TAUPO DISTRICT COUNCIL

CODE OF PRACTICE

For

DEVELOPMENT OF LAND

Adopted by Taupo District Council on 29 September 2009.

To be read in Conjunction with *NZS 4404: 2004 Land Development and Subdivision Engineering.*

SCHEDULE OF CHANGES

Amendment No.	Subject	Part No.	Paragraph	Page	Date
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

CONTENTS

CODE OF PRACTICE - DEVELOPMENT OF LAND

PART 1

INTRODUCTION

This *Code of Practice* (CoP) is intended to provide a guide to subdivision and developments within the Taupo District. It sets out a set of procedures and minimum technical standards for development against which all proposals submitted can be measured to assess their suitability for construction. It sets out what the Taupo District Council needs from developers so that the requirements of the Resource Management Act and the Taupo District Plan are met.

The *Resource Management Act (RMA)* is concerned with promoting the sustainable management of natural and physical resources. Emphasis is placed on the integrated management of the effects of activities on the environment. Environmental management under the RMA is intended to be outcome orientated, and this provides challenges for both developers and the Council.

The Act provides for effects-based Regional and District Plans through which the implementation of new and innovative solutions for development can be undertaken. However, the successful adoption of new and innovative designs depends to some degree on certainty in the resource consent process.

Section 11 of the Act requires local authorities to control subdivision. It requires the territorial authority to make specific provision for subdivision in a District Plan. To date, the Council's response has been mainly through rules and standards defined in the District Plan and through a prescriptive Code for Subdivision and Development. Although the Code was only one means of compliance, it tended to become the norm because of the certainty it provided in the resource consent process.

The Council is a signatory to the *NZ Urban Design Protocol*. As a result the Council is committed to creating quality urban design. The Council will also be encouraging local developers to become signatories.

The Council wishes to promote greater innovation in developments in order to provide for best environmental practice in terms of both design and provision of services.

A major initiative has been to provide landowners and developers with an alternative route which allows for innovative design, but does not penalise them in terms of working through the consent process.

To achieve this outcome the CoP sets out objectives and performance criteria that must be met in each area (e.g. transportation, reserves). Developers can either use the minimum standards as set out in *NZS4404:2004 Land Development and Subdivision Engineering* (with the Taupo District Council alterations as set out in schedules 1 to 9 of the CoP) or they can utilise an alternative method. The developer will need to provide certainty that the alternative meets the objectives and performance criteria. This is further explained in Part 3 Section A.

Although the Council is looking for an approach that reduces barriers to innovation, it is acknowledged that some developments will be more suited to a more traditional approach. The Council has determined that these will be best provided for by using the New Zealand Standard *NZS 4404:2004* as the base document for meeting minimum requirements with Schedules that provide specific design information, and any Council requirements that may differ from those in *NZS 4404:2004*. Notwithstanding this, the Council prefers that a design approach over a traditional hard engineering approach be pursued by developers, particularly for larger developments and environmentally sensitive sites.

The Council's policies are evolving in response to environmental concerns and service and infrastructure constraints within the District. These include the provision of adequate potable water supplies, treatment and disposal of wastewater, dealing with stormwater issues and design of roads. These are all relevant to development planning and need to be taken into account in development proposals.

The system now in place seeks to support the use of alternative designs and technologies, to be sufficiently flexible to allow innovation, but to also provide a degree of certainty for developers. It provides options for alternatives or innovative designs that a developer may wish to propose. Compliance with minimum standards is still available for those situations where alternatives are not desired.

To encourage innovative design, developers should discuss their development concepts with the Council at an early stage.

The use of alternative subdivision design and environmental technologies has not had a long history of use (compared to traditional approaches). This is apparent on a national basis and is not just a local issue. Knowledge regarding the long term operation, maintenance and success of some designs may be limited or not available. This requires, at least initially, that the Council accept some risk and take a trial and error approach to testing these alternative designs to build experience to a level where some degree of certainty in the selection and application of alternatives can be gained.

Conversely it also requires that sufficient information is provided by the applicants on proposals to address ongoing management, maintenance and asset management considerations. Each application will be assessed against specific criteria which also include guidelines on how to deal with issues such as asset management, private versus public ownership of infrastructure, and future maintenance of components in an alternative design approach.

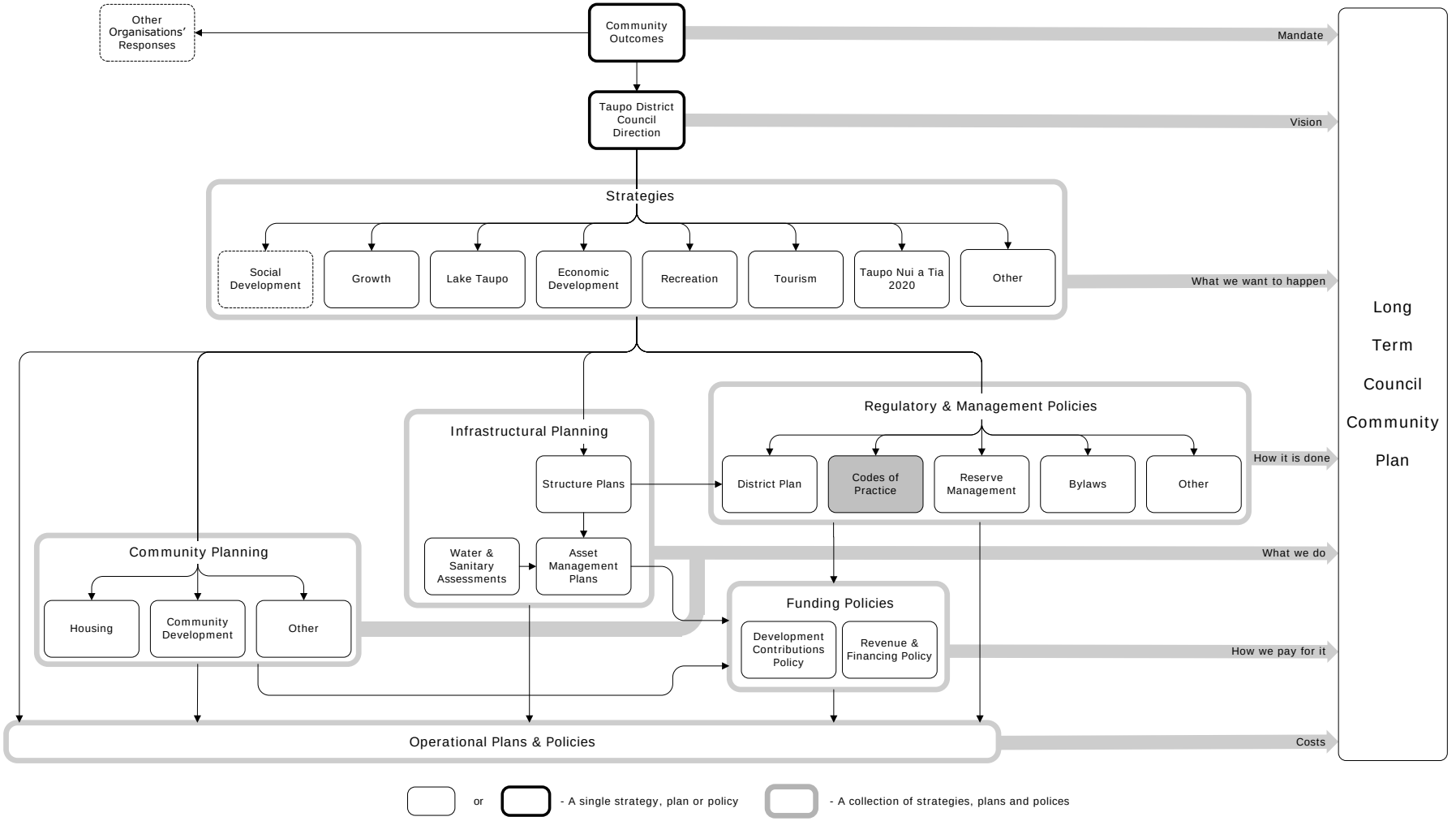
Transition Provisions

All consents and service connections issued post the adoption of this 2009 Code of Practice will reference the 2009 Code of Practice.

All consents and service connections issued pre the adoption of this 2009 Code of Practice will reference the 2001 Code of Practice or any such other document as stated in the resource consent.

Where consents issued pre the adoption of the 2009 Code of Practice are amended then where it is consistent with the intent of the consent, the amended consent will reference the 2009 Code of Practice.

The diagram on the following page summarises the linkages between the Code of Practice and other Council documents.


Other Organisations' Responses
Community Outcomes
Mandate
Taupo District Council Direction
Vision
Strategies
Social Development
Growth
Lake Taupo
Economic Development
Recreation
Tourism
Taupo Nui a Tia 2020
Other
What we want to happen
Long Term Council Community Plan
Regulatory & Management Policies
District Plan
Codes of Practice
Reserve Management
Bylaws
Other
How it is done
Infrastructural Planning
Structure Plans
Water & Sanitary Assessments
Asset Management Plans
What we do
Community Planning
Housing
Community Development
Other
Funding Policies
Development Contributions Policy
Revenue & Financing Policy
How we pay for it
Operational Plans & Policies
Costs
or
- A single strategy, plan or policy
- A collection of strategies, plans and polices

PART 2

DEVELOPMENT PROCESS

A) Preliminary

(i) Before any development can commence a resource consent may be required. Developers should consult with the Council at an early stage to ascertain any particular requirements or site limitations for the development proposed.

The Council can meet to work through design issues with developers. Experience has shown that there is a great deal of value in having such meetings at a very early stage, particularly prior to the lodgement of any resource consent application.

(ii) Applicants need to consider the requirements of the relevant regional councils. This is particularly the case where large scale earthworks and/or waterways are involved in the development. The Taupo District is located within four regional councils:

(a) Environment Waikato

(b) Environment Bay of Plenty

(c) Hawkes Bay Regional Council

(d) Wanganui/Manawatu Regional Council

(iii) Consultation with other persons or organisations may be required, including:

Local iwi
Adjoining owners
Department of Conservation
Environmental groups
LINZ
New Zealand Historic Places Trust
Network Utility Operators
New Zealand Transport Agency
New Zealand Fire Service
Other interested parties.

B) Concept Plans

(i) A concept plan may be required where a large area is proposed to be developed, particularly if to be staged over a number of years. It may also be advantageous to provide concept plans where alternative designs are proposed. Concept plans should look beyond the site to consider any strategic issues within the area.

(ii) Where the Council requires a concept plan, sufficient copies of the plan and supporting information shall be provided to the Council for evaluation of the proposal. The plan shall include sufficient details to give a general outline of the nature of the development, either as part of the plan or in the explanatory material accompanying the plan. Information supporting alternative design proposals should be sufficient to enable Council staff to assess the effectiveness of operation and analyse the proposal over a full life cycle of the infrastructure.

(iii) The plan should indicate approximate locations of:
Roads;
Reserves;
Waterways and flood plains;
Important natural features;
Cultural sites;
Hazards;
Cycleways, walkways and bridleways;
Proposed public amenities;
Other significant features.
It should also extend beyond the site to take account of any adjoining developable land, whether or not owned by the developer, and any effects on existing developed land.

C) Resource Consents

(i) Subdivisions and other developments require resource consents in accordance with the *Resource Management Act*. In some cases resource consents will be needed from both the Taupo District Council and the relevant Regional Council. In this case the Taupo District Council may seek to co-ordinate the processing of applications and, where required, to hold joint hearings. Developers are advised to consult with the Council's Consents staff prior to lodging resource consent applications.

(ii) Section 88 of the *Resource Management Act* and the *Taupo District Plan* set out the information that must be included with any application to subdivide. A checklist is available which states the information required by the Council's *District Plan*. Important parts of any application are the Assessment of Environmental Effects, reports covering specific aspects of the proposed development and plans of the development, being scheme plans for subdivisions and development plans for other developments. See below for requirements for these.

(iii) The application (particularly for subdivisions) should include reports covering proposed land uses, factors influencing the design of the development, the extent of any earthworks proposed, soils report if required for foundation design and/or as evidence to support any proposal to dispose of sewage effluent on-site, stormwater disposal proposals, potable and fire fighting water supply provisions, road safety audits, current and future effects of traffic, the provision of off-street parking, access for fire fighting appliances, landscaping proposals and any other relevant information which may assist the Council in making an informed assessment of the proposals. Where alternative or non-standard designs are proposed, then the applicant shall provide sufficient evidence to enable Council staff to assess the viability of the proposal, ongoing maintenance requirements and whole of life cost assessments.

(iv) An applicant is required to assess the floodability of any proposed subdivision through direct liaison with the authority responsible for the

administration of watercourses in the area. If the relevant Regional Council or the Taupo District Council does not have the necessary information, then the applicant will be responsible for providing it. Applications should include proposals for dealing with stormwater from the development, including, where necessary, assessment of the effects of the proposed development on upstream and downstream stormwater flows and levels. Potential increases in stormwater runoff peak flows shall be mitigated within the development by appropriate measures. Examples of such measures would include on site storage and soakage where soil types enable this. Secondary flow paths required to deal with run off from the 100 year design storm (1% annual exceedance probability event) should be identified. If secondary paths are not available, then the stormwater systems shall be designed to meet the flows arising from the 100 year design storm. To meet the requirements of Section 106 of the *Resource Management Act*, the Council needs to consider in any subdivision application the implications of flooding or inundation. Building sites within subdivisions are required to be above the flood level of the 1% annual exceedance probability (AEP) storm event plus an approved freeboard. A distinction is made between inundation by ponding and inundation where flood waters are likely to generate scour velocities and consequent erosion. Applicants must either establish that the land is not subject to material damage, or propose measures that will ensure that material damage under "bank full" conditions does not occur or can be remedied. Areas of private property may be able to become inundated (usually not exceeding 300mm) provided they are not used as building sites. These areas shall be designed to a 1% AEP storm event and shall be registered as building exclusion zones on the titles of the properties. Approval will not be given where it is considered that erosion is likely to occur. A report from a suitably qualified person covering stormwater disposal and inundation issues, including a catchment plan and calculations, should be included with the resource consent application. The Council will require easements or covenants to be recorded on the title if a planned secondary flow path arising from the 1% AEP event intrudes into an allotment within the development to a point where a dwelling site is normally permitted.

(v) Consents may have conditions imposed to ensure that developments are sound in relation to both engineering and environmental aspects, and to protect other landowners and future residents. Resource Consent staff and the Development Engineers will set the conditions using the District Plan and other planning and engineering documentation, including these requirements, as guidance. Applicants may appeal or object to any conditions set on their consent. Further information regarding appeals can be obtained from the Council.

(vi) Once resource consent has been granted, there is normally a period of five years to submit a land transfer plan for the Council's approval. This plan must be in accordance with the original plan and any conditions of approval. If the land transfer plan satisfies the Council's requirements, approval is granted. The land transfer plan is then lodged with Land Information New Zealand.

A longer period for the survey plan to be submitted may be agreed by the Council at the time consent is granted, and an extension can be granted later by the Council if certain criteria are met.

(vii) A certificate stating that all the conditions of consent have been satisfied must be provided within three years of the Council's approval of the land

transfer plan. This certificate and other documents are then lodged with the District Land Registrar to allow the new certificates of title to be issued. Failure to gain this certificate within the time limit may result in the consent approval lapsing.

(viii) The Council imposes fees for the processing of resource consent applications and for the later monitoring of resource consent conditions. Fees are split into two components. An application fee is required for the consent planning processes required for decisions on applications and, where applicable, an application fee is required for the engineering considerations required. Where consent monitoring is involved additional fees may be required. The quantum of these will generally be included in the resource consent conditions. Additional charges and costs are required to be fair and reasonable.

Schedules of the fees and charges are available in the *Long Term Council Community Plan (LTCCP)*.

(ix) Resource consent procedure and time frames can be obtained from the Council's Resource Consents Section.

(x) New Zealand Transport Agency (NZTA) shall be consulted with regarding any works which may affect or be accessed by a state highway.

D) Scheme Plans

(i) Scheme plans of subdivision shall comply with those requirements of the District Plan that apply to the land being subdivided and be submitted with the resource consent application.

(ii) Scheme plans shall generally provide the following information (in agreement with the TDC Engineer):

(a) The position of all existing public utility services and water courses, water catchments and other water features.

(b) Adequate contour information to illustrate the existence on each allotment of a suitable building platform for residential, commercial and industrial environments and to enable the gradients proposed for roads, rights of way and access ways to be assessed. For two or three lot subdivisions spot levels in terms of Moturiki Datum may be acceptable where the land is of gentle enough contour to enable road and right of way grades and feasibility to be assessed from such limited information.

(c) Topographical information, including a locality plan if necessary, to accurately identify the site. The position of all buildings and stands of trees or bush and any other feature of historic, cultural, environmental or other interest shall be shown.

(d) Where a scheme plan forms only part of the future potential development of a larger block of land held in the same ownership and zoned residential, and a concept plan has not previously been provided, the scheme plan shall show the total development including roading, drainage, water supply and the number of allotments, so as to ensure that the initial scheme plan application does not prejudice full and future development. The extended

development may be shown to a smaller scale as an insert on the initial application.

(e) All proposed allotments shall be numbered on a scale plan, including any land to vest. Areas of each allotment shall be shown

(f) Indicative roading networks and service layouts shall be shown with typical road cross-sections that provide sufficient information to check that adequate gradients and suitable manhole invert levels can be achieved.

(g) The draft conceptual cycleway, walkway and bridleway indicative network.

(h) All landscape works proposed, including on road reserves, including the location and species of trees.

(i) Details shall be given of any proposed reserve and its proposed development. The applicant shall identify the purpose for which each reserve is to vest and such information shall be shown on the plan. The Council may or may not approve part or any of the proposals.

(j) Public roads, private ways, service lanes, access ways and cycleway, walkway and bridleway networks shall be laid out to fit in with the general transport requirements of the locality in which they are situated. They shall generally provide for connectivity to existing road networks and adjacent undeveloped land and any requirements arising from road safety audits that have been undertaken.

(k) The width of legal road reserves and carriageways and road geometry and gradients shall be in accordance with the requirement of the *Taupo District Council Development Requirements* (Part 3 Section D of this CoP), unless alternative designs are required or approved by the Council.

(l) Plans shall be drawn to commonly accepted metric scales. The Council's preference is for scales of either 1:500 or 1:1000. However scales of 1:100 or 1:200 are acceptable in appropriate situations. Generally long sections are presented as 1:500 horizontal and 1:100 vertical. Cross sections are generally 1:100. Datum shall have reference to Moturiki Datum. A north point must be shown on plans.

(iii) Due regard shall be given for any road widening or upgrading proposals which the Council may have and any requirements shall be ascertained by consultation at an early stage with appropriate Council staff.

(iv) In designing any scheme plan, consideration shall be given to the future development of adjoining land and the Council may, as a condition of consent, require the creation of road reserve and/or the formation of roads to or near the boundary of adjoining land.

(v) In submitting any scheme plan for approval, the applicant shall provide documentary evidence that the general layout is sufficient for reticulation by other utility services authorities and meets New Zealand Fire Service

requirements for residential areas. When a scheme plan has been approved adequate provision shall be made for transformer sites, junction boxes and other special needs of these authorities.

(vi) Confirmation that the lighting will meet the requirements of the appropriate standards

E) Fees and Charges and Bonds

(i) Planning fees associated with resource consents are outlined in *Taupo District Council Fees and Charges Policy* as contained within the current LTCCP/Annual Plan.

(ii) Development contributions shall be required from new developments in accordance with the *Taupo District Council Development Contributions Policy* as contained within the current LTCCP.

(iii) Bonds

Any work for which a bond has been approved shall be separately priced as if it were to be constructed as a 'one off' item.

Bonds will normally only be considered for work which can not reasonably be completed for reasons of climate or where staged development makes the work inappropriate. Special circumstances will be considered by TDC but any decision about whether to accept a bond is at Council's sole discretion.

Bonds shall be in cash for a value of 200% of the estimated value plus supervisory and administrative costs. Provided that:

(i) bonds will not be accepted for work on private rights of way or anywhere where free right of access is not readily available once separate titles have issued;
(ii) except in special circumstances no bond will be permitted for works which cannot be completed within six months from the date of acceptance.

Bonds must be accompanied by a legally binding agreement providing for forfeit of all monies and allowing the Council to have access to undertake any outstanding works should the developer fail to complete those works within the specified time. Bonds may need to be registered on appropriate titles.

The bond form is to be that as included in this Code of Practice or any other form as approved by Group Manager Infrastructure and parks

F) Asset completion checklist

(i) Where the subdivision involves the extension of TDC Services, or the vesting of reserves or new public roads, a checklist of information to be provided with request for completion certificate follows.

Taupo District Council
SUBDIVISON/DEVELOPMENT
ASSET COMPLETION CHECKLIST

(Note: all sums include GST)

Developer's Name:_____**RM No:** _____

Location:_____

Representative:_____**Contractor:**_____

Type of Subdivision:_____**No. of lots (excl. Roads/reserves):**___

Land Use Type:_____**Date resource consent Issued**:__/__/_____

Development Requirements/Consent Conditions

(Use N/A for Not Applicable)

1. ACCESS

	Consultant	TDC
Public Roads		
• Public roads created Yes/No	☐	☐
• Subgrade & Basecourse Inspections by TDC:	☐	☐
• Beam test records attached showing compliance (Target: ___mm):	☐	☐
• Contractors sealing records specifying areas referred to enclosed:	☐	☐
• Street lights tested and operational:	☐	☐
• Road Markings, and signage inspected:	☐	☐
• Landscaping completed in accordance with approved plans:	☐	☐
• Berms grassed and turf established:	☐	☐
• All private entrance features/structures/boundary fences outside road reserve:	☐	☐
• Acceptable street name selections provided to TDC Land Information Administrator for TDC adoption:	☐	☐
• Street nameplate money paid. Number _____ @ $ = $_ _ _ . _ (Street and Accessway signs at current TDC cost plus 10%)	☐	☐
• 2nd Coat chipseal money paid. Area _____m^2 @ $ = $ _ _ _ _ _ _ _ (At TDC Cost plus 10%)	☐	☐
• Road Safety Audit approved by TDC	☐	☐
• Final TDC Inspection and Approval of Works. Date:	☐	☐
As Builts Provided for Public Roads		
• Plan of Road showing extent of kerb, seal and footpaths:	☐	☐
• Typical cross-section of each public road type provided:	☐	☐
• Long section of road(s) showing lengths, curve geometry and grades:	☐	☐
• Street Lighting Inventory form (from CoP appendix) submitted:	☐	☐
• Position of streetlights recorded on as-built plans off lot boundaries:	☐	☐

Private Roads/Rights of Way (ROWS)

- TDC inspections of subgrade and basecourse if required:
- New vehicle crossings onto **existing** streets inspected by TDC Engineering Officer -Transportation Operations before pouring/surfacing
- Shared urban or residential access and parking areas permanently surfaced:
- Construction approved:
- Easements created:

2. WATER SUPPLY

	Consultant	TDC

Public Supply

- All lots have individual connections within lots frontages:
- Passed pressure test witnessed by consultant and/or TDC:
- Watermains flushed and chlorinated:
- Hydrant Flow test by Fire Service (Results attached):
- Rural flow restrictors tested (Results attached showing target & measured flows):
- Meter serial numbers for each metered rural or commercial lot (Attached):
- As built plans checked and submitted showing dimensions off boundaries:
  (Note: for new public mains (water, sewer and stormwater -other than just new connections) TDC now require Coordinates in NZTM GD2000 (Transverse Mercator Geodetic Datum) and a Tif image file. DXF or DWG files are also appreciated. Tracings not required. Contact: Tracey May)
- Markings (including blue fire hydrant reflectors) and rural marker posts inspected:
- Construction approved by TDC:

Private Water Supply

- Daily quantity required from bore (***all*** users on bore) _ _ _ _ _ _ m^3/day
- Actual measured bore and/or pump daily flowrate (limit 16 hrs day): _ _ _m^3/day
- Environment Waikato water take consent needed: Yes/No
  Volume consented: _ __ m^3/day
- Water quality complies with current NZ Drinking Water Standards including iron (max 1.0mg/litre), manganese (0.4mg/l) and arsenic (0.01mg/l) levels:
- Treatment system installed (if required), tested and maintenance requirements specified in easement documentation:
- Easements created over bore, tank and pipeline routes. Easement documents specify minimum quantities for dominant tenements (attach copy):

3. WASTEWATER

	Consultant	TDC

Urban Development

- All lots have individual gravity connections to within lot boundary:
- Individual connections onto **existing** TDC mains inspected by Wastewater Services Supervisor of TDC (or representative):
- Ends of sewer laterals staked in accordance with CoP:

- New mains pressure tested, flushed and lamped between MHs by consultant:
- Min. 3m wide sewer easements provided centrally over all TDC mains (incl. existing pipes):
- Private easements provided for single users crossing adjacent lots:
- Construction completed; inspected and approved by Consultant and TDC:
- As-built plans checked and provided showing individual connections dimensioned off lot boundaries:
- As-built plans compiled from as-built survey and show dimensioned positions and legal boundary offsets, levels, grades, sizes, materials & classes of new mains:

RURAL ENVIRONMENT OR UNSERVICED AREAS

- Private and/or community wastewater disposal consented by Environment Waikato (if required):
- Existing septic tanks upgraded (if required by Environment Waikato consent):

4. STORMWATER

	Consultant	TDC

Public Mains

- Environment Waikato discharge and culvert consents complied with (provide copies of consent for TDC file as consent holder upon vesting):
- Secondary flowpaths formed and provided:
- Safety fences around potential fall-risk areas (eg. Culverts, sudden drops into ponds) and green culvert marker posts for rural road culverts:
- Construction approved by consultant and TDC:
- Easements over structures and flowpaths if over private land or recreation reserve:
- As-built plans (similar standard to the sewer requirements above) provided including all culverts, flumes and stormwater management infrastructure:

Private Stormwater

- Any Environment Waikato discharge and culvert Consents complied with:
- ROWs/parking areas have onsite stormwater management provided:
- Secondary flowpaths formed or available and clear of building sites:
- All existing lot soakholes within lot boundaries:

5. POWER, TELEPHONE AND GAS

	Consultant	TDC

- Low Voltage electricity connection point available for all lots:
- Telephone line available for connection outside frontage for each lot:
- All transformers and structures located outside normal road reserve width:
- Service now available:
- Easements created:

6. PUBLIC SEWERAGE AND WATER PUMPING STATIONS AND RESERVOIRS

	Consultant	TDC
• Structure and fittings checked and approved by consultant and TDC Utilities staff:		
• Pumps and all equipment test run and checked:		
• All control systems tested including telemetry (attach electrician's certificate):		
• Odour control function checked:		
• Reduced-pressure zone (RPZ) backflow preventer of minimum size 25mm securely installed above ground on sewer PS water supply:		
• Wash-down hose (min bore 25mm) provided in valve chamber of sewer PS with adjustable nozzle:		
• Standard TDC locks installed:		
• As-built plans of structure/pipework/fittings provided:		
• As-built electrical drawings of control system provided:		
• Pump and equipment manuals and guarantees provided:		

7. PUBLIC RESERVES

	Consultant	TDC
• Reserves provided in accordance with TDC Reserves Planner's requirements:		
• Reserves levelled, clear of debris/rocks, plant pests, stumps etc:		
• Equipment/paths/access/fences/barriers/seating/signs etc provided as agreed:		
• Suitable turf cover established:		
• Planting completed and maintained in accordance with approved landscape plans:		
• Infrastructure easements in favour of TDC provided over recreation reserves:		
• Local Purpose reserves developed in accordance with agreed purpose:		
• Fencing Covenants absolving TDC of fencing costs enclosed:		
• Maintenance agreements in place:		
• Any Financial or Development Contributions paid: $_____		

8. OTHER ITEMS

	Consultant	TDC
• Land Suitability Certificate; TDC CoP (if required):		
• Engineering Completion Certificate -TDC CoP (if required); with Legal survey completed and all boundary/ROW pegs intact at date of 224c application:		
• TDC Engineering Fees to be paid as part of completion certificate uplifting		
• Infrastructure headworks/Development Contributions paid Date: _____		

Itemised: Water $_____Sewage $_____Stormwater $_____

- All necessary TDC Traffic Management/Street Opening Notices obtained (from Engineering Officer –Transport Operations) and all requirements fully complied with: ☐ ☐
- Written NZTA completion approval for entrances or other works attached: ☐ ☐
- Environment Waikato approval for earthworks and Land Improvement Area Variations obtained if required: ☐ ☐
- Consent Notices/Covenant documents copies provided as required by consent: ☐ ☐
- Copies of all TDC Easement documents enclosed, specifying that no structures other than boundary fences to be erected within TDC easements : ☐ ☐
- Easement documents schedules checked for accuracy and completeness: ☐ ☐
- Existing redundant easements cancelled: ☐ ☐
- Bonds (if accepted by TDC) provide completed CoP Bond ☐ ☐

  Agreement Forms. Purpose of bond: _____

  Sum $_____ Period: _____

  Any other engineering items required by resource consent or Development

  Engineers: _____

  _____

CERTIFICATION

I have checked the above requirements and am satisfied that the asset development works have been done in accordance with the Resource Consent and the TDC Code of Practice for Development of Land or as otherwise agreed with the TDC Development Engineers and that the completion certificate may be issued:

Name:_____**Signed:**_____

Company:_____**Date:**_____/_____/_____

(Remainder for TDC Use):

Check List reviewed:
Asset managers advised and as-builts/asset information distributed as below (delete):
[Water/Wastewater, Roading, Reserves, Stormwater, Turangi Office, Rates (for service area extensions), GIS, others:_____]
Revised lot water entitlements entered into Infrastructure Manual:

Asset Completion Certificate issued. Signed:_____**Date**: __/___/____

Taupo District Council
SUBDIVISON/DEVELOPMENT
ASSET COMPLETION CERTIFICATE

(Note: all sums include GST)

To (delete as necessary): **TDC File**
Asset Manager Water
Asset Manager Wastewater
Asset Manager Stormwater
Transportation Manager
Team Leader Network Engineering
Senior Reserves Planner
Asset Management Systems Officer
Area Manager Turangi/Tongariro
Revenue Supervisor
GIS Manager
Others (Specify) - _____

Developer's Name:_____**TDC File No:** _____

Location:_____

Type of Subdivision:_____**No. of lots (excl. Roads/reserves):**___

Land Use Type:_____**Date resource consent Issued**:__/__/_____

The above project has been completed in terms of the conditions of consent.

Please make arrangements to assume responsibility for the additional public assets:

* Roading
* Water Supply Mains
* Sanitary Sewer
* Pumping Stations
* Landscaping
* Street lighting
* Stormwater Drainage
* Water /sewer Lot connections
* Reserves (Recreation/Local Purpose)

And arrange works for which money has been paid:

Purpose	Area / Scheme	Account Code	Value (incl GST)
Second Coat Seal			
Street nameplates ( )			
Street trees			

The Following Payments have also been made:

Purpose	Area/Scheme	Account Code	Value (incl GST)
Engineering Fee	-	569 1300	
Water Supply		___ 1316	
Sewerage		___ 1316	
Development Contributions	-	DC account	

Signed: _____ Date: __/___/_____
(TDC Engineer)

Dated

FORM OF BOND

TAUPO DISTRICT COUNCIL

[DEVELOPER]

FORM OF BOND

BETWEEN **TAUPO DISTRICT COUNCIL** a body corporate under the Local Government Act 2002 ("**Council**").

AND [the developer] ("**the Developer**").

This bond ("Bond") is given on 2009 by the Developer in favour of Council relating to

.....(the "**Development**"[1])

1 INTERPRETATION

1.1 In this Bond, the following words and expressions shall have the following meaning:

"**Bond Sum**" means $.....;

"**Cash Sum**" means $.....;

"**Outstanding Conditions**" means the conditions identified in schedule A to this Bond and/or the works identified in schedule B to this Bond;

"**RMA**" means the Resource Management Act 1991;

"**Target Date**" means.....[2];

2 BOND

2.1 The Developer shall pay the Council the Bond Sum:

a upon receipt from the Council of a written demand, requesting payment of the Bond Sum; or

b on the Target Date, if the Outstanding Conditions have not been satisfied in accordance with clause 5;

whichever is earlier.

3 CASH SUM

3.1 The Developer has provided the Cash Sum to the Council.

3.2 The Developer acknowledges that the Council is under no obligation whatsoever to account to the Developer for any interest accrued on the Cash Sum whatsoever, and that any interest so accrued will be for the sole and exclusive benefit of the Council.

---

1) [1] Include land registry number if applicable

2) [2] Should not be more than 2 years from initial certification.

4 EXPIRY DATE

4.1 This Bond will continue in full force and effect until the earlier of:

a the discharge by the Developer of the Outstanding Conditions in accordance with clause 5; or

b the payment to the Council of the Bond Sum by the Developer;

whereupon all obligations of the Developer under this Bond shall cease and this Bond shall have no further effect.

5 DISCHARGE OF THE OUTSTANDING CONDITIONS

5.1 The Outstanding Conditions shall be discharged on the date on which the Council, following written application from the Developer to do so, confirms in writing to the Developer that it is satisfied (in its absolute discretion) that the Outstanding Conditions have been fulfilled.

5.2 The Developer acknowledges that prior to any such confirmation the Council shall be entitled to inspect the Development and carry out any other inspections or tests that it deems necessary in its absolute discretion, and deduct the sum of $200 plus any other costs incurred from the Cash Sum.

