

Telstra's Lead-In Trenching Requirements

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1. Purpose

This document outlines Telstra's requirements for lead-in trenching from the Telstra property entry point to the building entry point. It is intended to provide guidance to property developers, consultants, builders and customers. It should be read in conjunction with other relevant Telstra documents (see section 17).

This document also:

- provides guidance on how to locate the Telstra property entry point; and
- outlines Telstra's requirements for the path and depth of the trench and for separation of Telstra's lead-in cabling from other services.

This document may be downloaded from the Telstra Smart Community® web site www.telstra.com.au/smartcommunity/ (look under "Builders").

2. Scope

While this document focuses on lead-in trenching for single dwellings, it also applies to lead-in trenching for multiple dwelling units and commercial premises.

3. Introduction

Telstra requires you, the property developer, builder or customer, as appropriate, to provide a suitable trench ("the trench") for the installation of Telstra lead-in cabling between the Telstra property entry point and the building entry point.

You are required to ensure that the trench is constructed and reinstated (together with any termite barriers and other building elements) in accordance with all relevant laws and regulations (which may vary between States and Territories).

For new building construction, Telstra recommends the use of a trench provided for, or to be shared with, another service (e.g. the electrical mains power).

For established premises, you must keep the trench well away from any other existing underground services for safety reasons and to avoid damaging the other services.

4. Interpretation

In this document, "premises" has the same meaning as the ACMA Wiring Rules (AS/ACIF S009), viz. it refers to land and all buildings (including caravans and mobile homes) situated on that land.

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5. Safety

5.1. General

The trench should be dug by an experienced person who is familiar with underground service arrangements and who is suitably accredited or licensed where required by the relevant authority. Careless excavation work may result in personal injury (e.g. through contact with live underground power cables) or costly damage to underground conduits, pipes and cables. Be aware that Telstra may seek to recover its entire repair and associated costs in the event that any damage is caused to Telstra's assets.

5.2. Locating existing underground services

In order to avoid personal injury or damage to property, existing underground services should be located and identified by an experienced or suitably accredited or licensed person.

Methods for locating underground services include:

- Before any earth breaking activity is contemplated, contact the **Dial Before You Dig (DBYD)** "free call service", by telephoning 1100 or by visiting the **DBYD** website at <http://www.dialbeforeyoudig.com.au> for information about any underground services that may be in the vicinity (note that while plans supplied by **DBYD** may contain information about underground services on public or adjoining land, you are not required to dig the trench outside the boundary of your premises, e.g. in public footways, roadways or in neighbouring premises).
- Review property documentation (e.g. building plans, electrical specifications, plumbing plan).
- Visually inspect the site noting the location of conduits, pipes or cables emerging from the ground at buildings, sheds, swimming pools, fountains, electric barbecues, garden lights, external power outlets, etc.
- Visually inspect the footway and verge for the location of any power, water, gas, sanitation, stormwater, drainage or telecommunications facilities (e.g. pedestals, pits, poles, meters, markers, drains, conduits/pipes, cables).
- Ascertain the likely path of underground services using the above indicators.
- Verify the location of services using a cable locator or similar equipment, if available (note that existing services may not have been installed in a straight line).
- Verify the presence or absence of underground services at appropriate points along the chosen trenching route by careful hand digging (see below).

Where there is evidence of underground services along the chosen trench route but their position cannot be verified with reasonable accuracy, look for a more suitable route or excavate by careful hand digging where uncertainty exists.

Apply the following precautions when digging the trench:

- Allow for at least one (1) metre separation from any suspected underground service.
- Except where otherwise required by this document, keep at least two (2) metres from any pole (to avoid disturbance of the pole footings and to allow for future replacement of the pole without disturbing the Telstra lead-in cabling that will be installed in the trench).
- When hand digging, use non-conductive tools (e.g. with wooden handles) and wear insulating (rubber) boots.
- Do not dig the trench any deeper than the recommended depth.

5.3. Service identification

As a guide only, the types of underground services that may be encountered on private property, and their typical characteristics, are as follows:

- Electrical power — power cables may be installed in orange conduit or covered by orange marker tape or cover strip. However, they may be incorrectly installed in galvanised iron pipe or grey conduit marked “ELECTRICAL” without an orange covering, so take care if you come across any such pipes or conduits.
- Garden lighting — cables for garden lighting operating directly from mains power (240 V a.c.) may be installed in the same way as electrical power cables described above. Cables for garden lighting that operate from a transformer (e.g. 12 V a.c.) are deemed to be non-hazardous and may be buried directly in the ground.
- Piped fuel gas — modern gas lines usually consist of yellow or yellow-ochre pipe (or a black pipe with a yellow stripe) or are covered by a yellowish marker tape, but earlier installations may have used copper or steel pipe.
- Water — potable water is usually supplied in copper, galvanised iron, black polyethylene or white plastic pipe.
- Grey water (recycled water) — pipes used for recycled water are likely to be black polyethylene (preferably with a violet stripe), white plastic or violet plastic pipe.
- Sanitation (sewerage/waste water) — modern sanitation pipes are generally white or light grey plastic, but earlier installations may have used earthenware (e.g. fired clay), concrete or asbestos cement pipes.
- Stormwater — modern stormwater pipes are generally light coloured plastic (e.g. white, grey, pink, blue) but earlier installations may have used earthenware (e.g. fired clay), concrete or asbestos cement pipes.
- Drainage (surface water or seepage drain) — pipes used for drainage of surface or seepage water are usually white plastic or black polyethylene with slots or holes cut in them, but earlier installations may have used earthenware or concrete pipes without seals, rubble (gravel) pits covered with sheeting and soil or a combination of these.

If you damage any underground service, do not attempt to fix it yourself. Call in an expert to make the repair.

6. Property entry point location

6.1. Property entry point description

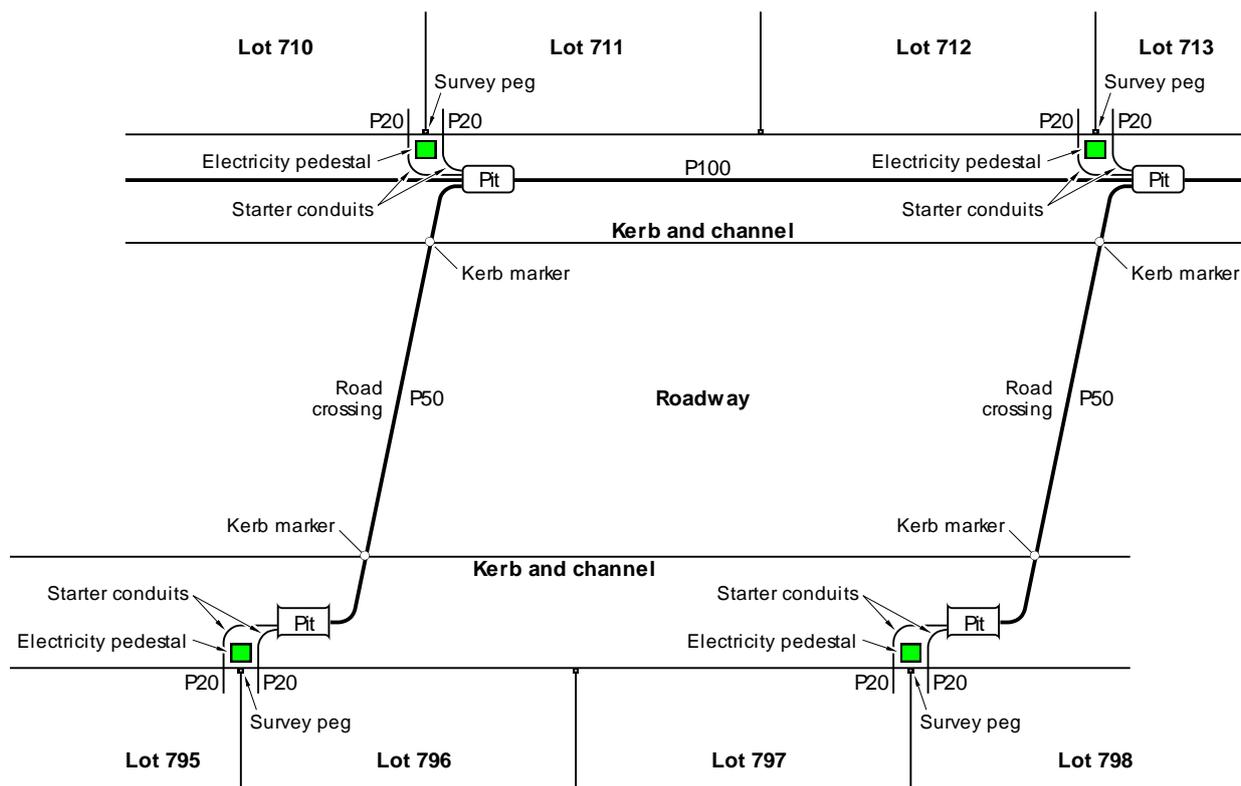
The property entry point is the point where the Telstra lead-in cabling will enter the private land in which your building is located, including any land occupied in common with, or shared with, other occupants (e.g. land controlled by a body corporate). Telstra determines the location of your property entry point based on the location of the nearest suitable lead-in cable connection point.

