NATURAL GAS REQUIREMENTS FOR DEVELOPER PROVIDED TRENCH

Interim Gas & Communications 2way Trench Format for the Endeavour Energy franchise areas.

Effective 1 March 2012

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1. Purpose

The purpose of this document is to provide assistance to the Developer / Trench Provider and Jemena on the specifications and technical requirements in the reticulation of Natural Gas in a Developer Provided Trench (*A single service trench to accommodate two or more Authority Assets*).

2. Scope

Ensure that the principles of Developer Provided Trench and the responsibilities of all Authorities technical specifications are met. While this document is primarily designed for new residential developments, it may also be applied in other simular situations.

3. Related Documents

The application of the ***Developer Provided Trench*** is to be carried out in conjunction with the following documents and references:

Streets Opening Conference (SOC) – Guide to Codes & Practices for Streets Opening 2007

AUS-SPEC # 2 SPECIFICATION 303- Service Conduits

3.1 Definitions

Jemena	Natural Gas Authority
Authorities	Any Service Authority and or other Government / Regulatory Body
Backfill	A specified material used to fill the “Developer Provided Trench” and or excavation
Bedding	A specified material used to pad, to ensure the protection of all plant and equipment.
Developer	The person, party or corporation / agents requiring the provision of services (ie) Natural Gas to be reticulated throughout a subdivision and or development.
Trench Provider	Any person or corporation engaged by the developer to excavate a “Developer Provided Trench”.
Exclusive Trenching	A Trench and or excavation that accommodates only one authorities plant or equipment.
Protective Measures	May include but not limited to combined warning tapes, conduits, PE (polyethylene) strips and kerb marking for road crossings.

4. Responsibilities

This section outlines the responsibilities of all parties involved in the servicing of land via the use of a Developer Provided Trench.

4.1 Responsibilities of the Developer/Consultant:

- Contact Jemena for Natural Gas availability and supply a layout of the proposed subdivision in DWG format.
- Provide Jemena with a final electrical layout in electronic format for the subdivision.
- Coordinate joint Authority requirements.
- Arrange Trench Civil works.
- Advise Jemena of the Civil Contractor and or Trench Provider's Name and details to arrange scheduling of the programmed works.
- Request Certificates of Operational Acceptance, after Jemena have completed works.

4.2 Responsibilities of the Civil Works Contractor /Trench Provider:

- Organise a pre-construction site meeting with a Jemena Representative.
- Supply & install road-crossing conduits as required.
- Program & coordinate the Developer Provided Trench & the Utilities.
- Provide 48 hours notice prior to trench being ready for Jemena's contractor.
- Supply and install all Protective Measures (ie) Warning tape relevant to the plant in the Developer Provided Trench.
- Excavate/backfill and compact to suit Developer Provided Trench specifications.
- Ensure manageable portions of the trench are provided. (ie) minimum length of 200mtrs of open trench is required before contacting Jemena to lay mains.
- Coordinate and manage the Developer Provided Trench "Accept and Release" process, as required.
- Supply and place all specified bedding and backfill materials to meet Jemena's specifications.
- Ensure that The Developer Provided Trench is within the correct alignment and in accordance with the Streets Opening Conference (SOC) – Guide to Codes & Practices for Street Opening.
- Monitor quality and the timing of the Developer Provided Trench.

- Coordinate with Jemena, to resolve any design changes that may be required on site during construction.

4.3 Responsibilities of Jemena:

- Provide Design input at the planning stage to optimise Developer Provided Trench opportunities and enable correct set out of plant.
- Issue relevant Developer Provided Trench plan prior to construction.
- Attend a pre Construction site meeting as required.
- Commit adequate resources to carry out work with in an agreed time frame.
- Carry out, in progress Audits and Post Audits as required.
- Supply and deliver pipe and fittings to Site
- Manage the installation and commissioning of Natural Gas asset.

5. Natural Gas Plant

The following is typical of a plant, which is used in reticulation of Natural Gas within land developments. Varying quantities and combinations of such Plant is to be accommodated by the Developer.