6 GENERAL

6.1 The powers, rights and remedies of the Council under this Bond are in addition to and not in substitution for all other powers, rights and remedies conferred upon it by law and the exercise of any power, right or remedy under this Bond shall not prejudice the Council's authority to exercise any other powers, rights or remedies.

6.2 This Bond is binding on the Developer, their executors, administrators, liquidators and assigns, and in the event that the Developer consists of more than one entity, individual or body corporate the Developers obligations hereunder shall be joint and several.

SIGNED by **THE DEVELOPER** in the presence of:	.....
..... Signature ..... Name ..... Address .....[3] Occupation	

3) [3] A certificate of the developer's solicitor as to due execution and binding on the company should be obtained.

SCHEDULE A – OUTSTANDING CONDITIONS

SCHEDULE B – OUTSTANDING CONDITIONS

ADVICE NOTE

(does not form part of bond)

1. The cash sum will be the same as the bond sum.

2. In the event that Council demands the Bond Sum from the developer in accordance with clause 2.1, Council will apply the Cash Sum held in satisfaction of the demand. A further payment will not be required.

3. For higher value bonds (greater than $100,000) Council will require bank guarantees. In such case the developer's solicitors are to be responsible for drafting a guaranteed bond which instrument will be reviewed by Council's solicitors at the cost of the developer.

PART 3

DEVELOPMENT REQUIREMENTS

A) Alternative Approaches

(i) The Council has adopted alternative approaches that allow variation in the ways compliance with District Plan requirements can be achieved.

- The more prescriptive approach is outlined in the Taupo District Council Minimum Engineering Requirements section of this document (Part 4)

- The less prescriptive approach, requires that developers demonstrate that the alternative meets the objectives and performance criteria as outlined in this section.

The requirements outlined in paragraphs **B** to **J** of this part apply to both approaches.

(ii) The Council has adopted the *New Zealand Standard NZS 4404: 2004* as the base document to meet its minimum engineering requirements. Schedules outlining the Council requirements that are different to, or not covered in the Standard, have been developed and form part of the minimum engineering requirements.

(iii) *Standards New Zealand Handbook, SNZHB 44:2001 Subdivision for People and the Environment*, provides guidance on alternative means of carrying out subdivisions. Other guidelines are also included in part 5 which can be used in support of applications. Applicants can also submit to the Council other alternative designs based on appropriate Design Guides and with adequate supporting detail.

(iv) Applicants can choose for their developments whether to use the Minimum Engineering Requirements section, use an alternative solution or use a combination of the two.

General Provisions

(i) General requirements

Developments shall comply with Part 1, General Requirements and Procedures *of NZS 4404:2004* whether using the Minimum Engineering Requirements or alternative approaches, except as modified by the schedule titled ***Schedule 1, Taupo District Council Altered Requirements to Part 1 NZS 4404:2004, General Requirements and Procedures*.**

(ii) Representatives

The owners of any development projects shall appoint a Developer's or Owner's Representative or Representatives who shall be responsible for the investigation, design and obtaining of approvals of the works, contract

administration and supervision of the works, testing, provision of as built plans and certification upon completion of the works.

The Developer's Representative shall be a person with qualifications and/or experience appropriate to the project with suitable liability and indemnity cover commensurate with the scale of the development.

(iii) Suitably Qualified Persons

Where investigations and reports are required by a suitably qualified person, a person or company should be agreed between the Council and applicant prior to the engagement. The person or company will normally be expected to be professionally recognized in the area of competence claimed and to carry professional indemnity insurance to a level suitable for the purpose but in any case not less than $2,000,000.

The Council reserves the right to have any work peer reviewed at the developers cost regardless of Council's prior approval as to the acceptability of the suitably qualified person.

Without limiting the Council's rights to require the use of suitably qualified persons the following are examples of areas of expertise where such people may be required:

- traffic engineering.
- flood mitigation and assessment of effects of development on flood and runoff issues.
- suitability of land for on site wastewater disposal.
- suitability of rural water supply proposed by the applicant.
- geotechnical engineering prior to development and to manage fill and excavation compliance during construction.
- site investigations and recommendations for foundation design.
- Geothermal issues
- landscaping

(iv) Maintenance of Standards

Developers have the responsibility, both directly and through their appointed representatives, to ensure that all works carried out directly or by contractors or sub-contractors are at all times in accordance with the approved drawings and specifications (including approved variations), and in accordance with sound engineering practice. While Council Officers will be available to offer advice and guidance, it remains the developers' representatives' responsibility to ensure the adequacy and correctness of the design and supervise the construction and ensure standards are maintained. See paragraph 4 of Schedule 1 for maintenance and defects liability period requirements.

(v) Safety

Developers, Developer's Representatives and Contractors must meet the requirements of the Health and Safety in Employment Act 1992. Developers and/or contractors working on a development site are responsible for the safety of Council employees and anyone else undertaking work on, or inspections of, the development.

Developers and their representatives shall ensure that contractors have in place effective safety management systems. They shall ensure that contractors have in place suitable plans to carry out the required work in a

safe manner and that the contractors comply with the requirements of relevant legislation covering the works.

Where a developer's contractor is to make connections to Council owned existing services or roads then the Developer, the Developer's Representative and the Contractor shall comply with the Council's Health and Safety Manual. For the purposes of the Health and Safety Manual requirements any work on Council owned assets is deemed to be managed by the Developer's Representative on behalf of the Council. The Developer's Representative shall ensure that the contractor complies with their health and safety obligations.

(vi) Engineering Services

Engineering services required for a development shall be provided and be in accordance with Council requirements, or as otherwise approved by the Council.

Notwithstanding any design approval by Council, the developer is responsible for the correctness and adequacy of the design. If approval to variations are being sought from Council's normal minimum standards these should be specifically highlighted when Council plan approval is sought.

Engineering works will generally include the provision of:

Urban developments

(a) Earthworks.

(b) Stormwater management, including pipe systems, swales, ponds, lakes, wetlands, attenuation devices, etc.

(c) Wastewater.

(d) Water supply, including for fire fighting purposes.

(e) Underground power, gas and telecommunication services.

(f) Street lighting.

(g) Kerbs and/or channels where appropriate.

(h) Road formation, metalling and sealing.

(i) Footpaths as required.

(j) Formation, metalling, sealing, drainage, kerbs and/or channels (where appropriate) and provision of services for private rights-of-way and service lanes.

(k) Paths and fencing (where appropriate) in public access ways, cycleways, walkways and bridleways.

(l) Grass areas, planting and other landscaping within road reserve or recreational and drainage reserves to vest.

Rural developments

(a) Earthworks.

(b) Road surface water drainage and culvert installations.

(c) Wastewater treatment and disposal.

(d) On site water supply or restricted water supply reticulation if a public system is available, including for fire fighting services.

(e) Electric power and telecommunication services.

(f) Street lighting, if appropriate.

(g) Formed, metalled and sealed road pavement, safety shoulders, property entrances and drainage channels.

(h) Formed, topsoiled and sown road berms.

(i) Cycleways, walkways and bridleways where appropriate.

(vii) Working in Existing Roads

The Council has adopted the *Transit NZ COPTTM – Code of Practice for Temporary Traffic Management*. The requirements set out in this code shall be followed where any work is undertaken in existing roads.

Reference shall also be made to the *National Code of Practice for Utilities' Access to the Transport Corridors; 2009* published by the NZ Utilities Advisory Group, which has been implemented as Council policy.

(viii) Design performance criteria

The purpose of an engineering design is to provide a common terms of reference for defining the physical works (as may be required to meet Council requirements and/or resource consent conditions) and to provide a mechanism to evaluate the proposed works against their performance requirements.

An engineering design shall:

- Define the scope of the works and incorporate all of the components required for the intended project.
- Be legible and understandable and be supported by sufficient drawings, calculations, reports and associated documentation to facilitate appraisal.
- Provide sufficient information for construction purposes.
- Provide for
    - Safety
    - The whole of the catchment
    - Sudden or catastrophic failure
    - Future development
    - Efficiency in operation and maintenance
    - Optimisation of life cycle costs.
- Be prepared and endorsed by suitably qualified persons.
- Demonstrate compliance with resource consent conditions, this document and other regulatory and statutory requirements.
- Be a platform for approvals and acceptance.

- Demonstrate compliance with the objectives and performance criteria contained within this document.

(ix) Commuted Sums

In some situations the Council will require a commuted sum to be paid by the developer based on the net present value of the ongoing operation, maintenance and replacement costs for a facility taken over by the Council. This particularly relates to sewer pumping stations, but may also apply to other non-normal situations. If relevant, applicants should discuss this aspect with the Council at an early stage.

B) Earthworks and Geotechnical

(i) Objective

To facilitate the undertaking of earthworks which create changes from the natural land form without generating instability and which minimise the risk of environmental pollution from wind blown dust or silt laden runoff.

The Taupo District is generally associated with volcanic pumice sands and ashes of widely varying composition.

Typically earthworks can be undertaken all year round with the better conditions being encountered in spring, autumn and winter when soil moisture is near the optimum level for compaction.

Most pumice sands can be readily compacted to form load bearing fills.

Volcanic ashes can sometimes be used if mixed with pumice material but may create unstable fills unable to develop the necessary strength if not properly managed.

Taupo pumices are light and friable and require special attention to prevent:

i) dust generation from construction plant and/or wind action on the disturbed surface;

ii) severe erosion from rainfalls – particularly when a dry prior condition prevails.

Taupo has a dry and windy summer climate with high intensity rainfalls of short duration common during December and January. Severe frosts can occur during winter.

Restoration grassing is generally only successful during short periods at Autumn or Spring.

(ii) Performance Criteria

Earthworks shall:

- Comply with any Regional Council rule and/or any other specific requirement for the control of surface water, alteration or diversion of natural waterways/stormwater flows, discharges of any type, the clearing of land and the alteration of landform

- Meet the relevant standards and criteria of the *District Plan or obtain resource consents for any departure from those standards and criteria.*

- Recognise and protect any existing or proposed land improvement agreement, wetland or areas of significant conservation value

- Be safe and stable and geotechnically sound during all stages of earthworks.

- Not unnecessarily alter the natural land form or interfere with natural features.

- Provide adequate foundations for building of roads, erection of buildings and construction of services.

- Provide an accessible building area within each lot of a subdivision appropriate to the zoning of the land.

- Control surface and ground water flows both during and after construction.

- Control sediment generated by the works.

- Not cause undue nuisance from silt, dust, noise or disposal of vegetation.

- Demonstrate adequate resources to manage the effects of dust, silt, sediment. Noise etc.

- Be rehabilitated with a visible and consistent grass strike.

(iii) Construction

Developments shall comply with *Part 2, Land Stability, Foundations and Earthworks*, of *NZS 4404:2004*, whether using the Minimum Engineering Requirements or the Design Guide approaches, except as modified by the schedule titled ***Schedule 2, Taupo District Council Altered Requirements to Part 2 NZS 4404:2004, Land Stability, Foundations and Earthworks*.**

Geotechnical appraisal and design may be required:

(a) prior to detailed planning, which usually involves some form of subsurface investigation;

(b) during the review of design concepts;

(c) during construction to ensure the adequacy of bulk filling and the execution of the earthworks design; and

(d) after construction, to provide certification and/or define limitations of the works.

C) Transportation

(i) Objective

The Council's Transportation and Roading objective is facilitate safe, comfortable and efficient travel throughout Taupo District. This will be accomplished through environmentally sustainable engineering designs and construction that achieve the performance criteria.

This CP does not cover works on State Highways and all works must be undertaken in accordance with the relevant Road Controlling Authorities requirements.

(ii) Performance Criteria

The design of the layout and structure of a road network and its associated amenities shall:

- Provide linkages and connectivity.
- Meet the relevant standards and criteria of the District Plan, road hierarchy and classification *or obtain resource consents for any departure from those standards and criteria*.
- Be designed to align with the strategic direction contained within the Councils *Long Term Council Community Plan (LTCCP),* the Council's *Transportation Strategy* and the *Regional Land Transport Strategy*.
- Provide for safe, efficient and comfortable passage of vehicular and non vehicular traffic.
- Provide for the safe and efficient passage of cyclists compatible with the Council's *Cycle Strategy*.
- Provide safe and efficient access for pedestrians, wheel chairs, mobility scooters etc with appropriate width, gradient and crossfall mindful of the future use of the area.
- Consider alternative, environmentally friendly designs.
- Provide pavements of sufficient strength to cop with design loads for their design life.
- Provide pavements of adequate width, gradient and crossfall to allow ease of passage.
- Provide for stormwater management, landscaping and utility services.
- Minimise noise to a level compatible with the character of the neighbourhood.
- Provide all lots with adequate access compatible with future parking requirements.
- Provide designs that are compatible with the existing environment.
- Comply with the standards, guidelines and other references prescribed in this document.

(iii) Road Safety Audits

All applications for consents or planning approval that have a roading component shall follow the *Transfund New Zealand Road Safety Audit Procedures for Projects Guideline* dated November 2004. In particular the Guideline requires audits at three stages throughout a project, being:

a) Feasibility/Concept and Scheme/ Preliminary Design Stages;

b) Detailed Design Stage; and

c) Post Construction Stage.

This audit requirement shall apply to all applications that involve subdivision with land to be vested in the Council as road, or any land use resource consent involving a vehicle crossing or entrance that accommodates more than 200 vehicles per day. The Council may require audits in other situations where it considers safety may be an issue.

The applicant should take careful note of the experience and suitability of the persons engaged to carry out the audits. If the independent audit team engaged by the developer considers that any stage of the Road Safety Audit is not required, the lead auditor may complete an "Exemption Declaration" as described in the guideline and submit it as part of the application process. The Council may then either accept or refuse the application.

The applicant shall submit the initial Road Safety Audit report at the feasibility/concept stage (if this stage is required) or with their applications for consents, submit the second audit report with their construction drawings and shall submit their final post construction audit prior to being granted the 224 certificate for the development. If a report is provided at feasibility/concept stage, then an updated report may be required at the application for consent stage.

(iv) Construction

Part 3, Roads, of *NZS 4404:2004*, except as modified by the schedule titled ***Schedule 3, Taupo District Council Altered Requirements to Part 3 NZS 4404:2004, Roads***, provide a means of compliance with the Council's requirements.

Alternative specifically designed proposals may be submitted with appropriate engineering information that will enable the Council to assess the viability of the proposal.

D) Stormwater

(i) Objective

The Council's stormwater objective is to provide and manage a public stormwater drainage system in urban areas so that people, property and the environment are protected from the adverse effects of flooding, erosion and water pollution.

(ii) Performance Criteria

A stormwater system proposed for a development shall:

- Meet the relevant standards and criteria of the *District Plan* and the *Regional Plan*.
- Implement industry best practice methodologies to manage and treat stormwater.
- Provide for the collection and/or control of stormwater, allowing for ultimate future development within the catchment or adjoining catchments.
- Meet the requirements of the *TDC Comprehensive Stormwater Discharge Consent*.
- Meet the requirements of any catchment management plans.
- Create a landscape where the design integrates with other aspects of site planning and provides multiple benefits
- Make use of available natural features on site wherever possible including public access, natural character, amenity, aesthetics etc.
- Result in minimal disturbance to natural water systems and receiving environments.
- Result in no increase in rate of runoff off a site in a 10% AEP event.
- Allow for the 1% AEP to be managed via overland flow paths while preventing damage to private property and minimising damage to the flow path.
- Retain pervious surfaces as far as practical.
- Allow for detention and infiltration opportunities. There is an expectation for new developments which vest in TDC to have 'open' systems of ponds with high storage volumes, rather than 'closed' systems of underground soakage areas which rely on high infiltration rates. Note: open systems are easier to maintain, provide treatment even when at capacity and reduce the reliance on high infiltration rates which experience shows are not maintained in the long term.
- Comprise of simple, non-structural, low-tech and low cost methods.
- Be low maintenance and easily maintained
- Be designed in such a way as to minimise health and safety issues

- Protect overland flow paths through appropriate mechanisms. Existing flowpaths on downstream property shall not be altered without agreement

- Shall not be connected to the wastewater system without specific TDC consent

(iii) Design Principles

The design of a stormwater system shall include the following:

- Stormwater drainage systems shall consist of both a primary system to cater for the more frequent rainfall events and a system of secondary flow paths to cater for higher intensity or longer duration rainfall events and occasions when there are blockages in the primary drainage system.

- The primary stormwater drainage system shall be designed to manage stormwater with minimal nuisance effects to adequately cater for the following rainfall events:

    - 10% Annual Exceedance Probability (AEP) (10 year) rainfall event for industrial/commercial areas and residential areas

    - 10% Annual Exceedance Probability (AEP) (10 year) rainfall event for culverts. However culverts may need to be designed up to 1% AEP depending on circumstances. This will be determined on a case by case basis and will be subject to the requirements of the relevant Regional Council. If culvert consents are required these are the responsibility of the developer. For any culverts which vest in TDC the resource consent must be transferred to TDC at the developer's expense, on consent conditions acceptable to TDC, with written confirmation from the consent authority confirming that all conditions have been met and fees are current.

    - 1% Annual Exceedance Probability (AEP) (100 year) rainfall event for all situations where secondary overflow paths are not available

- Secondary flow paths shall be designed to protect public and private property from damage to adequately cater for the full 1% AEP (100 year) flow less an appropriate contribution from the primary drainage system. The contribution from the primary drainage system shall take account of the risk and likely degree of blockage as well as the capacity of the inlets to the system. Allowance for 100% blockage may be necessary in certain situations. Provision of additional capacity in the primary drainage system does not eliminate the need to provide a secondary flow path unless approved by Council

- Detention and/or storage devices may be required as part of a development to mitigate stormwater effects on downstream catchments. Such devices shall make provision for grit and debris entrapment and be designed for ease of maintenance.

- The proposed stormwater system shall be compatible with the existing drainage network and comply with current requirements as identified by the District Plan and the TDC Comprehensive Stormwater Consent.

- The system design shall identify and incorporate downstream improvements required as a result of the proposed works.

- Design methods shall be in accordance with *NZS 4404:2004 Part 4, Stormwater Drainage* as modified by the schedule titled *Schedule 4, Taupo District Council Altered Requirements to Part 4 NZS 4404:2004, Stormwater Drainage* or as otherwise specifically approved by the Council.

(iv) Relevant Information

Applicants are referred to Auckland Regional Council publications, such as their "*Low Impact Design Manual*" and "*Stormwater Management Devices: Design Guideline Manual*". Other references include Metrowater's "*On-site Stormwater Management Manual*" and "*Stormwater Soakage Manual*"; and *Sustainable Urban Drainage Systems* design manuals for countries within the United Kingdom. Other appropriate design manuals may also be used. The New Zealand Water Environment Research Foundation (NZWERF) has compiled a stormwater directory, which can be accessed through the internet.

For design of stormwater systems that utilise natural gully systems to convey, treat and infiltrate stormwater, applicants should refer to "*Revegetation of Taupo Gullies for Stormwater Management*" (November 2005) by Robyn Simcock and Mark Smale, Landcare Research New Zealand Limited.

(v) Construction

Construction of stormwater systems shall be undertaken in accordance with the requirements of Part 4, Stormwater Drainage *of NZS 4404:2004*, except as modified by the schedule titled ***Schedule 4, Taupo District Council Altered Requirements to Part 4 NZS 4404:2004, Stormwater Drainage***, unless otherwise approved by the Council.

Low impact designs and other alternative specific proposals shall have construction details referenced to an appropriate design guide and/or have full construction details provided, with appropriate supporting engineering information.

Reference shall also be made to the *National Code of Practice for Utilities' Access to the Transport Corridors; 2009* published by the NZ Utilities Advisory Group, which has been implemented as Council policy.

E) Wastewater

(i) Objective

The Council is seeking to have reliable, affordable, sustainable and environmentally acceptable wastewater network collection and disposal systems that protect the Community public health and safety, and the environment and which are adequate to meet present and future needs.

Wastewater network systems shall minimise environmental impacts, including pollution of groundwater and waterways and habitats. In particular systems shall minimise the discharge of nitrogen into the environment in accordance with Regional Council requirements. Development of wastewater systems that minimise environmental concerns and are economic to build, operate and maintain will be encouraged.

Where the Council's wastewater network is available to service developments then each lot shall be provided with a connection and each development shall provided a piped wastewater system connecting to the Council's system.

Where no community reticulation is available appropriate treatment and disposal systems shall be provided "on site".

(ii) Performance Criteria

The design of a wastewater network system shall include the following:

Connection to Council systems

- Meet the relevant standards and criteria of the *District Plan* and the relevant Regional Council Plan.
- Provide for the collection of wastewater, allowing for ultimate future development within the catchment or adjoining catchments.
- Minimise Community health and safety related risks.
- Be compatible with the existing wastewater network system and its operation and maintenance.
- Prevent stormwater ingress (inflow and infiltration) into the system and prevent sewage egress out of the system.
- Where the Council wastewater network system is available, provide a connection for each lot.

Private Systems

- On-site systems (where required) are compatible with daily flow, waste water characteristics and soil/site conditions so that effective assimilation of pollutants without exceeding the carrying capacity of the receiving environment is achieved. Onsite systems must be capable on ongoing, sustainable owner management.

(iii) Regional Council Requirements

Taupo District is covered by four regional councils − Hawkes Bay Regional Council, Environment Bay of Plenty, Environment Waikato and Horizons Manawatu.

The discharge of wastewater is governed by rules in the relevant Regional Plan.

Applicants should consult with the relevant Regional Council to determine:

- Whether or not resource consents are required from the Regional Council for the activities they intend to undertake, and
- What conditions must be met to comply with permitted activity rules.

Any Regional Council requirements shall be noted in resource consent applications to TDC.

(iv) Design Principles

The design of a wastewater network system shall include the following:

- Design methods shall be in accordance with *NZS 4404:2004 Part 5, Wastewater* as modified by the schedule titled ***Schedule 5, Taupo District Council Altered Requirements to Part 5 NZS 4404:2004, Wastewater***, or as otherwise specifically approved by the Council.

(v) Private and Public Drains

A private drain (generally 100mm diameter) is a drain which serves one lot, regardless of the number of dwellings on that lot and regardless of whether it traverses adjacent lots. Drains for the general interest of the district as opposed to the particular or personal benefit of one or two individuals or households are generally public drains. Drains with appropriate private easements serving more than one land title will be considered common private drains.

Public drains include:

- Any drain or pipeline which serves more than one lot, except where a common private drain situation applies.
- Any section of drain within the road reserve
- Any drain over which the Council has exercised control for a period of not less than 20 years.
- Any drain so declared under Section 462 of the *Local Government Act*.

(vi) Construction

Construction of wastewater network systems shall be undertaken in accordance with the requirements of Part 5, Wastewater of *NZS 4404:2004*, except as modified by the schedule titled ***Schedule 5, Taupo District Council Altered Requirements to Part 5 NZS 4404:2004, Wastewater***.

Alternative specific proposals may be submitted with appropriate engineering information that will enable the Council to assess the proposal.

Reference shall also be made to the *National Code of Practice for Utilities' Access to the Transport Corridors; 2009* published by the NZ Utilities Advisory Group, which has been implemented as Council policy.

F) Water Supply

(i) Objective

The Council seeks to have a reliable potable water supply to acceptable quality and reasonable quantity standards that will meet the present and future water supply needs of domestic, commercial and industrial consumers in order to protect public health and meet fire fighting water requirements (residential, commercial, industrial), while promoting water conservation.

The Council is looking to reduce consumption to reasonable, sustainable levels using a range of conservation and demand management measures. This is set out in the Council's publication *"Water Supply Strategy: 2008"*

To aid this process Developers are encouraged to look to make efficient use of available water sources within a site through providing for sustainable systems of collection and use of rainwater.

Where the Council's potable water supply network is available to service developments or where Council's *Growth Management Strategy* indicates the extension of reticulation, then each lot shall be provided with a connection and each development shall be provided a piped water supply system connecting to the Council's system, unless alternatives are approved by the Council.

(ii) Performance Criteria

The design of a water supply system shall include the following:

- Be appropriate for the proposed Environment within the *District Plan* (e.g. residential, commercial).
- Be compatible with the operation and maintenance of the existing water network supply system.
- Provide for an adequate water supply that will meet fire fighting (residential, commercial and industrial) needs in accordance with *SNZ PAS 4509:2008 NZ Fire Service Firefighting Water Supplies Code of Practice*.
- Provide for an adequate water supply that will meet domestic needs, commercial and industrial requirements in accordance with *NZ Drinking Water Standards NZDWS2005* and capable of meeting a Ba grading for 'community' supplies and allowing for ultimate future development within the catchment or adjoining catchments.
- Provide adequate and sustainable volumes of water for domestic, commercial and industrial requirements.
- Prevent contamination of the water network supply system.
- Where a Council or community water network supply system is available, provide a connection for each lot.
- Meet the requirements of the Regional Council for the taking of water.

(iii) Design Principles

The design of a water network supply system shall include the following:

Community Schemes (owned/operated by Council or others)

- Design methods shall be in accordance with *NZS 4404:2004 Part 6, Water Supply* as modified by the schedule titled ***Schedule 6, Taupo District Council Altered Requirements to Part 6 NZS 4404:2004, Water Supply***, or as otherwise specifically approved by the Council.

- Pipe sizes shall be based on the design flows required to meet fire fighting and supply requirements.

- The design flows shall be calculated using the design information detailed in Schedule 6.

- The system design shall identify and incorporate improvements required to the existing network as a result of the proposed works. If demand on the system requires use of the Council's water reticulation model to ascertain effects, then this will be at the cost of the applicant.

- Where community schemes are to be owned and/or operated by entities other than Council the applicant will be required to demonstrate that there is a structure in place that can provide for the ongoing ownership, operation, maintenance, monitoring and compliance, consenting, system renewal and funding of the scheme in a sustainable manner over the life of the system.

On-site Individual Water Supply

- On-site water supply systems shall be specifically designed. The focus of the design shall be on the efficient and safe use of water resources within a site. The water system proposed shall result in minimal disturbance to the site and natural water systems.

  Applicants are referred to the Ministry of Health's *"Household Water Supplies" (1995)* which provides guidelines on the selection, operation and maintenance requirements of individual household water supplies.

(iv) Relevant Information

The Council holds significant information concerning the existing systems. Developers should approach the Council and obtain any information held that may be relevant to their proposed development.

(v) Pumping Stations and Reservoirs

A development may require the construction of booster pumping stations and/or storage in order to comply with requirements. Where these are required, the Council's Infrastructure Engineer shall be consulted on the specific requirements and shall be provided at the entire expense of the developer. If properly designed and constructed to the Council's approval, the Council may take over their future ownership, operation and maintenance after they have been commissioned. In some situations a financial contribution to cover future operation, maintenance and replacement costs may be required. Design shall be carried out by suitably qualified persons.

(vi) Construction

Construction of water supply network systems shall be undertaken in accordance with the requirements *of Part 6, Water Supply* of *NZS 4404:2004*, except as modified by the schedule titled ***Schedule 6, Taupo District Council Altered Requirements to Part 6 NZS 4404:2004, Water Supply*.**

Alternative specific proposals may be submitted with appropriate engineering information that will enable the Council to assess the proposal. Rainwater harvesting is encouraged by TDC in order to reduce water demand. No cross-connections with public potable water supply will be permitted.

Reference shall also be made to the *National Code of Practice for Utilities' Access to the Transport Corridors; 2009* published by the NZ Utilities Advisory Group, which has been implemented as Council policy.

G) Landscaping

(i) Objectives

The landscaping of public open space as part of a subdivision or development has a number of potential environmental and social benefits. These include improved amenity values, definition of open space and neighbourhoods, improved soil stability and erosion control, amelioration of stormwater flow, improvements to water quality, provision of shade in summer, mitigation of noise and light, and creation of habitat amongst others.

However, landscaping also has potential negative effects on services, sightlines, paths and kerbs, and neighbouring properties. Therefore landscaping of public open space will be controlled through this Code of Practice and the *Taupo District Council Tree and Vegetation Policy*. Landscaping of private open space is generally required for mitigation purposes as a condition of consent and will be managed through the consent process, but may use the COP as a guideline for acceptable standards.

Landscaping is a requirement of any subdivision or development that results in the provision of additional road or reserve. This Code of Practice contains objectives, performance measures and a schedule of Taupo variations to the *NZS4404* that will apply to landscaping of public open space where assets are to be transferred to Council.

The objective of landscaping is to:

- create an attractive and functional open space environment.
- define and enhance neighbourhood character.
- improve environmental outcomes.

(ii) Performance measures

Developers are encouraged to undertake landscaping within their developments that will provide an interesting and varied living environment which is attractive to residents and visitors. As a minimum, developers are required to:

- Meet the relevant standards and criteria of the *District Plan*.
- Meet the requirements of the *Taupo District Council Tree and Vegetation Policy*.
- Submit to the Council for approval a comprehensive landscape plan where new roads are created or existing roads extended, and where required for reserves.
- The comprehensive landscape plan shall consider the existing neighbourhood amenity and character of the surrounding streetscape, and the whole of life maintenance costs of the proposed landscaping.
- Provide suitable species for Taupo environmental conditions.

- Provide landscaping that is safe and suitable for its purpose, and does not create long term liabilities for Council as owner or problems for neighbouring landowners in terms of root damage, wildling trees, suckering, excessive winter shade, weed growth, high maintenance and replacement costs etc.

- Consider long term water requirements and provide landscaping that does not rely on irrigation post-establishment.

- Complete the landscaping work in accordance with the approved landscape design.

Other landscaping and plantings may be required for specific locations e.g. riparian planting in ephemeral watercourses, wetlands and adjacent to water bodies.

(iii) Construction

Landscape design and implementation shall be in accordance with *NZS 4404:2004 Part 7, Landscaping Design and Practice* as modified by the schedule titled ***Schedule 7, Taupo District Council variations to Part 7 NZS 4404:2004, Landscaping Design and Practice***, or as otherwise specifically approved by Council.

Alternative specific proposals may be submitted with an appropriate assessment and an explanation of how the proposal will meet the Objectives and Performance Measures specified.

H) Reserves

(i) Objectives

The provision of new reserves as part of a subdivision or development has a number of potential environmental, social, cultural and economic benefits. These include:

- settings for active and passive recreation;
- improvement of amenity values through provision of open space and landscaping;
- opportunities for cultural activities including sports, performing arts, music etc;
- conservation of wildlife habitat;
- access to waterways and other public open spaces;
- attenuation of peak stormwater flows; and
- opportunities for commercial recreation venues and activities.

There are three main mechanisms for acquisition of reserves.

- As a condition of consent e.g. for stormwater mitigation;
- Esplanade reserves set aside in accordance with Section 230 of the *Resource Management Act 1991*; and
- In accordance with Council's *Development Contributions Policy*.

In the latter case, the contribution for reserves purposes is generally taken as a cash contribution but may be used to purchase land from within the development (and elsewhere) and fund some of the development costs of that land.

This Code of Practice contains objectives, performance measures and a schedule of Taupo variations to *NZS4404:2004* that will apply where reserves are vested in Council as a result of subdivision or development.

The objectives of the COP with respect to reserves are to:

- Provide a network of reserve land of suitable topography, location and standard to meet the needs of the community.
- Create attractive, functional open spaces that are fit for their intended purpose and classifications.
- Improve environmental and social outcomes.

(ii) Performance measures

Developers must consider the requirement for reserves that will meet the needs of the community. As a minimum, developers are required to:

- Consult with the Reserves Planning Manager about reserve requirements where subdivisions or developments:
    - are located adjacent to water bodies; **or**
    - are located adjacent to existing reserves; **or**
    - create more than 15 new household units; **or**
    - are located in an urban environment or result in the creation of an urban environment **and** are 1 hectare or more in extent or are located more than 800m from the closest neighbourhood reserve;
- Identify all proposed reserve areas on preliminary subdivision plans. Reserve areas must be given the correct classification and purpose for their intended function prior to the approval of subdivision plans for deposit.
- Meet the requirements of the *Taupo District Reserves Strategy* and *Development Contributions Policy*.
- Meet the requirements of the RMA and *District Plan* with respect to esplanade reserves.
- Ensure that any areas of reserve vested in Council to mitigate adverse environmental effects are suitably designed and developed to achieve the outcomes intended.
- Develop reserves to a condition that will allow immediate use, and that can be maintained to a suitable standard without further work. This will include adequate control of plant pest species (as defined by Regional Councils). For reserves that include areas of grass, the grass sward must be a closely grown mix of suitable turf species with an average 97% cover (fewer than three 10cm square bare patches per m^2), and a maximum 10% of acceptable weed species.

(iii) Construction

Provision of reserves shall be in accordance with *NZS 4404:2004 Part 8, Reserves* as modified by the schedule titled ***Schedule 8, Taupo District Council variations to Part 8 NZS 4404:2004, Reserves***, or as otherwise specifically approved by Council.

Alternative specific proposals may be submitted with an appropriate assessment and an explanation of how the proposal will meet the Objectives and Performance Measures specified.

I) Power, Telecommunications, Gas

(i) General Requirements

- Subdivisions and developments are required to be serviced with electric power, telecommunications and, where applicable, gas reticulation. These services are generally to be provided by an appropriate network utility operator.

- All urban services shall be underground unless otherwise authorised by the Council. In rural areas the Council may require services to be underground (for example in a hamlet situation). Otherwise overhead reticulation is acceptable.

- The Council may consider proposals for alternative means of providing electrical and telecommunication services where conventional systems are either not viable or are not the most appropriate method of service provision, usually in rural areas. The Council's approval for any alternative proposals should be sought prior to seeking resource consent approval.

