



# **DEVELOPMENT CODE**

**June 2009  
Updated January 2010**

## PAPAKURA DISTRICT COUNCIL

### DEVELOPMENT CODE

**JUNE 2009**

- Part 1 - General Requirements and Procedures
- Part 2 - Earthworks and Foundations
- Part 3 - Roads
- Part 4 - Stormwater Drainage
- Part 5 - Waste Water
- Part 6 - Water Reticulation System
- Part 7 - Parks and Reserves
- Part 8 - Power, Telephone and Gas

#### Appendices

- Appendix A: Statement of Professional Opinion
- Appendix B: Certificate of Construction
- Appendix C: Soakage Pit Design
- Appendix D: Assets to Vest Sheets
- Appendix E: Electronic As-Built Requirements
- Appendix F: Road Asset Data Standard Specification
- Appendix G: Standard Detail Drawings
- Appendix H: Standards and Guidelines Relevant to the Road Network

<b>PART 1: GENERAL REQUIREMENTS AND PROCEDURES .....</b>	<b>14</b>
1.1 SCOPE .....	14
1.2 GENERAL .....	14
1.3 INTERPRETATION .....	14
1.3.1 General .....	14
1.3.1 Definitions .....	15
1.4 DEVELOPER'S REPRESENTATIVE .....	18
1.5 PROCEDURE FOR APPROVAL OF THE DEVELOPMENT AND FOR ITS DESIGN AND CONSTRUCTION .....	19
1.5.1 Documents to be Submitted for Approval .....	19
1.5.2 Draughting Standards and Drawings .....	21
1.5.3 Approval of Design .....	21
1.5.4 Notification of Contracts and Phases of Work .....	22
1.5.5 Supervision of Work .....	22
1.5.6 Connection to Existing Services .....	22
1.5.7 Testing .....	23
1.5.8 Maintenance of Assets .....	23
1.5.9 Completion Documentation .....	25
1.5.10 Completion Tasks .....	27
1.5.11 Certification on Completion .....	28
1.5.12 Approval of Uncompleted Work .....	28
1.6 BONDS FOR UNCOMPLETED WORKS .....	28
1.6.1 Acceptance of Bond .....	28
1.6.2 Conditions of Accepting Construction Bonds .....	29
1.6.3 Application for Bonding .....	29
1.6.4 Calculation of Amount of Bond .....	29
1.6.5 Period of Bond .....	29
1.6.6 Condition for Construction Bonds for Works .....	29
1.6.7 Completion by Council .....	30

<b>PART 2: EARTHWORKS AND FOUNDATIONS</b> .....	<b>31</b>
2.1 SCOPE .....	31
2.2 GENERAL .....	31
2.3 TECHNICAL RESPONSIBILITIES .....	32
2.4 SITE INVESTIGATIONS .....	33
2.4.1 Preliminary Site Evaluation .....	33
2.4.2 Specialist Services.....	33
2.5 PLANNING AND DESIGN .....	33
2.5.1 Landform.....	33
2.5.2 Soil Investigations .....	34
2.5.3 Stability Criteria.....	35
2.5.4 Quality of Filling Material.....	36
2.5.5 Compaction Standards for Fill Material.....	36
2.5.6 Erosion Control .....	36
2.5.7 Provision for Permanent Services.....	38
2.6 CONSTRUCTION PROCEDURES .....	38
2.6.1 Specifications.....	38
2.6.2 Fill Construction .....	39
2.6.3 Temporary Drainage and Erosion Control .....	39
2.6.4 Inspection and Quality Control.....	40
2.7 FINAL DOCUMENTATION.....	42
2.7.1 As-Built Drawings.....	42
2.7.2 Soils Engineer's Report .....	42
2.7.3 Asset Data Standard Specification .....	42

<b>PART 3: ROADS .....</b>	<b>43</b>
3.1 SCOPE .....	43
3.2 GENERAL .....	43
3.2.1 The Road Pattern and Hierarchy .....	43
3.2.2 Parking.....	44
3.2.3 Carriageway, Road and Formation Widths .....	44
3.2.4 Carriageway Geometrics .....	47
3.2.5 Pedestrian and Bicycle Traffic .....	47
3.2.6 Road Lighting.....	47
3.2.7 Drainage .....	48
3.2.8 Landscaping.....	48
3.2.9 Standards and Guidelines.....	49
3.2.10 Bylaws.....	49
3.3 ENGINEERING DESIGN.....	49
3.3.1 Road Geometry.....	49
3.3.2 Longitudinal Gradients .....	49
3.3.3 Vertical Curves.....	50
3.3.4 Horizontal Curves .....	50
3.3.5 Superelevation and Crossfall .....	51
3.3.6 Carriageway Crossfall.....	51
3.3.7 Intersection Design .....	52
3.3.8 Cul-de-Sac Heads.....	53
3.3.9 Crossfall on Grass Berms .....	54
3.3.10 Road Pavement .....	54
3.3.11 Traffic Services .....	58
3.3.12 Bridging.....	58
3.3.13 Subgrade Drainage.....	59
3.3.14 Kerbing and Channelling.....	59
3.3.15 Catchpits.....	60
3.3.16 Dished Channels.....	60
3.3.17 Footpaths/Accessways .....	60
3.3.18 Crossings.....	61
3.3.19 Berms.....	61
3.3.20 Service Lanes, Parking Bays, Privateways, Accessways and Cycle Paths ..	62

