

GUIDELINE

DESIGNING, CONSTRUCTING AND OPERATING ASSETS NEAR JEMENA GAS PIPELINES

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INTERNAL

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1 INTRODUCTION

1.1 GAS PIPELINES AND MANAGING RISK

Jemena operates a number of high pressure gas pipelines in Australia, including but not limited to:

- Jemena Gas Networks (JGN-NSW) consisting of:
 - License 1 (Central Trunk) Pipeline
 - License 2 (Southern Trunk) Pipeline
 - License 3 (Northern Trunk) Pipeline
 - License 7 (Northern Trunk) Pipeline
 - License 8 (Northern Trunk) Pipeline
 - Sydney Primary Main
 - Sydney Primary Loop
 - Western Sydney Primary Main
 - Wollongong Primary Main
- Evo Energy Gas Networks (EVO-NSW/ACT) consisting of:
 - Licence 29 Pipeline
 - Canberra Primary Main
 - Nowra North Primary Main
 - Nowra South Primary Main
- Northern Gas Pipeline (NGP-NT & QLD),
- Darling Downs Pipeline (DDP-QLD),
- Atlas Plant and Lateral (AL-QLD),
- Queensland Gas Pipeline (QGP),
- Eastern Gas Pipeline (EGP-VIC & NSW),
- Roma North Pipeline (RNP),
- Vic Hub (VIC) and;
- Colongra Gas Transmission and Storage Pipeline (CP-NSW).

These pipelines operate at gas pressures ranging from 3,500kPa to 14,900kPa. Failure to follow the guidelines listed in this document may lead to damage to these pipelines resulting in Catastrophic consequences; loss of life and major damage to property and infrastructure as well as loss of gas supply to thousands of gas consumers.

To manage the risk of damage to gas pipelines from construction activity, Jemena participates in the Dial Before You Dig (Visit: www.1100.com.au) system and provides information to Third Parties planning to perform work around Jemena pipelines. Pipelines are continuously patrolled via aerial surveys and ground patrol and monitored 24/7 days a week by a Control System.

To make an encroachment enquiry for any work potentially near the above pipelines assets, the first step is to lodge a DBYD enquiry. If the DBYD enquiry identifies work near a Jemena asset, you will be issued with a response document by the DBYD system. This response document will provide detail on the process to proceed.

For Jemena Gas Networks (NSW) and Evoenergy Network (NSW/ACT) assets, the next step will be to book a Jemena Representative to attend site and to review the proposed work. Depending on the complexity of the job, this may result in further detail being required by Jemena before the proposed work can proceed. To progress this step, an enquiry must be registered via the Jemena Gas Portal located at the following address:

<https://mygasservices.jemena.com.au/gdp/login/auth>

For the remainder of Jemena's gas assets, the process to proceed with Jemena assessment and approval of your proposed work is to review the response document. A Jemena representative will then make contact regarding your proposed work, however, if this contact is not received, **the Third Party is not authorised to undertake any work and written Jemena consent must be sought by contacting the appropriate Jemena representative listed on the DBYD response.**

1.2 PURPOSE

This document has been developed to provide general guidelines to assist the Third Party in their design/construction proposal, prior to submitting it to Jemena for review.

This document does **NOT under any circumstances,** authorise the Third Party to carry out any construction activities. All design/construction proposals **must** be reviewed, assessed and accepted by Jemena.

Jemena Pipelines are licensed under the legislative provisions of each State. The Legislations contain a number of requirements including the:

- Approval from the relevant statutory authority for any modification to the assets as a result of the encroachment.
- Where required separate easements for third party services crossing Jemena Pipelines, and
- Approval from the easement and pipeline licence holder for works within the easement or Pipeline working corridor.