- Where a community based system is used, a compliance certificate shall be provided once the system is properly installed. This shall contain: system type, system performance, operation and maintenance requirements, as built drawings, operating manuals, asset management plans, a life cycle analysis, system monitoring and reporting requirements.

- In some very isolated areas where it is unlikely that electric power and/or telecommunication services will be required, the Council may agree that these services need not be provided.

(ii) Performance Criteria

All utility installations shall:

- Comply with the appropriate industry standards and Code of Practice.

- Provide an individual connection to each separate site.

- Be laid underground in all residential, commercial, town centre and industrial streets

(iii) Construction

Design and construction shall be in accordance with *NZS 4404:2004 Part 9, Power, Telecommunication, Gas* as modified by the schedule titled ***Schedule 9, Taupo District Council Altered Requirements to Part 9 NZS 4404:2004, Power, Telecommunication, Gas***, or as otherwise specifically approved by the Council.

Reference shall also be made to the *National Code of Practice for Utilities' Access to the Transport Corridors; 2009* published by the NZ Utilities Advisory Group, which has been implemented as Council policy.

SCHEDULE 1

TAUPO DISTRICT COUNCIL

ALTERED REQUIREMENTS TO

PART 1 NZS 4404:2004 GENERAL REQUIREMENTS AND PROCEDURES

The Taupo District Council has adopted Part 1 of *NZS 4404:2004* with the following additions and/or alterations:

1. **Clause 1.5.1** *Documents to be submitted for design approval*

   - The Council requires the documents listed in paragraphs 1.5.1.1 (a) to (d) inclusive to be submitted along with the documentation outlined in Part 2 Section D of this Code.

   - Two copies of preliminary drawings, specifications and calculations shall be supplied to the Council printed at full scale. One set will be returned to the applicant when these have been checked by Council staff with any required amendments endorsed on the plans and specifications. These check prints shall be preserved intact and returned to the Council when the required amendments have been completed, along with two copies of the amended set of plans and specifications. Drawings shall be provided in PDF electronic format also

2. **Clause 1.5.4** *Approval of design*

   - Add to the existing paragraph 1.5.4.1

     In order to expedite the commencement of works, design approval in principle may be applied for prior to the granting of a resource consent. However design approval will not be given until after a resource consent is granted.

     Officer time spent will be charged for design check and inspections in accordance with Council's fees and charges policy and is payable prior to issue of completion certificate.

3. **Clause 1.5.6** *Supervision of work*

   - The Council requires completion certificates in the form given in schedules 1B and 1C.

4. **Clause 1.5.8** *Testing*

   - Add the following

     The Developer's Representative shall arrange and undertake all testing necessary to enable him to certify the works upon completion. The Engineer shall be kept informed of progress on the works and shall be granted access to the site at any time to view progress and witness any testing.

     The Engineer shall be notified of the commencement of various stages of the work and given the opportunity to inspect the work before construction advances beyond:

     i) commencement of earthworks;

ii) prepared sites prior to filling;
iii) subgrades prior to the spreading of basecourse and/or footpath and access construction;
iv) finished basecourse;
v) prepared basecourse prior to surfacing;
vi pipe-laying before backfilling.

A final inspection will be undertaken by the Engineer upon completion of the works at which time the work shall have advanced to :

i) roading and verge development completed with carriageways swept and all 'street furniture' in place;
ii) grass established and mown;
iii) all drainage works completed with pipes and/or structures clean and tested;
iv) all water mains tested, flushed and livened;
v) 'as built' plans and certification submitted.

Before any work is accepted into the public portfolio, it shall be :

I) essentially complete with any deferment of uncompleted work subject to a bond; bond form is to be that as included in this Code of Practice or any other form as approved by Group Manager Infrastructure and Parks;
ii) under an enforceable maintenance agreement to remedy any defect or complete outstanding works;
iii) complete with any 'third party' consents.

5. Clause 1.5.9 *Maintenance*

- Replace the existing clause with the following.

The developer shall maintain the works until they are formally taken over by the Council. Formal takeover is the date when the Council issues the Section 224(c) certificates, or such other earlier date as may be agreed by the Council. For uncompleted works covered by a bond the developer shall maintain the works until a date specified in the bond or, if earlier than such date, the works are completed to the satisfaction of the Council.

Unless stated otherwise in the engineering approval, a defects liability period of three months from formal takeover by the Council shall apply, except for sealed surfaces, mechanical plant and landscaping which shall have a defects liability period of 12 months. However the developer shall not be responsible for damage caused by other activities, such as building construction on completed sections, or for fair wear and tear caused by public use.

6. Clause 1.6.1 *Uncompleted works bonds*

- Where agreed by Council, the amount of any bond under paragraph 1.6.1.3 is 200% of the estimated value of the uncompleted work. GST shall be allowed for. The bond form is to be that as included in this Code of Practice or any other form as approved by Group Manager Infrastructure and Parks.

7. Schedule 1D *As built plans*

The Council requires the detail outlined in the schedule. A DXF file of the line work contained in each as built in terms of either the local Cadastral Circuit or New Zealand Transverse Mercator Coordinate system shall be supplied. The Linework shall be contained within the minimum number of logically named layers in the DXF file.

Add the following to (j) road construction: the location and extent of any geothermal ground plus details of any venting system, Benkelman beam and CBR test results.

In addition to this the following is required.

(l) compliance certificates for street lighting design and installation.

As built plans for the 3 waters (stormwater, water and wastewater) shall comply with the following requirements:

7.1 As Built Data Requirements

This section outlines the data requirements of Asbuilt Information for asset managers.

There are 3 basic requirements:

- Hardcopy Plan
- Digital Plans
- Attribute Information

HARDCOPY PLAN

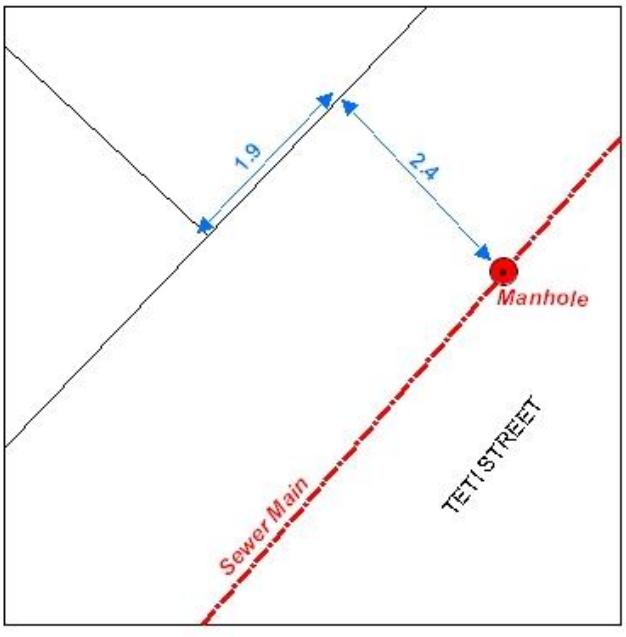
- An as-built plan is required to be submitted
- Long section plans have also been requested by the asset managers for Stormwater and Sewer pipe lines. They allow easier visualisation of the pipe networks.

Each plan should show:

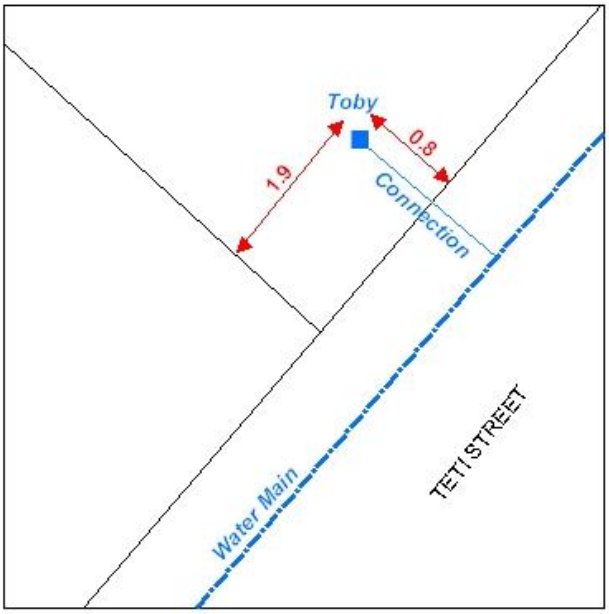
- All Assets (stormwater, water or sewer network) on *separate* hardcopy plans
- Property Boundaries
- Kerblines
- Lot Numbers / Legal Descriptions (if known)
- Street Names (if known)
- Basic Annotation of Detention Ponds, Reservoirs
- Dimensions (if no digital plans submitted)

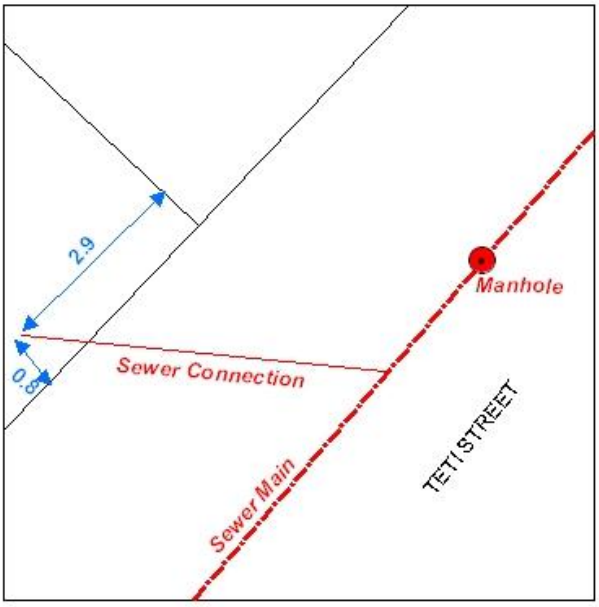
Dimensions

- *Manholes, inlets* and *outlets* must have 2 dimensions to boundaries shown. The preferred method of dimensioning is to use distances to and along boundaries. Dimensions should be taken from the centre of the manholes and cesspits.
- *Water valves, tees* and *hydrants* should have 1-2 distances to the nearest boundaries. Enlarged schematic diagrams are also necessary when the asset locations are not clear.

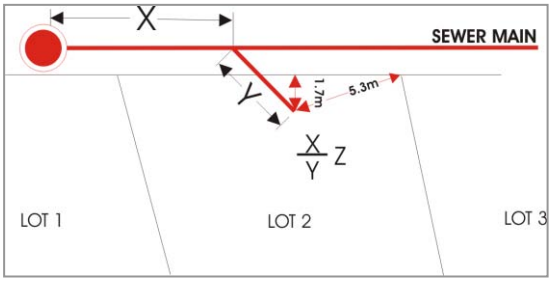


- *Water connections (tobies), Stormwater connections* and *Sewer connections* must have distances to the nearest 2 boundaries shown. When the property boundaries are curved, distances to the face of the kerb and the distance to the nearest corner boundary must be shown instead. Kerb lines must be displayed on water asbuilt plans if dimensions from the kerb are used.





- *Sewer* and *Stormwater* connections must also have the running distance to downstream manhole, length of connection and the depth of the connection. Note that connections which come straight off a manhole will have a distance of 0.0 for the running distance to the downstream manhole.



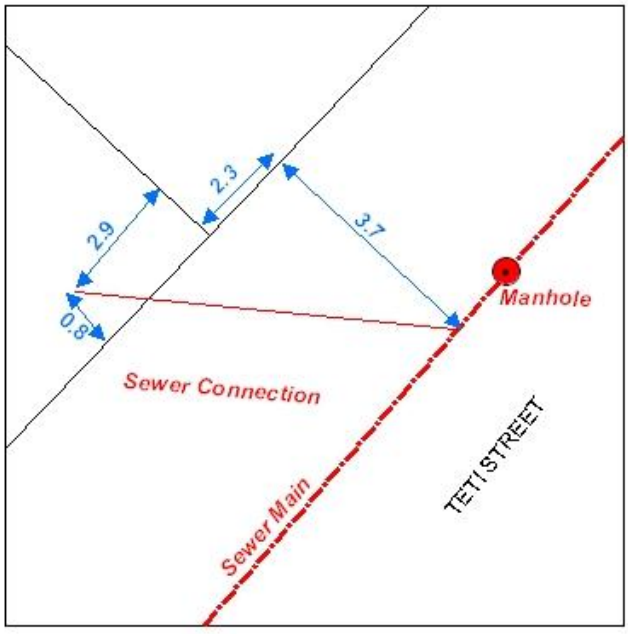
WHERE **X = Distance from downstream manhole**

Y = Length of Connection

Z = Depth of Connection

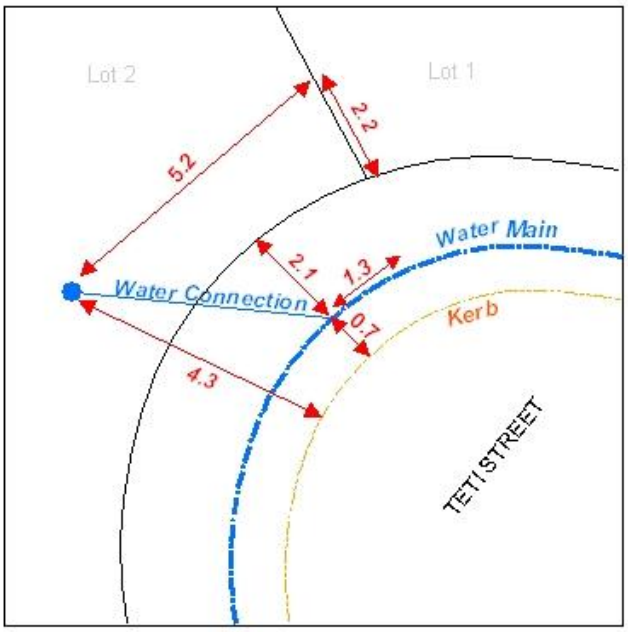
- *Water mains* should have a general offset from the boundaries displayed.

- If a *water or sewer connection* does not run perpendicular to the water main (by more than 100mm), dimensions showing where the connection meets the water main are required.



- Distances to *kerbs* should also be shown for *properties with curved boundaries*.
  Dimension required on curved boundaries are:

  - main to kerb (e.g. 0.7m)
  - main to boundary (e.g. 2.1m)
  - connection to kerb (e.g. 4.3m)
  - connection to boundaries (e.g. 5.2m to right boundary and 2.2m inside front boundary)
  - 2 boundaries to where the connection meets the water main (e.g. 2.1m outside front boundary and 1.3m to right boundary)



- If a feature cannot be easily dimensioned from a boundary, coordinates (preferably NZTM) can be supplied as an alternative to dimensions.

DIGITAL PLANS

A digital plan of the services assets is also required in addition to the hardcopy version of the plan as it that can be imported directly into the GIS. The digital plan may be in the format of a DXF file, XML, TXT or excel spreadsheet, however the network must be allow the following factors:

- A separate network is required for water, stormwater and sewer services
- All point assets, pipe mains, water tobies and service connections must be shown in the network file
- Each pipe shall be represented by a single line i.e. the pipe centreline.
- Each pipe shall run continuously between point assets such as inlets, manholes, nodes, valves, pump stations, backflow preventors (& broken into new pipes at these point assets). Note that in the case of water assets, this may produce some very small pipes (eg Valve to Tee).
- Each pipe shall be captured in the direction of flow (water mains are not required to be captured in the direction of flow however a logical sequence is desired)
- All lines must be "snapped" to point features where applicable e.g. stormwater pipes snap to stormwater manholes so the pipes meet up exactly with the point features.

ATTRIBUTE INFORMATION

Attribute information must be supplied. The necessary attributes have been defined below.

The assets are split into point and pipe features where point features are Manholes, Nodes, Valves, Hydrants, Inlets, Pump Stations, Meters and Backflow Preventors and Tobies.

The attributes that are required for each point feature are listed below. Not all attributes are required for all features and this is shown in the field 'When is it required?'

POINT FEATURES:

X Coordinate: X Coordinate, Supplied in NZTM, GD2000.

When is it required? Mandatory for **all point features.**

Y Coordinate: Y Coordinate, Supplied in NZTM, GD2000.

When is it required? Mandatory for **all point features.**

Point_ID: A Point ID is a unique ID which must be assigned to each point asset. This will later be converted into a UNITID.

When is it required? Mandatory for **all point features.**

Code: The asset code for each point is taken from the following table.
When is it required? Mandatory for **all point features.**

ASSET	COMMENT	CODE
Manhole	Includes standard manholes and lampholes. Applicable for Sewer and Stormwater Only.	MH
Node	Includes Bends (45° and more), end points, blank end caps, reducers, tees, junctions, change in diameter / material or age, soakholes, outlets,	ND
Fire Hydrant	Applicable for Water Only	HY
Valve	Applicable for Water and Sewer Only	VL
Inlet	Applicable for Stormwater Only	IN
Backflow Preventer		BF
Water Meter	Applicable for Water Only	MT
Pump Station	Applicable for Sewer and Water Only	PS
Toby	Applicable for Water Only	TB

Type: The asset type for each point is taken from the following table.

When is it required? Mandatory for **manholes, nodes, valves, inlets, back flow preventors, meters** and **hydrants**.

Code	Asset	Description	Type
MH	**Manhole**	Manhole	MH
		Lamphole	LH
		Manhole with an inlet	MHCP
ND	**Node**	45° bend in a pipe	45BEND
		90° bend in a pipe	90BEND
		A Bend in a pipe (>45°) other than 45° and 90°	OTHBND
		End point in a pipe	ENDPT
		Blank End Cap	BEC
		Reducer	REDUCE
		Tee intersection of pipes	TEE
		Other Intersection of pipes	JUNC
		A change in a pipes diameter	CHGSIZ
		A change in a pipes material	CHGMAT
		A change in a pipes age	CHGAGE
		Stormwater Soakhole (not private)	SKH
		Outlet	OUTLET
		Elongated GIB	ELONG
FH	**Fire Hydrant**	Tall fire Hydrant (standard)	TALL
		Squat Hydrant	SQUAT
		Unknown	UNKNWN
VL	**Valve**	Air Release Valve (sewer & water only)	AIR
		Bleed Valve	BLEED
		Butterfly Valve	BUTFLY
		Gate Valve (<75mm)	GATE
		Sluice Valve (>=75mm)	SLUICE
		Motorised Valve (sewer & water only)	MOTOR
		Pressure Release Valve (water only)	PRV
		Scour Valve (water & sewer only)	SCOUR
IN	**Inlet**	Cesspit	CP
		Double Cesspit (represented as one feature, not two)	DBCP
		Wing wall intake	WW
		Stormwater Inlet	INLET

Code	Asset	Description	Type
IN	**Inlet**	Cesspit	CP
		Double Cesspit (represented as one feature, not two)	DBCP
		Wing wall intake	WW
		Stormwater Inlet	INLET
BF	**Backflow Preventer**	Air Gap	AIRGAP
		Double Check Valve (sewer & water only)	DCV
		Single Check Valve (sewer & water only)	SCV
		Siphon Breaker (sewer & stormwater only)	SYPHON
		Reduced Pressure Zone (stormwater & water only)	RPZ
MT	**Water Meter**	Bulk	BULK
		Commercial	COMM
		Industrial	INDUST
		Residential	RESID
		Magflow	MAGFLO

Lid Level: Reduced Level of **manhole** or **inlet** cover in meters.

When is it required? Lid levels are required for all **manholes** and **inlets (Sewer and Stormwater** only).

Diameter: Diameter of asset in millimetres. Only use numbers in this field. For example, for a 1050mm diameter manhole, type 1050 rather than 1050mm.

When is it required? Diameters are required for all **manholes, valves, hydrants meters** and **backflow preventors***.*

Depth: Depth of asset in metres (2 decimal places).

When is it required? Depths are required on **all manholes, inlets** and **tobies**.

Serial Number: Serial Number of a **water meter**.

When is it required? Mandatory for all new **water meters** only.

Restrictor Size: Size of restrictor on **water meter** in Litres/min.

When is it required? Mandatory for all new **water meters** only.

Flow Test: **Hydrant** flow test in Litres/Second.

When is it required? Mandatory for all newly installed **water fire hydrants** only.

Contractor: Contractor of work – taken from the following table.

When is it required? Mandatory for **all point assets.**

Contractor	Contractor Code
Advance Civil	ADVANC
Aqua Tidwell	AQUA
Midland Civil (Formerly Greg Lamb)	LAMB
HEB Contractors	HEB
E & J Contractors	EJ
Hick Brothers	HICK
Fulton Hogan	FH
Downer EDi Works	WORKS
Barry Mayhill Contracting	MAYHIL
John Frew	FREW
Land Management Services	LANDMS
Merkel Engineering LTD	MERKEL
Treesap LTD	TREE
Hartley Seay & Sons LTD	HARTSS
Other	OTHER

NOTE: if a particular contractor is not in the code table, assign the Code OTHER and in the Notes field give the name of the contractor.

Manufacturer: Manufacturer of asset. STILL TO BE DEFINED Will most likely be required for valves and meters.

Installation Date: Date of Installation of Asset. Format for Date is to be DD/MM/YYYY. If exact day in a month is unknown just use the first day of the month.

When is it required? Mandatory for **all point assets.**

Notes: Any comments about the asset. Examples include '40 on 100 tee', 'manhole has irregular chamber' etc..
When is it required? Necessary in **unusual circumstances**, or when **additional comments** may help to describe an asset. If a contractor or manufacturer field is given the code of OTHER, the name of the contractor/manufacture must be put in the notes field. The material of BENDS should also be included in the notes field.

PIPE TABLE

From_POINT_ID: The ID of the point asset from which the pipe starts at (the upstream end of the pipe) (eg S1). *This is based on the direction of flow for sewer and stormwater. With water pipes there is no set direction of flow, so just assume a direction of flow, and label accordingly*. This will later be converted into a UNITID1.

When is it required? Mandatory for **all pipes**.

To_POINT_ID: The ID of the point asset from which the pipe finishes at (the downstream end of the pipe) (eg S2). *This is based on the direction of flow for sewer and stormwater. With water pipes there is no set direction of flow, so just assume a direction of flow, and label accordingly*. This will later be converted into a UNITID2.

When is it required? Mandatory for **all pipes**.

CODE: The asset code for each pipe main is always "PP". For Connections the codes are
WC = Water Connection
SC = Sewer Connection
SWC= Stormwater Connection

When is it required? Mandatory for **all pipes.**

TYPE: The asset type for each pipe is taken from the following table.

When is it required? Mandatory for **all pipe mains.**

Pipe	Description	TYPE
Water Pipe	Reticulation Main	RETIC
	Rising Transfer	RISTRF
	Rider	RIDER
	Inlet	INLET
	Overflow	OFLOW
Sewer Pipe	Gravity Main	MAIN
	Rising Main	RISING
	Syphon Main	SYPHON
	Main Interceptor	MI
	Overflow Pipe	OFLOW
Stormwater Pipe	Trunk Main	TRUNK
	Rising Main	RISING
	Cesspit Lead	CPLEAD
	Inlet Main (normally a pipe from a manhole debris riser into reticulation network)	INLET

Diameter: Diameter of asset in millimetres. Only use numbers in this field. For example, for a 100 diameter pipe, type 100 rather than 100mm.

When is it required? Mandatory for **all pipes**.

Material: The type of material the pipe is made out of and is taken from the following table.

When is it required? Mandatory for **all pipes**.

Material Description	Material Code
Asbestos Cement	AC
Brick	BRICK
Cast Iron	CAST
Concrete Lined Spiral Wound Steel	CLSWS
Concrete	CONC
Earthenware (Ceramic)	EW
Galvanised Iron	GALV
High Density Polyethylene	HDPE
Hel-Cor	HELCOR

Medium Density Polyethylene	MDPE
Modified Poly Vinyl Chloride	MPVC
Novaflo	NVAFLO
Polyethylene	PE
Perforated Fibrolite, Soakage and Drainage	PERF
Polyvinyl Chloride	PVC
Reinforced Concrete	RC
Spiral Wound, Ribbed, uPVC pipe	RIBLOC
Steel	STEEL
Stainless Steel	STSTE
Galvanised Steel Tube	STGWI
Unplasticised Polyvinyl Chloride	UPVC
Other	OTHER

NOTE: if a particular pipe material is not in the pipe type table, assign the Code OTHER and in the Notes field give the name of the pipe type.

Class: The pipe class for a pipe.

When is it required? Pipe Class is required on **all pipes**.

Class Description	**Class Code**
SN8	SN8
PN6 or Class B	PN6
PN9 or Class C	PN9
PN12 or Class D	PN12
PN15 or Class E	PN15
Class F	F
Class X or Class 1	1
Class Y or Class 2	2
Class Z or Class 3	3

Joint: The type of Joint on a pipe.

When is it required? Mandatory for **all pipes mains**.

Joint Description	Joint Code
Rubber Ring Jointed	RRJ
Flush Jointed	FJ
BUTT	BUTT
Ceramic Mortar	CMORTR
Fusion Welded	FUSION
Gibault	GIB
Glue Joint	GLUE
Sleeved	SLEEVE
Solvent	SOLVNT
Tap	TAP
Welded	WELD

Invert In: Invert Level at the upstream end of a pipe. This field is *not required for water assets.*

When is it required? Mandatory for **all sewer and stormwater pipe mains** (including cesspit leads).

Invert Out: Invert Level at the downstream end of a pipe. This field is *not required for water assets.*

When is it required? Mandatory for **all sewer and stormwater pipe mains** (including cesspit leads).

Depth: Depth of asset in metres.

When is it required? Depths are required on **all water pipe mains**.

Slope: Slope of asset (preferably as a percentage).

When is it required? Slopes are required on **all pipe mains**.

Design Flow: The expected flow in the pipe system for the design storm event, in m^3/ sec. This field is *not required for water or sewer assets.*

When is it required? Design flow is required on **all stormwater pipes of type TRUNK.**

Capacity: The total flow for a section of pipe in m^3/ sec. This field is *not required for water or sewer assets.*

When is it required? Design flow is required on **all stormwater pipes of type Trunk**.

Bedding: Bedding material under asset. See the TDC code of practice for details on each bedding types.

When is it required? Mandatory for **all pipe mains.**

Bedding Type	Bedding Code
Type A (stormwater only)	A
Type B (stormwater only)	B
Type C	C
Type D (stormwater only)	D

Contractor: Contractor of work.

When is it required? Mandatory for **all pipe mains.**

Contractor	Contractor Code
Advance Civil	ADVANC
Aqua Tidwell	AQUA
Midland Civil/Greg Lamb Ltd	LAMB
HEB Contractors	HEB
E & J Contractors	EJ
Hick Brothers	HICK
Fulton Hogan	FH
Downer EDi Works	WORKS
Barry Mayhill Contracting	MAYHIL
John Frew	FREW
Land Management Services	LANDMS
Merkel Engineering LTD	MERKEL
Treesap LTD	TREE
Hartley Seay & Sons LTD	HARTSS
Other	OTHER

Note: if a particular contractor is not in the code table, assign the Code OTHER and in the Notes field give the name of the contractor.

Manufacturer: Manufacturer of asset.

When is it required? Mandatory for **all pipe mains.**

Manufacturer	Manufacturer Code
Iplex Pipelines	IPLEX
Marley LTD	MARLEY
Keyplas LTD	KEYPLA
Prebensen Pipelines (Tyco Group)	PREBEN
Humes	HUMES
Naylor	NAYLOR
Waters & Farr	WATER
Hynes	HYNES
Other	OTHER

Installation Date*:* Date of Installation of Asset. Format for Date is to be DD/MM/YYYY. If exact day in a month is unknown just use the first day of the month.

When is it required? Mandatory for **all pipes.**

Notes: Any comments about the asset. Examples include 'Drain for hot spring', 'storage line'. 'pipe runs along bridge under concrete panels in footpath' etc.
When is it required? Only necessary in **unusual circumstances**, or **when additional comments may help** to describe an asset. If a contractor, manufacturer or pipe type field is given the code of OTHER, the name of the contractor/manufacturer must be put in the notes field.

8. Additional Requirements

- **Emergency Works**

  If during the course of the development, any situation arises associated with the development whereby, in the opinion of the Council, public safety, the security of public or private property, or the operation of any public facility or ecological site is endangered, the developer shall immediately carry out such remedial measures as the Council requires to remove the danger. Any work so required shall be at the expense of the developer.

  If such emergency works are not immediately carried out, the Council may arrange for the necessary remedial work to be carried out and charge the developer the cost for carrying out the works.

- **Damage To Existing Roads, Services And Property**

  All damage to existing roads, services or private property, or any disturbance of survey boundary marks due to or caused by any new works, shall be the liability of the developer. All damage must be repaired by the developer immediately following instructions from the Council. If such remedial works are not commenced within twenty four hours, the Council may arrange for the necessary work to be carried out and charged to the developer. This provision includes the removal of mud and debris from existing roads in the vicinity of the development. A daily removal of such debris may be necessary in the interests of traffic safety.

  In any situation where the Council considers that damage to existing roads, services or private property constitutes a risk or potential risk to the safety, of road users, pedestrians or other persons, the developer shall immediately repair the damage or otherwise abate the hazard or potential hazard.

- **Safety**

  Temporary fencing and warning signs shall be erected in accordance with the Health and Safety Plan to protect site personnel and the general public, particularly children, from all hazards associated with the development. All fences and warning signs shall comply with Occupational, Health and Safety requirements.

- **Final Valuations for the Council's Asset Register**

  An itemised schedule of quantities and costs shall be provided for those services and assets which are to vest in the Council.

  Where the work has been built by an independent contractor the work *Schedule of Prices*, modified to represent the work as built and complete with the market unit rates, will be considered a current market valuation.

  Where the work has not been undertaken by an arms length contractor (i.e. by own staff) the valuation shall be provided by a suitably qualified person in the form of a Schedule of Works as built, priced at current commercial market rates as assessed by the suitably qualified person.

  The Schedule shall take the following form:

Item description	**Unit**	**Quantity**	**Rate $/Unit**	**Amount $**

- **Easements**

Easements will be required where :

i) any public water or drainage reticulation is laid outside of the road reserve;
ii) any private reticulation crosses any adjacent private land;
iii) any utility reticulation is laid [or crosses above ground] outside of the road reserve.

Easements shall be :

i) of sufficient width and appropriately worded to allow all necessary access for construction and maintenance;
ii) suitably worded to prohibit building over and/or the erection of structures within an easement;

iii) in favour of the reticulation owner.

Easements over public services shall be easements in gross and of minimum width 3m or the depth of the service whichever is the greater.

Easements shall be shown on the land transfer title plan and documentation shall be prepared by solicitors at the Developer's expense. Draft easement documentation will require Council approval.

- **Insurance**

Where any part of the development is to be undertaken outside of any land owned by the Developer, there shall be in place a public liability insurance which jointly indemnifies the Council, the Developer and the contractor for a minimum sum of two million dollars [$2,000,000.00]. Such policy shall remain in force for the entire duration of the development.

Included in the policy shall be :

i) a cross liabilities/joint insured clause;

ii) indemnity against vibration from construction machinery;

iii) all insurable risks normally applicable to land development.

SCHEDULE 2

TAUPO DISTRICT COUNCIL

ALTERED REQUIREMENTS TO

PART 2 NZS 4404:2004 LAND STABILITY, FOUNDATIONS AND EARTHWORKS

The Taupo District Council has adopted Part 2 of *NZS 4404:2004* with the following additions and/or alterations:

1. Clause 2.3.2 (b) *Preliminary Site Evaluation*

- Note that the local requirements include that reference shall be made to Council hazard register information.

- Add further clause

2.3.2 (c) Particular attention may need to be given to:

a) any tomo formations

b) signs of current or past geothermal activity or tectonic movement

2. Clause 2.7 *Compaction standards for fill material*

Replace with the following:

2.7.1 Compaction standards

During the construction of earth fills regular testing for some [or all] of the following should be made:

i) water content;
ii) in situ density;
iii) maximum dry density;
iv) plasticity;
v) such other tests as may be specified by the Soils Engineer.

The minimum frequency of testing shall generally be one for each 1000m3 or 300mm lift of fill. Testing should be more frequent:

i) during the first 4000m^3 of filling carried out on the project;
ii) on the final layer of not less than 1.0m depth;
iii) when soil type or conditions alter.

Minimum standards of compaction shall be as follows. Higher standards may be necessary to achieve the specified site bearing strength or road subgrade deflections.

i) fill should be compacted to at least 95% relative compaction;
ii) all samples to be not less than 90% of NZ Standard Compaction;

iii) testing by SCALA Penetrometer at 100mm below newly rolled and compacted surface shall achieve the minimum of [per 300mm penetration] :

Roadways :	- 300mm below subgrade	30 blows
	- 300mm to 800mm	20 blows
	> 800mm -	15 blows
Residential Land :	-	12 blows

Note: SCALA Testing is not always representative in non-cohesive soils and may not be accepted as a testing method unless calibrated for the site conditions. SCALA is best used as a tool for comparing sites within the same earthworks area.

iv) testing by Clegg Impact Test at 100mm below newly rolled and compacted surface shall achieve the minimum hammer readings of :

Roadways :	300mm below subgrade	15
	300mm to 800mm	11
	>800mm	10
Residential Land :		10

Where testing shows the compaction achieved in the field to be below the specified minimum, all material represented by the test should be further compacted or removed and replaced as necessary.

- **2.7.2 Exemption from compaction standards**

Where the area of the fill is less than 250 square metres and/or the depth does not exceed 300mm, the requirements for testing need only apply to land within the road reserve.

In reserve areas and other areas not required to support buildings or services, the Engineer may allow lesser standards, provided that the area of such low strength fills shall be identified and recorded on the property title.

