

Chapter 9

Telecommunications, Electrical and Streetlighting

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CHAPTER 9 TELECOMMUNICATIONS, ELECTRICAL AND STREETLIGHTING

INTRODUCTION

9 PURPOSE

The purpose of this section sets out the information that the Council requires to ensure that telecommunications, electricity and street lighting networks are designed and installed to meet community expectations for power, lighting and communications.

The standards also seek to ensure that physical and legal access to all underground services is ensured with a minimum of disruption, and that networks are durable and affordable.

9.1 Performance Outcomes

Mandatory Matters

Telecommunications utilities performance outcomes sought by these standards are as follows:

- a) All new underground cabling and surface infrastructure meets the needs of people and communities for electricity, streetlighting and telecommunications;
- b) All new cabling is located within public land, or is legally and physically protected where it is located on private property;
- c) Legal and physical access to underground cabling is ensured for ease of repairs and maintenance, with a minimum of disturbance;
- d) The location of all telecommunication services is clearly marked;
- e) Cables and underground networks are installed with a minimum of disruption;
- f) Streetlighting has been provided to ensure personal and traffic safety;
- g) All surface infrastructure including streetlights is in keeping with the amenity and character of the environment;
- h) All underground cabling and surface infrastructure associated with telecommunications, streetlighting and electricity is robust, durable and safe.

9.2 Referenced Documents

9.2.1 District Plan Requirements

The standards set out in this chapter address matters that are specific to the Council asset creation or activities that may have an impact on an asset. They are subject to the Nelson City and Tasman District Resource Management Plans (RMP's).

9.2.2 External Standards

Mandatory Matters

Unless otherwise specified within the standards of this document, telecommunications, electrical and streetlighting networks shall be designed and constructed in a manner consistent with standards set out in Table 9-1. Where an Act or National Standard document is referenced, this shall be the current version including any associated amendments.

Table 9-1 Streetlight Networks Standards

Standard / Reference	Description
AS/NZS 1158.0	Road lighting – Introduction
AS/NZS 1158.1	Road lighting – Vehicular traffic (Category V) lighting – Performance and design requirements
AS/NZS 1158.1.2	Road lighting – Vehicular traffic (Category V) lighting – Guide to design, installation, operation and maintenance
AS/NZS 1158.2	Road lighting – computer procedures for the calculation of light technical parameters for Category V and Category P lighting
AS/NZS 1158.3.1	Road lighting – Pedestrian area (Category P) lighting – Performance and design requirements
AS/NZS 1158.4	Lighting for Roads and Public Spaces – Lighting of pedestrian crossings
AS/NZS 1158.5	Lighting for Roads and Public Spaces – Tunnels and underpasses
SA/SNZ TS 1158.6	Lighting for roads and public spaces – Part 6 Luminaires – Performance
AS/NZ S3000	Electrical installations (Australian/New Zealand wiring rules)
AS/NZ S4065	Concrete utility services poles
AS/NZS 4676	Structural design requirements for utility services poles
AS/NZS 4677	Steel utility services poles
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
AS 4702	Polymeric cable protection covers
New Zealand Legislation – Electricity Act 1992	Electrical safety regulations 2009 Design of reticulation
NZ Electricity Code of Practice	Current and voltage ratings
Line Owner	Design and Construct and Distribution Codes

9.3 Cable Protection

Mandatory Matters

- 9.3.1.1 Protection shall take the form of either:
- 50mm thick non-metallic reinforced concrete slabs (usually 150mm wide and 500mm long); or
 - 100mm x 50mm ground retention treated timber with a minimum specification of the New Zealand Timber Preservation Council classification; or
 - 5mm polymeric cable cover.
- 9.3.1.2 The depth and offset of trenches specified on the laying plan provided by the network line operator must be maintained.
- 9.3.1.3 Minimum cover shall be 450mm in footways and 600mm in roadways.
- 9.3.1.4 Appropriate mechanical protection shall be provided for any underground telecommunication reticulation in accordance with the network operator's requirements.

9.4 Pipe and Duct Installation

Mandatory Matters

- 9.4.1.1 All services crossing the proposed duct pipe route shall be exposed and the necessary clearances maintained to enable the network line operator's ducts to be installed either above or below these other services. The network line operator's ducts shall be laid above power cables.
- 9.4.1.2 All joints in duct pipe shall be water tight.
- 9.4.1.3 The base of the trench shall be level with large objects removed. The duct pipe shall be bedded in accordance with Chapter 7, Section 7.8.2.
- 9.4.1.4 Adequate provision shall be made for draining cable/ducting trenches in accordance with Chapter 7 of the Nelson Tasman Land Development Manual.
- 9.4.1.5 Cable and duct locations in the road reserve area shall be in general accordance with SD901, SD902, SD412 and SD413.
- 9.4.1.6 Cable and duct locations down rights-of-way shall:
- Be located 750mm from a boundary in a berm area where provided; or
 - Be at the centre of the right-of-way; and
 - Be at a depth 450-600mm; and
 - Where located in a common trench with water and power services, be in accordance with SD902.
- 9.4.1.7 Where telecommunication reticulation cables are on private property (excluding rights-of-way):
- Visible 'above ground' warning markers shall be placed where cables change direction; and;

- g) In between not more than 10m spacing in all but rural areas where the minimum spacing shall be not more than 20m; and
- h) Warning markers shall be as stated in the network operator's design and construction standards.

9.4.1.8 Road crossings for telecommunication reticulation cables shall be in PVC ducts to the network operator's requirement at a minimum depth of 450-600mm.

9.5 Access Points

Mandatory Matters

- 9.5.1.1 The pits and lids are designed to withstand light vehicular loading only. Therefore, installation shall only take place in the footpath or in grassed areas within the defined kerb network. On mountable kerbs they shall be located in grass areas and behind the footpath.
- 9.5.1.2 The grass berm or footpath shall be excavated to a sufficient depth to ensure that the pit lid will be level with the finished level of the surface.
- 9.5.1.3 Service pillars shall be set back close to section boundaries and are to be clear of designated vehicular access and pedestrian ways by a minimum of one metre.
- 9.5.1.4 The minimum spacing of any service pillars from any boundary line or survey peg shall be 200mm so as to enable future fencing construction.

9.6 Approvals and Records

Mandatory Matters

- 9.6.1.1 Any ducting systems installed in the road reserve area shall be considered as part of the telecommunication reticulation system for the purpose of 'as-built' records.
- 9.6.1.2 Any excavation within the existing road reserve is subject to the Councils' approval and a work approval notice issued by the Council.

Good Practice

The following matters provide additional direction and guidance in the installation of Telecommunications Utilities:

- 9.6.1.3 Where multiple driveways on lot boundaries make it impractical to position a service pillar at a common boundary between lots or, where a narrow road frontage width of a lot makes the location of a service pillar vulnerable to damage, it is permissible to install a duct in the road reserve from a lot boundary to a service pillar with an offset of no more than 10m from the affected lot. This is the only occasion service leads are to be run along road reserve.

9.7 Electrical Reticulation Design

This section outlines general design requirements for all electrical utilities.

Mandatory Matters

The Council requires the following standards to be met in the provision of electrical utilities.

