the works;
  - depth of cover of the existing gas infrastructure and any proposed changes;
- safe work method statements, including the type and size of equipment to be utilised and the proposed operating clearances from the gas infrastructure 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 cranes; and
- proposed schedule for the works / requested response time.

Gas infrastructure 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.

1.2.4 Required Lead Times

ATCO should be contacted at the earliest stage of the design, for assessment and to allow for any necessary relocation work to be planned and completed to ATCO's requirements, well in advance of your works (refer to below Table for typical timeframes). For works referred or addressed to ATCO Engineering Services you should allow up to 12 working days for a team member to correspond with you regarding your enquiry. You should allow for up to an additional 22 working days for resolution, depending on the level of complexity and information provided.

Where proposed works are complex or 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 schedule from the time of the initial submission.

ATCO Works Requested	Minimum Time Frame
Altering / relocating Critical gas infrastructure	12-18 months
Altering / relocating other gas infrastructure	6 months
Concept Study to assess complex works	3 months
Gas check on abandoned assets (Section 2.4.4)	8 weeks
DCVG survey to inspect for pipeline coating damage	8 weeks

1.3 Working Around Gas at Home

If you are planning on completing work at home such as landscaping, fence replacement, driveway works or any other ground penetrating works refer to the ATCO Digsmart - Working Around Gas at Home webpage for guidance on how to conduct these works safely.

1.4 Duty of Care for Working around Gas Assets

Working near any gas infrastructure, especially Critical Assets (refer to **Table 4**), can be extremely dangerous. Always exercise due care and caution when working near any gas infrastructure.

Further to your general duty of care, there may be other obligations under the Work Health and Safety Act 2020 (WA) (and other relevant legislation) which require you to maintain safe practices.

In addition to any legal obligations that you may have under the Work Health and Safety Act 2020 (WA) (and other relevant legislation), ATCO may prescribe specific requirements for working on and around its gas infrastructure designed to protect people who may be working on and around the gas infrastructure, the general public, the Network and other infrastructure.

Due care shall 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 shall be reported to ATCO Faults and Emergencies immediately (13 13 52).

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.

2. NETWORK FACTS

2.1 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 800,000 West Australians.

ATCO, ACN 089 531 975 is part of the ATCO Group of Companies.

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 assets and networks of gas infrastructure within Western Australia as "the Network".

ATCO along with building and maintaining the network, also undertake the work to connect your gas and read your meter.

2.2 Glossary

Table 1: Terms used within this document

Term	Reference
Approved Locator	ATCO Approved Critical Asset Locator.
ATCO	ATCO, Gas Division Australia
BYDA	Before You Dig Australia
Engineering Services	The department of ATCO responsible for providing engineering advice relating to working safely around the Network.
Critical Asset	Previously HP gas pipeline. Refer to **Table 3** for the current Critical Asset description.
Non- Critical Asset	Assets not described in **Table 4**.
Gas Service	Offtake from a gas main to a customer
Network	The gas distribution network which is owned and operated by ATCO. This includes Critical gas pipelines, non-critical gas mains, gas assets, gas services and gas facilities.
Proponent	Developer, Builder, Owner, Contractor, Customer or any party planning, designing and/or conducting works in the vicinity of the Network.

2.3 Further Information

A list of gas standards and legislation is provided in Section 6, Related Documents.

2.4 Gas Distribution Network Information

2.4.1 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

2.4.2 Gas Distribution Network Assets – BYDA Plans

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, noting these may not be marked on the BYDA plans. Caution must be used at all times.

Gas services (and/or gas pipelines under road crossings) to individual premises will often not be shown on the BYDA 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 excavation and backfilling works.

With the exception of Albany, our Network reticulates and distributes Natural Gas (NG) 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.

2.4.3 Pipeline Depth of Cover

The actual location of gas assets must first be proven as per Section 4.2 'Locating Gas Assets' as 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. Furthermore, fittings are often installed on the pipes which may protrude above the general pipe elevation or alongside, the pipeline.

Excavation in the vicinity of gas infrastructure must proceed with caution at all times.

The ground levels around ANY type of gas infrastructure must comply with the following, unless otherwise approved by ATCO Engineering Services:

- Critical gas pipelines, previously referred to High Pressure (HP), include both steel and polyethylene pipelines, require a minimum 1200mm depth of cover, particularly under roadways, trafficked areas or potential trafficked areas. The maximum depth of cover over a Critical gas pipeline must not exceed 1.8m unless otherwise approved. All Critical Assets require Notification to ATCO prior to changes to depths of cover.
- Non-critical gas mains, (labelled as MAOP 7kPa/20kPa/70kPa/350kPa, previously Medium Low Pressure (MLP), Medium Pressure (MP) and Polyethylene High Pressure (PEHP) gas mains, generally require a minimum 750mm depth of cover. Noting, Increased depth of cover may be required under roadways, trafficked area or potential trafficked areas. The maximum depth of cover over these gas mains must not exceed 1.5m unless otherwise approved. Where the existing depth of cover does not comply with the minimum levels indicated above, there is an increased risk of damage to the safety of the gas infrastructure. In these instances, further advice should be sought by contacting Engineering Services.

2.4.4 Abandoned Assets

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

- Prior to the removal of any abandoned pipelines, the pipes must be tested by ATCO to confirm the absence of gas. Gas testing can be arranged by Engineering Services once the request for removal has been received. The requesting party will be liable for all costs involved in conducting the gas testing. These requests can be made via the online webforms on the Engineering Enquiries web page
- Where approval has been provided for asset removal, the requestor must supply an "As Removed" drawing (gas map) within 24 hours of removal, which will enable ATCO to update the Network mapping system.

Assets annotated as ABS (Abandoned Sold) on BYDA 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 BYDA for reference only, ATCO makes no assurances about their contents, condition, removal or otherwise.

3. WORKING NEAR GAS INFRASTRUCTURE – PLANNING WORKS

3.1 Working near ATCO's Assets

Any activities occurring near gas infrastructure require due diligence of the risks involved and appropriate controls to ensure the activities can be conducted safely. The closer the proximity to gas infrastructure the risk and extent of controls will increase accordingly, as outlined throughout this document. Unless stated otherwise, the depth or radial distance from the gas infrastructure relate to the horizontal distance from the pipeline alignment and does not include any vertical separation stipulated.

Critical gas infrastructure (formerly High-Pressure HP) and metallic pipework have additional risks that necessitate particular controls being imposed. These controls will typically apply for works that are within **15m** of the gas infrastructure.

Activities likely to result in high vibration levels have an increased ranges of influence where they can impact the safety of the gas pipeline, particularly activities such as piling (within 30m) and blasting (within 100m). High Voltage assets may also influence the safety of metallic assets over large distances. The requirements for conducting these works in the vicinity of ATCO infrastructure is contained in the rest of this document.

3.2 BYDA Plans

BYDA 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 BYDA plans will help you to identify the type of gas pipeline and some key properties.