<b>PART 4: STORMWATER</b> .....	<b>64</b>
4.1 General Policy .....	64
4.1.1 Overview of Drainage Infrastructure Services in Papakura .....	64
4.1.2 Stormwater Management Objectives .....	64
4.1.3 Stormwater Catchments and Catchment Management Plans and Comprehensive Discharge Permits .....	64
4.1.4 Health and Safety Requirements for Working on Public Stormwater Assets	67
4.1.5 Building Over or In Close Proximity of Public Drains .....	67
4.1.6 Modifications to Existing Public Asset (diversion, realignment, relay and decommissioning of public assets) .....	67
4.1.7 Extension of Public Drains .....	68
4.2 STORMWATER DRAINAGE .....	68
4.2.1 Definition of Public Stormwater Drain .....	68
4.3 Flood Hazard Areas .....	68
4.3.1 Minimum Floor Levels and Freeboards .....	68
4.3.2 Encroachment of Flood Plains .....	69
4.3.3 Tidal Inundation Zone .....	69
4.4 stream management .....	69
4.4.1 Piping of Watercourse .....	69
4.4.2 Stream Crossings (Culverts and Bridges) .....	70
4.4.3 Stream Riparian Margins .....	70
4.4.4 Stream Hydraulics .....	71
4.4.5 Stream Bank Erosion Protection .....	71
4.5 Overland Flow Path Management .....	71
4.5.1 Definition of Significant Overland Flow Paths .....	71
4.5.2 Provision and Protection of Overland Flow Paths on Development Sites ....	72
4.5.3 Design of Overland Flow Paths .....	72
4.5.4 Maintenance of Overland Flow Paths .....	73
4.6 Stormwater Recharge in Peat Area .....	73
4.6.1 General Policy on Stormwater Recharge .....	73
4.6.2 Engineering Design of Recharge Pit .....	73
4.7 Stormwater Soakage .....	74
4.7.1 Percolation Test .....	75
4.7.2 Minimum Percolation Rate .....	76
4.7.3 Approved Soakage Devices .....	76
4.7.4 Falling Head Percolation Test .....	76
4.7.5 Falling Head Percolation Test .....	77
4.8 Stormwater Quality and Quantity Management Devices .....	77
4.8.1 Stormwater Quantity Management .....	77
4.8.2 Stormwater Quality Management .....	78
4.8.3 Low Impact Urban Design (LID) .....	78
4.8.4 Operation and Maintenance Requirements .....	78
4.9 Stormwater Discharge .....	79

4.10 Resource Consent from Regional Council .....	79
4.11 Primary Drainage System.....	79
4.11.1 Catchment and Land Uses .....	79
4.11.2 Design Storms .....	80
4.11.3 Hydrological Analysis.....	80
4.11.4 Time of Concentration.....	80
4.11.5 Runoff Coefficient .....	80
4.11.6 Hydraulic Design of Pipelines .....	80
4.11.7 Outfall Water Levels.....	81
4.12 Design of Stormwater Drainage Reticulation.....	81
4.12.1 Service Connections.....	81
4.12.2 Stormwater Reticulation Layout.....	82
4.12.3 Pipe Joints .....	83
4.12.4 Pipe Material .....	83
4.12.5 Pipeline Strength and Bedding for Reinforced Concrete Pipes .....	84
4.12.6 Pipeline Cover.....	84
4.12.7 Anchorage for Pipes with Steep Gradient.....	84
4.12.8 Connection to Deep Lines.....	85
4.12.9 Extended Connection.....	85
4.12.10 Pipes in Weak Ground or With High Ground Water Table (other than peat soils).....	85
4.12.11 Pipe Construction in Peat Areas .....	85
4.12.12 Acceptable Standards for Defects with Concrete Pipes .....	86
4.13 Manholes, Catchpits and Outlet Structures .....	86
4.13.1 Position of Manhole .....	86
4.13.2 Standard Manholes.....	86
4.13.3 Deep Manholes.....	87
4.13.4 Shallow Manholes.....	87
4.13.5 Stormwater Manholes on Larger Pipelines.....	87
4.13.6 Hydraulic Flow in Manholes .....	88
4.13.7 Steps Irons, Steps and Ladders.....	88
4.13.8 Manhole Covers and Frames.....	88
4.13.9 Drop Connections .....	88
4.13.10 Manholes in Soft Ground .....	88
4.13.11 Catchpits.....	89
4.13.12 Catchpit Lead Pipe.....	89
4.13.13 Inlet and Outlet Structures .....	89
4.14 Testing.....	90
4.15 LANDSCAPE ENGINEERING STORMWATER DEVICES.....	90
4.15.1 General .....	90
4.15.2 Standard Landscape Specifications .....	90
4.15.3 Mulch .....	90
4.15.4 Rain Gardens.....	91
4.15.5 Swales .....	91
4.15.6 Vegetated Filters.....	92

