



**WAIMAKARIRI**  
DISTRICT COUNCIL

**ENGINEERING CODE OF PRACTICE**

# **PART NINE**

## **UTILITIES**

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## Part 9: Utilities

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### 9.1 INTRODUCTION

This Part discusses issues that must be considered for any developer installing utilities that will not be maintained or owned by the Council. The design requirements of the utilities themselves are not covered here but can be obtained from the individual operators. To achieve good outcomes, view the web site [www.nzuag.org.nz](http://www.nzuag.org.nz) on the working road-share and the objectives agreed by the industries.

The Council should be consulted before designing large works. Designs that may cause major disruption or delays to traffic are unlikely to be approved. The costs of traffic management shall be paid by the developer.

All reticulation systems shall provide an adequate connection to each intended building site, as outlined in section 9.5. For communications systems, this shall include a data transmission rate that is approved by the relevant utility service provider.

#### 9.1.1 Developer's Responsibility

Reticulation shall be adequately designed and provided to efficiently cater for a developments full potential. All reticulation shall meet the materials and installation requirements of the utility service provider.

For new Residential and Business Zone developments separated or annexed to existing similar Zone developments all energy and communications reticulation shall be installed underground.

For lots that are able to be built on, the developer shall provide:

- Energy and communications reticulation to the main body of each lot for Residential and Business Zone subdivisions.
- Evidence from the relevant utility service providers that a physical connection can be made available to each new lot for Rural Zone subdivisions (wireless communication systems will not be acceptable).
- High voltage electricity reticulation on all through roads, where required. This requirement will depend on the network operation and specific system configuration
- Communications reticulation on all through roads.

In Residential and Business Zones low voltage reticulation shall be provided to allow a connection to individual service pillars at the head of all rights of way and leg-in rear lots.



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### 9.2 CONSENT AND COMPLIANCE ISSUES

The consent and compliance information set out in Part 2: *General Requirements* applies to all works within the Waimakariri District, with the addition of the clauses below.

#### 9.2.1 Legislation

The Electricity Act 1992 and amendments is the principal statute that controls the provision of electricity. The Electricity Regulations 1997 and amendments, and the Electrical Code of Practice shall also be complied with at all times.

The Gas Act 1992 and amendments is the principal statute that controls the provision of reticulated gas. The Gas Regulations 1993 and amendments, and the Gas Code of Practice shall also be complied with at all times.

The Telecommunications Act 2001 and amendments is the principal statute that controls the provision of telephone and internet services.

#### 9.2.2 District Council Requirements

The requirements for the provision and installation of utilities are set out in the *District Plan*.

Ensure that the appropriate resource consents are obtained for work in the vicinity of protected trees and that the work is carried out in accordance with CCC CSS: *Part 1*.



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### 9.3 QUALITY ASSURANCE REQUIREMENTS AND RECORDS

Provide the information detailed in CoP Part 3: Quality Assurance and the *Construction Standard Specifications (CSS)*, during design and throughout construction.



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### **9.4 NETWORK UTILITY OPERATOR REQUIREMENTS**

Ensure that the design, construction and operation of any network to be adopted by a utility operator complies with their standards.

Usually, utility providers will install infrastructure in a development only where they consider it is feasible to connect to the main network reticulation.

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### 9.5 UTILITY DESIGN

Where new developments occur within in a Residential and Business Zone that has existing overhead reticulation then communications and low voltage (single phase) domestic reticulation shall be underground except where that reticulation is a lateral that does not serve or cross more than one site. Refer also to the District Plan.

Dedicated lots for substations shall be created complete with appropriate easements. Substations shall be designed for a specified Maximum Demand, as agreed with the energy utility service provider. Loads should be balanced unless specified otherwise.

Transformers, lines, and wires shall not exceed a voltage of 110 kV or exceed a capacity of 100 MVA per circuit. Electrical cables shall be provided with short circuit/overload protection of appropriate capacity and rating. Transformers and switchgear must be provided with an earthing system in accordance with NZECP.

The minimum capacities shown in Table 9.1 shall be used for design purposes.

**Table 9.1 Minimum Design Capacities**

Development Zoning	Minimum Current Capacity (per dwelling)	ADMD (kVA per dwelling)
Residential low cost	60 Amperes Single Phase	3.0
Residential mid cost	60 Amperes Single Phase	4
Residential high cost	60 Amperes Single Phase	5
Business	100 Amperes Three Phase	N/A

Where gas is reticulated in a subdivision for the purposes of an energy supply, the above residential figures may be reduced by 0.5 kVA per dwelling.

The utility service provider will undertake overall reticulation analysis and approval.

#### 9.5.1 Design Life

Utility reticulation systems shall be capable of serving the development potential of the land for the design life of the development or an indefinite time but not be less than 50 years.