Stormwater reserves and areas that are intended to allow soakage of stormwater must be treated to avoid or remedy compaction.

3. Clause 2.8 *Erosion, sediment and dust control*

- Add further clauses

2.8.3 *Erosion and sediment control*

Developers shall apply the appropriate recommended treatments outlined in the relevant Regional Council standards and guidelines.

- Add further clauses

2.8.4 *Dust control*

Consideration should be given to earthworks outside of the dry summer period to avoid dust issues.

4. Clause 2.11.2 *As built drawings for earthworks and drainage*

- This clause applies for all earthworks situations.

5. Additional Requirements

- An Earthworks Management Plan (EMP) that addresses all potential adverse effects of the proposed earthworks shall be submitted with any consent application covering earthworks. As a minimum, the EMP will need to address at least the following matters:

1. Windblown soil.
2. Sediment control and stormwater run-off.
3. Maintenance of local drainage paths from adjoining properties.
4. Progressive top soiling and re-vegetation immediately following completion of each stage of the works.
5. The control of noise and other construction related effects.
6. A monitoring program for effects of the earthworks on and off site.
7. The discovery of an unrecorded archaeological site.

- Geothermal areas

  Where ground temperature at 1m depth is elevated above the ambient temperature as measured at a remote 'cold' location special conditions shall apply.

  Where the elevation in temperature exceeds 10^{o}C :

  1. i) all material showing evidence of modification shall be excavated and removed from the site;
  2. ii) all excavations shall be monitored for the accumulation of H_2S and/or CO^2 gases and vented as necessary.

  Where the elevation in temperature exceeds 40^{o}C, no earthworks shall be undertaken without special consent of the engineer. Application for any such consent must be supported by a hazard analysis prepared by a specialist geotechnical/geothermal qualified professional.

  Where the elevation in temperature exceeds 60^{o}C there shall be no disturbance of the vegetation cover and/or natural ground surface.

  No vent (natural or man made) shall be disturbed.

SCHEDULE 3

TAUPO DISTRICT COUNCIL

ALTERED REQUIREMENTS TO

PART 3 NZS 4404:2004 ROADS

The Taupo District Council has adopted Part 3 of *NZS 4404:2004* with the following additions and/or alterations:

1. **Clause 3.2.6** *Classification of urban roads*

   - For the purpose of the Standard the following *District Plan* hierarchies correlate to the *NZS 4404:2004* classifications

NZS 4404 Classification	Primary Arterial	Secondary Arterial	Collector Road	Local Distributor Road	Local Road	Service Lanes
TDC *District Plan* hierarchy	Arterial	Collector	Collector	Local	Local	Not defined in DP

2. **Clause 3.2.6** *Classification of rural roads*

   - For the purpose of the Standard the following *District Plan* hierarchies correlate to the *NZS 4404* classifications

NZS 4404 Classification	Arterial	Collector	Local	Minor Local
TDC *District Plan* hierarchy	Arterial	Collector	Local	Local

3. **Clause 3.3.1** *Minimum requirements*

   - Note that figure 3.1 on page 48 and figure 3.2 on page 49 of Part 3 are amended and retitled. The amended version is noted as figure 3.1R, titled *Taupo District Roading Guidelines*, and is attached to this Schedule as Appendix 1. Please also refer to road cross sections appended to this section

   - The following definitions should be used when referring to table 3.1R. Where a mixture of lot sizes occurs the higher standard of amenity shall be used.

     (a) Rural − lots larger than 2 hectares

     (b) Urban residential − lots smaller than 3000 m^2

(c) Low density – lots between 3000m^2 and 2 hectares

- Subsoil drains are generally not required where development is being undertaken in sand or other permeable materials.

- Pedestrian accessways and cycleways may also be required for connectivity purposes and in accordance with the Council's *Cycle and Pedestrian Policy*

- Specifically designed swales may be an acceptable form of side drain for rural roads.

4. **Clause 3.3.2.1** *Design parameters*

- Amend references to figure 3.1 to figure 3.1R.

5. **Clause 3.3.3** *Pavement structural design*

- Add the following:
  Geothermal Areas
  Where ground temperature at 1m depth is elevated more than 10^{o}C above the ambient temperature as measured at a remote 'cold' location, special requirements apply to combat any effect from :
  i) elevated temperatures;
  ii) poor quality soils;
  iii) chemically active soil or ground water.

  As a general rule [but subject to specific site requirements] the following shall apply:
  i) no temperature sensitive material shall be used;
  ii) all 'hot spots' shall be vented;
  iii) all vent discharges shall be made above ground at a location which will prevent steam drifting across the carriageway.

6. **Clause 3.3.6** *Parking*

- Private parking shall be in accordance with TDC *District Plan*. Where parking is to be vested with council then it shall be in accordance with *NZS4044:2004*. Parking on the carriageway shall be in accordance with appropriate Austroads standard.

- On a cul de sac head there shall be 2 parks per 3 sites, not more than 25m from the site.

- Where necessary, car parking set backs shall be arranged in conjunction with segregation strips to ensure property access does not conflict with the use of developed spaces.

7. **Clause 3.3.12.1** *Urban (pedestrian accessways)*

- Replace paragraph 5 with the following. Berm crossfall shall be 1 in 25 (4%) footpath cross-fall shall be 1 in 50 (2%)

- Replace paragraph 8 with Pedestrian accessways shall be in accordance with 8.3.6

8. **Clause 3.3.12.3** *Cycleways*

- A New Zealand cycle design supplement is available and is the official guide to the application of *Austroads Part 14* in New Zealand.

9. **Clause 3.3.13** *Traffic Services*

- Taupo District Council's requirements for street name signs are as follows:

REQUIREMENTS FOR STREET NAME SIGNS

1 STREET NAME BLADES

Name blades shall be made from aluminium extruded 'I' section of a minimum of 2.5mm thickness. The blade length shall be a minimum of 500mm and generally a maximum of 1400mm, inclusive of the end pointing. Unless otherwise specified, the blade depth shall be 225mm.

The end of the blade shall be pointed at an angle of 60^{o} to the horizontal.

2 ACCESSWAY BLADES

Accessway blades shall be constructed as for street name blades.

Accessway blades shall have a blade depth of 200mm and a length of 500mm and shall be pointed at an angle of 60^{o} to the horizontal.

3 COLOUR

The public road colour combination shall be white lettering on a green background. Private roads shall use different background-coloured naming signage (white is recommended) and also be labelled as 'Private Road' to avoid confusion with public roads. Size, format and construction should otherwise be similar.

4 REFLECTORISATION

The sign lettering and background shall be reflectorised with Class 1 materials [otherwise known as high intensity reflectorisation].

5 LETTERING

5.1 Alphabet Type

Lettering shall be a combination of upper and lower case lettering. Modified Series E lettering shall be used in all cases.

5.2 Letter Size

Lower case lettering shall be 100mm in height for letters used in the street name. Upper case letters being 133mm in height.

Letters used for the abbreviated St, Ave, Pl, *etc* shall have a lower case height of 60mm and an upper case letter height of 80mm. The stroke width for 133mm upper case letters and 100mm lower case letters shall be 25mm.

5.3 Letter Spacing

Spacing of letters and words shall be 70% of the spacing specified for Modified Series E as detailed in the NRB Manual of Traffic Signs and Markings 1975.

Word Spacing

Spacing between words shall be 100mm, but may be compressed to a minimum of 60mm on signs which exceed 1400mm in length.

Letter Placement

Lower case letters shall be placed along the sign centrally to ensure that the same width of border extends above and below the lettering. It may be necessary to trim the base of the down swing of lower case letters g and j where they extend below the bottom edge of the background material.

The distance from the end of the name plate to the first letter shall be 70mm, but may be reduced to 50mm where signs would exceed 1400mm in length. Where a logo space is requested then this distance shall be increased to 150mm. The distance

from the last letter to the end point of the sign shall be 150mm, but may be reduced to 115mm where signs would exceed 1400mm in length.

Symbols
Accessway blades shall carry a stylised pedestrian or cycle as appropriate. Symbols shall be 175mm in height and positioned to depict use of an accessway path.

The name of the street to which the accessway connects shall be shown as the blade using lettering to the same specification as for street name blades except that all dimensions shall be proportionately reduced so that the maximum height of lower case lettering is 20mm.

6 DIRECTIONAL CHEVRON

Where a street name or accessway sign is required to be end pointed, then a reflectorised white chevron shall be fitted. The chevron shall be 30mm wide and conform to the same shape as the end pointed sign. The chevron shall be fitted 30mm from the end of the sign and have an upper and lower border of 20mm.

7 LETTER BACKGROUND

The width of the green reflectorised background shall generally be the full width of the web of the name blade. The minimum width of the background shall not be less than 190mm.

8 SUPPLEMENTARY 'NO EXIT' SIGNS

The blade is to be extruded aluminium section with a blade depth of 75mm.
Lettering shall be the Modified Series E.
Letter sizes shall be 45mm lower case letter height, 60mm upper case letter height.

9 BRACKETS

Street name signs are to be supplied complete with approved fixed or adjustable brackets attached to the upper and lower flanges of the street name blades.

'No Exit' signs are to be constructed with a top flange to enable it to slide onto the lower flange of the street name blade or alternatively be supplied with approved brackets for fixing to the lower flange of the street name blade. 'Private Road' labels may also be fitted as a supplementary sign in a similar manner.

10 POLES

Street name plates and accessway plates shall be mounted on 76mm diameter galvanised steel poles which have been iron phosphate treated (galvanised) and powder coated [white].

Poles shall be erected truly vertical with the bottom embedded in a poured concrete base.

11 LOCATION OF SIGNS

Every intersection shall be sign posted with the name of each intersecting street.

Every accessway shall be sign posted at its junction with a street and at any junction with any other accessway.

12 ERECTION

Street name signs and accessway signs shall be mounted on poles erected in accordance with the detail plan attached hereto.

Poles shall be positioned not less than :
i) 500mm from the edge of a footpath;
ii) 450mm from a kerb face;
iii) 600mm from the edge of a sealed [unkerbed] carriageway.

No sign shall overhang a carriageway or private lot.

No sign shall overhang a footpath with less than 3.5m clearance to the underside of the blade.

Sign blades shall generally be mounted with the underside at 3.0m above ground level.

13 RELATED DOCUMENTS

Refer to plans entitled '*Street Nameplates'* appended to this section.

10. **Clause 3.3.12.4** *Footpath and cycleway surfacing*

- Amend figure 3.8 Footpath construction typical sections as follows:

- Concrete – amend depth from 110mm to 75mm, amend basecourse to 100mm compacted basecourse or compacted pumice (minimum Cleg impact test of 11 or greater)

- Interlocking pavers - amend basecourse to 100mm compacted basecourse or compacted pumice (minimum Cleg impact test of 11 or greater)

11. **Clause 3.3.15** *Road lighting*

- Add the following:

  Level of Illumination.

  Road lighting shall be designed to AS/NZS 1158 using categories of :

i) Arterial	V 4
ii) Collector and local	P 3
iii) Short cul-de-sac	P 4

  Off road lighting shall be designed to AS/NZS 1158 using categories of :

i) Accessways/cycleways:	P 3
ii) Carparks:	P 12
iii) Pedestrian Areas:	P 6

- Location of columns shall be in accordance with standard cross sections, 900mm behind kerb face.

- Street lights shall be connected to a separate 'controlled' power supply which is specifically for street lighting and controlled at source for operating times.

- All installations shall be fused at the base of the pole.

- All lights shall be fully installed and connected prior to completion of any development and proven to be functioning.

- All lights shall be made operational prior to issue of completion certificate (S224)

- Cabling shall be installed by a network company authorised agent.

- Shall be designed to minimise light spill.

12. **Clause 3.3.19** *Crossings*

- Refer to plans appended to this section

13. **Clause 3.3.19.2** *Crossings rural*

- Replace paragraph 1 with the following "All crossings are to be formed at the time of development."

- All visibility to and from crossings is to be in accordance with the *District Plan*.

14. **Clause 3.3.20** *Fencing*

- Fencing of accessways shall be in accordance with 8.3.8.

- Fencing of rural roads shall be stock proof rural post and batten fence.

15. **Clause 3.3.21** *Road drainage*

- Add the following

- Where side drains/cut outs are steeper than 5% special consideration should be given to erosion control using geotextile materials of similar

- In closer settled low density residential and in all urban residential areas stormwater discharge from the road to lots will not be acceptable and it will be necessary to construct a kerb and channel to collect stormwater into a reticulated drainage system. In rural areas runoff to adjacent land is expected.

16. **Clause 3.3.21.5.1** *Sumps*

- Sumps shall be recessed behind the line of the channel:

  (a) On arterial, collector, industrial and commercial streets;

  (b) On carriageways which are 6m or less in width;

  (c) On local roads where gradients are steeper than 10%

17. **Clause 3.4.2** *Materials for flexible pavements*

- The following notes on the use of Dacite metal for road construction shall be added:

  Locally occurring Dacite rock is a heavily jointed and comparatively soft material requiring some processes unique to the material. Despite its special characteristics high quality pavements and acceptable sealing chips can be produced from the Dacite rock.

  To avoid breakdown and the creation of excessive fines the metal should be spread and compacted with the minimum amount of working.

  The addition of fines and/or the use of bituminous binder is not an acceptable method of achieving the required tightly bonded pavement surface.

  Dacite rock is absorbent to bitumen and sealing binder migrates into the pavement with resultant loss of bond around sealing chip. To mitigate against this problem, all Dacite metal pavements are required to be prime coat sealed.

Primer is applied to the swept surface using a method which spreads the bitumen evenly over the entire surface. As the primer is absorbed into the basecourse during the first coat seal process no reduction in the application rate for the first coat binder is permitted. First coat binder should contain the minimum practical dilutants so as to minimise further absorption of binder.

Adhesion of Dacite sealing chip is improved by the use of precoated chip.

Dacite sealing chip breaks down due to mechanical action if left loose on the surface. Over chipping must be avoided and surplus chip must be removed immediately after full embedment is achieved.

18. **Clause 3.4.2.3** *Basecourse*

- Basecourse shall be constructed at a depth sufficient to achieve the appropriate maximum deflections on the final pavement surface.

- The minimum depth of *TNZ - AP40* graded basecourse on any road shall be :
  - i) 75mm on car parks and on private roads providing access to not more than six sites;
  - ii) 100mm on roads with 500 evpd or less;
  - iii) 150mm on all other local roads;
  - iv) 175mm on all collector, arterial or commercial/industrial roads.

  provided that :basecourse depth may be reduced based on specific designs for :
  - i) thin pavements or stabilised pavements with chip seal surfacing;
  - ii) thick asphaltic concrete pavements;
  - iii) concrete masonry pavements.

  provided also :
  - i) *TNZ - AP20* grading may be used on private roads and car parking areas;
  - ii) *Local - AP40* grading may be used for special pavements with the prior approval of the engineer.

19. **Clause 3.4.3** *Road surfacing*

- Add the following:

  All roads shall be provided with a sound, durable and waterproof surface except where:

  a) access is to a single residential site

  b) private rural roads serve three or less sites **and** the gradient is less than 6%

  Binder application shall be sufficient to provide 60% embedment of compacted chip after evaporation of volatiles and initial compaction of chips.

- Amend table 3.7 minimum surfacing standards to include the following:

Facility	Minimum surfacing
Commercial/industrial	50mm asphaltic concrete
Urban arterial	30mm asphaltic concrete
Urban residential	30mm asphaltic concrete

20. **Clause 3.4.4.1** *First and second coat chip seals*

- Amend as follows:

  For first coat seals the chip size shall generally be grade 3 on all roads, except on rural public roads where it shall be grade 4.

  For second coat seals the chip size shall be grade 4. Cycle and/or parking lanes shall be grade 6.

  Private rural roads shall be a grade 3/5 two coat wet lock.

  Cul de sac heads and intersections exposed to turning traffic should be dressed with Grade 6 chip dry rolled into the surface.

  Where any existing street is widened, the makeup width shall be sealed so that the second coat matches the existing surface texture.

  First coat sealing shall normally comprise a two stage application of prime coat and first coat seal.

  Prime coat seal shall [where required] be applied to the prepared and swept basecourse surface to add a minimum of 0.40 l/sq.m of residual bitumen on to the pavement surface. Primed surfaces shall be protected against damage until first coat seal is applied. First coat sealing shall follow as soon as practical after prime coating and shall be applied using minimum practical dilution of the bitumen.

  Second coat sealing on public roads will be applied by Council at a later date. The developer shall pay for this by way of a cash deposit in accordance with Council's *Fees and Charges Policy* in the *LTCCP*.

  Second coat seals on private roads shall be applied prior to acceptance of a subdivision.

21. **Clause 3.4.5** *Subgrade checking*

- Note that typically undercutting a minimum of 450mm below subgrade level and recompacting over the full formation will achieve acceptable subgrade

22. **Clause 3.4.7** *Sub-base*

- Before basecourse is placed Council is to be given the opportunity to inspect the subgrade.

23. **Clause 3.4.11** *Deflection testing prior to surfacing*

- Table 3.8 – Benkelman beam standards shall be replaced with the following table

Maximum Deflection (mm)			
Road Type - evpd	Urban		Rural
	Chip Seal	AC	
Arterial	1.0	1.0	1.0
Collector	1.0	1.0	1.0
Local < 30	2.0	2.0	2.5
Local < 200	1.6	1.6	1.6
Local > 200	1.3	1.3	1.3
Commercial/Industrial	1.0	1.0	NA

- Thin asphaltic concrete shall not be applied to any pavement where the benkelman beam deflection ratio D_{250}/D_0 is less than:
  - i) 0.70 for collector, arterial and commercial roads;
  - ii) 0.63 for local roads and through roads;
  - iii) 0.54 for cul de sacs.

- Pavements will be approved for the application of surfacing provided that the prepared basecourse meets the following criteria when tested with a benkelman beam using test points which are not more than 15m apart along the carriageway and at 1.0m and 3.0m from the centreline in both directions:
  - i) no single test result shall exceed 150% of the maximum value;
  - ii) not more than 5% of test results shall exceed the maximum value;
  - iii) no area of excessive deflection shall exceed 5 m^2 in area;

- Where any section of pavement fails to achieve the above results approval for surfacing may be granted provided that:
  - i) the pavement thickness is at least the depth established from the initial design;
  - ii) the basecourse is compacted to maximum density and conforms to TNZ - M/4 grading;
  - iii) measured deflections are within 25% of the required maximum;
  - iv) a suitable bond and agreement is in place providing for the repair/resurfacing of the work should it fail to achieve the required performance within 2 years of acceptance.

24. **Clause 3.4.16** *Berms and landscaping*

- Amend to specify that topsoil shall be to a minimum depth of 75mm, and that the finished level shall be flush with the footpath.

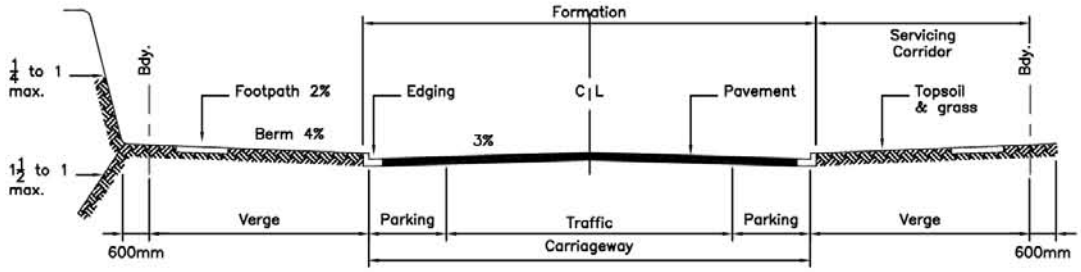
25. Additional Requirements

- Work undertaken on Council owned assets shall be undertaken in accordance with NZTA *Code of Practice for Temporary Traffic Management (COPTTM)*,

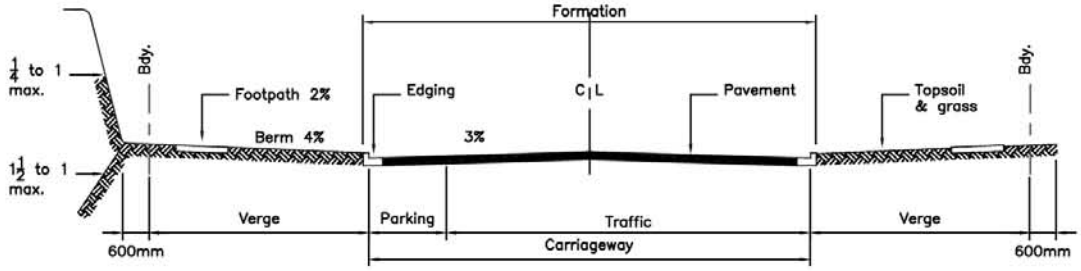
- See Taupo District Council drawing *Alignment for Utility Services* appended to schedule 9 for recommended position of services within the road reserve. Alternative positions may be acceptable if approved by the Council and Utility Companies.

Road Description			Criteria for Road Design			Elements of Road Width (m) (refer to std cross sections)					Geometry			
			Number of sites	Traffic volume	Speed	Parking[1]	Min traffic	Min verge	Edging		Min road	Min gradient	Max gradient	Normal crossfall	Max Super
Residential Environment Roads	**Urban residential**	Private road	≤2	<15	5	n/a	2.75	0.5/0.25	Nib		3.5	0.5%	15%	3%	6%
			≤3	<25				0.5/1.5			4.5				
			≤6	<50			4.0				6.0		12%		
			≤9	<70			5.0	1.0/2.0	Nib/M kerb		8.0				
		Public road	≤12	<100	20	2.0[2]		4.5	Vertical kerb	M kerb option[3]	16.0				
			≤20	<150											
			≤30	<250	30	1 @ 2.0	6.0	5.0			18.0				
			n/a	<300											
				<1000	40		6.5	5.25	Vertical kerb		19.0				
				<1500									10%		
	Collector			<5000	50	2 @ 2.0	7.0	5.5			22.0				8%
	Low Density				60	n/a	7.0	6.5	1.2 grass / M kerb[4]		20		12%		
Rural Roads	**Local**	Private Road	≤3	<30	10	n/a	3.0	1.0/2.0	0.5 grass		7.0	0.5%	15%	3%	8%
			≤6	<50	20		4.0				8.0				
			≤12	<120	60		6.0	2.0	1.2 grass		10.0		12%		
		Public Road	≤100	<1500	100		6.7	3.5			20.0		10%		
	Collector		n/a	<3000			7.4	4.0							
District Arterial Roads	**Urban**	Public Road	n/a	<20000	70	2 @ 2.5	8.0	6.0	Vertical kerb		25.0	0.5%	5%	3%	6%
				>20000	70	2 @ 3.0	8.0[5]	6.75			30.0				
	Rural			<5000	100	n/a	7.4	4.0	1.0 seal		24.0		7%		8%
				>5000			8.0								
Special Roads	**Industrial**	Public Road	n/a	<1000	30	2 @ 3.0	7.0	5.0	Vertical kerb		23.0	0.5%	5%	3%	6%
				>1000	50		8.0	4.5							
	Service lane			n/a	10	n/a		Nil	Nib		8.0		4%		
	Commercial				30	Angle		4.0	Vertical kerb		30.0				
	Regional Arterial				100	n/a			1.5 seal		25.0		5%		8%

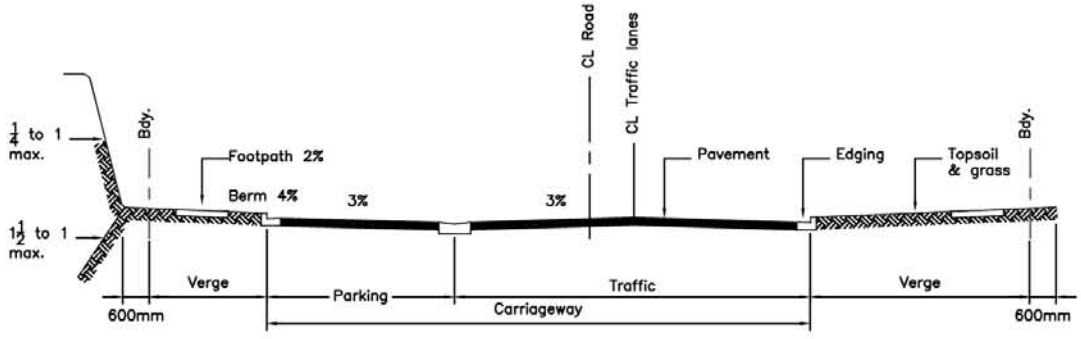
[1] Parking may be provided off carriageway
[2] Parking bay one side only
[3] In lakeside settlements
[4] optional combinations provided that grass edging shall only be used with lots larger than 1Ha
[5] Plus 2.5 median



Arterial or Collector



Local Road



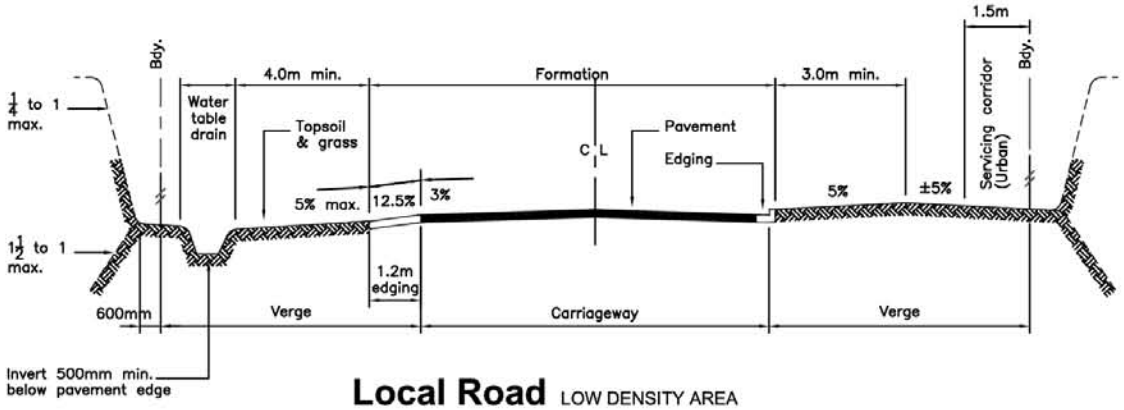
Local Road PARKING BAY OPTION

Taupo District Council

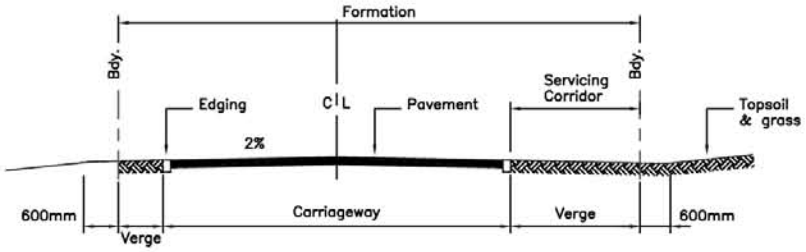
RESIDENTIAL ROAD CROSS SECTIONS

July 2009

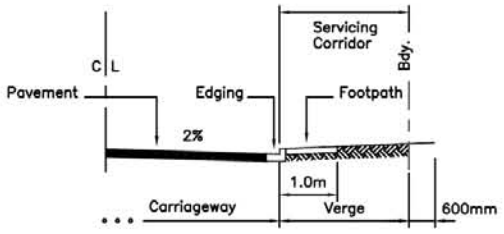
Plan 1



Local Road LOW DENSITY AREA



Local Road MAX. 6 SITES



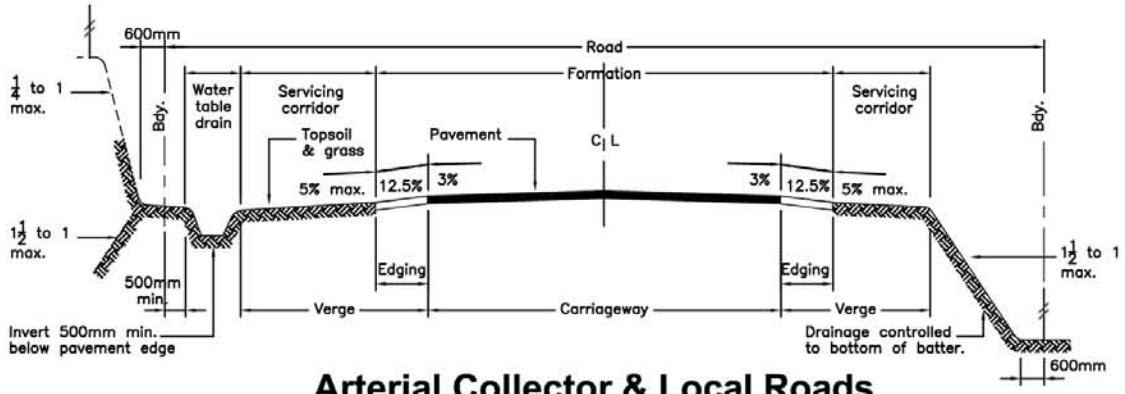
Local Road MAX. 12 SITES

Taupo District Council

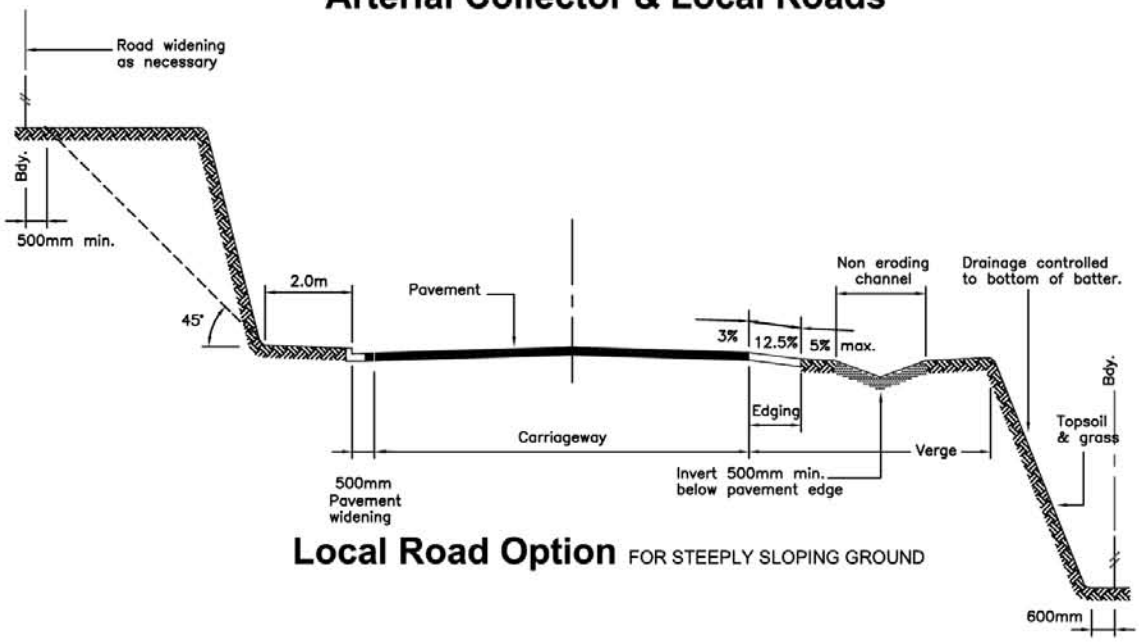
RESIDENTIAL ROAD CROSS SECTIONS

July 2009

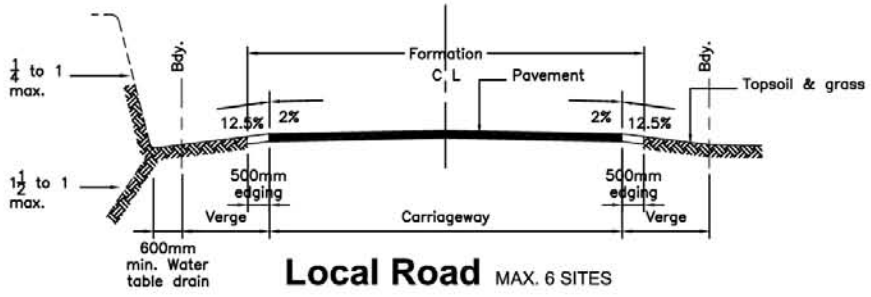
Plan 2



Arterial Collector & Local Roads



Local Road Option FOR STEEPLY SLOPING GROUND



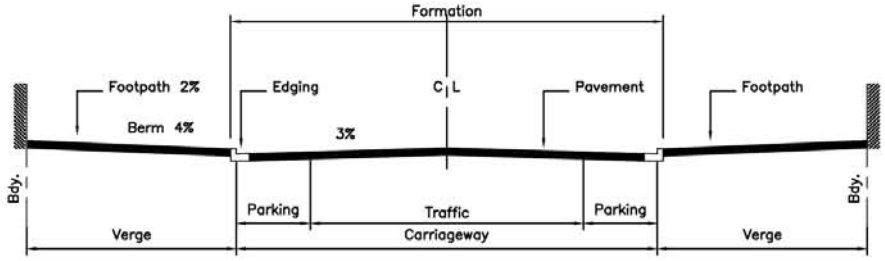
Local Road MAX. 6 SITES

Taupo District Council

RURAL ROAD CROSS SECTIONS

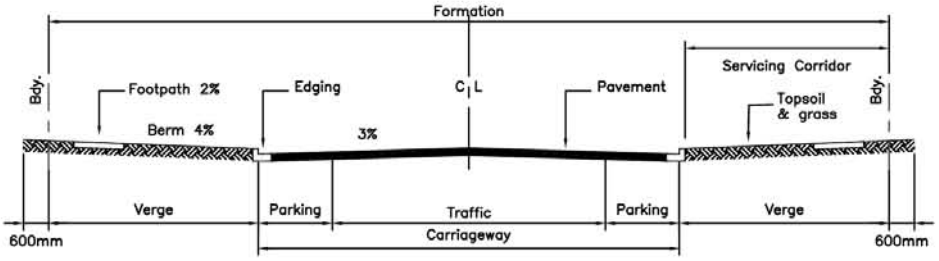
July 2009

Plan 3

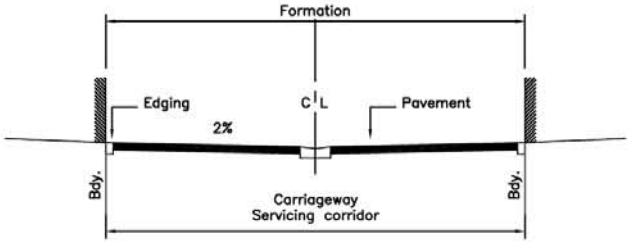


Note
No servicing corridor.
All servicing by servicing lane.