1.3 DEFINITIONS

Term	Definition
Easement	An easement is a form of tenure that is acquired by Jemena to provide protection to its high pressure gas assets. Easements give Jemena the right to use the land for operating its assets and include mandatory requirements for any landholder and third party undertaking work on, over or near the easement.
Encroachment	Any design or construction activity and changes in operating condition that may impact on the integrity of the pipeline.
Jemena Pipeline (AS2885 pipeline)	A Jemena owned/operated natural gas pipeline that operates above 1050 kPa pressure.
Jemena Representative	A Jemena Representative is an individual who has been authorised by Jemena as having undertaken the appropriate training and meets the competency requirements. A Jemena Representative will be present on site while third party work is undertaken and will issue the Third Party Works Notice prior to commencement of this work.
Road Reserves	Road Reserves are as defined by the relevant states Land Act and typically include footpath, stormwater drains, roadways, median strips, bus lanes and cycleways.
Shall	Designates a mandatory action
Third Party	Developer, Builder, Owner, Contractor or Customer planning or conducting works in the vicinity of Jemena Pipelines.

1.4 REFERENCE DOCUMENTS

- AS2885 Pipelines - Gas and liquid petroleum
- AS4853 Electrical hazards on metallic pipelines

1.5 EMERGENCY CONTACT DETAILS

1.5.1 FAULTS AND EMERGENCIES

For faults and emergencies only:

- Eastern Gas Pipeline (VIC / NSW) **1800 620 492**
- Queensland Gas Pipeline (QLD), Atlas and Roma Nth Pipelines (QLD) **1800 177 008**
- Northern Gas Pipeline (NT / QLD) **1800 531 709**
- Darling Downs Pipeline (QLD) **1800 571 880**
- Jemena Gas Network (NSW) / EVO Energy Distribution (NSW/ACT) and Colongra Lateral Pipeline (NSW) **132 909**

2 DUTY OF CARE FOR WORKING AROUND JEMENA PIPELINES

Working near high pressure gas pipelines is extremely dangerous if appropriate controls are not introduced and followed. You shall always exercise due care and caution when working near any gas infrastructure. In addition to your general duty of care, there may be other obligations under relevant state legislations which require you to maintain safe practices.

Due care **must** be exercised at all times to ensure there is no damage to any Jemena pipeline, asset (marker post, fencing, structure) or land.

Any damage shall be reported to Jemena immediately (see SECTION 1.5.1 for emergency contact numbers).

3 DESIGN

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 shall be paramount, with due consideration of safe methods for the construction of the works and the ability to apply effective controls for these activities.

Note: In exceptional circumstances it will be mandatory for Jemena Engineering to undertake a review if minimum separation distances cannot be maintained (See section 5).

3.1.1 SEPARATION DISTANCE FOR SERVICE CROSSING

Electrical assets encroaching on Jemena Pipeline are considered **HIGH RISK and have additional requirements to the separation requirements outlined in Section 4.1.12.**

3.1.1.1 Trenching (Open cut)

The **vertical** separation distance between a new service crossing a Jemena pipeline is as follows:

- **Major utility services** vertical separation to the nearest surface of the Jemena Pipeline:
 - Crossing over Jemena pipeline - **minimum separation of 500 mm**
 - Crossing under Jemena pipeline – **minimum separation of 1000 mm**

All services crossing above Jemena Pipelines are to be marked with buried gas warning marker tape at the bottom of the service trench.

All services crossing below Jemena Pipelines shall have a Jemena Pipeline Marker installed within 1 m of the crossing point.

The requirement for any service (with the exception of High Voltage Electrical) to be installed parallel to the Jemena Pipeline is as follows:

- Where there is a **Jemena easement**, the service shall be located **outside of the Jemena easement**.
- Where there is **no Jemena easement**, the service shall be installed with a **minimum horizontal clearance of 1000 mm** between the two nearest surfaces (JGN and Evo Energy Pipelines and new service).
- Where there is **no Jemena easement**, the service must be installed with a **minimum horizontal clearance of 3000 mm** between Jemena pipelines except JGN and Evo Energy and the new service.

3.1.1.2 Vertical Drill

Where a Jemena Pipeline has an easement, all vertical augering, including drilling for any geotechnical investigation, shall be outside the easement.