4.15.7 Planting .....	92
4.15.8 Maintenance Requirements .....	93
4.15.9 Defects Liability Period .....	93
4.15.10 Weed Free Requirement.....	94
4.15.11 Defects Liability Period Inspection.....	94
4.15.12 Defects Liability Period – Final Inspection .....	94



**PART 5: WASTE WATER ..... 95**

**PART 6: WATER RETICULATION SYSTEM ..... 101**

<b>PART 7: PARKS AND RESERVES .....</b>	<b>108</b>
7.1 SCOPE .....	108
7.2 GENERAL .....	108
7.2.1 Landscape Plans .....	108
7.2.2 Trees.....	108
7.2.3 Walkways.....	109
7.2.4 Fencing.....	109
7.2.5 Drainage .....	109
7.2.6 Park Furniture .....	110
7.2.7 Street Berm Planting.....	110
7.3 Site Preparation.....	110
7.3.1 Excavation of Planting Areas.....	110
7.3.2 Soil for Planting Areas .....	112
7.4 PLANT MATERIALS.....	113
7.5 INSTALLATION OF PLANTS .....	114
7.6 IRRIGATION.....	115
7.7 FERTILISER.....	116
7.8 MULCH.....	116
7.9 STAKING AND PROTECTION.....	117
7.10 PRUNING .....	117
7.11 CHEMICAL APPLICATIONS (WEED & PEST CONTROL) .....	118
7.12 MAINTENANCE REQUIREMENTS .....	119
7.12.1 Defects Liability Period .....	119
7.12.2 Weed Free Requirement.....	119
7.12.3 As-Built Plans.....	119
7.12.4 Defects Liability Period Inspection.....	120
7.12.5 Defects Liability Period – Final Inspection .....	120
7.13 GRASSING AND TURFING .....	120
7.13.1 General .....	120
7.13.2 Preparation for Sowing or Turfing .....	120
7.13.3 Fertilisers .....	121
7.13.4 Sowing .....	121
7.13.5 Establishment of Sown Areas .....	121
7.13.6 Turfing.....	122
7.13.7 Establishment of Turf.....	123
7.13.8 Chemical Applications (Weed and Pest Control).....	123
7.13.9 Defects Liability Period .....	123

7.14 LANDSCAPE STRUCTURES INSTALLATION.....	124
7.14.1 General .....	124
7.14.2 Fencing .....	124
7.14.3 Defects Liability Period .....	125
7.15 LANDSCAPE ENGINEERING STORMWATER DEVICES.....	125

<b>PART 8: POWER, TELEPHONE AND GAS .....</b>	<b>126</b>
8.1 SCOPE .....	126
8.1.1 General Requirements .....	126
8.1.2 Approval Conditions .....	126
8.1.3 Licensed Network Operators .....	127
8.1.4 Underground Cabling .....	127
8.1.5 Power Transformers, Switching Stations and Other Services .....	128
8.1.6 Conversion to Underground on Existing Roads .....	128
8.1.7 Industrial and Commercial Developments .....	128
8.2 LOCATION AND BACKFILLING OF SERVICES .....	128
8.2.1 Location .....	128
8.2.2 Backfilling of Trenches .....	128

## **PART 8: POWER, TELEPHONE AND GAS**

### **8.1 SCOPE**

The technical specifications of the network utility organisations shall be deemed to be an appendix to this code.

#### **8.1.1 General Requirements**

- (a) The developer is required to make all arrangements with the appropriate authorities for the supply and installation of electric power, and to the extent applicable for the provision of telephone and gas reticulation.