Examples;

CRITICAL 300 ST 4.2 (MAOP 1900kPa) NG
CRITICAL 150 ST (MAOP 1900kPa) NG
CRITICAL 160 PE 1.5 (MAOP 700kPa) NG
CRITICAL 160 PE 1.5 (MAOP 350kPa) NG
CRITICAL 155 PVC (MAOP 70kPa) NG
CRITICAL 195 PVC 7 (MAOP 20kPa) LPG
160 PE 5 (MAOP 70kPa) H2 Blend
100 PVC 1.5 (MAOP 70kPa)
100 PVC 10 (MAOP 20kPa) LPG

Where;

CRITICAL	= Critical Asset (mandatory requirements apply, refer Section 5 Critical Asset Infrastructure – Mandatory Requirements)
300	= Nominal Diameter of the pipe in mm (i.e. DN300mm)
ST	= Material of pipe (Steel, Polyethylene (PE), Polyvinyl Chloride (PVC), etc.)
4.2	= Approximate distance from property boundary in metres (as recorded)
MAOP	= Maximum Allowable Operating Pressure
1900	= Gauge pressure value
kPa	**=** Kilo Pascals – a unit of measuring pressure
NG	**=** Natural Gas
LPG	**=** Liquid Petroleum Gas, only in Albany region
H2 Blend	**=** Hydrogen has been blended into the Natural Gas network

Guidance on the interpretation of the BYDA plans is provided within the BYDA cover sheet. Where the works will be in close proximity to the underground assets, a more accurate position will be required to enable further assessment of detailed design and construction works. In this instance, locating of the pipeline must be conducted in accordance with Section 4.2. Locating Gas Assets

3.3 Design of Works around Gas Infrastructure

The most effective means of reducing the risks of working around gas infrastructure is to plan your 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 surveying of infrastructure and maximising the separation distances between the installations during the design phase.

Safety in design shall be paramount, with due consideration of safe methods for the construction of the work, the future maintenance of gas assets 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. Design phases shall anticipate the risk to gas infrastructure and clearly demonstrate that risk has been lowered as low as reasonably practicable

Designs or works which do not comply with this document or if additional controls cannot be implemented then the proposed works may not be permitted to proceed. Should mitigation, alteration or removal of ATCO infrastructure be required prior to your works taking place, the ATCO works will be completed at the proponent's cost.

Adequate lead times shall be allowed for in project planning by the proponent for ATCO to assess proposed designs, or works, to determine potential impact to ATCO infrastructure. If works are complex, large scale or impose increased risk to ATCO infrastructure lead times must consider potential requests for further information, engineering reports, risk assessments or Network alterations. Refer to Section 1.2.4 Required Lead Times for the minimum lead time frames for ATCO works.

3.3.1 Tendering for Construction

It is not recommended to issue any construction tenders or commence any site-works, without first contacting ATCO to assess whether any ATCO assets may be affected by your proposed works.

For works near Critical Asset Infrastructure the requirements of Section 5 Critical Asset Infrastructure – Mandatory Requirements will also apply.

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.
- specify in the tender / construction documentation that the successful site contractor will need to comply with the requirements of this document (as a minimum).

These requirements 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.

3.3.2 Easements and ATCO Infrastructure Outside Road Reserves

ATCO infrastructure not located in road reserve (i.e. in private or crown land) may be within an easement. It is the proponent's responsibility to confirm the presence of easements over gas pipelines or any other infrastructure. This information is available through Landgate or by consulting a suitably qualified surveyor. Gas infrastructure still needs to be positively located to confirm exact location within the easement as infrastructure is not necessarily located centrally within an easement.

In general, no other utilities, structures permanent or temporary, trees, roads, carparks or any other non-gas items are permitted to be installed within an ATCO easement. ATCO must have 24-hour access available to the full easement area for routine maintenance and/or emergency requirements including the ability to access the area with machinery and heavy vehicles. Access to an ATCO pipeline within an easement must not be restricted by structures or other items adjoining an easement.

ATCO generally requires up to 8m setback distance of any structure from the ATCO pipeline, regardless of the size of the easement area. This setback distance is measured from the ATCO pipeline, not from the easement boundary and may extend beyond the actual easement area. ATCO must be consulted to determine the appropriate and compliant setback distances to suit the proposed development.

The construction of driveways over a gas easement may be considered on a case-by-case basis to allow access to a lot/property.

3.3.3 Major Civil Infrastructure Construction

Design and construction of new civil structures in the vicinity of gas infrastructure must be assessed by ATCO in the planning and design phases of projects.

Installation of any civil infrastructure must not impact ATCO's existing accessibility to gas infrastructure to conduct regular maintenance and repairs, including the ability to excavate buried gas infrastructure, complete above ground leak survey and DCVG surveys and for safe access to pits and cabinets.

Gas infrastructure shall not be located within private property, rail reserves or other areas that may impact ATCO's ability to access, patrol, visually sight and survey the gas infrastructure.

Existing gas infrastructure impacted upon by (but not limited to) the alteration or widening of road surfaces requires ATCO investigation to determine the level of mitigation that may be required. These investigations are typically completed by ATCO as a Concept Study.

3.3.4 Concept Study

A concept study is a preliminary engineering assessment undertaken to ultimately produce a scope to adequately mitigate the impact of the proponents proposed design.

Should a proposed project require a Concept Study, ATCO will make contact to discuss the details of a concept study and the initial steps required to proceed to a concept study agreement.

This concept study involves the assessment of the proposed designs, both interim and final, and the method of construction to ascertain the type of impact to ATCO assets and the level of risk posed to the gas network. The investigation process for the impacted assets addresses the following:

- criticality and current condition
- location and accessibility

- condition monitoring ability
- physical vulnerability from the third-party construction.
- During this process, the client will be provided the opportunity to redesign or reassess their construction methodology to avoid or lessen the impact to the assets.

The concept study incorporates an options analysis Risk Workshop, to compare various mitigation scopes, and identify the most prudent cost-effective option that will provide an adequate level of protection to ATCO assets and the network. Should the client elect to redesign or make changes to avoid or lessen asset impact, a further risk workshop will be required to reevaluate the risk and confirm any mitigation scope.

A concept study is completed at the cost of the client, under a Concept Study Agreement and may take between 3 to 9 months depending on the,

- complexity of the client's designs
- number of impacted assets
- number of locations of impact
- MAOP and material type of the impacted assets - contributes to the mitigation scope complexity.
- A Concept Study Report will be produced for the client detailing the mitigation scope, and the cost and schedule to carry out the mitigation scope under a Works Agreement.

Should a proposed project require a Concept Study, ATCO will make contact to discuss the details of a concept study and the initial steps to take to proceed to a concept study agreement.

3.3.5 New Road Construction

The construction of new trafficable roads over any gas infrastructure shall not take place without prior approval from ATCO. This includes roundabouts, slip lanes, turning lanes, widening of existing roads or any other similar work that will result in additional gas infrastructure being temporarily or permanently under a trafficable surface.