Where Jemena Pipeline does not have an easement, the minimum separation distance to Jemena Pipeline shall be a minimum of **5 m** for any vertical augering, including drilling for any geotechnical investigations.

If the proposed Third Party design does not meet the above requirement, an engineering review of the design proposal shall be requested by the Third Party (See section 1.1).

The Third Party shall provide Jemena the following information in the design package:

- The methodology of drilling activity, such as hammering, rotating, etc.;
- Types of machinery proposed to be used, loadings, vibration settings and limits
- Findings of any Geotechnical assessment of formation being drilled to determine if ground settlement/heaving is likely and monitoring methodology to be used during works; and
- Demonstrate / recommended physical protection measures.

3.1.1.3 Trenchless Installations

The minimum separation distance between the Jemena Pipeline and any trenchless installation (including Horizontal Direction Drill (HDD), Micro Tunnelling (Laser Bore), or horizontal bore) shall be **3 m or greater**.

For trenchless crossings of Jemena Pipelines:

- A visual window in the form of a **slot/witness trench** 2-3m away from the pipeline on the drill approach side shall be provided. The slot/witness trench shall have a depth equivalent to the Jemena pipeline depth (positively identified) plus 1 m.

If a trenchless crossing is proposed within 3m of Jemena Pipelines, an engineering review of the design proposal shall be requested (See section 5). The following documents shall be provided by the Third Party to Jemena for review:

Trenchless installation details including:

- Drill path profile showing separation distance between the new service and the existing Jemena pipeline.
- The location and setup of the launch and receive pits where they are located within the Jemena Easement, where there is no easement, if located within 10 m;
- Drill head control, accuracy and monitoring methodology;
- Geotechnical assessment of formation being drilled to determine if ground settlement/heaving is likely and monitoring methodology to be used during works;
- Contingencies in the event of frac-out where drilling fluids are used; and
- Demonstrate recommended physical mitigation measures.

3.1.2 EXISTING ROAD WORK MAINTENANCE

The minimum cover including the reduction of cover for road maintenance shall be minimum **1.2 m** to the top of the pipe. And the maximum finish level to the top of the pipe is **3 m**.

3.1.2.1 Changes to ground levels or surface conditions

Ground levels within the easement shall not be altered without written permission from Jemena.

Any alterations to the finished surface level, width or surfacing of any street or road (sealed/unsealed) reserve shall not occur without written agreement from Jemena.

3.1.3 VEHICLE CROSSING AND CONSTRUCTION LOADINGS OVER JEMENA PIPELINES

Where the minimum depth of Jemena Pipeline is **1.2 m** to the top of the pipe, the acceptable load/axle for construction vehicle or plant crossing over the Jemena Pipelines is limited to **8 Tonnes/axle**, at the crossing point. The crossing shall be at right angles to the pipeline alignment.

If the minimum depth of the Jemena Pipeline is **less than 1.2 m** to the top of the pipe, an engineering review of the design proposal must be requested by the Third party (See section 5).

Vehicle crossings shall be limited to **dedicated pipeline crossing** locations, which must be clearly sign posted. Crossing of the pipeline at alternative locations are not permitted.

Where soil conditions exhibit poor compaction and load bearing characteristics, such as swamp areas or wet soil conditions, vehicles and equipment are not permitted to cross over the pipeline irrespective of weight without written approval from Jemena.

Temporary Stockpiles are not allowed within Jemena easement. Where there is no Jemena easement, temporary stockpiles shall be kept away from the pipeline at a minimum distance equivalent to the pipeline depth of cover plus one meter.

4 CONSTRUCTION ACTIVITIES

4.1.1 GENERAL

All construction personnel shall be made aware of the presence of gas infrastructure at the daily pre-start meetings and toolbox meetings, with due consideration given to the gas infrastructure within the relevant Job Safety Assessment.

Gas Marker sign posts and directional marker plates shall not be disturbed, relocated, removed or altered without the prior written approval from Jemena.