9.7.1 General

- 9.7.1.1 All new service mains will be by underground cabling in “rural areas” or as approved by the Council and the utility operator.
- 9.7.1.2 Reinforcement or replacement of existing overhead works will be by underground cabling apart from specific exemption from the Council. This will not exclude the line owner carrying out any maintenance (replacement or upgrade) of existing works as long as the land will not be injuriously affected as a result of the maintenance (replacement or upgrade).
- 9.7.1.3 Any variations (exceptional circumstances) given by either the line owner (for variation from its own electrical design and construction standards) or the Council (for variation from its Land Development Manual) will be in writing and shall indicate which section and subsection of the relevant standards the variation applies to.
- 9.7.1.4 Existing allotments with no “power to the boundary” and requiring an electrical supply will be by underground cabling.
- 9.7.1.5 All works assets to be vested with the line owner or electricity operator will meet their respective design and construction standards and distribution code.
- 9.7.1.6 Any underground or overhead works cable being vested with the electricity operator and installed on any titled land will be secured by way of an easement in favour of the line owner. See Section 9.9.
- 9.7.1.7 Service main exclusive fittings owned by a third party will also have private easements registered outside the point of supply if the route crosses titled land not owned by the third party. See Section 9.11.
- 9.7.1.8 Where a boundary is adjusted enabling a lot to contain an installation the Council will require confirmation from the line owner that the existing works are sufficient to supply another installation as required.
- 9.7.1.9 Designers are to liaise with other service authorities to achieve economical use of the road reserve area with due consideration given to ease of maintenance to the works system and other services in the road reserve area.

9.7.2 Design

- 9.7.2.1 All new works and service mains will be by underground cabling in urban areas.
- 9.7.2.2 The design of the works shall, as a minimum requirement, comply with the current Electricity Regulations and the requirements and standards of the line owner.

- 9.7.2.3 The design of the works shall give consideration to the likely electrical demand requirements per lot and allow for this in the initial design.
- 9.7.2.4 The minimum electrical demand design criteria per lot and allowable after diversity maximum demand factor, shall be to the requirements of the line owner.
- 9.7.2.5 All new residential, commercial and industrial subdivisions shall be reticulated with underground cabling running along each side of the road reserve. The Council may allow variation for a single sided reticulation in exceptional circumstances (e.g. where lot frontages are greater than 30m in length).
- 9.7.2.6 Provision shall be made by land developers for the continuation of appropriate cabling along road frontages to facilitate the works of adjoining future development. This may be achieved by the installation of cable ducting systems. The Council may waive this requirement where it is demonstrated, with approval from the line owner, that adjacent sub-dividable land may be reticulated from another suitable route.
- 9.7.2.7 Consideration shall be given to the future extension or reinforcement of the works system without necessitating major road reserve disturbance to achieve such expansion or reinforcement. Where appropriate, spare ducting shall be installed along routes likely to be used for an extension, or reinforcement of the works.
- 9.7.2.8 Road crossings for power cables shall be kept to a minimum and where necessary, shall be at right angles to the carriageway and have minimum cover of 900mm. All power cables crossing the road shall be in an orange electrical duct of minimum diameter 100mm. Streetlight cables shall be inside a separate orange 50mm diameter electrical duct.

9.7.3 Location and Capacity

- 9.7.3.1 Voltage drop shall be no greater than permitted under the current Electricity (Safety) Regulations and the requirements and standards of the line owner.
- 9.7.3.2 Current ratings shall be in accordance with line owner's design and construction standards, and relevant legislation.
- 9.7.3.3 The design shall take into account the requirements of Section 9.7.2 with specific attention given to the following details relating to likely electrical loads:
- a) Lot size in relation to permissible coverage and anticipated usage of the lot (e.g. multiple dwellings, cross-lease and potential subdivision permitted within the zoning);
 - b) An appropriate after diversity maximum demand factor;
 - c) The design of the works shall give consideration to the likely electrical demand requirements per lot and allow for this in the initial design. Residential subdivisions should allow a minimum of 15kVA with diversity per lot and industrial subdivisions should allow a minimum of 40kVA without diversity per lot;
 - d) Future load growth and works expansion or reinforcement.
- 9.7.3.4 Existing overhead electrical cabling shall be dealt with in accordance with Section 9.10.

9.7.4 Records

- 9.7.4.1 The network utility operator shall keep and maintain as-built records of their works within the road reserve and on private property where the reticulation will be owned by the line owner in accordance with the [Electrical \(Safety\) Regulations 2010](#).
- 9.7.4.2 The line owner shall ensure that they receive and maintain as-built records of the works and ensure that such records are made available upon request and as required, mark out cable routes on site for the Council or contractors carrying out works.
- 9.7.4.3 Provision of as-built drawings for planned works shall be made available with five working days' notice during normal working hours and for emergency call outs with no prior notice at any time.

Good Practice

The following matters provide additional direction and guidance in the provision of electrical utilities.

- 9.7.4.4 Residential subdivisions should allow a minimum of 15kVA with diversity per lot and industrial subdivisions should allow a minimum of 40kVA without diversity per lot.
- 9.7.4.5 The typical design position for electrical cabling in road reserve is parallel with and 600mm from the boundary.

9.8 Electrical Reticulation, Easements and Subdivision

This section details standards that relate to subdivision and easements, as these matters affect and are affected by the provision of electrical reticulation.

Mandatory Matters

The Council requires the following standards to be met in the provision of electrical reticulation, easements and subdivision.

- 9.8.1.1 New lots shall be serviced with live 400/230v works to the boundary of each lot.
- 9.8.1.2 High voltage power lines (greater than 1000 volts) across or fronting new subdivisions shall be relocated clear of the subdivisions or placed underground with the agreement of the line owner. Variation may be granted by the Council where it is demonstrated to be impractical to achieve this requirement.
- 9.8.1.3 All new subdivisions reticulated with service boxes or poles shall have service ducting (50mm orange PVC electrical duct) from the pole or box to 1.0m within the property it is intended to supply. Wide sweeping bends shall be used. Service ducting shall be installed to the depths shown on SD901 and SD902. Duct ends shall be clearly marked within properties, and fixed by measurement to survey points or other permanent fixtures on as built records.

9.8.2 Broadband Speed

- 9.8.2.1 The network design will provide a minimum of 25 M bps transfer speeds with provision for this to be increased to 100 M bps without necessitating major road reserve disturbance.

9.9 Easements

- 9.9.1.1 It is the responsibility of the Developer to ensure that all easements are obtainable. The Developer shall, where necessary and at their expense, provide any easements and obtain any formal consents required for overhead lines, underground cabling and equipment to be installed or altered in, on, under or over property other than road reserve.
- 9.9.1.2 Easements in Gross with the line owner as the grantee/transferee shall be obtained and registered on all private land.
- 9.9.1.3 Easements are required in the following cases but shall not be limited to:
- Where new works (lines or cables) are located on private properties;
 - Where a pad mount substation, switching station or transformer is to be located on other than road reserve;
 - Where an overhead line located in a legal road intrudes into a privately-owned property. This applies especially to cross arms and conductors where air space is encroached;
 - Where an existing service main is physically altered, shifted or its status is changed, for example, to supply a new separately subdivided property;
 - Where a network cable is used to supply lot(s) in rights-of-way or access lots.
- 9.9.1.4 Easements required on land being developed under subdivision consent must be described under a memorandum of easements. Land outside the subdivision and affected by new or altered network system changes must also be described in a memorandum of easements. Where lot servicing is able to be satisfied using service mains in rights-of-way or access lots, easements shall be prescribed on the deposited plan.
- 9.9.1.5 Works are to be vested with the line owner prior to connection and livening, and registration of the easement. A separate agreement will be required to confirm vestment conditions and will be signed by approved signatories.
- 9.9.1.6 Overhead lines require 6.0m wide easement corridors symmetrical to the actual line route.
- 9.9.1.7 Underground cables require 3.0m wide easement corridors symmetrical to the actual cable route.