Where radio is used to supply a service to the premises, the property entry point is the base of the radio shelter or antenna structure from which the cabling runs to the building.

6.2. Urban residential areas

In urban residential areas, underground Telstra lead-in cabling is typically fed from a pit or pole in the street or an easement adjacent to the property. In some cases, Telstra’s property entry point will be evident from the location of the Telstra pits and may be confirmed by digging at the property boundary to locate Telstra’s “starter conduit”. In other cases, the location of the Telstra property entry point may not be obvious and Telstra may need to be consulted.

Typical Telstra street cable distribution arrangements for new urban residential estates are illustrated in Figure 1 . Figure 2 shows typical “starter conduit” locations.

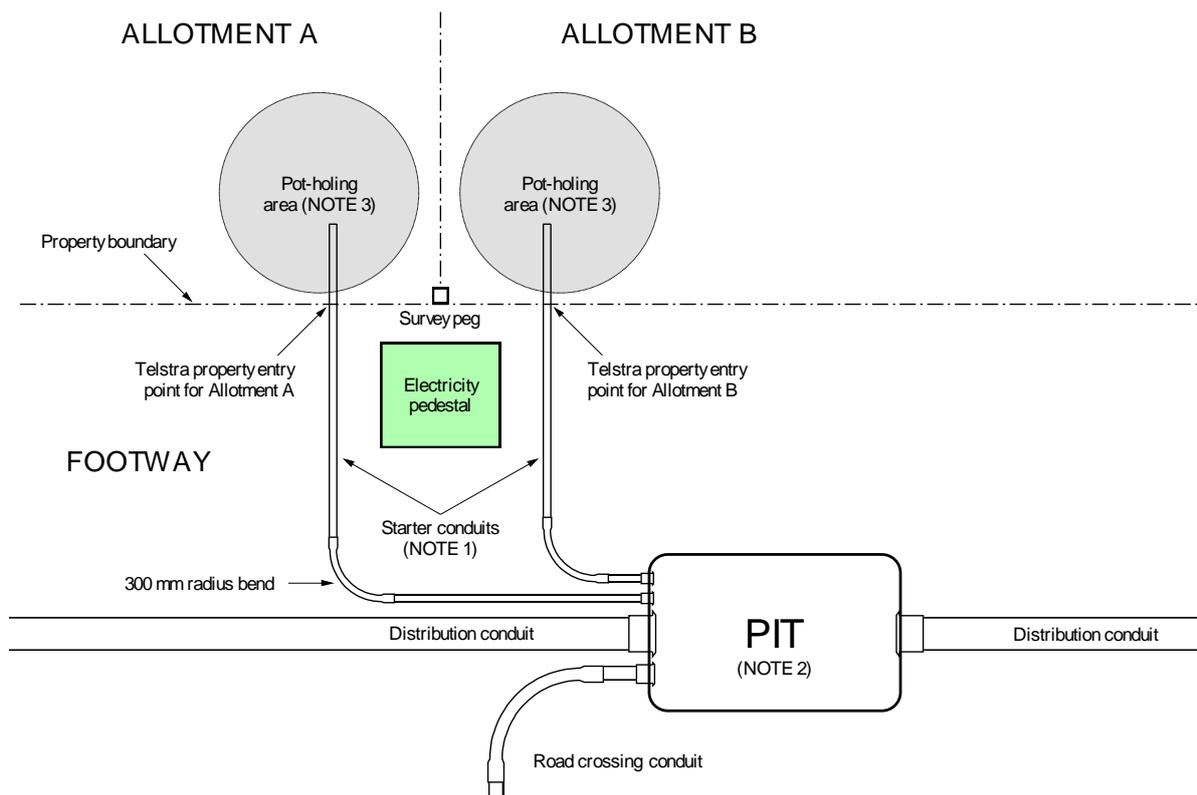


LEGEND: P20 Plastic 20 mm (inside diameter) conduit
P50 Plastic 50 mm (inside diameter) conduit
P100 Plastic 100 mm (inside diameter) conduit

NOTES:

1. The lead-in cable is normally coiled up in the nearest pit ready to draw through the lead-in conduit to the building. The cable is only to be drawn in by the Telstra installer. Non-Telstra persons are not authorised to open Telstra pits or to draw in the lead-in cable.
2. The starter conduits should extend at least to the property boundary and may extend up to one (1) metre into the property (see Figure 2).

Figure 1— Typical Telstra street distribution cabling for new urban residential estates using single-sided distribution with pits on both sides of the street



NOTES:

1. In new urban estates, starter conduits will usually be provided as shown and be installed at least to the property boundary but they may extend up to one (1) metre into the property. The minimum depth of cover for these conduits is normally 300 mm or 450 mm if the conduit runs parallel with the property boundary for some distance before it enters the property.
2. “Pot-holing” (e.g. careful hand digging with a wooden-handle shovel) may be necessary to confirm the location of the starter conduit from where the lead-in trenching is to be dug. With new building construction, the starter conduit may be exposed when the trench is being dug for the electricity mains.

Figure 2 — Typical Telstra starter conduit arrangements (urban residential)

6.3. Commercial/Industrial and rural areas

The Telstra cable distribution arrangements for commercial/industrial estates and rural communities may differ from the arrangements shown in 1, and are not specifically covered by this document. You are advised to seek advice from Telstra as to the location of the property entry point in such cases (see section 16).

7. Trenching route

7.1. Residential dwelling

For residential dwellings, it is important to locate the building entry point near the electricity enclosure (meter panel or switchboard) to ensure that Telstra has future ready access to its equipment and to facilitate earthing of the equipment to the building electrical earthing system. Accordingly, the lead-in trench should run from the Telstra property entry point to the electricity enclosure location — even if this means trenching across the front of the building.

The trenching route should be as direct as practicable while avoiding sharp changes of direction that may necessitate the use of conduit bends between draw points. Long, sweeping curves that allow the lengths of conduit to be laid in the trench without undue stress are acceptable. Refer to Figure 3.

7.2. Outbuilding or a building with a detached electrical switchboard

Where the Telstra service is required in a separate detached building (“outbuilding”), Telstra may require lead-in trenching to be provided via the main building or directly to the outbuilding, depending on the circumstances. Similarly, where the electricity enclosure is installed at a separate detached building or structure (e.g. a fence, pole or garage), the trenching for the Telstra lead-in cabling may need to be provided via the building or structure at which the electricity enclosure is located, as shown in Figure 4 and Figure 5. However, take care to avoid any pole carrying a power transformer as shown in Figure 5. In some cases, it may be possible or desirable to run separate lead-in cabling directly to an outbuilding, as shown in Figure 6.

The appropriate cabling/trenching method may be determined using the flow chart in Figure 7 — but you should contact Telstra for advice in such cases prior to digging the trench (see section 16).

7.3. Rural areas

In rural areas, Telstra normally buries the lead-in cable directly in the ground without conduit and marks the route at regular intervals with signs and marker posts. With directly buried cable there is no limitation on the number of bends in the cable. However, the cable route should be as direct as possible between cable route markers to enable subsequent location of the cable for repairs and to reduce the risk of accidental damage to the cable during any digging or cultivation activities.