A Jemena Representative shall be present during:

- Any construction activity within the Jemena easement or crossing the easement
- Any construction activity within road reserves within 3m or crossing the Jemena Pipeline

Note: A Jemena representative can be booked via the Jemena Gas Portal (See section 1.1)

4.1.2 LOCATING JEMENA'S PIPELINES

Jemena Pipeline locations shall be positively identified via potholing in the presence of a Jemena Representative prior to any drilling or excavation that may impact Jemena's buried pipelines.

Potholing can be carried out by HydroVac or AirVac. **Water jetting at high pressures has the potential to damage buried assets.** The Third Party shall exercise due care, and ensure that the water pressure will comply with the approved water pressure range depending on the type of Jemena Pipeline coating as per below:

Pipe material	Maximum allowable water pressure, psig	
	Rotating nozzle	Fixed nozzle
Uncoated steel pipe	3000	3000
PE coated steel pipe (yellow jacket)	2000	2000
Fusion bonded epoxy (FBE) coated steel	2000	2000
Coal Tar Enamel coated steel	0 (Not allowed)	0 (Not allowed)
Petroleum tape coated steel	1000	1000
Tek-Rap coated steel	1000	1000
Coated steel pipe (unknown coating)	1000	1000

4.1.3 EXCAVATORS AND EXCAVATION PROCEDURE

The biggest acceptable size of excavator that can be used during trenching (open cut) is **20 Tonnes** fitted **with general purpose bucket** (blade bucket toothless bucket, mud bucket).

The excavation **SHALL** be carried out in the presence of a Jemena Representative.

4.1.4 BACKFILLING MATERIAL

The general backfilling material surrounding the Jemena pipeline (**minimum 150 mm around the pipeline**) shall be:

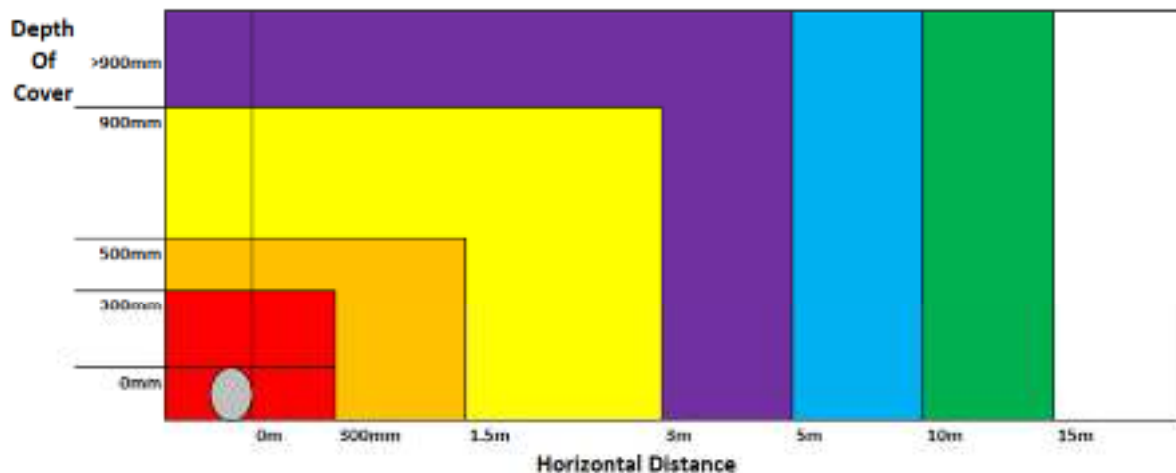
- Free of shell, stones and other deleterious material,
- Have a particle size not exceeding 1mm,
- Have a water extract pH value in the range of 6-8
- Sand bags are NOT allowed to be used as permanent bedding
- Recycled material is not to be used even if it meets the above specifications.

4.1.5 STABILISED SAND

If the Third Party needs to use stabilised sand, the stabilised sand shall not exceed a ratio of **14:1 (sand: cement)**.