Commercial



Industrial



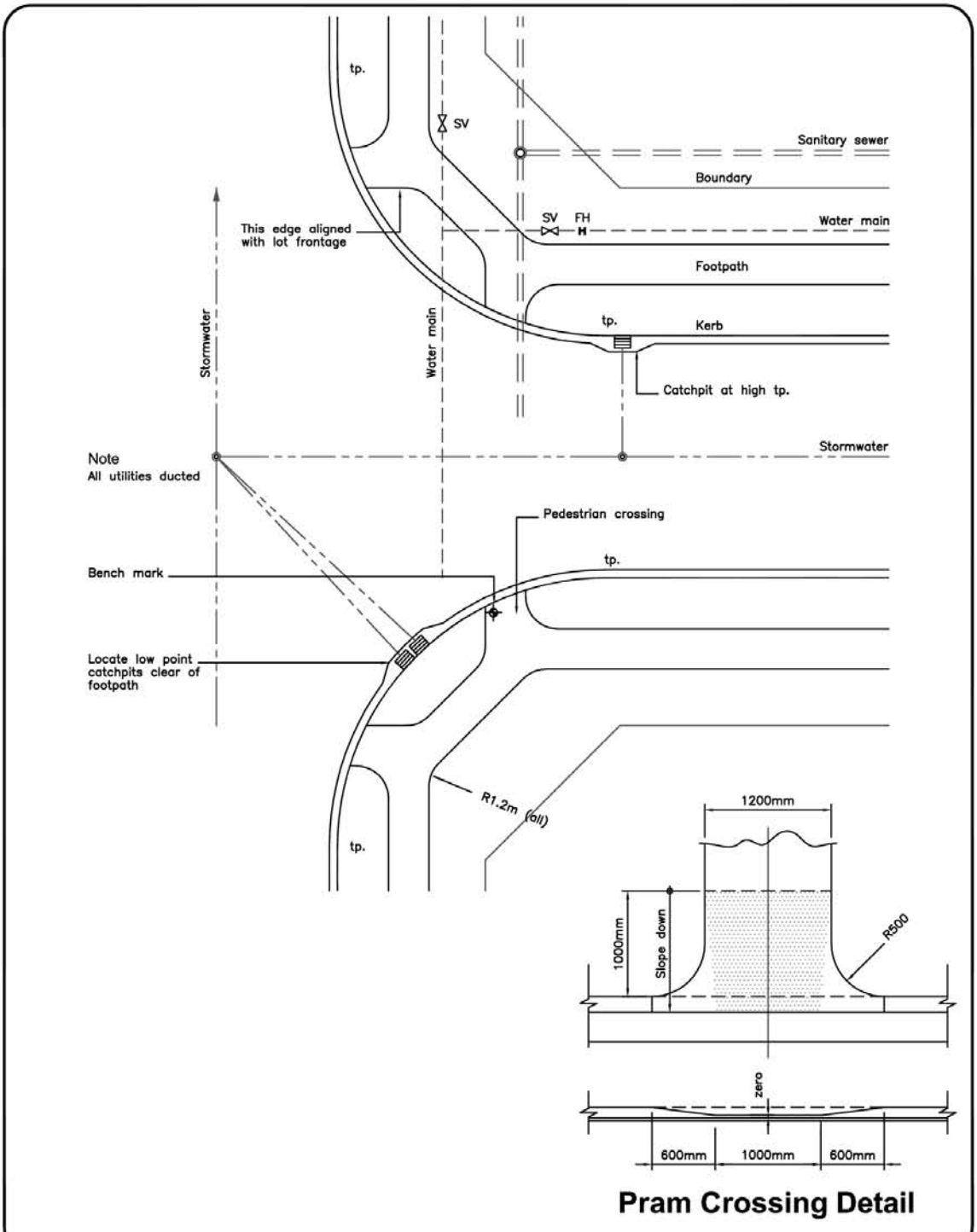
Service Lane

Taupo District Council

COMMMERCIAL & INDUSTRIAL ROAD CROSS SECTIONS

July 2009

Plan 4

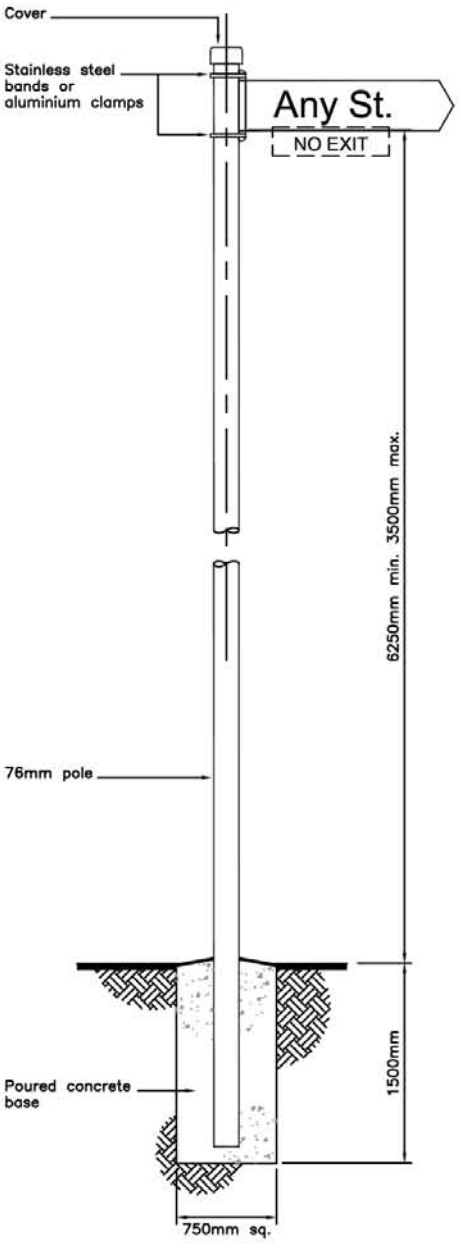


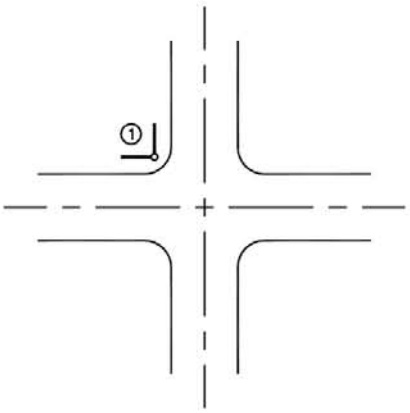
Taupo District Council

URBAN INTERSECTION SERVICES LAYOUT

July 2009

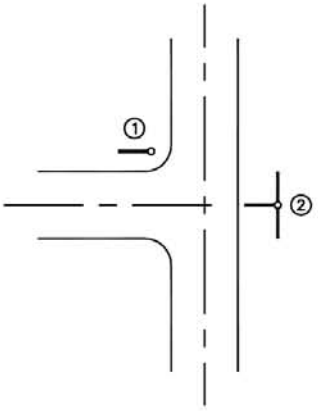
Plan 5





MINOR STEET INTERSECTIONS

① Both street names



MAJOR STREET INTERSECTIONS

① Side street names

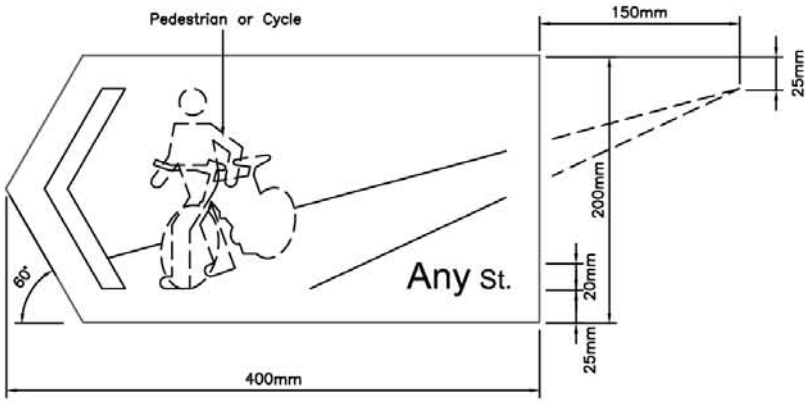
② Both street names

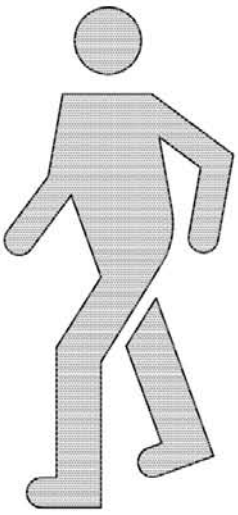
Taupo District Council

STREET NAME PLATES

July 2009

Plan 6





PEDESTRIAN

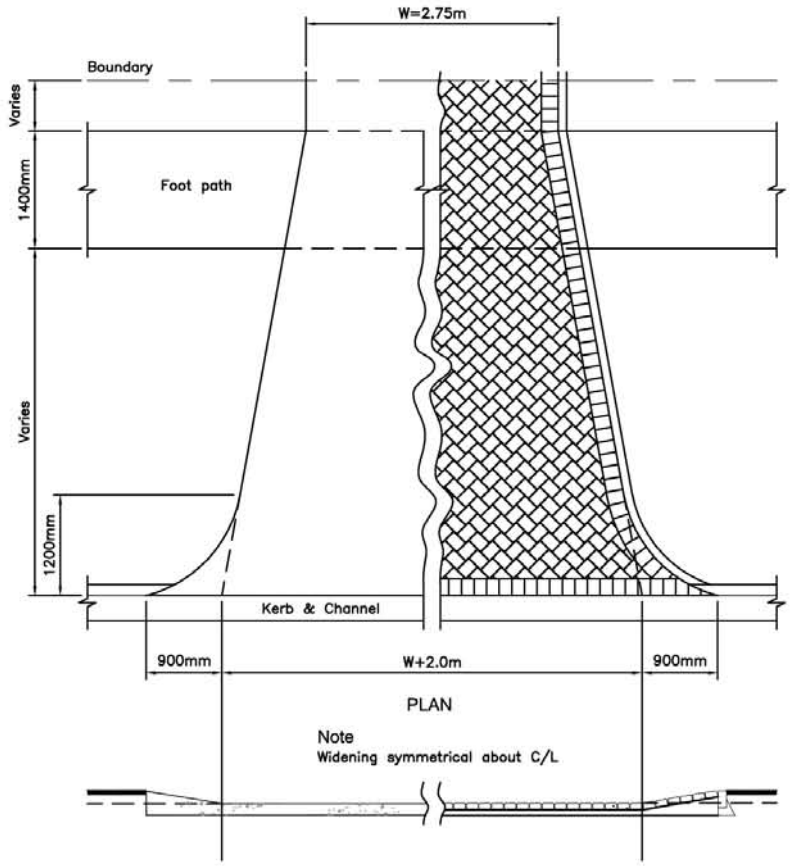
CYCLE

Taupo District Council

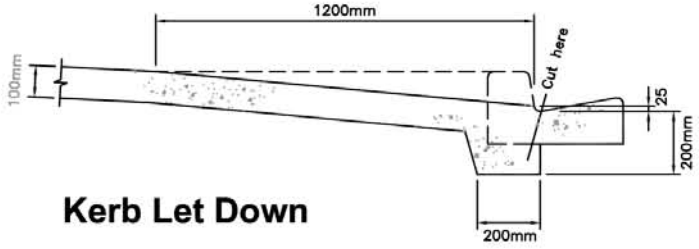
STREET NAME PLATES

July 2009

Plan 7



SECTION AT KERB LINE



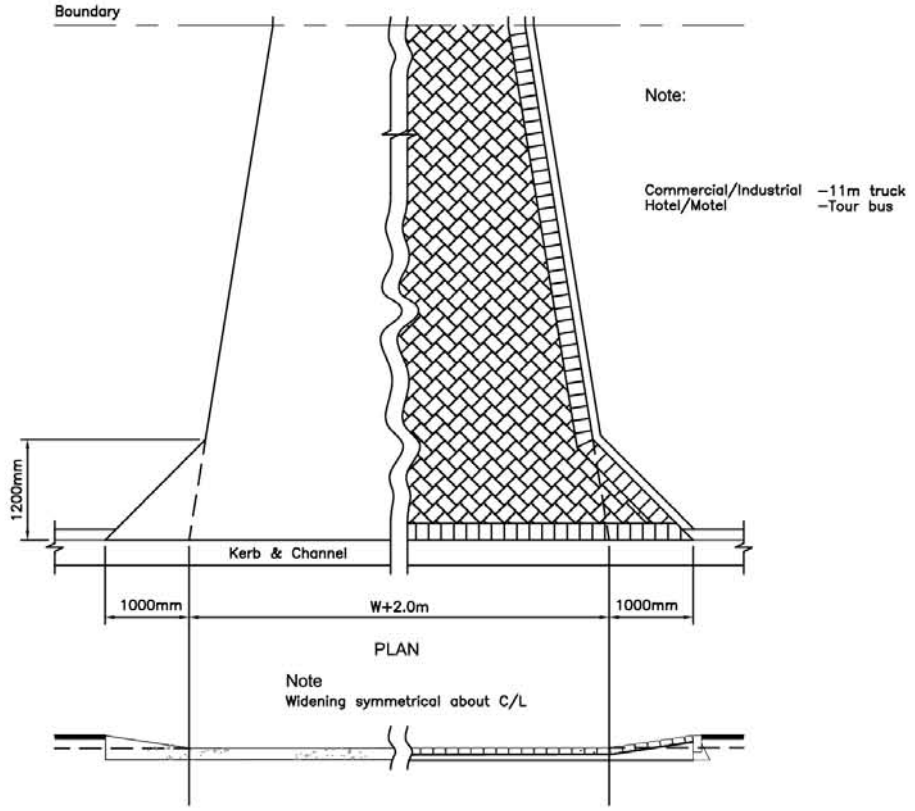
Kerb Let Down

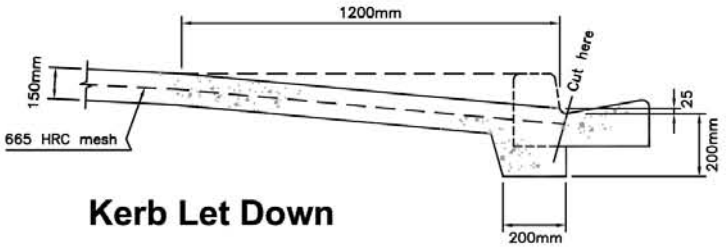
Taupo District Council

REQUIREMENTS FOR PROPERTY ACCESS RESIDENTIAL

July 2009

Plan 8





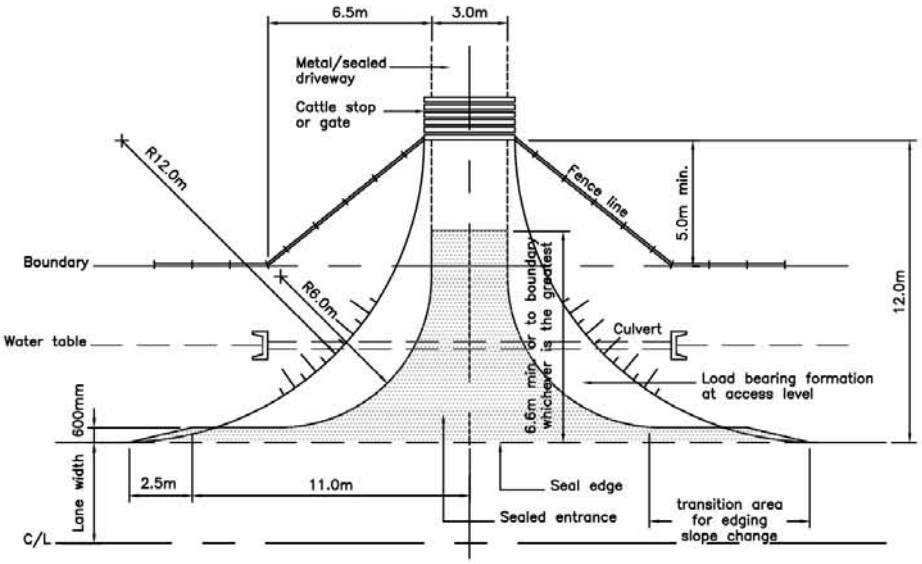
Kerb Let Down

Taupo District Council

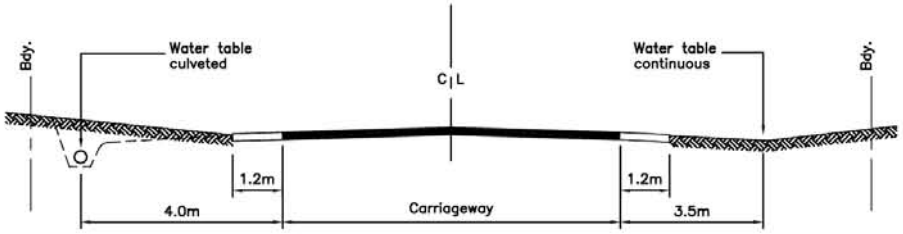
REQUIREMENTS FOR PROPERTY ACCESS COMMERCIAL / INDUSTRIAL

July 2009

Plan 9



PLAN



OPTIONAL ELEVATIONS

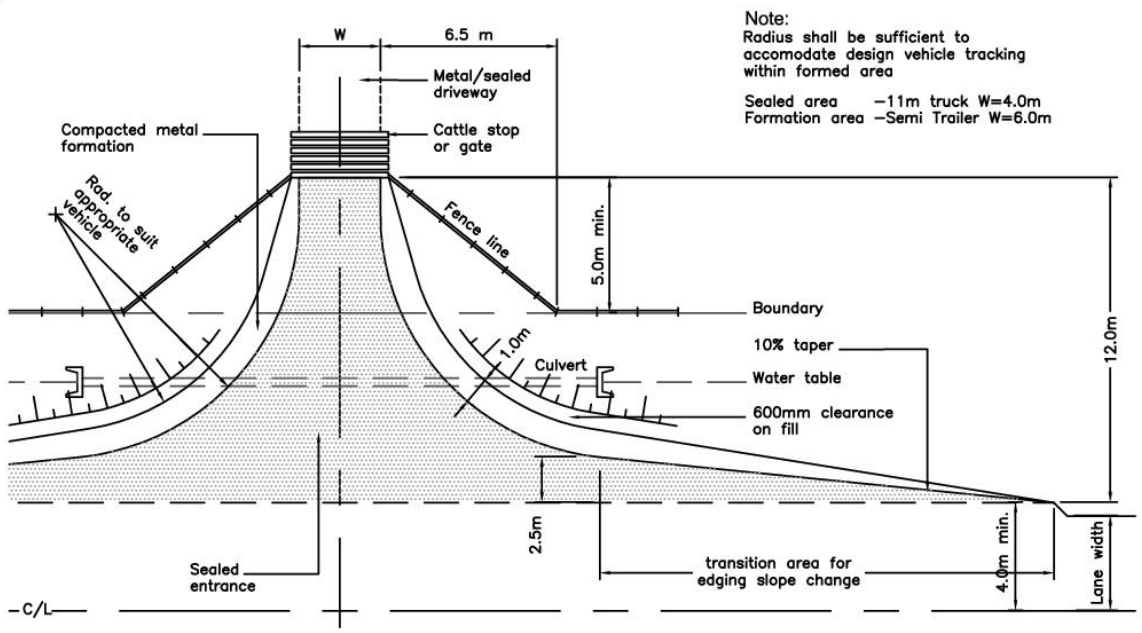
Rural Light Vehicle Entry

Taupo District Council

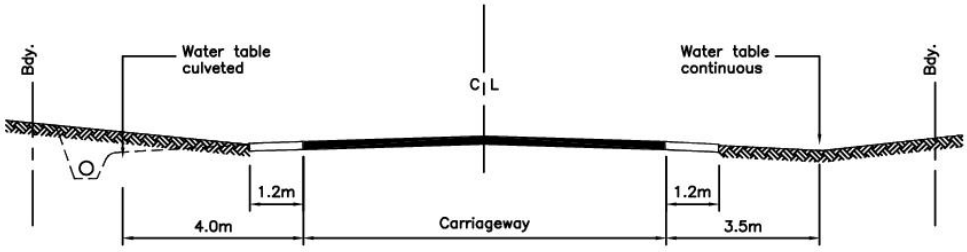
REQUIREMENTS FOR PROPERTY ACCESS RURAL - STANDARD

July 2009

Plan 10



PLAN



OPTIONAL ELEVATIONS

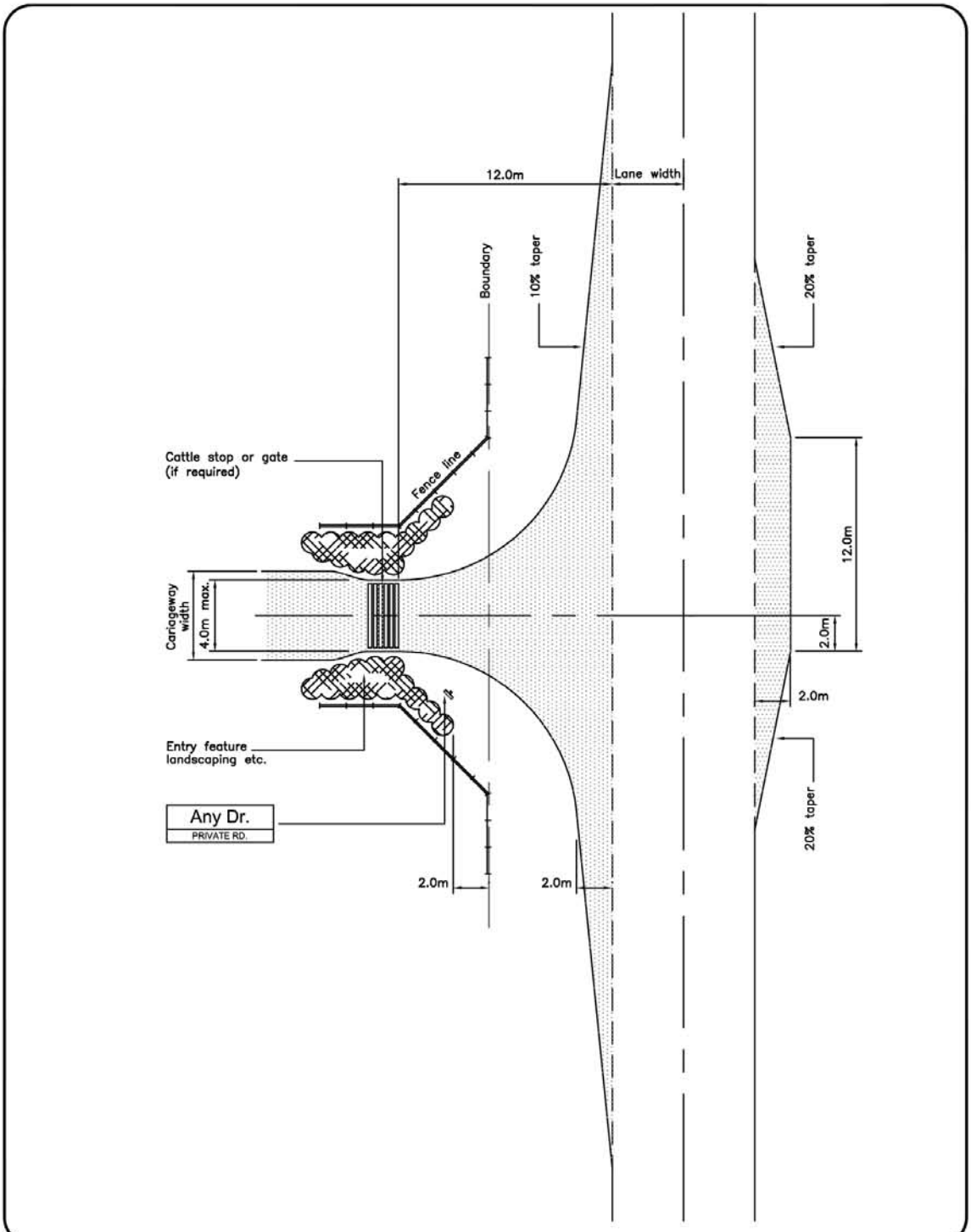
Rural Heavy Vehicle Entry

Taupo District Council

REQUIREMENTS FOR PROPERTY ACCESS RURAL - HEAVY DUTY

July 2009

Plan 11



Taupo District Council

REQUIREMENTS FOR PROPERTY ACCESS RURAL PRIVATE ROAD INTERSECTION

July 2009

Plan 12

SCHEDULE 4

TAUPO DISTRICT COUNCIL

ALTERED REQUIREMENTS TO

PART 4 NZS 4404:2004 STORMWATER DRAINAGE

The Taupo District Council has adopted Part 4 of *NZS 4404:2004* with the following additions and/or alterations:

1. Clause 4.3.1.2 *Information to be Provided*

- The information requirements outlined in the first set of sub-paragraphs (a) to (e) and subparagraphs (a), (c) and (d) from the second set are to accompany resource consent applications. The other information requirements are generally required for plan and specification approvals, but may be required for assessment of resource consent applications.

- The information is additional to any that is required under Parts 2 and 3 of this document.

2. Clause 4.3.2.1 *Design storms*

- Replace the table in clause 4.3.2.5.1 with the following table.

Function	**AEP (%)**	**Return Period (years)**
Primary protection	10	10
Secondary flow paths not available	1	100
Secondary protection	1	100

- Add the following table to clause 4.3.2.5.1.

  Rainfall intensity shall be calculated from:

Frequency (years)	Duration							
	10 min	30 min	1 hour	2 hour	6 hour	12 hour	24 hour	48 hour
Annual	9	18	25	35	53	64	80	96
5	14	25	36	49	73	88	106	124
10	19	34	45	62	94	109	128	148
20	23	41	55	79	114	131	151	172
50	28	51	68	99	141	161	180	202
100	33	58	77	113	161	182	201	222

Note that the above figures include for climate change to 2090.

Urban Runoff Coefficients:

A. Roads and Streets (Whole Road Reserve)

Commercial/Industrial		100%
Arterial/Collector		85%
Local	> 9 sites	85%
	</= 9 sites	90%

B. Reserves and Open Spaces

Designer's calculation based on topography, vegetation and state of compaction of catchment area.

C. Sites

Commercial/Industrial		95%
Residential Sites (average over whole lot)	< 800m^2	40%
	>800m^2	30%

Time of Entry

Commercial and Industrial areas	= 5 minutes
Residential	= 10 minutes

3. Clause 4.3.2.4 *Secondary flow paths*

- Add the following to the end of the second paragraph.

  Secondary flowpaths which drain urban public roads will not be permitted over private land without Council's prior approval. Where this may be approved, Council requires that a stormwater easement in gross is created over the land in favour of TDC on Council's standard terms. These terms prevent any buildings, obstructions or earthworks within the flowpath area without Council's specific approval. Where the secondary flowpath drains private land, private easements in favour of the benefiting lands shall be registered on the flowpath land to protect the function of the flowpath in perpetuity. Development controls, including any relevant floor level restrictions, shall be imposed within the flow area.

  Design and survey information on the secondary flowpaths on both private and public land showing:

  - the calculation of flows,
  - extent of wetted areas,
  - ground levels,
  - easements,
  - development controls,
  - resource consents obtained and
  - any other relevant information shall be supplied to council on the completion of the project.

  This information shall be in a form suitable for inclusion in Council's GIS Land Effects database. [Council has LIDAR level information for much of the Taupo town urban area which can assist developers with this. Any information lodged by the developer must be consistent with this levels database.]

4. Clause 4.3.3.1 *Location and Alignment of Stormwater Mains*

In general straight pipelines are preferred. Curved pipelines are subject to specific TDC approval

All reticulation outside of the road reserve shall be:

i) clear of buildable areas;
ii) at least 1.5m off a site boundary;
iii) laid centrally within an easement in favour of the Council.

5. **Clause 4.3.3.2** *Pipe Materials*

For pipelines and culverts under public carriageways RRJ Concrete pipe is the only pipe material acceptable without specific TDC approval.

For pipelines outside trafficked areas, such as links between soakholes uPVC pipes of Class SN8 or higher may be used. Other pipe materials may be used, subject to specific TDC approval.

6. Clause 4.3.3.3 *Building Over Pipelines*

- Only in exceptional circumstances will building over pipelines be permitted.

7. Clause 4.3.3.5 *Minimum pipe sizes*

- Add the following.

(a) Stormwater drains draining a single sump shall be a minimum of 225mm internal diameter.

(b) Double sump drains shall have a minimum internal diameter of 300mm.

(c) Where the double sump drains a low-point the sump drains shall be a minimum of 375mm internal diameter.

8. **Clause 4.3.3.6** *Minimum Cover*

Minimum cover shall be in accordance with manufacturer's recommendations, but cover shall be not less than:
i) 600mm under street verges and ROW;
ii) 750mm under other carriageways;
iii)500mm outside of road reserve.

Lesser cover must be specifically approved by TDC Engineer

9. **Clause 4.3.3.7** *Gradients and acceptable flow velocities*

- Replace with the following

Piped reticulation shall be constructed so that the design velocity [with allowance for proportionate flow] is not less than 0.75m/sec nor more than 4.5m/sec.

Velocity greater than 4.5m/sec will be permitted only where:
a) haunching is designed for non-turbulent flow generation;
b) energy dissipation devices are provided where appropriate.

Changes of pipe diameter, gradient or direction shall be made using a drop. Minimum drop shall be the larger of :

	Stormwater	***Wastewater***
Grade Change	50mm	15mm
Direction Change [per10^{o}]	5mm	3mm

Changes in diameter shall be made with the soffit of the outlet pipe no higher than the soffit of the lowest inlet pipe.

10. **Clause 4.3.3.9** *Culverts*

- Add the following

Culverts shall be designed to pass the design flow without surcharge and shall be:
i) of minimum diameter 375mm under a carriageway;
ii) aligned to and at levels in conformity with the natural land form;
iii) laid with 1.0m minimum cover. Lesser cover must be specifically approved by TDC Engineer

All bridges and culverts shall be designed to withstand HN-NO-72 loading.

11. **Clause 4.3.3.10** *Inlets and outlets*

- Add the following

  All inlets/outlets to piped reticulation with a diameter of 450mm or greater shall have safety grating installed to prevent unwanted access. For culverts attention must be given to the potential for debris collection. For large culverts safety grating may not be required, subject to TDC and Regional Council approval.

  Dual-use pedestrian underpasses/stormwater culverts may be required under major roadways where significant pedestrian and cycle usage of the gullies occurs. Box culverts with adequate headroom are to be used, along with protected overhead lighting. The base will be generally flat, with a single cross-fall of no more than 3% to a shallow drain channel along one wall. Graffiti-resistant paints or coating or other measures may be required on the walls and headwalls.

  A safety railing is required around the top of headwalls where there is a fall risk. Energy dissipation or aprons are required on both the approach and discharge from a headwall where a scour risk exists. Refer also *Cl. 4.3.10.2 Health and safety*.

12. **Clause 4.3.5.1** *Constructed waterways and* **Clause 4.3.5.2** ***N****atural waterways (including gully systems)*

- Add the following

  Open channels shall be designed and constructed so as to be non-eroding at maximum flow. The maximum design velocity for unlined channels shall be 0.5m/sec.

  Open channels shall pass the design flow while maintaining a minimum of 300mm free board against overtopping.

  Open ponds and channels shall have side slopes of no steeper than 1V to 4.5H. Where side slopes are steeper than this and with a maximum water depth of more than 600mm, safely fencing may be required. In general, the need for safety fencing shall be avoided in areas where the public will have access.

  Open stormwater ponds are to be constructed to allow access for maintenance vehicles for cleanout and vegetation control purposes. Typically this will take the form of a metalled access ramp, with a gradient no steeper than 15%. Where a fence is placed around the pond it shall have a lockable vehicle gate. Normally pond side slopes shall allow for maintenance by tractor mower. Where steeper sides are used they shall be stable, with a vegetated or low-maintenance surface.

  Care shall be taken to minimise heavy construction vehicle activity in waterways to prevent compaction of the natural soils. Excess topsoil shall not to be disposed of in the wetted areas of waterways. No topsoil is be placed in the base of constructed ponds. Ponds are to be located in natural ground, and not within any historically-filled or geothermally-modified area.

  Stormwater disposal ponds forming part of the primary stormwater system are to be located outside or above the 100year secondary flowpaths. As a minimum, primary stormwater system ponds shall be designed to store a 10% AEP rainfall event of 1 hour duration (i.e. no allowance for soakage during this period, but allowance may be made to discharge flows that are no worse in quality and flowrate to the original pre-developed condition. Flows discharged onto downstream lands in this situation must be within the original flowpath).