In general gas infrastructure alteration or protection works will be required when;

- 10m or greater of gas infrastructure will be under a trafficable road surface
- pipeline depth of cover changes or is inadequate
- Above ground gas infrastructure will be at risk of damage as a result of the road construction
- Accessing above ground gas infrastructure will pose additional risk to maintenance workers or require traffic management for safe access as a result of the road construction

ATCO requires access to gas infrastructure for ongoing maintenance and/or emergency requirements. Construction of roads over or in the close vicinity of gas infrastructure significantly limits or removes ATCO's ability to conduct safe routine maintenance activities, detect gas leaks and test infrastructure for damage. Depending on the extent of the road construction works a Concept Study (refer Section 3.3.4) may be required to assess the impact and possible protection mitigation requirements for the ATCO infrastructure.

3.3.6 Separation Distances

Guidance on separation distances are outlined in the following sections. Where these cannot be achieved you must,

- consult with Engineering Services to confirm the separation and/or buffer zone distances from the gas pipeline or gas service.
- receive approval from ATCO where new infrastructure will result in exclusion zones or other restrictions for ATCO's access to assets, including excavation restrictions related to gas assets access or reduced access requirements imposed upon the standard gas utility corridor.

Note all separation distances below are as measured horizontally from the edge of the infrastructure to the works/installation location.

Construction deemed to affect ATCO's asset accessibility may require alteration of gas infrastructure if no alternative solution can be identified. Alterations to gas infrastructure may require long lead times and it is recommended ATCO is contacted as soon as possible in the project planning phases to minimise impact on the proponents works.

3.3.7 ATCO Warning Signs, CP Test Points and Anode Beds

ATCO warning signs must not be removed or altered without approval from ATCO. Any damage to warning signs that require replacement will be completed at the proponent's costs.

Above ground Cathodic Protection (CP) test points must not be moved or altered by any party unless authorised and engaged by ATCO.

Test points and Anode beds contain electrical wiring that connects to steel gas infrastructure in the ground, these wires are generally not included in BYDA plans and non-destructive locating should be completed to find these wires before any excavation works commence.

3.3.8 Valves, Valve Pits, Regulator Sets and Cabinets

ATCO operates and maintains multiple different types of above ground gas infrastructure. Vehicles or machinery should not operate within 1m of above ground ATCO cabinets to avoid striking this infrastructure. No vehicles or machinery should traverse directly over any below ground gas infrastructure. When designing works around ground level gas infrastructure the following need to be considered

- ATCO requires 24/7 access to this infrastructure for maintenance and emergency requirements. Infrastructure should not be blocked, fenced off or be access restricted
- ATCO requires the ability to safely park a work vehicle in the vicinity of this infrastructure. Any proposed works must not impact ATCO's ability to access and park a vehicle.
- Proposed works must not introduce a requirement for ATCO to obtain traffic or pedestrian management to access this infrastructure
- No changes in ground level around this infrastructure should be completed without approval from ATCO. Infrastructure must not be located at a low drainage point and at risk of flooding or water inundation

- EV charging stations shall not be installed within 1.5m of Gas infrastructure (Hazardous Area consideration) and the stations location and patronage shall be clear of and not restrict ATCO requirement for 24-hour maintenance and vehicle access, including access to open pit lids and cabinets.

3.3.9 Underground Infrastructure

Infrastructure must not be installed in close proximity to gas assets creating access restrictions, without controls being installed to maintain access, as approved by Engineering Services.

The installation of below ground assets, including retaining walls, must not restrict access to ATCO's assets, including the prevention, or restriction on excavation without the use of shoring or other means of trench support.

The installation of any underground infrastructure must be conducted in accordance with Sections 4.3 and 4.4.

3.3.10 Thrust Blocks

Installation of thrust blocks should take into consideration surrounding gas infrastructure. New thrust blocks should not be installed in such a way that the exclusion zones around them prevent ATCO from excavating to access gas infrastructure.

Thrust blocks must not to be installed where in the event of a burst water main the thrust block would be projected in direct line of gas infrastructure, unless reviewed by ATCO engineering.

3.3.11 Posts, Poles, Supports and Footings

Posts, poles, supports and footings (including posts/sleeves/bores for water monitoring points) must have suitable clearance to gas assets with appropriate shoring or restraints to protect and maintain excavation access to gas assets. This generally requires a minimum horizontal clearance of 1.5m to Critical Asset Gas Pipelines, or 1m to other gas mains, as measured from the edge of the footing to the edge of gas infrastructure. 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.

Stay anchors for electrical poles should not be installed in such a way that it restricts excavation access to gas infrastructure. Gas infrastructure must always be accessible without compromising the integrity of stays, anchors or poles.

Posts, poles and supports located within road reserve, such as those used for signage, lighting and w-beams, 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, pole or support will not damage gas assets in event of a vehicle impact, through frangible post design or otherwise.

A minimum horizontal clear separation of 300mm from a pipeline for an existing post or pole replacement may be accepted, provided the required hole is created by vacuum extraction and the proponent provides acceptable controls to ensure the safety of the pipeline. Existing separation distances must not be reduced and where possible increase separation distance is preferred.

3.3.12 Pits, Walls and Structures

Separation distances from pits, walls, footings, retaining walls, gantry, hoardings or other structures must be maintained at a minimum of 1.5m to gas infrastructure. In general, no structure shall be installed over any gas infrastructure.

No opening to an enclosed structure is allowable within 3m of any Critical Asset, or within 1m of any other gas asset.

Any installation must consider future accessibility to gas infrastructure for maintenance or in case of emergency access. Adequate separation must be maintained for excavating the gas pipe or other asset, so 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.

Gas infrastructure access must not be restricted or impeded by surrounding installations.

3.3.13 Safe Excavations

Large or deep excavations have the potential to increase risk to nearby gas infrastructure. All excavations within the vicinity of gas infrastructure must consider the impact to other utilities and ensure adequate mitigation is in place to avoid subsidence or other hazards.

3.3.14 Shoring

Where shoring or trench support is required when excavating in the vicinity of gas infrastructure, shoring must be installed and removed by a competent person who has been trained in erecting and removing shoring. Installation of shoring should ensure that gas infrastructure is supported throughout the process and risk of damage is minimised. Lifting of shoring equipment must not be carried out over gas infrastructure, particularly shallow or exposed gas mains.

Shoring must be maintained at gas infrastructure that will potentially be undermined by the works, unless controls are assessed and approved by Engineering Services.

A 300mm minimum clear separation of a shoring box from a pipeline may be accepted, provided the proponent provides acceptable controls to ensure the safety of the pipeline. Prior to installation of shoring boxes gas infrastructure must be fully located by non-destructive methods of excavation to ensure no unrecorded fittings or similar are within the 300mm minimum clear separation distance.

