



NS204.2.1

Communications Pits – Specifications and Installation Guidelines

February 2008

Amendments included from; NSA1542 Nov 2009, NSA1543 Nov 2009, NSA1618 Jun 2011



SUMMARY

The purpose of this Network Standard NS204.2.1 is to provide the specifications and guidelines for the purchase and installation of communication pits to be used in the Ausgrid communications network for fibre optic cable installations, particularly when installed independently of power cable routes.

ISSUE

Ausgrid staff: This Standard is for issue to all staff involved with the design and construction of underground sub-transmission lines forming part of Ausgrid's network, and for general reference by field, technical and engineering staff.

Where this standard is issued as a controlled document replacing an earlier edition; remove and destroy the superseded document.

All other persons involved with construction work in substations, including Accredited Service Providers and Contractors: This document is issued on an uncontrolled basis. Users are responsible for ensuring that the document they are using is current and includes any amendments issued since the date on the document.

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DISCLAIMER

As Ausgrid's standards are subject to ongoing review, the information contained in this document may be amended by Ausgrid at any time.

It is possible that conflict may exist between standard documents. In this event, the most recent standard is to prevail.

This document has been developed using information available from field and other sources and is suitable for most situations encountered in Ausgrid. Particular conditions, projects or localities may require special or different practices. It is the responsibility of the local manager, supervisor, assured quality contractor and the individuals involved to ensure that a safe system of work is employed and that statutory requirements are met.

Ausgrid disclaims any and all liability to any person or persons for any procedure, process or any other thing done or not done, as a result of this Network Standard.

INTERPRETATION

In the event that the user of this document is uncertain about any information or provision herein, the user should contact Ausgrid for clarification. Ausgrid's interpretation shall then apply as though it was included in the Standard, and is final and binding.

Network Standard
NS204.2.1
Communications Pits – Specifications and Installation Guidelines
February 2008

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1 INTRODUCTION

1.1 Purpose

The purpose of this document is to provide the specifications and guidelines for the purchase and installation of communication pits to be used in the Ausgrid communications network for fibre optic cable installations, particularly **when installed independently of power cable routes**.

1.2 References and other Relevant Standards

NS174C	Environmental Handbook for Construction and Maintenance
NS130	Specification for Laying of Underground Cables up to 22 kV
AS/NZS 3084:2003	Australian Standard, Telecommunications installations - Telecommunications pathways and spaces for commercial buildings (ISO/IEC 18010:2002, MOD)
AS 3996—2006	Australian Standard, Access covers and grates (<i>specifies requirements for access covers and grates for use in vehicular and pedestrian areas. It applies to access covers and grates having clear openings up to 1300 mm, particularly to components manufactured from grey and ductile irons, cast and manufactured steels, aluminium and concrete. However, the use of other materials is not precluded</i>)
AS 4198—1994	Australian Standard, Precast concrete access chambers for sewerage applications (<i>describes the requirements of precast concrete access chambers and the minimum requirements for the materials to be used in, and the manufacture of controlled quality precast concrete access chamber (PCAC) components. It also describes methods of sampling and testing of components manufactured in accordance with this Standard</i>)
AUS-SPEC 1152	Road Openings and Restoration (Utilities)
NUS-100	Field Recording of Network Assets

1.3 Acronyms and Definitions

FOC	Fibre Optic Cable
WD	Working Drawings Approved for Construction
PDU	Power Distribution Unit
PCAC	Pre cast concrete access chamber
OH&S	Occupational Health and Safety
ADSS	All Dielectric Self Supporting cable

1.4 AUS-SPEC 1152

This Network Standard should be read in conjunction with AUS-SPEC 1152 - *Road Openings and Restoration (Utilities)* document which is a national Specification template dealing with road openings and restoration. It is managed by NatSpec, and supersedes AUS-SPEC#2, 306U, which was previously used in this regard.

A copy of the Aus-Spec 1152 - *Road Openings and Restorations (Utilities)* document is available from Natspec via their website, at <http://www.natspec.com.au/Documents/AUS-SPEC%20FAQs.pdf>. Note that this provides a one off copy of the document, and that a subscription would be necessary to routinely receive updates.

2 PIT INSTALLATION ENGINEERING GUIDELINES

2.1 Shared Trenching Arrangements

Ausgrid is signatory to a shared trenching agreement with Telstra, Optus, and AGL which is an initiative aimed at reducing the overall cost of infrastructure developments to the community.