4.1.6 COMPACTION OVER JEMENA PIPELINES

Compaction over Jemena Pipelines is limited to following:



Maximum Allowable Compaction

- No compaction permitted. Hand tamping only.
- Hand-held class 60kg compacter only.
- 8T tandem-drum static roller (no vibration), or a hand-held larger plate compacter at any vibration setting.
- 8T tandem-drum roller set at low-amplitude vibration, or 10T vibratory roller set to static roller only (no vibration).
- 8T tandem-drum roller at any vibration setting, or 10T vibratory roller set to low-amplitude vibration.
- 10T tandem-drum roller at any vibration setting.
- No restrictions.

4.1.7 VIBRATION

Vibrations from any equipment or processes including vibrating compaction equipment, jack hammers, rock hammers, seismic measuring processes, etc. **are not to exceed peak particle velocity readings of 20 mm/second** at the nearest surface of the buried pipeline.

In the event that such vibrating equipment is to be used close to the pipeline or in blasting operations, suitable trials (as accepted by Jemena) are to be conducted prior to proceeding with the proposed development to ensure that the stipulated peak particle velocities will not be exceeded.

Suitable (as accepted by Jemena) vibration monitoring equipment is to be used to record the tests and works as they progress in accordance with agreed procedures with Jemena.

4.1.8 BLASTING

Blasting is **not allowed within 100m** of Jemena Pipelines without prior written approval from Jemena.

If the Third Party has a requirement to conduct blasting activities within 100m of Jemena Pipelines, an engineering review of the design proposal shall be requested by the Third Party (See section 5).

The following information shall be included in the design package for review:

- The blasting distance from the pipeline and drawings, map references;
- Depth of the blast;
- Shot size (kg);
- Shot sequence and delay; and
- Shot strength.

Information on Peak Particle Velocity (PPV) and measures shall be in place during blasting to monitor PPV

4.1.9 PROLONGED JEMENA PIPELINE EXPOSURE

If the Jemena Pipeline is to be exposed for more than one day, suitable barricades and steel plates shall be installed to ensure the security of the exposed Jemena Pipeline from accidental (construction or vehicle impact) or deliberate damage (vandalism).

Damage to Jemena Pipeline due to sagging shall be prevented. For **any unsupported span of pipe exceeding 6 m**, written approval from Jemena will be required.

4.1.10 JEMENA PROTECTION MEASURES – POST CONSTRUCTION

All existing Jemena Pipeline's protection measures including but not limited to concrete slabs, marker posts, marker tape and Cathodic Protection Systems shall be retained. Any protection measure that was temporarily removed with Jemena's approval as part of construction is to be reinstated to its original condition post construction.

4.1.11 NEW / UPGRADED ROAD CROSSINGS

The following specific design requirements shall be required for new/upgraded road crossings:

- Minimum cover of 1200mm from the finished surface of the road or the invert of the drains to the top of the pipeline.
- Road alignment shall cross the pipeline at or close to a right angle.
- Road alignment shall not be parallel to and above the pipeline
- Where permanent protection measures are proposed, see Section **4.1.13**

4.1.12 ELECTRICAL UTILITY INSTALLATION

For **High Voltage Electrical installation**, defined as **voltage above 1000 VAC and 1500 VDC**, the Electricity Asset Owner or representative shall perform an electrical hazards study on the Jemena steel

Pipeline in accordance to the latest version of AS4853 (Electrical Hazards on Metallic Pipelines). The study shall be completed by a certified practitioner. The types of electrical hazards that need to be covered are as follows:

- Low frequency induction (LFI);
- Earth potential rise (EPR);
- EPR due to lightning current;
- Capacitive coupling on the pipeline due to adjacent high voltage power lines; and
- Accidental contact of pipeline with other electrical systems.

This report shall be submitted to Jemena for acceptance prior to implementing any design. The report shall clearly state the standards it refers to, e.g. AS 4853:2012, details of the proposed electrical infrastructure, the hazards that have been assessed, the assessment, findings and Jemena's pipe details (diameter, length, and distance to nearest pipeline facility where contact by personnel is expected, such as Cathodic Protection Test Points).