Where practicable the path of the lead-in cabling should follow established geographical features such as private roadways, tracks, right-of-ways, fence boundaries, etc. to minimise the risk of disturbance. Traversing of cultivated land or grazing paddocks should be avoided if possible. Where the cable runs beside a fence or property boundary, it must be spaced at least one (1) metre from the fence line (see also section 7.4 regarding proximity to power poles).

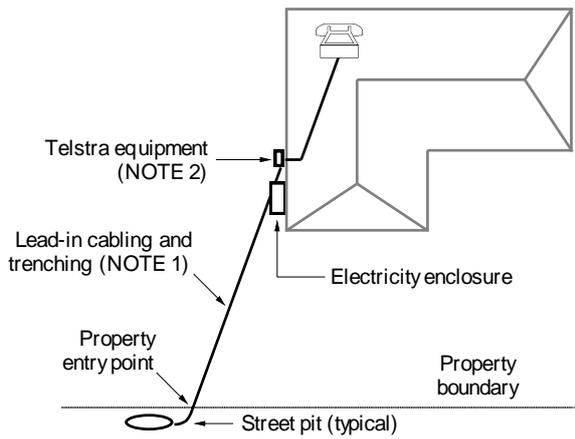
For long cable runs in rural areas, Telstra may opt to plough its lead-in cable directly into the ground instead of requiring you to provide an open trench. Nevertheless, even if the lead-in cable is to be ploughed in, Telstra will install the last section of lead-in cable to the building in conduit, so you will be required to provide an open trench for at least the last 5 metres of lead-in cabling to the building. Please seek advice from Telstra as to Telstra’s lead-in trenching requirements in rural areas (refer to section 16).

7.4. Proximity to power poles

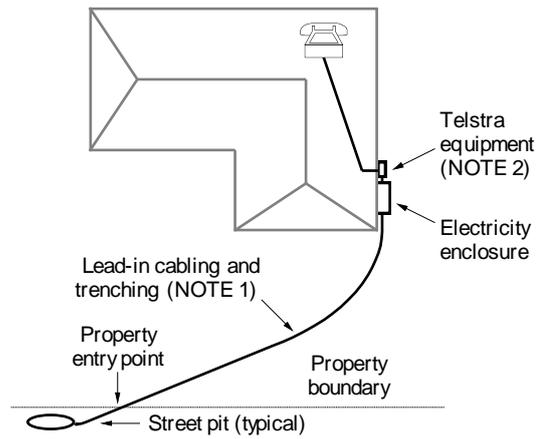
Lead-in trenching should be kept at least two (2) metres away from any power poles (including poles used for lighting) to allow for future replacement of the pole without disturbing the Telstra lead-in cabling — except in cases where the electricity enclosure is installed on the pole and it is necessary to run the Telstra lead-in cabling via the electricity enclosure. Refer to Figure 5 and Figure 7

7.5. Trenching outside the premises

You must NOT dig the trench outside the boundary of your premises, e.g. in a public footway, roadway or in neighbouring premises. Trenching outside your premises is subject to land access code requirements and is Telstra’s responsibility.



(a) Electricity enclosure on the same side of the building as the property entry point

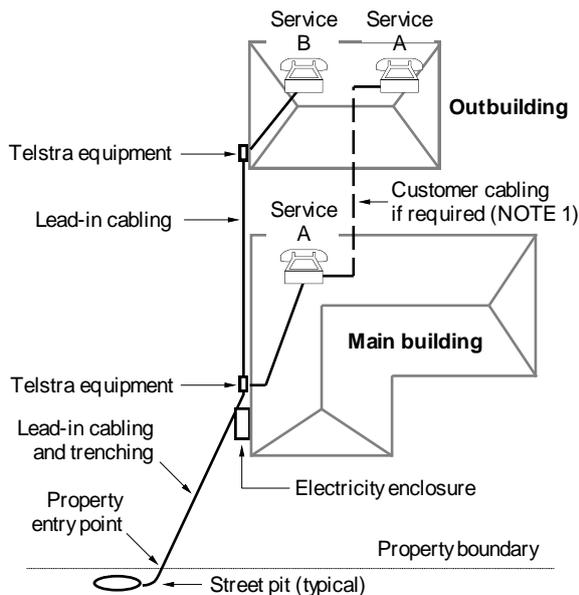


(b) Electricity enclosure on the opposite side of the building to the property entry point

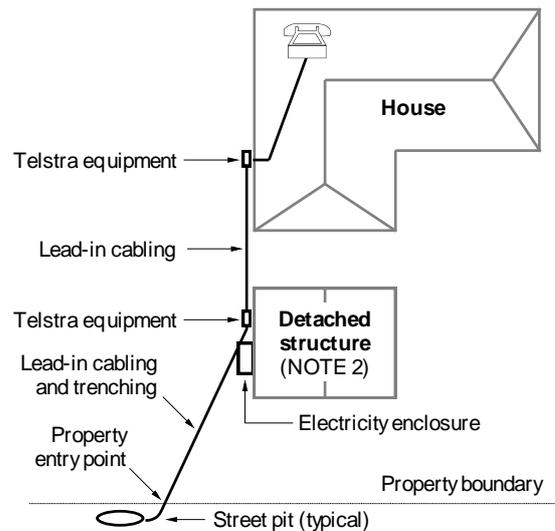
NOTES:

1. The trenching must be such that there are no sharp bends in the conduit between the property entry point and the building footings. Sweeping curves that will allow the glued lengths of lead-in conduit to be laid in the trench without significant stress are acceptable, as indicated in example (b) above.
2. The Telstra equipment will be mounted on the wall below the electricity enclosure where practicable.

Figure 3 — Typical path of the lead-in trench to a single dwelling or small business



(a) Lead-in cabling/trenching path for the supply of a separate Telstra service to an outbuilding

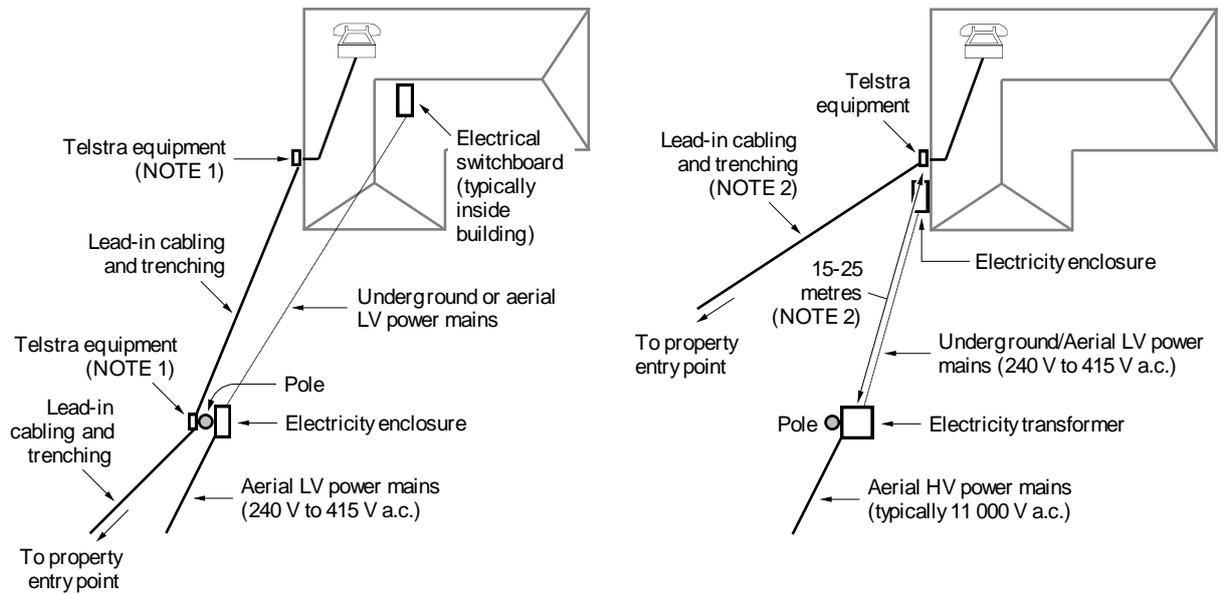


(b) Lead-in cabling/trenching path where the electricity enclosure is located at a detached building or structure

NOTES:

1. Any customer cabling required between the main building and the outbuilding, e.g. for additional outlets as shown for Service A in example (a), must be separate and distinct from the Telstra lead-in cabling, i.e. it must use separate cable and conduit to the Telstra lead-in cable and conduit.
2. The detached structure at which the electricity enclosure is located may be a garage, shed, pole or fence. However, the lead-in trenching must NOT be run near any pole that carries a SWER (Single Wire Earth Return) transformer, e.g. rural properties. Refer to Figure 5).