- **High Pressure Gas Main:** Steel gas main not exceeding 1,050 kPa used for bulk supply to development sites.
- **High Pressure Gas Service**. Steel service pipe not exceeding 1,050 kPa for provision of supply to customer premises.
- **Medium Pressure Gas Main:** Polyethylene and/or nylon main not exceeding 400 kPa used for bulk supply and reticulation of development sites.
- **Medium Pressure Gas Service:** Polyethylene and/or nylon service pipe not exceeding 400 kPa for provision of supply to customer premises.
- **Trace Wire:** Main and service location wire, copper wire for purpose of detecting Polyethylene / Nylon Gas Mains and Services.
- **Combined Warning Tapes:** A durable plastic tape, placed above Service Authorities plant to indicate their presence in a Developer Provided Trench.
- **Warning Tape:** A durable plastic tape, yellow in colour placed above gas plant to indicate their presence. (Exclusive trench only)
- **Marker Plate:** Concrete / cast iron square plate, with directional arrows to indicate location and direction of gas plant below ground.

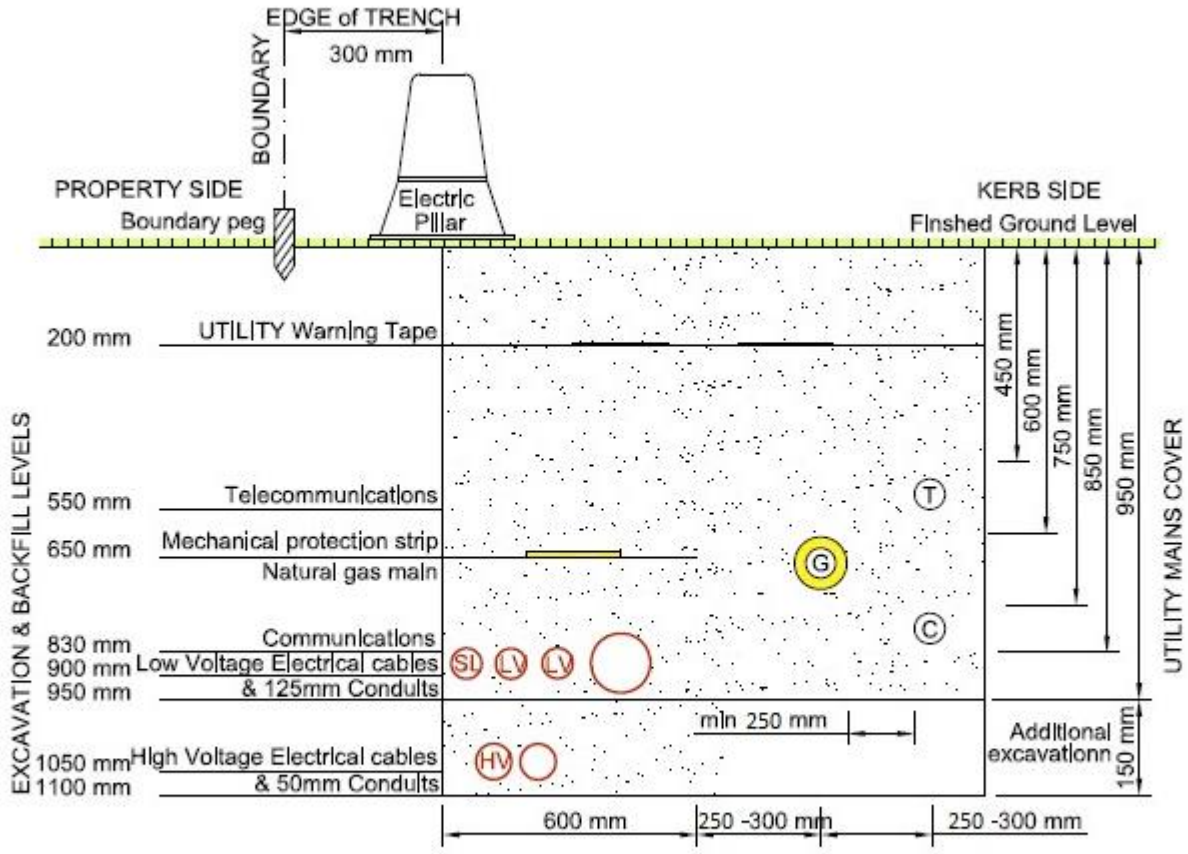
- **Isolation Valve:** An in-line control valve for the purpose of isolating specific Natural Gas mains and services.
- **Cathodic Upstands:** A galvanized steel pipe with internal testing equipment for the monitoring of induced current levels on steel Gas Mains.
- **District Regulator:** A pressure regulator set for the control of Natural Gas distribution pressures.
- **Paddock Markers:** An above ground Natural Gas location marker.