(b) **Electric Power**

The supply of electric power shall generally be made by means of an underground system. Ducts shall be installed at the time of road construction to the requirements of the network utility operators. Sites for power transformers and switching stations shall be provided as and where required. Power transformers shall not be placed over other services in the berm.

Adequate provision shall be made for road lighting to all roads within the development.

Access to power line support structures is necessary for maintenance purposes and as provided for by the Electricity Act 1992. Because this access may require the use of heavy vehicles, development plans should be discussed at an early stage with the network company concerned. Consultation should also be sought on the likely effect of power conductors above future buildings.

(c) **Telephone**

Arrangements shall be made with Telecom New Zealand for the telephone reticulation. Where only part of this reticulation is being supplied initially the arrangements shall include the requisite space being maintained for the installation of the remainder of the reticulation at a later date. Ducts will be supplied to the developer at the time of road construction for installation in the carriageway formation at locations where cables may be required at a later date.

(d) **Gas**

Where an existing gas supply is within 100 metres of a development, the developer shall arrange for gas reticulation within the development unless it can be demonstrated that it is not practicable or economically feasible to do so.

#### **8.1.2 Approval Conditions**

Before a Certificate of Compliance is issued, either the relevant reticulated services shall have been completed or the developer shall provide satisfactory evidence to the Council that the network utility operator is prepared to reticulate the development and that agreement on the financial arrangements for the installation of the supply has been reached.

### 8.1.3 Licensed Network Operators

Network services shall be installed, operated and maintained by licensed network utility operators and the developer shall certify which licensed network utility operator such network services within the development have been vested in for installation, operation and maintenance.

Should the vesting of network services within a development rest with a licensed network operator other than the owner of a network to which such network services are to be connected, Council will require written confirmation of the following, prior to issuing a certificate of completion.

- (a) That agreement has been reached with the licensed owner of the network to which the development network is to be connected and that a connection can be made available to the boundary of the development; and
- (b) That agreement has been reached that all the needs of the licensed owner of the network to which the development network is to be connected have been met for future extension to that network including increased capacity.

### 8.1.4 Underground Cabling

Where the supply is by underground means the cable laying shall be facilitated by the installation of pipe ducts. These are to be installed by the developer at road crossings in the positions required by the network utility operator. Duct pipes in the line of a proposed cable may also be required under paved drives, private ways, and accessways if the installation of the paving cannot be deferred until after the installation of the cables. Materials for ducting and the sizes of ducts shall comply with the requirements of the network utility operator.

Where a water or gas main is on the kerb side of a proposed cable, delaying the installation of service connection pipes will facilitate laying of the cable.

Copies of the scheme plan of the subdivision shall be forwarded by the developer to the network utility operator at an early date to facilitate the design of the reticulation.

It is important that the network utility operator be advised by the developer of any amendments to the scheme plan. Information, when available on the type of dwellings and likelihood of more than one dwelling on any lot, will be valuable for design purposes.

In preparing the engineering plans due regard shall be given to the requirements of the network utility operator as to:

- (a) Minimum cover to cables.
- (b) The network utility operator's desired position for the cable within the road berm.
- (c) The minimum separation distances between power or telephone cables, and gas or water mains.
- (d) The width of berm which must be clear of other services and obstructions to enable efficient cable laying operations.

Reference should be made to each network utility operator for their specific requirements.

### 8.1.5 Power Transformers, Switching Stations and Other Services

Power, telecom, gas or other service boxes, transformers, valves, switches or similar devices larger than 300mm x 300mm are to be placed within private property clear of Councils stormwater and sewer pipes and access is to be provided by way of an easement over the private property for the Utility Companies.

### 8.1.6 Conversion to Underground on Existing Roads

Where a proposed development fronts on to an existing road, the conversion of overhead reticulation to underground will in some instances be desirable. Agreement on the feasibility and benefit will first be agreed between the network company and the Council.

### 8.1.7 Industrial and Commercial Developments

The servicing requirements for industrial and commercial areas are often indeterminate. Close liaison between the developer and the network company is advisable, particularly immediately before cabling is installed so that changes can be incorporated to accommodate extra sites or the requirements of a particular industry.

## 8.2 LOCATION AND BACKFILLING OF SERVICES

### 8.2.1 Location

The position of services in the road shall conform to Papakura District Council Drawing R2. All services shall be within 100mm of the recommended location.

### 8.2.2 Backfilling of Trenches

Trenches shall be built up with an approved backfill material in 150mm layers placed and compacted simultaneously on each side of the pipes, in order to give a balanced loading. Full use shall be made of hand operated compaction tools.