Figure 4 — Typical path of the lead-in trench for supply of a separate Telstra service to an outbuilding or to the main building where the electricity enclosure is located at a detached building or structure



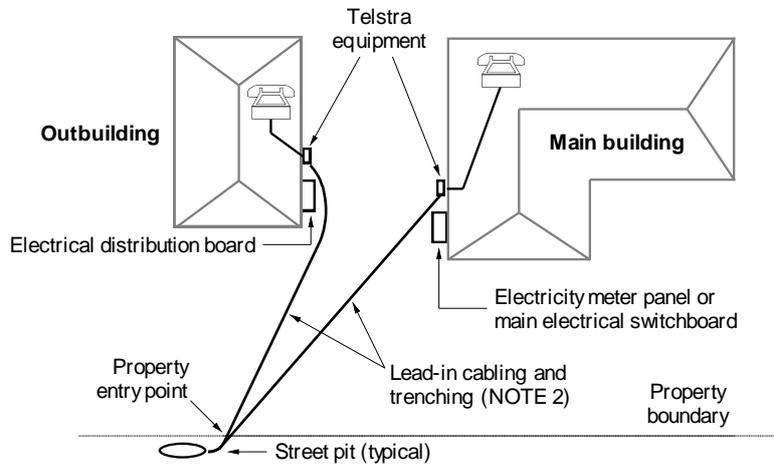
(a) Low voltage (240 V to 415 V a.c.) power mains connected via an electricity enclosure on a pole

(b) High voltage (e.g. 11,000 V a.c.) power mains connected to a transformer on a pole

NOTES:

1. In case (a), Telstra may need to install equipment at both the pole and the building. The equipment at the building must be located on the external wall as close as possible to the electrical switchboard.
2. In case (b), the Telstra equipment should be kept at least 25 metres away from any pole carrying a SWER (Single Wire Earth Return) transformer or at least 15 metres away from any other electricity transformer.

Figure 5 — Typical path of the lead-in trench to a building where the power mains are fed from an electricity enclosure or a transformer located on a pole (acreage or rural properties)



NOTES:

1. In some cases, the lead-in cabling/trenching should be provided via the main building for technical reasons. Refer to the flow chart in Figure 7 to determine whether it may be appropriate to provide lead-in cabling/trenching via the main building rather than directly to the outbuilding.
2. Some lead-in trenching and conduit may be common, using a pit where the lead-in cables branch off.
3. Any customer cabling required between the buildings, e.g. for intercommunication between the buildings, must be separate and distinct from the Telstra lead-in cabling, i.e. using separate cable and conduit to the Telstra lead-in cable and conduit.

Figure 6 — Lead-in cabling/trenching directly to an outbuilding (NOTE 1)

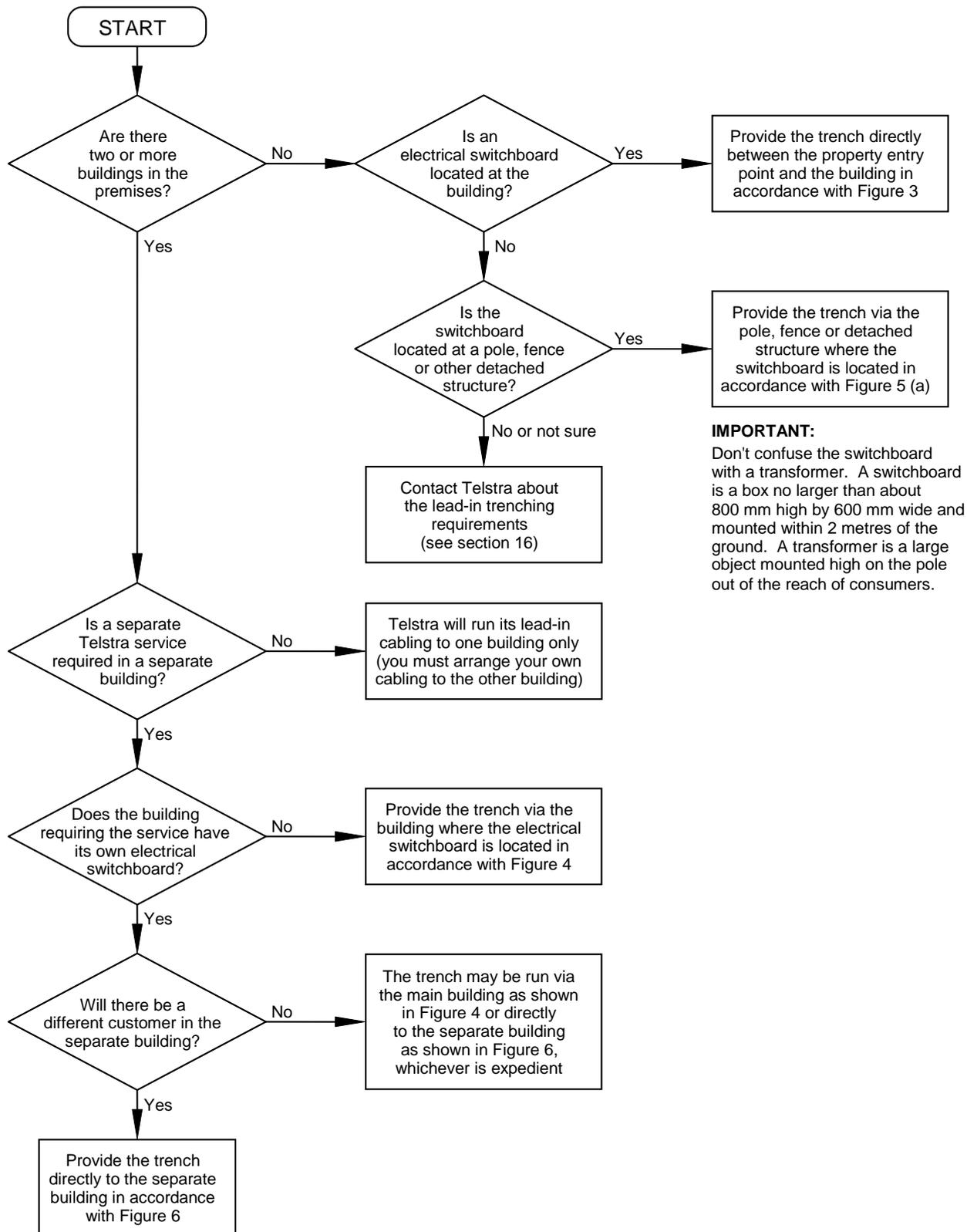


Figure 7 — Determining the appropriate method of cabling/trenching to a particular building

8. Trench depth

8.1. General

The trench depth requirements are different for urban and rural areas. You may need to contact Telstra (see section 16) for advice as to whether Telstra deems the area to be urban or rural.

To the extent that the terrain will reasonably allow, the conduit (or cable in rural areas where the cable is directly buried) must be installed in a uniform trench of the depth specified in Table 1 for the applicable conditions. The depth specified in Table 1 includes allowance for the depth of the conduit or cable itself. Table 4 indicates the size of the conduit that is likely to be required.

Where the length of the lead-in cabling will exceed 50 metres, Telstra may need to install pits at regular intervals (depending on the size of the conduit used), in which case additional excavation may be required to accommodate the pits at the pit locations. See section 14 for more details.