9.10 Rural Areas

- 9.10.1.1 Easements in gross are to be provided by the land owner, in favour of the line owner, for all new or altered works over private property. All proposed electricity easements over private property, whether the land is owned by the developer or not, must be listed under a memorandum of easements in gross on the subdivision plans.
- 9.10.1.2 400/230v works and service mains to individual premises shall be by underground cable unless precluded by ground profiles or other impediments in which case the Council may grant variation for overhead cables to traverse the area concerned.

- 9.10.1.3 Network connection points to individual lot boundaries shall be located to provide practical and legal access for service mains to specified or potential building sites.
- 9.10.1.4 Where the length of a service mains cable exceeds 200m from a network connection point to a specified or potential building site, the works designer shall state on the application drawing, the proposed service mains cable size and design criteria applicable to the lot.

Good Practice

The following matters provide additional direction and guidance in the provision of electrical reticulation and subdivision.

9.10.2 General

- 9.10.2.1 Rear lots down rights-of-way or through front lots may have ducts provided from the road reserve frontage to the rear lots ready for future service mains installation at the owner's cost. Exceptions are catered for where it is impractical to position a supply at a boundary.
- 9.10.2.2 Where practical, existing overhead 400/230v works or "service mains" crossing new subdivisions shall be placed underground.
- 9.10.2.3 Variation may be granted by the Council in regard to the location of high voltage power lines (greater than 1000 volts) across new subdivisions where it is demonstrated to be impractical to relocate them or put them underground.
- 9.10.2.4 The line owner will not connect new works or allow alterations to its network system which constitutes new work by definition in the Electricity Act 1997 and subsequent amendments, until an easement in gross has been acknowledged and receipted by the district land registrar on the properties affected. This requirement may be waived for subdivisions approved by the Council under the RMA or HASHA where property outside the subdivided property is unaffected and subdivision deposited plans with relevant transfers are lodged to the satisfaction of the line owner.

9.10.3 Rural locations

- 9.10.3.1 In remote rural subdivisions where the allotments have a large land area and it is demonstrated that the lots are not intended for habitable dwellings or buildings ancillary, the Council may waive the requirement for the supply of works to the boundary. A consent notice will be required noting that the site will not have an electricity supply.
- 9.10.3.2 Where works referred to in the above paragraphs is not practically accessible or economically viable, local generation e.g. hydro, solar, wind, may be considered as an alternative. It should be demonstrated that local electrical generation of 3kWhr minimum sustainable storage capacity over a 24-hour period per household is feasible for supplying lighting and small electrical appliances with alternative fuel for heating and cooking.
- 9.10.3.3 Recognising the extent of 11kV works in the rural sector, together with the difficulty and high cost of providing underground 11kV cabling, the Council may in accordance with Section 35 of the Electricity Act and at its discretion and in agreement with the line owner, allow overhead 11kV works and associated substations in the rural sector.

9.10.3.4 In rural locations, substations may be located on lot boundaries or within the subdivided lots to enable an adequate electrical supply to specified or potential building sites on the allotments.

9.10.3.5 In rural areas, subject to existing load and future development, the line owner may approve the use of an existing two phase 11kV overhead line for residential and general farming purposes where it is demonstrated that three phase power is not likely to be required for the management of the land (e.g. irrigation). The design of any two-phase 11kV line extension should be to a standard whereby a third phase can be run or livened without changes to poles, cross-arms or guys.

9.10.4 Private Access

9.10.4.1 Where service mains are used to service lots on a shared right-of-way, access lot, or across private land then an easement in favour of the line owner is not required. However, an easement between the respective parcels of land is necessary with the wording “right to convey electricity, telecommunications and computer data” entered as the purpose description.

9.11 Cabling, Ducting and Service Boxes

This section sets out standards for the design of cabling, ducting and service boxes.

Mandatory Matters

The Council requires the following standards to be met in the design of cabling, ducting and service boxes:

9.11.1 General

9.11.1.1 Access to a three-phase power supply shall be provided at the boundary of the road frontage of each lot of an industrial, commercial or residential subdivision.

9.11.1.2 Rights-of-way exceeding 60.0m to any allotment shall have an appropriate power cable installed to the main body of the rear allotments.

9.11.1.3 Fusing and “network connection points” shall be to the satisfaction of the line owner. No service duct system extending from a service box, within a right-of-way shall be longer than 60.0m. No service duct system in road reserve shall be longer than 10.0m.

9.11.1.4 Where either the service mains or the line owner’s works is installed within the sealed area of a right-of-way the cable is to be installed within a duct or a spare duct is to be laid beside the cable.

9.11.1.5 Appropriate registration of easements in gross to the line owner’s requirements shall be provided by the landowners prior to livening for all works. Where service cables cross other properties or rights-of-way, private easements between lots will be required prior to livening.

9.11.1.6 Any ducting systems installed in the road reserve area shall be considered as part of the works system for the purpose of as-built records.

- 9.11.1.7 Any excavation within the existing road reserve is subject to the Councils' approval including the National Code of Practice for Utilities Access to the Road and Rail Corridors and a Corridor Access approval issued by the Council.
- 9.11.1.8 Service boxes shall be set back 250mm from section boundaries and are to be clear of designated vehicular access and pedestrian ways by a minimum of 1.2m along the boundary and 700mm diagonally to the nearest point where the driveway tapers out to the kerb, refer to SD903.
- 9.11.1.9 The minimum spacing of any service box from any boundary line or survey peg shall be 250mm so as to enable future fencing construction.
- 9.11.1.10 Cable and duct locations in the road reserve area shall be in general accordance with SD901 being 600mm from section boundaries at a nominal laying depth of 1.0m (900mm cover) with provision for shared trenching with communication services.
- 9.11.1.11 All joints in duct pipe shall be watertight and shall use rubber ring seals, depending on the ducting supplied. The rubber "o" ring sealed pipe is the preferred type of duct and will replace solvent cement glued ducting in the long term.

9.11.2 Substations

- 9.11.2.1 Substations shall be of adequate design capability to supply the anticipated after diversity maximum demand with consideration to Section 9.7.3.
- 9.11.2.2 Ground-mounted substations will be permitted within new residential, commercial and industrial subdivisions.
- 9.11.2.3 Substations shall be located in the berm, (recessed into adjoining lot or public reserve) clear of designated vehicular access ways by a minimum of 1.0m and close to section frontages (but no closer than 300mm), secured either by easement or preferably designated as road reserve. The line owner is to determine the size of the recess.
- 9.11.2.4 Adequate public protection shall be provided at all substation sites, giving consideration to:
- a) Earthing (NZECP 35);
 - b) Physical location to minimise the risk of damage by vehicles; and
 - c) Security to protect against public access to electrical contents.

9.11.3 Approvals and Records

- 9.11.3.1 Prior to any works commencing on site, the following requirements shall be submitted and approved:
- 9.11.3.2 A line owner's approved electrical works design plan and the designated streetlight connection point.
- 9.11.3.3 The plan shall bear a design statement covering the following:
- a) Before diversity load per lot (i.e. 15 kVA per residential lot);
 - b) Compliance with the line owner's design and construction standards;
 - c) Compliance with the Land Development Manual.