3.3.15 Dewatering

All dewatering activities must be undertaken by a competent person. Relevant dewatering calculations and figures may be requested by ATCO for review of proposed dewatering within the vicinity of gas infrastructure

The site contractor must ensure that any on-site dewatering does not result in soil subsidence that will impact gas infrastructure. The proponent is responsible for ensuring dewatering operations will have no detrimental impact to gas infrastructure and the surrounding soil.

Dewatering spears must not be installed within 1m of gas infrastructure unless controls are assessed and approved by ATCO.

3.3.16 Planting and Removal 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 pipeline breakages and damage to pipeline coating are issues for below ground assets.

Should ATCO require access to gas infrastructure for maintenance or emergency requirements, any vegetation that is impeding this access will be removed.

Table 2 contains guidelines for the appropriate tree root mitigation when planting trees near gas infrastructure. If further guidance is required, please contact Engineering Services.

Should ATCO require access to gas infrastructure for maintenance or emergency requirements, any vegetation that is impeding this access will be removed.

Table 2: Tree Root mitigation for planting of vegetation near gas infrastructure

Clear Distance from Gas Asset	Required Root Mitigation Methods
Greater than 3m	A minimum clear 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	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. Root arrestors, normally consisting of properly wrapped and secured robust high-density polyethylene / nylon sheeting, solid high density polyethylene sheets or similar, must be employed to a minimum depth of 1m; or 250mm deeper than the gas pipeline, whichever is greater.
0.5 – 1 metres	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. In this case, minimum 3mm thick solid high density polyethylene root barriers or sheets should be used. Root barriers with holes or openings will not be considered in this instance
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 the resultant leak will likely kill any vegetation in contact.

Installation of grasses or native ground coverings at 500mm or greater distance from gas infrastructure will be acceptable providing the species have shallow root structure extending up to 100mm below ground level once fully grown. It is the proponent's responsibility to ensure their planting meets these requirements.

For removal of trees and root systems an arborist should be contacted for appropriate advice, however the following should be considered;

- Tree roots are regularly found to be wrapped around gas infrastructure. Trees must not be pulled or ripped from the ground without consideration of potential infrastructure in its vicinity,

- Gas infrastructure to be fully located in the vicinity of the tree/vegetation to be removed
- Trees lopped above ground as much as possible
- Non mechanically excavate around stump, fully expose and remove the exposed tree roots
- Stump grind to below ground level or fully remove as required. Note any stump grinding must comply with Section 4.5 Hot Works.

4. WORKING NEAR GAS INFRASTRUCTURE – CONDUCTING THE WORKS

All works in the vicinity of gas infrastructure should consider the points below. In addition, you must not conduct any works / activities on-site within 15m of Critical Asset infrastructure prior to obtaining a Critical Asset Notification relevant to the works, as detailed in Section 5

- 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 pipeline marker danger signs must not be disturbed, relocated, removed, or altered without the prior written approval of ATCO.
- Sources of electrical current such as above and below ground electrical cables, earth rods, substations, generators, other machinery, transformers, or impressed current systems of pipelines must be designed to not create any electrical hazard on any ATCO metallic asset.

4.1 Current BYDA Plans

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

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

4.2 Locating Gas Assets

Prior to works commencing, it is the responsibility of the proponent to arrange for the location of all utilities that may 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 BYDA enquiry (Section 3.2). After receiving the BYDA plans, buried gas assets can be located through safe excavation methods (potholing) as detailed in the following sections.

Prior to any works taking place, gas infrastructure must be Quality A located,

- visually sited, as per AS 5488.1:2019 Classification of subsurface utility information, Part 1: Subsurface utility information and AS 5488.2:2019 Classification of subsurface utility information, Part 2: Subsurface utility engineering.
- Quality B locating can be accepted for design assessment purposes only

Critical Asset gas infrastructure (approximately 10% of the Network), are designated by the pressure, and require location by an Approved Locator (refer to **Table 3** and Section 5.1).

For the rest of the Network, it is acceptable for the proponent to carefully 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 accredited locator is recommended.

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

Table 3: Critical Assets - on BYDA maps, the ATCO critical assets are notated 'Critical'.

Pressure	Historical Acronym (obsolete)	Network Descriptor
350kPa	PEHP	Polyethylene High Pressure
350kPa	CHP	City High Pressure
500kPa -6900kPa	HP	High Pressure

4.2.1 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 excavation or drilling 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 using a fan jet at 1500 psi (100bar) and water at 50L per minute to avoid damage. Water jetting should be completed in a sweeping motion and should not be directly pointed at exposed gas infrastructure. Potholing should never be carried out with a mechanical excavator.

Prior to any potholing being carried out you must read the BYDA 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 Critical Assets without a valid Critical Asset 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 between the bottom of the marker pole and the gas pipeline.

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 under the post and around the pipe returning the clean fill 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. All pothole markers must be removed after site works are completed or the end of the project by those conducting the work. ATCO takes no responsibility for pothole markers and their condition during or after any works taking place.

To determine the position of the pipe, you will generally need to locate the gas pipeline at 10m intervals along the parallel straight sections and physically locate all bends, junctions/laterals service offtakes and tapping's/protrusions at entry and exit locations.

Some site conditions may require 5m intervals or less, for accurate location of services, if installation is to be within 1.5m of ATCO Infrastructure.

Any warning or marker tape that is moved or damaged during potholing shall be reinstated to its condition prior to any works taking place. It is the responsibility of those conducting the works to replace any damaged tape at their costs. Note that marker tape should be installed at 300mm separation distance above gas infrastructure.

Consideration should be given to utilise qualified locators for all asset locations. For Critical Assets, an Approved Locator must be used in all cases, after a valid Critical Asset Notification has been issued (refer to Section 5).

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, your supervisor must contact the utility provider and shall NOT proceed with any drilling or mechanical excavation.

4.2.2 Locating Assets under Slabbing

In some locations concrete slabbing (or other appropriate material) 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.

BYDA information may indicate the start and end points of the slabs. The concrete protective slabs are generally 1.0m x 1.0m x 150mm of concrete with lifting lugs to assist with removal, however other configurations have previously been used and other materials) are becoming more commonly available. Gas pipes are generally 300mm below the bottom of the protective slab, but this depth can vary.

Where required, to excavate to allow removal of the protective slab ensure 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 with hand excavation under the slab until the pipeline is located in accordance with the requirements of sections 4.2.1 Locating Buried Assets (Potholing) and 5.3 Works within 5 Metres of Critical Gas Infrastructure. For all works around Critical Assets, 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 slabbing (or other appropriate material) 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.

4.2.3 Locating Assets Bored within Rock

For location of bored sections of pipe within rock, where the pipe cannot be visually checked, BYDA information may indicate the start and end points of the bores, but where drawings do not show this information, Engineering Services shall be contacted.

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 should have tracer wire attached to the PE pipe which should also be connected to an above ground test point. 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) may be available.