Table 1— Trench depth required (NOTE 1)

		Urban area		Rural area	
		For 20 mm and 50 mm conduit	For 100 mm conduit	Soil & non-continuous rock (NOTE 2)	Continuous rock (NOTE 3)
Non-trafficable area, driveway or private footway (NOTE 4)	Minimum	360 mm	415 mm	500 mm (where deep cultivation ploughing is not likely)	250 mm
	Maximum	560 mm	615 mm	650 mm	650 mm
	Recommended (NOTE 5)	400 mm	550 mm	550 mm	300 mm
Private roadway (NOTE 4)	Minimum	510 mm under the lowest point	565 mm under the lowest point	500 mm under the lowest point (usually the gutter or kerb)	

NOTES:

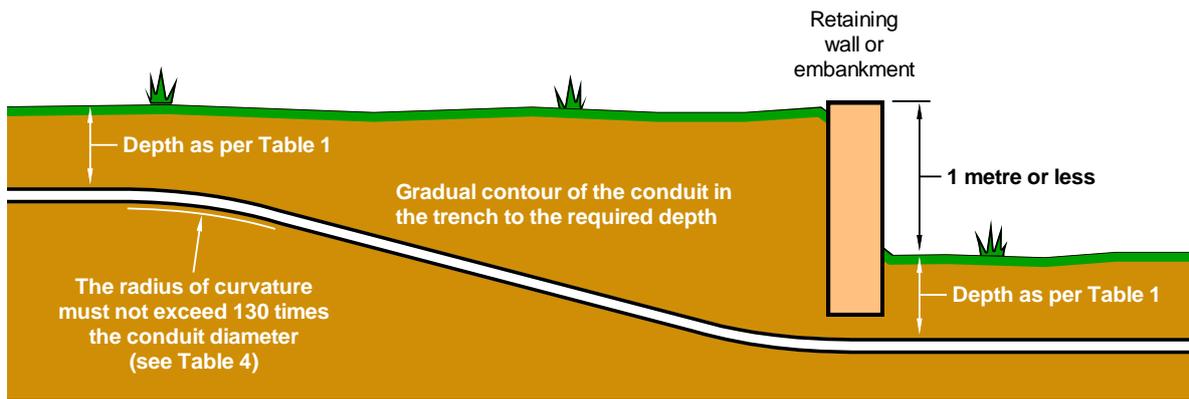
1. If it is not possible to provide the required depth due to ground conditions, seek advice from Telstra.
2. "Soil" means sand, gravel, clay, loam or silt. "Non-continuous rock" means stones and boulders ("floaters") set in soil.
3. "Continuous rock" means rock in continuous strata or prevailing on a massive scale. It can only be removed by blasting and ripping or by using a rock breaker or a rock saw.
4. Private footways and roadways are typically found in townhouse/villa complexes, retirement villages, caravan parks, technology parks, etc. Such complexes do not generally have clearly defined footways.
5. The recommended depth allows for fluctuations in ground conditions and for the use of bedding material, if required, to ensure the minimum depth of cover above the conduit or cable is achieved.

8.2. Retaining walls and embankments

Where there is, or will be, a retaining wall or embankment in the path of the lead-in trenching:

- (a) If the vertical height of the retaining wall or embankment does not exceed one (1) metre, the trenching may continue under the wall or embankment at a gradual incline to resume the appropriate depth set out in Table 1 on the high side of the wall/embankment (see Figure 8). Alternatively, the technique described in (b) may be applied.
- (b) If the vertical height of the retaining wall or embankment exceeds one (1) metre, the trenching must end at the foot of the retaining wall or embankment and recommence at the high side of the wall/embankment at the depth set out in Table 1 (see Figure 9).
- (c) If the wall or embankment is at a gradual incline to the horizontal, the trenching should follow the incline as close as practicable to the appropriate depth set out in Table 1 (see Figure 10).

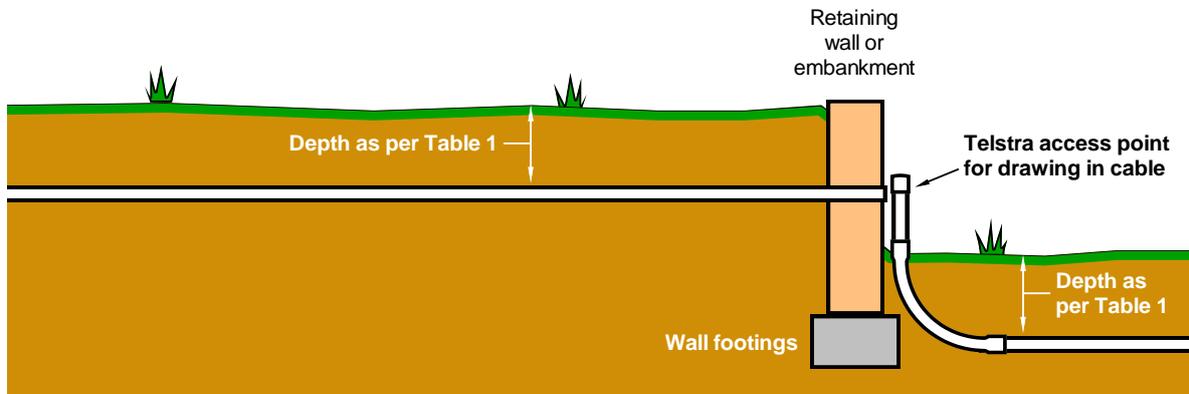
NOTE: If one side of the wall or embankment is on public property (such as a footway) or a neighbouring property, the trenching on that side of the wall/embankment is Telstra's responsibility.



NOTES:

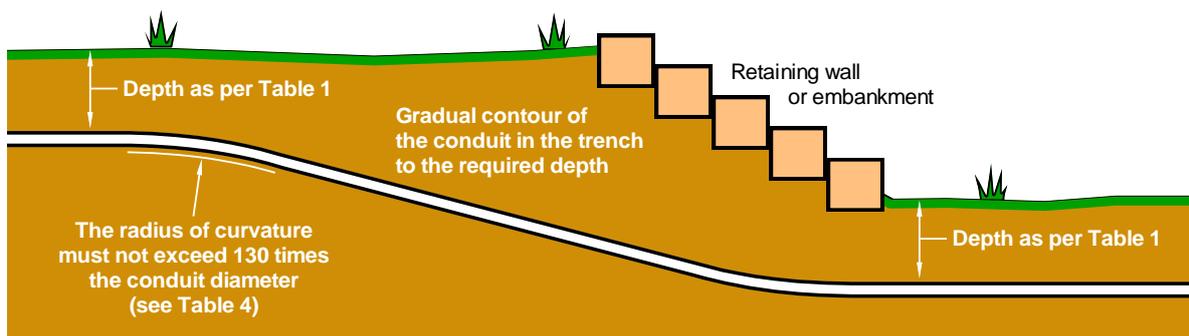
1. The technique may be applied either before or after the retaining wall is installed or an embankment is created.
2. For an existing retaining wall or embankment, the technique shown in Figure 9 may be applied.

Figure 8 — Trenching/Conduit arrangement where a retaining wall or embankment does not exceed a vertical height of 1 metre



NOTE: Telstra will install conduit on the surface of the retaining wall or embankment as shown. Telstra may also install a metal cover strip over the conduit as a mower guard.

Figure 9 — Trenching/Conduit arrangement where a retaining wall or embankment exceeds a vertical height of 1 metre



NOTE: The trenching should follow the contour of the finished ground level within the curvature (flexing) constraints of the conduit to be installed (see Table 4).

Figure 10 — Trenching/Conduit arrangement for a gradually sloping retaining wall or embankment

9. Trench width

For 20 mm and 50 mm conduit or directly buried rural cables, the width of the trench should be no less than 100 mm. For 100 mm conduit, a trench width of at least 150 mm is required.

For large buildings or multi-tenant developments, Telstra may need to install two or more 100 mm conduits. Two conduits are normally laid side by side, which requires a trench width of at least 300 mm. If more than two conduits are required (such cases are rare), the conduits will be “nested” in two rows, in which case a greater trench depth is required to maintain the required depth of cover for the upper conduits. Prior consultation with Telstra is strongly recommended to determine trenching requirements for larger buildings or developments.