- 9.11.3.4 A list of easement requirements for any works on titled land to be vested with the line owner and a list of reciprocal rights for service mains cables or ducts over shared rights-of-way or easements for service mains cables crossing titled land.
- 9.11.3.5 The Council signed approval of the design plan (for subdivision or large area works).
- 9.11.3.6 Prior to the 224-certification stage (for subdivision), the following details shall be forwarded via the Designer to the Council:
- A letter of acceptance by the line owner confirming that adequate services are provided:
 - As-built documentation has been filed for network extensions and/or service mains; and
 - The works has been lived and fulfils the line owner’s design and construction standards and any other line owner requirements.
- 9.11.3.7 Regarding cable locations, the location and layout of the works shall be shown on the design plan, with all variations authorised by the network line operator’s representative.
- 9.11.3.8 Where a shared services trench is used, separation between the services in subdivisions is required. These will be detailed in the laying specification. However, safe working distances are required for all services within minimum separations for power cables. Table 9-2 shows the minimum clearances between power and telecommunications cables. SD901 and SD902 show the general layout of services.

Table 9-2 Minimum Separations Between Power and Telecommunications Cables

Voltage and cable type	At Crossings		On Parallel Runs	
	With protection	Without protection	With protection	Without protection
LV, neutral screened, or armoured	50mm	150mm	50mm No limit to length	300mm No limit to length
LV, neutral unscreened, or unarmoured	50mm	450mm	450mm No limit to length	450mm No limit to length
HV, single and multicore	150mm	450mm	450mm 2.4km limit to length	450mm 2.4km limit to length

LV (low voltage) power cable is defined in the current electricity regulations as “any voltage exceeding 50 volts a.c. or 120 volts ripple free d.c. but not exceeding 1000 volts a.c. or 1500volts d.c.

HV (high voltage) power cable is defined in the current electricity regulations as “any voltage exceeding 1000 volts a.c. or 1500 volts d.c.

9.11.4 Protection

- 9.11.4.1 The depth and offset of trenches will be specified on the laying plan. It is essential that these be maintained. Minimum cover shall generally be as shown on SD901, SD902 and SD904.
- 9.11.4.2 All services crossing the proposed duct pipe route shall be exposed and the necessary clearances maintained to enable other network line operator’s ducts to be installed either above or below these other services. Telecommunication ducts shall be laid above power cables, but not directly above.

- 9.11.4.3 Appropriate mechanical protection shall be provided for any underground works in accordance with the line owner's design and construction standards and appropriate legislation. Cable marker warning strip shall be placed along all cable routes at half the cable trench depth.
- 9.11.4.4 Road crossings for works cables shall be in 100mm minimum orange electrical PVC ducts to the line owner's requirement at a depth of 1.0m (900mm cover).
- 9.11.4.5 At all sites where cable is installed cable marker warning strip shall be placed along the cable route at half the cable trench depth unless the cable is mole-tunnelled or drilled and ducted.

Good Practice

The following matters provide additional direction and guidance in the design of cabling, ducting and service boxes:

- 9.11.4.6 Rights-of-way no longer than 60.0m may have individual service duct systems (orange 50mm minimum diameter PVC and wide swept bends) or appropriately sized service mains cable installed from a service box on the road frontage down the right-of-way to each rear allotment.
- 9.11.4.7 Where multiple driveways make it impractical to position a service box at a common boundary between lots or where a narrow road frontage width of a lot makes the location of a service box vulnerable to damage, it is permissible to install a service duct (orange 50mm minimum diameter PVC) in the road reserve from a service box offset no more than 10.0m from the affected lot.
- 9.11.4.8 Pole-mounted substations may be permitted in rural subdivisions.
- 9.11.4.9 Pole-mounted substations may be allowed in existing overhead works.

9.12 Streetlighting

This section contains standards for the design and installation of streetlighting.

Mandatory Matters

The Council requires the following standards to be met in the design of streetlighting:

9.12.1 General

- 9.12.1.1 The lighting design must maximise safety and efficiency while minimising the life cycle cost and impact on the environment.
- 9.12.1.2 Lighting shall be designed to match the style, height and spacing of adjoining sections of road that have the same hierarchical classification.
- 9.12.1.3 Lighting should complement the neighbourhood character and, as far as is reasonably practicable, minimise the impact on the neighbouring properties and environment with regard

to aesthetics, topography, elevations, glare and light spill. The Councils' support the dark night sky concept.

- 9.12.1.4 The design must comply with all the appropriate New Zealand Standards, in particular the requirements of AS/NZS 1158 and New Zealand Transport Agency (NZTA) M30 specifications. Anything not specified within the Land Development Manual is specified in those standards.
- 9.12.1.5 Pedestrian area (Category P) lighting must comply with AS/NZS 1158.3.1 and for pedestrian crossings AS/NZS 1158.4. Vehicle area (Category V) lighting must comply with AS/NZS 1158.1.2.
- 9.12.1.6 Category V lighting should provide a lighted environment conducive to the safe and comfortable movement of vehicular and pedestrian traffic at night.
- 9.12.1.7 Category P lighting should assist pedestrians to orientate themselves and detect potential hazards, and discourage fear of crime and crime against the person.
- 9.12.1.8 New roads and public accessways shall have lighting levels and parameters by roading hierarchy classifications (refer Section 4 Transportation). The lighting level associated with that classification is given below:

a) Sub Collectors, Local Roads and Residential Lanes	Category P3
b) Principal and Collector	Category V4 or P3
c) Arterial	Category V3 or V2
d) Public Accessways	Category P4
- 9.12.1.9 The streetlight design must be certified by a suitably qualified and experienced lighting professional. This shall be endorsed on the plan.
- 9.12.1.10 Rural Road Flag Lights shall be installed as per clause 3.5 of AS/NZS 1158.1.1.

9.12.2 Luminaires

- 9.12.2.1 All new streetlights shall be solid state Light Emitting Diode (LED) type luminaires. Road lighting spacing shall be designed to meet the requirements in AS/NZS 1158.
- 9.12.2.2 All luminaires must have a light distribution style with a UWLR (upward waste light ratio) of less than 1%.
- 9.12.2.3 All luminaires shall have a tilt angle of 0-2.5deg, which has been set to achieve consistency across the network and reduce unwanted light spill. This will reduce the likelihood of luminaires being installed at a negative angle. A tilt angle variation may be accepted only on approval of the Engineering Manager.
- 9.12.2.4 All new luminaires should be fitted with a 7-pin NEMA socket and a DALI compatible LED driver. This is to future-proof for possible implementation of a streetlight Central Monitoring System (CMS).
- 9.12.2.5 All lighting designs must be submitted to the Council for approval.
- 9.12.2.6 In relation to pedestrian crossings, lighting levels shall meet the requirements of AS/NZS 1158.4.

- 9.12.2.7 All luminaires, in general, should be NZTA M30 approved.
- 9.12.2.8 For non-M30 approved luminaires, verification shall be by the supplier's independent M30 test criteria. Any such luminaires will also need to meet the Engineering Manager's approval in terms of expected whole-of-life cost. Whole-of-life costs are to be measured over a 20-30 year period.