For **Low Voltage Electrical installation** defined as voltage **below 1000 VAC and 1500 VDC**, the Electricity Owner or representative shall perform a Level 1 assessment on the Jemena steel Pipeline in accordance to latest version of AS4853 (Electrical Hazards on Metallic Pipelines). The study shall be completed by a certified practitioner.

4.1.13 NEW PERMANENT STRUCTURAL PROTECTION INSTALLATIONS OVER JEMENA PIPELINES

If the depth of the cover of Jemena Pipeline is less than 1.2m or more than 3m, and the Third Party is proposing to design and install a new permanent structure on the top of Jemena Pipeline to provide protection from external loads or damage, the Third Party shall request an engineering review of the design proposal (See section 5). The following information must be provided for assessment with the design package:

- The slab design drawing (plan and cross section);
- How the slab will be supported, i.e. vertical piers or similar
- Geotechnical investigations
- Design calculations; and
- Certification from an appropriately qualified structural engineer certifying the adequacy of the design in ensuring the pipeline is isolated from excessive loading

The permanent structure shall be submitted to Jemena for review and acceptance.

5 JEMENA ENGINEERING REVIEW REQUIREMENTS

In some cases, where the Third Party design and construction activities do not comply with the requirements set in Section 3 and 4 of this document, the Pipeline Engineer may elect to conduct an Encroachment Management Study (EMS) with the relevant stakeholders (Third Party and Jemena) to ensure that the threats from the proposed design/construction activities are considered and effective controls are put in place. Any action items from the EMS will be communicated to the third party in a formal written response. Any additional controls identified shall be incorporated in the design/construction documents and re-submitted by the Third Party to Jemena for approval.

The Third Party shall provide the Design/Construction Package to Jemena for review and acceptance.

The package shall include but not be limited to the following:

- Due Dates or Project Program;
- Scope/Description of the project impacting on the Jemena Pipeline/s;
- Site Layout: Site Layout drawings shall include the following:
 - The location/address of the proposed work.
 - Site Access Designated Area including Jemena pipeline location and depth of cover (confirmed by positive identification) relative to the works
 - Sheds: The Third Party shall not install sheds directly over pipeline or within the easement without obtaining Jemena approval.
 - Temporary Stockpile: The Third Party shall not stockpile any heavy material directly over the pipeline, temporary Stockpile should be kept away from the pipeline to a distance equivalent to pipeline depth of cover plus 1 m.
- Design: depending on the proposed design/work, the drawings shall include the following:
 - Plan drawing: show the location of the Jemena's pipeline and the new service crossing including the separation distance;
 - Cross sectional drawing: show the vertical separation distance between Jemena's pipeline and the new service.
 - Details of Cathodic Protection where applicable for the new service
- Construction:
 - Construction alignment sheet (if applicable);
 - Construction methodology: Specify the construction activities, what equipment and how it will be used around the Jemena Pipeline
 - Plant and Equipment Specifications including:
 - Size of the plant, equipment or machinery that will be used within the Jemena Easement or where there is no easement, within a 10 m distance;
 - Load per axle where the vehicles will be crossing the Jemena pipeline;
 - Wheels configuration or track dimensions where the vehicle will be crossing the Jemena pipeline

The design documents required in this Section shall take into account the requirements outlined within this document, along with any other controls that may be required by Jemena.

The above encroachment management system is outlined in the process flowcharts in Appendix 1.

In addition, if the scope of works involve a Land use change within a measurement length of the pipeline due to new major residential development or sensitive development such as schools, day care centres, hospitals, aged care centres etc. A formal Land use change Safety Management Study (SMS) will need to be undertaken to comply to AS2885.6.

Similarly, when the works fall outside the general guidelines, or when there are major roadworks, structures and other heavy construction project that may apply significant loading to the pipe, or cause damage to the pipe, this would also require an Encroachment SMS.