Handheld rock breakers and jack hammers may be used greater than 1m away from gas infrastructure. Rock breakers attached to machinery such as excavators may be used 5m away or greater from gas infrastructure. Use of rock breakers with less separation distance than those stipulated above must not be used without approval from ATCO. Use of rock breakers, or similar vibration creating equipment, must comply with the Vibration criteria in Section 4.11.1 and vibration monitors may be required to be installed on site to ensure this vibration criteria is met.

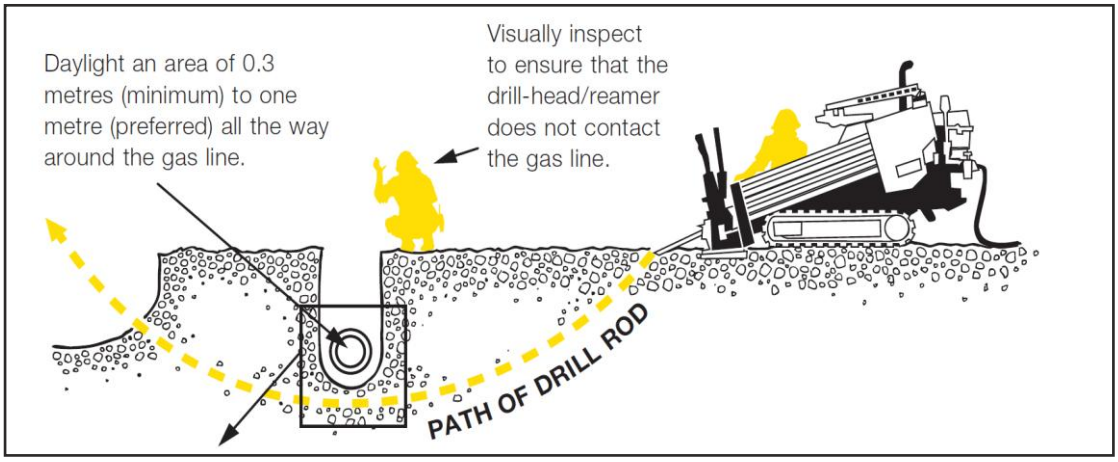
4.3 Service Crossing under, or over, any Gas Pipeline

For any proposed third-party pipe or service crossing, you must locate the gas pipeline and verify its position and depth visually at the proposed crossing point. A service crossing must be perpendicular to the gas pipeline, unless written approval from Engineering Services is obtained prior to the installation of the service.

Before installation, any new steel infrastructure crossing ATCO's steel gas pipelines must be reviewed and approved by ATCO Engineering Services as such crossings can adversely affect the cathodic protection systems of both the new and existing assets. To monitor and mitigate potential DC interference, a standard cathodic protection test point, as per ATCO's standard drawing, must be installed as part of the new infrastructure. The proponents Interference testing reports for the proposed service crossing must be shared with ATCO, and if further mitigation is required, it will be implemented at the proponent's cost.

For the service crossing, 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 shall not be attempted under any circumstances.

Caution: No machinery is to be used within 1m of a Critical Asset or non-critical asset and Asset exposure shall be by **non-mechanical excavation only**.



Refer Directional drilling inset below

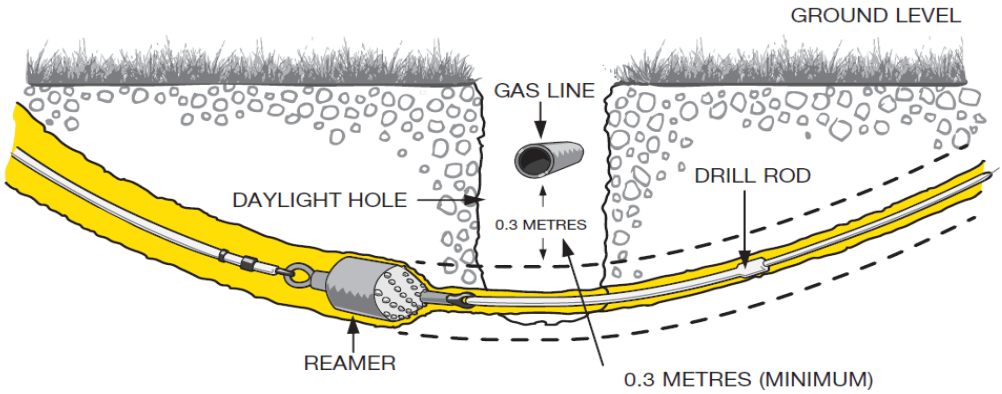


Figure 1: Observing and maintaining safe clearances when boring

The minimum vertical clearance required for any third-party pipe or service crossing is,

- 300mm above or below the gas pipes
- 500mm for concrete mains passing above gas pipes
- If these minimum separation distances cannot be maintained then relocation or mitigation to ATCO infrastructure may be required before installation can commence, at the proponent's costs

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.

Micro tunnelling crossing over or under gas infrastructure may be completed providing the following controls are in place;

- All micro tunnelling activities, including spotting, shall be completed by a competent person
- Observation pit to be non-mechanically excavated 500mm around the gas infrastructure
- Drilling company/ contractor to provide a competent spotter in place watching the observation pit as tunnelling is approaching within 1m of gas infrastructure with direct communication with the drill operator.
- Driller to advise when drill head is approaching 1m before and when 1m past the gas infrastructure
- Once 1m past gas infrastructure backfill observation pit
- When crossing Critical Assets, an ATCO Approved Locator is required to supervise all works once the drill head comes within 5m of a Critical Asset. Works should not proceed until the location of the drill head can be confirmed by the Approved Locator

If any of these controls cannot be complied with then the proposed installation will require assessment by ATCO Engineering Services

4.4 Service Paralleling a Gas Pipeline

To determine the position of the gas pipeline, you will need to locate the pipeline at 10m intervals by potholing along the parallel straight sections and physically locate all bends, junctions/laterals service

offtakes and tapping's/protrusions and at entry and exit locations. Some site conditions may require potholing intervals of 5m or less for accurate location of services.

For installation parallel to a gas line, the service must not be installed such that the gas pipeline cannot be safely accessed without working in the collapsible soil zone of the service. (The collapsible area around the excavation results from the angle of repose or natural angle of the lay of the soil during the works).

When installing new assets parallel within 1m of any gas infrastructure HDD or micro-tunnelling must not be used. Non mechanical excavation shall be used for these installations unless approval has been received from ATCO.

For any service installation less than 1-metre from a gas pipeline, pothole spacing must be no greater than every 5 metres. Services running parallel to a gas line should have a 500mm minimum horizontal clear separation from any ATCO gas asset.

On completion of service locating requirements, the ground around the pipe should be reinstated to existing ground levels as described in section 4.2.1 Locating Buried Assets (Potholing)and section 5.3 Works within 5 Metres of Critical Asset Gas Infrastructure, as relevant to the specific circumstances.

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.

4.5 Hot Works

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.

All hot works conducted within 15m of any gas infrastructure must be in compliance with applicable laws and Australian Standard 1674.1.