9.12.3 Columns

- 9.12.3.1 The specified intended life of new pole bases shall be 50 years unless otherwise approved by the Council.
- 9.12.3.2 Columns and outreaches shall meet the requirements of the relevant AS/NZS standards:
- AS/NZS 4065 – Concrete utility services poles;
 - AS/NZS 4677 – Steel utility services poles;
 - AS/NZS 4676 – Structural design requirements for utility services poles;
 - AS/NZS 4680 – Hot-dip galvanised (zinc) coatings on fabricated ferrous articles.
- 9.12.3.3 The outer surfaces of galvanised ground-planted columns and stub bases shall be protected to 100mm above finished surface level (ground or concrete) and to the base of the column, with a continuous self-priming, non-conductive barrier coating (epoxy-mastic or similar) at least 350 micron thick.
- 9.12.3.4 All streetlight poles shall have installed at the pole door aperture an approved Streetlighting Cut Out (SLCO) for connection of the incoming neutral screen cable(s) to the flexible cable connection to the luminaire(s). All stripping back of cables to be contained within the body of the SLCO.
- 9.12.3.5 Frangible (impact absorbing) type shall be used in high-risk crash locations, within the clear zones in areas with a speed limit of 70kph and below.
- 9.12.3.6 Slip base type shall be used in high-risk crash locations, within the clear zones in areas with a speed limit of 70kph and above.
- 9.12.3.7 Painting of lighting columns is generally not permitted, but if there is a particular reason for doing so, approval shall be obtained from the Council.
- 9.12.3.8 The painting system to be used shall be the Resene paint system Altex Devoe or a similar approved equivalent. The following methods shall apply:
- Devthan 379 (previously named E-line 939) used in all exposed marine environments
 - E-line 929 used in all other locations
 - Any new paint system will require a 10-year workmanship warranty from supplier.
- 9.12.3.9 The painting system shall be applied over galvanised poles which meet hot dip galvanised standard AS/NZS 4680. (Note: this requires galvanising both inside and outside the pole.)
- 9.12.3.10 If an adjacent property has not been developed (for example, a new subdivision) and the pole cannot be positioned in line with the common boundary, locate the pole at least 5m from the boundary to allow for a future vehicle entrance.

- 9.12.3.11 Position poles at least 1m away from a vehicle entrance or kerb cutdown. Poles to be positioned to provide clearance of at least 6m from any existing street or private tree canopy. Note: where protected trees are present, large clearances may be necessary. Trees planted as part of the subdivision landscaping are to comply with the above clearances.
- 9.12.3.12 Where installing a pole against the building line, ensure that it is installed on the legal road or on the Council land and not on private property.
- 9.12.3.13 Regarding ownership, there are two regimes of underground cables within the Council areas. These are as follows:
- a) Nelson Electrical Ltd (NEL) area – All underground cables up to the fuse located in the base of the streetlight pole and all overhead cables shall be scheduled as the property of NEL. The cable from the fuse in the base of the streetlight pole up to the streetlight shall be scheduled as the property of the Council.
 - b) Network Tasman (NWT) area – All lanterns, control circuits, underground cables (except streetlight pilot cores in underground cables), relays and associated equipment up to but not inside of NWT service boxes or padmount transformers shall be scheduled as the property of the Council.
- 9.12.3.14 All unmetered lighting load connected to the line owners “works” must have prior approval from the Line Owner. Any maintenance changes or new design details must include individual site details, lamp wattages and losses and proposed livening dates. Once connected, the livening date must be confirmed to the Line Owner within 48 hours, allowing the Line Owner 24 hours (pursuant to the Electricity Governance Rules) to enter details into the Electricity Commission’s Registry. All work involving streetlights directly connected to the line owners “works” may only be performed by persons with a Authorised Holders Certificate approved by the respective line owner.
- 9.12.3.15 Prior to the issuing of the Section 224 Resource Management Act certification for new subdivisions the developer must submit streetlighting as-built data, including GPS location of all columns. This information shall be supplied on the street light data collection form.
- 9.12.3.16 Private street lighting on private roads or rights-of-way will only be permitted if the luminaires are on a separate metered circuit and a charging agreement is set up with owners and a power supply company. (Note: private streetlighting on any private right-of-ways in the Network Tasman area are approved by Network Tasman. The Council has no involvement with private streetlighting on private property).
- 9.12.3.17 The maintenance of private lights on private property will be the landowner’s responsibility.
- 9.12.3.18 The installation of privately owned road lights (owned by a power company or other private company) are not permitted on public roads.
- 9.12.3.19 Amenity lighting that is lighting for decorative purposes that does not serve to provide lighting for pedestrians, vehicles or direction signage is not permitted on legal road.
- 9.12.3.20 Regarding reserves lighting in Nelson City, lighting standards for neighbourhood parks shall be the Salisbury Short with Cardiff Column or similar design as approved by the Council.

Good Practice

The following matters provide additional direction and guidance in the design of street lighting.

9.12.4 General

- 9.12.4.1 Where existing streetlights are already installed on part of a Local Road (including cul-de-sacs or residential lanes), then any extension of that road should preferably have matching pole types, height, spacing and luminaires to provide a consistent appearance along the road. The new design shall be submitted to the Council for approval.
- 9.12.4.2 In general, all streetlight luminaires will be pole mounted type. However, for Tasman District Council, bollards may be considered for a rural zoned subdivision and will be determined on an individual case basis with the subdivision application. Note: Maintenance lifetime costs of “conventional” luminaires are likely to be significantly less than those of “decorative” luminaires.
- 9.12.4.3 In general, all new streetlights in subdivisions should be controlled using a photocell sensor switch which is NEMA compatible type. Five-pin or seven-pin types are acceptable.
- 9.12.4.4 In infill installation, the new streetlights can be connected to streetlight control cable if it is available in the vicinity of the install.

9.12.5 Columns

- 9.12.5.1 In general, all columns should be NZTA M26 compliant.
- 9.12.5.2 Ideally, lighting poles should be positioned in line with the common boundary between properties; however, these locations do not always coincide with the spacing requirements of the lighting design.
- 9.12.5.3 If column set back complies with the requirements of AS/NZS 1158.1.1 and AS/NZS 1158.1.3 recommendations, then “solid” ground embedded columns may be used.
- 9.12.5.4 Octagonal steel columns are preferred for “conventional” style luminaires.
- 9.12.5.5 Where possible, poles should be located close to reserves and other open spaces to provide light in these areas and improve safety.
- 9.12.5.6 Consider maximising the clear zone and thus road safety when placing lighting poles, especially when they are on or near bends, intersections, threshold treatments, road humps and roundabouts.

9.12.6 Reserves and Carparks

- 9.12.6.1 Generally reserve lighting will be installed by the Council following vesting of the reserve.
- 9.12.6.2 In Nelson City, Council prefers to light only those paths, access ways and cycleways that receive high night-time use. Lighting should be provided where necessary in a manner that is consistent with the Nelson City Council *Safer by Design - Crime Prevention through Environmental Design (CPTED) Guidelines*. Consideration will be given to the brightness, placement and coverage of any lights to ensure adequate illumination where necessary and to prevent adverse effects on adjacent landowners from light spill.