Where this agreement is invoked, the positioning of the trench, pits and the associated services shall be as detailed in the shared trenching agreement. Further, the recording details of the project shall clearly define the start and finish points of the shared trench, its dimensions, and the service utilities involved (sectionalised if necessary to indicate the presence or absence of certain utilities).

Where trench sharing is proposed, the arrangements and installations must be in accordance with the "Underground Services in a Shared Trench" 1998 agreement for Ausgrid, Telstra, Optus and AGL.

Note that communication infrastructure installed for Ausgrid will meet or most often exceed the requirements for telecommunication carriers. An example of this under the shared trenching agreement is the required depth of Ausgrid cables, including communication cables. This is specified as 900 millimetres rather than the nominated 550 millimetre for telecommunication carriers.

2.2 Engineering

Surface pits (where the top of the pit is level with the surrounding ground) only are to be utilised in the underground network to house the fibre optic cable splices and/or loops. Buried pits (where the top of the pit is below the surrounding ground and covered with soil) shall not be used.

For ADSS installations, splices and loops will generally be located on the poles but pits will be used when the ADSS is brought down the pole for a particular reason, eg under road bore. For only a change in direction, the ADSS will continue to follow the line of poles.

Pit type shall be specified by its size and material composition. The method of installation will be either nominated as "pre-formed" or "in-situ" and the material composition shall be nominated as "concrete" or "other".

The pit to be utilised will depend upon its purpose, i.e. number of penetrations, future capacity requirements, location and the surrounding ground conditions and therefore the following should be taken into consideration when selecting a pit type:








- services to be installed and maintained
- depth of cover for conduits
- ongoing access required by installation and maintenance staff

There is no Australian standard relating to electrical or communication pit performance. Pits are selected by use which is determined by size, volume and location. Users should note that cover loadings are transmitted to pit structures. It is

mandatory that HDPE plastic or polymer concrete pits are not used. To give specifiers, installers and users help in selecting the right pit and cover, the table below is based on loadings outlined in AS3996 (Access covers and grates) and AS4198 (precast concrete access chambers for sewerage applications) standards.

Special provisions may need to be identified in respect to the future requirements for co-location with other utilities and as such the selection of pit type may alter as a consequence.

AS3996 road gully and inspection chamber covers

A_{10kN}	B_{80kN}	C_{150kN}	D_{210kN}	E_{400kN}	F_{600kN}	G_{900kN}
						
Pedestrian applications, inaccessible to motor vehicles	Footpath and paved areas where vehicles mount accidentally or for light vehicles such as tractors and livestock	Light vehicular traffic. Minor roads such as cul-de-sacs and parking areas	Roads carrying fast moving, heavy vehicles	Very heavy wheel loads as found on construction sites, mining and industrial areas	Extra heavy wheel loads as encountered on container terminals, docks and mining areas	Extra heavy wheel loads - airports, military traffic etc.

Generally, Ausgrid will specify a **prefabricated concrete pit with a locking lid** for the majority of communications applications. The use of alternatives can be approved by the Manager of Engineering Standards and Communications and will be based on the following considerations relative to the concrete polymer pit.

- High resistance to chemical and biological attack
- Excellent noise and vibration absorption
- Excellent dielectric properties
- Good weathering and UV resistance
- Low water absorption
- Ability to be cut with masonry drills and grinders
- Ability to be recycled as rubble or crushed for use as road foundation
- Approximately 4 times the flexural strength of cement concrete
- Good thermal properties and stability

On the design drawings, the following shall be specified, and any amendments to such specifications shall require the prior approval of Ausgrid Engineering Standards and Research:

- type of pit required for any particular site
- pit siting locations
- type of lids and security requirements i.e. lockable
- requirement for special loading etc.

Pits shall be used for a change in direction of conduit routes and where the use of long radius conduit bends is not practicable. In this instance the pit size can be smaller mindful of the minimum bending radius of the optical fibre cable and the depth of the conduits..

2.3 Security/Locking of Pits

All pits containing Ausgrid communications assets will be lockable using a substation type padlock, irrespective of the type of pit.