#### 9.5.2 Service Plans

Use the latest service plans when preparing engineering drawings. Be aware that electricity plans may not show all cables for private connections, wastewater plans may not show all laterals to individual properties and gas service plans may not show all service connections.

#### 9.5.3 Location of Utilities

Consider the following when planning the layout of a development:

- Utility services are generally installed parallel to road or legal boundaries;
- Laterals are perpendicular to the main supply and configured to service two lots, wherever possible;
- Boundary boxes and distribution pillars are installed together on a boundary junction and clear of likely vehicle access and trees;
- Allow for maintenance access.





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Consider the following when planning the location and design of structures and their corresponding utility lots:

- Place and design them to minimise adverse visual impact by integrating them with the design of hard and soft landscaping;
- Design to minimise the potential for damage to the structure from vandalism;
- Reduce their impact on traffic movement;
- Structures must not reduce vehicle sight distances and should not interrupt pedestrian movement;
- Ensure that they do not compromise property rights or access;
- Provide access to the structure;
- Allow for the minimum separation distance between telecommunications cabinets and power kiosks or substations.

Some structures may contribute to the environment if designed to enhance the neighbourhood character.

Consult comprehensively with the relevant network utility operators regarding the location of utilities and the spacing and final location of the structures. Refer to CoP Part 10 clause 10.5.2.3 – *Location of Utilities on Reserves* before considering locating utilities in reserves.

Point of supply to each lot/customer is deemed to be the service pillar/junction box. This shall be located at the boundary of the lot, the exact position to be determined by the utility service provider.

For lots accessed by right of way, the point of supply is deemed to be the low voltage pillar/cable pillar located at either the front or rear of the right of way depending on site-specific factors and easement arrangement.

Any point of supply and associated upstream reticulation that crosses any private property to service another property shall be protected by way of easement in favour of the utility service provider.

Service & link pillars shall comply with NZS 6300 series standards that address electrical safety. Pillars shall be installed on every second front lot boundary. This should minimise lateral reticulation within the road reserve. Pillars shall be located 100mm minimum and 400mm maximum from the boundary.

The location of services within the road reserve should generally be as shown in the Standard Drawings 600-245A/B/C. The offset of any footpath, street lighting or street trees shall be considered when siting paths and utility services. The Council will assess the proposed layout at the time engineering plans are submitted for approval.

The developer shall minimise construction of services under concrete paths.

In Residential and Business Zone, all reticulated services shall be laid underground. Where power and telecommunication cables are installed in ducts, duct colours shall meet the relevant utility services provider's requirements.

Service-boxes and access-covers shall be flush with and parallel to the finished surface of the carriageway, berm or footpath as appropriate.



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**9.5.4 Typical Services Layout and Clearances**

Minimum separation distances to other utilities shall be determined in consultation with those utility service providers.

There are specific working clearances required between different utility services. Confirm these clearances with the network utility operators before deciding on any utility layout or trench detail.

**Table 9.2 Utility Clearances**

Service Type 1	Service Type 2	Clearance (mm)	
		Crossing	Parallel
Electricity (Low Voltage)	Electricity – 66 or 33kV	500	1000
	Electricity – 11kV or LV	100	300
	Water – Mains	100	500
	Water – Submains	100	450
	Wastewater	100	500
	Stormwater – in right-of-way or private accessway	300	300
	Stormwater	100	500
Electricity (High Voltage)	Electricity – 66 or 33kV	500	1000
	Electricity – 11kV or LV	100	300
	Water – Mains	100	1000
	Water – Submains	100	450
	Wastewater	100	500
	Stormwater – In right-of-way or private accessway	300	300
	Stormwater	100	500
Telephone	Telephone	150	300
	Electricity – LV (neutral screened or armoured cables)	150	300
	Electricity – LV (not neutral screened or armoured cables) or High Voltage	150	450
	Electricity – High Voltage	150	450
	Water – Mains	100	450
	Water – Submain	100	450
	Wastewater	100	1000
	Stormwater – In right-of-way or private accessway	300	300
	Stormwater	100	500
Gas	Gas	150	300
	Electricity	150	300
	Telephone	150	300
	Water – Mains	100	450
	Water – Submains	100	300
	Wastewater	100	1000
	Stormwater – In right-of-way or private accessway	300	300
	Stormwater	100	500

Typically, the utilities are installed as indicated in Standard Drawings 600-245A/B/C.

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Electricity and phone cables can be installed in a shared trench in a new development.

Gas shall be located at a convenient offset, preferably within the berm. If this is not practicable, locate it under the path or, as the final option, in the carriageway.

Substations, exchanges and other fixed utilities shall be located to optimise reticulation efficiency and facilitate access for maintenance works. They shall be located clear of other services, and not within the road reserve. Where this cannot be satisfied, Council approval is required to locate the structures in a road reserve

### 9.5.5 Network Reticulation

The telecommunications layout is not usually designed until the electricity layout is substantially complete - this is an economic decision as the layouts are inter-related and, in land developments, service trenches are shared wherever possible. Ensure that power is provided to telecommunication cabinets, cable television cabinets and amplifiers.