10. Bedding and backfill material

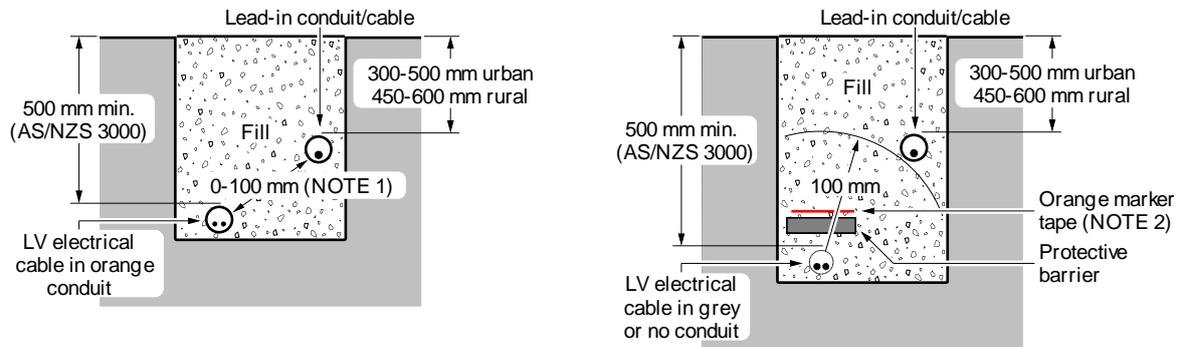
The installed conduit must be supported firmly and evenly on all sides using bedding sand or the excavated material as long as the material does not contain any metal or rocks exceeding 50 mm in cross-section. The bedding and backfill material must be free of any timber or other fibrous material that may decompose or attract termites.

11. Shared trench arrangements

For new building construction, Telstra lead-in cabling may be installed in a shared trench with another service (preferably the electrical power mains) to reduce costs and minimise the width of the service corridor through the property. Trench sharing arrangements are illustrated in Figure 12, Figure 13 & Figure 14. Where the trench is shared with more than one other service, their respective separations must be maintained. Local authority requirements, or the requirements of the other utility, may preclude a shared trench with some services.

No separation is required (by Telstra) from conduits or cables of another telecommunications service unless:

- separation is required by the owner of the other telecommunications service; or
- the other telecommunications service is a conduit or cable of another carrier, in which case a minimum radial clearance of 100 mm is required in accordance with ACIF Industry Code C524, “External Telecommunication Cable Networks”.



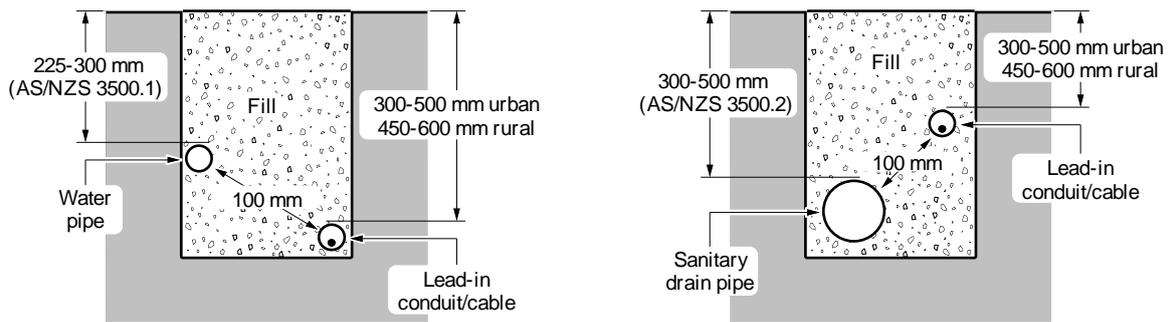
(a) Electrical cable in orange conduit

(b) Electrical cable physically protected by means other than orange conduit

NOTES:

1. No separation is required if the Telstra lead-in cable is installed in white conduit and the electrical cable is installed in orange conduit. At least 100 mm separation is required if the electrical cable is installed in orange conduit and the Telstra lead-in cable is directly buried without conduit (e.g. rural areas).
2. Orange marker tape is required where the protective barrier is not orange in colour. The Telstra lead-in conduit must be installed above the electrical cable/conduit and separated from it by a minimum distance of 100 mm whether or not the lead-in cable is buried in conduit.
3. Telstra lead-in cabling must NOT share a trench with unprotected electrical cable (e.g. not in orange conduit or not covered by concrete, approved bricks etc.) or electrical cable that is not identified by orange conduit, orange cover strip or orange marker tape. In such cases the lead-in cable must be installed in a separate trench.
4. In some rural areas, Telstra installs a guard wire above the cable to provide additional protection against lightning ground strikes. However, this does not affect the trench depth requirements or the separation distances required from other services.
5. Telstra lead-in cabling may only share a trench with HV (high voltage) electricity (i.e. exceeding 1000 V a.c.) by special arrangement with Telstra.

Figure 11 — Shared trench with LV (low voltage) electricity (e.g. normal domestic single phase or three phase power mains)

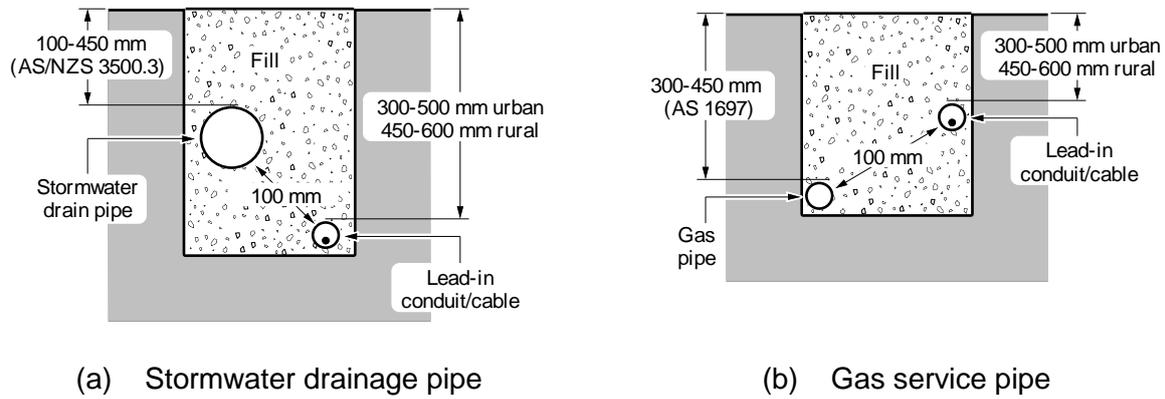


(a) Water service pipe

(b) Sanitary plumbing/drainage pipe

NOTE: The depths shown for water pipe and sanitary plumbing/drainage pipe are provided for guidance. The depths stated are the minimum specified in the relevant standards for burial of the pipe on private property. The required minimum depth may vary according to exposure of the location to vehicular traffic or the type of pipe used.

Figure 12 — Shared trench with water and sanitary pipes



NOTES:

1. The Telstra conduit/cable must NOT be installed above the stormwater drainage pipe (this is a requirement of AS/NZS 3500.3).
2. The depths shown for stormwater pipe and gas pipe are provided for guidance. The depths stated are the minimum specified in the relevant standards for burial of the pipe on private property. The required minimum depth may vary according to exposure of the location to vehicular traffic, the type of pipe used or, in the case of gas pipe, the service pressure.

Figure 13 — Shared trench with stormwater and gas pipes

12. Exclusive (separate) trench

Where it is not possible to use a shared trench with another service, the lead-in cabling must be installed in an exclusive (separate) trench.

For parallel runs with services other than electrical cables, the minimum separation from these services must be in accordance with section 11. For parallel runs with electrical cables, the minimum separation between the lead-in cable or conduit and the electrical cable/conduit must be in accordance with Table 2 and Figure 14.

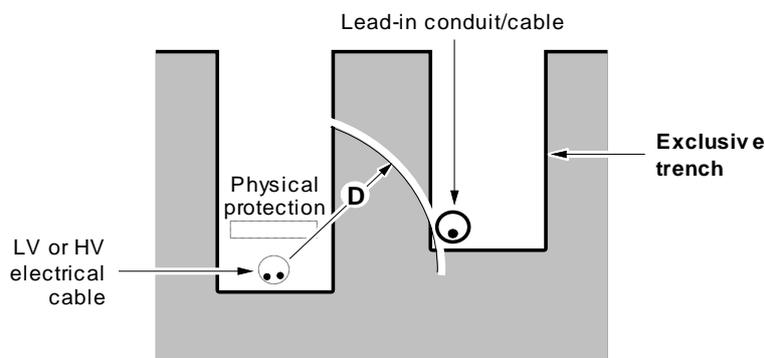
Where the Telstra conduit crosses the path of another service, the crossover must comply with section 13.