2.4 Installation Restrictions

- no pit is to be located within a drive or road way
- pits are not to be installed in positions that prevent the serviceability of equipment within the pit
- pits are not to be located in a position where obstructions would impede ongoing access i.e. traffic lights, bus shelters etc.
- where possible, avoid pit locations where access to the pit will generate a hazard or impediment to pedestrian/vehicular traffic or staff
- pits shall not be located where they will be potentially damaged by vehicular traffic
- pits should not be located over existing utility services unless approved in writing by the relevant authority.
- avoid locations outside heritage listed buildings. If circumstances dictate that a pit has to be located outside a heritage listed building, seek local government consultation and approval, which may be denied.

2.5 Alignment / Location

Pits are to be positioned:

- parallel to the line of the asset route
- parallel to a reference line such as a footpath, property boundary, line of kerb, cable run etc.
- so that the largest dimension of the pit is parallel to such a reference line
- within the electricity utility allocation as per guidelines set out in authority guidelines and agreements i.e. Sydney Streets Opening Conference
- minimum 5metre back from any street corner. (reference to NS167, *Positioning of Poles and Lighting Columns*, "In roads declared to be in the following classifications poles and columns should be located, wherever possible, with their roadside face at least 2.5 metres behind the face of the kerb". This would put a pit approx. 12 metres from the pole. Unfortunately, many other services also cause underground congestion at intersections).
- so as the vertical alignment of the pit shall be flush with the surrounding pavement on all sides. This may result in sloping horizontal positioning.
- Suitably for fibre installation and splicing, ie within 10 to 15 metre from a location where a splicing van can be parked.

2.6 Notification of Proposed Works

Property owners, the relevant Traffic Committee and the Police shall be notified in accordance with the requirements of AUS-SPEC 1152, Section 1.10 - *Provision for Traffic*.

A written notice must be provided to local authorities prior to commencing work in areas under the control of such authorities and, prior to such commencement, all necessary permits required by law to execute the works must be obtained.

2.7 Pre-formed Pits

"Ausgrid will use a Class 'B' or better, preformed concrete pit as discussed in Section 2.2 above, as a minimum standard. The pit shall be a minimum of 1000mm long, 500mm wide, 900mm deep (e.g "J8" type pit) in order to accommodate cable and splice."

Pre-formed concrete pits require careful transportation and storage on site. Consideration needs to be given to the location of pre-formed concrete pits as they require special lifting apparatus during installation.

All installations are to conform to requirements established by the relevant Local Government Authority.

2.8 Cast in-situ Pits

Where approval has been granted for a pit to be constructed on site, accurate moulds or forms are required and should be adequately braced during pouring to ensure the walls remain straight and true.

Concrete shall be vibrated and once cured shall meet a minimum concrete compressive strength of 25 Mpa, at 28 days. Concrete slump shall not exceed 80mm where calcium chloride or mixture additives containing significant amounts of calcium chloride exist. Certified test results detailing attainment of specified standards for all cast in-situ products shall be obtained.

In areas with Acid Sulphate Soils (ASS) or in tidal areas, only wholly reinforced concrete pits shall be used. 50MPa concrete utilising sulphate resisting (SR) cement shall be specified.

Pit and lid dimensions, concrete strength and reinforcing shall meet the requirements specified on design documentation.

Ausgrid supplied lid identification markers shall be cast into the lid.

On completion, the number of the drawing that was used to construct the pit and survey information of the pits location is to be given to the Ausgrid Project Manager who will forward details to the Geographical Information Section, (GIS) for recording.

All signage in pits shall be corrosion resistant and shall be fixed with corrosion resistant fasteners.

A plaque displaying the name of the company that designed the pit, the number of the drawing that was used to construct the pit and any other identification is to be displayed on one side of the pit. The plaque shall be from 3mm thick aluminium plate and shall have smoothed and rounded edges and corners.

2.9 Materials

All pre-formed pits shall be fabricated to Ausgrid approved quality standards. The manufacturer shall assume full responsibility for structural design where by engineering and materials data documentation shall be submitted to Ausgrid for approval of each product prior to the inclusion of such within Ausgrid projects. Such data shall include manufacturer drawings, structural calculations, specifications, certified test reports and other data covering design and manufacture of pre-formed pits. Acceptance by Ausgrid of shop drawings does not relieve the manufacturer of design responsibility. Acceptance by Ausgrid refers to dimensions, materials and connection interface with other materials. Pre-formed cement pits and lids shall be designed to withstand a point load of Two Tonne. Manufactures of pre-formed pits shall provide test data as part of the quality assurance requirements.

2.10 Pit Lid Class Classifications

All pit lids have a specific classification. Refer to Section 2.2 above. It has been determined that a Class B lid will be utilised as a **minimum requirement** within the Ausgrid network.