6. Trench Specifications

The diagram below (Figure 1.0) outlines the requirements for the provision of a Developer Provided Trench specification and construction requirements.

Any party wishing to vary the layout of the Services within and/or the alignment of the Developer Provided Trench will require approval from all *Authorities* involved in the Developer Provided Trench prior to construction.

(Figure 1.0)



TYPICAL SHARED TRENCH DETAIL

7. Alignment of Trenches

The alignment of the Developer Provided Trench shall be determined only after completion of detailed site investigations and design analysis, to ensure that due consideration is given to the following:

- Proximity and impact of the *Developer Provided Trench* to all other existing and proposed underground services.
- Proximity and impact of the *Developer Provided Trench* to all other existing and proposed structures.
- Proximity and impact of the *Developer Provided Trench* on existing sensitive features such as heritage and cultural features.
- Proximity and impact of the *Developer Provided Trench* on existing flora (ie) special consideration must be given to the protection of existing trees.
- Proximity and impact of the *Shared Trench*, in order not to degrade the environment (ie) soil erosion, water pollution etc.

7.1 Preferred Alignment of 3 Way Trenches

Not applicable during interim period.

7.2 Preferred Alignment of 2 Way Trenches

Incorporating Natural Gas and Telecommunication Providers only, **900mm off property line.**

7.3 Alignment of Exclusive Trenches

Where one Service Authority requires trench provision for their sole use, the alignment of this trench will be as Streets Opening Conference (SOC) – Guide to Codes & Practices for Streets Opening, or whatever is mutually agreed.

7.4 Positioning of Services Structures

This section outlines the requirements for the provision of the Developer Provided Trench, its specifications and construction requirements, in conjunction with the standard drawing in Figure 1.0

8. Minimum Separations between Services and Natural Gas Mains

(Table 1.0)

Nylon or Polyethylene Gas Mains	Telecommunication cables and/or conduits	***Protected*** **Low** Voltage electricity cables	***Protected*** **High** Voltage electricity cables
Gas Mains up to 75mm diameter	250mm	250mm	300mm
Gas Mains of 110mm diameter or larger	300mm	300mm	300mm

The above Table 1.0 refers to the minimum separation requirements between services as per **AUS-SPEC #2 Specification 303 – Service Conduits.**

Note:

- Separations relate to distances between conduits/cables peripheries.
- "***Protected*****"** refers to mechanical protection over the cables, which usually takes the form of either polymeric strips (at least 3mm thick) or clay brick.
- The above tables are considered to provide desirable minimum separations. Consideration should also be given for the need to access for future maintenance of Services when determining the required separations.

9. Trench Dimensions

This section outlines the requirements for the provision of the *Developer Provided Trench,* its specifications and construction requirements, in conjunction with the standard drawing in Figure 1.0

10. Width of Trench

- The width of trench shall be determined by the plant to be installed, and their relevant dimensions, including horizontal separation between Services.
- Provision is to be made for the placement where required of suitable bedding/backfill materials as specified by the relevant Service Authorities.
- Provision is to be made for the inclusion of Protective Measures and associated equipment.
- Provision is to be made for the installation of Service Authorities associated structures as required, (ie) pit, pillars, valves etc.
- In the case of abnormal site conditions existing, i.e.; substantial amounts of rock, confined verge corridors etc, a site specific Shared Trench arrangement may be utilized upon approval by all Authorities.

11. Depth of Trench

- Jemena specified "depth of cover" is only relative to finished surface level. Developer Provided Trench and *Services* plant depth is to be determined from finished ground level.

- The depth of the *Developer Provided Trench* is to be determined by the plant to be installed, their relevant dimensions and clearances, including vertical separations between *Services*.

- Provision is to be made for the placement where required of suitable bedding/backfill materials as specified by Jemena.

- Provision is to be made for the inclusion of *Protective Measures* and associated equipment.