Table 2 — Separation from electricity — exclusive trench

	LV (NOTE 1)		HV (NOTE 2)	
	With protective covering (NOTE 3)	Without protective covering (NOTE 4)	With protective covering (NOTE 3)	Without protective covering (NOTE 4)
Minimum separation distance "D" (see Figure 15)	100 mm	300 mm	300 mm	450 mm

NOTES:

1. LV (Low Voltage) is typically used for electrical mains supply to small residential and commercial premises (i.e. 240 V a.c. single phase or 415 V a.c. three phase power).
2. HV (High Voltage) is typically used for electrical mains supply to large multi-residential or large commercial premises (e.g. 11,000 V a.c. power to an HV transformer).
3. For an exclusive trench, try to keep at least 300 mm away from LV and 450 mm from HV whether or not the electricity has a protective covering. In any case, where there is any doubt as to whether the electricity is, or will be, physically protected in accordance with AS/NZS 3000, a minimum separation distance of 300 mm from LV or 450 mm from HV must be maintained.
4. Installation of underground electrical cable in customer premises without a protective covering is not allowable under the electrical wiring rules (AS/NZS 3000). However, there may be cases where unprotected cable is installed.



NOTE: The trench must be located such that distance "D" (refer to Table 2) is maintained between the electrical conduit or cable and the Telstra conduit/cable. This distance may be measured radially in any direction from the electrical conduit/cable.

Figure 14 — Separation from electrical conduit or cable — exclusive trench

13. Crossovers with other services

Where the Telstra lead-in cabling crosses another service, separation from the other service at the crossover must be in accordance with Table 3.

Table 3 — Separation at crossovers with other services within customer premises

Other service	Telstra's separation requirements
LV electrical cable with a protective covering	The lead-in cabling must be separated from the electrical cable by at least 100 mm at the crossover, and should cross ABOVE the electrical cable (see Figure 16). The lead-in cabling may only cross under the electrical cable if a concrete protective covering is installed above the electrical cable at the crossover in accordance with Figure 19.
LV electrical cable WITHOUT a protective covering *	The lead-in cabling must cross at least 300 mm ABOVE the electrical cable (see Figure 17) unless a protective covering of concrete is provided over the electrical cable 600 mm each side of the crossing as shown in Figure 18, in which case a 100 mm separation is allowable. If it is necessary for the Telstra cabling to cross under the electrical cable: <ul style="list-style-type: none"> • it should only be installed by boring; • a concrete protective covering must be installed above the electrical cable at the crossover in accordance with Figure 19; and • a minimum separation distance of 300 mm must be maintained from the electrical cable at the crossover.
HV electrical cable with a protective covering	The lead-in cabling must be separated from the electrical cable by at least 300 mm at the crossover, and should cross ABOVE the electrical cable (see Figure 16). The lead-in cabling may only cross under the electrical cable if a concrete protective covering is installed above the electrical cable at the crossover in accordance with Figure 19.
HV electrical cable WITHOUT a protective covering *	The lead-in cabling must cross at least 450 mm ABOVE the electrical cable (see Figure 17) unless a protective covering of concrete is provided over the electrical cable 600 mm each side of the crossing as shown in Figure 18, in which case a 300 mm separation is allowable. If it is necessary for the Telstra cabling to cross under the electrical cable: <ul style="list-style-type: none"> • it should only be installed by boring; • a concrete protective covering must be installed above the electrical cable at the crossover in accordance with Figure 19; and • a minimum separation distance of 300 mm must be maintained from the electrical cable at the crossover.
Water service pipe	The lead-in cabling must cross at least 100 mm BELOW the water pipe at an angle not less than 45°.
Sanitary plumbing/ drainage pipe	The lead-in cabling must cross at least 100 mm ABOVE the pipe at an angle not less than 45°.
Stormwater drainage pipe	The lead-in cabling must cross at least 100 mm BELOW the pipe at an angle not less than 45°.
Gas service pipe	The lead-in cabling must cross at least 100 mm ABOVE the gas pipe and at an angle not less than 45°.
Telecommunications	The lead-in cabling must cross at least 100 mm above or below (whichever is expedient) the other telecommunications conduit or cable.

* Installation of underground electrical cable in customer premises without a protective covering is not allowable under the electrical wiring rules (AS/NZS 3000). However, there may be cases where unprotected cable is installed.

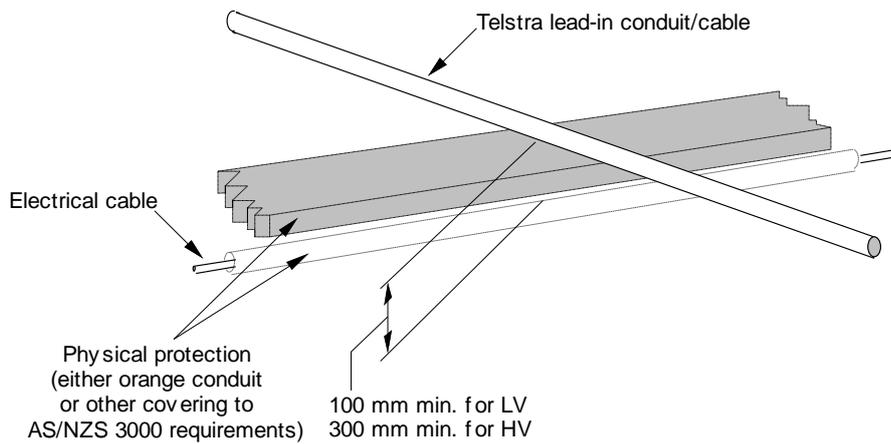
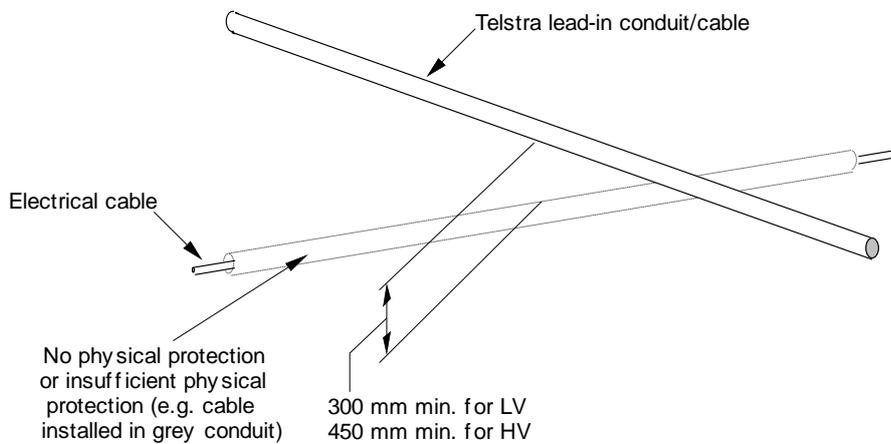
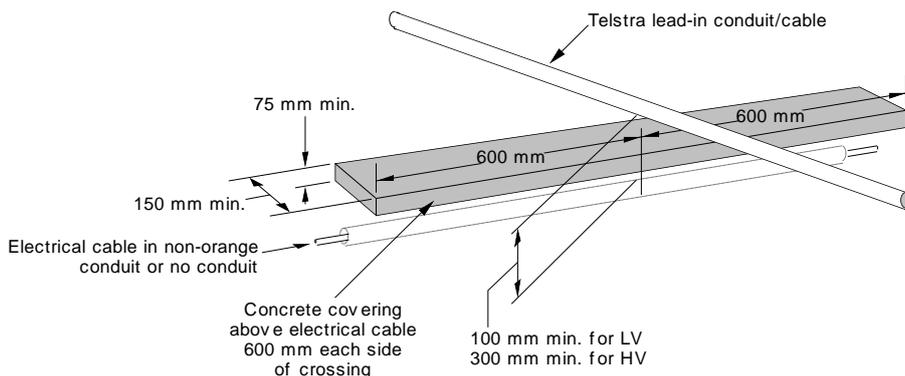


Figure 15 — Crossing ABOVE electrical cable with a protective covering that complies with AS/NZS 3000 requirements



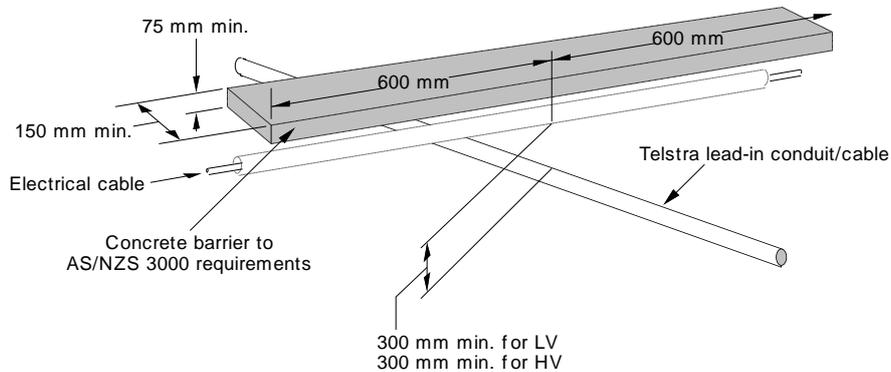
NOTE: Installation of underground electrical cable in customer premises without a protective covering is not allowable under the electrical wiring rules (AS/NZS 3000). However, there may be cases where unprotected underground electrical cable is installed.