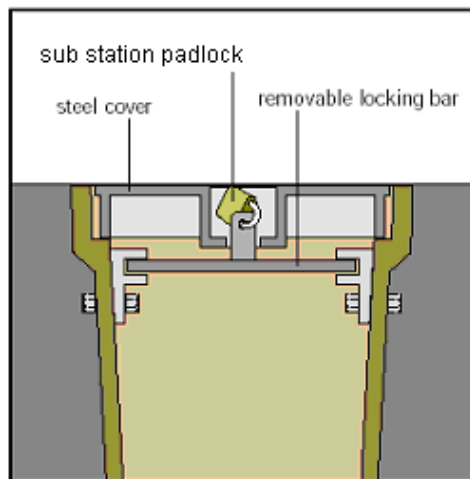
- Class B - Units for use on footpaths or footways where it is possible for a motor vehicle to mount the footway or for light vehicles, such as park tractors, or livestock to use the pedestrian facility.

All pits shall be provided with a locking, galvanised steel cover. In particular, for pre-formed (e.g. "J8" type) pits, the cover shall accept a standard Ausgrid Z1 padlock. The padlock shall be accommodated in a recess within the lid and protected by a suitable hinged cover plate. The lock cover plate must be provided with a means of keeping it in a closed position until accessed, however this must not be by screws as the screws have the potential to be lost and/or seize preventing access to the lock – e.g. an acceptable method would be for the lock cover plate to be spring loaded.

The installation of locks at each location shall be decided as required on a case-by-case basis.

The pit cover shall also be provided with suitable lifting holes to facilitate the lifting of the lid using standard Telstra pit lid lifters. Two lifting holes are to be provided in each section of lid. The holes shall accept a standard Telstra pit lid key / lifter. It should be noted that the use of pit lid lifters, with a "safety lock" mechanism that prevents accidental dropping of the lid, is preferred.

'Military style' cover security



The load rating of each pit cover will need to be assessed regarding the specific requirements for the location.

All pit lids will be labelled with the appropriate logo and wording as Ausgrid, viz



2.11 Maintenance

- gatic lids are to be removed and the relevant frame area greased
- ensure that relevant locking mechanism dust covers are reinstalled
- remove dirt/debris/other from the lid frame prior to replacing the pit lid
- replace broken or distorted lids with the appropriate lid
- ensure that locking mechanism is correctly secured/locked
- lubricate the padlock to inhibit corrosion and water ingress

2.12 Pit / Manhole Ladder

A galvanised steel ladder is to be installed in all manholes that exceed 1.0m in depth. For ladder specifications refer to the Site Built Manhole specifications.

3 PIT INSTALLATION PROCEDURES

3.1 OH&S

Notwithstanding Ausgrid's safe work practices, the following will apply:

- Prior to cutting penetrations in any pit, obtain a Material Safety Data Sheet from the manufacturer
- when installing pits, all trench excavation shoring and associated requirements must be taken into consideration
- ensure that lifting equipment does not encroach upon the excavated area shoulder so as to minimise the potential for any trench collapse
- prior to lifting, check any proposed lifting equipment limitations against the proposed lifting weight and situation
- minimise the period in which pit lids are removed so as to minimise the potential of accidental entry to the pit by personnel, spoil or other
- ensure that all pedestrian and traffic barriers/signage are suitably located and in place at all times
- ensure that good housekeeping methodology is utilised i.e. minimise spoil spread and inconvenience to pedestrians/traffic

3.2 Handling, Transportation and Storage

- Where pits are delivered banded and palletised for mechanical handling, it is recommended that the pits are not removed from pallets until required.
- pits should be stacked in a dry, clean place where they are not likely to be damaged
- Where pits must be mechanically handled, Nylon Slings or other suitable lifting methods that will not damage the pit, are to be used. Where the manufacturer has provided recommended lifting points these must be used.
- Although concrete products are not fragile, reasonable care is required in handling. For example; Pits should never be dropped; and they should be lifted, not dragged across the ground.