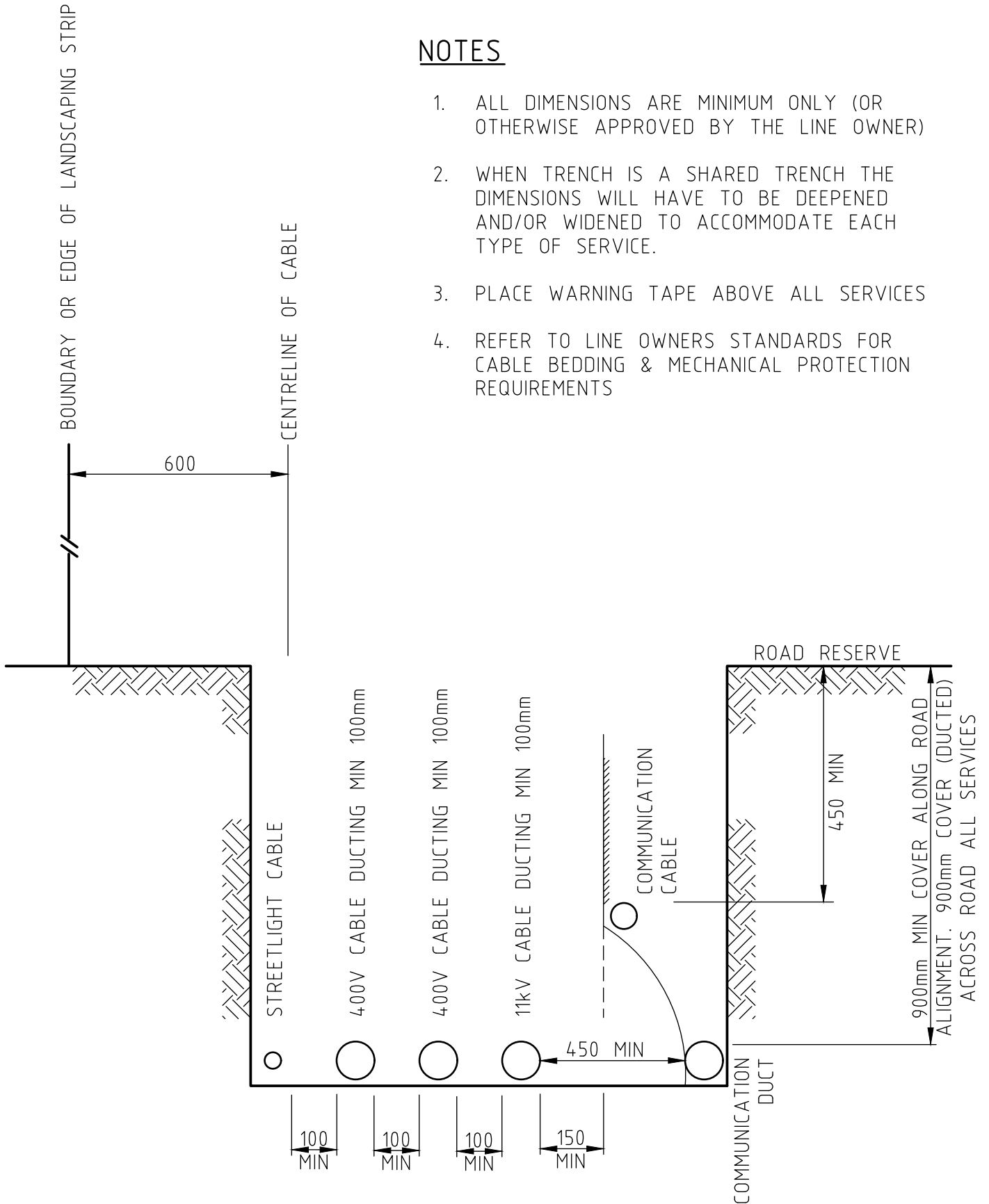
- 9.12.6.3 For other locations such as major access roads and car parks within reserves, AS/NZS 1158 shall be used to determine the lighting level considering the future night-time use and anticipated risk of crime as approved by the Engineering Manager.
- 9.12.6.4 In the Tasman District, the Council supports the lighting of all reserves and all lighting designs shall be approved by the Reserves and Facilities Manager prior to their installation

Appendix A Nelson/Tasman Council Street Light Data Collection Form

Site code	Plot no	Easting	Northing	Legend
				heading
Type / Attribute		Location / Value	Notes	fill in if known
				leave blank
Date Acquired - dd/mm/yyyy				
Date Installed - dd/mm/yyyy				
Date of Last Inspection - dd/mm/yyyy				
Date of Routine Maintenance - d/mm/yyyy				
Distance from boundary - m				
Distance from edge of seal - m				
Distance from kerb - m				
Lamp Wattage				
Lamps per luminaire				
Luminaire mounting height - m				
Luminaire tilt angle - degrees				
Number		1.00		
Number of luminaires				
Outreach length				
Ballast type				
Column colour				
Column make / model				
Column mounting				
Column ownership				
Column type				
Control type				
Data Source				
Group control position				
Isolation point				
Isolation point Service box no				
Lamp type				
Light metered?				
Luminaire make / model				
Origin of power supply				
Outreach type				
Plan reference				
Confidence - Location				
Shield				

NOTES

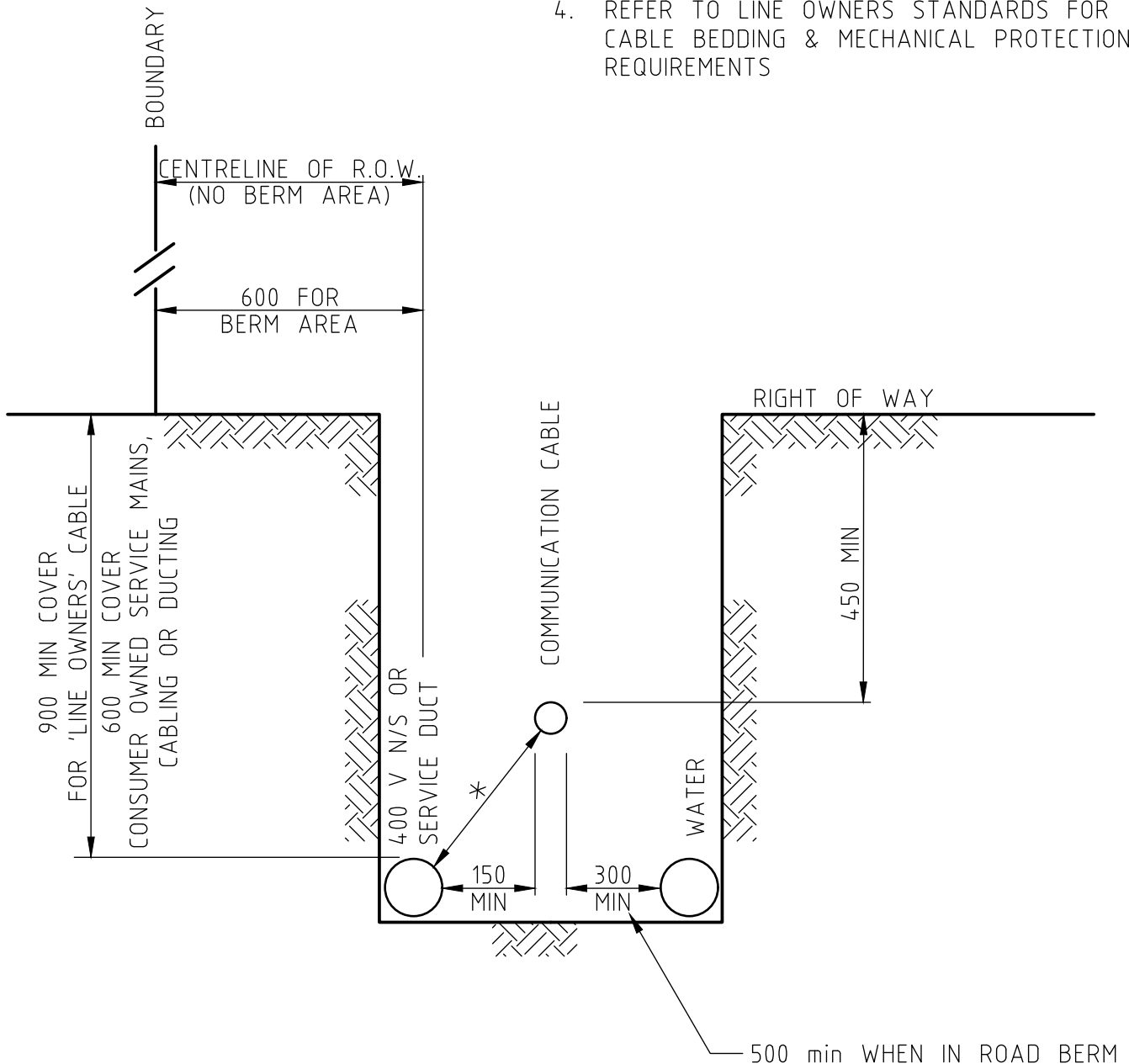
1. ALL DIMENSIONS ARE MINIMUM ONLY (OR OTHERWISE APPROVED BY THE LINE OWNER)
2. WHEN TRENCH IS A SHARED TRENCH THE DIMENSIONS WILL HAVE TO BE DEEPENED AND/OR WIDENED TO ACCOMMODATE EACH TYPE OF SERVICE.
3. PLACE WARNING TAPE ABOVE ALL SERVICES
4. REFER TO LINE OWNERS STANDARDS FOR CABLE BEDDING & MECHANICAL PROTECTION REQUIREMENTS