The Encroachment Safety Management Study (Land use change SMS or Encroachment SMS) would be held in a workshop setting arranged by the third party and would need to be facilitated by a Jemena approved SMS facilitator and attended by Jemena Pipeline Engineers. The purpose of the EMS is to ensure that the threats from the proposed design/construction are assessed and effective controls are put in place. It is the responsibility of the third party to issue a final SMS report to Jemena and also ensure an Actions Closed Out report is submitted to Jemena for acceptance as part of design / construction works completion. Any actions required by Jemena as part of the EMS process will be raised in JCARS (Jemena Compliance and Risk System) for formal management, close out and governance.

Third Party works will only be approved to proceed once all required actions (and additional safeguard/controls) identified in the EMS have been implemented.

6 OTHER ACTIVITIES THAT REQUIRE APPROVAL OR MONITORING AND SUPERVISION

The Third Party shall consider the following requirements and provide the appropriate documentation for acceptance by Jemena, where applicable:

- Prior to construction of any fencing and access gates within an easement or in the vicinity of Jemena pipelines, Jemena must be notified and Jemena approval shall be obtained. For all new gate installations limiting access to Jemena pipelines, the Landowner shall provide Jemena access at all times by allowing Jemena to install a Jemena padlock on the gate.
- Any tree planting and removal within the vicinity of the Jemena Pipeline or on easement shall be reviewed and approved by Jemena. The proposed tree planting shall include the plan drawing showing the layout of the trees with respect to Jemena pipeline, and type of the trees that will be planted. Consideration shall be given to the expected size of trees and shrubs at maturity, and any required placement of root barrier measures.
- An operational management plan is required for works around the gas assets, describing site layout, materials management and logistics/supply, traffic movements in/near gas mains area, air, noise, vibration, dust and erosion management requirements on site;
- A soil recovery management plan is required where work is carried in rehabilitated areas;
- A weed management plan is required to ensure weeds, diseases are not imported/exported from site including vehicle cleaning process;
- A groundwater & construction water management plan, including information relation to treatment & disposal of existing groundwater or water for hydro testing;
- A soil or erosion management plan;
- An area rehabilitation plan to ensure vegetation is reinstated consistent with the local area;
- Information on type and source of soils/fill to be imported, demonstrating that material is suitable for use, and is not contaminated;
- Information relating to soil mechanics, properties of fills to be imported, friction angle, calculation of soil pressures and mitigation measures for mains protection where surcharge may occur. Information shall include the design of any proposed protective slab, shoring and retaining walls; and
- Obtain any relevant regulatory permits required to undertake the works.

7 AS-BUILT DRAWINGS

On completion of new **individual residential services**, constructed near Jemena assets, all As Built drawings, as well as the following information shall be presented by the Third Party to the Jemena Representative:

- Address
- Plan view;
- Cross section view;
- GPS coordinates.

On completion of new **major services** (power and communication conduits, water, sewer or storm water infrastructure) or changes to existing services, **major roadworks** projects, **major rail** projects that are constructed either parallel or crossing a Jemena Pipeline, the following information shall be provided by the third party in hard copy and electronic medium format such as DWG or other agreed format with Jemena engineering:

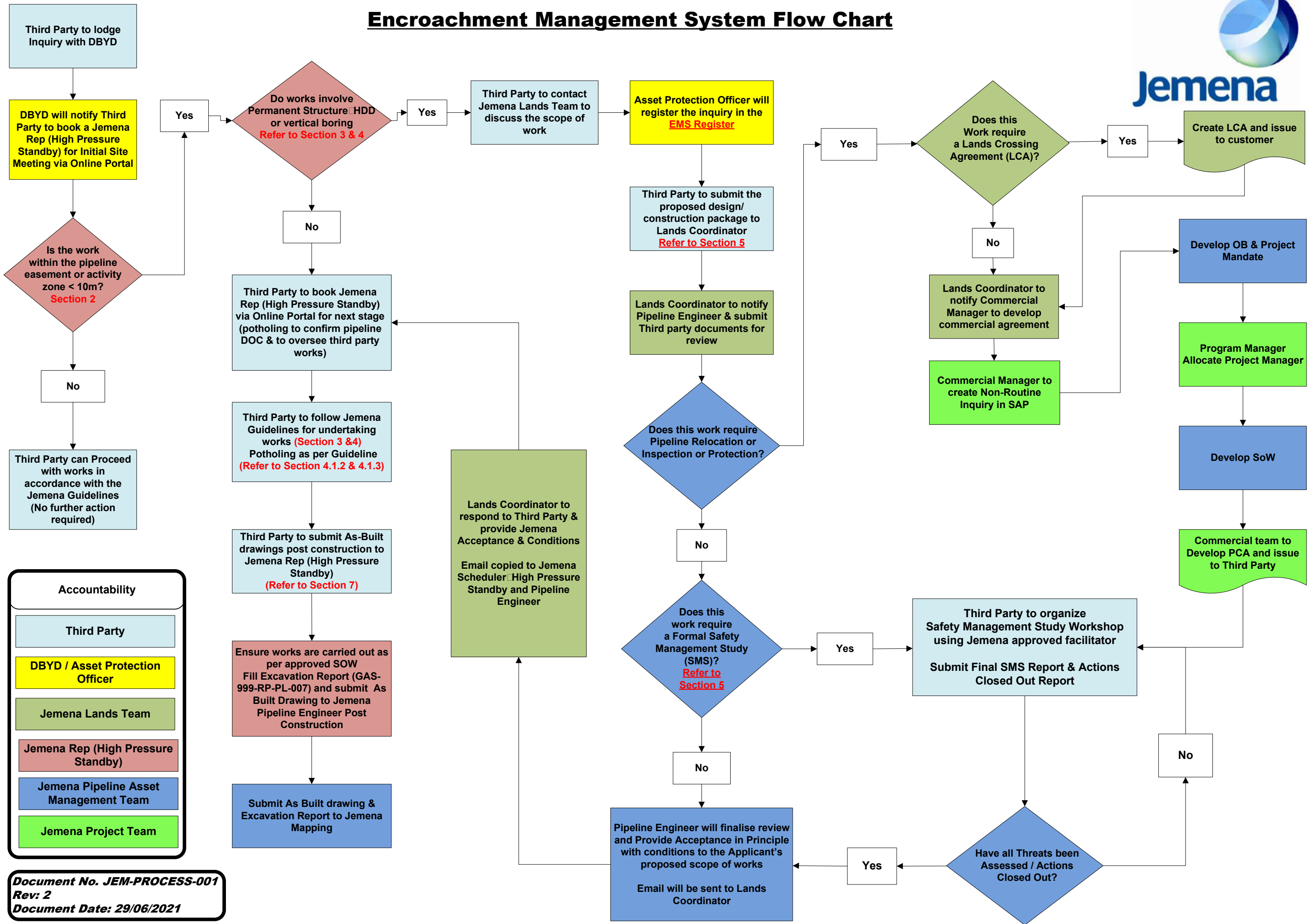
- “As Built” drawings of the service in the vicinity of the Jemena Pipeline
- Obvert level of services crossing under, and invert level of services crossing over Jemena Pipelines
- Separation distance between new service and Jemena Pipeline
- Coordinates of the services on GDA datum.
- The location of each feature crossing the pipeline is to be accurate to ± 100 mm.
- As-Built survey is an engineering survey, and may be undertaken by qualified Engineering Surveyors. A Registered Surveyor shall supervise all engineering surveys.

8 APPENDICES

8.1 APPENDIX A

ENCROACHMENT MANAGEMENT SYSTEM FLOWCHART

Encroachment Management System Flow Chart



Accountability	
Third Party	
DBYD / Asset Protection Officer	
Jemena Lands Team	
Jemena Rep (High Pressure Standby)	
Jemena Pipeline Asset Management Team	
Jemena Project Team	

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