Figure 16 — Crossing ABOVE electrical cable with NO protective covering



NOTE: The concrete covering is to protect against accidental contact with the electrical cable if excavating along the path of the Telstra lead-in cabling subsequent to its initial installation.

Figure 17 — Crossing ABOVE electrical cable with a concrete protective covering that complies with AS/NZS 3000 requirements installed at the crossing



NOTES:

1. Telstra cabling should only be installed under electrical cable during boring. If a concrete protective covering to AS/NZS 3000 requirements has not been provided above the electrical cable, a concrete strip at least 150 mm wide and 75 mm thick must be provided 600 mm each side of the crossing. A reinforced concrete slab or driveway is an acceptable barrier for this purpose.
2. The concrete covering is to protect against accidental contact with the electrical cable if excavating along the path of the Telstra lead-in cabling subsequent to its initial installation.

Figure 18 — Crossing UNDER electrical cable

14. Conduits and pits

Table 4 indicates the sizes of the conduit Telstra is likely to use for certain types and sizes of lead-in cable. The size of the conduit that Telstra uses affects the depth of the trench required (see Table 1). The conduit will be installed by Telstra's installer and must NOT be installed by the customer or any other person except by special arrangement with Telstra.

If the length of the lead-in cabling will exceed 50 metres where 20 mm conduit is used or 100 metres where 50 mm or 100 mm conduit is used, it will usually be necessary for Telstra to install pits at 50 m or 100 m intervals respectively, in which case additional excavation may be required at the pit locations.

NOTE: Telstra's lead-in conduit (or any Telstra pits) must NOT be used for customer cabling. Customer cabling must be installed in separate conduits (and pits) but may share the lead-in trench.

15. Cable

Telstra will supply, install and connect the lead-in cable. The customer's cabler must NOT draw the Telstra lead-in cable through the conduit or connect it to the Telstra equipment.

NOTE: Telstra will NOT allow its lead-in cabling to be used for customer cabling purposes. Customer cabling must be separate and distinct from Telstra lead-in cabling.

16. Contacting Telstra

16.1. New lead-in cabling

Where it is necessary to contact Telstra for trenching advice for the installation of **NEW** lead-in cabling, please call the appropriate number listed below and follow the procedure listed.

Home	13 2200
Business	13 2000

- To the automated voice greeting, respond “Connections”, then “Home” or “Business”, as applicable.
- Tell the Telstra consultant that you are ringing about pre-provisioning of your premises.
- Tell the Telstra consultant your name, contact number and the address to which the enquiry is related.
- Discuss your requirements with the Telstra consultant who will tell you the name of the Telstra contractor for your area and will forward your details to the Telstra contractor. The Telstra contractor should contact you within 2 business days.
- The Telstra consultant or the Telstra contractor may provide you with a reference number for any follow-up enquiries.
- General information about cabling your premises and Telstra contractor contact numbers can be accessed on the Telstra.com website via the “Moving home?” link (www.telstra.com.au/movinghome/newhome.cfm)

16.2. Existing lead-in cabling

If the lead-in trenching is for relocation of **EXISTING** lead-in cabling (e.g. due to building renovations or land redevelopment), please call the number listed below and select the appropriate option.

Home or Business	1800 810 443
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You will receive an automated voice greeting giving the following options:

- Press **1** to lodge a new request for relocation of existing lead-in cabling.
- Press **2** for follow-up enquiries about a request that has previously been lodged.

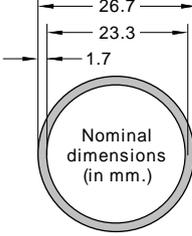
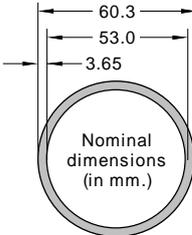
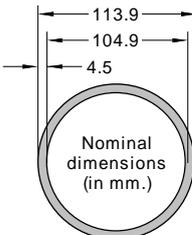
You will be switched through to the Telstra Non Standard Works Team for your area with which you may discuss your requirements.

17. More information

For more information about cabling your premises, go to the Telstra Smart Community® web site www.telstra.com.au/smartcommunity/ (look under “Builders”). Information provided there includes:

- guidance on the installation of conduits at homes and small businesses for the entry of lead-in cabling to the building;
- a summary of ACMA and Telstra requirements for the location and installation of a customer main distribution frame (MDF);
- guidelines for cabling of multi-tenant premises; and
- guidance on how to cable your home for telecommunications services including information about network termination devices, home networking and “smart wiring”.

Table 4 — Telstra lead-in conduit specifications & cable capacity guide (NOTE 1)

Typical max. cable combinations	No. of conduits	Nominal size (inside diameter)	Conduit standard	Typical application
4 x 2-pair	1	20 mm (for actual conduit dimensions, see diagram at right)	Telstra S.73/91 to Telstra Specification 010059 	Individual feed to a house or unit
3 x 5-pair				
3 x 2-pair plus 1 x Series 6 coax				
2 x 2-pair plus 1 x Series 11 coax				
2 x 5-pair plus 1 x Series 6 coax				
1 x 5-pair plus 1 x Series 11 coax				
1 x 10/0.40 plus 1 x Series 6 coax				
1 x 10/0.64				
1 x 30/0.40 (NOTE 2)				
1 x optical fibre (Fibre To The Home)				
6 x 2-pair * (NOTE 3)	1	50 mm (for actual conduit dimensions, see diagram at right)	Telstra S.73/95 to Telstra Specification 010059 	Primary feed to a distribution pit or a common MDF for a block of adjoining flats, units, etc., or an individual feed to commercial premises (maximum combined pair count less than 100 pairs)
6 x 5-pair * (NOTE 3)				
4 x 10/0.40 *				
2 x 30/0.40 *				
1 x 50/0.40 *				
* plus at least 1 x Series 6 coax in all cases (NOTE 3)				
1 x 100/0.40 (NOTE 2)				
Lead-in 100 pairs or greater	1 or more (as required)	100/4 mm (for actual conduit dimensions, see diagram at right)	Telstra S.73/207 to Telstra Specification 010059 	Primary feed to a distribution pit for a large private property development, or to large commercial premises or high-rise block of residential units
Optical fibre lead-in (commercial)				
Hardline coaxial cable (multi-tenant)				
Sub-ducted cable (e.g. fibre or other carrier's cable)				
Sum of diameters of all cables and sub-ducts in any conduit not to exceed 95 mm				
In any case, no more than 6 cables or sub-ducts per conduit (NOTE 3)				

NOTES:

1. This table is a basic guide to determine the trench depth (see Table 1). Telstra will install the conduit.
2. For cable upgrade only in existing conduit (where possible), not for a new conduit installation.
3. For lead-in design purposes, no more than 6 cables are generally permitted in any one conduit. Existing installed conduit may accept more than 6 cables.
4. The maximum conduit capacities indicated in this table assume a clear, undamaged run of underground or building entry conduit not exceeding the specified distance limit between draw points, with the radius of any curvature in the conduit not exceeding 130 times the nominal conduit diameter, and containing no more than two 90° bends between draw points.
5. The conduit standard as indicated above may be varied by Telstra from time to time.