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, but not limited to,

- A hot works permit authorised by a responsible officer
- Monitoring for flammable gases
- Response procedures in the event of fire or flammable gas detection
- Do not let heat sources or hot works impact on gas infrastructure – consider that the ground or adjacent structures may also be capable of transmitting heat, circumventing protection afforded by a heat shield or barrier

Any ground penetrating work using machinery, such as using a road/concrete saw or similar, within 5m of Critical Asset requires supervision by an approved locator.

The following controls must be in place where the clearance for hot works **cannot** be maintained between Critical Asset pipelines and/or gas infrastructure of 600mm for below ground gas infrastructure and/or is within 5m of above ground gas infrastructure (e.g. valves, pits etc.),

- Hot works permit must be completed and kept on site for the duration of works.

- Calibrated Gas Detector must be on site and constantly monitoring for the duration of the hot works. (15m radius around the work area must be checked e.g. pits, manholes, drains, service covers)
- Fire extinguishers (in date)
- Fire Blanket (on site and to be used as a cover/shield)
- Fire Shield (19mm timber board)

If the above controls cannot be implemented, ATCO requires review by Engineering Services.

4.6 Changes to Surface Conditions or Ground Levels

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.

If up to 100mm depth of cover is to be temporarily removed over a Critical Asset 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 Critical Asset Notification providing an approved locator visually sights the gas infrastructure prior to works taking place. 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 at the proponent's costs.

4.7 Footpath Reinstatement

For concrete footpath repair/reinstatement that requires lifting of existing concrete path sections up to 100mm below ground level only up to a 1.7T bobcat may be used for the lifting and moving of the concrete sections providing an approved locator visually sights the gas infrastructure prior to works taking place

4.8 Routine Road Maintenance Up To Maximum 100mm Deep

Routine road maintenance consisting of resurfacing existing road surfaces without excavation deeper than 100mm and within 15m of Critical infrastructure can proceed with a Critical Asset Notification.

Changes to road levels, road widths or for maintenance with deeper excavation requirements, require an assessment by ATCO Engineering prior to commencement of site works.

When selecting machinery to complete any road maintenance work, depth of cover of gas infrastructure shall be considered so appropriate size machinery is used to minimise risk of damage to gas infrastructure. The machinery used for routine road maintenance such as compaction equipment must still comply with section 4.11.2 and other relevant sections of this document. For further guidance please contact ATCO Engineering Services.

4.9 Road Stabilisation or Maintenance of Depth Greater Than 100mm

4.9.1 Around Critical Infrastructure

Road maintenance within 1m of Critical gas infrastructure and greater than 100mm below ground level requires assessment by ATCO Engineering Services. The below listed information will need to be provided, at a minimum;

- Location of works
- a map of work area
- Full scope and methodology (including depths, machinery type and size)
- Proving data identifying the gas infrastructure depth

Road maintenance greater than 1m from Critical gas infrastructure and no deeper than 100mm below existing surface level and may proceed without further assessment from ATCO. The machinery used for road maintenance such as compaction equipment must still comply with section 4.11.2 and other relevant sections of this document. For further guidance please contact ATCO Engineering services

4.9.2 Around Non-Critical Infrastructure

While no mandatory requirements to inform ATCO for these types of work around non critical gas infrastructure, it is recommended to contact ATCO with full details of your work via the Notification of Works webform below particularly where gas infrastructure has reduced depth of cover.

By not contacting ATCO regarding proposed works you agree that your works comply with this document. Any damage to the infrastructure will be at the proponent's risk.

When selecting machinery to complete any road maintenance and/or road stabilisation works, depth of cover of gas infrastructure shall be considered in selecting appropriate size machinery so as to minimise risk of damage to gas infrastructure. All compaction must still comply with section 4.11.2 of this document. For further guidance please contact ATCO Engineering Services.

4.10 Operating over Gas Infrastructure with Vehicles, Cranes or Heavy Equipment

Vehicles crossing over any gas infrastructure are limited to road legal vehicles using established sealed roads or equivalent crossovers/driveways.

Vehicles or machinery greater than 4.5T must not traverse over any gas infrastructure where the surface is not sealed, unless assessed by ATCO Engineering Services.

An appropriate temporary sealed surface such as a limestone access track may be approved for installation over gas infrastructure, depending on the existing depth of cover, to enable to cross over gas infrastructure with approval from ATCO.

For any crossing over unsealed surface the following information/ data must be provided by the proponent:

- Locations where crossing gas Infrastructure
- Pothole data
- Depth of Cover above gas Infrastructure at crossing point of temporary track

- Proposed temporary Surface track Material, thickness and width
- Crossing Vehicle types and details including; Axle Weight, Axle Width, distance between Axles, Tyre width & pressure, frequency of crossings

Cranes, or other lifting equipment that use outriggers, are generally NOT permitted to straddle over gas infrastructure. Outriggers shall be setup with a separation distance greater than the underside depth of the gas infrastructure, i.e. if gas infrastructure is 1m deep, edge of outrigger pads must be positioned greater than 1m plus the size of the gas pipe outside diameter (OD) from the edge of gas infrastructure

If lifting equipment, such as a crane, cannot meet the separation distance mentioned above then assessment by ATCO Engineering will be required and the following information/data must be provided;

- Outrigger loads & bearing pressures
- Separation distance between edge of outriggers and gas infrastructure
- Outrigger specification i.e. thickness, area and material
- Potholing data
- Lifting plan- weight of load and whether it will be lifted over gas infrastructure

Typically, an Engineering review is not required where the outrigger positions are more than 5m from gas infrastructure.

NOTE: For all crane setup and use of Heavy Civil Machinery operating within the vicinity of ATCO assets, the proponent must demonstrate that the machine bearing pressure & vibrations will not impact the gas infrastructure

4.11 Vibration and Compaction Operations

4.11.1 Vibration

Gas infrastructure can be sensitive to vibration emitting activities. 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.

The proponent must clearly demonstrate that any resultant vibration from construction activities will not exceed the PPV of 5mm/second. If requested, you must provide ATCO with the results of the vibration readings by the next working day.

4.11.2 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 **4: Allowable compaction near gas pipelines** 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 receive written agreement from Engineering Services prior to conducting any works.

Table 4: Allowable compaction near gas pipelines

Horizontal distance to gas pipeline	Minimum undisturbed depth-of-cover provided		Size of Compacter / Roller (Total machine operating weight)	Vibration mode
0 – 5 metres	300mm		Small hand-held plate compacter only (<75Kg)	Any vibration setting
	500mm		Hand-held larger plate compacter (>75Kg)	Any vibration setting
			Maximum (total) 8-tonne tandem-drum	Static roller only (no vibration)
	900mm All Critical Assets	750mm PVC & PE	Maximum (total) 8-tonne tandem-drum	**low-amplitude** 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	**low-amplitude** vibration setting only
			No size limit static roller only	**Static roller only (no vibration)**
10 – 15 metres	N/A		Maximum (total) 10-tonne vibratory roller	Any vibration setting
			No size limit static roller only	**Static roller only (no vibration)**
> 15 metres	N/A		No restrictions	

Note 1: Requests for use of a larger static roller only, 2m to 5m (horizontal) from a gas pipeline may be allowed to proceed without further assessment, provided 750mm minimum depth of cover to PVC/PE and 900mm minimum depth of cover to any Critical pipeline.