3.3 Excavation and Bedding

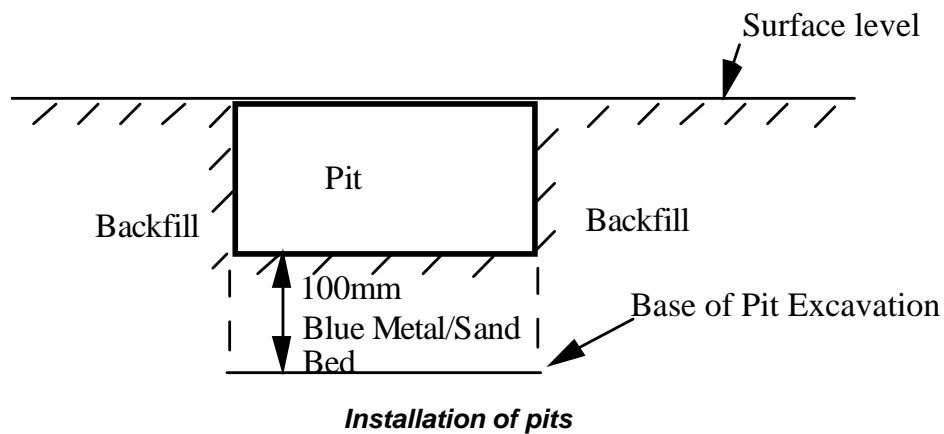
Where the excavation for a pit installation requires the breakout of pavement type surfaces, the surface breakout area is to be kept to a minimum, but must take into consideration the requirements for backfill, compaction and the concrete surround. Methods such as saw cutting shall be used to define and limit the extent of excavation and reinstatement.

In removing surface and sub-surface materials, maximum care shall be exercised to safeguard existing underground services and other structures within and around the work site against damage. The guidelines in AUS-SPEC 1152 Section 2.2 – *Surface Treatment Removal* shall be adhered to unless otherwise specifically approved by Ausgrid.

Excavation for the pit should be approximately 150mm greater around the entire pit than the pit to be installed. Depth should be kept to the minimum required. Gravel, fine crushed rock or recycled concrete are to be utilised as a bedding material. Bedding material is to be installed with a minimum depth of 100mm in substances other than rock; 50mm in rock. Refer to Figure 1. Any large, sharp or other protrusions that may damage the pit must be removed prior to placement of the pit. Note that the pit bedding material also acts as a drainage medium.

The guidelines for the stockpiling or disposal of excavated material in AUS-SPEC 1152 Section 3.2 - *Excavation* shall be adhered to.

Where it is required to place a pit over existing power cables, a precast concrete slab is to be placed beneath the pit bedding material.



3.4 Drainage

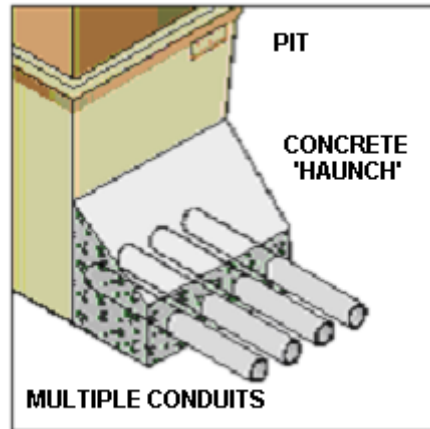
The majority of pits will be drained via drainage holes within the floor of pits in association with the pit blue metal/sand bedding material. All pits are to be drained, with drainage being provided for:

- Pits up to and inclusive of 0.75 square metre surface area shall be drained via 2 x 25mm holes placed within the floor of the pit, located centrally (width) and 100mm from the end wall of the pit
- For pits greater than 0.75 square metre surface area and up to 1.5 square metre they shall be drained via 3 x 25mm holes positioned in the floor of the pit, located centrally (width); 2 to be 100mm from the end walls of the pit with the third placed centrally longitudinally
- Prefabricated pits and in-situ built pits with a greater surface area than 1.5 square metres shall have a 450mm wide x 50mm deep sump located in the corner of the pit envisaged as being the low point of the floor area. The sump to be located 100mm from any wall.

The majority of pre formed concrete pits are provided with acceptable drainage holes or 'knockouts' installed during manufacture.

3.5 Conduit Penetrations

There is no restriction on the amount of conduits that can be connected to a pit. However, care must be taken that the pit's structural integrity is not compromised by removing excessive pit wall area. Care must be taken with multiple entry conduits in trafficable areas. To spread loads transmitted through the pit structure it is recommended that concrete haunching is applied around conduits to prevent pit collapse.