Any Regional Council consents for assets to be transferred to TDC shall be transferred to TDC on vesting, be on terms acceptable to TDC and with a certificate or letter of compliance as to construction from the relevant Regional Council.

The development of natural waterways and ephemeral watercourses in gully systems for recreational use (e.g. walkways and cycleways) should not compromise their primary function for stormwater management.

Stormwater systems that make use of ephemeral watercourses in natural gullies to convey, treat and infiltrate stormwater shall be designed, constructed and established in general accordance with the Landcare Research Report "Revegetation of Taupo Gullies for Stormwater Management". For gullies that are to vest in TDC, the landscaping and planting is subject to specific consent and design approval.

Where natural ephemeral waterways are utilised as part of the stormwater drainage system, the channel shall be designed to manage the maximum1% AEP flow without damage to the ground surface. This requires channel slopes to be gentle gradients to limit flow velocities. In all cases a non-eroding channel base and sides are required. Where flow velocities are elevated or changes to gradient or direction occur, channel reinforcement or liners shall be provided. Energy dissipation is required where a concentration of higher-velocity flow occurs.

Garden areas with bark beds or bare soil are not permitted within wetted areas. Walking and cycling pathways shall not run along the floor of gullies, rather be elevated along the sides, outside of the 1% AEP flowpath wherever possible. Where pathways cross the wetted channel they shall be permanently surfaced.

Council's standard signage warning of rising stormwater levels is required in areas where public have open access.

13.Clause 4.3.7.1 *Individual Lots and Developments*

- Replace the first sentence with the following:

  In general connection of individual lots to the public road stormwater system is not permitted. Where connection may be approved the connection of individual lots and developments to a stormwater system shall meet the following requirements, unless otherwise approved by the Council:

- Replace paragraph (b) with;

  Where stormwater connections are provided they shall be extended to a minimum of 600mm inside a site boundary and be marked with blue-painted stakes inserted prior to backfilling.

- Replace paragraph (h) with the following:

  Connection to an alternative stormwater disposal system (such as vegetated swales, soakpits or soakage basins) may be acceptable, provided that the system meets the Council's requirements and any Regional Council requirements.

- Add new paragraph (k) : Only clean stormwater may be discharged to the public system. Where high-usage carparks, materials storage areas or other areas at risk of grit or oil discharge connect to the stormwater system, an oil and grit separator is required on the private land. Proprietary stormwater treatment devices may also be acceptable, subject to design and installation in accordance with the suppliers guidelines. In areas of high risk of hydrocarbon discharge (such as motor workshops,

service station forecourts etc) an API rated interceptor is required. An appropriate maintenance plan shall be put in place for these devices, based on the suppliers recommendations. Maintenance records shall be kept of the systems by the property owner, and shall be made available for Council inspection on request.

- Add new paragraph (l): In all cases the quality of stormwater discharges to the public system must comply with the current TDC Comprehensive Stormwater Consent. The current requirements are available from TDC on request.

14.Clause 4.3.8.2 *Soak Pits*

- In areas with satisfactory soakage the Council normally requires on-site disposal through soakholes. Soakholes shall be protected from sediment discharge, particularly during earthworks and construction.

- For assets that vest in TDC, TDC requires 'open' systems of soakage ponds and attenuation systems that are designed to accommodate design storm volumes and are vehicle accessible for maintenance purposes. Specific Council approval is required for 'closed' soakage systems, such as drilled soakholes. Media-filled pits or underground tanks will only be accepted in special circumstances.

- Where soakholes are accepted for transfer to Council, the soakholes shall be designed as a minimum to manage a 10% AEP rainfall event of 1 hour duration, with a maximum of 25% of the stormwater lost to soakage during this period i.e. a minimum 75% of the runoff will be stored in the soakhole for later soakage. The soakholes shall be constructed with porous concrete liners in accordance with TDC standard drawing (Plan 14) appended to this section. Concrete bases shall be used to support the risers. Concrete risers should be interlocking to ensure alignment. The void between the drilled wall and the outside of the risers shall be filled with pea-metal. Where there are clusters of soakholes they shall be spaced no closer than 5 metres apart at their closest edge, be linked by distribution pipes to ensure equal water loadings and be situated in natural ground selected for its good soakage characteristics.

- Site investigations shall determine whether there is a recommended maximum depth of the soakhole to reduce the risk of 'tomo' formation in areas of excessively rapid infiltration or loosely-packed granular layers. This investigation shall have regard to the local area geology and any history of excessive soakhole or 'tomo' problems. If drilled soakholes are not recommended due to an excessive local risk of problems, then alternative storage and soakage systems shall be installed.

- Where soakholes are to be vested in Council, pre-filtration through sump filter bags will be required. Manufacturer and filter-bag sizing are subject to Council approval. Only clean stormwater may be discharged to a soakhole. Roofs not subject to leaf-fall loadings may discharge direct to soakholes without inline treatment, but ground surface areas subject to vehicle movements or debris deposition require gross pollutants to be trapped before discharge to soakholes.

- Soakholes located on private land shall be constructed in accordance with the relevant requirements of the NZ Building Act. Soakholes in commercial or shared situations shall be designed and sized by a professional experienced in stormwater design. In the absence of comprehensive on-site soakage tests, the maximum soakage rate in natural pumice conditions to be assumed is no more than 1500mm/m^2/hr, taken through the average wetted sidewall of the soakhole, with the base area ignored. An appropriate long-term soakage reduction factor shall be estimated and allowed by the designer to allow for the deterioration of soakage over time.

- 'Closed' soakage pits filled with scoria or similar materials are discouraged due to the impracticability of maintenance, but may have some use in areas subject to high ground

water levels, such as in close proximity to lake level or in areas with unsuitable conditions for drilled deep soakholes (either too little soakage, or too rapid soakage causing an excessive 'tomo' risk in loose granular layers). Where 'no-fines' scoria pits are used a maximum of 40% voids may be allowed for, with any discharges to them being clean filtered water. Other stormwater storage systems (such as tanks) may be used, subject to design approval.

- Shallow stormwater soakage trenches may be used in areas of high groundwater, poor deeper soakage or tomo-prone areas. Trench design is subject to site soakage tests with an appropriate long-term acceptance soakage reduction factor allowed. It is recommended that reference be made to the NZ Standard for onsite wastewater effluent disposal for guidelines on design of shallow soakage trenches. Soakage trenches shall be level and shall not be interconnected

- Rainwater may be harvested for irrigation or other usage on site, but adequate soakage must still be provided for the 10% AEP design storm to allow for high rainfall periods when irrigation is not required and rainfall tanks are full.

15.Clause 4.3.9.1 *Easements*

- Easements are required for protection of public stormwater pipelines, subsoil drains, waterways and secondary flow paths, when these are located in private property.

  Pipeline easements shall be a minimum of 3 metres wide and be granted on Council's standard 'Rights and Powers' easement terms. Where pipes are laid to depths of 3 metres or more, greater easement widths may be required to facilitate maintenance, with the easement width generally no less than equal to the pipe invert depth. Secondary flowpaths easements which drain urban public infrastructure shall be required also on council's standard terms which are available on request.

16. Clause 4.4.5 Earthworks, erosion and sediment control.

Winter is considered the best season for Taupo earthworks in pumice conditions. Spring and summer are typically subject to greater dust issues and more intense rainfall periods.

On significant greenfield subdivisions which create bare sections (no buildings at completion) which slope towards the road reserve, it is a requirement that temporary bunds and excavated soakage holes are provided by the developer at the low point of each site (each site has it's own independent system) to capture and dispose of stormwater runoff up to the 10% AEP rainfall event of 1 hour duration. These lots shall have a consent notice placed on them requiring that the bunds remain in place until the issue of the Code Compliance Certificate for the first buildings on the respective site. [Note: the purpose of these bunds is to control sediment and site runoff from building sites to prevent damage or overload in the public stormwater soakage system. They also provide a ready-made sediment control system for the builder]

A Consent Notice is required on each lot that slopes toward the public road requiring that a slot-drain is placed adjacent to the front boundary on the driveway. This shall discharge back to an on-site drilled soakhole located outside any TDC easement areas..

17. Additional Requirements

- Geothermal Areas

  Where ground temperatures at 1m depth are elevated more than 10^{o}C above the ambient temperature as measured at a remote 'cold' location, special requirements may apply to combat any effect from :

  i) elevated temperatures;
  ii) poor quality soils;
  iii) chemically active soil or groundwater.

  As a general rule [but subject to specific site requirement] the following shall apply:

  i) no temperature sensitive materials [plastics] shall be used;
  ii) all materials [other than those which are chemically inert] shall be coated;
  iii) special handling and construction techniques shall be used to prevent damage to any protective coating;
  iv) special bedding may be required to prevent damage from soft foundations;
  v) special formula temperature resistant rubber shall be used in all jointing.

- Protective coatings

  Where protective coatings are to be used, the entire exterior surface of pipes and structures shall be coated with 100% coverage of protective material which may be:

  i) high density polyethylene;
  ii) fibreglass;
  iii) other suitable type thermal tolerant/chemically inert epoxy or similar material.

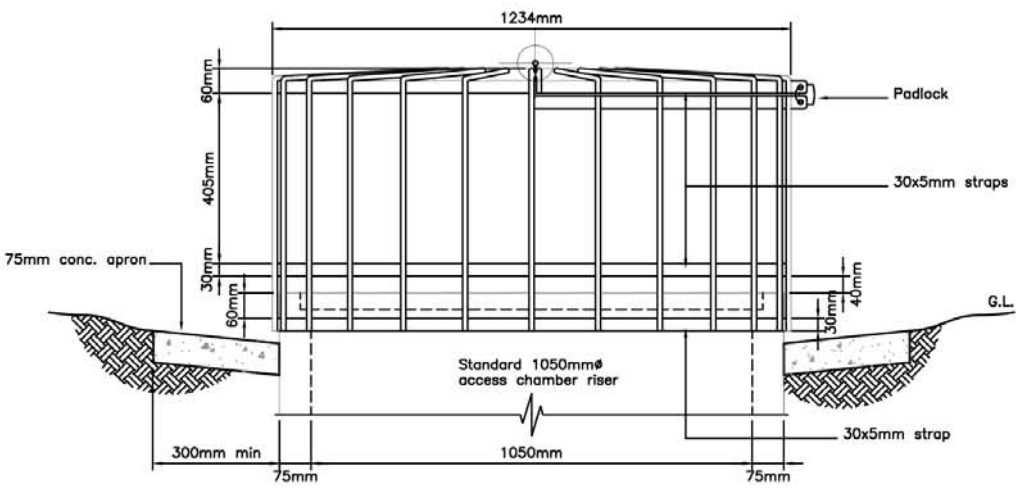
- Unstable ground

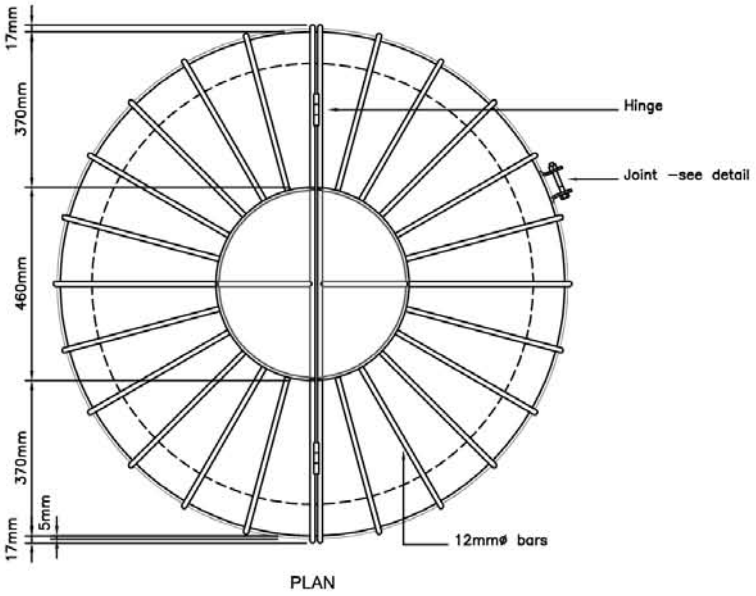
  Where unstable ground is encountered in the trench base that material shall be removed and replaced with compacted selected backfill up to the level of the pipe invert. When carriageways are in a mixture of cut and fill conditions, such as when traversing a hillside, the pipes should be placed in cut sections in natural ground. Pipelaying in 'embankment' fill conditions shall be avoided without specific design. Soakage areas shall not be placed in or adjacent to engineered fill areas.

  Where instability cannot be overcome pipelines shall be constructed from suitably anchored and/or supported steel pipes.

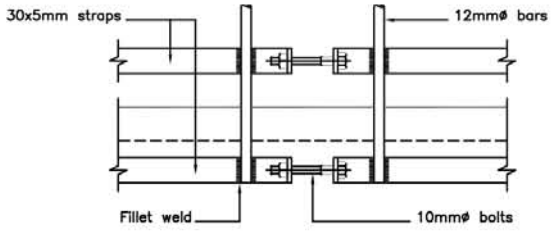
  All pipes shall be flexible jointed to allow for movement without joint failure.

- Work undertaken on Council owned assets shall be undertaken in accordance with *NZTA Code of Practice for Temporary Traffic Management (COPTTM)*





PLAN



JOINT DETAIL

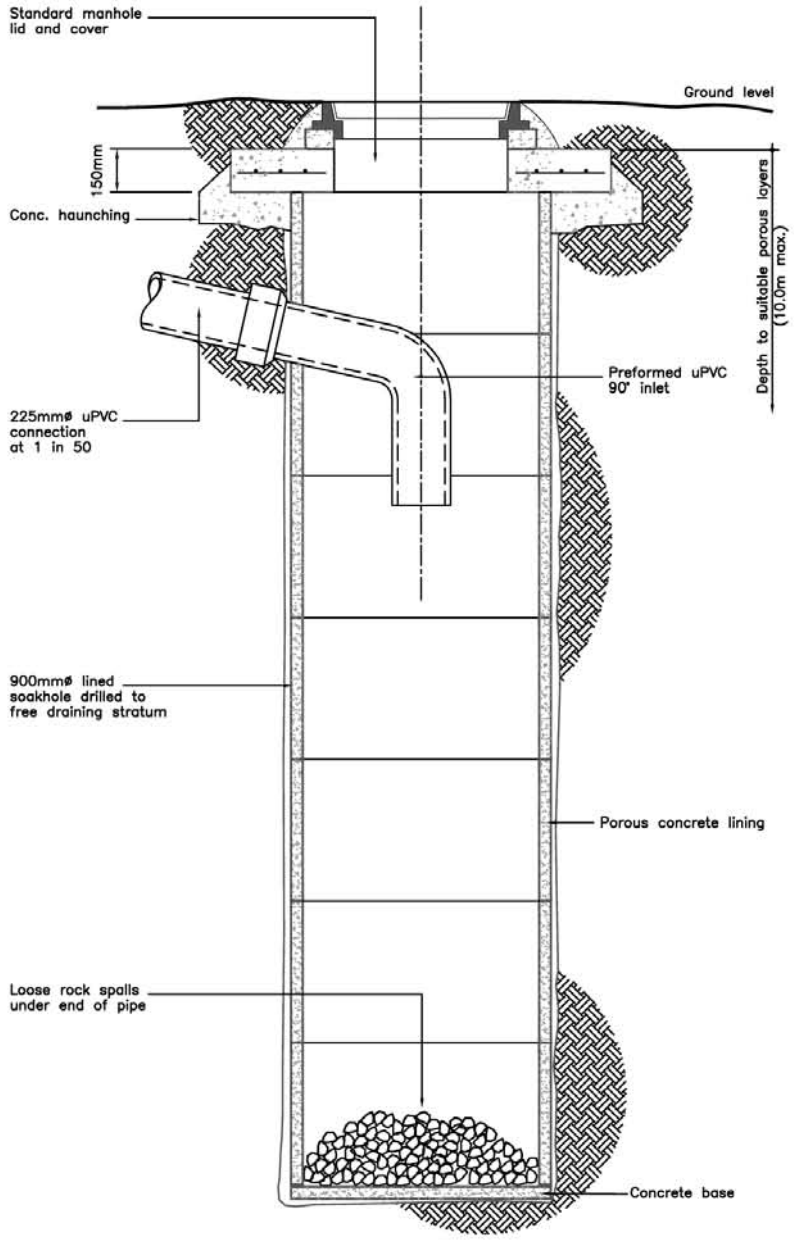
NOTE: All bars and rods to be mild steel and galvanised after fabrication.

Taupo District Council

DEBRIS SCREEN

July 2009

Plan 13



Note:
Concrete risers shall be interlocking to ensure alignment.

Taupo District Council

SOAKHOLE

July 2009

Plan 14

SCHEDULE 5

TAUPO DISTRICT COUNCIL

ALTERED REQUIREMENTS TO

PART 5 NZS 4404:2004 WASTEWATER

The Taupo District Council has adopted Part 5 of *NZS 4404:2004* with the following additions and/or alterations:

1. **Clause 5.3.2.2** *Scheme layout*

   - The Council's requirements for pipe locations are that wastewater reticulation shall be laid outside of the road reserve on an alignment which is:

     (a) Clear of buildable areas

     (b) At least 1.5m off a site boundary

     (c) Central within an easement in favour of Council.

   - Where the above is not possible, wastewater reticulation may be laid in the road reserve in conformity with alignments agreed between the Council and the various utility service providers.

2. **Clause 5.3.2.5** *Horizontal curves*

   - In general horizontal curves are not acceptable. However the Council may consider special case situations where normal straight alignments are impractical. In these cases specific designs, supported by appropriate information shall be provided to enable the Council to evaluate the proposals.

3. **Clause 5.3.2.6** *Vertical curves*

   - In general vertical curves are not acceptable. However the Council may consider special case situations where normal straight grades are impractical. In these cases specific designs, supported by appropriate information shall be provided to enable the Council to evaluate the proposals.

4. **Clause 5.3.*4*** *Easements*

   - Add the following clause:

     Easements are required for protection of public wastewater pipelines that are located in private property and shall be centred on the as built position of the pipeline. The easement shall be a minimum of 3 metres wide and provide unlimited and unrestricted access for the Council to undertake maintenance work. Where pipes are laid to depths of 3 metres or more, the easement width must be equal to the pipe depth.

5. **Clause 5.3.5.1** *Design Flow*

- (a) Residential flows

  a. Allow for average dry weather flow (ADWF) of 250 litres per day per person, unless otherwise approved by the Council.

  b. A diurnal peaking factor (PF) of 2.3

  c. Wet weather infiltration factor (WWIF) of 3.5

  d. Total number of people per dwelling (HEU) 2.7

6. **Clause 5.3.5.7** *Minimum Cover*

- Minimum cover requirements shall be in accordance with manufacturer's requirements but shall be no less than:

  (a) 600mm under street verges and ROW;

  (b) 900mm under other carriageways;

  (c) 500mm outside the road reserve

7. **Clause 5.3.8.1** *Pipeline materials (Gravity applications)*
   Wastewater drainage pipes shall be from:
   i) PVC-U to *AS/NZS 1260*;
   ii) spun concrete to *AS/NZS 4058* (only for pipes >300mm and subject to specific approval);
   iii) ceramic to NZS 3302 [up to 150mm diameter];
   iv) exterior coated and concrete lined spiral welded steel to *NZS 4442*.

   All PVC-U pipes shall be of a strength determined from:

Type	***Pipe Class***
Public Sewer	SN8
Private Drains	SN6

Special laying conditions such as heat or higher loading may require higher pipe classes. The design shall take account of this.

Pressurized and pumping sewer network piping (PE/PVC-U/PVC-M) shall be as per *AS/ NZS 4131, 1477* or *4765*.

Pipe fittings shall be of the same diameter and material as the pipe with which they are to be used.
Design and installation standards are:

- *AS2032 Installation of PVC Pipe Systems.*
- *AS2033 Installation of Polyethylene Pipe Systems.*
- *AS/NZS2566.1 Part 1 Structural Design. Buried Flexible Pipelines*
- *AS/NZS2566.2 Part 2 Installation. Buried Flexible Pipelines.*
- *AS/NZS 4998 –Unrestrained mechanical couplers*
- *AS/NZS 4793- tapping bands for water works purposes.*
- *AS/ NZS 2566* -Part 2 for Site Pressure Testing

Pipes shall be flexible jointed using spigot and socket rubber ring joints.

8. Clause 5.3.9.2 *Requirements of design*

- Where there is a single connection to existing TDC wastewater system then an appropriate saddle branch fitting will be issued by TDC, inspected and signed off before backfilling at the developers cost (in accordance with TDC *Fees and Charges* in the operative *LTCCP*)

9. Clause 5.3.9.4 *Location of connection*

- No connection from any site shall be laid across a public road carriageway or longitudinally along a verge in a public road.

- Connections shall be extended to a minimum of 1000mm inside a site boundary and be marked using tanalised stakes or pegs inserted prior to backfilling as shown on *WW002*. Stakes shall be coloured red for wastewater

11. Clause 5.3.10 *Pumping Stations and Pressure Main*

a. In general Pumping Stations are to be constructed in accordance *with the plans attached.* However applicants should discuss requirements with the Council for particular proposals prior to final design. In general the Council will require:

b. Stations to have not less than two 3-phase pumps. One pump must be on standby.
c. Above ground control system protected from the weather and 100 year flood level.
d. The pump station should have adequate capacity (minimum of 12 hours of average dry weather flow) for emergency storage to prevent sewage overflows. Chambers to have adequate access for cleaning and maintenance purposes. Storage volumes should not include reticulation without Council approval.]
e. Automatic and manual operation.
f. SCADA installed.
g. Soft step start or VSD.
h. Pumping stations to be located in publicly-owned land.
i. Wet wells deeper than 1.5m will be required to have a ladder and a landing installed at a depth of approx 850mm – 1m. Landings are to have hinged lids to allow pumps to be lifted out easily.
j. Odour emanating from the pump station must be eliminated by using suitable Biofilters as per the specifications and prior approval of the design specs by Council's Asset Manager. The design criteria and construction requirements for Biofilters to be employed on the Taupo District sewerage reticulation are as follows:

Performance Criteria

Odour Control
Biofilters operating on the Taupo sewerage reticulation system are considered to be operating effectively if there is no perceptible offensive sewage odour in the proximity of the filter under normal operating conditions. Slight musty odours associated with the biofiltration medium do not qualify as sewage odour.

Noise
The noise limitations applicable to Biofilters are the same as those applying to the pumping stations they serve.

BIOFILTER GENERAL ARRANGEMENT

Biofilters on sewerage systems in the Taupo District are constructed according to one of the following three configurations:
a) Sunken
b) Free bed
c) Confined bed

The choice of Biofilter configuration is to be decided by Council's Asset Manager based on the characteristics of the location including:

- Volume of general human traffic in the vicinity
- Safety in the given terrain
- Ground conditions
- Available space
- Ease of maintenance
- Risk of vandalism
- Aesthetic considerations

The following table gives ranges and recommended values for the essential design parameters of Biofilters on the Taupo sewer reticulation. Further design guidelines follow the table.

Item	**Specification**	**Additional Notes**
Volumetric Extraction Capacity	10 – 15 air changes per hour based on the total volume of the pump station wet wells and any connected air spaces above BWL including storage tanks. See also section on fan rating.	The space being ventilated requires an intake at the opposite end to the biofilter suction point to ensure ventilation of all headspaces.
Biofilter Bed		
Medium	Thoroughly blended mixture of: **90%** by volume screened pine bark essentially free of soil, fines, weeds and other foreign matter. Grading: < 10mm < 10% > 25mm < 10% **10%** by volume crushed shell.	Allow additional medium (over and above calculated bed volume) for side slopes where applicable. Shell is for buffering of possible occasional low pH conditions. Typically oyster shell.
Bed area (smallest bed cross-section perpendicular to flow)	Calculated for a volumetric loading (empty bed velocity V) in the range 0.8 – 1.5m^3/m^2/minute.	Tend towards upper range of volume where odours are known or anticipated to be strong, or the environment particularly sensitive to odour.
Bed volume	Empty bed residence time (T) 50 – 90 seconds.	
Bed depth, D	1.00 – 1.50m	

Foul air distribution system – fan, piping and distribution pipework		
Fan	To provide the specified 10 – 15 changes per hour at the combined pressure drop of the distributor system and the bed. To be constructed of corrosion-resistant materials.	Consider security, maintenance access and noise in proposed position.
Main	Pressure drop in the main between the first and last lateral to be less than 30% of individual lateral pressure drops. To be constructed of corrosion-resistant materials.	To ensure even distribution through the bed.
Laterals	Pitch/spacing: 500mm max. Hole sizes: designed to ensure that pressure drop through any hole is more than 70% of total pressure drop through the lateral. To be constructed of corrosion-resistant materials.	To ensure even distribution through the bed.
Distribution / drainage media	Evenly graded, free-draining scoria or coarse gravel, free of fines. Minimum depth twice OD of embedded main.	Typically 35/7 scoria. Provide drain to ensure media cannot become waterlogged.
Humidifying Spray		
Design Flow Capacity	Able to supply a continuous flow equivalent to 1.2ℓ / 100m³ odorous air.	Flow to be continuous if practical. Periodic dosing can be used where continuous flow is too low for spray nozzle.
Spray	Atomising spray producing a fine mist that will ensure at least 90% relative humidity at the bed entrance. Timer to be installed on irrigation system.	
Positioning	Duct centre-line immediately downstream of fan to provide maximum volume for evaporation. Duct to fall towards biofilter.	Unevaporated water to drain to biofilter drain system, not to fan.
Irrigation System – timer, solenoid valve, distribution piping and sprinklers		
Daily water requirement	1.2ℓ / 100m³ odorous air	
Design Flow Capacity	System to be capable of supplying the daily water requirement within 8 hours' operation.	
Sprinklers	Able to produce a uniform coverage of medium-sized droplets over the whole of the top surface of the biofilter bed when operated off the town water supply at the local water pressure and design flow.	Pop-up sprinklers generally suitable. Avoid both coarse droplets and mist sprays.

Biofilter Bed Sizing

The above table has ranges for three bed sizing parameters, namely bed depth D, empty bed velocity V and empty bed residence time T. These are interrelated:

$D = T * V / 60$

Fan Rating
The fan pressure rating is the sum of the dynamic pressure losses in the collection and distribution pipework and the biofilter bed. For freshly-filled biofilters an allowance of 85mm water gauge per metre bed depth should be provided for the pressure losses through the biofilter media.

Fans shall be belt and pulley driven and selected so that they operate within the lower half of the fan operational speed range at the biofilter design duty flow rate and head loss. This will allow the duty extraction flow rate to be maintained by changing the belt and pulleys to increase the fan speed should the head loss through the biofilter be greater than expected or increase over time owing to bed settlement and associated increase in back-pressure. Irrespective of the initial fan duty point, the fan motor power shall be rated to operate the fan at the maximum operational speed recommended on the fan nameplate.

Female threaded ports (½" BSP) with blank plugs shall be provided in the ductwork immediately upstream and downstream of the extraction fan to facilitate the periodic temporary installation of instrumentation such as manometers, anemometers and thermometers for performance monitoring purposes.

Prehumidification
The atomising spray will generally be mounted on a crossbar supported at both ends in the foul air duct. The section of piping holding the crossbar shall be readily removable for maintenance, typically by being mounted in a short flanged spool piece. The feed line to the crossbar shall have an isolating ball valve and simple disconnection for the same purpose. Alternative proprietary designs may be used with the approval of Council.

Sprinkler System
An auxiliary irrigation system with timer and solenoid will be installed.

Other important parameters for Biofilter design considerations

Safety
Consideration should be given as to the likelihood and consequences of people or animals gaining access onto the bed surface. If this is a possibility appropriate measures must be included and documented in the design.

Location of auxiliary equipment
The fan, solenoid valve and associated timer and electrical equipment need to be located in secure positions with suitable lockable access for maintenance.

Foul Air Ductwork
The design should avoid the possibility of accumulation of condensate in the ducting. It is preferred that it be underground for most of its length. It should be free draining into the biofilter.

Drainage line
The drainage line from the base of the bed is to have a fall of at least 1% towards the disposal point. This point will generally be the wet well of a pump station or a gravity sewer manhole. The drainage line is to be fitted with an approved water trap, accessible for cleaning, to prevent short-circuiting of contaminated air through the drain line.

LOCATION
The location of the biofilter will be agreed in discussion with Council once its approximate size and configuration have been confirmed by the designer. The location will be decided primarily by consideration of

- Space requirement for the biofilter

- Space requirements for ancillary equipment (fan, fan controls and water supply system)
- Proximity to the facility being vented
- Proximity to nearby sensitive land use
- Security and safety
- Maintenance access

Materials
All materials are to be selected for durability and minimal maintenance. All major components and items difficult to replace in the course of normal maintenance shall be designed for a minimum service life of 20 years.

Timber
All timber used is to be treated to the degree appropriate to the location.

Membrane
The biofilter liner is to be impervious, preventing soil and groundwater contamination by biofilter leachate. It should be constructed of HDPE at least 1mm thick or a higher specification material. Any portion of the membrane exposed to sunlight is to either be rated UV-resistant or have suitable protection. The supporting surface is to have neither protrusions which could pierce the membrane nor significant unsupported gaps where the membrane could be stressed by the mass of moist adsorption medium. The edges of the liner are to be secured either to the frame of the bed or in a trench with suitable backfill, as appropriate to the type of biofilter.

Piping, Fan, Valves and Fasteners
To be constructed of corrosion-resistant materials.

DOCUMENTATION REQUIREMENTS
Documents to be supplied to Council for biofilters for approval are to include as a minimum:
- General arrangement drawings
- Design air flow and sizing calculations
- Membrane material details
- Details of equipment including fan, electrics, timer and valves.

12.Additional Requirements

- **Geothermal Areas**

  Where ground temperatures at 1m depth are elevated more than 10 degrees C above the ambient temperature as measured at a remote 'cold' location, special requirements may apply to combat any effect from :

  i) elevated temperatures;

  ii) poor quality soils;

  iii) chemically active soil or groundwater.

  As a general rule (but subject to specific site requirement) the following shall apply :

  i) no temperature sensitive materials (plastics) shall be used above their recommended temperature rating (evidence of this shall be supplied at the time of design);

  ii) all materials [other than those which are chemically inert] shall be coated;

iii) special handling and construction techniques shall be used to prevent damage to any protective coating;

iv) special bedding may be required to prevent damage from soft foundations;

v) special formula temperature resistant rubber shall be used in all jointing.

- **Protective Coatings**

Where protective coatings are to be used, the entire exterior surface of pipes and structures shall be coated with 100% coverage of protective material which may be:

i) high density polyethylene;

ii) fibreglass;

iii) other suitable type thermal tolerant/chemically inert epoxy or similar material.

- **Unstable Ground**

Where unstable ground is encountered in the trench base the material shall be removed and replaced with compacted selected backfill up to the level of the pipe invert. Adjacent to unsupported embankments, pipes shall be located below a 45^0 plane projected upwards from the toe of the embankment.

Where instability cannot be overcome pipelines shall be constructed from suitably anchored and/or supported steel pipes.

All pipes shall be flexible jointed to allow for movement without joint failure.

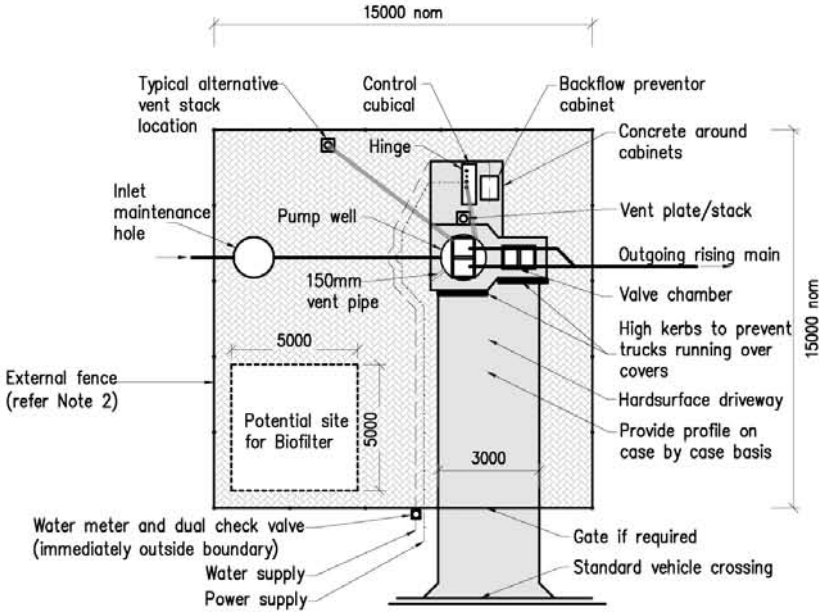
- **Testing**

All gravity wastewater mains and laterals shall be tested, either with a water test or an air test. The Council may also require testing of manholes if it considers infiltration may be a problem.

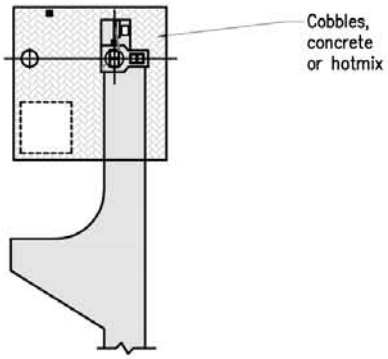
The water test shall be maximum test height of 6.0 metres above the invert of the low manhole of the line being tested and a minimum of 1.8 metres above the invert of the high manhole. The pressure head shall be maintained for a minimum of 15 minutes and no loss is permitted. Testing shall only be carried out between adjacent manholes. The air test shall be to a pressure of 20 kilopascals. No pressure loss is allowed over a one minute period from the application of pressure.