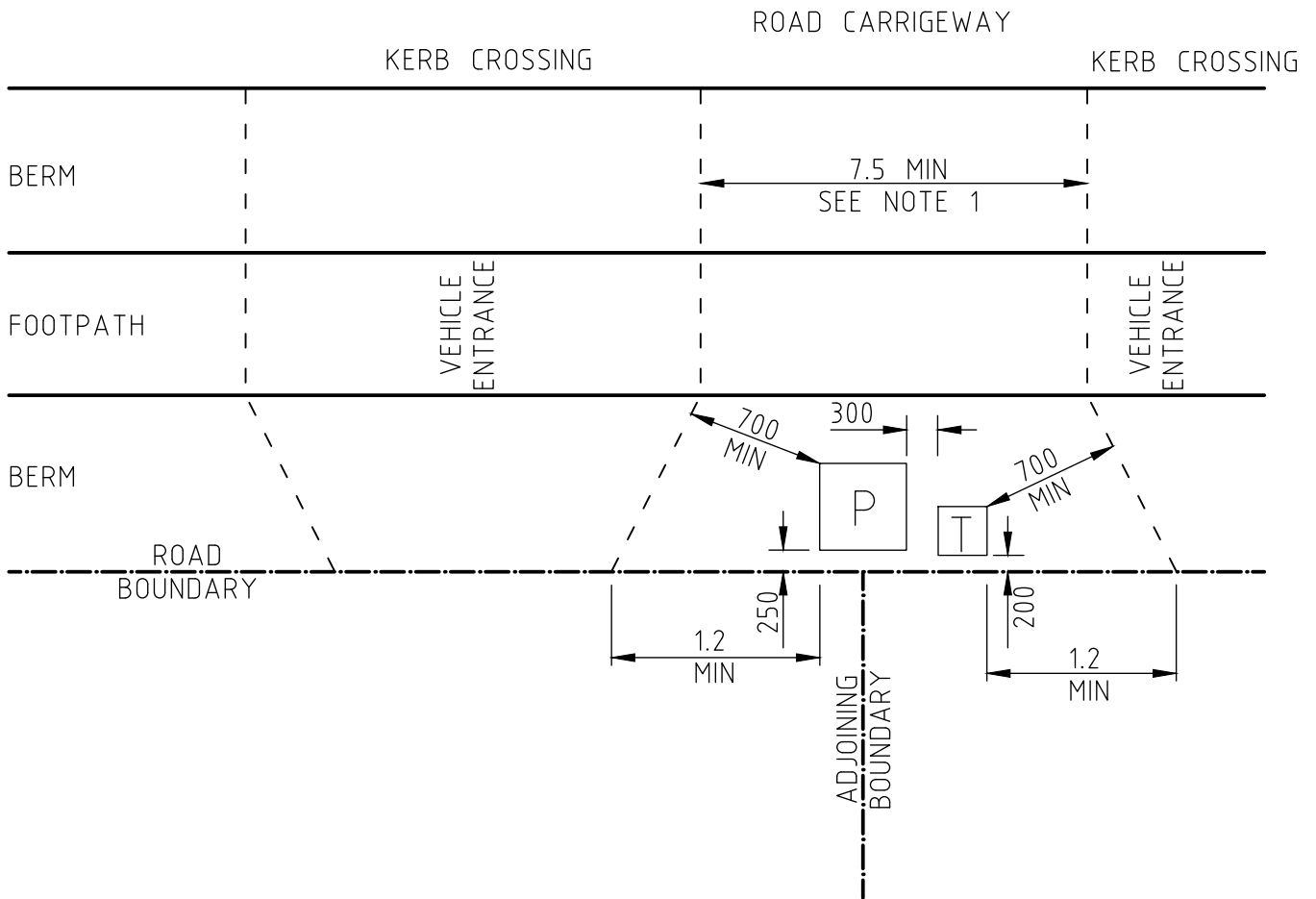
<p>NELSON CITY COUNCIL</p> <p><i>[Signature]</i></p> <p>GROUP MANAGER INFRASTRUCTURE, NELSON</p>	<p>UTILITY RETICULATION ROAD RESERVE (DEPTH, LOCATION & CLEARANCES)</p>		
<p>TASMAN DISTRICT COUNCIL</p> <p><i>[Signature]</i></p> <p>ENGINEERING SERVICES MANAGER, TASMAN</p>	<p>DATE</p> <p>01/07/19</p>	<p>NELSON - TASMAN LAND DEVELOPMENT MANUAL</p>	<p>901</p>

NOTES

1. * ANY CABLE WHETHER OWNED BY A LINE OPERATOR or CUSTOMER MUST BE SEGREGATED FROM A TELEPHONE CABLE BY MIN 450mm IF UNSCREENED OR 150mm IF SCREENED
2. SEE CLAUSE 9.4 RE DUCTS UNDER ROW
3. SEE TABLE 9-2 FOR SEPARATION BETWEEN POWER & COMMUNICATION SERVICES. PLACE WARNING TAPE ABOVE ALL SERVICES
4. REFER TO LINE OWNERS STANDARDS FOR CABLE BEDDING & MECHANICAL PROTECTION REQUIREMENTS



<p style="text-align: center;">NELSON CITY COUNCIL</p> <p style="text-align: center;"><i>[Signature]</i></p> <p style="text-align: center;">GROUP MANAGER INFRASTRUCTURE, NELSON</p>	<p>UTILITY RETICULATION ROAD RESERVE (DEPTH, LOCATION & CLEARANCES)</p>		
<p style="text-align: center;">TASMAN DISTRICT COUNCIL</p> <p style="text-align: center;"><i>[Signature]</i></p> <p style="text-align: center;">ENGINEERING SERVICES MANAGER, TASMAN</p>	<p style="text-align: center;">DATE</p> <p style="text-align: center;">01/07/19</p>	<p style="text-align: center;">NELSON - TASMAN LAND DEVELOPMENT MANUAL</p>	<p style="font-size: 2em; font-weight: bold;">902</p>



NOTES

1. VEHICLE ENTRANCES AT ADJOINING BOUNDARIES CAN BE JOINED TOGETHER AND HAVE A CONTINUOUS KERB CROSSING WHERE THERE ARE NO ABOVE GROUND UTILITY BOXES AND THE KERB CROSSING LENGTH DOES NOT EXCEED 8.0m
2. P = POWER BOX
T = TELECOMMUNICATION BOX