- Provision is to be made for the installation of all Jemena associated structures as required, i.e. pits, marker plates and valves etc.

- In the case of abnormal site conditions existing, i.e. substantial amounts of rock, confined verge corridors etc, a site specific *Developer Provided Trench* arrangement may be utilized upon approval by all Authorities.

12. Trench Bedding, Backfill & Landscaping

This section outlines the requirements for the provision of the *Developer Provided Trench,* its specifications and construction requirements, in conjunction with the standard drawing 1.0.

13. Bedding & Backfill Material

Where *Services* are to be protected via the use of Bedding materials, the material is to be as specified by the relevant *Service Authorities* and/or the Authorities responsible for management of that land, and is to be laid in accordance with their specifications.

The Backfill material used within the *Developer Provided Trench* is to meet the requirements of each *(Service Authority),* incorporated in the *Developer Provided Trench*.

All Backfill materials are to comply to requirements of Authorities responsible for the road reservation.

14. Staging of Backfill

All Bedding and Backfill is to be carried out in stages so as to ensure the requirements of the respective *Service Authorities* plan are met.

Staging of Backfill is to facilitate all plant and associated equipment including *Services*, structures and *Protective Measures*.

15. Subsequent work in trenches

The subsequent maintenance renewal or re-arrangement of the plant of any *Service Authority* shall be the responsibility of the *Service Authority* owning it.

No *Service Authority* shall alter the position of its plant in the *Shared Trench*, nor add to it without consultation with the other *Service Authorities*.

The *Service Authority* that re-opens a *Developer Provided Trench* shall take precautions to avoid damage to or interference with the plant of the other *Service Authorities*. The costs of repair to plant of any party damaged/disturbed during such subsequent work shall be the responsibility of the *Service Authority* causing the damage.

The *Service Authority* that subsequently works in a *Shared Trench* shall be responsible for the restoration of the Developer Provided Trench.

The Civil Contractor / Trench Provider subsequent to the initial installation of the Shared Trench, must ensure that all alignments are correct.
In the event that the service authorities Asset has been laid outside of the correct alignment, the cost of relocation to the correct alignment will be borne by the Civil Contractor / Trench Provider.

16. Conduit and Padding Specifications

16.1 Natural Gas Conduits

- Under the terms and conditions outlined in the "Underground Services in a Shared Trench" agreements, the Developer's Contractor shall supply and install Jemena specified conduits for gas mains. They are to be installed at specified locations and depths, and sealed with end caps or other Utility approved seals.

Specification for Jemena Conduits is as follows:

Pipe Sizes (OD mm)	Conduit Diameter (OD mm)	Depth of Cover (mm)	Type (for all sizes)
Nylon Pipe 32, 50 & 75 **Polyethylene Pipe (PE) 40**	**100**	**750**	**Rigid PVC Pipe** **Smooth or Ribbed Exterior, Smooth bore** **Blue/Grey in colour**
110 Nylon **63 & 110 Polyethylene Pipe (PE)**	**225**	**750**	
160 Polyethylene Pipe (PE)	**250**	**750**	

(Table 1.1)

- Prior to installing conduits, the Developer's Contractor shall notify Jemena and arrange a Pre-Construction site meeting to confirm all conduit requirements.

- All roads under construction are to have a natural gas conduit installed beneath. Access through all bridge structures, bebo arches, flood-ways, and culverts, etc, is also via specified conduits during construction.

- The Developer's Civil Contractor shall install conduits on an alignment to suit an exclusive trench or a Developer Provided Trench with the correct horizontal and vertical separations as detailed.

- All conduits shall extend 1000 mm beyond kerb, roadway edge or any other obstruction with marker tape installed above.

- The Developers Contractor shall be responsible for clearly and accurately identifying the location of road crossings, by marking the kerb face with the letters **"G"** where relevant.

17. Padding for Nylon and Polyethylene Pipe

17.1 Padding material for nylon pipe

Spoil from the excavation may be used for bedding nylon pipe in unsealed surfaces as long as it fulfils the following requirements:

- the material shall be fine and loose
- trencher soil, recycled spoil or sand may be used
- particles are to be $\leq$ 25 mm
- material to be compactable by hand

17.2 Padding material for Polyethylene pipe

- padding for polyethylene pipe shall be sand