Manholes shall be tested, after a 24-hour period of soaking to allow for absorption, by completely filling with water to the top surface of the roof slab. The rate of water loss shall not exceed 5 litres per hour.

All pumping sewer mains shall be tested according to *AS/ NZS 2566* -Part 2.Work undertaken on Council owned assets shall be in accordance with *National Code of Practice for Utilities' Access to the Transport Corridors*, *NZTA Code of Practice for Temporary Traffic Management (COPTTM), OSH 2000 Code of Practice for Safety in Excavations and Shafts for Foundation* and *AS/NZS 2865:2001. Safe Working in a Confined Space.*



TYPICAL LAYOUT FOR PUMP STATION SITES ACCESSIBLE FROM ADJACENT ROADWAY



ALTERNATIVE LAYOUT FOR PUMP STATION SITES NOT ACCESSIBLE FROM ADJACENT ROADWAY

NOTES:

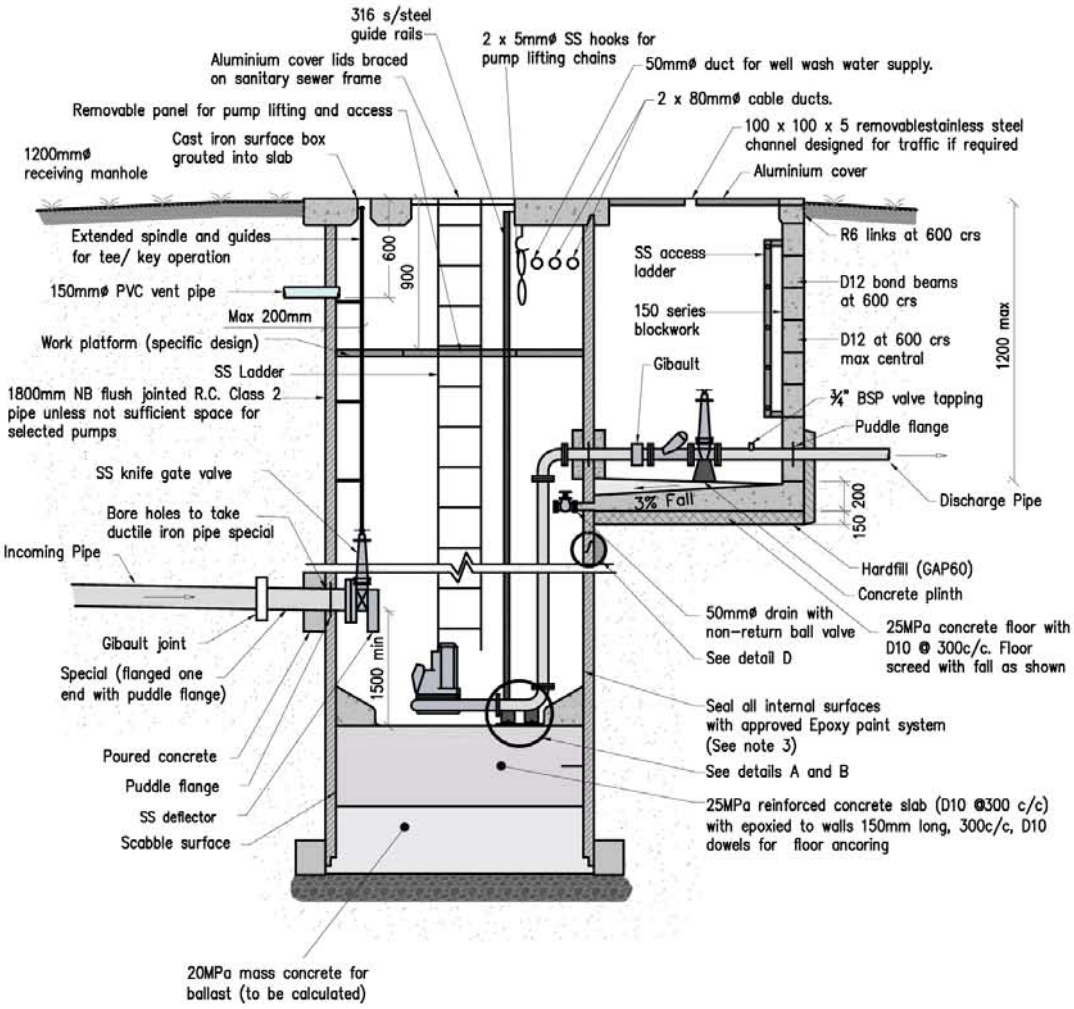
1. The details shown on this drawing are typical details only.
2. Fencing to suit if required by Council.
3. Landscaping may be requireddependent upon site location and area available.
4. Pump station platform shall be graded away from openings.
5. Area around pump station shall be graded to prevent surface water flowing onto or over pump station cover slabs. Alternatively, sufficient drainage shall be constructed.
6. Pump station Lot shall be on separate title.
7. Vent pipe to be installed 500mm beyond concrete slab or driveway.
8. If close to the public road, truck turning facilities shall be provided.
9. For emergency work at night, light pole close to the Control Cubical shall be provided.

Taupo District Council

WASTEWATER PS TYPICAL SITE LAYOUT

July 2009

PS01



NOTES:

1. If valve chamber is in ground water, precast concrete panels should be used in lieu of concrete blocks.Vent pipe to be installed 500mm beyond covering concrete slab or driveway.
2. Suction clearance from wetwell invert must be according to manufacturers recommendations.
3. Expand concrete surface coating to have 1 primer + 2 top coats.
4. All specials anchored in concrete walls shall be DI or 316 Stainless Steel.
5. Provision should be made for supply, delivery and installation of automatic wet well washer.
6. Valve chamber to be 150 series block work or a precast chamber.
7. Where trade waste discharge is likely chemical resistant concrete shall be used.
8. Puddle Flange anchorage to be determined by the designer and approved by Council prior to construction.
9. In situations where elevated odour risk occurs, e.g. 'old' sewage, a submerged dropper inlet should be installed.

Taupo District Council

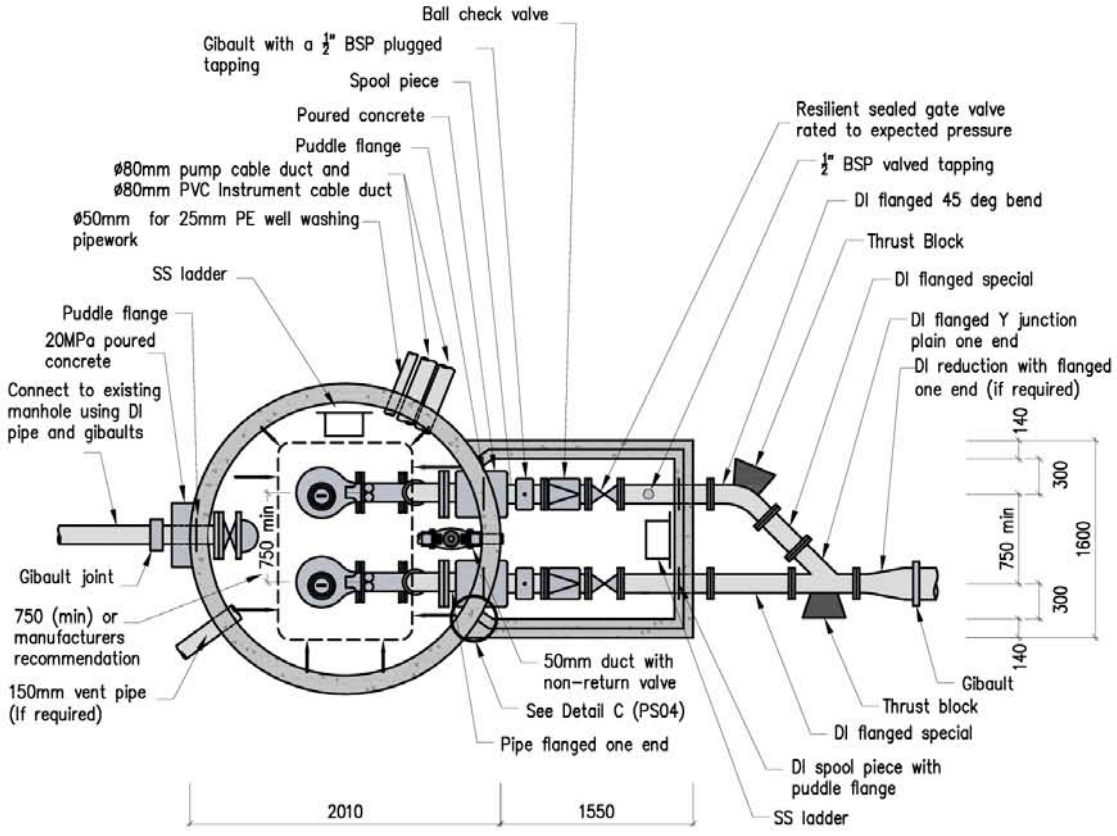
WASTEWATER PS ELEVATION SECTION

July 2009

PS02

NOTES:

1. Unless stated otherwise all internal pipework to be DI or 316L stainless steel (Schedule 10).
2. All stainless steel shall be 316L quality.
3. All nuts, bolts and washers shall be 316 stainless steel, and coated to prevent 'binding' prior to installation.
4. Denso–tape wrap protects all buried flanges, gibault joints and SS fasteners.
5. Pumps are to be Flygt type or similar approved.
6. All DI pipe fittings and valves to be nylon coated.
7. No stainless steel pipe outside of wet well and valve chamber.
8. 750mm between pump centres is for standard Flygt 150mm MT pumps. Manufacturers recommendations for pump clearances must be followed.



Taupo District Council

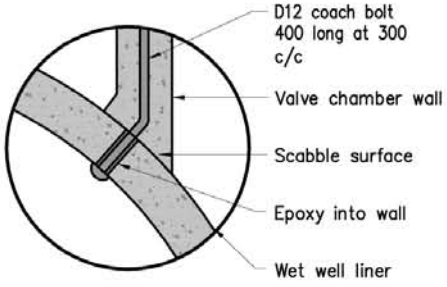
WASTEWATER PS PLAN SECTION

July 2009

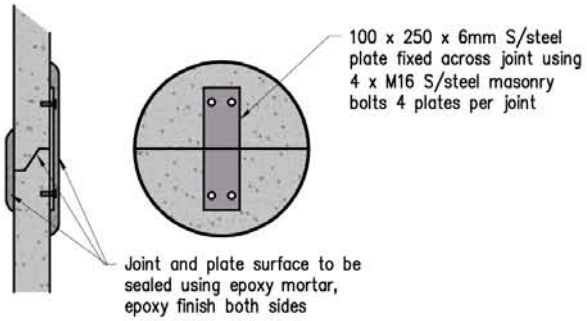
PS03

NOTE:

1. All metal fasteners to be 316 stainless steel.



DETAIL C
CONNECTION VALVE
CHAMBER TO WET WELL



DETAIL D
WET WELL RISER
CONNECTION

Taupo District Council

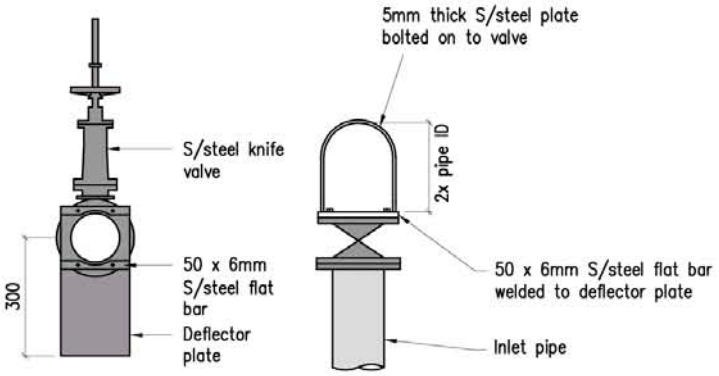
WASTEWATER PS DETAILS

July 2009

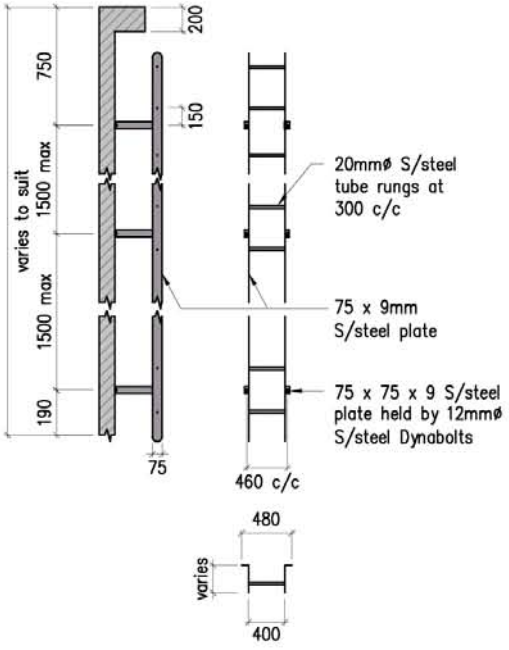
PS04

NOTES:

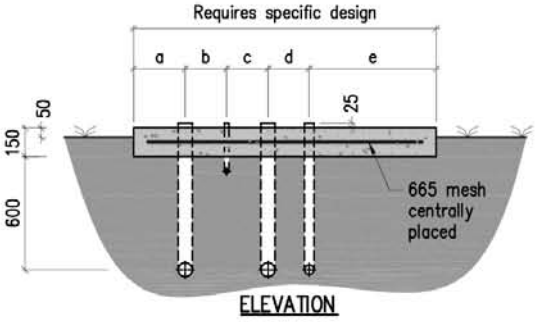
1. All dimensions must be agreed with electrical contractor.



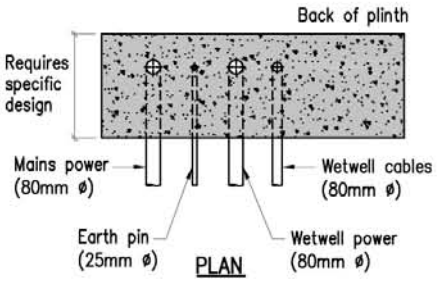
DEFLECTOR PLATE DETAIL (150mmø)



LADDER DETAIL



ELEVATION



PLAN

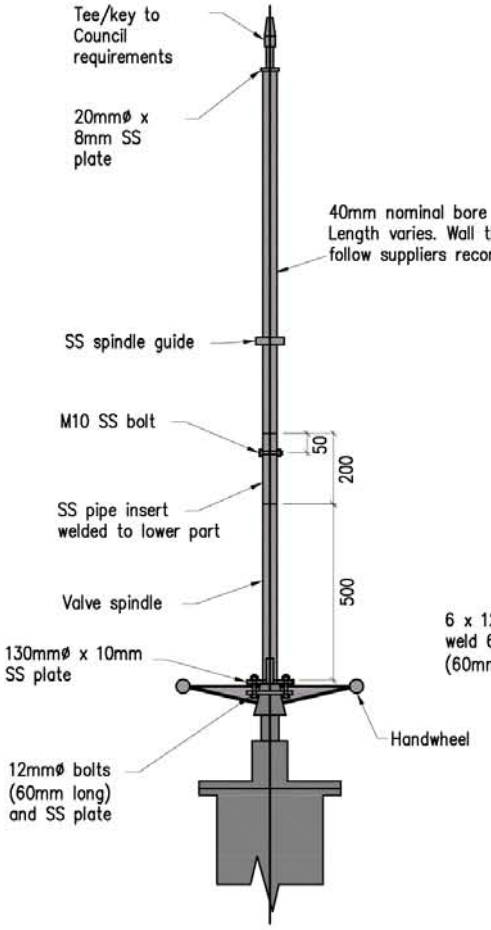
MOTOR CONTROL CENTRE PLINTH DETAILS

Taupo District Council

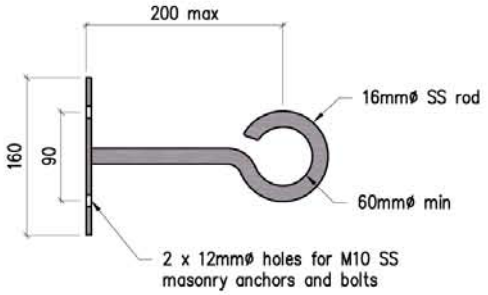
WASTEWATER PS DETAILS

July 2009

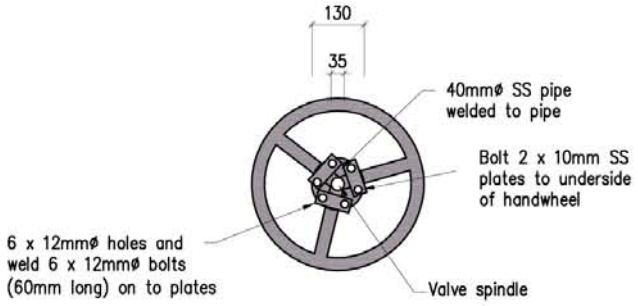
PS05



VALVE EXTENSION SPINDLE DETAIL



SPINDLE GUIDE DETAIL

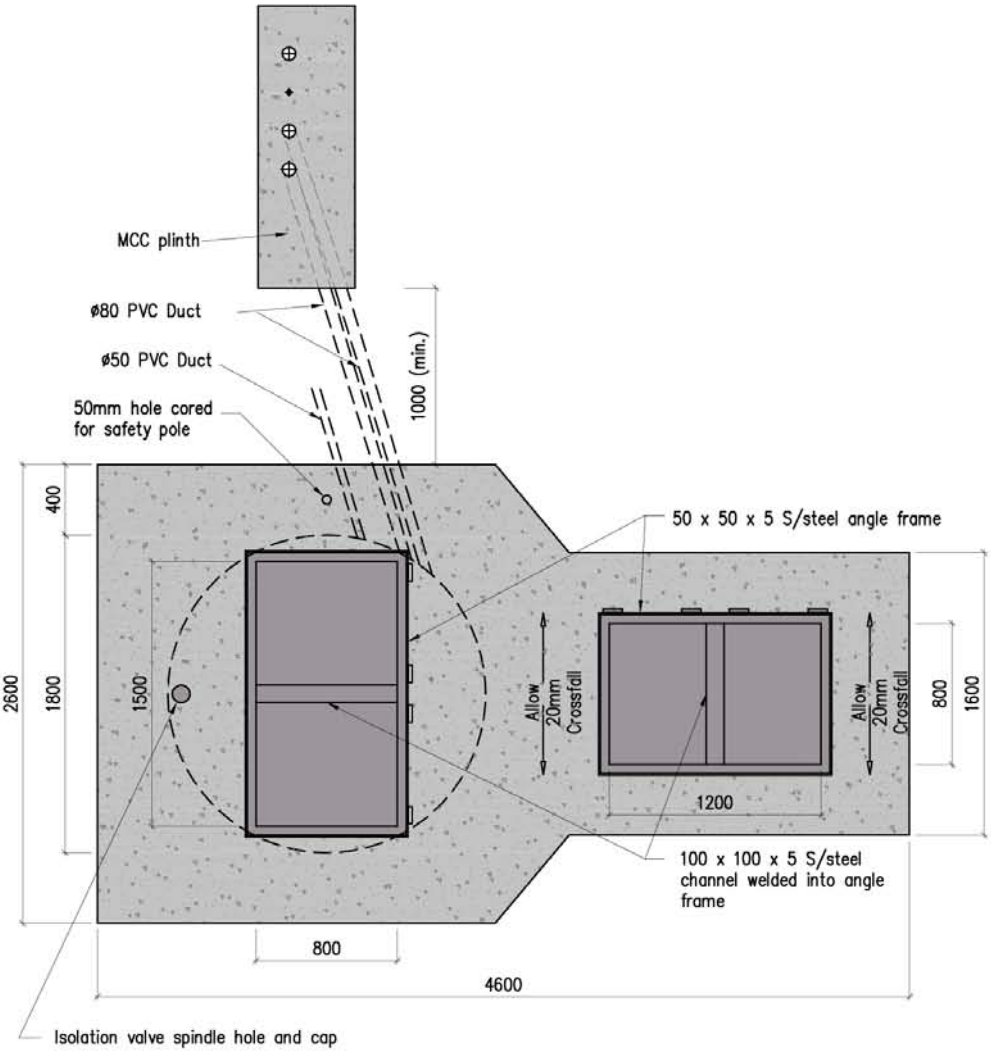


HANDWHEEL DETAIL

Taupo District Council	**WASTEWATER PS DETAILS**	July 2009 **PS06**

NOTES:

1. All dimensions shown are a minimum.
2. Large pumps may require greater dimensioning which will need Council approval.
3. Location of plinth to be agreed on site in consultation with Council representative.
4. Location of safety pole to be agreed on site in consultation with Council representative.
5. Cover slab and aluminium cover are designed for pedestrian loading only.
6. Specific structural design will be required if traffic loading is anticipated



Taupo District Council

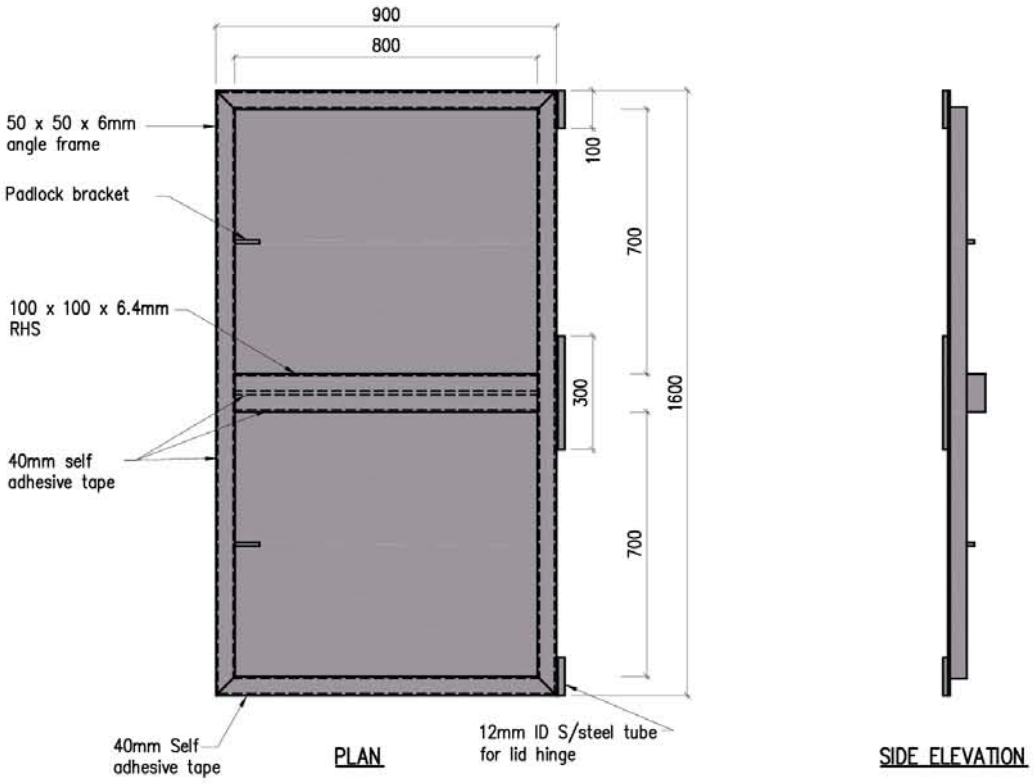
WASTEWATER PS COVER SLAB

July 2009

PS07

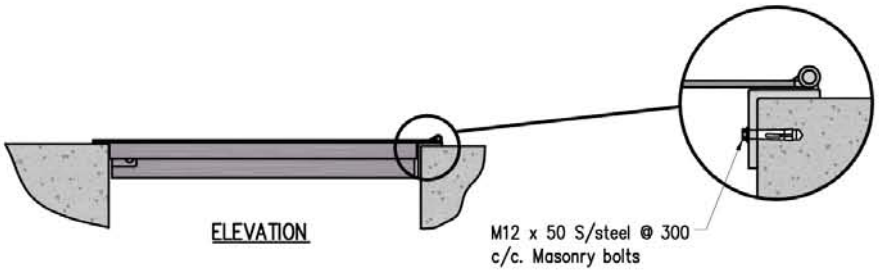
NOTES:

1. The entire frame is to be constructed of 316L stainless steel.



PLAN

SIDE ELEVATION



ELEVATION

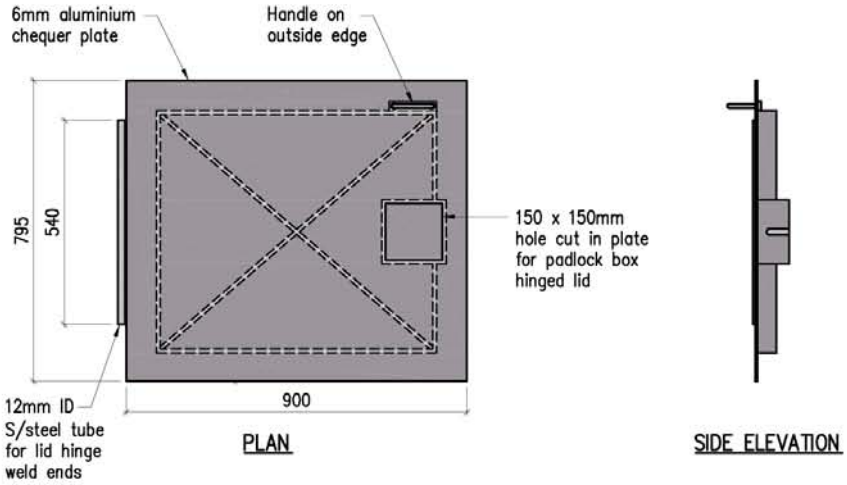
CHAMBER FRAME

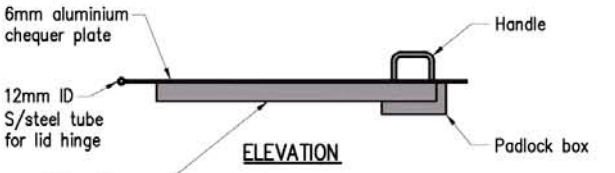
Taupo District Council

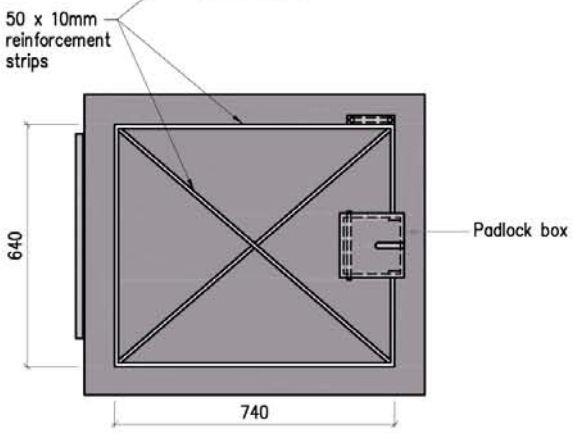
WASTEWATER PS ENTRY FRAME DETAILS

July 2009

PS08







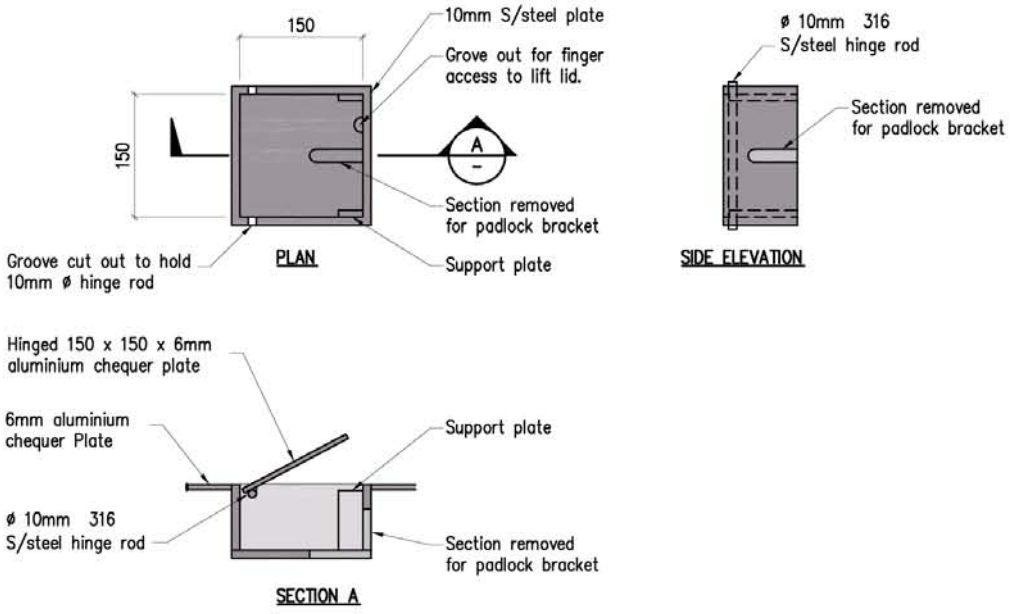
UNDERNEATH LID

Taupo District Council

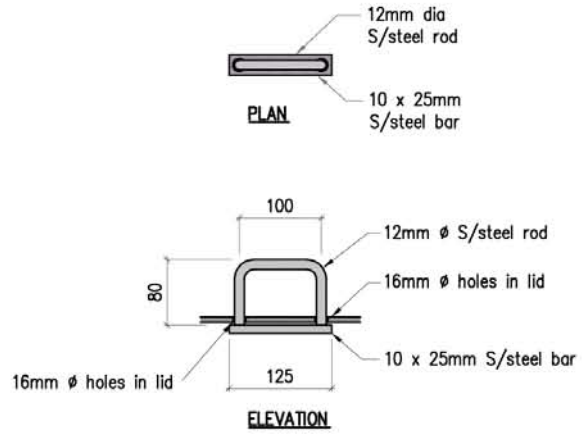
WASTEWATER PS CHAMBER LID DEAILS

July 2009

PS09



PADLOCK BOX DETAIL



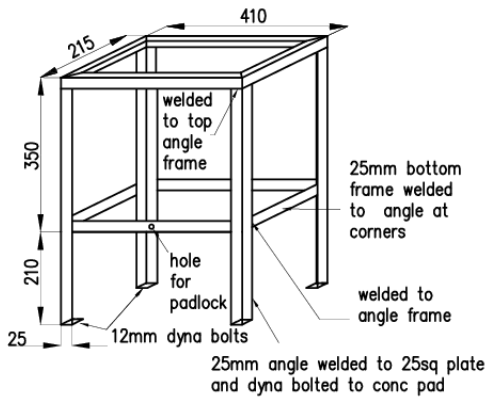
HANDLE DETAIL

Taupo District Council

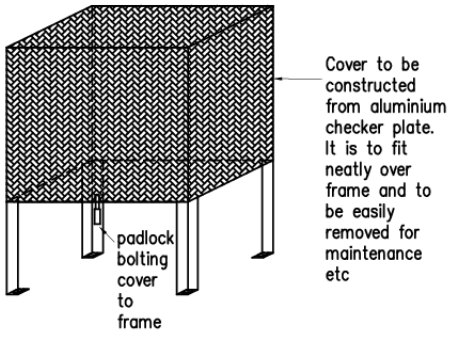
WASTEWATER PS CHAMBER LID DETAILS

July 2009

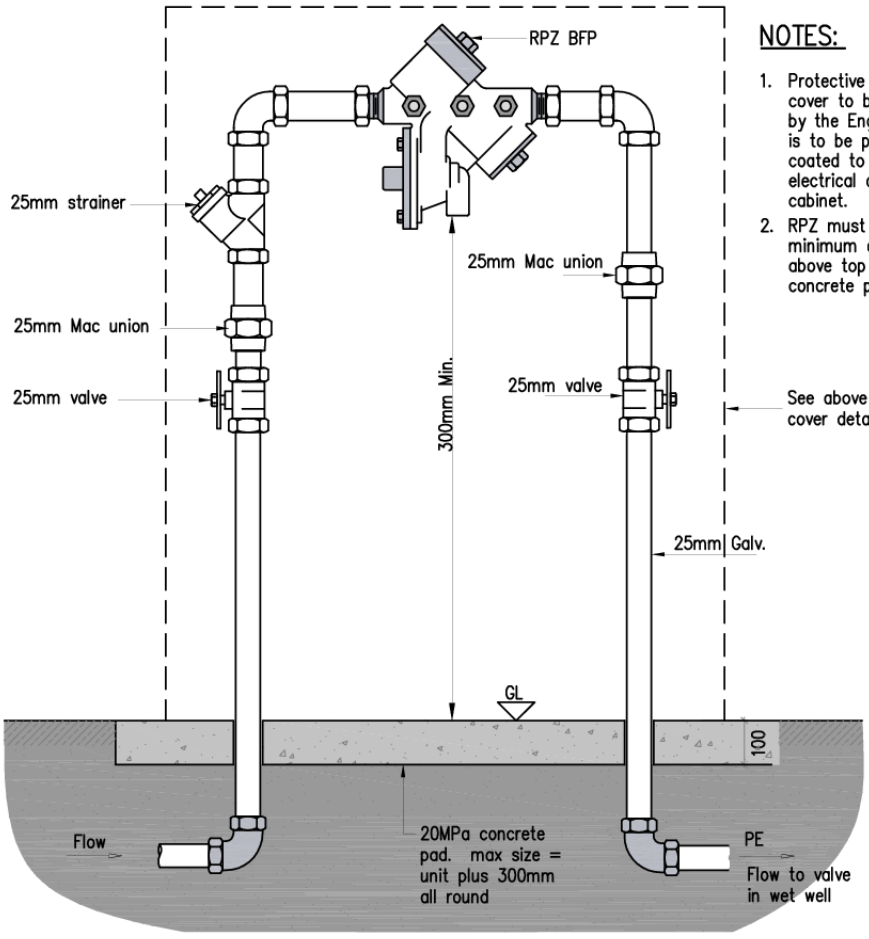
PS10



BACK FLOW METER COVER FRAMEWORK



BACK FLOW METER COVER



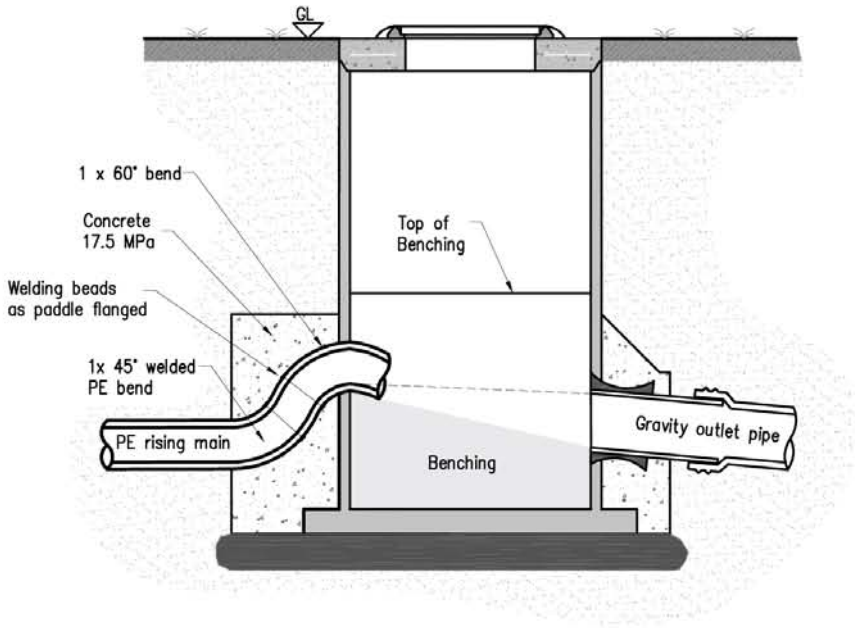
NOTES:

1. Protective frost proof cover to be approved by the Engineer, and is to be powder coated to match electrical control cabinet.
2. RPZ must be a minimum of 300mm above top of concrete plinth.