NELSON CITY COUNCIL

[Signature]
GROUP MANAGER INFRASTRUCTURE, NELSON

ABOVE GROUND UTILITY BOX LAYOUT

TASMAN DISTRICT COUNCIL

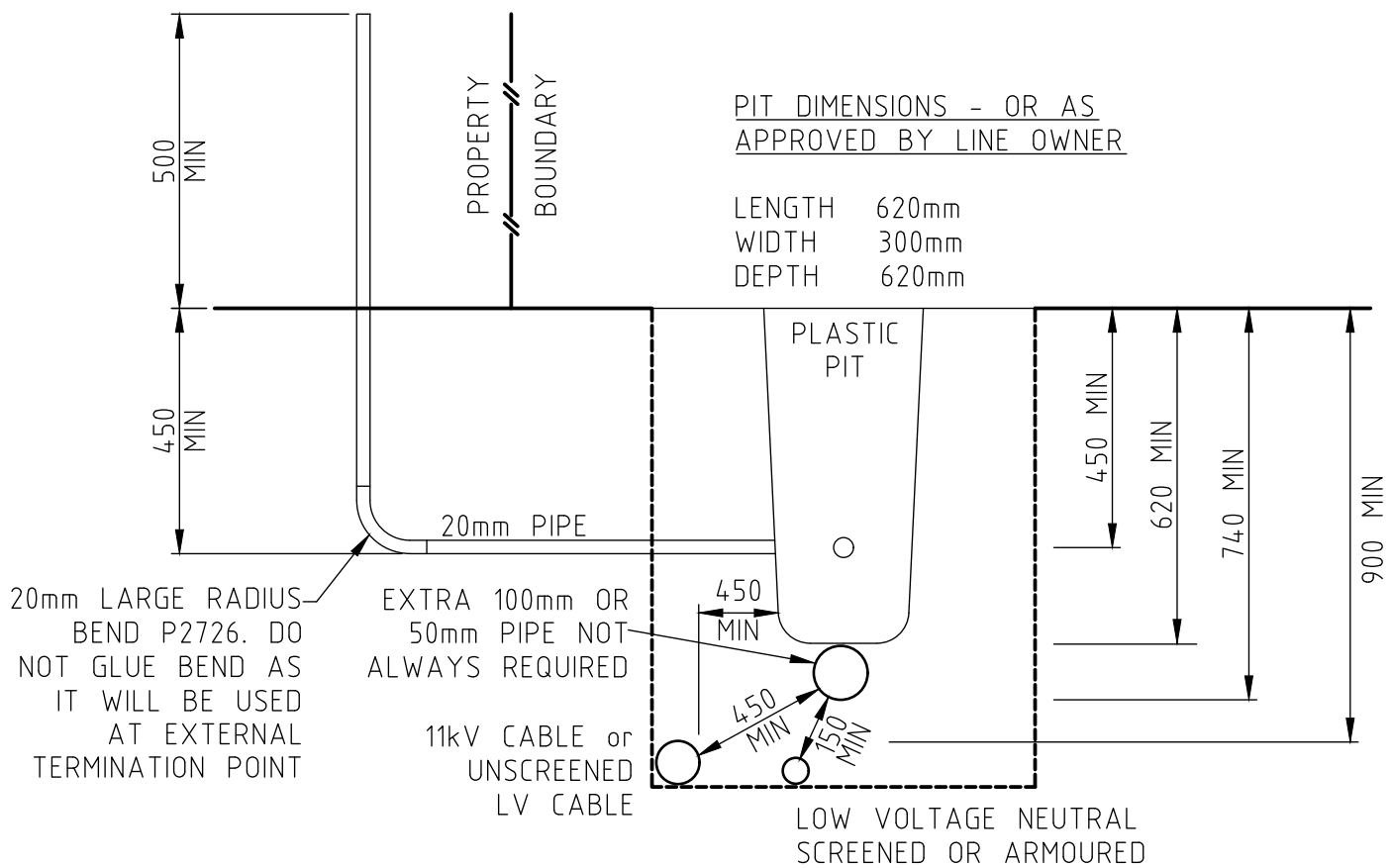
[Signature]
ENGINEERING SERVICES MANAGER, TASMAN

DATE

01/07/19

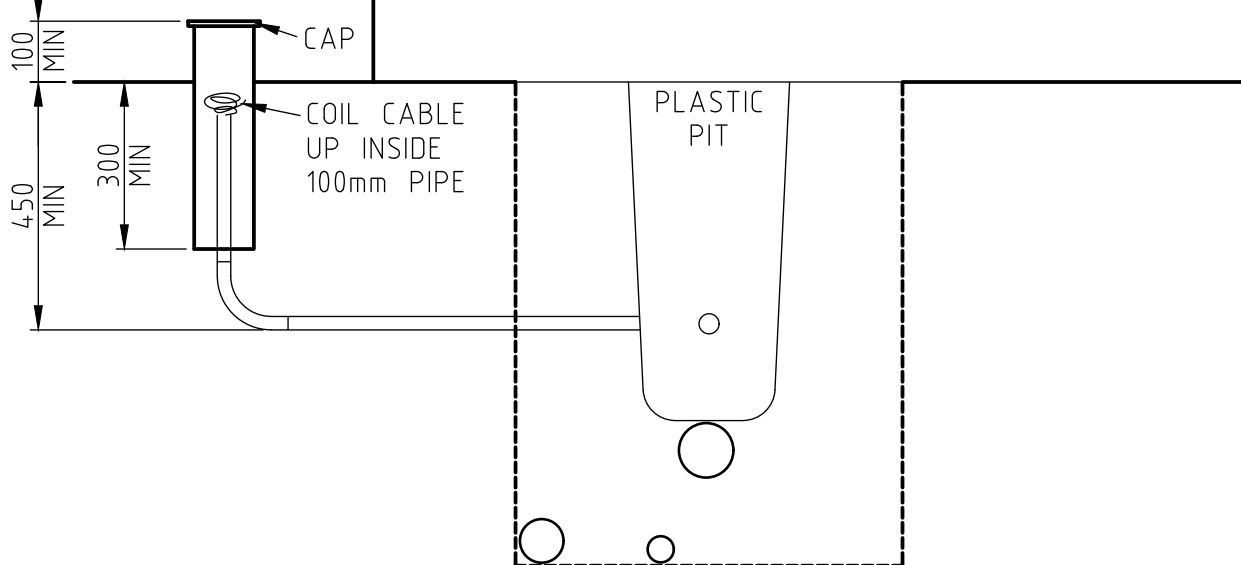
NELSON - TASMAN
LAND DEVELOPMENT MANUAL

903

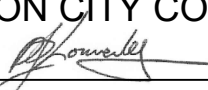



INITIAL INSTALLATION

WHEN PULL-IN WORK UNDERTAKEN, CUT AWAY 20mm EXNT 100mm BELOW GROUND LEVEL & PLACE 400mm OF 100mm PIPE OVER BEND.



FINAL INSTALLATION WHEN CABLES PULLED THROUGH

NELSON CITY COUNCIL  GROUP MANAGER INFRASTRUCTURE, NELSON		TELECOMMUNICATION SERVICE PIT DEPTHS & CLEARANCES	
TASMAN DISTRICT COUNCIL  ENGINEERING SERVICES MANAGER, TASMAN	DATE 01/07/19	NELSON - TASMAN LAND DEVELOPMENT MANUAL	904