Ensure that drawings sent to the utility designer and the network utility operator show all the existing services. Ideally, these drawings should be the approved subdivision consent or engineering drawings. This reduces the likelihood of conflicts between existing and new services and increases the cost-efficiency of service provision.

Send a copy of the utility layout plans that have been accepted by each network utility operator to the Council, with the engineering drawings.

### 9.5.6 Above-Ground Utilities

Locate above-ground utilities within legal road to provide the clear zone required by CoP Part 8 clause 8.12.10 – *Clear Zones*. Locate street light poles in accordance with CoP Part 11 clause 11.4.10 – *Pole Setback from Road or Path*. In addition to clear zone distances within the 50km/hr speed environment, locate the utilities clear of the footpath and at least 0.7m behind the kerb

For overhead energy supply greater than 1 MVA and up to two thirds of feeder capacity, the supply shall have alternative sources connected by manual switching on the network (unless the supply is on a spur line) or otherwise a ring-main can be provided.

### 9.5.7 Under-Ground Utilities

The minimum cover to finished ground level shall be as noted in Table 9.3 below. Installation shall include marking tape marking that complies with NZS 4275.

**Table 9.3 Minimum Cover**

Utility	Cover (mm)	
Communications and Gas	400	
Electricity	Low Voltage	600
	High Voltage	800

For underground energy supply greater than 300 kVA and up to two thirds of feeder capacity, the supply shall be provided with a ring main unit. Manual switching shall be provided to restore supply in the event of feeder fault.

### 9.5.8 Energy Reticulation Layout

Service pillar positions should preferably be nested with those of other utility service providers.

A 110 mm diameter duct shall be installed along the road frontage of each lot for Business Zone developments.



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### **9.5.9 Communications Reticulation Layout**

Cabling shall be laid:

- To allow a connection to each service pillar/junction box.
- To the boundary of each lot.
- Along rights of way as appropriate.
- Such that minimum separation distances from other services shall be met.
- Using capacities that cater for the full potential of the development.



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### 9.6 CONSTRUCTION

All reticulation and structures shall comply with the relevant NZ standards, acts, regulations, industry standards and utility provider's requirements for standard design criteria and approved materials.

For any works within a road reserve, the developer shall obtain a road opening permit from the Council. Refer also to *Standard Specification – [ Corridor Access Request ]* (QP-C843) and Standard Drawings 600-243, 600-245A/B/C, 600-246, 600-347 and 600-351.

For any temporary works within a road reserve, the developer shall meet the Council's requirements for temporary traffic management, which may include the submission of a traffic management plan to the Council for approval and prior to commencing work.

#### 9.6.1 Proposed Installation Method

There are various methods of installing underground services, including open trenching, directional drilling, pipe bursting, pipe ramming, thrusting, and sliplining. Refer to Part 6: *Wastewater* for further information.

Factors that may affect the choice include the ground conditions, disruption to traffic, presence of trees, site safety, the availability of Council blue ducts and redundant services, e.g. old gas mains or their offsets.

When the intention is to lay a number of utilities in a common trench, ensure the minimum covers and separation distances for each utility in the trench cross-section are obtained.

#### 9.6.2 Installing New Reticulation within Legal Roads

Wherever utility services are installed along existing legal roads, obtain a Corridor Access Request (CAR) from the Council for that work, unless the works form part of an approved roading design. Typically, the CAR is obtained after the utility reticulation layouts are confirmed.

If granted, the CAR defines the Council's requirements for the restoration of the construction within the legal road and any constraints on the permitted hours of work within that road. To avoid possible conflicts, ensure that the requirements of the CAR are included in any contract documentation.

#### 9.6.3 Backfill

Bedding materials should comply with the network utility operator's requirements.

Specify backfill materials individually. The material used must be capable of achieving the backfill compaction requirements set out in *CSS: Part 1*. The CAR specifies the final surfacing to the excavation. Orion has particular requirements for trench restoration on hillsides.

#### 9.6.4 Materials

All Low Voltage (single phase) and High Voltage distribution cables shall use cables constructed to AS/NZS 4026 and/or neutral screened cables constructed to NZS 6401 as appropriate.

Streetlighting cables shall be neutral screened copper. Minimum conductor size shall be 10 mm<sup>2</sup>. These cables can be laid alongside or integrally with low voltage cables.

Underground joints shall be adequate, permanent and of electrical industry standard, and use industry recognised materials and techniques.

Ducts shall be constructed to NZS 7649 and shall be readily identifiable by label and/or tape and/or colour.



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### 9.7 AS-BUILT INFORMATION

The developer shall submit to the utility service provider for approval as-built drawings for the installed reticulation and utility, including street lighting.

All as-built information shall comply with CoP Path 12: *As-Builts* and this Part.