WASTEWATER PS
25mm WATER SERVICE CONNECTION

July 2009

PS11



Taupo District Council

WASTEWATER PS ALTERNATIVE R. MAIN ENTRY TO RECEIVING MH

July 2009

PS12

SCHEDULE 6

TAUPO DISTRICT COUNCIL

ALTERED REQUIREMENTS TO

PART 6 NZS 4404: 2004 WATER SUPPLY

The Taupo District Council has adopted Part 6 of *NZS 4404:2004* with the following additions and/or alterations:

1.0 Clause 6.3.7.1 *Sizing of Mains*

Residual pressures due to peak demand shall be a minimum of 300 kPa.

2.0 Clause 6.3.7.2 *Pipe Class*

Minimum pipe classes shall be PN9 where appropriate to the maximum static pressure (for example: gravity flow) or have a pressure rating of PE80 PN12.5 or PE100 PN16, according to specific design & pressure zone.
SDR 11 pipe shall be used when installed by directional drilling.

Pipes should have standard metric O.D. dimensions complying with the following:-

Nominal Size (mm)	**Minimum Outside Diameter (mm) ≈ DN**
100	125
150	180
200	250
300	355

3.0 **Clause 6.3.7.3** *Pipe material*

PE Pipe manufacture shall comply with the standards & tests as set out in *NZS/AS 4130: Polyethylene (PE) Pipes for Pressure Applications* and be fabricated from PE80 or PE100 materials complying with *NZS/AS 4131: Polyethylene compounds for pressure pipes & fittings*.

- PVC-U pipe and fittings for pressure application, in accordance with *AS/NZS 1477*;
- PVC-M pipe for pressure application In accordance with *AS/NZS 4765*;
- PE 80 (formerly known as MDPE) in accordance with *AS/NZS 4130* [maximum, nominal internal diameter 50mm/ DN 63].
- Bi-axially oriented PVC [PVC-O] pressure pipes, DN (100/150/200/300). Pressure Class PN 12.5, Design Material Class 400, Design Coefficient 1.6, conforming to *AS/NZS 4441*.
- The exterior surface shall be clearly labelled with "Trade mark", Series number", Nominal diameter", "Pressure rating", "SDR number", "material", "NZS/AS standard".

Pipe fittings shall be of the same diameter and material as the pipe into which they are to be inserted, except that:

- fittings for PVC shall be :
  - Ductile iron if 50mm diameter or larger; as per AS / NZS 2280
  - PVC-U to *AS/NZS 1477* if smaller than 50mm diameter;
- Ductile iron pipes /fittings shall be to AS/NZS 2280;
- PE 80 (formerly known as MDPE) fittings shall be to *AS/NZS 4129* and rated at PN 12.5
- The pipe jointing system for PVC-M pipe shall be either of the following:-
  - Z' type rubber ring jointing system
  - Universal couplings with tapered EPDM-Rubber seals.

Design and installation standards are:

- *AS2032 Installation of PVC Pipe Systems.*
- *AS2033 Installation of Polyethylene Pipe Systems.*
- *AS/NZS2566.1 Part 1 Structural Design. Buried Flexible Pipelines*

- *AS/NZS2566.2 Part 2 Installation. Buried Flexible Pipelines.*
- *AS/NZS 4998 –Unrestrained mechanical couplers*
- *AS/NZS 4793- tapping bands for water works purposes.*
- *AS/ NZS 2566* -Part 2 for Site Pressure Testing

4.0 Clause 6.3.9.5 *Pressure Zones*

The Council has some 22 water supply network schemes all of which have specific characteristics and which are subject to modification from time to time. Designers should approach Council to obtain the most relevant information for a particular proposal. Some schemes are at capacity and closed to new connections.

5.0 Clause 6.3.9.6.1 *Design Pressures*

The maximum static pressure should generally not exceed 750kPa (75 metres head)

Minimum requirements are that in any road no watermain shall be laid above a hydraulic gradient line falling at the head loss defined in paragraph 6.3.9.4, starting at a point 9 metres below the floor of the supply reservoir.

Minimum working pressures may be set by fire fighting requirements, but in no case shall they be less than 225kPa in urban areas.

6.0 Clause 6.3.10.1 *Layout of water mains general*

The location shall be in accordance with the standard trench alignment as shown in the transportation corridor cross section.

7.0 Clause 6.3.10.3 *Water mains in easements*

All water mains outside of road reserves shall be:

- Clear of buildable areas and carriageways
- At least 1m off any boundary demarcation
- Contained within an easement in favour of Council

8.0 Clause 6.3.10.6 *Shared Trenching*

The Council allows shared trenching, subject to TDC Asset Manager /Engineers approval.

9.0 Clause 6.3.12 *Reservoirs and Pumping Stations*

If reservoirs and/or pump stations are proposed then these should be discussed with the Council at an early stage. Reservoirs will require specific design by a suitably qualified person. Pumping stations will be required to meet the design criteria in *WSA 03, Water Reticulation Code of Australia*, and in general the Council will require:

Stations to have not less than two 3-phase pumps generally located within a building located on publically owned land. These should be a minimum of a "duty and standby" pump.

Above ground control system protected from the weather, in a separate space to the pumps.
Automatic operation with manual operation selectable
TDC SCADA installed.
Soft step start or variable speed drive (VSD) (to be finalized in consultation with the TDC Engineer)
There shall be provision for a valve chamber for reservoir isolation and drainage provided in case of emergencies or for maintenance requirements.

Based on risk assessment by TDC, the control panel for the pump station shall also require a separate room to prevent any damage to the electrical panel due to splashes, leak and or bursts in the water discharge line.

Bulk flow meter(s); ABB magflow meter, is to be installed for continuously recording of both flow "to and from" (in and out of) the reservoir.

Note: At the commencement of any development, if the reservoir turnover rate is low, it will be necessary to install pH, turbidity and Chlorine analyser, in order to meet compliance with *DWSNZ*.

10.0 Clause 6.3.14 *Water quality*

The water infrastructure shall be designed and constructed such that there is no impediment to the obtaining of a Ba grading, such gradings being determined from the grading rules adopted by the Ministry of Health at the time of system approval.

11.0 Clause 6.4.1 *Valves General*

Sluice valves shall be plain ended cast iron sluice valves to *AS 2638.2*.

In general : Existing Taupo and 'old' Turangi (east of SH1) valves are *clockwise closing* - elsewhere in the District valves are *anti clockwise closing.*

All new valves operated by spindle (DN >50) shall be installed as anti-clockwise closing valves. Where new anti-clockwise valves are installed in an area that has existing clock-wise closing valves, the lids shall be painted Harbour Blue (B24) to AS 2700 (top and inside of the lid) to distinguish them. In all other areas valve lids and frames shall be painted White (N14) to *AS 2700* with road-marking grade paint.

Gate valves DN ≤ 50 shall be bronze gate valves to *BS 5154* Class 150 or higher [clockwise closing].

Fittings: All bolts, nuts and washers shall be grade 316 stainless steel with factory applied "Molybond" coating. Each bolt head shall be marked A4 or A4-70/80 and have rolled threads.

NOTE: This applies to ALL exposed bolts including those for valves, pump stations and pressure reducing valve assemblies.

Water meters sizes of 20 and 25 mm:

- The water meter shall comply with *ISO 4064/1 or BS 5728.1: Measurement of water flow in conduits, Part. 1: Meters for Cold Potable Water*.
- Have a pressure rating of 16 bar (1600 kPa).
- Performance of the meter shall be equal to, or better than the requirements for 'Class C' classification of *ISO 4064/1* and OMIL R49 type 1 or 2.
- Meter shall have ± 2% accuracy.
- The required flow to start the meter shall not be greater than 15 l/hr.
- A pulse unit & reed switch output (electronic volumetric) shall be integral with the meter for data logging and future automatic meter reading. The meter register shall be a sealed unit that will prevent the ingress of dirt & silt and will not permit the fogging of the numerals.
- A hinged protective cover shall also be fitted to shield the reading face. The preferred unit is one that is raised at least 70mm above the centre line of the service pipe.
- The meter serial number shall be positioned suitably so that it can be read in conjunction with the meter reading. This number shall be supplied to Council on completion of installation.
- Water meters currently approved and currently in use within Taupo District are:-
    - *Kent and Socam*

Supplementary fittings and equipment shall be of proprietary type as approved by the engineer for specific use (manifold type toby connection) at a particular location/ development within the District.

12.0 Clause 6.4.2.2 *Butterfly Valves*

Butterfly valves are generally not acceptable.

13.0 Clause 6.5.1 *Hydrants general*

Fire hydrant valves shall be resilient seat, screw-down type; factory tested to 16 PN and shall comply with *BS 750: Underground fire hydrants & surface boxes*. In addition:

- Hydrants and risers shall be cast from ductile iron conforming to *AS 1831: Ductile cast iron*.
- Only tall pattern shall be used.
- Protective coating shall be coloured blue fusion bonded nylon or other polymeric coating complying with *NZS/AS 4158: Polymeric Coatings on Valves & Fittings for Water industry*.
- The sealing stopper shall be fully encapsulated with EPDM or nitrile rubber compound in accordance with *AS/NZS 1646: Elastomeric Seals for Waterworks Purposes*.
- Hydrant valves shall be clockwise closing.
- The stem gland shall have a minimum of two "O" seal rings and the gland held in place by two fully encapsulated bolts.
- Fire hydrant boxes installed in trafficked areas shall be made from grey cast iron, complying with *BS 750: Underground fire hydrants & surface boxes*.
- Boxes located in berm or carriageway shall have a complete concrete surround 150mm deep x 150mm wide. The lids and frames shall be painted Golden Yellow (Y14) to *AS 2700* with road-marking paint.
- Marker posts are not required in urban areas. Blue 'catseye' reflectors are required adjacent to the carriageway centreline.

14.0 Clause 6.6.2 *Property Service Connections*

The Council requirements to prevent water which has been drawn from the Council's water supply from returning to that supply are as follows:

- Backflow prevention devices shall be as per the NZ Water Supplies Protection Regulations 1961 and are required on commercial, industrial, low-density residential and rural water supply connections, unless otherwise agreed by Council.
- They shall
- Be Independently Certified to *AS/NZS 2845*,
- *Meet AS/NZS 3500 National Plumbing Code*.
- In accordance with the *Water New Zealand (formerly NZWWA) Backflow Prevention for Drinking Water Supplies Code of Practice*.

All double check testable valve (DCV) and reduced pressure zone (RPZ) backflow prevention assemblies shall be designed for in-line service and must be installed to prevent freezing, flooding and mechanical damage with adequate space to facilitate maintenance and testing. The installation shall be easily accessible. Adequate clearances from floors, ceilings and walls must be provided to access the test cocks and to allow the repair and/or removal of the relief valve and check valves.

Reduced Pressure Zone valves (RPZ) shall be installed in high hazard installations where back-pressure or siphoning could occur (for example: wastewater pumping stations, sewer

flushing lines, service stations, medical centres, laboratories, hair salon washbasins, commercial dishwashers, chemical handling facilities or industrial usages which may have the potential to contaminate the council's water supply).

After plan approval has been issued and installation completed, it shall be tested by a certified tester. The designer is then responsible to certify that the installation has been done in accordance with approved plans and NZ standards; or describe any changes and submit "As Built" plans as appropriate.

- After issuance of the Completion Certificate, the assembly must be tested at least annually by a certified tester with the results reported to the Council's Asset Manager.

Council's standard domestic residential water connection is the Acuflo GM900S MKII Manifold water connection, without water meter. Low density residential, rural, commercial and industrial water connections shall be the Acuflo GM100STR, testable Double Check BFP and Diaphragm valve. A flow restrictor is required for low density residential and rural water connections. Flow test results of the flow-restrictors shall be provided to Council prior to completion of the development or usage on site, with acceptable test results to be within -5%/+15% of the target flow

The minimum size of any connection shall be 15mm for a front residential or rural site. 20mm connections shall be used for a rear residential, commercial or industrial site. An increased connection size may be required for sprinkler installations to achieve design flows. A separate service with a water manifold assembly in a standard Acuflo box with fitted base and blue lid shall be installed for each lot. Generally the water manifold should be located 300 to 400 mm within the lot from the front boundary and clear of where any driveway carriageway is likely to be located Water connections may be positioned outside the property boundary in shopping centre precincts.

- For automatic sprinkler installations, *NZS4541:2007* shall be complied with.

A reduced pressure detector assembly (RPDA) shall be used where onsite fire-protection systems are installed. The RPDA should have a metered by-pass line, equipped with a 3/4" RPZ to record any unauthorized water usage downstream.

Water connections off the mains or ridermains shall be taken from the tops of the mains with a self-tapping ferrule. After pressure testing and chlorination the ferrules shall be **turned off** before backfilling.

White-painted marker posts are required for rural water connections. Marker posts are also required where council pipes cross under fence-lines or private right of ways.

Clause 6.11.5 *Minimum Water Demand*

Water demand for the purposes of designing water infrastructure shall be determined as follows:-

RESIDENTIAL AREAS:-

Water infrastructure shall be designed to provide for the worst of the following 2 scenarios:

A. Peak Domestic Demand

Peak domestic demand (taken as the peak hour) for the portion of the network being designed shall be determined by:

- An allowance of 400L/person/day with not less than 2.69 persons/HEU unless a different figure is agreed with, or required by, Council for a specific situation, plus:
- An allowance of 400 L/day for irrigation for each HEU
- A peak factor of 5 being applied to both of the above
- The demand being not less than the Peak Annual Demand (L/s) defined in Appendix K of *SNZ PAS 4509:2008 "New Zealand Fire Service Firefighting Water Supplies Code of Practice"*. For the information of designers, this criteria is likely to determine design demand for catchments of less than 200 HEU
- For small developments the peak demand per household may be derived from the Appendix K formula for 10 dwellings i.e. 15.3 L/minute/HEU

B. Combined Fire and Domestic Demand

Peak combined fire and domestic demand for the portion of the network being designed shall be determined by:

- The fire flow required by Tables 1 and 2 of *SNZ PAS 4509:2008 "New Zealand Fire Service Firefighting Water Supplies Code of Practice"* plus
- Two thirds of the peak domestic demand as defined in A. above. For the information of designers, the Appendix K flow is likely to be critical for catchments of less than 200 HEU.
- The residual pressure at this demand shall not be less than 100kPa anywhere in the network.

COMMERCIAL AND INDUSTRIAL AREAS

Commercial and industrial areas (including schools, shopping centres and medical facilities and intensive residential developments) can have widely varying water demands depending on the type of development undertaken. However they are also subject to re-development and changes in use and the water infrastructure must be able to accommodate reasonably anticipated changes without major re-work.

Designers must assess the likely demand for a particular proposal and design for that. However such design shall not be less than the following:

Type of Development (examples)	Fire Flow Classification	Normal Consumption : Peak hourly design flow (L/s/ha)
Intensive residential (>50 persons/ha)	Minimum FW2	Not less than 1.0 or Residential Area design. Specific assessment required
Schools, small shopping areas	Minimum FW3	1.0
Suburban commercial, light industrial areas, neighbourhood centres	Minimum FW4	1.00
Town centres, large commercial complex and industrial sites	Minimum FW5	2.00

RURAL WATER SUPPLIES

Where development is not connected to a TDC rural water supply network, it is not a requirement to install a water supply scheme. Roof water supply is considered an acceptable option in rural areas and it will be the homeowner's responsibility to ensure the adequacy of this at the time of house construction. If however the developer chooses to install a reticulated water supply at the time of subdivision, the water reticulated shall be demonstrated to comply with *DWSNZ* (Drinking Water standards for New Zealand) current at the time. Evidence to this effect shall be provided to TDC at the time of subdivision, including water tests and evidence of compliance with any other regulations, such as registration as a Community Water Supply with the Health Department. If the domestic water supply needs treatment to meet DWSNZ , this treatment shall be installed, tested to demonstrate compliance and a Consent Notice registered on the titles of the affected properties identifying the exceedences and requiring the ongoing maintenance of the treatment system.

Where a development is connected to a TDC rural water supply new connections shall comply with the requirements of the scheme. This requires the provision of a standard TDC metered, flow-restricted water connection with backflow prevention. Minimum flowrate entitlement shall allow for 1,600 lit/day/residential site, plus a stock-watering entitlement (if applicable) of 130 lit/ha/day, or such other allocation as agreed with the Asset Manager.

Such flows shall be provided through a flow restrictor to an on-site tank such that the supply can be provided over a 24 hour period.

All sites shall have a minimum of 24 hours of water storage on site in addition to any storage required to manage daily peak demands.

Pressure:-

The maximum working pressure in any reticulated rural water supply shall be 1,500 kPa

Each site shall receive a pressure at the connection point of not less than 200 kPa.

FIRE SUPPLY

If the development is:

- outside an Urban Fire District and
- sites are less than 2,000 m^2 in area and
- dwellings could be grouped closer than 30m apart

then the water supply shall be designed to provide a fire supply in accordance with *SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice*. For such supplies the combined fire and consumptive demand shall use the design average restricted flow daily flow without reduction.

For developments in the *Low Density Residential Zone* "first aid" tanker filling points shall be provided not more than 500m apart on mains of not less than 100 mm nominal internal diameter.

For water supplies in rural areas there is no requirement to provide for fire-fighting in the network design. However it is recommended that fire appliance access and adequate onsite storage is provided, or a sprinkler system installed to meet the rural recommendations of *SNZ PAS 4509:2008*

15.0 **Clause 6.11.6** *Sizing of Mains*

Table 6.6: Note that single feed is limited to less than 40 sites unless there is special agreement with Council.

16.0 Additional Requirements

Work undertaken on Council owned roads and assets shall be undertaken in accordance with *National Code of Practice for Utilities' Access to the Transport Corridors (available from www.nzuag.org.nz), NZTA Code of Practice for Temporary Traffic Management (COPTTM), AS/NZS 2865 2001 Safe Working in a Confined Space & the Department of Labour's Code of Practise for Safety in Excavation and Shafts for Foundations*. This is available from www.osh.dol.govt.nz-order-catalogue/ excavation.pdf. A TDC *Works Approval Notice (WAN)* is also required.

SCHEDULE 7

TAUPO DISTRICT COUNCIL
VARIATIONS TO PART 7 NZS 4404:2004
LANDSCAPING DESIGN AND PRACTICE

Taupo District Council has adopted Part 7 of *NZS 4404:2204* with the following variations:

1. 7.3.1 Location

- Add 7.3.1.4

- Landscape design must be specific to each site and development. However, the expectation of any development or subdivision that vests public road or reserve in Council is that the comprehensive landscape plan will include provision for one tree or 6m^2 of garden per lot or title created unless otherwise approved.

2. 7.3.2 Tree/plant size

- Replace 7.3.2.2

  A landscape tree is one planted for individual effect rather than as part of a massed garden bed. The minimum planting size of a landscape tree is 2m tall at the time of planting with a trunk diameter of at least 50mm when measured at 1400mm. Local conditions of a site may require consideration of alternatives e.g. small, well hardened trees in an exposed site.

- Add 7.3.2.3

  Shrubs and ground cover plants shall be a minimum size of pb5 to pb8. Trees planted within garden beds shall be a minimum of pb40. All plants shall have well established root systems at the time of planting.

- Add 7.3.2.4

  Juvenile trees are defined and specified at 7.4.5. Specimen trees are larger than juvenile trees and shall be a minimum size of pb150 at planting.

3. Amend 7.3.3.2(d) to read:

   Non-suckering or seeding habit

4. Add to Clause 7.4 Construction

   A refundable cash bond of 200% of the agreed value of the landscaping works will be required unless otherwise agreed.

5. Add to Clause 7.4.1.1

   They shall put in place a monitoring system to ensure that appropriate maintenance and replacement is undertaken and shall be responsible for arranging a final inspection by Council's Parks Operations manager at the end of the maintenance period to get sign-off of practical completion.

6. Add to Clause 7.4.2.1

   Where top-soil has been stock-piled it must be tested and treated before use to rectify pH and fertility imbalances.

7. Amend Clause 7.4.5.4 (b) to read:

   Ground shall be cultivated to a minimum depth of 2.5 times the diameter of the plant container to break up any compaction and fracture subsoil to improve drainage. Any tree pit within 1.5m of services, footpaths or kerbs must include an approved root barrier to direct roots to a depth of at least 600mm below ground level.

8. Amend Clause 7.4.5.4(d) to read:

   Where tree pits are excavated into pumice soils they are to be back-filled to finished ground level with fresh top-soil.

9. Amend Clause 7.4.5.4(e) to read:

   Each tree shall be fertilised with a minimum of 15g of slow release fertiliser.

SCHEDULE 8

TAUPO DISTRICT COUNCIL
VARIATIONS TO *PART 8 NZS 4404:2004 RESERVES*

Taupo District Council has adopted Part 8 of *NZS 4404:2004* with the following variations:

1. 8.3.6 Pedestrian accessways

- Replace the existing paragraph with the following:

  Pedestrian linkages are to be provided to facilitate safe pedestrian and cycle movement through neighbourhoods, and to create a more permeable, open space environment. Linkages may be provided that either:

  (i) Provide a short, direct route between streets (local purpose (accessway) reserves). Such pedestrian accessways are to be provided in accordance with 3.3.12 except that they are to be a minimum of 6 metres in width with a central permanently surfaced (concrete, pavers or asphaltic concrete) shared path a minimum of 2.2 metres in width. The developer is responsible for signage of the shared paths. The length of a pedestrian accessway must be no more than five times its width at the narrowest point. Boundary fencing shall be in accordance with 8.3.8 Fencing of reserves. Removable barriers shall be installed in accordance with Figure 3.7 to control vehicle access and allow maintenance.

  or

  (ii) Facilitate pedestrian and cycle movement and create a continuous, permeable, open space environment. Such linkage reserves are to be provided as local purpose (amenity) reserves and are to be no less than 12 metres in width with a permanently surfaced (concrete, pavers or asphaltic concrete) shared path a minimum of 2.2 metres in width. Such reserves may contain landscaping at a suitable safe distance from paths and boundaries. Paths should be no closer than 2 metres from boundaries. The developer is responsible for signage of the shared paths. Fencing shall be in accordance with 8.3.8 fencing of reserves.

  and must have the agreement of Council Transportation and Reserves officers.

2. 8.3.7 Presentation of Reserves

- Replace paragraph (c) with the following:

  Land is to be accessible and of a suitable contour and vegetative cover to allow ongoing maintenance. All turf cover must be established in accordance with 8.3.9 Grassing of reserves, and have a gradient no steeper than 1:4 to allow mowing. Steeper areas that are not suitable for mowing must be established in low maintenance shrubs and trees in accordance with Part 7 of this standard unless otherwise agreed. All grassed areas must be sufficiently well drained to allow vehicle access. Permanently wet areas that are not suitable for mowing must be established in suitable wetland vegetation.

- Add to paragraph (d)

  A marker post at least 10cm in cross section and 600mm above ground level with a TDC reserve boundary marker attached is to be erected against the reserve face of each reserve boundary peg. TDC boundary marker to be provided by TDC.

- Add 8.3.7 (g)

All contaminated sites must have been identified and remediated to Council's satisfaction.

3. 8.3.8 Fencing of Reserves

- Add the following to paragraph (a).

  The covenant will also specify that fencing on the boundary with the reserve shall be in accordance with the following table:

Height Above Ground Level	Close boarded	Visually permeable*
Passive reserve	900mm	1200mm
Active or linkage reserve	1200mm	1500mm

  *Visually permeable means that fence materials comprise less than 50% of the fence surface.

- Replace paragraph (b) with:

  A fence is to be erected in accordance with the above table for urban areas, or in the case of reserves in a rural area, in accordance with figure 8.2. A fencing covenant in accordance with the criteria outlined in paragraph (a) is also required.

4. Add 8.3.9 Grassing of Reserves

Establishment of a suitable turf cover is a critical aspect of reserve development. Most reserves that are set aside for recreation or local purposes require grass as a surface for active and passive recreation, and stormwater attenuation. If turf is not established correctly, particularly on Taupo pumice soils, it will fail to thrive and will not perform its function adequately.

Grass is to be established in accordance with the following requirements:

a) Grass establishment should be undertaken at a time of year when there is likely to be sufficient moisture for grass growth and frosts are not anticipated until grass has established. If seasonal weather conditions are not suitable for grass growth, then establishment may need to be delayed or additional steps taken to protect the new grass. Turf that has not established in accordance with performance measures by the end of the maintenance period may need to be resown or relaid.
b) Prepare seedbed by removing existing topsoil and ripping the subgrade to a minimum depth of 400mm to alleviate surface compaction. Debris is to be removed and the subsoil surface levelled with light machinery prior to spreading topsoil.
c) Good quality topsoil (source and quality to be approved by TDC Parks Operations Manager prior to spreading) is to be evenly spread over the entire area to a minimum depth of 200 mm. Topsoil which has been stockpiled must be prepared for use as a seedbed by aeration, pH correction and fertility correction as necessary.
d) The topsoil is to be power harrowed to get a suitable seed bed tilth. Harrowing must not result in the mixing of topsoil and subsoil.
e) Grass seed is to be certified and approved by TDC Parks Operations Manager prior to sowing.
f) The grass seed mix recommended for reserves is:

Species	Recreation and amenity reserves		Stormwater gully floors	
	Parts	Percent	Parts	Percent
Chewings fescue	2	25	3	40
Crested Dogstail	1	10	1	15
Browntop	0.5	5	1	15
Amenity Rye (perennial)	5	60	n/a	n/a
Hybrid pasture Rye	n/a	n/a	2	25
Clover	n/a	n/a	0.5	5

g) Hybrid pasture rye and clover are suitable for stormwater reserves but must not be sown in recreational areas.
h) The rate of application is 350kg/ha on stormwater reserves and lots, and 400kg/ha on recreation reserves.
i) Grass seed is to be evenly sown in two directions at right angles and followed by a Cambridge roller to bed the seed in place.
j) Grassed areas must be fertilised at the time of sowing and again one month after germination. Prior to application of fertiliser the topsoil must be tested to determine any deficiencies or specific requirements for turf establishment. If soil fertility and pH are adequate, Serpentine Super at a rate of 250 kg/ha is suitable for the initial sowing, and Nitrophoska Blue at 250 kg/ha for later applications.
k) All grassed areas are to be maintained until grass has established and any maintenance period is complete. Any erosion channels and bare areas are to be repaired and resown. Grass shall be mown regularly to improve the density of turf and prevent the establishment of weeds. Grass should not exceed 100mm in height during establishment, and must not be cut by more than one third its height in any one cut.
l) Watering may be required during prolonged dry periods to assist germination and prevent dessication of seedlings.
m) Weeds such as broom, thistles, gorse, blackberry, dock, flatweeds and other plant pests or weeds that will compromise the amenity and utility of turf must be controlled in new turf.

SCHEDULE 9

TAUPO DISTRICT COUNCIL

ALTERED REQUIREMENTS TO

PART 9 NZS 4404: 2004 POWER, TELECOMMUNICATION, GAS

The Taupo District Council has adopted Part 9 of *NZS 4404:2004* with the following additions and/or alterations:

1. Clause 9.3.2 *Utilities above ground*

- Add the following:

  Where approval is given to the erection of overhead reticulation, all poles shall be located as close as practical to the road boundary.

  In rural areas, poles should be located outside of the road reserve or if not possible as close to the edge of the road reserve as possible.

  Where possible surface plant associated with a utility reticulation shall be located on sites outside of the road reserve. Such sites may be vested as localised road widening or may remain as separate sites owned by the utility operator.

  Plant associated with utility reticulation may be placed in the street provided that :

  i] it can be contained within the spread of alignment allocated to the utility and does not encroach onto any adjacent alignment;

  ii] it can be located in unallocated space adjacent to a street boundary and within 900mm of that boundary;

  iii] it does not obstruct the free flow of pedestrians or access to sites;

  iv] it does not impinge on visibility requirements at any intersection or property access;

  v] it does not impact detrimentally on any existing frontage.

2. Clause 9.4.3 *Conversion to underground on existing services*

- Add the following:

  When development occurs in a future urban area there would normally be a requirement to underground existing overhead lines.

3. Clause 9.4.5.1 *Position in the Street*

- Add the following

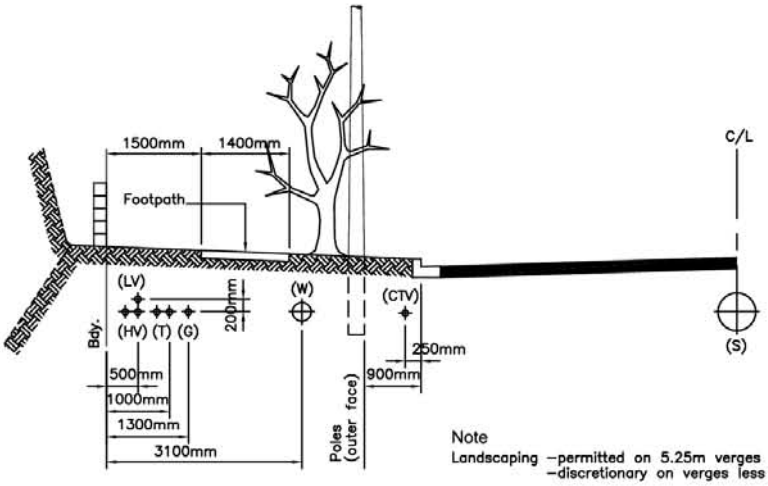
- Utilities in new residential, commercial and industrial areas shall be underground. See Taupo District Council drawing appended alignment of utility-services for recommended

position of services within the road reserve. Alternative positions may be acceptable if approved by the Council and Utility Companies.

4. Clause 9.4.7 *(new clause) certification*

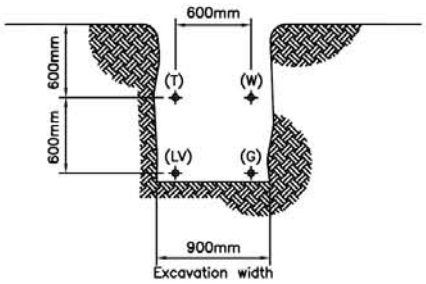
- Where new reticulation is provided, the developer shall supply a certificate from the network company confirming the work has been completed to the requirements and that the service is available when requested.

Reference shall be made to the *National Code of Practice for Utilities Access to the Transport Corridors; 2009* (available from www.nzuag.org.nz), particularly where utilities works are being undertaken in existing public roadways. Council has adopted this Code and any requirements must be complied with as part of development works.



Note
Landscaping –permitted on 5.25m verges
–discretionary on verges less than 5.25m

HV/T overlay alignments should be ducted at time of initial constructiuon



Common Trench Alignments

FOR ACCESS LOTS & SIMILAR

Legend
(LV) Low voltage power
(G) Gas
(W) Water
(HV) High voltage power
(T) Telecom
(S) Stormwater

Taupo District Council

ALIGNMENT FOR UTILITY SERVICES

July 2009

Plan 15