Where a conduit enters a pit, the following requirements are to be adhered to:

- The preference is for all conduits to enter through an end wall rather than a side wall. This helps with the bending radius of the fibre cable.
- conduits entries into a prefabricated pit should utilize the manufacturers recommended (generally preformed) access points, noting that side entries are not acceptable
- inlet / outlet openings should be drilled out using a hole saw, or similar, to achieve the correct hole size. Additional holes can be drilled as needed even after pit installation
- conduit (ducts, pipe) ends shall be smooth and cleanly cut square
- conduit ends are to protrude 50mm internally into the pit
- all conduit ends shall be reamed so as to remove sharp edges and burrs
- a height of 50mm between the pit floor and the lowest point of the conduit to be obtained
- a minimum 50mm separation between pit wall and any conduit to be observed
- a minimum 20mm separation between conduits to be obtained
- conduit entries to the pit shall be positioned so as to allow for smooth cable/subduct flow
- conduit penetrations shall be sealed to prevent the ingress of water and any foreign matter that may hinder the removal and/or installation of cables. Apart from being susceptible to blockage, unsealed conduits may cause flooding of pits and basement style installations of substations and switch rooms.
- Approved conduit caps shall be fitted to all unused conduit ends to prevent water migration in such a way that they provide a proper seal and can be removed without damaging the conduits.
- conduit penetration into a plastic pit is to be externally sealed utilising a silicone type product in conjunction with a cement surround
- All conduits entering and exiting pits and buildings shall be sealed in accordance with NS130.
- conduits or ducts that interconnect the Ausgrid network to another utility/authority network shall be sealed between networks in accordance with NS130. Expandable foam type sealers are not to be used.
- Bell-mouths shall be installed on the ends of all conduits within the pit.

3.6 Backfill

Backfilling of pit excavations shall be performed to the methods and standards, including temporary surface restoration, in accordance with NS130.

3.7 Reinstatement

It is prudent to determine and document the condition of all pavements and the site in general, prior to the commencement of the work. All pre existing damage should be documented (and photographed) with copies being forwarded to the relevant authority or property owner prior to the commencement of the work.

Reinstatement shall conform to the requirements and satisfaction of the local government authority, other relevant public authorities or property owner. It is imperative that the installer determine the application, extent and relevance of these requirements.

Note that additional removal and restoration works beyond the scope of works required by Ausgrid may be requested by the Local Council (see AUS-SPEC 1152 Section 1.7 *Additional Work*). Such additional work will be identified and defined by Ausgrid in negotiation with the Local Council's Restoration Officer.

At the completion of the works all spoil, debris and surplus materials shall be removed from the site. All pavements, driveways, gutters and grass verges are to be cleaned and reinstated to their original condition. The appearance of the reinstatement shall match as close as reasonably possible the existing nature of the surrounding pavements and surfaces. Sub grades are to be compacted and levelled to support the correct and uniform pavement thickness.

3.8 General Pit Installation Procedure

In addition to the general pit installation procedure where applicable refer also to the specific pit/lid installation and handling requirements contained within this document.

3.8.1 Installation in Non Paved Areas

- ensure that all relevant approvals, permits and other utility/authority asset locations are in place/undertaken prior to works commencing
- excavate a clean/neat lined hole slightly larger (approx. 150mm around the entire pit or enough to allow for the required compaction to take place) than the pit to be installed
- all soft silt/clay is to be removed
- the excavated hole should be approx. 100mm deeper than the pit to be installed so as to allow for pit bedding material to be placed
- the base of the excavated pit area is to be levelled and compacted, to provide a smooth flat surface
- place a minimum 100mm layer of bedding material
- remove any large or sharp protrusions from the bedding material that could damage the pit
- inlet / outlet openings should be drilled out using a hole saw, or similar, to achieve the correct hole size. Additional holes can be drilled as needed even after pit installation. (majority of pre fabricated pits have 'knockouts' fitted)
- place the pit into the hole to determine the appropriate levelling. Make any necessary adjustments to ensure the completed pit will sit 5mm above the adjoining ground (to prevent water ingress).