Note 2: Requests for the use of a larger static roller only, within 2m (horizontal) of a gas pipeline will be assessed on a case-by-case basis for the pipeline type and depth of cover.

4.11.3 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 or augured piling is a preferred method of retaining, subject to assessment by Engineering Services and may require vibration monitoring and reporting.

4.11.4 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.

4.12 Additional Requirements near Metallic Pipelines

4.12.1 Electrical Equipment

Installation and alterations of sources of electrical current (such as earth rods, substations, transformers, impressed current systems of non- ATCO pipelines or above and below ground High Voltage electrical cables operating equal or greater than 1kV) must not interfere with the corrosion

protection and electrical hazard mitigation equipment of existing ATCO assets. It should be noted that BYDA plans may not show all gas infrastructure, nor may it distinguish from above or below ground assets. Further information can be requested to ATCO should plans be unclear.

Earthing rods, substations, transformers, earthing-stakes, high voltage cables impressed current systems (i.e. pipelines) and other electrical sources, may adversely affect the safety of the metallic gas distribution network, unless mitigation is employed in accordance with AS/NZS 4853:2012. During the design stage the proponent must verify the location of metallic pipelines subject to Low Frequency Induction from proposed parallel electrical infrastructure as well as any appurtenance or coating defect affected by the Earth Potential contour hazard.

Earthing rods, stakes and similar should be installed minimum 1m from any gas infrastructure. Proposed installations closer than this must be assessed by ATCO Engineering.

ATCO Engineering Services must be pre-notified in all cases, with an Earth Potential Rise (EPR) and Low Frequency Induction (LFI) report completed by a qualified Electrical Engineer and provided to ATCO for review. ATCO requires any new electrical infrastructure near gas assets to comply with AS/NZS 4853:2012 "Electrical Hazards on Metallic Pipelines "as follows:

- AS4853:2012 Level 1 Conservative Compliance
    - If your proposed design complies with the requirements of a Level 1 assessment, a signed report must be provided to ATCO Engineering Services. The report must demonstrate compliance to Level 1, with all parameters explicitly stated. As part of the Level 1 assessment, it is necessary to additionally complete a steady-state voltage assessment on the gas pipeline section impacted by the proposed design.
    - If the Level 1 study does not meet the steady-state voltage criterion of 4V, a detailed AC interference (corrosion) assessment must be carried out as part of the Level 2 or, if required, Level 3 study.
    - If the proposed installation does not pass the level 1 assessment, the proponent is required to inform ATCO Engineering Services via email and request pipeline specific data prior to completing a Level 2.
- AS4853:2012 Level 2 Voltage Limit Compliance
    - If a Level 2 report is provided to ATCO prior to requesting pipeline specific data, the report will not be accepted, and the proponent will be required to resubmit an appropriate report that utilises actual pipeline data.
    - The proponent is permitted to consider the pipeline as uncoated steel or with coating holidays present, in lieu of completing a new DCVG, provided they have used all other pipeline data as provided by ATCO.
    - If a Level 2 assessment fails, a Level 3 assessment is required to be completed in consultation with ATCO. ATCO will provide contact scenarios and specific voltage limits as required for the assessment to be completed.

4.13 Exposure of Gas Assets

Where gas infrastructure is required to be temporarily exposed, measures must be put in place to protect the pipelines from damage. Measures must be taken to protect the infrastructure from accidental (construction or vehicle impact) and deliberate damage (vandalism). Where any exposed gas infrastructure will be left unattended, approval must be obtained from ATCO. Exposure of gas infrastructure will be assessed on a case-by-case basis, however the following controls are generally required;

- Traffic management and site setup will be in place ensuring no public access to work area
- Minimum 1.8m temporary fencing will be in place around open excavation
- If there is a risk of vehicle strike, vehicle impact protection barriers must be in place around open excavation
- Steel plates will be installed over open excavation when site is unattended

Damage by exposed pipeline sagging must also be prevented, with safe working procedures developed for exposing any gas pipelines. For any proposed supporting of exposed pipe the proponent should have a temporary works design demonstrating how the pipe will be supported and provide this to ATCO for review and acceptance prior to proceeding. ATCO may not accept a temporary works design and may require network alteration prior to proponent's work taking place

Subject to on-site review of the pipeline condition and safe working methods being utilised,

Table 5 provides guidance for maximum lengths of pipe that can be left unsupported for a short period of time,

Table 5: 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 of clean fill must be placed and pack all around the pipe. 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 compactions must comply with Section 4.11.2 Compaction.

5. CRITICAL ASSET INFRASTRUCTURE – MANDATORY REQUIREMENTS

5.1 Assets Subject to these Mandatory Requirements

Additional mandatory requirements apply to all works within 15m of Critical Asset gas infrastructure. Critical Assets are integral to the gas distribution network and therefore carry increased risk to the security of gas supply.

These requirements are in addition to the obligations set out in section 3 Planning and section 4 Conducting Work in this document.

Critical gas infrastructure is labelled Critical in the ATCO BYDA plans. Examples, but not limited to, are listed below;

- CRITICAL 300 ST 4.2 (MAOP 1900kPa) NG
- CRITICAL 150 ST (MAOP 1900kPa) NG
- CRITICAL 160 PE 1.5 (MAOP 700kPa) NG
- CRITICAL 160 PE 1.5 (MAOP 350kPa) NG
- CRITICAL 155 PVC (MAOP 70kPa) NG
- CRITICAL 195 PVC 7 (MAOP 20kPa) LPG

The mandatory conditions around critical infrastructure apply to all works including service location and all above ground activities that could impact on the infrastructure.