- where ever practicable pits should be positioned so as to provide for natural drainage and in all cases drainage holes shall be provided
- complete conduit and marker wire entries and seal as specified
- ensure that all cable rails, crossbars, lids etc. are in place prior to commencing the backfill/compaction operation
- undertake backfill/compaction utilising approved spoil or fine material
- compact backfill in layers of 150mm
- last 150mm of backfill to be undertaken utilising approved top dressing material
- compact lightly and turf with existing grass or seed so as to restore the surrounding area to original condition

3.8.2 Installation in Footway and Paved Areas

- follow the first 15 dot points as per pit Installation in Non Paved Areas requirements above
- where a tiled or paved areas, finish as per surrounding areas
- The installation of pits in decorative paved areas, requiring the used of infill lids, is to be avoided wherever practicable

3.9 Over existing assets

Where it is required for a pit to be placed over existing assets this can be undertaken via:

- site built
- utilisation of virtually any pit from the suggested pit range

When a prefabricated pit is to be utilised there are a number of options in which to undertake this work:

- do not cut the pit:
 - downwards from the upper surface level
 - along the corners
 - entirely from top to bottom at any point of the pit
- removal of the bottom of the pit
 - turn the pit upside down on a level surface, using a hand saw or grinder cut around the entire base of the pit
 - cut a slot from the bottom of the pit up each end wall so as to allow for the conduit/asset entry to occur at the usual level
- excavate the pit hole so as to be 30mm deeper than a standard installation, place bedding material and level
- place 30mm of packing material onto the bedding material so as to lift the pit and allow for the concrete pour to travel internally and externally up the wall of the pit
- install the pit as per a standard pit installation
- once the pit is installed pour a concrete floor which will then encompass the walls of the pit and is approximately 30mm below the pit and 30mm up the wall of the pit
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3.10 Extensions or Risers

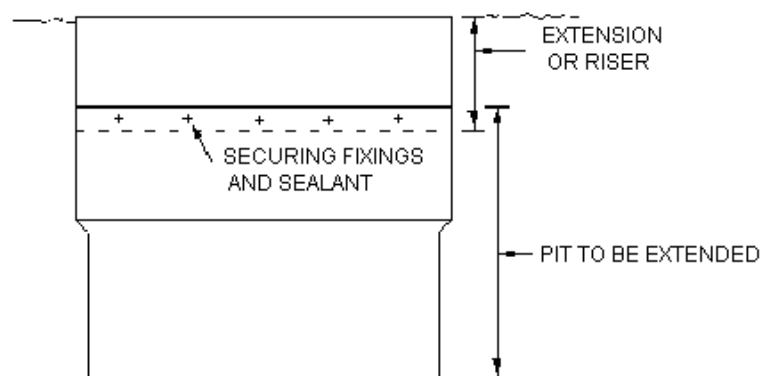
The extending or deepening of a pit may be required so as to allow a pit to capture assets installed at a deeper depth or in situations where additional fill is going to be placed within the vicinity of the pit and it is only necessary to raise the pit lid height to meet the new grade elevation.

In order to accommodate the depth for the majority of installations by Ausgrid in public footways, where the optic fibre pilot is installed with the same cover as HV cables, (refer to NS130), it will be necessary to utilize a pit fitted with a riser to provide an overall depth of 900mm. In other locations, such as within substation areas, the pit depth may be the regular pit depth of 600mm.

Some of the prefabricated pits can be modified and utilised as extensions on themselves (by removing the bottom of one) or in other cases, the manufacture offers a purpose designed riser or extension for the existing product range

To fit extensions or risers to a pit, follow the manufacturer's instructions.

Where an existing pit is to be extended, excavate around the upper level of the pit to a depth of approximately 200mm, enabling sufficient access to secure the extension to the existing pit. Dependent on the manufacturer, the extension will 'lock in' to the existing pit or require screw type fixings. Ensure that fixings are corrosion protected, (galvanised or SS), and a suitable sealant is applied to the joint to limit the ingress of water.



4 INSTALLATION OF COMMUNICATIONS CABLE CONDUITS

All underground Fibre Optic Cables shall be installed in a 50mm, heavy duty, orange, conduit. The conduit shall be installed generally in accordance with Network Standard NS130 - Specification for Laying of Underground Cables up to 22kV, but noting the following:

- Communications conduits not installed in a common trench with other electricity cables shall have a minimum cover of 900mm and have a continuous 4mm² copper conductor, green/yellow, PVC insulated marker wire installed in the trench directly beside the conduit to facilitate location of the conduit at a later date.
- The 4mm² marker wire shall terminate in the pits at either end of the conduit run, with a minimum of 2m of spare wire left in each pit at each end
- For conduits installed via directional boring the 4mm² marker wire may be installed in the 50mm conduit.
- Any change of directions shall be via a properly formed conduit bend, the minimum radius of which shall be 1200mm.



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Manager Major Standards & Communications

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