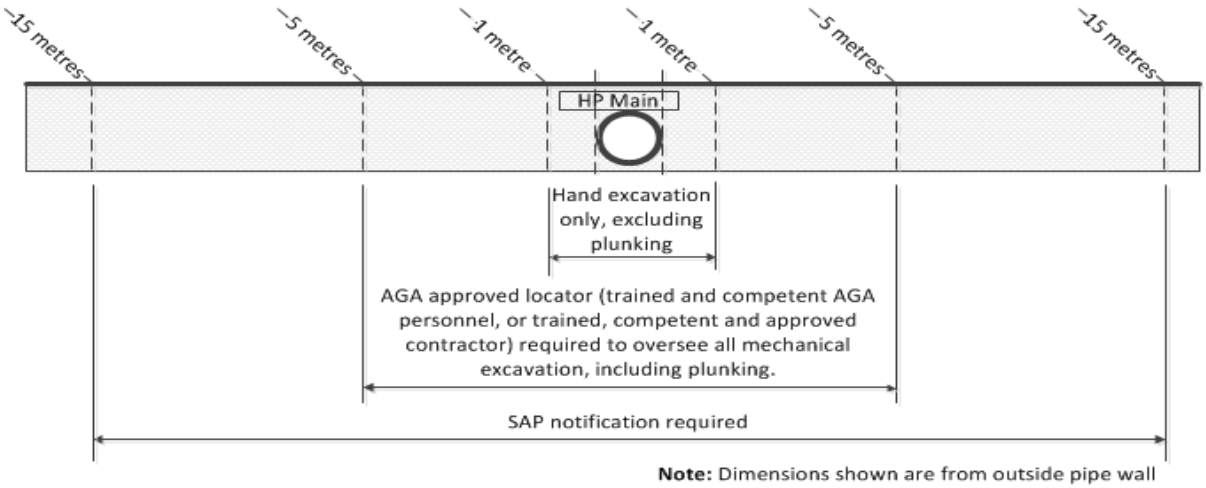
The mandatory requirements are shown schematically in **Figure 2** and detailed in this section, summarised as,

1. **Works within** 15m **(horizontal) of Critical Asset Gas Infrastructure:**
    a) All works must have a current ATCO Critical Asset Notification (Section 5.2.1).
2. **Works within** 5m **(horizontal) of Critical Asset Gas Infrastructure:**
    a) All works must have a current ATCO Critical Asset Notification (Section 5.2.1).
    b) Attendance is required by an Approved Locator for all activities / works (Section 5.3.1).
    c) The location of gas assets must be proven immediately prior to work (Section 5.3.2)

The horizontal separation distances are from the edge of the Critical gas infrastructure.

Working above a Critical pipeline which has a depth of cover greater than 1m is still classified as working within 1m of Critical gas infrastructure.

Figure 2: Mandatory Location Requirements



Note: Limitations on activities and use of mechanical equipment apply (Section 5.3.2).

5.2 Works within 15 Metres of Critical Asset Gas Infrastructure

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

To apply for a Critical Asset Notification, visit the ATCO webform Critical Asset Notification Request Form

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 imposed onto the pipeline – heavy vehicle crossings, crane positioning, equipment storage, compaction, increasing depth of soil coverage.
- Vibration loading – compaction, drilling, piling, vibratory rolling.
- Impact – digging, drilling, tie-back bars, pole installation, fencing, boring, new service installation, ground anchors, thrust blocks, 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 or change depth of cover over/around gas infrastructure
- Hot works – grinding, welding, thermal cutting or heating, and other related heat-producing or spark-producing operations per Section 4.5.

The location / position and crown level (i.e., 'top') of all gas pipelines must be proven using direct visual identification during the planning / design stage of the project. The proving of the whole circumference and area immediately around the gas pipeline is necessary to obtain a Critical Asset Notification, in most instances, for subsequent activities.

5.2.1 Critical Asset Notification

The Critical Asset Notification will be provided by ATCO once all requested information has been provided by the proponent, and ATCO is satisfied that the works can proceed safely. Depending on the nature of the works a review by Engineering Services may be required.

ATCO may issue a site-specific Critical Asset Notification with accompanying conditions / impose requirements and the proponent must comply with such conditions / requirements.

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

Caution: The Critical Asset Notification must be kept on site in digital or paper format. **All the activities** within 15m of Critical Asset Gas Infrastructure must be covered under the Critical Asset Notification.

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

Note: ATCO reserves the right to notify WorkSafe and Building and Energy WA in cases of non-compliance and initiate prosecution as necessary.

5.2.2 Requesting a Critical Asset Notification

The minimum times that should be allowed for requesting and receiving a Critical Asset Notification to allow works within 15m of Critical Asset Gas Assets are as shown in **Table 6**.

Table 6: Minimum time frames for requesting a Critical Asset Notification

Type of Request	Time Frame
Critical Asset Notification without Engineering Assessment	3 business days
Critical Asset Notification with Engineering Assessment	Up to 12 business days for Engineering Services to correspond Up to an additional 22 working days for resolution depending on complexity and information provided

Note 1: Where the proposed works are altered or added to, additional time must be allowed for re-assessment.

Note 2: Where the proposed works require alterations to the Network, additional time must be allowed as outlined in Section 4, Required Lead Times.

5.3 Works within 5 Metres of Critical Asset Gas Infrastructure

5.3.1 Attendance by an Approved Locator

In addition to the Critical Asset Notification requirement (Section 5.2.1), an ATCO Approved Critical Asset Locator **(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 Critical Asset Notification, use these links provided or visit the ATCO website (refer Section 1.1) or if you are unsure, call 1300 926 755 Monday to Friday, 7:30am to 3:30pm.

All on-site attendance by Approved Locators is at the requestor's booking and cost.

You are responsible for any landscaping reinstatements or road reinstatements required by local regulations imposed by a local government authority or road-owner / landowner.

5.3.2 Work Requirements

The location of ATCO assets must be visually proved immediately prior to commencing any site works / construction. All proving digging must be by non-mechanical methods (vacuum extraction, hand excavation) until the gas pipeline is visually located and confirmed.

When working near or over Critical Asset gas pipelines, the location of the pipeline must be pegged or suitably visually indicated at all times.

Mechanical excavation and vertical boring/auguring 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 Critical Asset Gas Pipelines you must provide suitable labourers for hand-digging or vacuum extraction under the 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 larger excavators, tiger tooth buckets or similar equipment that can damage pipelines, without ATCO Engineering approval).

Note: Your site works may be delayed or stopped at time of construction should pre-proving of the gas asset by an Approved Locator not have been completed and/or Engineering Services has not otherwise agreed to the proposed design, design changes and gas infrastructure separation distances.

6. RELATED DOCUMENTS

Standards and Legislations

The current version of the following standards and legislation in **Table 7** must be referred to when conducting works around gas infrastructure.

Table 7: Standards and legislation applicable to working around gas infrastructure

Standards and Legislation
AS2885.0 Pipelines – Gas and Liquid Petroleum
AS/NZS 4645.1 Gas Distribution Networks
AS4799 Installation of Underground Utility Services and Pipelines within Railway Boundaries
AS/NZS 4853 Electrical Hazards on Buried Metallic Pipelines
AS4041 Pressure Piping
AS/NZS 4130 Polyethylene (PE) Pipes for Pressure Applications
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)
Work Health and Safety Act 2020 (WA)
Work Health and Safety (General) Regulations 2022 (WA)
Utility Providers Code of Practice for Western Australia
Western Australia Excavation Code of Practice
AS 5488.1:2019 Classification of subsurface utility information, Part 1: Subsurface utility information
AS 5488.2:2019 Classification of subsurface utility information, Part 2: Subsurface utility engineering

7. 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.
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6. In this document, 'including' means 'including, but not limited to'.
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